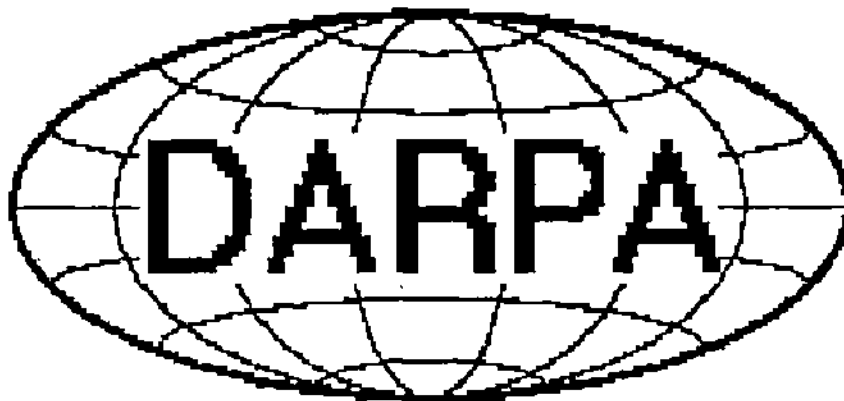


AO HISTORY

1- LINERS



DEFENSE ADVANCED RESEARCH PROJECTS AGENCY

PREPARED BY POLARIS, INC.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1	0	0					\$18,820,000
TITLE: FOUR SPACE VEHICLES							
2	0	0					\$9,439,591
TITLE: THREE LUNAR PROBES							
3	0	0					\$399,504
TITLE: GROUND SCANNING FOR LUNAR PROBES							
4	0	0					\$8,912,680
TITLE: ARGUS							
5	0	0					\$3,820,039
TITLE: FEASIBILITY STUDIES							
5	0	1					\$0
5	0	2					\$0
5	0	3					\$29,906
TITLE: SYMPOSIUM ON SPACE MEDICINE							
5	0	4					\$0
5	0	5					\$0
5	0	6	10/01/58	11/30/58	GD(GEN ATOMIC)	NONR-2786(00)	\$84,000
5	0	7					\$279,757
TITLE: ADVANCED PROPULSION RESEARCH							
5	0	8					\$130,650
TITLE: PLASMA ACCELERATION STUDIES							
5	0	9		12/31/60	GEN. DYNAMICS	NONR-2953(00)	\$99,706
TITLE: HUMAN ELEMENTS IN BMD							
DESCRIPTION: Investigating the role the human can play in high speed complex ballistic missile systems in decision making.							
REMARKS: PROG: BMD - Techniques and Devices - Radar.							
5	0	10					\$103,150
TITLE: TWO SPACE POWER STUDIES							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
5	0	11					\$0
5	0	12					\$0
5	0	13	10/01/58	09/30/66	STANFORD RES.IN.	NONR-2728(00)	\$1,266,000
5	0	14		09/30/60	WESTINGHOUSE	NONR-2584(00)	\$226,000
5	0	15		06/30/58	STANFORD RES.	NONR-2588(00)	\$234,000
5	0	16	06/01/59	02/29/60	SEE BELOW	SEE BELOW	\$1,635,754
6	0	0					\$14,668,949

TITLE: FEASIBILITY STUDIES

6	0	1	06/16/58	04/11/60	RCA	AF18(600)-1804	\$348,000
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TITLE: Satellite Defense Study.

DESCRIPTION: A study of weapon systems to combat hostile satellites with the following options (a) ballistic missile type intercept trajectory with large warhead vehicle; (b) orbiting intercept system which matches velocity vector and chooses time and place; (c) patrol type system.

REMARKS: PROG: BMD - System Studies - Satellite Defense.

REF: Final Report, "Satellite Intercept Study," Report ARDC TR-59-3, CR-58-588, 1/31/59 (S/RD). See also AO 6 Task 32.

See also AO 6, Task 32.

6	0	2	07/01/62	09/30/63	GE	AF19(628)-207	\$538,870
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TITLE: Investigation of Nuclear Detonation on Offensive and Defensive Missile Systems.

DESCRIPTION: Task 1 - Study of high altitude burst as a penetration aid.
Task 2 - Study of the low altitude fireball effects on defense.
Task 3 - Compilation of nuclear detonation effects on hard point defense.

RESULTS: See reference below.

REMARKS: PROG: BMD - Techniques & Devices - Nuclear Effects - Hard Point Defense.

AFCRL-62-371(1), R62 TMP-50-(1), "Investigation of Effects of High Altitude Nuclear Detonations on Propagation of Electromagnetic Waves", 6/1/62 (S/RD).
Amendments 62, 66 and 68.
Continued under AO 491.

6	0	3					\$2,320,653
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TITLE: STUDY OF NUCLEAR-PULSE-PROPELLED SPACE VEHICLE

6	0	4					\$0
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
6	0	5	03/16/59	05/15/60	GE	AF29(601)-1891	\$225,000

TITLE: Nuclear Effects in the Upper Atmosphere and Effects on EM Propagation.

DESCRIPTION: A study of the basic physical mechanisms that cause ionization of the atmosphere and interference with the propagation of EM energy (HF thru UHF).

REMARKS: PROG: BMD - Gen. Research - Nuclear Effects - HF to UHF Propagation.
See also AO 6 T33; AO 6 T34; AO 6 T35; AO 6 T36; AO 6 T37; AO 6 T38; AO 6 T39;
AO 6 T40; AO 6 T41; AO 6 T42; AO 6 T43.

6	0	6					\$759,456
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TITLE: DECOY DISCRIMINATION

6	0	7	01/01/59	07/01/60	LOCKHEED AIRCRAF	AF 18(600)-1847	\$592,716
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TITLE: Satellite-Based Infrared Tracking/AICBM System Study (INSATRAC/AICBM)

DESCRIPTION: Investigation of satellite-based infrared tracking of ICBM launch phase and AICBM/AIRBM ground based systems that used satellite track data. Included system analyses and initial computation rocket-flame and background radiation data. Also initial orbited boost intercept system study (BAMBI).

RESULTS: See final report.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - INSATRAC/AICBM STUDY - BAMBI
REF: Final Report, ARDC-TR-59-8, 8/25/60

6	0	8					\$370,448
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TITLE: ADVANCED PROPULSION RESEARCH

6	0	9					\$0
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6	0	10	11/01/59	02/01/62	HUGHES AIRCRAFT	AF33(616)-6982	\$590,984
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TITLE: Midcourse Discrimination Study.

DESCRIPTION: Study of midcourse discrimination by IR techniques. An extension in which a survey investigation and evaluation of other phenomena could be used for midcourse discrimination.

REMARKS: PROG: BMD - System Studies - Midcourse Discrimination.
REF: IR Concepts: Final Report, AF33(616)-6982, WADD-TR-60-805, Nov. 1960
Other Phenomena: Final Report AF33(616)-8131, ASD-TR-62-160
(2 volumes), 1/1/62.

6	0	11					\$2,710,030
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TITLE: SPACE PROPULSION STUDIES

6	0	12	05/14/59	06/01/62	TRG	AF49(638)-673	\$2,253,350
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AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: Development and Evaluation of Laser Devices.

DESCRIPTION: Development of working models of laser devices and theoretical prediction and experimental verification of their performance.

REMARKS: PROG: BMD - Techniques & Devices - Laser Research.
This was continued under AO 356 on 6/1/62.
See also AO 676, F29601-67-C-0030.

6	0	13	10/01/59	10/01/61	WARNER/SWASEY CO AF19(604)-6106	\$300,887
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TITLE: INFRARED LABORATORY MEASUREMENTS OF FLAMES.

DESCRIPTION: THE IR RADIANCE MEASUREMENTS OF FLAMES AS A FUNCTION OF TEMPERATURE, FUELS, COMBUSTION CONDITIONS REPRESENTATIVE OF CURRENT AND FUTURE BALLISTIC MISSILE PROPULSION TO PERMIT EXTRAPOLATION AND INTERPOLATION OF FULL-SCALE IR TEST MEASUREMENTS.

REMARKS: PROG: BMD - GENERAL RESEARCH IN INFRARED MEASUREMENTS IN SUPPORT OF IR EARLY WARNING SYSTEMS.
MISC: CONTINUED UNDER NONR-3657(00), AO237 T12, 11/61.

6	0	14				\$1,005,173
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TITLE: SIX SPACE POWER STUDIES

6	0	15	10/30/59	04/30/60	DOUGLAS AIRCRAFT AF33(616)-6808	\$247,853
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TITLE: Missile Early Warning Studies.

DESCRIPTION: Study of concepts to provide global, reliable earliest possible warning of a mass ballistic missile attack that could be operational by 1962.

RESULTS: Study was made but concept could not be implemented by the 1962 operational dead line.

REMARKS: PROG: BMD - System Studies - Missile Early Warning.
REF: SM-37494 and SM-37495, 4/1/60.
Parallel study was made by Ramo-Wooldridge, see AO 6 T31.

6	0	16	01/04/60	01/04/61	GEN. ELECTRIC AF33(616)-6876	\$245,514
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TITLE: SATELLITE-BORNE RADAR TRACKING SYSTEM

DESCRIPTION: Investigation of techniques suitable for a satellite-borne radar for tracking ballistic missiles after initial IR acquisition.

RESULTS: See final report.

REMARKS: PROG: BMD - Techniques & Devices - Radar - Satellite-Borne.
REF: Final Tech. Summary Report, "Satellite-Borne Radar Tracking System Study," Report No. CH-CPR-747, 1/1/61 (S).

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
6	0	17					\$151,478

TITLE: RECOVERABLE BOOSTER SYSTEM

6	0	18	02/01/60	11/01/61	ELECTRO-MAG RES	AF19(604)-6656	\$85,000
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TITLE: DESIGN OF A SATELLITE BASED IONOSPHERIC PROBE.

DESCRIPTION: TO DESIGN AN ANTENNA PROBE SYSTEM FOR INSTALLATION ON A SATELLITE FOR MEASUREMENT OF IONOSPHERIC PARAMETERS.

RESULTS: A PROBE SYSTEM WAS DESIGN CAPABLE OF MEASURING IONOSPHERIC PARAMETERS UP TO AN ALTITUDE OF 1000 MILES.

REMARKS: PROG: BMD - GENERAL RESEARCH ON THE IONOSPHERE IN SUPPORT OF LAUNCH, MID-COURSE AND REENTRY PHASES.

REF: AFCRL-1096, NO. CCC-6656-4, FINAL RPT, 30 NOV 1961.

6	0	19	05/01/59	08/01/60	MELPAR	AF30(602)-2123	\$60,000
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TITLE: RADAR MEASUREMENTS OF BALLISTIC ORBITS

DESCRIPTION: TO STUDY A METHOD FOR IMPROVING THE ACCURACY OF RADAR MEASUREMENTS OF THE PARAMETERS OF BALLISTIC ORBITS THROUGH TRANSMITTER RADAR WAVEFORM OPTIMIZATION.

REMARKS: PROG: BMD - TECHS & DEVICES - RADAR.

6	0	20					\$52,951
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TITLE: SPECTRAL ANALYSIS OF IR

6	0	21					\$380,160
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TITLE: KILL MECHANISMS STUDY

6	0	22					\$2,424,100
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TITLE: NUCLEAR EFFECTS STUDIES

6	0	23	03/01/60	07/01/61	HUGHES AIRCRAFT	AF 29(601)-2538	\$59,000
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TITLE: NUCLEAR BURST INDUCED TRANSIENT EFFECTS ON ELECTRONIC CIRCUITS.

DESCRIPTION: THE INVESTIGATION OF THE FEASIBILITY OF PREDICTING THE EFFECTS OF PULSE RADIATION FROM A NUCLEAR BURST ON SIMPLE ELECTRONIC CIRCUITS.

RESULTS: ANALOG COMPUTER TECHNIQUES CAN BE USED TO DETERMINE SIGNAL LEVEL CHANGE, RECOVERY TIME AND PHASE SHIFT IN LINEAR AMPLIFIERS; ALSO CHANGES IN SEMICONDUCTOR DIODE DETECTORS AND MULTIVIBRATORS WERE DETERMINED.

REMARKS: PROG: BMD - GENERAL RESEARCH ON NUCLEAR EFFECTS PERTINENT TO BALLISTIC MISSILE DEFENSE

REF: FINAL REPORT, AFSWC-TR-61-40, "THEORETICAL STUDY OF BURST INDUCED TRAN-

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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SCIENT RADIATION EFFECTS IN BASIC ELECTRONIC CIRCUITS", (u) 15 MAY 61.
NOTE: WRITTEN AS AO 6, T22B.

6	0	24	02/01/60	05/01/61	AEROJET GEN CORP AF 29(601)-2552	\$90,000
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TITLE: STUDY TO DETERMINE FEASIBILITY OF SIMULATING X-RAYS

DESCRIPTION: TO ESTABLISH THE FEASIBILITY OF USING EXPLOSIVE-TYPE D.C. GENERATOR AS AN ENERGY SOURCE FOR A PLASMA GUN THAT COULD SIMULATE X-RAY EFFECTS.

RESULTS: THE FEASIBILITY STUDY INDICATED POWER SOURCES FOR PLASMA ACCELERATORS CAPABLE OF DELIVERING ENERGY DENSITIES OF TENS OF KILOJOULES/CM² OVER AN AREA OF A FEW SQUARE CENTIMETERS WERE POSSIBLE.

REMARKS: PROG: BMD - GENERAL RESEARCH ON NUCLEAR EFFECTS PERTINENT TO BALLISTIC MISSILE DEFENSE.

NOTE: WRITTEN AS AO 6, TASK 22C

6	0	25	05/01/60	12/01/61	REPUBLIC AV. AF 29(601)-2792	\$49,000
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TITLE: A STUDY IN PLASMA CYCLOTRON RADIATION

DESCRIPTION: A GENERAL STUDY OF THE PHYSICS OF RELATIVISTIC ELECTRONS FROM A NUCLEAR BURST WHICH ARE TRAPPED IN THE GEOMAGNETIC FIELD.

RESULTS: CHARACTERISTICS OF THE PHENOMENA SUCH AS ELECTRON DISTRIBUTION, RADIATION INTENSITIES, RESTRICTED REGIONS OF OBSERVABILITY ARE DERIVED AND SUMMARIZED.

REMARKS: PROG: BMD - GENERAL RESEARCH ON NUCLEAR EFFECTS PERTINENT TO BALLISTIC MISSILE DEFENSE.

REF: FINAL RPT, AFSWC-TR-61-71, "A STUDY OF PLASMA CYCLOTRON RADIATION", VOL. I AND II, DEC 1961 (S).

NOTE: WRITTEN AS AO 6, TASK 22D.

6	0	26	05/01/60	08/01/62	RCA AF 29(601)-2806	\$110,000
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TITLE: DESIGN OF HIGH ENERGY FAST PULSE SYSTEM

DESCRIPTION: TO DESIGN A SYSTEM WHICH WOULD TRANSFER STORED ENERGY (200,000 - 1,000,000 JOULES) INTO A VERY SMALL WIRE WITHIN 0.5×10^{-8} SECONDS.

REMARKS: PROG: BMD - GENERAL RESEARCH ON NUCLEAR EFFECTS PERTINENT TO BALLISTIC MISSILE DEFENSE.

REF: FINAL RPT, AFSWC-TDR-62-84, "HIGH ENERGY FAST PULSE SYSTEM THEORETICAL STUDY AND EXPERIMENTAL PROGRAM", AUG 1962.

NOTE: WRITTEN AS AO 6, TSK 22E.

6	0	27	06/01/61	04/01/65	AERONUTRONIC AF 29(601)-6005	\$66,000
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TITLE: NUCLEAR WEAPON EFFECTS COMPUTER CODES

DESCRIPTION: TO DEVELOP AND MODIFY COMPUTER CODES FOR THE AFSWC CDC 1604 COMPUTER TO ANALYZE VARIOUS NUCLEAR WEAPON EFFECTS. CODES INCLUDED A FAST RUNNING ONE-D HYDRODYNAMIC CODE, A 2-D HYDROMAGNETIC CODE AND A 1-D RADIATION TRANSPORT-

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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HYDRODYNAMICS CODE.

REMARKS: PROG: BMD - GENERAL RESEARCH ON NUCLEAR EFFECTS PERTINENT TO BALLISTIC MISSILE DEFENSE.

REF: "THE PUFF-VTS COMPUTER PROGRAM (U)", AFSWC-TDR-62-72, FEB 1963 (C);
"THE ROC-VTS COMPUTER PROGRAM," AFSWC-TDR-62-114, JULY 1963 (U).

MISC: (1) EXTENSION OF AF 29(601)-4545.

NOTE: WRITTEN AS AO 6, TASK 22F.

6	0	28	07/01/61	05/01/62	FIELD EMISSION	AF 29(601)-4568	\$27,000
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TITLE: DESIGN OF A CAPACITIVE ENERGY STORAGE SYSTEM

DESCRIPTION: TO DESIGN AN ELECTRONIC SYSTEM CAPABLE OF DELIVERING 100-10,000 JOULES OF STORED ENERGY IN A PULSE 50 NANOSECONDS LENGTH HAVING A RISE TIME OF 8 NANOSECONDS. ALSO, DIAGNOSTIC INSTRUMENTATION TO DETERMINE THE SYSTEM PARAMETERS.

REMARKS: PROG: BMD - GENERAL RESEARCH ON NUCLEAR EFFECTS PERTINENT TO BALLISTIC MISSILE DEFENSE.

REF: AFSWC-TDR-62-55, MAY 1962, "DESIGN OF A HIGH-SPEED CAPACITIVE ENERGY STORAGE SYSTEM."

NOTE: WRITTEN AS AO 6, TASK 22G.

6	0	29	08/01/61	11/01/62	HUGHES AIRCRAFT	AF 29(601)-4743	\$90,000
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TITLE: NUCLEAR BURST INDUCED TRANSIENT EFFECTS ON ELECTRONIC CIRCUITS

DESCRIPTION: THE INVESTIGATION OF THE FEASIBILITY OF PREDICTING THE EFFECTS OF PULSE RADIATION FROM A NUCLEAR BURST ON SIMPLE ELECTRONIC CIRCUITS. THIS WAS A CONTINUATION OF AO 6, T22B (T23) AND ADDED THE STUDY OF A WEIN-BRIDGE OSCILLATOR AND 90 DEGREE PHASE SHIFT AMPLIFIER.

REMARKS: PROG: BMD - GENERAL RESEARCH ON NUCLEAR EFFECTS PERTINENT TO BALLISTIC MISSILE DEFENSE.

REF: AFSWC-TDR-62-118 (U); AFSWC-TDR-62-118 SUPPLEMENT (SD-R/D), JAN 1963.

MISC: (1) EXTENSION OF AO 6, T22B, (T23), AF 29(601)-2538.

NOTE: WRITTEN AS AO 6, TASK 22H.

6	0	30	05/01/64	03/01/65	AERONUTRONIC	AF 29(601)-6419	\$0
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TITLE: NUCLEAR WEAPONS RADIATION TRANSPORT - HYDRODYNAMIC CODE (RAINBOW CODE)

DESCRIPTION: REVISION OF THE RADIATION TRANSPORT-HYDRODYNAMIC CODE TO RUN ON CDC-1604 COMPUTER AND MODIFICATION TO INCLUDE SCATTERING AND COMPATIBILITY WITH OTHER AFWL ROUTINES.

REMARKS: PROG: BMD - GENERAL RESEARCH ON NUCLEAR EFFECTS PERTINENT TO BALLISTIC MISSILE DEFENSE.

MISC: (1) RELATED TO AO 6, T22F (T27), AF29(601)-6005.

NOTE: WRITTEN AS AO 6, TASK 22I.

6	0	31	10/30/59	04/30/60	RAMO-WOOLDRIDGE	AF33(616)-6809	\$227,256
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TITLE: Missile Early Warning Study.

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: Study of concept to provide global, reliable earliest possible warning of a mass ballistic missile attack that could be operational by 1962.

RESULTS: Study was made but concept could not be implemented by the 1962 operational deadline.

REMARKS: PROG: BMD - System Studies - Missile Early Warning.
 REF: Final Report C98-0535, Vols. I & II, 4/1/60.
 Parallel study by Douglas Aircraft, see AO 6 T15.
 Note: Written as AO 6, Task 15B.

6	0	32	06/16/58 04/11/60	CONVAIR	AF18(600)-1807	\$112,000
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TITLE: Satellite Defense Study.

REMARKS: PROG: BMD - System Studies - Satellite Defense.
 REF: Final Report, "Satellite Interceptor Study," Report Z0-P-038, TR-59-2, Volumes I, II, and III, 1/1/59 (S)
 See also AO 6, T1.
 Note: Written as AO 6, T 18.

6	0	33	06/01/59 07/30/60	AVCO	AF29(601)-1985	\$34,819
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TITLE: Study of Spontaneous Ionospheric Disturbances.

DESCRIPTION: Theoretical study of D region ionization processes under normal and disturbed conditions including solar events and nuclear explosions.

REMARKS: MISC: Continued under AO 6, Task 34 AF19(604)-8058.
 Note: Written as AO 6, Task 5A.

6	0	34	03/01/61 11/30/62	AVCO	AF19(604)-8058	\$50,000
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TITLE: Prompt Effects of High Altitude Nuclear Detonations on the Ionosphere.

DESCRIPTION: The initial effects of a high altitude nuclear detonation on the ionosphere are similar to the initial effects produced by a solar flare. Under this program the reflection and penetration of VLF radio waves in the ionosphere was observed during solar flares. Additional characteristics of the ionosphere were obtained by reometers. Experimental results were compared with theory.

REMARKS: PROG: BMD - General research in support of nuclear effects program.
 REF: Final Report - AFCRL-63-213, RAD-TR-62-58, 11 February 1963.
 Note: Written as AO 6, Task 5B.

6	0	35	06/01/59 07/30/60	SRI	AF29(601)-1994	\$42,000
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6	0	36	02/01/61 03/30/63	SRI	AF19(604)-8355	\$59,000
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TITLE: Determination of Ionospheric Recombination Coefficients.

DESCRIPTION: To investigate the feasibility of determining electron production and removal processes in the upper atmosphere using ionospheric research techniques;

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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estimated the accuracy and applicability of man-made ionization to the reaction rates determined from measurements, and recommended additional experiments to complete the list of reaction rates under normal and disturbed conditions.

REMARKS: PROG: BMD - General research in support of nuclear effects studies related to ballistic missile defense.

REF: Final Report, SRI Project No. PAU-3624, "Ionization and De-Ionization in the Lower Ionosphere," March 31, 1963.

Note: Written as AO 6, Task 5D.

6	0	37	12/01/59	01/30/61	RADIATION INC.	AF29(601)-2348	\$37,000
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TITLE: Study of the Applicability of Van Allen Belt Radiation to Project ARGUS (nuclear test).

DESCRIPTION: (a) A theoretical study of Van Allen belt radiation and the relationship between Van Allen radiation and Project ARGUS-type injection.
(b) Design of experimental program to obtain the parameters of Van Allen radiation to complete (a).

REMARKS: PROG: BMD - General research in support of nuclear effects studies related to ballistic missile defense.

Note: Written as AO 6, Task 5E.

6	0	38	01/02/60	05/30/61	HUGHES AIRCRAFT	AF29(601)-2370	\$35,000
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TITLE: Study of Relativistic Electrons Trapped in the Earth's Magnetic Field.

DESCRIPTION: The design of a laboratory experiment to simulate the behavior of relativistic electrons trapped in the earth's magnetic field as perturbed by natural and nuclear detonations.

REMARKS: PROG: BMD - General research in support of nuclear effects studies applicable to ballistic missile defense.

Note: Written as AO 6, Task 5F.

6	0	39	02/02/60	06/30/61	BOEING CO.	AF29(601)-2450	\$41,000
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TITLE: Design of an Experiment to Study Relativistic Electrons Trapped in the Earth's Magnetic Field.

DESCRIPTION: The design of a laboratory experiment to simulate the behavior of relativistic electrons trapped in the earth's magnetic field as perturbed by natural and nuclear detonations.

REMARKS: PROG: BMD - General research.

REF: Final Report, AFSWC-TR-62-21, "Laboratory Simulation of Geomagnetic Trapping of Electrons from Nuclear Explosions," April 1961 (S-R/D).

This was a parallel study to that done under AO 6, Task 5F (T38) Hughes Aircraft, AF29(601)-2370.

Note: Written as AO 6, Task 5G.

6	0	40	03/01/60	03/30/61	LOCKHEED AIRCRAFT	AF29(601)-2452	\$107,000
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	Initial	Final			
AO AND Task	Date	Date	Contractor	Contract Number	Total Funds

TITLE: Study of the Early History of a Nuclear Explosion.

DESCRIPTION: Investigation of phenomena associated with ARGUS and HARDTACK explosions including (a) bomb debris movement, (b) bomb debris effect on air through which it passed and radiation emitted by the air, (c) trapping of betas and (d) propagation of the hydromagnetic wave. A model for the numerical analysis of the formation of a magnetic bubble was developed and the laboratory simulation of some phenomena was considered.

REMARKS: PROG: BMD - General research on nuclear effects pertinent to ballistic missile defense.
REF: AFSWC-TR-61-27, "Theoretical Study of the Motion of Bomb Debris (U)," April 1961 (S-R/D)
Note: Written as AO 6, Task 5H.

6 0 41 03/01/60 06/30/61 LOCKHEED AIRCRAFT AF29(601)-2453 \$24,000

TITLE: Artificial Injection of Relativistic Electrons in the Earth's Magnetic Field.

DESCRIPTION: Investigation of the feasibility of injecting relativistic electrons by non-nuclear means in the earth's magnetic field to simulate the ARGUS effect and design of experiment to measure the success of the most feasible technique.

REMARKS: PROG: BMD - General research on nuclear effects pertinent to ballistic missile defense.
REF: AFSWC-TR-61-38, "Artificial Injection of Electrons into the Geomagnetic Field," dated May 1961 (U).
Note: Written as AO 6, Task 5I.

6 0 42 04/01/60 03/30/61 GEN. DYNAMICS AF29(601)-2768 \$40,000

TITLE: Emission of Gamma Radiation as a Function of Time After Photofission of Uranium.

DESCRIPTION: Analysis of experimental data of the absolute rate of emission of gamma radiation from fissioned uranium as a function of time (30 microsecond to 10 millisecond region).

REMARKS: PROG: BMD - General research on nuclear effects pertinent to ballistic missile defense.
REF: Final report, AFSWC-TR-61-10, "Emission of Gamma Radiation as a Function of Time After Photofission of U238," February 11, 1961.
Note: Written as AO 6, Task 5J.

6 0 43 06/01/60 12/30/62 ALLIED RESEARCH AF29(601)-2865 \$177,000

TITLE: Simulation of the Ionized Gas Shell Expansion of Nuclear Explosions (Project PUMPKIN).

DESCRIPTION: The design and fabrication of experimental apparatus for studying the expansion of a shell of ionized gas in a vacuum with an applied uniform magnetic field.

		Initial	Final			
AO	AMD	Task	Date	Date	Contractor	Contract Number
						Total Funds

RESULTS: Apparatus was designed, fabricated and delivered for installation to AFSWC late 1961.

REMARKS: PROG: BMD - General research on nuclear effects pertinent to ballistic missile defense.

Note: Written AS AO 6, Task 5K.

6	0	44	02/01/60	11/30/61	AM.MACHINE & FDY AF29(601)-2533	\$97,000
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TITLE: A Theoretical Study of Response to Impulsive Loading.

DESCRIPTION: (1) The formulation of equations governing the response to extremely high and impulsive pressure and temperature environments in terms of finite strain and irreversible thermodynamics.

(2) For sustained but time-dependent loads, a theoretical approach to the dynamic elastic plastic deformation of solids was developed using dislocation theory.

REMARKS: PROG: BMD - General research on nuclear effects pertinent to ballistic missile defense.

REF: Final Report, AFSWC-TR-61-67, "A Theoretical Study of Response to Impulse Loading."

Note: Written as AO 6, Task 22A.

6	0	45	06/01/59	09/30/60	TEXAS NUCLEAR CP AF29(601)-1967	\$99,000
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TITLE: Neutron and Gamma Rays for Neutron Induced Reactions in Elements.

DESCRIPTION: Experimental determination of number and energy level, as a function of angle, of the neutrons and gamma rays emitted when various elements were bombarded with neutron (1-14 mev energy level).

REMARKS: PROG: BMD - General research on nuclear effects pertinent to ballistic missile defense.

REF: Final Report, AFSWC-TR-60-30 APP-I, "A Study of Neutron and Gamma Rays from Neutron Induced Reactions in Several Elements (U)," 6/60 (S-R/D).

6	0	46	05/15/59	12/01/60	DIKEWOOD CORP. AF29(601)-1937	\$76,877
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TITLE: Feasibility of Decoy Discrimination Using Nuclear Weapons.

DESCRIPTION: A feasibility study of the use of the nuclear weapon to assist in decoy discrimination in ballistic missile defense. The contract coordinated and evaluated all the other efforts under AO 6.

REMARKS: PROG: BMD - General Research - Decoy Discrimination Using Nuclear Weapon Effects.

See also AO 6 T6 B, C, D, E, F, G, H (47 - 52).

Note: Written as AO 6, Task 6A.

6	0	47	06/01/59	09/01/60	GEN. DYNAMICS AF29(601)-1940	\$100,410
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TITLE: Feasibility of Using Gamma Rays for Decoy Discrimination.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: Investigation of the use of gamma rays produced by a nuclear explosion source to perform mass discrimination.

RESULTS: See final report.
This concept was determined to be unpromising.

REMARKS: PROG: BMD - General Research - Decoy Discrimination Using Nuclear Weapon Effects.

REF: Final Report, AFSWC-TR-60-32, "A Study to Determine the Feasibility of Using Gamma Rays for Decoy Discrimination (U)," 7/8/60 (S/RD).

See also AO 6 T6A,B,C,D,E,F,G,H (46,48-52).

Written as AO 6 T6B.

6	0	48	06/01/59	09/01/60	REPUBLIC AV.	AF29(601)-1942	\$74,188
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TITLE: Feasibility of Decoy Discrimination Using Re-Radiation Process and X-ray Momentum Transfer.

DESCRIPTION: Theoretical investigation of the feasibility of using the re-radiation process and x-ray momentum transfer to perform decoy discrimination.

REMARKS: PROG: BMD - General Research - Decoy Discrimination Using Nuclear Weapon Effects.

REF: Final Report, AFSWC-TR-60-33, "Research Studies on Decoy Discrimination (U)," 6/24/ (S/RD).

Note: Written as AO 6, T6C.

See also AO 6, T6 A,B,D,E,F,G,H (46, 47, 49-52).

6	0	49	06/01/59	08/01/60	ALLIED RESEARCH	AF29(60L)-1945	\$56,884
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TITLE: Decoy Discrimination by X-Ray Momentum Transfer.

DESCRIPTION: Parametric system study of performing decoy discrimination by using x-ray momentum transfer. Study considered threat, surface interaction, number of objects, spacing, ground-based sensor, etc.

RESULTS: See final report.
This concept was determined to be unpromising.

REMARKS: PROG: BMD - General Research - Decoy Discrimination Using Nuclear Weapon Effects.

REF: Final Report, AFSWC-TR-60-24, "Decoy Discrimination by X-Ray Momentum Transfer (U)," 6/1/60 (S/RD).

Note: Written as AO 6, Task 6D.

See also AO 6, T6 A,B,C,E,F,G,H (46-48, 50-52).

6	0	50	05/05/59	09/01/60	BENDIX AVIATION	AF29(601)-1950	\$57,720
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TITLE: Feasibility of Using Neutrons for Decoy Discrimination

DESCRIPTION: A study to determine the feasibility of using neutrons for decoy discrimination. Areas of consideration included background, geometrical considerations, detector and number of decoys and spacing.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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RESULTS: See final report.

This concept was determined to be unpromising.

REMARKS: PROG: BMD - General Research - Decoy Discrimination Using Nuclear Weapon Effects.

REF: Final Report, AFSWC-TR-60-31, "A Study to Determine the Feasibility of Using Neutrons for Decoy Discrimination," 7/26/60 (S/RD).

Note: Written as AO 6, Task 6E.

See also AO 6, T6 A,B,C,D,F,G,H (46-49, 51,52).

6	0	51	06/19/59	10/14/60	AM.SCIENCE & ENG AF29(60L)-1998	\$33,560
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TITLE: Decoy Discrimination Using Nuclear Weapon Effects.

DESCRIPTION: An investigation of the feasibility of using a nuclear burst to aid in discrimination against decoys. The effects of prompt gamma-rays, neutrons, and thermal X-rays were considered. Also, review of all previous X-ray studies.

REMARKS: PROG: BMD - General Research - Decoy Discrimination Using Nuclear Weapon Effects.

Note: Written as AO 6, Task 6G.

See also AO 6, Task 6 A,B,C,D,E,F,H (46-50, 52).

6	0	52	06/12/61	02/02/63	DIKEWOOD CORP.	\$0
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TITLE: Decoy Discrimination Using Nuclear Weapon Effects.

DESCRIPTION: The contract coordinated and reviewed seven contractors effects on decoy discrimination using nuclear weapon effects.

RESULTS: See final report.

This concept was determined to be unpromising.

REMARKS: PROG: BMD - General Research - Decoy Discrimination Using Nuclear Weapon Effects.

REF: AFSWC-TR-60-50, "Summary and Critique of Decoy Discrimination Studies Conducted Under ARPA Task 6."

Note: Written as AO 6, T6 H.

See also AO 6, T 6A,B,C,D,E,F (46-51).

6	0	53	09/15/60	12/29/61	GEN. DYNAMICS AF29(601)-3069	\$23,612
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TITLE: Theoretical Studies of the Motion of Bomb Debris

DESCRIPTION: The study of the motion of bomb debris as a function of time, yield and burst altitude. Times from seconds to minutes, yields of 1KT to 10MT and altitudes from sea level to 100KM were studied.

RESULTS: Models and codes were developed that contributed to the general nuclear effects code.

REMARKS: PROG: BMD - General Research - Nuclear Effects.

Note: Written as AO 6, T 5L.

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
6 0 54	01/15/61	10/31/62	GEN. ELECTRIC CO	AF29(601)-4194	\$126,000

TITLE: Study of Shock Produced Ionization From a High Altitude Nuclear Burst.

DESCRIPTION: Investigation and evaluation of blackout effects produced by the heating and ionization of the atmosphere caused by a nuclear detonation shock wave propagated down into the atmosphere.

RESULTS: See final report.

REMARKS: PROG: BMD - General Research - Nuclear Effects.

REF: Final Report, AFSWC-TDR-62-68, "Study of Shock Produced Ionization," 3/1/63 (S/RD).

Note: Written as AO 6, T5 M.

7 0 0					\$20,490,000
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TITLE: MINITRACK SYSTEM (SHEPHERD)

8 0 0					\$5,286,994
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TITLE: DOPPLER SYSTEM (SHEPHERD)

9 0 0					\$96,598,353
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TITLE: RECONNAISSANCE

10 0 0					\$7,924,339
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TITLE: METEOROLOGICAL PAYLOAD (TIROS)

11 0 0	08/01/58	12/01/58	RAND CORP.	AF49(638)-500	\$72,000
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TITLE: COLLECTION AND DISTRIBUTION OF HI-ALTITUDE NUCLEAR WEAPON EFFECTS INFORMATION (QUICK KEY)

DESCRIPTION: TO COLLECT AND DISTRIBUTE INFORMATION ON HIGH ALTITUDE ATMOSPHERIC NUCLEAR WEAPON EFFECTS INCLUDING MEASUREMENTS, RESULTS OF BASIC EXPERIMENTAL AND THEORETICAL WORK, IGY MEASUREMENTS, AND ANALYTICAL STUDIES.

REMARKS: REF: FINAL REPORT, "SUMMARY OF PROJECT QUICK KEY ACTIVITIES," R-334-ARPA, JAN 1959 (S-RD).

12 0 0					\$0
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TITLE: 100-FOOT INFLATABLE SPHERE

13 0 0	10/01/58	06/30/64	MIT-LL	AF19(628)-500	\$24,721,000
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TITLE: Re-entry Physics Program.

DESCRIPTION: Investigation of physical phenomena associated with re-entry into the atmosphere of bodies traveling at high speeds. Program included aero-

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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ballistic tunnel measurements at Ames and field experiments at Wallops.

REMARKS: PROG: BMD - Missile Phenomenology - Reentry Physics - Theory and Measurements
Extension of AF 19(604)-4557 and AF 19(604)-7400.

14	0	0					\$92,739,159
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TITLE: SATURN

15	0	0					\$4,973
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TITLE: COMPONENT DEVELOPMENT PROGRAM (LONGSIGHT)

16	0	0					\$4,463
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TITLE: SIX MODIFIED JUPITERS (TRIBE)

17	0	0					\$19,957,924
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TITLE: LAUNCH VEHICLES

17	0	1					\$3,567,205
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TITLE: ONE THOR-BASED VEHICLE FOR TIROS

17	0	2					\$1,708,000
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TITLE: UPPER STAGE VEHICLE AJ10-104

17	0	3					\$900,000
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TITLE: MODIFICATION OF BELL-HUSTLER STAGE

17	0	4					\$5,872,926
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TITLE: THOR-DELTA & THOR-104 FOR NAVIGATION SATELLITE

17	0	5					\$4,438,000
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TITLE: TWO THOR-104 VEHICLES FOR COURIER

17	0	6					\$3,371,793
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TITLE: TWO THOR-HUSTLER VEHICLES FOR NAVIGATION SATELLITE

17	0	7					\$100,000
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TITLE: FOUR THOR BOOSTERS

18	0	0					\$683,935
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TITLE: PROJECT SCORE

19	0	0					\$21,495,780
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: CENTAUR (TRIBE)							
20	0	0					\$3,560,000
TITLE: STUDIES OF LIGHT ELEMENT COMPOUNDS (PRINCIPIA)							
21	0	0					\$5,536,880
TITLE: SOLID PROPELLANT RESEARCH (PRINCIPIA)							
22	0	0					\$31,324,976
TITLE: SOLID PROPELLANT RESEARCH							
22	0	1					\$750,225
TITLE: FUEL AND OXIDIZER RESEARCH							
22	0	2					\$9,385,500
TITLE: MM&M SOLID PROPELLANT RESEARCH							
22	0	3					\$5,995,443
TITLE: ACC SOLID PROPELLANT RESEARCH							
22	0	4					\$2,791,758
TITLE: ASI STUDY WORK							
22	0	5					\$3,214,010
TITLE: THREE SOLID PROPELLANT CONTRACTS							
22	0	6					\$1,836,500
TITLE: ABL SOLID PROPELLANT RESEARCH							
22	0	7					\$2,164,181
TITLE: NOTS & OM SOLID PROPELLANT RESEARCH							
22	0	8					\$250,000
TITLE: EVALUATION OF PROPELLANTS							
22	0	9					\$645,523
TITLE: COMBUSTION INSTABILITY INVESTIGATION							
22	0	10					\$597,052
TITLE: A-G SOLID PROPELLANT RES.							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
22	0	11					\$130,000
TITLE: NOTS COMBUSTION INSTABILITY STUDY							
22	0	12					\$2,433,210
TITLE: HYBRID PROPULSION CONTRACTS							
22	0	13					\$202,000
TITLE: AMERICAN CYANAMID CONTRACT							
22	0	14					\$755,500
TITLE: THIOKOL CHEMICAL CORP.							
22	0	15					\$49,300
TITLE: NYU LIQUID PROPELLANT RES.							
22	0	16					\$100,000
TITLE: DETONATIONS							
23	0	0					\$3,980,127
TITLE: SOLID PROPELLANT RESEARCH							
23	0	1					\$1,041,698
TITLE: EIGHT SOLID PROPELLANT CONTRACTS							
23	0	2					\$459,814
TITLE: THREE SOLID PROPELLANT CONTRACTS							
23	0	3					\$49,500
TITLE: TEMPLE UNIVERSITY CONTRACT							
23	0	4					\$1,128,980
TITLE: IMPERIAL CHEMICAL CONTRACT							
23	0	5					\$227,843
TITLE: COMBUSTION INSTABILITY INVESTIGATION							
23	0	6					\$214,116
TITLE: MIDWEST RES. INSTITUTE STUDY							
23	0	7					\$451,697

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: TWO RESEARCH CONTRACTS							
23	0	8					\$234,119
TITLE: NATL. RES. CORP. CONTRACT							
23	0	9					\$169,400
TITLE: INTERHALOGEN STUDIES							
24	0	0					\$24,275,387
TITLE: SOLID PROPELLANT RESEARCH							
24	0	1					\$11,429,743
TITLE: DOW SOLID PROPELLANT RES.							
24	0	2					\$0
TITLE: SIX SOLID PROPELLANT CONTRACTS							
24	0	3					\$0
TITLE: ORGANIC DERIVATIVE OF LIGHTER ELEMENTS							
24	0	4					\$5,606,435
TITLE: NINE SOLID PROPELLANT CONTRACTS							
24	0	5					\$258,448
TITLE: EVALUATION OF PROPELLANTS							
24	0	6					\$2,428,278
TITLE: SOLID PROPELLANT MATERIALS RES.							
24	0	7					\$985,791
TITLE: THREE SOLID PROPELLANT CONTRACTS							
24	0	8					\$0
TITLE: FULMER RESEARCH INST. CONTRACT							
24	0	9					\$0
TITLE: COMBUSTION INSTABILITY INVESTIGATIONS							
24	0	10					\$0
TITLE: COMBUSTION INSTABILITY INVESTIGATIONS							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
24	0	11					\$0
TITLE: UNIV. OF ILLINOIS STUDY OF ANGULAR DISTRIBUTION IN EFFUSION							
24	0	12					\$0
TITLE: COMBUSTION INSTABILITY INVESTIGATIONS							
24	0	13					\$1,839,600
TITLE: RSCH IN HYBRID ROCKET PROPULSION							
24	0	14					\$410,300
TITLE: ROCKETDYNE DIV.-NORTH AMER. AV.							
24	0	15					\$118,900
TITLE: OZARK MAHONING CO.							
24	0	16					\$142,170
TITLE: STANFORD RSCH INST.							
24	0	17					\$252,630
TITLE: MIDWEST RSCH INST.							
24	0	18					\$684,600
TITLE: LIQUID PROPELLANT EVAL.							
24	0	19					\$100,700
TITLE: HIGH STRENGTH H2O2							
25	0	0					\$8,892,286
TITLE: DOPPLER NAVIGATION SYSTEM							
26	0	0					\$991,918
TITLE: SUBSYSTEMS FOR METEOROLOGICAL PROJECTS (TIROS)							
27	0	0					\$3,751,784
TITLE: ORDIR RESEARCH							
27	0	1	01/01/59	09/01/61	COLUMBIA UNIV.	AF30(602)-1971	\$3,624,000
TITLE: ADVANCED RADAR RESEARCH - FM-CW RADAR TECHNIQUES (ORDIR)							

DESCRIPTION: CONTINUATION OF RESEARCH ON A LONG RANGE DECOY DISCRIMINATION AND TRACKING

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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FM-CW RADAR (ORDIR) WITH EMPHASIS ON ULTRASONIC DELAY LINE, TWO-DIMENSIONAL FILTERING, WIDE BAND MODULATOR AND COMPUTING TECHNIQUES.

RESULTS: A multistatic radar concept was designed and evaluated for ballistic missile defense detection, tracking and discrimination. Major technical issues were identified and component development undertaken to develop the feasibility.

REMARKS: PROG: BMD - TECHNIQUES AND DEVICES - RADAR
MISC: (1) RESEARCH CONTINUED UNDER AO279, CONTRACT AF 49(638)-1113
DTIC is a report on the major issue of deghosting of targets.

27	0	2	06/01/59	07/01/60	FEDERAL SCIENTIF	AF30(602)-2044	\$153,000
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TITLE: COHERENT MEMORY FILTER

DESCRIPTION: DESIGN AND DEVELOPMENT OF A COHERENT MEMORY FILTER (CMF) FOR PERFORMING REAL-TIME SPECTRAL ANALYSIS USEFUL TO DETECTION AND IDENTIFICATION IN RADARS.

REMARKS: PROG: BMD - TECHNIQUES AND DEVICES - RADAR

28	0	0					\$0
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TITLE: TRANSFER OF FUNDS TO NASA

29	0	0					\$15,472,316
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TITLE: ESAR

29	0	1	09/30/58	03/01/64	BENDIX CORP.	AF30(602)-3029	\$14,437,358
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TITLE: Electronically Steerable Array Radar (ESAR), AN/FPS-46(XW-1)

DESCRIPTION: The development and evaluation of an L-band electronically steerable array radar.

RESULTS: This was the first full scale radar. It was highly successful and formed the basis of an operational radar built by and now in use by the Air Force.

REMARKS: PROG: BMD - Techniques and Devices - Radar - Phased Arrays
REF: "AN/FPS - 46 (XW-1) ESAR-L-Band Model (U)," Final Report RADC-TDR-63-262, 3/20/64 (S).
Extension of AF 30(602)-1855.

29	0	2	07/01/61	12/31/64	BENDIX CORP.	AF30(602)-3028	\$1,040,000
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TITLE: Wide Band Phased Arrays

DESCRIPTION: Investigation of method for increasing the bandwidth of phased arrays by compensating for the incremental time difference in each channel by using a linear frequency modulation (FM) pulse compression.

RESULTS: The concept was successfully demonstrated on the UHR linear array (218 MHZ) experimental model.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - Techniques and Devices - Radar - Phased Arrays.
 REF: "Wide Band Phased Arrays (U)," Final Report 1/31/65.
 Extension of AF30(602)-2538, completed 9/28/62.

30	0	0	10/09/58 08/01/63 AFRL	MULTI	\$11,426,758
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TITLE: Project LAMPLIGHTER - IRMP 1959/1960

DESCRIPTION: Multi-task effort to perform IR/OPT/UV measurements, instrument fabrication and data analysis of ballistic missile signatures.

RESULTS: Missile-borne measurements of plume obtained and other pertinent IR optical missile data. Quality of effort mixed.

REMARKS: PROG: BMD - Missile Phenomenology - Ballistic Missile Signature Measurements.
 REF: AD-914 289L, 914 290L, 323 329.
 See AO 363, AO 236, AO 60.

31	0	0			\$1,615,471
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TITLE: ACANIA MSMTS PROGRAM

32	0	0			\$3,485,884
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TITLE: OVER-THE-HORIZON RADAR MEASUREMENTS

33	0	0			\$10,106,245
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TITLE: DELAYED REPEATER COMM. SATELLITE (COURIER)

34	0	0			\$23,115,920
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TITLE: SOLID PROPELLANT RSCH. (PRINCIPIA)

34	0	1			\$11,762,448
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TITLE: ESSO INTEGRATED SOLID PROP. RES.

34	0	2			\$6,199,737
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TITLE: OM & AC SOLID PROPELLANT RESEARCH

34	0	3			\$250,000
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TITLE: EVALUATION OF PROPELLANTS

34	0	4			\$4,004,570
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TITLE: SOLID PROPELLANT MATERIALS RESEARCH

34	0	5			\$93,300
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TITLE: OLIN MATHIESON CHEM, CORP.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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34	0	6					\$604,000
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TITLE: AEROJET-GENERAL CORP.

34	0	7					\$201,865
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TITLE: AEROPROJECTS, INC.

35	0	0					\$119,954
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TITLE: JPL GROUND SPACE SURVEIL. ASSISTANCE (SHEPHERD)

36	0	0					\$104,251
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TITLE: STUDY OF STAGNATION POINT BALLISTICS (LONGSIGHT)

37	0	0	12/01/58	05/01/60	GEN. DYNAMICS	AF18(600)-1843	\$2,754,985
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TITLE: Systems Studies in Defense Against Ballistic Missiles.

DESCRIPTION: A comprehensive study of defensive systems against ballistic missiles including defining characteristics, cost, etc.

REMARKS: PROG: BMD - System Studies - General AICBM Studies.

REF: ARDC TR-59-31(ZRA1-36), and (ZR-AP-023), 12/1/59.

ARDC TR-59-81(ZR-AP-024), 2 vols., 12/1/59.

ARDC TR-60-04(ZR-AP-041-1 and ZR-AP-041-2) 5/1/60 Gen. System Studies.

ARDC TR-60-04(ZR-AP-038,ZR-AP-039, and ZR-AP-040) 3 vols., 5/1/60,

SPAD studies.

38	0	0					\$22,799,999
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TITLE: SATELLITE PROJECT

39	0	0					\$10,156,808
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TITLE: FEASIBILITY STUDIES

39	0	1					\$197,000
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TITLE: TERMINAL INTERCEPTOR STUDY

39	0	2	09/18/62		GEN. DYNAMICS	DA044950RD1660	\$1,320,000
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TITLE: Re-Entry Physics Research.

DESCRIPTION: To study the phenomena existing in the re-entry phase of ICBM flight which could be utilized for detection, tracking, discrimination and kill. Theoretical and experimental investigations were conducted in equilibrium thermodynamics of air with C, O₂, H and N additives; shock tube studies of chemical reaction rates of ablation; and optical and microwave measurements of hypervelocity projectiles and wakes.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - General research - Re-Entry Physics Program.
 MISC: Continued under AO 125 T12; then under AO 393.
 Also contract Nos. DA-04-495-ORD-3112 and DA-04-495-ORD-3383.

39	0	3	08/01/59 11/01/60 SRI	DA042000RD-1019	\$199,719
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TITLE: Data Network Requirements for AICBM Systems.

DESCRIPTION: A study of data transmission and switching network requirements for anti-ballistic missile weapons system for North America.

RESULTS: Task was cancelled because the state of the art developments needed to be completed before consideration of networks was appropriate.

REMARKS: PROG: BMD - System Studies - Netting Requirements.

39	0	4	05/01/59 10/01/60 RAYTHEON	DA-19-020-ORD-4944	\$256,904
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TITLE: UTILITY OF HIGH ALTITUDE PLATFORM FOR ACTIVE TERMINAL BALLISTIC MISSILE DEFENSE SYSTEMS.

DESCRIPTION: DETERMINATION OF ELEVATED PLATFORMS FOR ACTIVE TERMINAL BMD SYSTEMS INCLUDING VEHICLE DESIGN, GROUND ENVIRONMENT, SENSORY EQUIPMENT GUIDANCE, INTERCEPTOR AND KILL MECHANISMS.

REMARKS: PROG: BMD - SYSTEMS & TECHNICAL REQUIREMENTS - STUDIES
 FINAL RPT: RAYTHEON, MISSILE SYSTEMS DIV - BR-969, 29 JULY 60
 ALTHOUGH THE PC ON THIS PROGRAM BELONGS UNDER E-90, E90 PROBABLY DID NOT EXIST AT THE INITIATION OF THIS PROGRAM.
 GOODYEAR, GENERAL MILLS, BOEING, CARLTON-YASUI CO. DID STUDIES UNDER SUBCONTRACT.

39	0	5	05/01/60 05/01/61 BENDIX	DA11022-ORD3430	\$1,206,499
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TITLE: AICBM TARGET STUDY - General Re-entry Phenomenology.

DESCRIPTION: Theoretical and experiment program to study and define the general re-entry phenomenology, radar and optical, associated with ICBM targets available for ballistic missile defense applications.

REMARKS: PROG: BMD - Missile Phenomenology - Radar and Optical.
 REF: "AICBM Target Study", Final Report, Vol. 1, BSR-479, May 1961.
 Extension of AO 39, T 5, with Bendix Products Div., South Bend, Ind. under contract DA-11-022-ORD-2649, negotiated 1/23/59.

39	0	6	06/01/61 12/01/63 AVCO	DA19020-ORD5476	\$3,104,105
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TITLE: RE-ENTRY PHYSICS RESEARCH.

DESCRIPTION: Theoretical and experimental research to understand aerodynamic, physical, and chemical phenomena associated with re-entry of hypersonic objects that may be observed by radar and optical sensors to determine weight, size, configuration and materials of construction.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: Research initiated under DA-19-020-ORD-4862, 2/9/59-6/1/61.
Continued under AO 525, 12/10/63.

39	0	7					\$50,000
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TITLE: LUMINESCENCE & IONIZATION STUDY

39	0	8	09/01/59	09/01/60	FRANKFORD ARSNL	IN HOUSE	\$452,000
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TITLE: Ballistic Missile Decoy Packaging and Launch Study.

DESCRIPTION: To investigate the feasibility of using ballistic missile systems for delivering decoys. This included the packaging design and establishing the design criteria for launcher development.

RESULTS: Standard cartridge actuated devices with modification were determined to be suitable for this application. Theoretical performance calculations for several reactionless-type launchers were made. One type was demonstrated.

REMARKS: BMD - Techniques & Devices - Penetration Aids.

39	0	9					\$199,720
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TITLE: DATA NETWORK REQ'TS.

39	0	10					\$100,065
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TITLE: SPACE POWER STUDY

39	0	11	08/01/59	06/01/62	RCA	DA36034ORD3061-RD	\$290,000
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TITLE: DEVELOPMENT OF A LIGHT MODULAR 2-D RADAR DATA PROCESSOR

DESCRIPTION: DEVELOPMENT AND CONSTRUCTION OF A BREADBOARD FEASIBILITY MODEL OF A TWO-DIMENSIONAL RADAR DATA PROCESSOR USING AN ULTRASONIC LIGHT MODULATOR AND EVALUATE ITS APPLICATION TO THE BALLISTIC MISSILE DEFENSE DATA PROCESSING PROBLEM OF MULTIPLE TARGETS AND DECOY DISCRIMINATION.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - RADAR.

39	0	12	05/15/59		EASTMAN-KODAK	DA300690-ORD2803	\$625,431
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TITLE: SPACE BACKGROUND & IR DISCRIMINATION

DESCRIPTION: Analytical study of space background particularly the stars and fabrication of IR photometer to perform experimental program.

RESULTS: Study completed and IR photometer given to OSU to perform measurements.

REMARKS: PROG: BMD - Optical Technology, Systems - Background Analysis
See OSU Program.

39	0	13	06/01/59	01/01/60	PICATINNY ARS.	IN HOUSE	\$151,311
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: Anti-Satellite Lethal Mechanisms Study

DESCRIPTION: A survey and analysis of possible kill mechanisms that might be effective against satellites. Study included US and Soviet satellites; nuclear, non-nuclear devices, and was based on Nike-Zeus and RCA satellite interceptor systems.

REMARKS: PROG: BMD - General Research - Anti-Satellite
Part of effort performed by Electro-Optical Systems under DA-04-495-501-ORD-1777.

39	0	14	08/07/59	07/06/61	SRI	DA04200-ORD1019	\$200,000
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TITLE: Study of Threat Parameters and Observables of Ballistic Missiles.

DESCRIPTION: (1) To investigate the relationship between threat parameters and observables along the missile trajectory from launch through re-entry useful for defense system discrimination techniques. (2) Formulate a time and space density model of threatening objects in an attack against the U.S.

RESULTS: General attack scenarios were established; threat models were formulated including RV's and penetration aids. These were modified as a function of time with planned U.S. developments. This study formed an initial baseline for future studies.

REMARKS: BMD - Techniques & Devices - Threat Model Development.

39	0	15					\$199,978
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TITLE: ECM & ECCM STUDIES

39	0	16	07/01/59	11/01/61	EASTMAN KODAK CO	DA30069ORD3516	\$209,000
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TITLE: INFRARED STELLAR BACKGROUND MEASUREMENTS FOR SPACE DEFENSE

DESCRIPTION: MEASUREMENT OF INFRARED STELLAR BACKGROUND AT VARIOUS OPTICAL OBSERVATORIES APPLICABLE TO THE DESIGN OF SPACE DEFENSE SYSTEMS.

REMARKS: PROG: BMD - GENERAL RESEARCH
MISC: (1) CONTINUED UNDER AO 39T12, 1/62-1/63, DA-30-069-ORD-3516 AT A COST OF \$60,000 (INCLUDED ABOVE)
NOTE: WRITTEN UP AS AO 39, T12A.

39	38	12	04/01/63	03/31/65	OHIO STATE UNIV.	DA33019AMC105(Z)	\$98,500
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TITLE: Infrared Photometry and Stellar Background Measurements

DESCRIPTION: To establish infrared stellar background in X(2-2.4u), Y(3.2-4.2u) and Z(8-13u) bands, with emphasis on 8-13u band by studying specific star groups. Eastman-Kodak built the radiometers. Telescopes used were 69" Lowell & 32" Perkins.

RESULTS: The instrumentation and access to telescopes caused problems, however,

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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numerous stars were measured. Several black stars were found as companion to visible ones. The program was well conceived, however, instrumentation was limited and very experimental.

REMARKS: PROG: BMD - Missile Phenomenology - IR Background Measurements
REF: Stellar Background Measurement Program, OSU No. 1636-8.
See AO 39, Task 12.

40	0	0			\$1,894,665
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TITLE: SOLID PROPELLANT RSCH. (PRINCIPIA)

40	0	1			\$58,616
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TITLE: FLUORINE ACTIONS STUDY

40	0	2			\$846,946
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TITLE: SOLID PROPELLANT STUDIES

40	0	3			\$126,500
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TITLE: FLUOROCARBON N-F STUDIES

40	0	4			\$220,809
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TITLE: SOLID PROPELLANT STUDIES

40	0	5			\$241,851
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TITLE: SOLID PROPELLANT STUDIES

40	0	6			\$144,943
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TITLE: TRANSPIRATION AND/OR EFFUSION EXPERIMENTS

40	0	7			\$203,900
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TITLE: RSCH ON FLUORINATION OF ORGANIC COMPOUNDS

40	0	8			\$50,100
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TITLE: RSCH ON THERMODYNAMIC PROPERTIES OF LIGHT-ELEMENT COMPOUNDS

41	0	0			\$8,938,758
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TITLE: LAUNCH FACILITY AND MISSILE ASSEMBLY BLDG.

42	0	0	11/01/58 07/01/65 AFRL		\$4,309,627
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TITLE: CHEMICAL RELEASE STUDIES (Project FIREFLY 1959-63).

DESCRIPTION: An experimental study of atmospheric perturbations associated with ballistic missile systems by the introduction of molecules, atoms, ions and electrons

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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by release of chemical from canisters fired into the ionosphere. The controlled experiments complimented theory and laboratory studies.

RESULTS: This program was very successful and resulted in providing perturbed environments for the evaluation of communication and radar system. Firefly led to a follow-on project known as SECEDE which was jointly supported by DNA. After DARPA involvement, the program was carried on by DNA and DCA.

REMARKS: PROG: BMD - General Research - Missile Phenomenology/Nuclear Effects.
REF: "Chemical Release and Missile Exhaust Studies (U)," AFCRL-65-495, Environmental Research Paper No.119, Final Report AO 42, 6/1/65, N.W. Rosenberg (S).

Program was also supported by DASA, NSA and U.S. Army Signal Corp.
See also AO 65-1, AO 258-1.

There were many sub-contractors participating in this program.

43	0	0			\$178,923
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TITLE: MAGNUS EFFECT STUDY (LONGSIGHT)

44	0	0			\$377,000
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TITLE: SOLID PROPELLANT RSCH. (PRINCIPIA)

45	0	0			\$1,312,350
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TITLE: PLASMA PHYSICS STUDIES

46	0	0			\$885,418
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TITLE: RADAR DISCRIMINATION

47	0	0			\$8,434,433
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TITLE: TEST TOWER & LAUNCH STAND CONSTRUCTION (SATURN)

48	0	0			132,296,493
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TITLE: SPACE PROGRAM

49	0	0	08/28/59 08/31/63 RCA	DA36034-ORD3063	\$38,522,620
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TITLE: Procurement of TRADEX RADAR for Project PRESS.

DESCRIPTION: Design, fabrication and installation of an instrumentation tracking radar (TRADEX - a UHF and L-band radar) at Roi Namur.

REMARKS: PROG: BMD - Missile Phenomenology - Re-entry Measurements - Radar UHF/L-Band.
FC includes AO 49 amend. 15 funding of \$2,700,000.

50	0	0			\$298,996
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TITLE: NATIONAL SPACE SURVEILLANCE CONTROL CENTER (SHEPHERD)

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
51 0 0					\$39,870,429

TITLE: DRM SHIP OPERATION

51 0 1	11/01/59	08/31/64	BARNES ENG. CO.	DA19020AMC00368(Z)	\$1,748,573
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TITLE: Optical Re-entry Measurements from DAMP (Down-Range Anti-Missile Measurement Program) Ship.

DESCRIPTION: Optical measurement (photographic, photometric, spectrometric and radiometric, 0.35 to 3 microns) from DAMP ship of re-entry object to obtain information for AICBM discrimination.

REMARKS: PROG: BMD - Missile Phenomenology - Optical Measurement - Project DAMP.
Contracts DA-19-020-ORD-4764, Mod. 7 and DA-19-020-ORD-4994, Mod. 5.

51 0 2	01/01/59	12/31/64	RCA	DA36034ORD3143RD	\$39,887,569
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TITLE: Shipborne Re-entry Measurements - Project DAMP (Down-Range Anti-Missile Measurement Program (DAMP)).

DESCRIPTION: Radar and Optical Measurements of Reentry Vehicles from the USAS American Mariner - Project DAMP.

REMARKS: Contracts also applicable are: DA-36-034-ORD-3144RD; DA-36-034-ORD-2579RD; DA-36-034-ORD-2683RD, and DA-36-034-ORD-2660RD.
The DAMP ship also supported re-entry systems, NASA Mercury and Fish Bowl nuclear tests.

51 0 5	04/01/64	12/31/64	RCA	DA01021AMC10963(Z)	\$770,000
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TITLE: Analysis of Radar Data - Project DAMP.

DESCRIPTION: Analysis of radar data collected on DAMP, TTR and TRADEX to develop analytic models of radar backscatter phenomena of re-entry plasma sheaths and wakes of RV's.

REMARKS: PROG: BMD - Missile Phenomenology - Radar - Data Analysis.
REF: "Re-Entry Analysis (U)", Final Tech. Rpt., MD-S-1208, Feb., 1965(S/XF).

52 0 0	01/01/59	09/15/61	SR1	DA04200-ORD1009	\$1,237,000
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TITLE: Coordination of Laboratory and Field Radio Frequency Measures Applicable to BMD.

DESCRIPTION: Review, analysis, and coordination of radio frequency measurements in field and laboratory programs applicable to missile flight and re-entry.

REMARKS: PROG: BMD - Missile Phenomenology - Radio Frequency - Coordination.
Continued under AO 281, SD-103(OSD)

53 0 0	02/13/59	07/31/64	CORNELL AERO LAB	DA-30-069-ORD-2554	\$3,090,000
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TITLE: HIGH POWER MICROWAVE RADAR RESEARCH PROGRAM.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: 1) EXPERIMENTAL STUDY OF TECHNIQUES FOR RADIATING VERY HIGH MICROWAVE POWER APPLICABLE TO AICBM RADAR.

2) STUDY OF SECONDARY NOISE LEVELS THAT MAY BE POWER DEPENDENT SUCH AS INCOHERENT BACK SCATTER FROM IONOSPHERE, AURORA, MAGNETIC FIELD-ALIGNED STREAMERS AND OTHER DISCONTINUITIES.

3) INVEST. TECHNIQUES FOR GENERATING PEAK POWER 10E+09 & 10E+06 WATTS AVERAGE.

REMARKS: 1) PROG: BMD - TECHNIQUES AND DEVICES - RADAR

2) REFERENCES: CAL REPORT NO. UB-1309-P-111, FINAL RPT. 31 JUL 1964.

54	0	0			\$23,951,139
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TITLE: ACTIVE REPEATER COMMUNICATIONS SATELLITE

55	0	0			\$991,420
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TITLE: ACTIVE REPEATER COMMUNICATIONS SATELLITE

56	0	0	01/01/59 09/01/63 MIT LIN. LAB	AF 19(604)-7400	\$2,126,000
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TITLE: ADVANCED RADAR TECHNIQUES RESEARCH

DESCRIPTION: THEORETICAL AND EXPERIMENTAL IN HOUSE RESEARCH ON RADAR CONCEPTS AND TECHNIQUE APPLICABLE TO BALLISTIC MISSILE DEFENSE.

RESULTS: Signal processing for radar target discrimination; microwave riometer measurements of Fish bowl; theoretical studies in support of AMRAD radar; and investigation of radar problems associated with terminal defense were major results.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - RADAR

MISC: (1) INITIALLY SUPPORTED UNDER AF 19(604)-5960

(2) CONTINUED UNDER AO 498.

Also contract AF 19(628)-500.

57	0	0			\$8,048,388
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TITLE: SPAIN & JAPAN TRACKING INSTALLATION (SHEPHERD)

REMARKS: CANCELLED

58	0	0			\$1,771,000
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TITLE: IR TRACKING UNIT

58	0	1	07/01/59 06/01/62 AEROJET	AF33(616)-6752	\$1,382,762
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TITLE: Precision Infrared Tracking Development

DESCRIPTION: Design studies for precision LWIR space-based tracking and experimental evidence using fabricated tracker.

RESULTS: Goals too optimistic

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - Optical Technology - Device Development

58	0	2	07/01/59	01/01/61	RCA	AF33(616)-6912	\$385,000
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TITLE: Infrared Detectors

DESCRIPTION: Development of IR detectors for cold body tracking.

RESULTS: Progress made in the development of Ge:Al and other Ge doped semiconductor detectors.

REMARKS: PROG: BMD - Optical Technology - IR Detector Development.

59	0	0	04/01/59	02/20/62	SEE NOTE	IN HOUSE	\$254,000
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TITLE: Vertical Probe Launching Facility at Eglin in Support of Chemical Release Program (Firefly).

DESCRIPTION: Range support of upper atmospheric and re-entry experiments involving chemical releases. Support included test management, launch facilities and personnel, range instrumentation and operation, data collection and reduction and contractor logistic support.

REMARKS: PROG: BMD - General Research in support of re-entry physics - ARPA participation in AFCRL chemical release program (Firefly).

MISC: (1) Work done in-house and under support contracts: AF08(635)-813, Paul Hardeman Inc. - Tech. Support; AF08(635)-874, Aerojet - General - Tech. Support; (Unknown) Bell Construction - Modification Facilities. See AO 42 and AO 83.

60	0	0					\$489,672
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TITLE: INSTRUMENTATION SHIP, (b)(6) (SHEPHERD)

61	0	0					\$2,276,212
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TITLE: TWO VC2 VESSELS-RECOVERY PMTR (SHEPHERD)

62	0	0	12/01/59	01/01/64	RAYTHEON CO.	AF30(602)-2864	\$2,087,000
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TITLE: RADAR DECOY-SORTING TECHNIQUES

DESCRIPTION: TO DEVELOP AND ANALYZE RADAR TECHNIQUE FOR RESOLVING AND IDENTIFYING THREATENING OBJECTS WITHIN AN ICBM DECOY-CLOUD ENSEMBLE. TECHNIQUES INCLUDE PULSE COMPRESSION AND REAL-TIME DATA PROCESSING.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - RADAR.

REF: FINAL RPT, "DECOY DISCRIMINATION STUDIES," BR-2873, RADC-TDR-64-76, VOL. I, II AND III, 31 JAN 64.

MISC: CONTINUATION OF AF30(602)-2121.

63	0	0	09/21/59		RCA	AF30(602)-2115	\$1,379,483
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: AICBM Radar Techniques

DESCRIPTION: An analytical and experimental investigation of radar techniques applicable to AICBM radar systems. Principal areas included high powered transmitters, low noise receivers, and filtering and correlation techniques.

REMARKS: PROG: BMD - Techniques & Devices - Radar.

64	0	0			\$349,542
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TITLE: RADAR DISCRIMINATION STUDIES

65	0	0	06/01/59 01/01/60 GEOPHYSICS CORP	DA36039SC78925	\$39,000
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TITLE: DETERMINATION OF RECOMBINATION AND ATTACHMENT COEFFICIENTS FROM ARTIFICIAL ELECTRON CLOUDS.

DESCRIPTION: TO INVESTIGATE THE FEASIBILITY OF USING ARTIFICIAL ELECTRON CLOUDS RELEASED IN THE UPPER ATMOSPHERE TO DETERMINE VARIOUS ATOMIC AND MOLECULAR DECAY PROCESSES SUCH AS ATTACHMENT, RECOMBINATION, MUTUAL NEUTRALIZATION, ETC.

RESULTS: THE STUDY CONCLUDED IT WAS FEASIBLE TO MEASURE ATOMIC AND MOLECULAR CONSTANTS AND OBTAIN VALUABLE INFORMATION COMPLEMENTING EXISTING LABORATORY AND THEORETICAL STUDIES.

REMARKS: PROG: BMD - GENERAL RESEARCH RELATED TO NUCLEAR EFFECTS PERTINENT TO BALLISTIC MISSILE DEFENSE.

66	0	0			\$6,443,543
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TITLE: LARGE THRUST TEST STAND - EAFB

67	0	0	05/01/59 10/01/61 BRL	IN HOUSE	\$80,000
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TITLE: CATALYTIC EFFECT OF TRACE IMPURITIES ON MICROWAVE DISCHARGES

DESCRIPTION: EXPERIMENTAL DETERMINATION OF THE CATALYTIC EFFECTS OF TRACE IMPURITIES (N2, NO, H2, H2O) IN PRODUCING ATOMIC OXYGEN (O) DURING MICROWAVE DISCHARGES IN PURE OXYGEN (O2).

REMARKS: PROG: BMD - GENERAL RESEARCH ON NUCLEAR EFFECTS PERTINENT TO BALLISTIC MISSILE DEFENSE. ALSO, COULD CONTRIBUTE TO LAUNCH, MID-COURSE AND REENTRY PHYSICS.

68	0	0	11/01/59 12/01/61 RAYTHEON	AF30(602)-2144	\$15,858,530
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TITLE: PINCUSHION RADAR [AN/FPS-62(XW-1)]

DESCRIPTION: The design, fabrication, installation and checkout of a multibeam, S-band tracking radar. Sixteen transmitter beams were formed by horns in a 60 foot parabolic reflector and a Cassegrain sub-reflector.

RESULTS: Radar was installed at White Sands and used in gathering data by the Air Force

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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for the penetration aids program.

REMARKS: PROG: BMD - Techniques & Devices - Radar - Pincushion Radar (AN/FPS-62)
 REF: "Pincushion Final Report," Vol. I and II, 2/1/62, Raytheon, No.
 BR-1383A, BR-1383B, RADC Report No. RADC-TDR-62-57 (S).

69	0	0	06/22/59	07/31/60	GENERAL DYNAMICS AF 33(616)-6721	\$1,005,897
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TITLE: Hypersonic Interceptor Subsystem Research for BMD

DESCRIPTION: To study hypersonic interceptor subsystems (flight control, guidance, configurations, etc.) with non-nuclear kill mechanisms for ballistic missile defense - exo-atmospheric.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - INTERCEPTOR TECHNOLOGY
 CONTINUED ON AO 278

70	0	0	05/15/63	06/08/64	GENERAL DYNAMICS AF 29(601)-5980	\$50,500
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TITLE: INVESTIGATION OF HYPERVELOCITY IMPACT CRATERS.

DESCRIPTION: DETAILED ANALYSIS OF HYPERVELOCITY IMPACT CRATER BY ELECTRON MICROSCOPY AND ELECTRON PROBE MICRO-ANALYSIS.

RESULTS: MERCURY/ATLAS-6 SUSTAINER BOOSTER FRAGMENTS REVEALED THAT THERE WAS NO EVIDENCE OF EXTRATERRESTRIAL MATERIALS. CRATERS WERE CAUSED BY ABLATING MATERIALS FROM TITANIUM ADAPTER AND/OR NOSE SECTION.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - KILL MECHANISMS - HYPERVELOCITY IMPACT
 PER VAN EVERY: FC = 50,580

71	0	0				\$2,150,000
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TITLE: HYPERVELOCITY IMPACT RSCH.

71	3	0	06/30/67		BALLISTIC RES. IN HOUSE	\$2,150,000
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TITLE: Experimental and Theoretical Research on Hypervelocity Impact.

DESCRIPTION: (a) Experimental research to determine detailed information on the formation of hypervelocity impact craters as a function of mass, momentum, material strength, etc. (b) Theoretical research to predict crater formation. (c) Develop fundamental concepts and experimental procedures for determining viscoplastic behavior of materials.

REMARKS: PROG: BMD - Techniques & Devices - Kill Mechanisms - Hypervelocity Impact.
 Under contract with BRL (b) was carried out by General Atomic [DA-04-495-AMC-0116(X)]; and (c) was conducted by Brown University [DA-19-020-AMC-0077(R)].
 (This is amendment 3, 4, and 5).

71	4	0	06/30/67		GENERAL ATOMIC DA04495AMC0116(X)1	\$0
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TITLE: Experimental and Theoretical Research on Hypervelocity Impact.
 SEE 71 AMENDMENT 3.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: SEE 71 AMENDMENT 3.

REMARKS: SEE 71 AMENDMENT 3.

71	5	0		06/30/67	BROWN UNIV.	DA19020AMC0077(R)1	\$0
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TITLE: Experimental and Theoretical Research on Hypervelocity Impact.
SEE 71 AMENDMENT 3.

DESCRIPTION: SEE 71 AMENDMENT 3.

REMARKS: SEE 71 AMENDMENT 3.

72	0	0			NBS	IN HOUSE	\$30,000
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TITLE: UV Monochromator

DESCRIPTION: Development of a fast, large aperture monochromator for studying photo-detachment cross sections in the UV region (1A).

RESULTS: Instrument was developed and used to support work being done under,
AO 125 T9 (3A).

REMARKS: PROG: BMD - General research - Established data base for launch, mid-course
and re-entry physics.

73	0	0					\$1,107,946
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TITLE: DATA PROCESSING FOR DECISIONS AND DECOY DISCRIMINATION

73	0	2	01/01/60	01/01/61	IBM FED SYS DIV	AF30(602)-2161	\$258,000
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TITLE: HIGH SPEED COMPUTATIONAL TECHNIQUES

DESCRIPTION: TO INVESTIGATE TECHNIQUES FOR IMPROVING STORAGE DEVICES AND STORING UTILIZATION TECHNIQUES APPLICABLE TO BALLISTIC MISSILE DEFENSE, INTELLIGENCE, AND RECONNAISSANCE DATA-PROCESSING.

REMARKS: PROG: BMD - TECHNIQUES AND DEVICES.

73	0	3	01/01/59	05/01/61	GENERAL ELECTRIC	AF30(602)-2087	\$201,000
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TITLE: THERMOPLASTIC RECORDING TECHNIQUES FOR RADAR

DESCRIPTION: A SURVEY ON THE APPLICATION OF THERMOPLASTIC RECORDING TECHNIQUES FOR ANALOG AND DIGITAL PROCESSING OF RADAR DISCRIMINATION. OBJECTIVE WAS TO DETERMINE TECHNIQUE WITH POTENTIAL FOR 40 MHZ BANDWIDTH RECORDING.

REMARKS: PROG: BMD - TECHNIQUES AND DEVICES - RADAR

73	0	4	01/01/60	01/01/61	SERVOMECHANISMS	AF30(602)-2287	\$0
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TITLE: DATA STORAGE DEVICES

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: TO INVESTIGATE THIN FILM MAGNETIC MEMORY DEVICES.

REMARKS: PROG: BMD - TECHNIQUES AND DEVICES - RADAR.

73	0	5	01/31/61 GEN. ELECTRIC	AF33(616)-6805	\$95,873
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TITLE: Artificial Neuron Component Development.

DESCRIPTION: To conduct research and development on the design and construction of artificial neuron-like components that could be used for adaptive systems for radar signal processing.

RESULTS: Artificial neuron circuitry was developed using electroluminescent and photo-conductive materials and multihole magnetic devices for analog memory circuits.

REMARKS: PROG: BMD - Techniques and Devices - Radar processing.

73	0	6	12/01/60 OHIO ST. UNIV.	AF30(602)-2107	\$40,930
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TITLE: Man-Machine Relationships in Automatic Defense System.

DESCRIPTION: Simulation and prediction, by analog computer techniques, of a human operator responses to a variety of situations in an automatic defense system.

REMARKS: PROG: BMD - Techniques & Devices - Radar.

74	0	0	06/19/59 11/30/61 SYLVANIA ELEC.		\$1,774,177
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TITLE: Coherent Digital Phased Array Radar Systems (CODIPHASE).

DESCRIPTION: Design study to investigate pre-beam forming techniques applicable to ballistic missile defense phase array radars. Specific techniques included super-limiting, video beam forming, digital beam forming, and self-aligning.

RESULTS: The study indicated that the CODIPHASE techniques are applicable to an operational radar and would meet the specification required for a BMD radar.

REMARKS: PROG: BMD - Techniques & Devices - Radar - Phased Arrays.

75	0	0	10/30/59 10/30/60 RCA	DA19020509-ORD5085	\$218,232
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TITLE: Study of Tank Fragments.

DESCRIPTION: The conduction of tank explosions to determine the dynamic behavior of tank fragments, develop a practical theory to predict tank explosion effects and investigate tank destruction methods.

REMARKS: PROG: BMD - Missile Phenomenology - Tank Fragment Characteristics.
First contract phase 10/30/59-10/30/60 - \$120,000, Pl (b)(6)

76	0	0			\$184,000
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: PROPERTIES OF MATERIALS AT LOW TEMPERATURES (LONGSIGHT)

77	0	0					\$93,201
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TITLE: SPAIN TRACKING STATION CONSTRUCTION (SHEPHERD)

REMARKS: CANCELLED

78	0	0					\$99,977
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TITLE: TRANSMISSION OF ION & ATOMIC BEAM STUDIES (LONGSIGHT)

79	0	0					\$85,989
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TITLE: SPACE PROGRAM

REMARKS: TERMINATED

80	0	0					\$1,711,739
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TITLE: NINE STUDIES IN SPACE POWER RESEARCH

81	0	0					\$410,000
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TITLE: STUDY IN SPACE POWER RESEARCH

82	0	0					\$116,274
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TITLE: RSCH IN HIGH TEMPERATURE & PRESSURES (LONGSIGHT)

83	0	0	09/30/60	SEE NOTE	SEE NOTE		\$253,916
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TITLE: Vertical Probe Launching Facility at Eglin in Support of Chemical Release Program - Military Construction.

DESCRIPTION: Construction of vertical probe launching facilities at Eglin Air Force Base in support of upper atmospheric and re-entry physic experiments involving chemical releases.

REMARKS: PROG: BMD - General Research in support of re-entry physics - ARPA participation in AFCRL chemical release program (Firefly).

MISC: (1) Work was performed in-house and under support contracts:
AF 08(635)-608 Aerojet-Gen. - Aerobee Launch Tower; AF08(635)-1365
B.B. Saxon - Explosive Loading/Storage; AF08(635)-1521 B.B. Saxon -
Solid Propellant Rocket Processing Facility.
(2) Related to AO 59, AO 42.

84	0	0					\$0
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TITLE: NONE

REMARKS: CANCELLED

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
85	0	0		09/30/63	MIT-LL	AF19(604)-7400	\$4,167,200

TITLE: HIGH POWER RADAR TUBE STUDY

DESCRIPTION: Research on the fundamentals of high power generation applicable to amplifiers for radar and communication.

REMARKS: PROG: BMD - Techniques & Devices - Radar - High Powered Tubes and Components.
(1) Initial research was conducted under AF19(604)-5960.
(2) Work under AO 85 was transferred to AO 498, July 24, 1963.

86	0	0	07/01/59	06/30/62	CORNELL AERO LAB	AF40(600)-804	\$4,202,857
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TITLE: Construction of Wave Superheater Hypersonic Tunnel.

DESCRIPTION: Construction of a wave superheater hypersonic tunnel of up to Mach 15, 9000 degree R for study of molecular dissociation and recombination as well as the interaction of electromagnetic radiation with ionized flow.

RESULTS: Tunnel was completed and used for re-entry phenomenology measurements.

REMARKS: PROG: BMD - Missile Phenomenology - Hypersonic Tunnel Measurement.

87	0	0					\$0
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TITLE: Cancelled.

DESCRIPTION: Cancelled.

REMARKS: CANCELLED

88	0	0					\$250,000
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TITLE: SUBMARINE LAUNCHED ATCBM STUDY

89	0	0					\$422,250
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TITLE: IR SYSTEM EVALUATION

89	4	1	05/25/59	11/01/61	RAYTHEON	NOAS 58-428	\$422,249
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TITLE: Infrared Equipment for Airborne Measurements

DESCRIPTION: Provide and maintain Sparrow III seekers for missile plume measurements in IRMP 59/60 and Project LAMPLIGHTER.

RESULTS: Limited data obtained.

REMARKS: PROG: BMD - Missile Phenomenology - Infrared Target Measurements
REF: AO 39; AFCRL 19(604)-8805, Project LAMPLIGHTER.

89	4	2	05/25/59	06/01/61	HUGHES	AF19(604)-8805	\$0
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TITLE: Infrared Equipment for Airborne Equipment.

AD AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: Infrared devices to support IRMP 59/60, LAMPLIGHTER.

RESULTS: Delivered LWIR device to NMTC, Pt. Mugh for installation in aircraft.

REMARKS: PROG: BMD - Missile Phenomenology - Infrared Measurements.

Note funds are salsumed in AO 89, Task 1, Amendment 4, Raytheon statement.

See AO 39, AO 222;

90	0	0			\$32,864,247
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TITLE: R&D PROJECTS

90	0	1	06/01/59 01/31/60 RCA	SD-60	\$587,583
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TITLE: Satellite Interceptor System Study.

DESCRIPTION: Study of the feasibility of earth satellite interception with emphasis on a ground-based interceptor which co-orbited with the target satellite.

RESULTS: Study resulted in threat definition; formulation of interception system and associated subsystem requirements, and development of a weapon system plan.

REMARKS: PROG: BMD - System Studies - Satellite Interception.

REF: Final Report CR-59-588-39(S).

90	0	2			\$4,100,000
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TITLE: CLASSIFIED WORK

90	0	3			\$8,000,000
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TITLE: NASA MANNED SATELLITE PROJ.

90	0	4			\$40,000
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TITLE: BIBLIOGRAPHY ON SPACE MEDICINE-LIBRARY OF CONGRESS

90	0	5	10/16/59 03/31/60 A.D. LITTLE	SD-62	\$124,982
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TITLE: Evaluation of Space Patrol Air Defense System (SPAD).

DESCRIPTION: A system and operational evaluation of a satellite base active AICBM system concept to intercept offensive ICBM during their boost phase.

REMARKS: PROG: BMD - System Studies - Space Patrol Air Defense System (SPAD).

REF: Final Report C-62509, 4/15/60(S).

The initial SPAD concept was outlined by Gen. Dynamics, Convair Division, AO 37, AF 18 (600)-1843.

90	0	6			\$470,029
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TITLE: DATA COLC. & ANAL CNT OVER-THE HORIZN. MISSILE DETC. RSCH-SRI

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
90	0	7	06/17/60	08/15/61	A.D. LITTLE	SD-70	\$176,921

TITLE: Intercept Satellite Tracking (INSATRAC) System Evaluation Studies and Others.

DESCRIPTION: (1) System evaluation of a defense system based on interception after satellite tracking (INSATRAC); (2) Additional on Space Patrol Air Defense (SPAD) AO 37; (3) Analysis of "Random Barrage System (RBS) AO 134; (4) Analysis of ARPAT System AO 138.

REMARKS: PROG: BMD - System Studies

REF: 8/15/61.

Need to clarify relationship & def. on INSATRAC, SPAD, BAMBI, RBS, ARPAT.

90	0	8	06/30/60	09/30/63	U CHICAGO-LAS	SD-71	\$754,566
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TITLE: Consulting Services & IR/OPT/UV Research

DESCRIPTION: U Chicago provide consulting services and in-house research on IR/OPT/UV. Also serve as national center of background data for Project DEFENDER.

RESULTS: A number of studies performed on Sky Background and Mechanisms involved. Background center was transferred in 1963 to UMIST.

REMARKS: PROG: BMD - Missile Phenomenology - IR Signature & Background Data Analysis

REF: Numerous LAS-U Chicago published.

See AO 236, Tasks 1 and 3.

90	0	9					\$86,981
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TITLE: RELIABILITY STUDIES FOR SATELLITE SYSTEMS-ARINC RES. CORP.

90	0	10					\$20,000
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TITLE: STUDY OF DOD'S BASIC RSCH. PROGRAM-A.D. LITTLE

90	0	11					\$115,000
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TITLE: ADVISORY SERV. ON FIRE RES. NBS

90	0	12					\$4,873,900
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TITLE: IKARA PROG.-AUSTRALIAN GOVT.

TITLE: IKARA PROG.-AUSTRALIAN GOVT.

90	0	13					\$13,139,690
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TITLE: IDA CONTRACT

TITLE: IDA CONTRACT

90	0	14					\$12,000
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TITLE: UNITED RSCH, INC. MGMT STUDY

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
90	0	15					\$125,000
							TITLE: SUPPORT OF SCIENCE INFO. EXCH.
90	0	16					\$7,511
							TITLE: OFFICE FURNITURE FOR IDA
90	0	17					\$37,500
							TITLE: STATE DEPT-EXT. RES. DIV.
90	0	18					\$123,700
							TITLE: DOD PROCUREMENT OF R&D
90	0	19					\$14,000
							TITLE: INTERNATL. CONF. ON SCIENCE OF SUPERCONDUCTIVITY
90	0	20					\$2,470
							TITLE: OFFICE FURNITURE FOR IDA
90	0	21					\$20,000
							TITLE: SUPPORT OF USIA STUDY
90	0	22					\$2,732
							TITLE: OFFICE FURNITURE FOR IDA
91	0	0					\$1,057,119
							TITLE: SYSTEM STUDIES-RAND
92	0	0					\$1,150,040
							TITLE: SPACE SUBSYSTEM STUDIES (LONGSIGHT)
93	0	0					\$50,000
							TITLE: STUDY OF LARGE PAYLOADS
94	0	0					\$342,000
							TITLE: PROPELLANT TEST FACILITIES AT NAD HINGHAM ANNEX(PRINCIPIA)
95	0	0					\$1,259
							TITLE: UPPER STAGE VEHICLE AJ-10-104 (TRIBE)
96	0	0					\$0

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: AGENA (TRIBE)							
97	0	0					\$8,124,824
TITLE: D&L THOR-DEL, THOR 104, 2 THOR-AGENA VEH. (NAV. SAT.)							
98	0	0					\$4,802,974
TITLE: DELIVERY & LAUNCHING OF TWO THOR-104 VEHICLES(COURIER)							
99	0	0					\$0
TITLE: NONE							
REMARKS: CANCELLED							
100	0	0					\$99,997
TITLE: SAMBO							
100	0	1	01/01/60	07/01/61	BRL	IN HOUSE	\$99,997
TITLE: STRATEGIC ANTI-MISSILE BARRAGE OBJECTS (PROJECT SAMBO)							
DESCRIPTION: STUDY OF THE FEASIBILITY AND OPTIMIZATION OF THE USE OF PELLETS EMPLACED AND MAINTAINED IN ORBIT TO KILL BALLISTIC MISSILES.							
REMARKS: PROG: BMD - TECHNIQUES & DEVICES - KILL MECHANISMS - HYPERVELOCITY IMPACT. REF: "STRATEGIC ANTI-MISSILE BARRAGE OBJECTS (PROJECT SAMBO)," BRL MEMO RPT. NO. 1361, JULY 1961.							
100	0	2	07/08/60	11/30/60	CORNELL AERO LAB	DA30069509ORD3117	\$0
TITLE: VULNERABILITY OF REENTRY BODY STRUCTURES TO FRAGMENT IMPACT (PROJECT SAMBO)							
DESCRIPTION: INVESTIGATION OF THE VULNERABILITY OF IRBM AND ICBM REENTRY BODIES TO THE GROWTH OF DAMAGE INFLICTED BY SMALL FRAGMENTS.							
REMARKS: PROG: BMD - TECHNIQUES & DEVICES - KILL MECHANISMS - HYPERVELOCITY IMPACT REF: "STRATEGIC ANTI-MISSILE BARRAGE OBJECTS (PROJECT SAMBO)," BRL MEMO RPT., NO. 1361. NOTE: A SUBCONTRACT UNDER THE BRL PROGRAM, AO 100 TASK 1.							
101	0	0					\$1,449,771
TITLE: HIIMP SOLID PROPELLANT RES.							
102	0	0					\$69,857,000
TITLE: PROJECT VELA							
103	0	0					\$9,782

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: PROJECT VELA-SIERRA

104	0	0					\$47,851,078
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TITLE: PROJECT VELA-UNIFORM

105	0	0					\$84,279
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TITLE: FACILITIES AT HANSCOM FIELD (SHEPHERD)

106	0	0	12/01/59	06/01/64	CORNELL UNIV.	AF 19(604)-6158	\$8,348,000
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TITLE: DESIGN AND CONSTRUCTION OF ARECIBO IONOSPHERIC OBSERVATORY (AID)

DESCRIPTION: CORNELL UNIV. WAS PRIME CONTRACTOR FOR THE DESIGN, AND CONSTRUCTION OF THE ARECIBO IONOSPHERIC OBSERVATORY. THE FINAL CONFIGURATION CONSISTED OF A FIXED 1000 FT SPHERICAL REFLECTOR, A MOVABLE FEED (+/-20 DEGREE) FOR STEERING AND TRANSMITTING, RECEIVING AND COMPUTING EQUIPMENT.

RESULTS: AID MADE MAJOR CONTRIBUTIONS IN IONOSPHERIC RESEARCH, PLANETARY RADAR AND RADIO ASTRONOMY. ITS CONTINUED SUPPORT COULD NOT BE JUSTIFIED UNDER THE BMD PROGRAM & IT WAS TRANSFERRED TO NATIONAL SCIENCE FOUNDATION 1967-71 PERIOD. IT HAS BEEN UPDATED & CONTINUES TO MAKE IMPORTANT CONTRIBUTIONS TO IONOSPHERIC PHYSICS AND RADIO ASTRONOMY.

REMARKS: BMD - GENERAL RESEARCH ON THE IONOSPHERE IN SUPPORT OF LAUNCH, MID-COURSE AND REENTRY PHYSICS.

SEE FOLLOWING RELATED AOS: AO106A3 - DESIGN OF EXPERIMENTS

AO122 - MILITARY CONSTRUCTION; AO270 - TECHNICAL OPERATIONS & MANAGEMENT;

AO713 - ADDITIONAL OFFICE SPACE

106	3	0	06/01/61	06/01/62	CORNELL UNIV.	AF 19(604)-8840	\$37,000
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TITLE: DESIGN OF EXPERIMENTS - ARECIBO IONOSPHERIC OBSERVATORY (AID)

DESCRIPTION: THEORETICAL STUDIES TO DESIGN EXPERIMENTS UTILIZING AID FOR IONOSPHERIC MEASUREMENTS.

REMARKS: PROG: BMD - GENERAL RESEARCH ON THE IONOSPHERE IN SUPPORT OF LAUNCH, MID-COURSE AND REENTRY PHYSICS.

MISC: (1) THIS EFFORT WAS CONTINUED ON AO 270

(2) SEE AO 122, 270, 713.

107	0	0					\$2,025,000
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TITLE: JPL SOLID PROPELLANT RSCH (PRINCIPIA)

108	0	0					\$514,567
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TITLE: NAS CONTRACT FOR SERVICE OF MAB (PONTUS)

109	0	0					\$178,613
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: MODIFICATION OF STAND 17B AT AMR

110	0	0	10/30/59		AMICOM	IN HOUSE	\$11,493,327
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TITLE: Project PRESS/Project GLOW - Kwajalein Test Site.

DESCRIPTION: Management and coordination of site preparation, construction planning, and logistic support of the ARPA projects at the Kwajalein Test Site. (Project PRESS and Project GLOW.

RESULTS: Performed necessary duties to support program and contractors.

REMARKS: PROG: BMD - Missile Phenomenology - Re-entry Measurements - Project PRESS/
Project GLOW.

See also AO 600, AO 404, AO 453. AO 459, AO 49, AO 668.

111	0	0					\$420,912
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TITLE: INFRARED BLACKOUT

112	0	0					\$1,494,238
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TITLE: CHARGED PARTICLE BEAM STUDIES THE MEGATRON

112	0	3	02/01/61	06/15/64	STEVENS IN. TECH	DA36039-SC87240	\$1,489,224
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TITLE: Megatron Accelerator

DESCRIPTION: Investigation of the feasibility of the plasma accelerator (megatron) as an electron beam accelerator.

REMARKS: PROG: BMD - General Research - Charged Particle Beam Program
Megatron was constructed under contract DA-36-039-SC-78097 by Stevens Institute of Technology.

113	0	0					\$485,000
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TITLE: DOWN-RANGE TRACKING & TELEMETRY REQTS. FOR THOR EPSILON TRIBE

114	0	0					\$3,612,437
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TITLE: OPTICAL/IR OBSERVATIONS, WOOMERA

114	0	1	01/22/60		BARNES ENG. CO.	DA19020-ORD5703	\$342,675
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TITLE: Optical Measurements of Black Knight (UK experimental test vehicle) Project GAS LIGHT (US); Project DAZZLE (UK).

DESCRIPTION: Optical measurements of launch and re-entry phases of UK developed experimental test vehicle (BLACK KNIGHT) at Woomera, Australia. Barnes provided instrumentation, trained Woomera personnel, participated in measurements and data reduction, analysis and reporting.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - Missile Phenomenology - Launch/Re-entry Meas. - DAZZLE.
 Extension of DA-19-020-ORD-5159.
 Program was continued thru 1966 - \$4,694 was provided for VHF radar (SRI) and optical mounts (Barnes).

114	0	2	05/01/62	05/01/66	SRI	DA04200-ORD1268	\$3,506,621
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TITLE: Radar Instrumentation for Measurements on Black Knight (UK experimental vehicle) Project GASLIGHT (US), Project DAZZLE (UK).

DESCRIPTION: Installation of VHF radar at Woomera range Australia (DA-04-200-ORD-1268).
 Data analysis of radar data [DA-01-021-AMC-12012(Z)]

RESULTS: Radar was designed, constructed and installed at Woomera by summer of 1964
 Six Black Knight vehicles were flown and observed (8/5/64-11/25/65).

REMARKS: PROG: BMD - Missile Phenomenology - Radar Launch/Re-Entry Meas. - DAZZLE.
 REF: "Radar Instrumentation for Re-Entry Physics Program (U)," Final Rpt., DA04-200-ORD-1468.
 See also: AD 367 648, AD 367 649, AD 359 573, AD 367 645, AD 367 650, AD 368 004.
 "Second DAZZLE Data Workshop Summary (U)", Final Rpt., May 66, Vol. I, Radar (S), Vol. II, Optical (C). DA04200-ORD1268 expired 3/1/66.
 DA-01-021-AMC-12012(Z) also applies.

114	13	4	04/07/65		COLLINS RADIO	DA01021AMC12179(Z)	\$1,120,100
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TITLE: Test and Modification of DAZZLE Radar.

DESCRIPTION: Amend 13: Inspection, tests and modification of DAZZLE radar.
 Amend 14, 16: Modification of DAZZLE radar for SPARTA tests.

REMARKS: PROG: BMD - Missile Phenomenology - Radar Launch/Re-entry Meas.- DAZZLE.
 Also amend. 14 and 16.

115	0	0	04/21/60	10/31/61	ELECTRO-OPTICAL	DA04495ORD-2000	\$200,000
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TITLE: GENERATION OF MASSIVE HYPERVELOCITY PARTICLES BY ELECTRICAL MEANS

DESCRIPTION: AN ANALYTICAL, EXPERIMENTAL, AND THEORETICAL INVESTIGATION OF ELECTRICAL TECHNIQUES FOR GENERATING MASSIVE HYPERVELOCITY PARTICLES. INITIAL OBJECTIVE WAY TO ACCELERATE MICROGRAM SIZE PARTICLES TO 25KM/SEC.

RESULTS: DENSE METAL-DERIVED PLASMAS (10E+18 PARTICLES/CM E+03) CREATED BY EXPLOOING AL AND LI WIRES WERE ACCELERATED TO 40 TO 50 KM/SEC.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES.
 REF: ELECTRO-OPTICAL SYSTEM, EOS REPORT 1470- FINAL, 11/15/61.

116	0	0	01/01/60	01/15/63	GEN. DYNAMICS	AF19(604)-5554	\$2,190,000
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TITLE: MIDCOURSE & LAUNCH PHASE PHYSICS RESEARCH

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
<p>DESCRIPTION: Develop an understanding of physics of ballistic missiles in powered flight and midcourse phase.</p> <p>RESULTS: Measured and models of significant molecular radiators of exhaust plumes and plumes respectively.</p> <p>REMARKS: PROG: BMD - Missile Phenomenology - IR Signature of Ballistic Missiles REF: AD-259 922, 252 819, 323 010, 333 860, 331 085, 331 086. See AO 363, Task 5; AO 42.</p>							
117	0	0					\$200,000
TITLE: PROJECT LONGLIFE							
118	0	0	07/08/60	12/01/65	VARIAN ASSC.	DA36039-SC85350	\$6,812,444
TITLE: VA-899 Superpower Klystron Amplifier Development Program.							
<p>DESCRIPTION: To develop a klystron microwave amplifier having 50 MW peak, 1 MW av, 300 MHZ bandwidth, 30% efficiency and 30 db gain.</p> <p>RESULTS: The ultimate technical objectives were not accomplished but were enough of an advance in the state of the art to save 2 yrs on Nike-X program. Program was transferred to Army Electronics Command who continued further development and testing for the Nike-X program.</p> <p>REMARKS: PROG: BMD - Techniques & Devices - High Powered Tubes.</p>							
118	0	1			LITTON INDUS.	DA36039-AMC00153	\$227,000
TITLE: Pulse Modulator Tube Development.							
<p>DESCRIPTION: (a) Development of a magnetron injection gun type pulse modulator (switch tube L3630). (b) Procurement of tubes for the super-power amplifier developed by Varian Assoc.</p> <p>REMARKS: PROG: BMD - Techniques and Devices - Radar - High Power Tube and Components.</p>							
119	0	0					\$863,854
TITLE: DEVELOPMENT CONTROL CENTER							
120	0	0					\$929,676
TITLE: PASSIVE RF RADIOMETER MEASUREMENTS							
120	0	1	01/01/59	12/01/60	U. MICH.	DA36039-SC85403	\$0
TITLE: Field Measurements of Passive Microwave Radiation of Re-Entry Vehicles.							
<p>DESCRIPTION: Radiometer measurements on RV's from DAMP ship.</p> <p>RESULTS: Data was obtained on missile reentries during 1959-60 period.</p>							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - Missile Phenomenology - Passive Microwave Radiation - Detection.
Data obtained was used on AO 120 T2 experimental and theoretical studies.

120	0	2	04/01/58	07/14/62	U. MICH.	DA36039-SC75041	\$845,000
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TITLE: Experimental and Theoretical Studies of Passive Microwave Radiation from RV's/
Satellites.

DESCRIPTION: Task 2 - Investigate the feasibility of detecting re-entry vehicles and
satellites by passive microwave radiation (200-2000MHZ) -
theoretical studies (U. Mich.).

Task 3 - USASRD (In house) - Observation of satellites with radiometer.

REMARKS: PROG: BMD - Missile Phenomenology - Passive Microwave Radiation Detection.
Contracts ALL, DA-36-039-SC-88896, radiometer, Jasik Labs., DA-36-039-SC-
88930, antenna feed, Datex Corp., DA-36-039-SC-88944, radio telescope prog.
mod., and Electronic Specialty Co., DA-36-039-SC-89364 support USASRD
measurements.

121	0	0	12/18/59		USA CORPS OF EN. IN HOUSE		\$31,939,700
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TITLE: Project PRESS Construction.

DESCRIPTION: Construction of PRESS (Pacific Re-entry Signature Study) sites on Kwajalein
and Roi-Namur. Work included development of master plan, establishment of
design criteria, architectural and engineering work, and construction of all
facilities.

REMARKS: PROG: BMD - Missile Phenomenology - Re-entry Measurements - Project PRESS.
Subcontractors were : AETRON and R.M. Parsons - design technical facilities.
Quinton Engineers - design of support facilities.
Pacific - Martin & Zachary -
ALCO - power plant.

121	07400						\$22,873,500
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TITLE: PROJECT PRESS CONSTRUCTION

122	0	0	05/01/60	12/01/61	CORPS ENGINEERS	NAVY BUYED	\$1,016,000
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TITLE: MILITARY CONSTRUCTION - ARECIBO IONOSPHERIC OBSERVATORY (AIO)

DESCRIPTION: SITE CONSTRUCTION, EARTHWORK, STEEL AND CABLE WORK, TOWERS AND CABLES AND
GENERAL SITE INSTALLATION.

RESULTS: CONSTRUCTION WAS STARTED SEPT. 1959 AND WAS COMPLETED THE FALL OF 1963.

REMARKS: PROG: BMD - GENERAL RESEARCH ON THE IONOSPHERE IN SUPPORT OF LAUNCH, MID-
COURSE AND REENTRY PHYSICS.

MISC: SEE AO106, 122, 270 AND 713.

123	0	0					\$649,949
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: RSCH ON FIELD ELECTRON EMISSION

123	0	1		06/14/62	LINFIELD INST.	DA36039-SC-85368	\$234,000
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TITLE: Field Electron Emission Research.

DESCRIPTION: Research on high power field emission cathodes including anodic oxidation of refractory metals, high current cathode structures, electron optics of beams and low work function materials.

REMARKS: PROG: BMD - Techniques & Devices - Radar - High Power Tubes and Components. Work was continued under AO 123 by Field Emission Corp., DA-36-039-SC-90829 by same personnel.

123	0	2		06/14/64	FIELD EMISSION	DA36039AMC03266(E)	\$379,264
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TITLE: Field Electron Emission Research.

DESCRIPTION: Research on high power field emission cathodes including high current field emission cathodes, high current density field emission beams, field cathode life and stability at high average power levels, new cathode materials and oxidation of refractory metals.

REMARKS: PROG: BMD - Techniques & Devices - Radar - High Power Tubes and Components. Continuation of work started under AO 123 with Linfield Research Institute, DA-36-039-SC-85368.

124	0	0					\$2,598
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TITLE: HIGH INTENSITY ACCELERATORS

125	0	0					\$5,184,000
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TITLE: COLLISION CROSS SECTIONS & TRANSITION PROBABILITIES

125	0	1		01/31/66	NEW YORK UNIV.	NONR-285(49)	\$166,000
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TITLE: Theoretical Investigation of the Calculation of Atomic Scattering Problems.

DESCRIPTION: Theoretical studies of electron scattering, atomic structure, scattering by complex potentials and formulation of general approximation methods for many particle problems.

REMARKS: PROG: BMD - General research in support of launch, mid-course and re-entry physics.

125	0	2			NEW YORK UNIV.	NONR-285(15)	\$208,000
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TITLE: Experimental Electron Scattering.

DESCRIPTION: Experimental studies of excitation and ionization of atmospheric gases by electrons using crossed beam apparatus.

AD AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - General research in support of launch, mid-course and re-entry physics.

125	0	3	UNIV. OF CALIF.	NONR-222(70)	\$210,000
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TITLE: Atomic Collisions and Atomic Structure.

DESCRIPTION: (a) Study of atomic reactions and structure using optical pumping techniques, (b) theoretical studies of low energy (0-10ev) electron and positron scattering from hydrogen, and spin exchange in atom - atom scattering.

REMARKS: PROG: BMD - General research in support of launch, mid-course and re-entry physics.

125	0	4	UNIV. OF S.CALIF	NONR-228(11)	\$75,000
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TITLE: Vacuum Ultraviolet Radiation Physics.

DESCRIPTION: Study of hot gaseous plasmas using ultraviolet radiation. Absorption transitions in atomic and molecular gases from the ground states into the ionization continuum and specification of photoionization cross-sections in terms of atomic and ionic products.

REMARKS: PROG: BMD - General research in support of launch, mid-course and re-entry physics.

125	0	5	UNIV. OF FLORIDA	NONR-580(01)	\$29,000
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TITLE: Study of Gaseous Negative Ions.

DESCRIPTION: Determination of cross sections for collisional detachment of negative ions, including measurements on the life times of excited states.

REMARKS: PROG: BMD - General research in support of launch, mid-course and re-entry physics.

125	0	6	QUEENS U.BELFAST	N625582637,3207,	\$924,000
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TITLE: Theoretical Calculations on Atomic and Molecular Processes.

DESCRIPTION: (a) Theoretical calculations on the processes of association, dissociation, x-radiation absorption, electron capture, and excitation and ionization by electron and ion impact; (b) study of long range atomic forces, photo ionization cross section, and configuration interaction for auto-ionizing states in two and three electron systems.

REMARKS: PROG: BMD - General research in support of launch, mid-course and re-entry physics.

125	0	7	UNIV. OF WASH.	NONR-477(32)	\$288,000
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TITLE: Collision Processer.

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: (a) Experimental study of disoriented recombination of molecular positive ions and electrons using cross beam apparatus. (b) Study of N and O afterglow and of negative ion formation in O and other gases.

REMARKS: PROG: BMD - General research in support of launch, mid-course and re-entry physics.

125	0	8	UNIV. OF MINN.	NONR-710(37)	\$208,000
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TITLE: Basic Properties of Gaseous Discharge Plasmas.

DESCRIPTION: Investigation of the decaying plasma generated by a pulse microwave discharge identifying the important processes and determine associated rate constants.

REMARKS: PROG: BMD - General research in support of launch, mid-course and re-entry physics.

125	0	9	NATL.BU.STDS.	NONR-2-61	\$1,560,000
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TITLE: Collision Cross Sections and Transition Probabilities for Astrophysics and Aeronomy.

DESCRIPTION: Expansion and acceleration of NBS in house program in atomic physics with emphasis on atmospheric problems and establishment of a data center on the relevant cross sections and transition probabilities.

REMARKS: PROG: BMD - General research in support of launch, mid-course and re-entry physics.

125	0	10	09/30/60 WESTINGHOUSE	NONR-2584(00)	\$1,010,000
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TITLE: Studies of Atomic Collision Processes in Ionosphere

DESCRIPTION: (1) To study electron collision excitation of the vibrational states of oxygen, nitrogen and hydrogen, and of the processes of negative ion formation in triatomic molecules in electron beams;
(2) To analyze experimental data to determine fractional energy losses and elastic and inelastic collision cross sections for electron, nitrogen and air;
(3) To study negative ion formation for ozone.

REMARKS: BMD - General Research in support of launch, midcourse and reentry physics.
MISC: Transferred to AO 125 Task 10, 9/8/60. Funds shown probably include those of AO 5 T1.

125	0	11	GEN. DYNAMICS	NONR-2786(00)	\$541,000
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TITLE: Investigate Interaction of Cross Section Electronic Atomic Species Molecular Gases

REMARKS: PROG: BMD - General research in support of launch, mid-course, and re-entry physics.
FC: \$541,000 probably includes AI 5 T6 funds.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
125	0	12			GEN. DYNAMICS	NONR-3674(00)	\$1,010,000

TITLE: Low Energy Elastic and Inelastic Collisions of Electrons and Molecules With Neutral Particles.

DESCRIPTION: (1) Measurement of total cross sections for ionized atomic oxygen, hydrogen and nitrogen using modulated molecular beam technique in electron beam impact range 100 to 750 ev. (2) Development of a merged, superimposed beam apparatus for meas. of low energy (below 1 ev.) cross sections for ion-molecule and ion-ion interactions. (3) Measurement of low energy x-sections for neutral-neutral specie interactions (IA).

REMARKS: PROG: BMD - General research - Data base for launch, mid-course and re-entry physics.

FC probably includes funds from AO 39 T2.

125	0	13			SRI	NONR-2588(00)	\$249,000
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TITLE: Collision Processes of Electrons and Atoms

DESCRIPTION: Experimental measurement of cross sections for the ionization of nitrogen and oxygen atoms by electron impact.

RESULTS: A crossed beam apparatus was designed and constructed which employed an atom beam of 2 to 3 Kev kinetic energy as a target. Absolute cross sections were determined for incident energies ranging from below threshold to 500 ev. Results were obtained for the ionization of nitrogen and argon atoms and nitrogen molecules.

REMARKS: PROG: BMD - General research in support of launch, mid-course and re-entry physics.

MISC: Transferred from AO 5 T2.

FC: \$249,000 (probably includes funds from AO 5 T2.

125	0	14		12/31/61	ELECTRO-OPTICAL	NONR-3305(00)	\$67,000
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TITLE: Cesium Ion-Atom Charge Exchange Scattering.

DESCRIPTION: Theoretical and experimental determination of the charge transfer cross section for cesium ions and atoms as a function of interaction velocity in 300 ev.-10kw range.

REMARKS: PROG: BMD - General research in support of launch, mid-course and re-entry physics.

125	0	15			GEN. ELECTRIC	NONR-3942(00)	\$265,000
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TITLE: Electron Spectroscopy.

DESCRIPTION: Development of an electron time-of-flight spectrometer for measurement of scattering cross sections at very low energies and measurement of collision cross sections in selected gases.

REMARKS: PROG: BMD - General research in support of launch, mid-course and re-entry

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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physics.

125	0	16			UNIV.OF CALIF.	NONR 4222(01)	\$30,000
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TITLE: Quantitative Studies by Optical Spectroscopy.

DESCRIPTION: Quantitative measurements by optical spectroscopy of energy exchange mechanisms in simple gaseous and solid systems at temperatures between 1 and 10,000 degrees K.

REMARKS: PROG: BMD - General research in support of launch, mid-course and re-entry physics.

125	0	17	01/31/68		NEW YORK UNIV.	NONR 285(49)	\$181,000
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TITLE: Theoretical and Experimental Scattering Research.

DESCRIPTION: Theoretical and experimental applied research program in atomic and molecular interaction parameters.

REMARKS: PROG: BMD - General research program in support of launch, mid-course and re-entry physics.
Combined program of AO 125 Task 1 and 2.

125	0	18	01/31/69		UNIV.OF WINDSOR	N00014-67-C-0538	\$34,000
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TITLE: Collisional and Radiative Processes in Atoms and Molecules at Low Energies.

DESCRIPTION: (a) A study of the quenching of alkali resonance radiation by inert gases.
(b) Determination of energy transfer in inelastic collisions between excited alkali atoms and inert gas atoms and molecules.

REMARKS: PROG: BMD - General research in support of launch, mid-course and re-entry physics.

126	0	0					\$460,923
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TITLE: CONTAINMENT OF REACTIVE CHEMICALS (PRINCIPIA)

127	0	0					\$2,198,451
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TITLE: DOWN RANGE AIRBORNE MSMTS PROGRAM

127	0	1	01/13/60	05/13/60	AEROJET-GEN	DA04495 ORD1461	\$22,213
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TITLE: C-54 Down Range Airborne Measurements - Project PRESS.

DESCRIPTION: Spectrographic and photoradiometric measurements in the visible spectrum made down range in a C-54 of ICBM re-entry vehicles on Project PRESS.

REMARKS: PROG: BMD - Missile Phenomenology - Optical Measurements - Project PRESS.
Aerojet-Generals participation was continued under DA-04-495-ORD-3067; then under an RCA sub-contract and later under a Bendix sub-contract.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
127	0	2	06/28/60	04/27/61	AEROJET-GEN.	DA04495ORD3067	\$249,521

TITLE: C-54 Down Range Airborne Measurements - Project PRESS.

DESCRIPTION: Contractor provided equipment and services to perform down range airborne measurements on Project PRESS.

REMARKS: PROG: BMD - Missile Phenomenology - Optical - Project PRESS
Aerojet-Gen provided equipment and services for measurements being made by RCA then later to Bendix - See A0127,T 3.

127	0	3	06/01/61	05/01/62	BENDIX CORP.	DA20018-ORD23576	\$1,790,014
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TITLE: Passive Radiation Experiment Platform (PREP) - WV-2 Aircraft.

DESCRIPTION: The use of advanced optical techniques in measuring passive radiation from RV's on the Atlantic Missile Range in conjunction with the DAMP ship and on the Pacific Missile Range on Project PRESS. WV-2 aircraft was used as platform.

RESULTS: Use of WV-2 on PRESS was cancelled late 1961 because could not fly above cloud cover in Marshall Island area.

REMARKS: PROG: BMD - Missile Phenomenology - Optical Measurements - AMR/PMR.
Agent was changed to AFBSO 3/28/62 under AO 304.
Aerojet performed installation and operation of some equipment and Lockheed Aircraft modified aircraft under subcontract to Bendix.

127	0	4	02/15/61	01/31/62	BENDIX CORP.	DA20018 ORD23333	\$90,667
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TITLE: C-54 Down Range Airborne Measurements - Project PRESS.

DESCRIPTION: Contractor conducted airborne measurements on ICBM RV's.

REMARKS: PROG: BMD - Missile Phenomenology - Optical Measurements - Project PRESS.
Bendix was prime contractor and Aerojet-Gen. sub-contractor.
See AO 127, Task 1, 2.
See also RCA contract DA-36-034-ORD-3193RD, AO 127.

128	0	0					\$424,978
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TITLE: IR ICBM-DECOY FEASIBILITY

128	0	1	01/04/60	06/30/61	NOTS	IN-HOUSE	\$425,000
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TITLE: ICBM Decoy Feasibility, Code FIRE-2

DESCRIPTION: Analysis of rocket flames and missile signatures; experimental studies of flame augmentation and suppression.

RESULTS: Interesting results on flare decoy developments, suppression was partially successful. Work was continued under DARPA - Project TABSTONE.

REMARKS: PROG: BMD - Missile Phenomenology - Analytical & Experimental CM.

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REF: NAVWEPS Report 843D, December 1963.
See AO 153.

129	0	0			\$165,594
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TITLE: VLF LAUNCH-PHASE DETECTION

130	0	0	06/25/60 06/30/63 S-F-D LABS.	DA36039-SC-85379	\$846,464
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TITLE: Crossed-Field Amplifiers for Super-Power Microwave Generation.

DESCRIPTION: Investigation methods of improving the characteristics of crossed-field amplifiers for super-power microwave generation.

REMARKS: PROG: BMD - Techniques & Devices - Radar - High Power Tubes and Components.
Continued under AO 474.

131	0	0	01/01/60		\$0
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TITLE: CANCELLED

REMARKS: CANCELLED

132	0	0			\$65,594
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TITLE: STUDY OF SATELLITE DETECTION & CATALOGUING SYSTEM (SHEPHERD)

133	0	0			\$3,263,860
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TITLE: CARDE-PHYSICS PHENOMENOLOGY SUPPORT-PROGRAM

133	0	1	02/01/60 09/01/61 BENDIX CORP.	DA-11-022-ORD-3140	\$1,062,000
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TITLE: CARDE REENTRY PHYSICS PHENOMENOLOGY SUPPORT PROGRAM

DESCRIPTION: PROVIDED FOR EQUIPMENT AND PERSONNEL SUPPORT OF REENTRY SIMULATION EXPERIMENTS OF THE ARMY, NAVY, AND AIR FORCE CONTRACTORS IN THE ALTITUDE SIMULATIVE HYPER-VELOCITY BALLISTIC RANGES AT CANADIAN ARMAMENT RESEARCH AND DEVELOPMENT ESTABLISHMENT (CARDE).

REMARKS: PROG: BMD - GENERAL RESEARCH IN SUPPORT OF REENTRY PHYSICS PHENOMENOLOGY.
MISC: (1) CONTACT AT CARDE, (b)(6)

133	0	2	06/01/60 12/01/62 PERKIN-ELMER CO.	DA-19-020-ORD-5244	\$265,000
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TITLE: CARDE HYPERVELOCITY RANGE INSTRUMENTATION

DESCRIPTION: TO PROVIDE OPTICAL AND ELECTRONIC INSTRUMENTATION FOR REENTRY SIMULATION EXPERIMENTS AT THE CANADIAN ARMAMENT RESEARCH AND DEVELOPMENT EST. (CARDE)

REMARKS: PROG: BMD - GENERAL RESEARCH IN SUPPORT OF REENTRY PHYSICS PHENOMENOLOGY.

133	0	3	04/01/67 03/01/68 COMP. DEV OF CAN	DA01021AMC14468(Z)	\$6,788,000
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: CARDE REENTRY PHYSICS RESEARCH PROGRAM ON TURBULENT WAKES

DESCRIPTION: TO OBTAIN HIGH-RESOLUTION INFORMATION ON WAKE STRUCTURE. CORRELATE AERODYNAMIC STRUCTURE WITH IONIZED STRUCTURE AND BASIC WAKE OBSERVATIONS WITH BODY-DRAG CHARACTERISTICS. COMPARE EXPERIMENTAL RESULTS WITH AVAILABLE FIELD DATA AND PREDICTIONS.

REMARKS: PROG: BMD - GENERAL RESEARCH IN SUPPORT OF REENTRY PHYSICS PHENOMENOLOGY.
 REF: "REENTRY PHYSICS RESEARCH PROGRAM ON TURBULENT WAKES (U)", SEMI-ANNUAL PROGRESS REPORT 1 (JULY - DEC 66), CARDE TN 1747/67, FEB 1967.
 MISC: (1) SEE ALSO AO 13311, 2; AO 322, 205.

134	0	0	03/17/60	05/20/60	RAMO-WOOLDRIDGE	AF04(647)-561	\$195,000
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TITLE: Random Barrage System Study (RBS) - AICBM.

REMARKS: PROG: BMD - System Studies - Random Barrage System (RBS)
 REF: "(U) The Random Barrage System", Final Report, Ramo-Wooldridge, Rpt. No. C109-058, AFBMD No. TR-60-59, Vol. I and II, 5/20/60 (S).
 See also AO 90 T7.

135	0	0					\$0
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TITLE: PHASED ARRAY MODULE DEV.

(CANCELLED)

DESCRIPTION: (CANCELLED)

REMARKS: CANCELLED

136	0	0					\$1,110,113
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TITLE: PHASED ARRAY TUBE DEV.

136	0	2	03/02/66	03/02/68	S-F-D LABS	AF30(602)-4082	\$1,014,462
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TITLE: X-Band/C-Band Phased Array Tubes

DESCRIPTION: (1) To modify an SFD 214 X-band tube for high-powered phased array application in ballistic missile defense radars.
 (2) Develop a C-band tube for high-powered phased array application for BMD radars.

RESULTS: (1) X-band development was dropped at the end of the second year.

REMARKS: PROG: BMD - Techniques & Devices - Radar - High-Powered Tubes.
 REF: "X-Band Phased Array Tube Development (U)", SFD No. AF30(602)-4082 was an extension of AF30(602)-3420 and AF30(602)-3633.

137	0	0					\$447,525
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TITLE: FACILITY FOR NON-DESTRUCTIVE TESTING IN SUPPORT OF AO#107JPL

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
138	0	0					\$858,326

TITLE: ARPAT STUDIES

138	0	1	04/01/60	10/15/60	MIT-LL		\$75,000
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TITLE: Monostatic Radar Design - Terminal Defense ARPAT.

DESCRIPTION: A study of use of monostatic radar design to perform the functions required to terminal defense.

REMARKS: PROG: BMD - System Studies - ARPAT - Radar.
Major part of work was accomplished under AO 56.

138	0	2	04/01/60	07/31/60	COLUMBIA UNIV.	NONR-266(77)	\$57,500
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TITLE: Multi-Static Radar Techniques - Terminal Defense ARPAT.

DESCRIPTION: A study of the use of multi-static radar techniques for the discrimination function in a terminal defense system.

REMARKS: PROG: BMD - System Studies - ARPAT - Radar.

138	0	3	04/01/60	10/25/60	CAL	NONR-3152(00)	\$0
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TITLE: Parametric Study of Interceptor System Concepts - Terminal Defense ARPAT

DESCRIPTION: (1) Phase I - A parametric study of several interceptor system concepts for terminal defense.
(2) Phase II- A plan for an ARPAT collision interception test program design.REMARKS: PROG: BMD - System Studies - Terminal Defense - Interceptors.
REF: CAL Report "ARPAT Interceptor Study".

138	0	4	03/28/60	07/31/60	HUGHES AIRCRAFT	NONR-3149(00)	\$0
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TITLE: Small Homing Interceptor Missile (DART) - Terminal Defense (ARPAT).

DESCRIPTION: The study of a small homing missile (DART) to accomplish intercept against ballistic missile nose cones during re-entry.

REMARKS: PROG: BMD - System Studies - Terminal Defense - Small Homing Interceptor.

138	0	5	04/26/60	08/26/60	ACF INDUSTRIES	NONR-3188(00)	\$0
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TITLE: Interceptor Studies - Terminal Defense (ARPAT).

DESCRIPTION: A general study of the interceptor missile required for terminal defense.
Study included analysis of re-entry target characteristics, background and environmental characteristics and overall system requirements.

REMARKS: PROG: BMD - System Studies - Terminal Defense - Interceptor.

138	0	6	04/01/60	07/01/60	RAYTHEON	NONR-3190(00)	\$0
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: Semi-Active Radar Seeker for Interceptor (DART) - Terminal Defense (ARPAT).

DESCRIPTION: A study of the feasibility of a semi-active radar seeker for the small homing missile interceptor in a terminal defense concept (ARPAT).

REMARKS: PROG: BMD - System Studies - Terminal Defense (ARPAT) - Interceptor (DART).

138	0	7	04/15/60	08/15/60	RAYTHEON	NONR-3191(00)	\$0
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TITLE: Loftor and Interceptor Assignment Concept - Terminal Defense (ARPAT).

DESCRIPTION: Investigation of the loftor and interceptor assignment concepts for AICBM terminal defense (ARPAT).

REMARKS: PROG: BMD - System Studies - Terminal Defense (ARPAT).

138	0	8	05/02/60	09/02/60	GEN. ELECTRIC	NONR-3194(00)	\$39,374
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TITLE: Camera Tube Seeker for Interceptor - Terminal Defense (ARPAT).

DESCRIPTION: Preliminary design and analysis of a camera tube seeker for a small homing interceptor in terminal defense (ARPAT).

REMARKS: PROG: BMD - System Studies - Terminal Defense - Interceptor Seeker.

138	0	9	03/02/60	03/02/60	PERKIN-ELMER	NONR-3199(00)	\$40,480
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TITLE: Optical Guidance for Interceptors - Terminal Defense (ARPAT).

DESCRIPTION: A study of the feasibility of using optical guidance for the interceptors of a terminal defense system.

REMARKS: PROG: BMD - System Studies - Terminal Defense (ARPAT).

138	0	10	05/01/60	08/31/60	JHU-APL	WORD-7386	\$0
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TITLE: Signal Emissions from Re-Entry Bodies - Terminal Defense (ARPAT).

DESCRIPTION: Collect, review and summarize signal emissions from re-entry bodies that could be used by interceptor-borne seekers. Particular emphasis was in UV and IR region.

REMARKS: PROG: BMD - System Studies - Terminal Defense - Re-entry Vehicle Emissions.

138	0	11	06/01/60	09/30/60	BOEING CO.	NONR-3231(00)	\$94,560
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TITLE: Performance Characteristics and Optimum Deployment - Terminal Defense (ARPAT).

DESCRIPTION: A study to establish the performance characteristics and optimize deployment plan for the principal units of a terminal defense system.

REMARKS: PROG: BMD - System Studies - Terminal Defense - Component Deployment.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
138	0	12	07/15/60	10/15/60	A.D. LITTLE	SD-62	\$35,000

TITLE: Cost Study - Terminal Defense (ARPAT).

DESCRIPTION: Investigation of the terminal defense concept (ARPAT) from a cost effectiveness viewpoint.

REMARKS: PROG: BMD - System Studies - Terminal Defense (ARPAT) - Cost Effectiveness.

138	0	13	01/16/61	02/23/62	VITRO LAB.	NONR-3410(00)	\$122,379
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TITLE: Study of Defense Against SLBM's

DESCRIPTION: Investigation of the feasibility of a defense against sea-launched intermediate range ballistic missiles fired at the US. - Establish the requirements for a defensive system and study the feasibility of meeting requirements.

REMARKS: PROG: BMD - System Studies - Defense Against SLBM's.

139	0	0					\$23,602
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TITLE: VLF OBSERVATIONS

140	0	0					\$3,320,000
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TITLE: PROJECT VELA

141	0	0	12/01/60	03/31/64	WATKINS-JOHNSON	DA36039-SC-87384	\$576,000
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TITLE: Low-Noise Traveling-Wave Tube for Satellite Application.

DESCRIPTION: To develop a 90 KMC low noise traveling-wave receiving tube for satellite-borne sensor application.

REMARKS: PROG: BMD - Techniques & Devices - Radar - High Power Tubes and Components.

142	0	0					\$998,147
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TITLE: EQUIPMENT FOR BASIC RSCH IN MATERIALS (PONTUS)

143	0	0					\$1,152,000
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TITLE: EQUIPMENT FOR BASIC RSCH IN MATERIALS (PONTUS)

144	0	0					\$1,005,000
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TITLE: EQUIPMENT FOR BASIC RSCH IN MATERIALS (PONTUS)

145	0	0					\$746,429
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TITLE: SYNTHETIC SPECTRUM RADAR RESEARCH

146	0	0					\$24,700
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: SEISMIC NAS PANEL (VELVA)

147	0	0	07/01/60 07/01/61 UNIV OF MICHIGAN AF	19(604)-7428	\$102,431
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TITLE: NON-LINEAR MODELING OF PLASMA - ELECTROMAGNETIC FIELD INTERACTION

DESCRIPTION: DEVELOPMENT OF NON-LINEAR MODELING TECHNIQUES OF THE INTERACTION OF PLASMAS WITH ELECTROMAGNETIC FIELDS.

RESULTS: EXPRESSIONS WERE DERIVED FOR VARIOUS PARAMETERS OF THE BASIC PLASMA - ELECTROMAGNETIC FIELD INTERACTION.

REMARKS: PROG: BMD - GENERAL RESEARCH ON NUCLEAR EFFECTS AND LAUNCH, MID-COURSE AND REENTRY PHYSICS.

148	0	0			\$179,828
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TITLE: BM CROSS SECTION STUDIES

149	0	0			\$9,022,000
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TITLE: HYPERVELOCITY KILL MECH.

149	0	1	09/01/60 12/31/66 IN HOUSE	6219-9	\$3,060,000
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TITLE: Hypervelocity Kill Mechanisms - Impact Damage.

DESCRIPTION: Study of hypervelocity impact into thick metallic targets, ablative materials, and space structures.

REMARKS: PROG: BMD - Techniques & Devices - Kill Mechanisms - Non-nuclear.
See also AO 149 T2 thru 10; AO 71; AO 853; A0254 and AO 552.

149	0	2	07/13/65 12/31/67 NRL	IN HOUSE	\$300,000
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TITLE: Hypervelocity Kill Mechanisms - Small Particle Impact.

DESCRIPTION: Theoretical and experimental investigations to assess the damage to reentry vehicles that can result from hypervelocity impacts with minute particles.

REMARKS: PROG: BMD - Techniques & Devices - Kill Mechanisms - Non-nuclear.

149	0	3	09/01/60 01/01/62 PICATINNY ARSNL	DA-503-04-011	\$217,000
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TITLE: Hypervelocity Kill Mechanisms Program - CARDE Counterfire Program

DESCRIPTION: Establish a facility and develop counterfire techniques for obtaining hypervelocity fragment impact data in the regions beyond the capability of existing guns.

RESULTS: Difficulty was experienced in obtaining the design objectives and the program was cancelled.

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - Techniques & Devices - Hypervelocity Kill Mechanisms Program.
Continued on AO 552.

149	0	4	09/01/60	11/01/62	NOL	IN HOUSE	\$112,000
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TITLE: Hypervelocity Kill Mechanisms Program - Aerodynamics Phase.

DESCRIPTION: Experimental program using wind tunnels and ballistic ranges to determine the order of magnitude of damages to defeat (aerodynamically) the ICBM mission.

RESULTS: With no induced roll damping moment re-entry vehicle only trimmed and followed nominal trajectory. When a roll damping moment was induced vehicle deviated from nominal trajectory.

REMARKS: PROG: BMD - Techniques & Devices - Hypervelocity Kill Mechanisms Program.
Joint effort by NOL and GE(MSD).

149	0	5	02/01/61	01/01/64	AEROJET-GEN.	AF08(635)-1382	\$1,000,000
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TITLE: Hypervelocity Kill Mechanisms Program - Impact Damage and Vulnerability Phase (Propulsion System).

DESCRIPTION: A study of the effects of hypervelocity projectile impact against representative ICBM propulsion systems. Damage as a function of mass, material, size, shape, velocity, orientation for target material, thickness and configuration.

RESULTS: See summary reports.

REMARKS: PROG: BMD - Techniques & Devices - Hypervelocity Kill Technology.
REF: Final Report, "Propulsion System Damage Study," ASD-TDR-64-2, 1/1/64 (S/NF).
See AO 149, T2,3,4.

149	0	6	08/22/60	11/21/60	RAYTHEON	NONR-3277(00)X	\$20,000
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TITLE: Hypervelocity Kill Mechanisms Program - Intelligence Phase.

DESCRIPTION: To determine the threat models through analysis of observed data and extrapolation.

REMARKS: PROG: BMD - Techniques & Devices - Hypervelocity Kill Mechanisms.

149	0	7	10/06/60	09/30/66	GEN. ELECTRIC	NONR-3295(00)X	\$1,375,000
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TITLE: Hypervelocity Kill Mechanisms Program - Aerothermal Phase

DESCRIPTION: To investigate the aerodynamic heating and loading on nose cones subject to perforation and cavitation due to hypervelocity particles prior to re-entry.

RESULTS: A comprehensive theoretical and experimental data base on aerodynamic heating and loading was established which led to the redesign of nose cones to minimize the damage due to hypervelocity particles.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - Techniques & Devices - Hypervelocity Kill Mechanisms.
REF: (a) "Hypervelocity Kill Mechanisms Program," Final Report 65SD873,
9/24/65 (S).
(b) NRL Report 6421, Vol. 4, 3/1/66.

149	0	8	10/01/60	06/30/65	AVCO	NONR 3307(00)X	\$950,000
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TITLE: Hypervelocity Kill Mechanisms Program - Impact and Aerothermal Phase.

DESCRIPTION: Impact Phase: Determination of damage to heat-sink materials as a function of fragment impact velocity, mass and material, and temperature.
Aerothermal Phase: Determination of damage due to heading on re-entry vehicles due to hypervelocity fragments.

RESULTS: See reports.

REMARKS: PROG: BMD - Techniques & Devices - Hypervelocity Kill Mechanisms.
REF: (a) "Aerothermal Effects in Non-Nuclear Kill-Mechanisms (U),"
RAD-TR-65-19, 7/19/65 (S).
(b) NRL Report 6421, Vol. 5, 3/1/66.

149	0	9	07/01/62	08/01/66	AERONAUTICAL RES	NONR-3903(00)X	\$200,000
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TITLE: Hypervelocity Kill Mechanisms Program - Aerothermal Phase Program Support.

DESCRIPTION: (1) Assistance to NRL in management and coordination of the aerothermal research program. (2) Studies of internal heating of RV's due to punctures. (3) Development of internal jet behavior theory, and study of protection systems.

RESULTS: See referenced report.

REMARKS: PROG: BMD - Techniques & Devices - Hypervelocity Kill Mechanisms.
REF: (a) ARAP Report No. 76, 7/1/65.
(b) NRL Report No. 6421, Vol. 6, 3/1/66.

150	0	0	07/01/60	06/13/66	WESTINGHOUSE EL.	DA01021AMC12384(Z)	\$6,528,462
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TITLE: Synthetic Spectrum Radar

DESCRIPTION: Modification of an AN/FPQ-4 radar into a high powered, broadband (500 MHZ) satellite tracking radar to obtain a catalogue of high range resolution signatures.

RESULTS: Radar was modified and operated. It demonstrated the ability to track and obtained the first high range resolution target signatures.

REMARKS: PROG: BMD - Techniques & Devices - Radar - High Resolution.
REF: "AN/FPQ-4 Synthetic Spectrum Radar Evaluation Program (U)," Final Tech. Report on Contract DA-36-034-ORD-3335(Z), Report No. 86-31020, 9/15/65 (S).
Program continued under AO 849.

			Initial	Final		
AO	AMD	Task	Date	Date	Contractor	Contract Number
151	0	0	06/10/60	06/01/67	LRL	IN HOUSE
						\$4,595,000

TITLE: Charged Particle Beam

DESCRIPTION: To modify and perform experiments with the astron accelerator located at LRL in support of the charged particle beam program.

REMARKS: PROG: BMD - General Research - Project SEESAW (Charged Particle Beam).

152	0	0				\$396,400
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TITLE: RETRIEVAL OPTICAL INFO DEGRADED BY ATMOSPHERE & OPTICAL SYSTM

152	0	1	03/01/61	12/22/66	UCSD-SCRIPPS	NOBS-92058
						\$896,400

TITLE: Retrieval of Optical Information Degraded by Atmosphere & Optical Systems

DESCRIPTION: Analytical and experimental techniques to remove atmospheric/system effects from imagery.

RESULTS: Considerable contribution to the techniques of image restoration.

REMARKS: PROG: BMD - Optical Techniques.

153	0	0				\$2,361,322
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TITLE: BAMBI COMPONENT STUDIES

153	0	1	11/23/60	07/31/61	GEN.DYNAMICS	AF04(647)-644
						\$126,000

TITLE: Satellite and Interceptor Dynamics - BAMBI Support Studies.

DESCRIPTION: (1) Analytical studies of stability and attitude control problems of spinning and inherently stable satellites.
(2) Analytical study on control methods for minor and major alignment changes in interceptors.REMARKS: PROG: BMD - BAMBI - Support Studies - Satellite/Interceptor Dynamics.
REF: General Dynamics/Pomona & General Dynamics/Convair Final Reports.
ZR-AP-061-20(S), SSD-TR-61-14, Satellite.
ZR-AP-061-20(U), SSD-TR-61-14, Satellite.
ZR-AP-061-21(S), SSD-TR-61-15, Interceptor.

153	0	2	10/05/60	07/05/61	RAMO-WOOLDRIDGE	AF04(647)-643
						\$245,753

TITLE: Satellite and Interceptor Dynamics - BAMBI Support Studies.

DESCRIPTION: (1) Analysis of the dynamics and control problems of a spinning satellite - interceptor vehicle.
(2) Analysis of dynamics encountered during interceptor phase of attack on targets.REMARKS: PROG: BMD - BAMBI - Support Studies - Satellite/Interceptor Dynamics.
REF: Final Report, 9/1/61, SSD-TR-61-23.

			Initial	Final			
AO	AMD	Task	Date	Date	Contractor	Contract Number	Total Funds

Parallel study to AO 153T1.

153	0	3	10/03/60	08/03/61	RAMO-WOOLDRIDGE	AF04(647)-643	\$165,822
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TITLE: Infrared Radiation Cell Cooling - BAMBI Support Studies.

DESCRIPTION: Research on infrared techniques involving feasibility and limitations of a "radiation heat exchange" cell cooler for satellite applications. Research included design, development, and construction of an experimental model plus studies.

REMARKS: PROG: BMD - BAMBI - Support Studies - Infrared Techniques.

REF: Final Technical Report, SSD-TR-61-22, 8/1/61.

153	0	4	03/11/61	08/07/62	LOCKHEED AIRCFT.	AF04(647)-688	\$207,100
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TITLE: Infrared Diffraction Pattern Scanning Study - BAMBI Support Studies.

DESCRIPTION: Theoretical analyses on the optimum method for forming diffraction patterns in the focal plane of an IR telescope to provide maximum information using modulating reticle for satellite usage.

RESULTS: Investigations of apertures, scanning reticle patterns, source characteristics and optical design were carried out, leading to construction of a very high resolution experimental optical design, upon which limited testing was conducted.

REMARKS: PROG: BMD - BAMBI - Supporting Studies - Infrared Scanning.

REF: Final Report, LMSC Report No. 2-03-62-2, 10/1/62.

153	0	5	11/23/60	11/30/61	GEN. DYNAMICS	AF04 (647)-644	\$57,200
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TITLE: Space-Time Sampling and Filtering in Satellite Based Infrared Detection Systems - BAMBI Support Studies.

DESCRIPTION: An analytical study based on information theory techniques for space, time and filtering concepts for satellite base infrared ballistic missile detection and tracking.

REMARKS: PROG: BMD - BAMBI - Support Studies - Infrared Scanning and Filtering.

REF: Final Report SSD-TR-61-17, 12/1/61.

See also AO 153 Tasks 3,4,6.

153	0	6	11/23/60	10/31/62	GEN. DYNAMICS	AF04(647)-644	\$756,000
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TITLE: Wind Tunnel Simulation of Ballistic Missile Launch-Phase Plumes-BAMBI Support Studies.

DESCRIPTION: Theoretical and experimental studies on the fluid mechanical, chemical, and radiative properties of launch-phase ballistic missile plumes in a wind tunnel.

REMARKS: PROG: BMD - BAMBI - Support Studies - Launch Plume Characteristics.

REF: Final Report, "BMPWTR", 2R-AP-061-24, 4/25/62.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
See also AO 153 Tasks 3.4.5.							
154	0	0					\$4,000,000
TITLE: NANCY RAE							
155	0	0					\$94,468
TITLE: GUIDANCE SEEKER STUDIES							
156	0	0					\$204,191
TITLE: VHF RADAR INVESTIGATIONS							
157	0	0					\$82,950,135
TITLE: INTERDISCIPLINARY MATERIALS LAB. PROGRAM (PONTUS)							
158	0	0					\$709,424
TITLE: HIGH ALTITUDE NUCLEAR EXPLOSIONS							
159	0	0					\$7,663,159
TITLE: VELVA-SIERRA							
160	0	0					\$1,270,000
TITLE: MUSIC MADRE							
161	0	0	06/01/60	12/01/65	UMIST	NONR-1224(52)/(12)	\$512,650
162	0	0					\$21,508
TITLE: IR COMPONENT DEV. OPTICAL & ULTRAVIOLET TECHNIQUES							
RESULTS: CANCELLED.							
REMARKS: CANCELLED.							
163	0	0					\$621,646
TITLE: VELA-SIERRA							
164	0	0					\$421,405
TITLE: VELA-SIERRA							
165	0	0					\$12,500
TITLE: VELA-UNIFORM SEISMIC RSCH.							
166	0	0	09/08/60	06/30/64	MIT-LL	AF19(628)-500	\$51,811,000

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: PROJECT PRESS (Pacific Range Electromagnetic Signature Study) - Scientific Direction.

DESCRIPTION: Scientific direction of Project PRESS including: Planning and executing experiments, recommending radar, optical, and data-processing instrumentation; procurement of instrumentation; reduction and analysis of data; and conducting theoretical and laboratory experiments. See description Project PRESS below.

REMARKS: PROG: BMD - Missile Phenomenology - Re-entry Physics/Penetration Aids.
Extension of AF19(604)-7400.
Continued under AO 600.

Project PRESS's primary objective was to obtain late mid-course and re-entry missile phenomenological information of RV's leading to the formulation of discrimination techniques and information pertinent to development of penetration aids. The radar and optical instrumentation fielded also provided support to the Army NIKE Zeus/X Program and others.

167	0	0			\$0
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TITLE: RELIABILITY STUDIES FOR SATELLITE SYSTEMS (STRIVE)

168	0	0			\$59,480
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TITLE: RELIABILITY STUDIES FOR SATELLITE SYSTEMS (STRIVE)

169	0	0			\$71,300
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TITLE: LIQUID PROPELLANT INFO AGENCY (PRINCIPIA)

170	0	0			\$1,193,795
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TITLE: RSCH ON HIGH ENERGY CMPDS (PRINCIPIA)

171	0	0			\$196,834
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TITLE: ORGANIC ENERGY CONVERSION RESEARCH

172	0	0			\$9,410,057
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TITLE: VELA-UNIFORM

173	0	0			\$7,557,973
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TITLE: VELA-UNIFORM

174	0	0	09/25/61 01/31/63 HAC	AF04(695)-11	\$1,544,757
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TITLE: BAMBI PHASE II Technical Investigation - Advanced Interceptor Technology.

DESCRIPTION: Investigate the technical feasibility of an advanced space-based interceptor (structure, propulsion, tracker, guidance, warhead, and fuzing) which can be integrated with the space-based BAMBI-AICBM concept (See AO 6T7).

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - Studies - BAMBI PHASE II
 REF: Final Reports (a) SSD-TR-62-112, 10/1/62.
 (b) SSD-TDR-63-25, 2/28/63.
 See also AO 6T7, 153, 176, 177, 308.

175	0	0					\$794,000
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TITLE: SEISMIC INFO. ANALYSIS CENT.

176	0	0	09/10/61	01/31/63	GEN. DYNAMICS	AF04(695)-9	\$1,905,965
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TITLE: BAMBI PHASE II - Technical Investigations.

DESCRIPTION: Determining the feasibility of the BAMBI AICBM concept using multiple interceptor satellites including satellite dynamics, acquisition, commitment, attack and kill.

RESULTS: See referenced report.

REMARKS: PROG: BMD - Studies - BAMBI PHASE II
 REF: Final Phase II Report - SSD-TR-62-111, 10/1/62.

177	0	0	10/02/61	01/31/63	SPACE TECH LAB	AF04(695)-10	\$1,488,830
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TITLE: BAMBI PHASE II Technical Investigations - Single Interceptor Satellite.

DESCRIPTION: Investigation of the feasibility of the spin-stabilized BAMBI satellite interceptor concept including the aspects of acquisition, tracking hand-over, propulsion, warhead, and fuzing.

RESULTS: See referenced reports.

REMARKS: PROG: BMD - Studies - BAMBI PHASE II
 REF: SSD-TR-62-113, 11/2/62.
 SSD-TDR-63-24, 2/28/63.

178	0	0	10/26/60	09/30/63	MIT-LL	AF19(604)-7400	\$3,476,000
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TITLE: Research on Radar Signal Detection, Discrimination and Information.

DESCRIPTION: Development and evaluation of radar techniques in the area of transmitter waveform, signal processing and recording techniques to permit wake measurements that may be applicable to discrimination.

REMARKS: PROG: BMD - Techniques and Devices - Radar Discrimination Techniques
 (1) Funds include \$680,000 for monitoring and equipment.
 (2) Continued on AO 498, 7/24/63.

179	0	0					\$772,029
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TITLE: NUCLEAR WEAPONS EFFECTS STUDIES

179	0	1	12/01/60	01/01/62	BOEING CO	AF33(616)-7804	\$486,000
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		Initial	Final			
AO	AMD	Task	Date	Date	Contractor	Contract Number
						Total Funds

TITLE: PREDICTION OF TRANSIENT NUCLEAR RADIATION EFFECTS IN ELECTRONIC CIRCUITS

DESCRIPTION: TO DETERMINE THE EFFECTS OF TRANSIENT RADIATION PULSES ON CRITICAL MATERIALS AND COMPONENTS IN ELECTRONIC COMPONENTS; TO DEVELOP EFFECTS PREDICTION TECHNIQUES FOR DOSE RATES 10^7 - 10^{12} R/SEC; AND EXPERIMENTALLY VERIFY PREDICTION TECHNIQUES.

REMARKS: PROG: BMD - GENERAL RESEARCH ON NUCLEAR EFFECTS PERTINENT TO BALLISTIC MISSILE DEFENSE.

179 0 2 05/01/61 04/01/62 IBM AF33(616)-8341 \$277,000

TITLE: NUCLEAR RADIATION EFFECTS ON ELECTRONIC DEVICES

DESCRIPTION: EXPERIMENTAL STUDY OF THE NUCLEAR RADIATION EFFECTS ON DIGITAL COMPUTER CIRCUITS AND COMPONENTS.

REMARKS: PROG: BMD - GENERAL RESEARCH ON NUCLEAR EFFECTS PERTINENT TO BALLISTIC MISSILE DEFENSE

MISC: (1) CONTINUATION OF AF33(600)-40462

180 0 0 \$0

TITLE: RSCH INTO GENERATION & PROPAGATION OF SEISMIC WAVES(VELA-U)

181 0 0 \$2,659,547

TITLE: ENVIRONMENTAL TEST SATELLITE

182 0 0 01/06/61 06/12/62 MELPAR AF 30(602)-2420 \$344,992

TITLE: APPLICATION OF RECOGNITION THEORY TO MISSILE IDENTIFICATION AND DECOY DISCRIMINATION.

DESCRIPTION: THEORETICAL AND EXPERIMENTAL RESEARCH APPLYING RECOGNITION THEORY TO MISSILE IDENTIFICATION AND DECOY DISCRIMINATION.

REMARKS: PROG: BMD - TECHS & DEVICES - RADAR - IDENTIFICATION AND DISCRIMINATION.

NOTE: EXTENSION OF AO 73, TASK 4, CONTRACT AF 30(602)-2112 "DATA PROCESSING FOR DECISIONS AND DECOY DISCRIMINATION."

183 0 0 \$3,957,125

TITLE: ABNORMAL IONOSPHERIC BEHAVIOR STUDIES (VELA-S)

184 0 0 \$116,444

TITLE: THERMOCHEMISTRY OF O-F BONDS (PRINCIPIA)

185 0 0 \$169,151

TITLE: THERMIONIC CONVERTERS, EXT. OF AO #6, TASK 14

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
186	0	0					\$209,355

TITLE: SOLID PROPELLANT RESEARCH (PRINCIPIA)

187	0	0	01/02/61		UNIV. OF MICH.	AF19(604)-8032	\$145,000
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TITLE: PLASMA-ELECTROMAGNETIC FIELD INTERACTION

DESCRIPTION: Continuation of an electron beam experiment including (a) theoretical study of the thermal motion in a plasma on the interaction. (b) determination of the absorptive, refractive, and coherence effects appearing in the penetration of a plasma by a radio-frequency beam.

RESULTS: Experimental data was obtained below and above the plasma frequency. Theoretical effort determined electron distribution in experimental portion.

REMARKS: PROG: BMD - General Research - Data base for Charged Particle Beam Program (Project SEESAW).
Continuation of electron beam experiment started under AO 73 [AF30(602)-2099].

188	0	0	06/01/61	08/01/62	GEOPHYSICS CORPS	DA-49-146-X2-075	\$92,330
189	0	0			RAND CORP.	DAHC1567 C-0142	\$674,000
189	0	1					\$142,120
189	0	2			RAND	SD 79	\$200,000
189	0	3			RAND CORP.	DAHC1567-C-0141	\$441,000

TITLE: RAND Support to Hydrodynamics

DESCRIPTION: Investigation of optimum shape for a submarine vehicle, to obtain minimum drag. RAND conducted a three week meeting in Santa Monica, at which experts in hydrodynamics examined the theoretical reasons for the boundary layer to go from laminar flow to turbulence, as a function of body shape. RAND continued to provide support for the program.

RESULTS: The RAND results were used by the DARPA program manager in guiding and evaluating the programs of the other contractors in the submarine vehicle program.

REMARKS: PROG: Started as an Advanced Engineering Program. Moved to TTO when AE was disestablished - Submarine Vehicle.

189	0	4			RAND CORP.	DAHC1567-C-0142	\$674,000
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TITLE: GVN Border Control System

DESCRIPTION: RAND Corp. analyzed the border of Vietnam in order to establish the kind of border control system which would be required to keep Viet Cong and North Vietnamese infiltrators from penetrating into South Vietnam.

RESULTS: RAND concluded that an effective border control system was beyond the

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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capability of the South Vietnamese government, even with U.S. help, and that it would be impossible to prevent individual infiltrators from penetrating any border control system that could be installed.

REMARKS: PROG: TTD - Border Control - Counter-Insurgency.

190	0	0			\$0
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TITLE: BAMBI SUPPORT STUDIES

DESCRIPTION: Cancelled

REMARKS: PROG: BMD - System Studies - BAMBI Support.

191	0	0			\$275,000
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TITLE: HELMET STUDIES

192	0	0			\$1,613,138
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TITLE: RSCH UNDERWATER TECHS FOR DETC. & ID. SUBSURFACE NUCLEAR EXPL

193	0	0			\$4,971,130
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TITLE: STUDY OF SEISMIC PROPAGATION PATHS & REGIONAL TRAVEL TIMES

194	0	0			\$525,484
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TITLE: TECHS HANDLING & STABILITY SODIUM-AMMONIA SOLUTIONS LORRAINE

195	0	0			\$119,000
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TITLE: R&D PROJECTS CARDS ON DDC MACHINES

196	0	0			\$4,471,100
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TITLE: MULTIHOP HF BACKSCATTER

196	2	3	05/25/61	STANFORD UNIV. NONR 3853(00)	\$1,389,488
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TITLE: LONG RANGE PROPAGATION EXPERIMENT (LRPE) PHASE II

DESCRIPTION: TO OBTAIN OBLIQUE IONOGRAMS OVER SELECTED PATHS USING GRANGER STEP FREQUENCY SOUNDERS.

RESULTS: IONOGRAMS WERE OBTAINED FOR A PERIOD OF ONE YEAR AND CONTRIBUTED TO THE KNOWLEDGE OF STRUCTURE OF THE IONOSPHERE.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - LAUNCH PHASE DETECTION - OVER THE HORIZON.

NOTE: LRPE WAS INITIATED BY AO 196 AMD. 2 AND WAS EXTENDED BY AMEND. 6, 8, AND 10.

197	0	0			\$3,450,000
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: SCIENTIFIC & TECH. INFO. ANALYSIS

197	0	2	03/01/61 03/31/68 BMI	SD-80	\$0
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TITLE: Effectiveness of Simple Decoy.

DESCRIPTION: A study to determine the survival limits for re-entry dart-type decoys and balloons.

RESULTS: Results reported in Semi-annual Report 2 dated 3/31/62.

REMARKS: PROG: BMD - General Research - Penetration Aids - Decoys.
Under AO 197 were a large number of tasks. Funds for individual tasks not available. Approximately 49 AO's and tasks constituted Pen Aids program. Initial work was done under E-20, some work was done under E-40 but majority of work was done under E-50.

197	0	7	03/01/61 03/31/83 BMI	DA49083-OSA3176	\$0
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TITLE: Penetration Aids Program Summary.

DESCRIPTION: A 12-volume reference on U.S. Re-entry Systems and related technology. Contains trajectory and signature data, as well as vulnerability (nuclear) data on operational systems through the AF MK 12.

RESULTS: Transferred to USAF, SAMSO (now Space Div.) in 1971. SAMSO funded the update of the volumes through 1972, date of last update. A limited number of the reference sets are available throughout government and industry (8/83). Not in DTIC.

REMARKS: PROG: BMD - General Research - Penetration Aids.
See also AO 197, T2, AO 197, T24 under DA-49-083-OSA-3176.

197	0	24	03/01/61 03/31/68 BMI	SD-80	\$0
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TITLE: Decoy Technology.

DESCRIPTION: Vulnerability of the Model 1033 Decoy to Nuclear Effects.

REMARKS: PROG: BMD - General Research - Penetration Aids - Decoys.
See also AO 197, T2 and AO 197, T7 (contract DA-49-083-OSA-3176).

198	0	0	01/12/61 06/30/65 RAYTHEON	DA19020-ORD5466	\$40,666,422
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TITLE: ARPA Terminal System (ARPAT).

DESCRIPTION: Continuation of initial 1959-60 studies and the addition of an experimental ARPAT interceptor and test program (EAI) and ARPAT measurement radar (AMRAD).

RESULTS: The EAI was designed, developed and successfully tested in 1964. The AMRAD radar was designed and installed at WSMR and served to evaluate the EAI.

REMARKS: PROG: BMD - Studies - Techniques & Devices - Intercept Technology - ARPAT

AD AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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See AO 138.

Various contractors participated in the program.

199	0	0	02/28/61 08/01/70 CAL	SD-81	\$3,715,234
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TITLE: AICBM Terminal Defense Studies.

DESCRIPTION: (1) Systems synthesis and evaluations of defense systems concepts involving pre and post discrimination coupled with terminal defense.

(2) General technical analysis in all areas of terminal defense - HiBex, Up Stage, HIT, RHOGI and ablation research.

REMARKS: PROG: BMD - Studies - Terminal Defense.

REF: (a) "An Experiment and Analytical Study of Ablation in a High Shear Environment (U)", CAL Rpt. BM-1526-G-8, 6/1/64.

(b) "Terminal Defense Activities (U)", Rpts. BM-1526-G-7, 6/1/64; BM-1526-G-9 and BM-1526-G-13, 12/31/64.

200	0	0			\$642,592
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TITLE: RADAR DUPLEXING

201	0	0			\$147,582
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TITLE: CRUSTAL STRUCTURE RSCH (SOUTH AFRICA)

202	0	0			\$181,457
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TITLE: ELECTROSTATIC PHENOMENA

202	0	1	06/01/61 11/01/64 COSMIC, INC.	AF19(628)-1694	\$120,000
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TITLE: ELECTROSTATIC PLASMA OSCILLATIONS GENERATED BY PASSAGE OF A VEHICLE IN IONOSPHERE

DESCRIPTION: THE THEORETICAL STUDY AND EXPERIMENTAL VERIFICATION OF A POSTULATED ELECTRO-STATIC PLASMA OSCILLATION DEVELOPED BY A VEHICLEPASSING THRU THE UPPER IONO-SPHERE (300-2000 KM).

RESULTS: THE CONTRACTOR WAS UNABLE TO COMPLETE THE THEORETICAL WORK ON AN ELECTROSTATIC PLASMA OSCILLATION.

REMARKS: PROG: BMD - GENERAL RESEARCH RELATED TO MID-COURSE PHYSICS FOR DETECTION AND TRACKING OF BALLISTIC MISSILES.

REF: "MISSILE PLASMA INTERACTION PHENOMENA (U)", FINAL REPORT, COSMIC REPORT NO. 79, NOV. 1964 (U).

MISC: (A) EXTENSION OF AF 19(628)-203.

202	0	2	06/01/63 06/30/64 SYLVANIA ELEC.	AF19(628)-3238	\$59,000
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TITLE: Study of Kinetic Theory of Magnetohydrodynamic Generation in the Upper Atmosphere.

DESCRIPTION: Theoretical investigations to determine the dynamical and electrical proper-

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
					ties of an expanding infinite, cylindrical plasma shock wave into the earth's ambient ionosphere in the presence of an axial and/or radial magnetic field.		
		REMARKS: PROG: BMD - General Research in support of launch, mid-course and re-entry physics.					
203	0	0	04/22/61	11/14/64	ELECTRO OPT SYS	DA04495AMC-28(2)	\$399,217
		TITLE: Research on Base Flow and Wakes of Hypersonic Re-Entry Bodies.					
		DESCRIPTION: Formulation of theoretical models for and determination of observables associated with atmospheric trails of hypersonic re-entry bodies.					
		REMARKS: PROG: BMD - Missile Phenomenology - Base Flow/Wakes.					
		REF: "(U) Research on Base Flow and Wakes," EOS Rpt. 1810-Final, (b)(6)					
		(b)(6) 5/10/62 (S) on DA-04-495-ORD-3245.					
		"(U) Research on Base Flow and Wakes," EOS Rpt. 3620 - Final, 1/30/64 (S).					
		See also DA-04-495-ORD-3245.					
		Continued 3/1/64 on AO 254.					
204	0	0					\$59,660
		TITLE: ELECTROCHEMISTRY OF FUEL CELLS ELECTRODES					
205	0	0	04/01/61	11/01/72	CA INST.OF TECH	DA31124ARO(D)-33	\$943,000
		TITLE: EXPERIMENTAL AND ANALYTICAL HYPERSONIC GAS FLOW RESEARCH					
		DESCRIPTION: EXPERIMENTAL AND ANALYTICAL RESEARCH PROGRAM ON HYPERSONIC AND RAREFIED GAS FLOWS AND IONIZED GASES.					
		REMARKS: PROG: BMD - GENERAL RESEARCH IN SUPPORT OF REENTRY PHYSICS PHENOMENOLOGY.					
		MISC: EXTENSION OF DA-04-495-ORD-3231.					
206	0	0					\$147,900
		TITLE: RSCH ON HEAT-TRANSFER FROM IONIZED GAS TO GASSIOUS COOLENT					
207	0	0	08/01/61	07/31/62	VIDYA INC.	NONR-3581(00)	\$79,000
		TITLE: Electrical Breakdown Conditions in the Flow Field of a Hypersonic Vehicle.					
		DESCRIPTION: Theoretical and experimental program of research on antenna breakdown phenomena in the high temperature, non-equilibrium aerodynamic flow field of a hypersonic vehicle.					
		RESULTS: See reference.					
		REMARKS: PROG: BMD - Missile Phenomenology - Antenna Breakdown - Applicable to RV Instrumentation/Penetration Aids.					
207	0	1	03/01/61	03/15/65	GASL	NONR-3475(00)	\$619,954

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: Electromagnetic Characteristics of Moving Ionized Gases.

DESCRIPTION: Theoretical and experimental research on the electromagnetic properties of a moving ionized gas with strong thermal gradients.

RESULTS: See reference below.

REMARKS: PROG: BMD - Re-Entry Physics - EM Characteristics of Moving Ionization.

REF: Final Report, GASL Technical Report, 519, 4/25/65.

208	0	0			\$137,962
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TITLE: TIROS EQUIPMENT

209	0	0			\$1,303,268
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TITLE: PARTIALLY IONIZED GAS

210	0	0			\$279,904
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TITLE: HIGH CURRENT SUPERCONDUCTIVITY

211	0	0			\$85,860
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TITLE: SEMICONDUCTOR TRANSPORT PHENOMENA (FORMERLY AO#5, TASK 10)

212	0	0			\$95,781
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TITLE: PROPAGATION EXPERIMENTS

213	0	0			\$848,917
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TITLE: RADIOMETERS

214	0	0			\$500,862
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TITLE: ENERGY CONVERSION MATS.

215	0	0			\$1,073,595
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TITLE: EARTH CURRENT MAGNETIC FIELD MEASUREMENTS

216	0	0			\$301,000
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TITLE: EHF PROPAGATION MSMTS AND ANALYSIS

217	0	0	12/01/61 04/30/64 S-F-D LABS.	AF33(657)-11492	\$295,188
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TITLE: High Power 60 KMC Oscillator for Spaceborne Applications.

DESCRIPTION: Development and test of a high-power (peak power 250kw, average 5kw) oscillator at 60 KMC.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - Techniques & Devices - Radar - High Power Tubes and Components.
 REF: "A High Power 60 GC Source," Technical Report, No. AL-TDR-64-119,
 AF Avionics Lab., April 1964.
 Extension of AG33(657)-7712.

218	0	0			\$1,885,255
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TITLE: HYDROACOUSTIC & SEISMIC CHARACTERISTICS OF ARCTIC OCEAN

219	0	0			\$2,434,296
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TITLE: THERMOELECTRICITY

220	0	0			\$139,626
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TITLE: TRANSPORT PHENOMENA ASSO. WITH ELECTRODE SYSTEMS

221	0	0			\$1,550,962
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TITLE: COMBUSTION IN HYBRID PROPELLANT

222	0	0	03/30/61 09/01/67	NAVAL AIR PRESS IN HOUSE	\$6,394,733
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TITLE: Project PRESS - Airborne Missile Measurements Program.

DESCRIPTION: Modification, logistic support, maintenance and down-range operational control of all aircraft performing. Airborne missile measurements in support of Project PRESS.

RESULTS: Aircraft became operational in 7/64 and participated in Project PRESS.

REMARKS: PROG: BMD - Missile Phenomenology - Airborne Measurements.

223	0	0			\$247,572
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TITLE: GAS-SOLID INTERACTIONS

224	0	0			\$0
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TITLE: CORROSION ON THERMIONIC CONVERTER ELEMENTS BY CESIUM

REMARKS: CANCELLED

225	0	0			\$59,800
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TITLE: GAS-SOLID INTERACTIONS

226	0	0			\$225,000
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TITLE: ABSORPTION MECHANISM ON OXYGEN ELECTRODES

227	0	0	06/01/61 06/30/64	W.C. STATE NONR-486(0)	\$212,000
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AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: Generation and Study of Intense Ionized Gas Streams.

DESCRIPTION: To develop techniques for the generation of intense ionized gas streams and study their formation and significant parameters as a function of voltage.

REMARKS: PROG: BMD - General Research in support of launch, mid-course and re-entry physics.

MISC: See special note AO 5 T1.

228	0	0			\$124,493
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TITLE: F-LAYER PERTURBATION STUDIES

229	0	0			\$7,973
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TITLE: INDIRECT RADIATION DETECTION FOR PRE-LAUNCH INSPECTION

230	0	0			\$2,240,000
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TITLE: GRANTS FOR ELECTRONIC RSCH. EQUIPMENT

231	0	0			\$800,000
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TITLE: GRANTS FOR ELECTRONIC RSCH. EQUIPMENT

232	0	0			\$1,260,000
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TITLE: GRANTS FOR ELECTRONIC RSCH. EQUIPMENT

233	0	0			\$548,317
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TITLE: HYDRAZINE, UDMH & PENTABORANE

234	0	0	10/01/61 12/01/63 BOSTON COLLEGE	AF 19(628)-240	\$49,967
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TITLE: IONIZATION OF MISSILE TRAILS

DESCRIPTION: ELECTRON DENSITY AND ION PROBES WERE MOUNTED ON MISSILES TO DETERMINE CHARACTERISTICS OF MISSILE TRAILS DURING LAUNCH PHASE TO DEFINE TARGET CHARACTERISTICS FOR LONG RANGE MISSILE LAUNCH DETECTION SYSTEMS. DATA OBTAINED WAS ANALYZED UNDER THIS PROGRAM.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - LAUNCH PHASE DETECTION - OVER-THE-HORIZON DATA OBTAINED BY AFCRL AND UNIV. OF UTAH (AF 19(629)-299; AO234 WAS ANALYZED UNDER THIS CONTRACT.

235	0	0			\$300,000
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TITLE: VLF DETECTION PHENOMENA EXPERIMENTS

236	0	0			\$7,714,000
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TITLE: BALLISTIC MISSILE RADIATION ANALYSIS CENTER (BAMIRAC)

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
236	0	1	07/01/61	09/30/67	U MICH INST	DAHC15-67-C0062	\$5,544,000

TITLE: Ballistic Missile Radiation Analysis Center - (BAMIRAC)

DESCRIPTION: Multi-task effort to collect and analyze data center for missile signature and phenomenology. Provide consulting services and supporting research.

RESULTS: Numerous proceedings and research reports on pume physics and models, and re-entry physics and spectrum. This task has continued at least until 1972.

REMARKS: PROG: BMD - Missile Phenomenology - Signature Analysis During Entire Missile Projectory.

REF: Launch Phase Summary UMIST 4613-139-F, July 1966 (AD-377 009); AD-375 449/8; AD-376 442; AD-516 276; AD-517 036; 516 745; 368 382; 347 347; 524 463; 377 008; 375 450; 616 563L; 347 168; 421 447; 456 093; 838 311; 814 894; 289 375; 367 058.

See SD-91, AO 30.

236	0	2	06/28/63	09/15/69	U MICH INST	DA49083-OSA3263	\$8,335,000
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TITLE: Project AMOS - ARPA Midcourse Optical Station

DESCRIPTION: This phase (6/26/66-9/15/69) is to use observatory to measure space objects and, secondarily upgrade pertinent instrumentation and astronomical research.

RESULTS: A well-executed program was performed.

REMARKS: PROG: BMD - Missile Phenomenology and Space Object Identification - Midcourse Satellite Background - Infrared Measurements

REF: AD-395 617L (SD-91); AD-395 107L Final in AD-502 101; 386 647L.
See SD-210.

236	7	3	10/01/63	09/30/67	U MICH INST	SD-91	\$200,000
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TITLE: Backgrounds Center

DESCRIPTION: Correlate and analyze available infrared cloud background data, perform system capability to discriminate IR missile signatures against clouds.

RESULTS: Analyzed TABSTONE data and generated 2-color model.

REMARKS: PROG: BMD - Missile Phenomenology - IR Cloud Backgrounds.

REF: See listings under AO 236, Task 1.
See SD-91, AO 236, Task 1.

236	21	0			U. OF MICHIGAN	DAHC1567-C0119	\$11,000
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TITLE: Silent Aircraft Noise Analysis

DESCRIPTION: The objective of this program was to analyze background sound from data recorded in Thailand and to process the results in a form that would prove readily applicable to the problem of combat surveillance.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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RESULTS: The final report presented diurnal variations of from 20 cps to 1000 cps (band spectrum level) as well as one-third-octave spectrograms for many physiographic regions of Thailand.

REMARKS: REF: "Analysis of Background Sound From Data Recorded in Thailand," Final Report. (b)(6), The University of Michigan, Institute of Science and Technology, Willow Run Laboratories, Ann Arbor, Michigan, Report No. 8743-1-F. Prepared for Advanced Research Projects Agency, June 1967.

237	0	0			\$4,641,411
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TITLE: TABSTONE

237	0	1	10/01/61 12/01/62	LOCKHEED	NONR-3559(00)	\$42,868
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TITLE: Project TABSTONE - Optical Radiation Transfer in Launch Phase

DESCRIPTION: Theoretical analysis to treat space signature observations as an integral radiation transfer problem.

RESULTS: Preliminary results encouraging for future investigations.

REMARKS: PROG: BMD - Missile Phenomenology - Missile IR Signature as Seen From Space. See other AO 237 tasks.

237	0	2	06/19/61 06/19/62	GCA	NONR-3558(00)	\$98,798
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TITLE: Airglow - Auroral Phenomena - Project TABSTONE

DESCRIPTION: Theoretical analyses to establish sky background and effects on space based defense systems.

RESULTS: Prepared several monographs on qualitative and quantitative natural sky background intensities. Gaps in necessary data identified.

REMARKS: PROG: BMD - Missile Phenomenology - IR/UV/Optical Sky Background
REF: Two-volume report published, ref. unknown.
See SD-71.

237	0	3	09/15/61 11/01/62	PE CO.	NONR-3542(00)	\$22,561
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TITLE: Observations on Rocket Plumes With ROTI Filter Wheel

DESCRIPTION: Fabrication and installation of filter wheel on HFMTIC ROTI camera to obtain visible plume spectral balance data. Obtain data.

RESULTS: Data obtained of visible radiance data to high altitude which aided in plume modeling.

REMARKS: PROG: BMD - Missile Phenomenology - Missile Plume Radiance Measurements.

237	0	4	08/07/61 03/28/67	THIDKOL	NONR-3543(00)	\$502,947
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: Investigation of After Burning at Very High Altitude

DESCRIPTION: Theoretical and Lab studies on phenomena of after burning, liquid and solid systems to very extreme altitudes.

RESULTS: For liquids emphasis was placed on the role of OH* and other fragments. Interesting data was obtained on solid systems.

REMARKS: PROG: BMD - Missile Phenomenology - Theoretical and Lab Study on Missile Exhaust

REF: Thiokol, RMD Reports 5505-F1 (1962); 5505-F2 (1963); 5505-F3 (1964); 5505/5523-F (1967).

237	0	5	06/19/61 01/21/64	GE - ITHACA	NONR-3548(00)	\$867,750
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TITLE: Airborne IR Vidicon System - Project TABSTONE

DESCRIPTION: Design and installation of GE IRTV systems in KC-135 and U-2 for spectral radiance missile plume measurements. Also support and spares.

RESULTS: Limited capability of early systems yielded IR data of first stage (booster).

REMARKS: PROG: BMD - Missile Phenomenology - IR Signatures and Instrumentation
REF: AD-431 253.

237	0	6				\$0
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TITLE: CANCELLED

DESCRIPTION: CANCELLED

237	0	7	07/17/61 10/31/64	A.D. LITTLE	NONR-3556(00)	\$605,605
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TITLE: IR Cloud Emittance and Reflectance - Project TABSTONE

DESCRIPTION: Perform theoretical, lab and field studies of IR cloud signatures. Field studies used a U-2 aircraft.

RESULTS: Spectral measurements of cloud and terrestrial backgrounds were unique and made significant contribution.

REMARKS: PROG: BMD - Missile Phenomenology - IR Cloud Measurements
REF: Final Report published (U).

237	0	8	08/01/61 08/31/68	AERONUTRONICS	NONR-3560(00)	\$630,208
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TITLE: Experimental Investigation of Absorption of IR - Project TABSTONE

DESCRIPTION: National Lab effort to establish absorption characteristics of significant molecules in atmosphere and missile flow fields.

RESULTS: Established a major contribution to international literature.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - Missile Phenomenology - IR Measurements

REF: Aero; Philco-Ford Reports U-3200, 3201, 3202 (August 1965); U-3704, 3930 and 3857 (July 1966). AO-739 759; 669 468; 657 629; 657 614; 651 043; 624 568; 626 726; 626 316.

237	0	9	10/01/61	05/31/64	PHILCO-FORD	NONR-3606(00)	\$104,911
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TITLE: Theoretical Study of Cloud Background; IR Emissivity of A1/2 O/3 in Solid Exhaust Plumes.

DESCRIPTION: Theoretical study of statistical properties of sunlit cloud IR background and, model of cloud scattering; properties of solid particles in aluminum based properties.

RESULTS: Developed statistical models of cloud background for missile warning systems, and determined effects of A1/2 O/3 in solid propellant exhaust plumes.

REMARKS: PROG: BMD - Missile Phenomenology - IR Cloud Signatures, A1-based Solid Motor IR Signatures.

REF: Aeronutronics Report U-2266 (1963); U-2627 (5/64); U-2623 (5/64). See AO 237, Task 16.

237	0	10	06/01/62	07/01/62	ASTROSYSTEMS	NONR 3561(00)	\$77,300
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TITLE: UV Properties at High Altitudes of an OXY-RP Rocket Exhaust Plume

DESCRIPTION: Use of micro-size rockets to simulate high altitude combustion phenomena and obtain ultraviolet and infrared radiance and spectral data; OXY-RP and other fuels (non-hydrocarbon) used.

RESULTS: Significant data obtained that could be used in Project TABSTONE.

237	0	11	10/08/61	06/30/64	DEHAVILLAND-CAN	NONR-3595(00)	\$502,071
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TITLE: CARDE Support - Project TABSTONE

DESCRIPTION: DeHavilland Aircraft Co. provided engineering support to CARDE at AMR where IR missile signatures and atmospheric transmittance data were obtained.

RESULTS: CARDE provided aircraft plus advanced instrumentation to assist in obtaining data to support BM detection systems.

REMARKS: PROG: BMD - Missile Phenomenology - IR Missile Signatures and Transmittance.

REF: Reports available from DREY, Valcartier, Quebec. See AO 30.

237	0	12	11/01/61	10/14/64	WARNER & SHAZEY	NONR-3657(00)	\$454,500
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TITLE: Study of Fundamental Aspects of Flame Radiation - Project TABSTONE

DESCRIPTION: Lab study of fuel mixture flames simulating solid and liquid fuels for missile propulsion.

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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RESULTS: Spectral properties of flame emissivities and temperature were obtained.
Atlas of propellant types and spectra prepared.

REMARKS: PROG: BMD - Missile Phenomenology - IR Signatures.
REF: AD-270 832, AD-271 673.
See AO 6, Task 13; (AO 19 (6043-6106) \$300,888 E-20); AO 237, Amendments 14,17.

237	0	13	08/15/62	08/31/64	ROCKETDYNE	NONR-3899(00)	\$89,446
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TITLE: IR Spectral Radiance of Rocket Exhaust Plumes - Project TABSTONE

DESCRIPTION: Spectral radiance of full scale tie-down rocket motors.

RESULTS: Determined spectral radiance of LOX-RP1 and UDMH-N/2 O/4 missile motors.

REMARKS: PROG: BMD - Missile Phenomenology - IR Missile Signatures.

237	0	14	08/15/62	10/14/63	ROCKETDYNE	NONR-3900(00)	\$49,223
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TITLE: Absorption Coefficient of Molecules in the Ultraviolet - Project TABSTONE

DESCRIPTION: From analytical model for electronic transitions UV/visible absorption coefficients for a number of molecular species were calculated.

RESULTS: Valuable set of calculated data determined and found to agree with experimental data and other theoretical data.

REMARKS: PROG: BMD - Missile Phenomenology - Molecular Properties.
REF: Rocketdyne Report R-5393, October 1963.

237	0	15	10/10/62	08/30/67	GD-ASTRO	NONR-3902(00)	\$466,982
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TITLE: IR Emission Studies of Mixed Gases (Project TABSTONE)

DESCRIPTION: Extensive Lab study of H/2 O and CO/2 infrared emission at rocket plume temperatures; also simulated solid propellant plume mixtures, i.e., A1/2 O/3.

RESULTS: Numerous reports produced yielding necessary data for modeling.

REMARKS: PROG: BMD - Missile Phenomenology - Measurements of Gas Emission
REF: AD-616 089, AD-625 582.
See AO 363.

237	0	16	09/01/62	08/09/67	PHILCO-FORD	NONR-3907(00)	\$604,925
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TITLE: High Altitude Rocket Plume Phenomena (Project TABSTONE)

DESCRIPTION: Theoretical and Lab exp to determine dynamic and radiation properties of solid propellant rocket plumes.

RESULTS: Characteristics of two phase plume flow established and searchlight effect.

REMARKS: PROG: BMD - Missile Phenomenology - Signature Measurements.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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238	0	0					\$4,622,998
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TITLE: TABSTONE

238	0	1	07/17/61	01/20/62	AEROJET-GENERAL	AF04(695)-14	\$300,000
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TITLE: Radiation Airborne Measurement Program (RAMP)

DESCRIPTION: Purpose to obtain airborne spectral intensity and radiance of infrared wave-lengths at AMR and PMR as permitted.

RESULTS: Program obtained some data but temporarily halted, after two additional months under Contract AF04(695)-701; the work continued again under AD 362.

REMARKS: PROG: BMD - Missile Phenomenology - Missile Exhaust Measurements.
See AO 362.

238	0	2	05/14/62	11/30/64	GD-ASTRO	AF04(695)-149	\$1,311,498
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TITLE: Pod Instrumentation for TABSTONE

DESCRIPTION: Prepare, install and launch instrumented pods to obtain high altitude infrared radiance data. (Project FLIP).

RESULTS: The experiment was successful and extensive data obtained for analysis.

REMARKS: PROG: BMD - Missile Phenomenology - Missile Measurements.
REF: GD Report GDA-DBE-64-049, September 1964.

238	0	3					\$0
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TITLE: C A N C E L L E D

DESCRIPTION: C A N C E L L E D

238	0	4	12/29/61	12/31/63	RAYTHEON	AF04(695)-87	\$193,697
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TITLE: Plume Data Reduction and Measurements

DESCRIPTION: Ground based measurements and data correlation of missile engines.

RESULTS: Data obtained and correlated with other results.

REMARKS: PROG: BMD - Missile Phenomenology - Measurements (Special)
REF: Raytheon Co, MSD.
See AF04(695)-349 from 6/63 to 9/64.

238	0	5	01/01/63	12/31/63	GD-POMONA	AF04(695)-242	\$224,000
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TITLE: IRCM Oxidizer-Amine Fuel Combinations

DESCRIPTION: Develop means to quench missile exhaust radiation produced by amine fuels; measure radiation emission with and without quenching.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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RESULTS: Measurements made in 0.2 to 0.8um and 1.2 to 15.0 um bands.

REMARKS: PROG: BMD - Missile Phenomenology - Missile CM

REF: AFCRL-64-310, CR-332-759-001, Volumes I and II (1964).

238	0	6	01/15/63 04/15/64	BAIRD ATOMIC	AF04(695)-217	\$216,773
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TITLE: High Altitude IR Background Evaluation (Project TABSTONE)

DESCRIPTION: Reduce and analyze U-2 data including digitization and models.

RESULTS: Work conducted with LAS, U of Chicago. Extremely useful models were constructed for use in the design and evaluation of military systems.

REMARKS: PROG: BMD - Missile Phenomenology - Background Data Analysis

REF: AF04(647)-564.

238	0	7				\$0
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TITLE: C A N C E L L E D

DESCRIPTION: C A N C E L L E D

238	0	8	11/01/63 09/30/66	UTC	AF33(615)-5251	\$150,179
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TITLE: Spectral Measurement of Rocket Motor Plumes (TABSTONE)

DESCRIPTION: High spectral resolution measurements of solid propellant motors up to 120" diameter. Also theoretical predications of line intensity as a function of altitude.

RESULTS: Objectives of the program met.

REMARKS: PROG: BMD - Missile Phenomenology - Missile Plume Measurements

REF: UTC Report 2232-FR (1966); JMDR 4,33 (1966).

Ext. of AF33(615)-1146.

238	0	9	01/27/64	AUTONETICS	AF33(615)-1188	\$126,867
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TITLE: Instrumentation of X-15 Aircraft (Project TABSTONE)

DESCRIPTION: Fabricate a two color radiometer (3-4um and 8-14um) for use in X-15 to obtain sky and earth backgrounds.

RESULTS: Difficulty with device fabrication resulted in scheduling slippage. Radiometer was not tested.

REMARKS: PROG: BMD - Missile Phenomenology - Background Measurements.

238	0	10		AEROSPACE CORP.		\$615,000
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TITLE: C A N C E L L E D

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: C A N C E L L E D

238	0	11	EDWARDS AFB		\$30,000
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TITLE: Study of Launch Phase Radiation Measurements, Feasibility.

DESCRIPTION: C A N C E L L E D

RESULTS: C A N C E L L E D

238	0	12	04/16/64	LOCKHEED M&S	AF04(647)-787	\$270,000
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TITLE: TV Camera for RM-15 Radiometric Experiments

DESCRIPTION: Installation of camera in RM-15 payload for background statistics.

RESULTS: No results.

REMARKS: PROG: BMD - Missile Phenomenology - Background Measurements.

238	0	18	07/01/65	12/31/65	CUTLER-HAMMER	NONR-5105(00)	\$40,000
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TITLE: Rocket Exhaust Studies

DESCRIPTION: Purpose to observe microwave emission from rocket exhausts.

RESULTS: Results were obtained.

REMARKS: PROG: BMD - Missile Phenomenology - Missile Measurements.

REF: Cutler-Hammer report 5967-1 (1965).

239	09800					\$349,907
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TITLE: CATHODE MATERIALS FOR CESIUM THERMIONIC CONVERTERS

240	09500					\$1,635,000
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TITLE: EQUIPMENT GRANTS

241	0	0				\$1,092,000
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TITLE: EQUIPMENT GRANTS

242	0	0				\$1,540,382
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TITLE: EQUIPMENT GRANTS

243	0	0				\$7,303,328
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TITLE: TABSTONE

243	0	1	05/18/61	06/01/65	NOTS	\$7,603,000
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: TABSTONE/HITAB

DESCRIPTION: Multi-vehicle launch to observe and measure missile signatures and back-grounds.

RESULTS: Partial success was attained in each category with the exception of Aerobees for missile measurements. Significant background data collected.

REMARKS: PROG: BMD - Missile Phenomenology - Missile/Background Measurements
REF: NOTS, Hitab Rocket Probe Program, NOTS-TR-3862/NAVWEPS 8778, 12/65.

243	2	2	05/22/62 12/01/62 NOTS	IN-HOUSE	\$150,000
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TITLE: Probe Launching for TABSTONE

DESCRIPTION: Assemble ten Terrier/Viper rockets for launch at AMR. Payload to include .25-.29um, 1.8-2.7um and 4.3um radiometers capable to observe 100 KW/stereo at S/N=5.

RESULTS: Excellent measurements made, highly successful.

REMARKS: PROG: BMD - Missile Phenomenology - Launch Phase Measurements.
REF: AO 237, Task 17 (b).

244	0	0			\$0
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TITLE: THEORETICAL STUDY OF BOMB DEBRIS

DESCRIPTION: CANCELLED AO244 AMENDMENT 2, 6/62.

245	0	0		VARIOUS	\$2,405,000
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TITLE: AGILE QUICK FIXES

DESCRIPTION: This ARPA ORDER was used as a funding source for a wide variety of 'quick fix' tasks for Vietnam. Tasks and funding were handled by memorandum and no list of the efforts undertaken was kept.

RESULTS: Since it would take a major effort to even determine what was done under this Order the results are unknown.

REMARKS: This was a 'loose' activity even for early ARPA

245	0	1			\$0
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TITLE: STOL Troop/Cargo Aircraft

DESCRIPTION: The objective of this program was to assess the usefulness of assault aircraft in the combat environment of South Vietnam, and to test methods of improving their STOL characteristics. The tests were conducted on a Y-Model DeHavilland Caribou aircraft.

RESULTS: Tests indicated that improvements were effected in take-off and landing

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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distance. Positive control was provided at minimum speeds in and near the ground plane.

REMARKS: REF: "Periodic Report, CDTC, RVNAF," for the period 1962 October 1 - 1962 October 31. Advanced Research Projects Agency, Office of the Secretary of Defense, Washington, D.C., 44pp., 11/1/62.

245	0	2			\$0
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TITLE: Anemometers

DESCRIPTION: The objective of this task was to develop and test rugged, small, hand-held anemometer with an easily read dial that is visible in darkness. The instrument was for use in gauging wind velocities in drop zones.

RESULTS: Tests of a commercially available hand-held pocket-size anemometer indicated that it was acceptable.

REMARKS: REF: "Project AGILE Quarterly Report (U)," for the period 1963 January 1 - 1963 March 31. Advanced Research Projects Agency, Rpt. No. QR-9, 4/15/63.

245	0	3	RDFU-V		\$20,000
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TITLE: Junk Blue Book

DESCRIPTION: The purpose of this project was to prepare a descriptive handbook in Vietnamese and English, giving pictorial and definitive descriptions of the types of surface craft used in coastal and river waterways localities of South Vietnam.

RESULTS: Data were collected by officers from RDFU-V and officers detailed from CINCPACFLT. Material was collected by 27 June 1962 and printed by Commander Naval Forces, Philippines.

REMARKS: REF: COMUSMACV Message, MAGRD 859, 080739Z (1962 February)
CINCPAC Message, 101707Z (1962 February)
The Junk Blue Book (1962 Summer).
Expanded versions were compiled by BMI Under AO 324 and AO 935.

245	0	4	VARIOUS	VARIOUS	\$1,966,000
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TITLE: Field Support

DESCRIPTION: These funds were granted for the general support of AGILE field units and office and were used to establish and operate a field survey team in Vietnam. They were made available for direct obligation covering expenses that could not logically be funded under specific subprojects assigned under other ARPA Orders.

RESULTS: See descriptions of individual task under this AO.

REMARKS: REF: Subject: "Monthly Report, CDTC, RVNAF (1-31 July 1963) (U)." From (b)(6) (RDFU-V); (b)(6) (CDTC). Advanced Research

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
			Projects Agency, Research and Development Field Unit-Vietnam; Combat Development and Test Center, Republic of Vietnam Armed Forces. To: Advanced Research Projects Agency, Washington, D.C., 6/63.		

245	0	5			\$0
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TITLE: Swimmer Support Boats

DESCRIPTION: The objective of this program was to develop and test a lightweight, high-speed boat which could substantially increase military mobility in the delta region of South Vietnam.

RESULTS: Over 200 swimmer support boats were constructed with styrofoam and fiberglass. The boats were tested in both Vietnam and Thailand. The boats were capable of speeds up to 20 knots carrying 8 or 9 persons.

REMARKS: REF: Project AGILE Quarterly Report (U)," for the period 1963 January 1 - 1963 March 31. Advanced Research Projects Agency, Report No. QR-9, 4/15/63.

245	0	6			\$0
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TITLE: T-28 Nomad Aircraft.

DESCRIPTION: The objective of this program was to evaluate the fighter-bomber characteristics of the modified T-28 single engine trainer aircraft for counterinsurgency actions.

RESULTS: Test results indicated the modified aircraft was suitable as an interim measure for a tactical attack role.

REMARKS: REF: "Periodic Report, CDTC, RVNAF (U)," for the period 1962 October 1 - 1962 October 31. Advanced Research Projects Agency, Office of the Secretary of Defense, Washington, D.C., 44pp., 11/1/62.
Expenditures are included in operating costs of RDFU-V.

245	0	7			\$0
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TITLE: Helicopter Armament

DESCRIPTION: The objective of this program was to provide helicopters with a system of armament to add protection to the aircraft and crew in the conduct of normal operations. The system was to comprise light automatic weapons.

RESULTS: The U.S. Army effort in the development of helicopter armament systems overtook the AGILE effort; therefore, Project AGILE transferred the task to the Army.

REMARKS: REF: "Periodic Report, CDTC, RVNAF (U)," for the period 1962 October 1 - 1962 October 31. Advanced Research Projects Agency, Office of the Secretary of Defense, Washington, D.C., 44pp., 11/1/62.
Expenditures are included in operating costs of RDFU-V.

245	0	8	CDTC-V		\$0
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: Command Junk

DESCRIPTION: This program called for the Combat Development and Test Center-Vietnam to build a prototype Command Junk for purposes of proving design and construction techniques and establishing performance parameters.

RESULTS: The prototype was built in mid-1962 at a shipyard in Saigon. Trials, minor modifications, and testing were completed early in 1963. The Command Junk was found to be seaworthy and to have good speed characteristics under power or sail or both.

REMARKS: REF: "Requirement List for CDTC-V (U)," Combat Development and Test Center-Vietnam, 100+ pp. - Undated.
Subject: Command Junk, Report. Combat Development and Test Center-Vietnam.
Expenditures covered under AO 245.

245	0	9	CDTC-V		\$0
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TITLE: Border Surveillance and Control.

DESCRIPTION: A pilot model border surveillance plan was prepared by OSD/ARPA R&D Field Unit and submitted to the RVNAF Joint General Staff in December 1961. The Field Command reported on 14 March 1962 that the proposed plan was not feasible, and recommended that a new plan be prepared. This was prepared and submitted to CDTC on 15 June 1962.

RESULTS: CDTC conducted studies on other feasible means to accomplish border security.

REMARKS: REF: "Requirement List for CDTC-V (U)," Combat Development and Test Center-Vietnam, 100+ pp. (Undated)
"The Border Control Problem in South Vietnam," (b)(6) RAND Corp. 6/63.
Funded under AO 245, work also accomplished under AO 189.

245	0	10	BMI	SD-171	\$0
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TITLE: Leech Repellent

DESCRIPTION: A program was conducted to obtain scientific knowledge on the leech, determine the effect of insecticides on leeches, and to develop an all-purpose leech repellent.

RESULTS: Four repellents were used in field tests in Thailand; three of them containing diethyl toluamide (DEET). All of them provided protection for over 1 hour when the subject remained relatively immobile and did not have to wade in water. The three DEET repellents were not penetrated until the subject had waded several times in water.

REMARKS: REF: "State of the Art Study on Leech Repellents," Research Report.
(b)(6) Battelle Memorial Institute, Columbus, Ohio. Prepared for Project AGILE, Advanced Research Projects Agency, 7/10/63.

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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Subject: Leech Research Program, Memorandum for the Record, (b)(6)
 (b)(6), ARPA, R&D Field Unit, 11/18/64.
 Completed under AO 324.

246	0	0			\$1,225,550
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TITLE: MAGNETOHYDRODYNAMICS

247	0	0			\$4,796,020
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TITLE: ELECTROCHEMISTRY OF AMBIENT TEMP. HYDROCARBON FUEL CELLS

248	0	0			\$44,894
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TITLE: AIRBORNE MEASUREMENTS

249	0	0			\$549,364
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TITLE: COMPLETION & SHIPMENT OF COMPUTER

250	0	0			\$260,000
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TITLE: TABSTONE

250	0	1	06/13/61 06/30/67	ESSA-BOULDER IN-HOUSE	\$380,000
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TITLE: Atmospheric Transmission at Elevated Altitudes

DESCRIPTION: Collate all available data on atmospheric transmission and establish high resolution tables; Amend (3) extend to N/2 0 and 0/3 in 4.5 to 5.5 um. Amend (4) complete machine code; and Amend (5) code to cover 1-14um region.

RESULTS: Results on H/2 0 and CO/2 published as NBS monograph. Precursor to HITRAN model. Other species included for development of complete machine code of all TABSTONE transmission data.

REMARKS: PROG: BMD - Atmospheric Transmission - Analysis and Model.
 See AO 237; AO 363.

251	0	0	09/04/61 01/01/68	GEN.DYNAMICS CP. AF29(601)-7155	\$5,565,460
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TITLE: CASABA/HOWITZER -

DESCRIPTION: Investigations of unique techniques for ballistic missile kill mechanisms using directed energy consisting of plasma or pellets.

RESULTS: BMD - General Research - Kill Mechanisms - Directed Energy
 Extension of target AF29(601)-4759.

252	0	0			\$465,370
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TITLE: RADAR ECHO CHARACTERISTICS

252	1	0	10/14/64	RAYTHEON CO. DA19020-ORD-5519	\$459,000
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: Radar Echo Characteristics.

DESCRIPTION: (a) Investigating the feasibility of target and decoy discrimination on the basis of comparing an observed scattering matrix with a stored matrix.
(b) Model measurement of scattering matrices and comparison with theory.

REMARKS: PROG: BMD - Techniques & Devices - Radar.

REF: AD 354 521, "Radar Echo Characteristics (U)", Fourth Semi-Annual Report, FR-4-481, Oct. 14, 1964 (S).

252	2	0	10/31/64	RAYTHEON CO.	DA19020-ORD-5519	\$0
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TITLE: Radar Echo Characteristics.

DESCRIPTION: (a) Measurement of target surface coating; (b) theoretical study of short pulse techniques for individual scatterer discrimination; (c) study of the relationship of target dynamics to the process of hypothesis testing; and (d) how to incorporate discrimination techniques in radar systems.

REMARKS: PROG: BMD - Techniques and Devices - Radar.

REF: AD 354 521, "Radar Echo Characteristics (U)", Fourth Semi-Annual Rpt., FR-4-481, October 1964 (S).

Funding included under AO 252, Initial and Amend. 1, October 1961.

253	0	0	09/05/61	03/04/62	ARMOUR RES. FN.	DA11022ORD4012	\$80,000
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TITLE: Shock Tube Studies of Gaseous Radiation and Heat Transfer Under Simulated Re-Entry Conditions.

DESCRIPTION: Conduct analytical and experimental research of air and its constituents in a shock tube and light gun, simulating re-entry conditions (10,000-35,000 feet per second and 100K to 200K feet altitude).

REMARKS: PROG: BMD - Re-entry Physics - Shock Tube Studies - Gaseous Radiation/Heat Transfer.

REF: "Shock Tube Studies of Gaseous Radiation and Heat Transfer Under Simulated Re-entry Conditions", Final Rpt., ARF Project 4252, (U) 3/19/62.

253	0	1	10/30/64	CORNELL AERO LAB	DA30069ORD-3443	\$614,000
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TITLE: Study of Infrared Emission From Hypersonic Air Flows.

DESCRIPTION: Analytical and experimental research on the IR spectral emissivity of shocked air and its constituent gases at high temperatures at altitudes up to 150,000 feet applicable to RV detection, tracking and discrimination.

REMARKS: PROG: BMD - General Research in support of launch, mid-course and re-entry physics. Could have also applied to Pen Aids.

REF: CAL Report No. QM-1626-A-16, "Study of IR Emission From Hypersonic Air Flows (U)," date Nov. 1964.

Continued under AO 665 T5.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
254	0	0					\$10,150,000

TITLE: RE-ENTRY VEHICLE INSTRUMENTATION

254	0	1	01/01/62	07/01/67	GE	AF04(694)-268	\$5,353,300
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TITLE: MK VI Re-Entry Vehicle Instrumentation Program.

DESCRIPTION: Design, fabrication and installation.

RESULTS: Three RVIP MK VI flights were conducted 11/1/63-10/1/64.

REMARKS: PROG: BMD - Missile Phenomenology - Re-entry Vehicle Onboard Measurements.

REF: Final Rpts., "VIP Experimental Critique (U)," R65SD1101 through
R65SD1107, 9/30/65 (S).

Extension of AF 04(694)-148.

254	0	2			VARIOUS	VARIOUS	\$1,265,000
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TITLE: Re-Entry Vehicle Instrumentation Program - Support

DESCRIPTION: Contractors listed below supported GE(A0254T1) and AVCO(A0254T3) in developing, installing, and/or analyzing information on specific instruments on board re-entry vehicles.

REMARKS: PROG: BMD - Missile Phenomenology - Re-Entry Vehicle on Board Measurements.

Contractor: Utah St. U - Radiometers, data analysis field support; Block
Assoc - Dual Channel Radiometers, AC Radiometer; GCA - Langmuir Probe; Block
Assoc - Rocking Grating Spectrometers; TE Co. - Wake Angle Scanner; Electro-
magnetic Res. Corp. - Impedance Probe; Aerospace Corp. - Magnetic Conduct-
ance Gage; Physical Studies - Data Analysis [AF19(628)-2426]; U.Utah - Wake
sensor feasibility [AF19(628)-3243]; Lear Seigler-Analysis of electric
field-meter data.

254	0	3	04/18/62	02/01/67	AVCO	AF04(694)-307	\$4,609,700
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TITLE: Low Observable Re-Entry Vehicle Instrumentation

DESCRIPTION: As prime contractor AVCO procured and modified seven low observable re-entry vehicles (LORV) with auxiliary hardware and special instrumentation, then tested integrated instrumentation, evaluated and reported on test results.

RESULTS: Seven LORV instrumented flights were conducted.

REMARKS: PROG: BMD - Missile Phenomenology - Low Observable Re-Entry Vehicles.

REF: (a) RVIP/LORV Data Analysis Final Rpt. (U), Optical Measurements,
AVMSD-0463-66-RR, 12/7/66 (S).

AVMSD-0458-66-CR, 12/7/66 (S)

(c) "Experiment Critique and RVIP Instrument Data Validation -
Impedance Probe" (U), AVMSD-0457-66-CR, 12/7/66 (S)

Extension of AF04(694)-144 and AF04(694)-264. This is Task 3A.

254	0	4	01/01/62		AFCL	IN HOUSE	\$1,172,000
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: Re-Entry Vehicle Instrumentation Program (RVIP) - Instrumentation Support.

DESCRIPTION: Survey of available instrumentation; development of specific instrumentation; formulate experimental plans, and assist in data reduction and analysis of measurements. Supported by subcontractors (see misc. remarks).

REMARKS: PROG: BMD - Missile Phenomenology - Re-Entry Vehicle Onboard Instrumentation
Contractors supporting effort: GE - Electron density probe - \$73,000; Block
Assoc. - Mock Interferometer Boundary Layer Probe - \$55,000; American Science
and Engineering - general assistance - \$40,000; Armour Research Foundation -
Spectrometer - \$35,000.

254	0	5	01/01/62	09/01/66	TRW	AF04(694)-747	\$805,000
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TITLE: Re-Entry Vehicle Instrumentation Program (RVIP) - Flow Field Model Development.

DESCRIPTION: Analysis of data obtained on RVIP flights to update the existing flow field models in particular that of the base flow and recirculation region. Also TRW conducted mass injection studies at JPL wind tunnel. Amend. 10 involved data analysis of those studies with JPL and CIT.

REMARKS: PROG: BMD - Missile Phenomenology - RVIP Flow Field Models.
REF: "Re-Entry Vehicle Instrumentation Program. Report on 2nd Data
Workshop" (U).
Final Tech. Rpt., TRW, 0487-6003-R3-00, BSD-TR-67-46, Feb. 67 (S).
Extension of AF04(694)-638.
Electro-Optical Systems participated on this task under AF04(694)-570.

254	0	6	11/25/64				\$120,000
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TITLE: Reentry Vehicle Instrumentation Program - Recoverable R/V.

DESCRIPTION: The design and development of the instrumentation for 5 to 10 recoverable MK VI vehicles.

RESULTS: Program for recoverable MK VI vehicles was cancelled.

REMARKS: PROG: BMD - Missile Phenomenology - Vehicle Instrumentation.

254	0	7	01/01/62	11/30/62	COOK TECH. CTR.	AF04(694)-149	\$240,000
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TITLE: Re-Entry Vehicle Instrumentation Program - Piggy-Back Instrumentation Vehicle.

DESCRIPTION: Design and development of a special re-entry instrumentation vehicle to be carried piggy back on ballistic missiles where instrumentation can not be incorporated.

REMARKS: PROG: BMD - Missile Phenomenology - Re-Entry Vehicle Onboard Measurements.
This is Task 3B.

254	0	8	01/01/62	09/01/66	GCA	AF04(694)-295	\$543,374
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: Re-Entry Vehicle Instrumentation Program - Experimental Requirement Studies.

DESCRIPTION: (1) Experimental requirements and techniques for investigation of initial re-entry phenomena characteristics between 400,000 and 250,000 feet.
(2) Development of Langmuir probe packages for measurement of lower electron densities in ionized wakes and reduction and analysis of collected data.

REMARKS: PRDG: BMD - Missile Phenomenology - Re-Entry Vehicle Onboard Instrumentation Extension of AFD4(694)-150.

255	0	0					\$50,000
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TITLE: FORWARD SCATTER MONITOR

256	0	0	07/01/62	06/30/63			\$163,000
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TITLE: Calibration of Spray Systems, C-123/MC-1, H-34/HIDAL, A-1H/FIDAL.

DESCRIPTION: In the interest of developing spray data for operational use in SEA, ARPA sponsored the calibration trials of two aerial spray systems, THE HIDAL AND THE FIDAL.

RESULTS: Crosswind flights were flown intentionally for the primary purpose of obtaining information on mass median diameter. Deposit information from these tests formed the basis for much of the later defoliation operations in Vietnam.

REMARKS: AGILE - DEVICES - SPRAY

REF: Calibration of Spray Systems, C-123/MC-1, H-34/HIDAL, A-1H/FIDAL.

(b)(6) U.S. Army Biological Laboratories,
Fort Detrick, Frederick, Maryland, Report No. 46.

256	0	1			USABIOLABS	IN HOUSE	\$49,500
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TITLE: DEFOLIATION - RVN FEASIBILITY STUDIES

DESCRIPTION: In response to a request from the highest level of the Republic of Vietnam government, relayed by the US Military Assistance Command, ARPA initiated a crash program to deploy commercially available herbicides and USABIOLABS personnel to RVN to investigate the feasibility of defoliation. Spray equipment and chemicals arrived in-country in July 61 and tests were carried out from then until Jan 62.

RESULTS: A total of 19 tests, principally with a RVNAF C-47, were carried out from July 61 to Jan 62 with mixed defoliation results. No question remained that tropical defoliation occurred but spray equipment, chemicals and deposition methods were seriously deficient.

REMARKS: Section III-A of Project AGILE Completion Report on Defoliation dated January 1981 gives a detailed summary of the task, its complexities and its follow-on activities.

256	0	2	05/01/66	07/01/67	AMER. CYANAMID	D18035AMC748A	\$57,000
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AD AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: Feasibility Study, Marking and Identification in Ground Operations.

DESCRIPTION: This study involved the selection of suitable marking substances, formulating and testing them and evaluating them for field use and for marking river traffic.

RESULTS: The feasibility of using these marking agents in both land and water applications was proven in some cases.

REMARKS: REF: "Feasibility Study, Marking and Identification in Ground Operations (U)," Final Report, for the period 1966 May - 1967 July. (b)(6)
(b)(6), American Cyanamid Company, Bound Brook, N.J., Report No. 4. Prepared for Ground Munitions Laboratory, Weapons Development and Engineering Laboratories, Edgewood Arsenal, Maryland, 8/67, (PA 29,534).

256	0	3			\$44,000
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TITLE: Fixed-Wing Insecticide Dispersal Apparatus, Liquid (FIDAL) Herbicide Spray System

DESCRIPTION: In June, 1961 a requirement was stated for a means of clearing jungle areas, particularly along the VN borders, so that the observation of VC activities would be possible.

RESULTS: Six FIDAL units were fabricated, tested and evaluated. Certain modifications were determined to be necessary, but were not accomplished. The system itself, as improved by various modifications, is workable, but no actual prototype of the improved version was built.

REMARKS: REF: "Project AGILE/ARPA Monthly Status Report No. 7 (U)." From: (b)(6)
Directorate, Commodity Management, U.S. Army Edgewood Arsenal, Maryland.
To: Director, ARPA, Office of the Secretary of Defense, ATTN: Remote Area Conflict Office, Washington, D.C., 6/20/63.

256	0	4	CDTC		\$31,000
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TITLE: Herbicide Bomblets

DESCRIPTION: The objective of this program was the design and evaluation of an interim munition system for use on Army aircraft to deliver, disperse and disseminate herbicide material.

RESULTS: The item produced as a result of this effort was the Bomblet, Biological, four-pound, E138, which is a cylindrical, air-to-surface, free-fall missile, 3.5 inches in diameter and 8.56 inches long.

REMARKS: REF: "Quarterly Report (U)," for the period 1964 Fourth Quarter. Combat Development and Test Center, Republic of Vietnam Armed Forces; Advanced Research Projects Agency, Research and Development Field Unit-Vietnam.

256	0	5			\$0
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
256	1	4			CRDL	IN HOUSE	\$7,500

TITLE: DYE GRENADES

DESCRIPTION: Procure and ship to Vietnam 250 dye filled hand grenades and 500 dye filled rifle grenades.

RESULTS: The grenades were not tactically useful for marking insurgents.

REMARKS: MISC: Part of the marking, tracking and identification program.

256	2	0					\$0
256	2	5			CRDL	IN HOUSE	\$5,200

TITLE: Smoke Grenades

DESCRIPTION: Procure and ship to Vietnam long burn fuzes for Army standard smoke grenades and 100 Army experimental smoke bombs with delay fuzes and long burn time.

RESULTS: Longer delays and longer burn times were useful in marking targets.

REMARKS: Part of the marking, tracking and identification program.

256	3	6			CRDL	IN HOUSE	\$17,171
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TITLE: Flame Throwers.

DESCRIPTION: Procure and ship to Vietnam 2 Army tank type flame throwers, an M-4 mixer and 1500 pounds of new napalm thickener. Items to be mounted and tested on an LCM.

256	4	0			FT. DETRICK		\$0
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TITLE: MC-1/C123 Defoliation System.

DESCRIPTION: In June 1961 CDTC identified requirements for means of clearing jungle areas to remove cover and to destroy crops.

RESULTS: An evaluation team judged the MC-1/Hourglass equipment used with the C-123 aircraft to be the most effective system; later tests in VN and at Eglin AFB indicated they were correct.

REMARKS: REF: "Review and Evaluation of ARPA/OSD Defoliation Program in South Vietnam (U)," for the period 1961 July 15 - 1962 March. Delmore, Fred J., (et al.), U.S. Army Chemical Corps., 88 pp.
Continued under AO 256, Amendment 6.

256	4	2 61			USABIOLABS	IN HOUSE	\$514,785
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TITLE: DEFOLIATION - SPRAY SYSTEMS MODIFICATION AND TEST

DESCRIPTION: Carry out quick-fix and mid-range modification to improve the performance of USAF and RVNAF spray systems in operational use in RVN.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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Conduct detailed aerial spray grid testing in the US to establish dependable dispersal data.

RESULTS: Numerous modifications were made and tested for the C-123/MC-1, H-34/HIDAL, and A-1/FIDAL spray systems.

Detailed spray grid measurements were made to optimize aircraft speeds, altitudes and flow rates.

Acceptable deposition rates were established.

REMARKS: DTICS (cont.) - AD 478 158 , AD 442 477 , AD 442 477 , AD 442 478 , AD 442 479 , AD 442 480 .

Section III-B of Project AGILE Completion Report on Defoliation dated January 1981 gives a detailed summary of this effort.

256	5	0	AAI	DA18108CML-7157	\$21,000
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TITLE: Flame Throwers

DESCRIPTION: This program had a twofold objective, one a study on the mounting of flame-throwers on monitor-type LCM conversions and the other the procurement of a quantity of West German single-blast flame throwers and E72 experimental smoke bombs.

RESULTS: It was concluded that the mounted flamethrowers would be a feasible weapon for use against ambushes without compromising the basic mission of the boat.

REMARKS: AGILE - WEAPON

REF: "Study of Flame Installation in LCM Type Boats". Aircraft Armaments, Inc., Cockeysville, Maryland, Report No. ER-2752. Prepared for U.S. Army Chemical Research and Development Laboratory, Army Chemical Center, Maryland, 5/62.

256	7	7	CRDL	IN HOUSE	\$143,000
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TITLE: Multiple Grenade Launcher-Truck Mounted.

DESCRIPTION: Procure and ship to Vietnam an Edgewood Arsenal experimental launcher, 2000 grenades and associated grenade nests for tests by CDTC-V on lead truck in road convoys.

RESULTS: Unit capable of launching single and salvo shots forward, left, right or all. An interesting concept overtaken by the tactical use of helicopters for most movement in Vietnam.

REMARKS: MISC: Part of the counter-ambush program.

REF: "Truck Mounted Grenade Launcher (U)." (b)(6) U.S. Army Chemical Research and Development Laboratories, Edgewood Arsenal, Maryland. 11/27/62.

256	8	0			\$1,000
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TITLE: Test and Modify HIDAL Spray Equipment

DESCRIPTION: This program was authorized to modify the existing Helicopter Insecticide

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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Delivery Apparatus-Liquid (HIDAL) in order to increase its delivery capacity for use with herbicides and to test the modified equipment.

REMARKS: AGILE - DEVICE - SPRAY

REF: "Design and Evaluation of an Interim Anticrop Weapons System (U)," United States Army Biological Laboratories, Fort Detrick, Maryland, Technical Report 47. Sponsored by ARPA, 5/64.

256	8	3 62	USABIOLABS	IN HOUSE	\$31,107
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TITLE: DEFOLIATION - HERBICIDAL BOMBLET CLUSTERS

DESCRIPTION: See ARPA Order 572, Task 1

RESULTS: See ARPA Order 572, Task 1

256	12	8	LEESONA MOOS	DA18108AMC-110A	\$50,000
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TITLE: Encapsulated Chemicals.

DESCRIPTION: Basic research on new chemicals and encapsulation techniques for marking insurgents. Idea similar to the carbonless carbon system in use for business use.

RESULTS: A very few new insights into the basic sciences involved. No tactical value.

REMARKS: MISC: Part of the marking, tracking and identification program. See AO 563, Task 1.

256	16	0	07/01/66 08/30/67 GAF	DA18035AMC-395A	\$151,000
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TITLE: Research Study of Marking and Identification Agents.

DESCRIPTION: The object of this research was to study and categorize potential candidate marking substances which could be detected using electro-optical devices. Primary interest on the part of the US Army was in UV absorbing materials which emit energy in the UV, visible or IR regions.

RESULTS: A variety of fluorescent compounds were studied, fluorescent emission measurement techniques were modified, and techniques were explored for enhancing the fluorescence of a system.

REMARKS: AGILE - MARKING - DETECTION

REF: "Research Study of Marking and Identification Agents," Final Summary Report, for the period 1966 July - 1967 August. Catino, Sigmund, (et al.), General Aniline and Film Corporation, New York, N.Y., Report No. GAF-US-17. Prepared for Dept. of the Army, Edgewood Arsenal, Research Laboratories, Chemical Research Laboratory, Edgewood Arsenal, Maryland, 8/67.

256	16	10	07/01/66 08/30/67 GEN. ANALINE	DA18035AMC-395A	\$151,125
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TITLE: Research Study of Marking and Identification Agents (Fluorescent Chemicals)

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: The object of this research was to study and categorize potential candidate marking substances which could be detected using electro-optical devices. Primary interest on the part of the US Army was in UV absorbing materials which emit energy in the UV, visible or IR regions.

RESULTS: A variety of fluorescent compounds were studied, fluorescent emission measurement techniques were modified, and techniques were explored for enhancing the fluorescence of a system. No tactical utility.

REMARKS: PROG: Marking - Detection

REF: "Research Study of Marking and Identification Agents," Final Summary Report, for the period 1966 July - 1967 August. Catino, Sigmund, (et al.). General Aniline and Film Corporation, New York, N.Y., Report No. GAF-US-17. Prepared for Dept. of the Army, Edgewood Arsenal, Research Laboratories, Chemical Research Laboratory, Edgewood Arsenal, Maryland, 8/67.

256	19	9		AM CYANIMIDE	DA18035AMC-748A	\$56,800
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TITLE: Water Marker System

DESCRIPTION: See AO 386, Task 1.

REMARKS: See AO 563, Task 1.

257	0	0	11/06/62	SYLVANIA ELEC PR	DA36-039-AMC00023E	\$1,316,286
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TITLE: PROJECT O-T-H

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - OTH DETECTION
PER VAN EVERY: FC = 446,000

258	0	0	09/02/61 08/30/64	GEOPHYSICS CORP.	AF19(628)-3320	\$323,242
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TITLE: Research Directed Towards Studies on Chemical Release Applications.

DESCRIPTION: Theoretical and experimental program to determine interaction of missile launch phase interaction with the ambient atmospheric gases. Of interest were reaction rates, chemiluminescent efficiencies, spectra, mechanisms and emitting species in chemiluminescent reactions between atmospheric species and gases released from missiles.

REMARKS: PROG: BMD - General research applicable to launch phase detection and tracking. Also applicable to techniques for suppression launch phase signatures.
Continuation of AF19(628)-231.

259	0	0				\$0
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TITLE: PRECISION LIGHTWEIGHT OFF-AXIS & ASPHERIC OPTICS

260	0	0				\$66,486
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: SITE SURVEYS; SEISMOLOGICAL OBSERVATIONS

261	0	0	11/01/61	01/31/62	GEN. ATRONICS CP	NONR-3660(00)	\$50,000
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TITLE: Angular Rotational Radar Signal Characteristics.

DESCRIPTION: Investigate the application of the tangent approximating manifold method to measure angular coordinates, velocities, accelerations and resolution.

REMARKS: PROG: BMD - Techniques and Devices - Radar.

262	0	0					\$568,620
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TITLE: US/CANADIAN/BRITISH HELMET PROGRAM

263	0	0					\$605,777
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TITLE: CLOUD PHYSICS

264	0	0					\$150,000
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TITLE: CLOUD PHYSICS

265	0	0					\$697,000
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TITLE: CLOUD PHYSICS

266	0	0					\$3,334,632
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TITLE: INFRARED RESEARCH

266	0	1	11/03/61	04/01/65	GEC	DA44009-AMC353(X)	\$192,381
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TITLE: Research on Electrostatic Pickup Tube

DESCRIPTION: Theory & Experiments of PC and bolometric materials used with return beam amplifier to evaluate electrostatic focus and deflection tubes. Also ferroelectrics were investigated.

RESULTS: Ferroelectrics too insensitive for IR camera tubes.

REMARKS: PROG: BMD - Optical Technology - IR Imaging, Theory & Experiments
REF: GEC Report, "Research on an Electrostatic Pickup Tube," March 1963.
Ext. of DA-44-009-ENG-4866; AO 266, Task 1 - Amendment 3.

266	0	2	11/17/61	09/30/62	GE CO.	DA44-009-ENG-4860	\$29,551
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TITLE: Electroluminescent - Bolometric Image Tube Investigation

DESCRIPTION: Analysis & Experiments to establish whether thermistor mosaic could yield image conversion when in juxtaposition with II or IO tube.

RESULTS: Results depended heavily on each of the three major components involved.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - Optical Technology - IR Imaging Development.

266	0	3	11/30/61 09/30/62 GE CO.	DA44009-ENG-4855	\$49,039
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TITLE: Research on Electronic Readout for Mosaics

DESCRIPTION: Analytical and limited experimental investigation to readout 30x300 array of thermistor bolometric elements. Tasks to be done on 10x10.

RESULTS: Different means of switching in conjunction amplification looked promising for further investigations.

REMARKS: PROG: BMD - Optical Technology - IR Imaging Development
REF: GE Report IT-7186-R-46, March 63.
See AO 266, Task 17.

266	0	4	07/01/63 12/01/65 GE	DA44-009AMC338(X)	\$0
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TITLE: Research in Doped GE Crystalline Materials.

DESCRIPTION: Theoretical and experimental studies to develop a LWIR doped GE camera tube: Studies of Zn(II) and Hg(I) for 8-15um region.

RESULTS: Effort focused on Zn II level doping and satisfactory results achieved after considerable difficulties.

REMARKS: PROG: BMD - Optical Technology - LWIR Camera Tube Development.
Also DA44-009-ENG-4852.

266	0	5	11/27/61 12/20/64 HUGHES AIRCRAFT	DA44009-AMC352(X)	\$147,490
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TITLE: Research on Image Tube Surfaces

DESCRIPTION: Analytical & experimental studies to consider adsorbed gases on photoemissive surfaces for IR imaging.

RESULTS: Xe on tungsten; CS on CS/2SB and others were examined to achieve very rudimentary imaging.

REMARKS: PROG: BMD - Optical Technology - IR Imaging
REF: HAC Report, "Research on Thermal Image Tube Surface."

266	0	6	11/01/61 09/15/65 RCA	DA44009AMC324(X)	\$206,816
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TITLE: Research and Development on IR Camera Tube

DESCRIPTION: Attempt to improve RCA PbTe camera tube.

RESULTS: Laboratory studies gave indication that tube performance could be improved.

REMARKS: PROG: BMD - Optical Technology - IR Imaging Tube Development.

266	0	7	11/21/61 11/30/65 RCA	DA44009AMC-341X	\$0
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AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: Research on Extrinsic Photoconductor Detectors

DESCRIPTION: Theoretical and experimental study on the use of extrinsic materials for infrared cameras, Ge or Ge-Si alloy doped with appropriate activator.

RESULTS: Studies focused on doped Ge particularly Ge:Au with some primary results. Other makes were Ge:Ni, Ge:Co and Ge:Cu.

REMARKS: PROG: BMD - Optical Technology
See AO 266, Task 4.

266	0	8	11/21/61 11/30/65 RCA	DA44009-AMC358X	\$257,198
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TITLE: Research on Intrinsic Photoconductors.

DESCRIPTION: Conducted study of intrinsic detector materials for imaging devices including P-Ag/2Te and other binding II-V and II-IV compounds.

RESULTS: No major developments reported although Ag/2Te and Ag/2Se were tested in low temperature beam scanning operations.

REMARKS: PROG: BMD - Optical Technology - Imaging Device Development.

266	0	9	11/16/61 09/26/64 SERVO CORP.	DA44009AMC359(X)	\$148,785
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TITLE: Charge Camera Read-Out Using Drift Mobility

DESCRIPTION: Theoretical and laboratory study of using voltage gradient induced mobility for scanning. Materials suitable for LWIR were examined for suitability. InAs was examined from MIR.

RESULTS: Drift mobility as a read-out process in solid state images was demonstrated.

REMARKS: PROG: BMD - Optical Technology - IR Imaging.
REF: SCA Report, WS-45,500, September 1964.

266	0	10	10/31/61 12/31/67 WEST EL.CO-PITTS	DA44009AMC357(X)	\$349,494
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TITLE: Research on New Materials for Heat Image Tubes

DESCRIPTION: To achieve a matrix element based on tunnel emission from bolometric layers.

RESULTS: Modest progress made to achieve objective.

REMARKS: PROG: BMD - Sensor Development
See AD-501 481L, 501-482L, 395 837L, 468 633L.
Ext. DA-44-009-ENG-4854.

266	0	11	10/30/61 10/30/62 WESTINGHOUSE	DA44009-ENG-4846	\$39,850
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TITLE: Study of Mesomorphic Materials for IR Detection.

DESCRIPTION: Theoretical and laboratory study to evaluate mesomorphic materials, e.g.,

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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cholesterol compounds, for use in IR imaging.

RESULTS: Test shows utility but of limited practical value to Military.

REMARKS: PROG: BMD - Optical Technology - IR Imaging.

REF: Westinghouse Electric Report Number 62-912-254-R4-X, (10/62).

266	0	12	10/31/61	06/01/68	WESTINGHOUSE EL.	DA44009AMC349(X)	\$374,319
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TITLE: Research on Multilayer Single Crystals

DESCRIPTION: Analytical and experimental research program for 2-D IR image, electron-beam reading, i.e., electron-beam-scanned vidicon retinas of InSb, Ge & Si:In.

RESULTS: Significant progress made in solid state focal planes and e-beam scanned vidicon retinas - retinas of multilayer crystal structures not promising.

REMARKS: PROG: BMD - Optical Technology - LWIR Images, Vidicon Type.

REF: AO-330 163, 338-202.

Ext. of DA-44-009-ENG-4869.

266	0	13	10/31/61	11/12/64	WESTINGHOUSE-BA.	DA44009AMC342(X)	\$223,260
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TITLE: Research on Signal Enhancement in IR Pickup Tubes

DESCRIPTION: Analysis and applied research in charge gain technique for practical infrared image tube with electron beam readout with either bolometric or photo-conductive retinas.

RESULTS: Technique was established as practical, however, emphasis was placed on broader research program.

REMARKS: PROG: BMD - Optical Technology

Extension of DA-44-009-ENG-4868.

266	0	14	06/25/62	08/25/64	ZENITH RADIO CP.	DA44009-ENG-5188	\$188,221
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TITLE: Research on Photo Stimulation in Alkali Halides

DESCRIPTION: Conduct research, analytical and experimental, to evaluate some alkali halides as infrared-to-visible image converters.

RESULTS: Very limited results, approach not fruitful except for near-infrared.

REMARKS: PROG: BMD - Optical Technology

REF: Final Report, "Research on Photo Stimulation in Alkali Halides," ZRC-64-665, August 1965.

266	0	15	03/26/64	02/29/68	GE-MSD	DA44009AMC520(X)	\$1,100,408
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TITLE: Integrated R&D Program for Image Tube Improvement.

DESCRIPTION: Improve deficient features in LWIR image vidicons (GE) using extrinsic photo conductive layers. Test performed on GEZ-7934 IR vidicon.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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RESULTS: Program provided little improvement in the LWIR regions investigated.

REMARKS: PROG: BMD - Sensor Development - LWIR Vidicons
REF: AD-848 713L
See AO 266, T4, and T19.

266	0	16					\$0
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DESCRIPTION: CANCELLED

RESULTS: CANCELLED

REMARKS: CANCELLED

266	0	17	11/09/65	01/02/67	IBM FED SYSTEMS	DA44009AMC1365(T)	\$99,000
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TITLE: Investigation of Analog Readout Techniques for Detector Mosaics

DESCRIPTION: Use of analog circuit techniques for commutating signals from hi-density IR detector (InSb) mosaic into single amplifier. Investigations included TD1, channel equalization and other techniques for integrated circuit package.

RESULTS: Feasibility model of commutation technique fabricated and could handle up to 50x50 PV or PC detectors.

REMARKS: PROG: BMD - Optical Technology - Device Development.

266	0	18	12/23/63	03/01/65	SYLVANIA ELEC.	DA44009AMC-428(X)	\$107,384
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TITLE: Evaluation of IR Pickup Tubes.

DESCRIPTION: Laboratory and theoretical study of current IR imaging tubes, evaluate performance characteristics and make model of tube operation.

RESULTS: RCA 74012 was quantified and beam readout phenomena were studied in detail.

REMARKS: PROG: BMD - Optical Technology - IR Imaging Devices.
REF: Sylvania Report, "Study of Limitations of IR Pickup Tubes IR," (3/65).

266	0	19	03/15/65	05/31/68	WESTINGHOUSE-BA	DA44009AMC971(T)	\$252,255
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TITLE: Equipment for Test and Evaluation of IR Pickup Tubes.

DESCRIPTION: Design and fabrication of test equipment to measure standardized performance parameters of IR image tube.

RESULTS: Equipment delivered to ERDL and worked satisfactorily.

REMARKS: PROG: BMD - Optical Technology.

266	0	20	01/03/66	07/01/68	TI	DA44009AMC1347(T)	\$57,890
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TITLE: Readout Technique for Detector Mosaics

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: Emphasis on switching to readout LWIR photodiodes, e.g., p-n functions in Ge:Cu. Two dimensional scan achieved with electron beam system.

RESULTS: Feasibility of photodiode switching demonstrated and applications were considered at 10 degree K.

REMARKS: PROG: BMD - Sensor Development.

266	0	21	07/01/67	02/01/69	UNIV. OF ILL.	DAA-K02-67-C-546	\$136,885
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TITLE: Solid State IR-to-Visible Image Converter

DESCRIPTION: Research to establish feasibility of three layer structures for PC-EL image converter.

RESULTS: Modest progress was made in PC-EL technology.

REMARKS: PROG: BMD - Optical Technology.

266	0	22	02/14/67	08/01/68	RCA-PRINCETON	DA44009AMC-1276(Z)	\$97,000
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TITLE: Thin Film Photoconductive Multiplier

DESCRIPTION: R&D to study IR mosaic array requirements on photoconductive and solid state readout.

REMARKS: PROG: BMD - Optical Technology - IR Imaging
AO 266, T22 is to fund ext. of DA-44-009-AMC-1276(Z).

267	0	1			NATICK LABS	IN HOUSE	\$41,000
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TITLE: CHEMICALS FOR FIELD USE OF DOGS

267	0	2					\$0
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267	0	3			NATICK LABS	IN HOUSE	\$130,000
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TITLE: SOUTHEAST ASIA MILITARY RATIONS

DESCRIPTION: This effort sought to develop tactical rations for indigenous Forces that were ethnically acceptable and locally producible. It further sought to assist the local Forces to identify or acquire production facilities and develop skills necessary for such production.

RESULTS: Ration menus were developed in both the Republic of Vietnam and Thailand. Production was undertaken by both countries, in Vietnam thru local contracts and in Thailand under the auspices of the Royal Thai military establishment.

267	0	4			ECOM NVLAB	IN HOUSE	\$130,000
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TITLE: SEASIA Clothing & Equipment

DESCRIPTION: Determine if there are inhibiting factors to combat effectiveness in the

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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design, size, weight, material, or other aspects of the clothing and equipment of the Vietnamese and Thai combat forces. Where major inhibiting factors are determined, develop test quantities of pertinent clothing or equipment for evaluation.

RESULTS: Major inhibiting factors discovered in materials, design, and size of uniforms, rain gear, packs and web equipment. Test quantities of uniforms and equipment provided and evaluated under combat conditions. Test results led to incorporation of new clothing and equipment for Vietnamese and Thai Forces.

REMARKS: PROG: Test results led to new uniforms and equipment for U.S. Forces. RDFU-V, RDFU-T, and Project AGILE.

267	0	5	ECOM NVLAB	1W HOUSE	\$42,000
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TITLE: SEASIA Military Boot Last System

DESCRIPTION: This program included the collection and evaluation of data and applying modern technological methods to the development of individual clothing and equipment for indigenous forces in Southeast Asia.

RESULTS: New boot last designed and implemented by Vietnamese Quartermaster Corps.

REMARKS: SEASIA Clothing & Equipment effort determined that an extremely high number of ARVN soldiers suffered from foot problems. Investigation revealed heretofore unknown fact that configuration of Vietnamese foot so different from American foot that U.S. last used in VN boot manufacture created serious foot problems.

Also funded under AO 267, Amendments 11,12,13,14,16,17,18.

267	1	0	USA NATICK		\$41,000
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TITLE: Dog Scent Training Program.

DESCRIPTION: The objectives of this program were to identify and provide test quantities of one or more chemicals for the detection of humans by trained dogs.

RESULTS: It was determined that squalene in liquid form met these qualifications. Five dogs were trained and field trials proved successful. The level of detection by the dogs is less than one microgram of squalene on an individual.

REMARKS: REF: "Identification of Squalene by Dogs," Final Report. (b)(6)
(b)(6), Pioneering Research Division, Headquarters Quartermaster Research and Engineering Command, U.S. Army, Quartermaster Research and Engineering Center, Natick, Massachusetts, 11/8/63.

Also funded under AO 267, Amendments 2, 3, and 7.

267	4	0	05/01/64 08/30/66 UTAH RES.& DEV.	DA19129AMC-150(X)	\$294,000
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TITLE: Low Velocity Penetration Phenomena.

DESCRIPTION: The purpose of the work done under this contract was to develop methods for analyzing and predicting the behavior of materials subjected to impact by

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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projectiles traveling at velocities of a few hundred to a few thousand feet per second.

RESULTS: An investigation was carried out on equations of state for materials of interest in armor development resulting in a simple equation for the shock compression of metals and other materials and a computer code for calculating adiabatic expansions from a shock-compressed state.

REMARKS: AGILE - BASIC RESEARCH

REF: "Theoretical and Experimental Study of Low-Velocity Penetration Phenomena," Final Report, for the period 1964 May - 1966 August. Utah Research and Development Company, Salt Lake City, Utah. Sponsored by U.S. Army Natick Laboratories, Natick, Massachusetts.
Continued under AO 267, Amendments 9 and 10.

267	4	2	63	64	UTAH R&D CO.	\$285,593
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TITLE: PENETRATION PHENOMENOLOGY

DESCRIPTION: The need for effective, lightweight armor for use on personnel, vehicles and light aircraft had been shown in RVN. Parametric data was not available.

RESULTS: This study quantitatively defined the parameters associated with penetration phenomena in the 0-4000 feet/second range translated these parameters into useful engineering data and modelled the lightweight armor needed.

267	5	0			USA NATICK	\$70,000
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TITLE: Southeast Asian Rations.

DESCRIPTION: Under this program candidate rations were produced for both the Vietnamese and Thai armed forces.

RESULTS: The prototype ration for the Vietnamese was found to be acceptable to the Vietnamese soldier, but this ration was not accepted by the RVNAF Joint General Staff due to the absence of industrial facilities for its immediate production. The Thai ration was generally acceptable, though deficient in several nutrients.

REMARKS: AGILE - RATIONS

REF: "ARPA-Sponsored Field Ration Development and the Lessons Learned."
(b)(6) RACIC, Battelle Memorial Institute, Columbus Laboratories, Columbus, Ohio, Report No. RACIC-LR-2505. Prepared for Advanced Research Projects Agency, Project AGILE, 3/69.
Continued under AO 267, Amendments 6, 8, and 12.

267	6	0				\$0
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267	6	4	63		NATICK LABS	IN HOUSE	\$170,000
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TITLE: SOUTHEAST ASIA CLOTHING & EQUIPMENT

DESCRIPTION: This effort sought to establish a data base of environmental and anthropometric information and to establish a comprehensive program for development

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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of individual clothing & equipment for indigenous forces. Resources of the host country were to be used to the maximum extent, supported by US technology where necessary.

RESULTS: A large number of items were improved thru this effort. Major redesign of the ranger pack and the Special Forces jungle hammock were made to fit these items to the unusual anthropomorphic needs of SEA troops. These redesigns were used by the MAP program in their procurement of over 500,000 items and were integrated into the in-country production in RVN and Thailand.

267	14	5	65	JONES & VINING	DA19129AMC485N	\$5,000
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TITLE: SEA MILITARY BOOT LAST SYSTEM

DESCRIPTION: Based on the anthropometric data collected during the SEA Clothing and Equipment task (Amds 6 & 11) the need for a boot last system based on the unusual, by US standards, measurements of SEAsians was recognized and addressed.

RESULTS: A complete set of military boot lasts were developed and turned over to the Royal Thai Armed Forces who successfully used them in both their local production and purchase of military boots.

REMARKS: Some early funding for this task was made from Amd 11 of this ARPA Order.

268	0	0				\$956,936
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TITLE: INFRARED RESEARCH

268	0	1	01/20/62 11/01/67	RCA VICTOR	AF33(615)-3101	\$175,000
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TITLE: Germanium Photodiode IR Research

DESCRIPTION: R&D to produce cooled Ge photodiodes of high performance with integrated 1st-stage amplifier. Fabrication of detector system for Project Glow and radio-meter-scanner for re-entry phenomena, both in Ge spectral band.

RESULTS: Developed excellent devices for use in ARPA field programs.

REMARKS: PROG: BMD - Sensor Development.

REF: RCA Report, RES-66.524,7 (1962).

Ext. of AF33 (657)-7545; Amendments 3, 4, and 13 of AO.

268	0	2	10/18/61 12/01/65	NORTHWESTERN U.	AF33(657)-7568	\$60,000
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TITLE: Study of Semiconducting IR Detecting Materials.

DESCRIPTION: Research program to obtain new semiconducting materials for infrared detectors

RESULTS: Results were obtained on vitreous thin film and photoconductors for near/short IR band and 1.0um respectively. Ternary and quaternary materials for the SWIR band and narrow band-gap semiconductors for LWIR. Also Mg/3 Bi/2 and Mg/3 Sb/2 were investigated for LWIR.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - Optical Technology
REF: Final Report published in 1967.

268	0	3	12/01/61 06/30/67	SYRACUSE UNIV.	AF33(615)-3194	\$132,000
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TITLE: Study of Ternary Materials as IR Detectors

DESCRIPTION: Conduct long range study of ternary materials for LWIR region.

RESULTS: Promising 3-5 systems were In-Ga-Sb, Al-Ga-Sb and Al-In-Sb. Also results obtained for 4-6 systems.

REMARKS: PROG: BMD - Optical Technology - Detector Material.
See AD-807 623L
Ext. of AF33(657)-7590.

268	0	4	01/01/62 08/01/64	RCA-PRINCETON	AF33(615)-1020	\$209,600
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TITLE: Photoconductor Development and Cell Evaluation

DESCRIPTION: Lab study to develop extrinsic (Ge-doped) detectors for LWIR use; also Group III and Group V semiconductors.

RESULTS: Ge:Cu and Ge:As were studied, imperfection reduction not as effective on sensor performance as expected.

REMARKS: PROG: BMD - Optical Technology - LWIR Detectors.

268	0	5	07/16/62 10/01/64	GE-SYRACUSE	AF33(657)-9487	\$160,000
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TITLE: Low-Noise Preamplifier Investigation

DESCRIPTION: Research to construct a low noise preamplifier to match the high impedance infrared detectors, e.g., extrinsic photoconductors.

RESULTS: Two preamplifiers were designed and built: (1) a field-effect transistor type, and (2) a diode parametric type. The latter was tested successfully.

REMARKS: PROG: BMD Optical Technology
REF: GE report prepared 1963.

268	0	6	09/12/62 08/01/64	SYRACUSE UNIV.	AF33(657)-9706	\$68,790
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TITLE: Investigation of a New Cryogenic Method Applicable to Infrared Devices.

DESCRIPTION: A research and analysis program based on regenerative cycle to design a high performance closed-cycle cryostat. Evaluate concepts on single stage and test multistage cooler.

RESULTS: A pulse tube version in single stage using helium yielded only (-128 degree C) but, a two stage version was anticipated to reach 77 degree K.

REMARKS: PROG: BMD - Optical Technology.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
268	0	7	11/01/63	09/01/67	TI	AF33(615)-3353	\$127,795

TITLE: Mercury-Doped Germanium Study Program

DESCRIPTION: Analytical and experimental investigation to produce InSb or Hg:Ge detector arrays by epitaxial techniques.

RESULTS: Results on InSb were not realized; however, Ge:Hg could yield $D^* = 10 \times 10^{10}$ cm²/Hz per watt at 40 degree K.

REMARKS: PROG: Optical Technology - LWIR Detector Development.
See AD-350 391; AFAL-TR-66-336; TI-03-70-12.
Ext. to AF33(615)-1107; Also AF33-615-69-1042 period 9/1/68 - 12/31/69.

268	0	8	01/04/65	04/01/66	HONEYWELL-MINN	F33(615)67C1069(A)	\$326,601
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TITLE: Intrinsic Detector Development

DESCRIPTION: Perform performance characterization measurements of Hg-Cd-Te system for 8-14um.

RESULTS: Excellent measurements performed on Hg-Cd-Te samples. Further development under AF33(615)-68-C-1050 (5/8/67-5/7/68).

REMARKS: PROG: BMD - Optical Technology - LWIR Detector Development.
REF: HRC Report, "Intrinsic IR Detector Development," July 1966.
*Funds for AO 268, T8 and T9; AF33(616)-7901.

268	0	9	01/04/65	04/01/66	HRC-BOSTON	F33(615)67C1060(B)	\$0
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TITLE: HgCdTe Sensitive Element Preparation Techniques.

DESCRIPTION: Experimental studies on epitaxial vapor techniques to produce 8-14um detectors comparable to bulk materials; extend wavelength response and response time.

RESULTS: Thermal close-spaced method developed. Experiments helped to establish the energy-band structure of Hg_{1-x}Cd_xTe and dependence of gap on alloy composition. Basic knowledge of HgCdTe system established.

REMARKS: PROG: BMD - Optical Technology - LWIR Detector Development.
See Task 8 for FC.

268	0	10	06/01/65	05/31/66	HRC	AF33(615)-2321	\$38,387
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TITLE: An Infrared Study Program

DESCRIPTION: Analytical and experimental program was conducted relative to special detector arrays in MIR region.

RESULTS: Problem areas defined particularly fabrication.

REMARKS: PROG: BMD - Optical Technology.
REF: HRC Final Report, "TR-IR Study Program," 6/66.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
268	0	11	07/15/65	12/01/68	RCA	AF33(615)-3213	\$92,800

TITLE: Research on Binary and Ternary Detector Materials.

DESCRIPTION: Theoretical and Lab study develop PbTe-SnTe system into LWIR detectors at LN/2 temperatures. Develop GeSi intrinsic alloys for p-n junctions in 0.8 to 1.5um region.

RESULTS: Considerable progress made to develop PbSnTe and PbSnSe detectors.

REMARKS: PROG: BMD - Optical Technology - Detector Technology.

REF: RCA Report by (b)(6) et al. 12/19/66; AD-831 082L
Follow-on F33(615)-68-C-1000.

268	0	12	08/15/65	10/15/66	TI	AF33(615)-3218	\$78,535
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TITLE: Long Wavelength Intrinsic Materials Research.

DESCRIPTION: Lab experiments on phosphorous binary systems, P+Sb/2-P+As/2 alloys and 4 and 6 compounds alloyed to group 5.

RESULTS: P-As binary formed with gap of 0.23; P+Sb/2 was prepared, gap = 0.1 ev with some bolometric response; only GeSe-As showed any solubility, approach of 4-6 group with 5 group not promising.

REMARKS: PROG: BMD - Optical Technology - LWIR Detector Development.

REF: AFAL-TR-66-375, 08-66-139 (1966).

268	0	13	02/15/67		AEROJET-GEN		\$75,000
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TITLE: Low Noise Ge:Hg Arrays (8-14 micron)

DESCRIPTION: Exploratory development of multi-element (4 or more) arrays of Ge:Hg with low noise MOS transistors on same substrate. Goal to develop the fabrication and signal extraction technology for very-low-temperature background-limited performance.

RESULTS: Some satisfactory elements.

REMARKS: PROG: BMD - Optical Technology - LWIR Detector.

268	0	14	12/15/67	04/15/69	SBRC	F33(615)68C1254	\$80,000
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TITLE: Low Noise Ge:Cu and Ge:Cd Arrays (8-28um)

DESCRIPTION: Conduct laboratory investigations on multi-element arrays (4 or more) elements for very-low temperature background limited detectors to 22um or beyond.

RESULTS: Some promising results.

REMARKS: PROG: BMD - Optical Technology - LWIR Detector Development.

268	0	15		02/01/69	AUTONETICS	F33615-68C-1661	\$0
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AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: Balloon Anti-Frost Experiment

DESCRIPTION: Develop and test devices to protect LWIR cooled windows

RESULTS: 85K Healthbude - 4 flights purge system for 2-10" anti-frost devices - purge rate, etc.

REMARKS: PROG: BMD - Optical Technology - Measurement Technique Devices.

269	0	0			\$1,375,693
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TITLE: INFRARED RESEARCH

269	0	1	09/12/61 09/01/67	NRL	IN HOUSE	\$700,000
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TITLE: 8-15 and 100-4000 Micron Detector Investigation

DESCRIPTION: Conduct theoretical and experimental program for detectors in the 8 to 4000 micron region both intrinsic and extrinsic types.

RESULTS: Doped germanium detectors to 1000 um were developed; a Putley detector performance established at 4.2 degree K, i.e., InSb, InAs, HgSe and HgTe were also considered.

REMARKS: PROG: BMD - Optical Technology - Detector Research
REF: NRL Reports 1712, 5996, 1630, and 1673.

269	0	2	05/01/62 01/31/67	TI	N00014-66C0085	\$241,097
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TITLE: 8-14 Micron Glass Transmission Evaluation

DESCRIPTION: Laboratory study to develop window material in 8-14um region, 1-20um and studies on amorphous systems structure.

RESULTS: Qualitative evaluation of windows of 4A-5A-6A ternary systems. Also 4-component glasses and 2-ternary systems developed. A non-oxide chalcogenide glass was developed and a large piece made for quantitative measurements.

REMARKS: REF: TI-08-64-135, TI-08-65-121, 08-67-18.
AO 269, Amendment 4, Ext. of Nonr-3810(00).

269	0	3	12/01/61 09/30/67	UNIVOF ROCHESTER	NONR-668(19)	\$190,000
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TITLE: Research of Infrared Transmitting Glasses

DESCRIPTION: Laboratory studies on the IR (2-200 cm) transmission of binary alkali and alkaline earth metaphosphate glasses.

RESULTS: Transmission spectra of many phosphates measured, correlated zigzag chain model with observed results, extension to other systems other than Na₂O.P₂O₅ considered applicable.

REMARKS: PROG: BMD - Optical Technology - Experimental Studies of IR Glasses.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REF: "International Congress of Glass," 1965.

269	0	5	11/01/61	06/30/64	ALFRED U.	NONR-1503(01)	\$60,000
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TITLE: Research on Hot-Pressed IR Transmission Materials

DESCRIPTION: Study program to develop indome materials for infrared region.

RESULTS: Sulfides, selenides and tellurides were studied for suitability as hot-pressed blanks. As₂SeFe₂ was shown to be suitable material.

REMARKS: PROG: BMD - Optical Technology - IR Material Development.

REF: AD-294 416, AD-614 472, AD-601 800, AD-286 385.

269	0	6	10/27/61	12/31/64	BAUSCH & LOMB	NONR-3632(00)	\$106,783
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TITLE: Study of Non-Oxide Materials with Defect Structures

DESCRIPTION: A joint program with Penn State Materials Lab to evaluate and prepare new ionic fluorides and other non-oxide optical materials.

RESULTS: Determined defects under high concentration conditions (20% mole concentration). New results on defect concentration in tysonite structure (K Mg F₃-Sc F₃ tetragonal plane).

REMARKS: PROG: BMD - Optical Technology - IR Glasses, Lab Studies.

269	0	7	07/01/62	06/30/64	MIT	NONR-1844(88)	\$200,000
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TITLE: Research on IR-Microwave Transmission Material

DESCRIPTION: Theoretical and experimental research on synthesizing materials for LWIR and 1-10mm simultaneous use.

REMARKS: PROG: BMD - Optical Technology - IR-MM Material Development.

269	0	8	10/01/61	12/30/62	IRCO CORP	NONR-3649(00)	\$132,000
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TITLE: Electrostatically Deflected Membrane Optics Investigation

DESCRIPTION: Produce membrane-type mirror with optical scanning system using electrostatic-modulated deflection.

RESULTS: 18" diameter F/2-F/3 mirror produced and tested to be satisfactory for space use. 2-D scanning was achieved. This was a major achievement.

REMARKS: PROG: BMD - Optical Technology - Mirror Technology.

269	0	9	09/01/65	03/01/68	UMIST	NONR-1224(57)	\$93,000
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TITLE: Theoretical Studies on Infrared Glasses

DESCRIPTION: Experimental techniques to study properties of various structures - silica, non-silica and non-oxide glasses. A unified glass theory to predict struc-

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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tural behavior and effect of impurity introduction.

RESULTS: Considerable progress made in glass property quantification. Unified glass theory successful in categorizing various glass systems studied.

REMARKS: PROG: BMD - Optical Technology - IR Material Development Study, Theoretical and Laboratory.

REF: UMIST 7518-8-F (67).

269	0	10	05/01/65	12/01/65	PHILCO	NONR-4848(00)	\$74,975
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TITLE: Impurity Doped Photoconductors

DESCRIPTION: Analytical model for the optical cross-section of deep centers

RESULTS: Model developed was improvement. Si:Gn a sensitive extrinsic photoconductor and can be doped more heavily than Ge photoconductors.

REMARKS: PROG: BMD - Optical Technology - Detector Development.

REF: Philco report on results prepared.

NOTE: Task 269 T 10; also, NAS task on glass.

269	3	4	11/15/61	08/01/64	SERVO CP OF AM	NONR-4212(00)	\$174,484
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TITLE: 8-14 Micron Glass Transmission Evaluation

DESCRIPTION: Transmission properties of glasses in 8-14um region measured; determine best A-S-Se-Te glasses in 2-6 um region. Emphasis placed on high resolution, wide index of refraction and wide angle refractivity.

RESULTS: Properties of 20 glasses examined. Fundamental structure of chalcogenide glasses were established.

REMARKS: PROG: BMD - Optical Technology - IR Glasses Properties.

REF: SCA-43,600 (1964.

Ext. of Nonr-3647(00)

269	13	10	03/16/67	06/01/67	MATERIALS ADV BD	N00014-67A02440004	\$35,000
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TITLE: Long Wavelength Infrared Optical Materials

DESCRIPTION: Study on the preparation of LWIR materials and provide guidance to DoD for R&D.

RESULTS: Provided guidance on the need for bulk and castable glasses in the 8-14um region particularly structural at high temperature for DoD applications.

REMARKS: PROG: BMD - Optical Technology - Material Development.

269	13	11	03/16/67	05/14/68	TI	N000 14-67C-0497	\$68,000
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TITLE: Multi-Parameter Characterization of Mercury-Doped Germanium

DESCRIPTION: Theoretical study of Ge:Hg and Ge:Cu parameters that control response speed,

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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i.e., D*-bandwidth maximum.

RESULTS: D-i-n diode preferred to photoconductive mode if speed > 1ns @ 10.6 um. Cu getting from Ge:Hg is a concern.

REMARKS: PRDG: BMD - Optical Technology - Detector Parameters for Laser Detection.
REF: AD-663 749.

270	0	0	02/01/62	01/01/68	CORNELL UNIV.	F44620-67-C-0066	\$8,814,000
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TITLE: TECHNICAL OPERATION AND MANAGEMENT ARECIBO IONOSPHERIC OBSERVATORY (AIO)

DESCRIPTION: TECHNICAL OPERATION AND MANAGEMENT OF AIO WAS PROVIDED BY THE CONTRACTOR. IN ADDITION THE CONTRACTOR CONDUCTED A RESEARCH PROGRAM IN IONOSPHERIC PHYSICS, SOLAR SYSTEM MEASUREMENTS, AND GALACTIC AND EXTRA-GALACTIC RADIO SOURCE MEASUREMENTS.

RESULTS: THE ARECIBO IONOSPHERIC OBSERVATORY HAS MADE MAJOR CONTRIBUTION TO THE FIELDS OF IONOSPHERIC RESEARCH, PLANETARY MEASUREMENTS AND RADIO ASTRONOMY. IT WAS TRANSFERRED TO THE NATIONAL SCIENCE FOUNDATION IN 1969-71 PERIOD.

REMARKS: PROG: BMD - GENERAL RESEARCH ON THE IONOSPHERIC IN SUPPORT OF LAUNCH, MID-COURSE AND REENTRY PHYSICS.

MISC: (1) SEE AO106, 122 AND 713
(2) CONTINUATION OF AF 49(638)-1156

271	0	0					\$290,741
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TITLE: REPETITIVE PULSED OPERATION & HIGH POWER OUTPUT-LASER

272	0	0					\$1,931,872
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TITLE: MILITARY OPERATIONS RSCH CENTER FEASIBILITY STUDY

272	0	7			GRC	SD-231	\$520,000
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TITLE: Latin American Threat Study.

DESCRIPTION: Study of insurgent threat to critical facilities such as lines of communications, transportation arteries and key industrial sites.

RESULTS: Critical targets identified, threats analyzed and limited protective measures set forth.

272	1	3			SRI		\$45,000
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TITLE: Military Operations Research Centers in Southeast Asia - Feasibility Study.

DESCRIPTION: A study to determine optimum management structure for U.S. participation in overseas centers conducting research and equipment T&E to improve indigenous counterinsurgency capabilities.

RESULTS: Study was of little help but DARPA established major joint centers in South Vietnam and Thailand (CDTC-V and MRDC) in 1961 and minor centers in Lebanon

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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(RDFO-ME) and Panama (RDFO-LA) in the mid 1960's.

272	2	0					\$0
272	2	4			U. OF NEW MEXICO SD-181		\$11,272

TITLE: Strategic Hamlet Study.

DESCRIPTION: This program was intended to analyze and evaluate the impact of the strategic hamlet program on the military security of the Republic of Vietnam and to consider both economic and general development problems as they will affect the long term security situation.

RESULTS: It was concluded that the strategic hamlet program was sound politically and socially, but that poor execution had detracted from its potential.

REMARKS: PROG: AGILE - Environment - Strategic Hamlet

REF: "An Analysis of the Long-Range Military, Economic, Political and Social Effects of the Strategic Hamlet Program in Vietnam," (b)(6) Dept. of Economics, The University of New Mexico, Albuquerque, New Mexico, for ARPA/OSD, undated.

272	4	1			RAC	SD-212	\$3,554,400
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TITLE: Operations Research Studies.

DESCRIPTION: This was a multi-year "helper" contract which carried out studies on every facet of counterinsurgency.

RESULTS: A full list of studies could probably be put together using the RAC annual reports.

272	5	5			GRP	SD-215	\$468,850
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TITLE: Counterinsurgency Studies of Latin America.

DESCRIPTION: Conceived as an unclassified "newspaper" review of patterns of counterinsurgency in various Latin American countries in the post-1900 era.

RESULTS: Contractor performance poor. Collected vast amounts of data but produced few studies. Many cost overruns and missed report deadlines.

REMARKS: One report, "Historical Survey CI Patterns Post-1900 Latin America," published three reports in draft (never published): I/CI Operations in Venezuela; I/CI in Peru; I/CI in Columbia.
FOI requests continued to be received as late as 1982.

272	6	0			DRC	SD-231	\$484,000
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TITLE: Physical Security Studies: Analysis of Threats, Vulnerabilities, and Modes of Response.

DESCRIPTION: This program had as its objectives to assess the utility of advanced technology in war gaming, computer simulation, and surveillance and detection as

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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tools in CI.

RESULTS: Examples of finite CI problems amenable to solution through the application of gaming methodology were developed and the utility of devices such as implanted sensors to monitor guerrilla activity were investigated.

REMARKS: AGILE - OPERATIONS RESEARCH

REF: "Game Theory Analogues of Insurgent/Counterinsurgent Conflict,"
 (b)(6) Defense Research Corporation, Santa Barbara, California,
 Technical Memorandum 303, 4/66.
 Also funded under AO 272, Amendment 12.

272	9	2	RAC	SD-212	\$485,000
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TITLE: Project STAR

DESCRIPTION: Reacting to the Kennedy assassination, with Sec. Def. and White House approval a series of studies on presidential protection were made. Areas covered were armor for limousines, non-lethal weapons for crowd control and modification of presidential travel patterns.

RESULTS: Better limousine design and armor was implemented. Work on soft projectiles led to the rubber bullet implemented by U.S. Army. Travel pattern studies concluded that politicians will always be at risk being politicians.

REMARKS: MISC: All records will be found in Box 1 of 68-A-6033 including a black notebook giving a fair synopsis of the project.

272	13	6	PRINCETON UNIV.		\$35,000
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TITLE: Conference on Southeast Asia Tribal Minorities.

DESCRIPTION: Participants with recent field experience provided information on: planning and evaluating of action programs, tailoring programs to fit differing cultures, program impact on relations between central government and minority populations.

RESULTS: Many insights into magnitude of problems in bringing minorities into main-stream were enumerated. Little follow-up then or later.

273	0	0			\$559,000
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TITLE: OPTICAL MASERS

274	0	0	11/22/61 01/15/63 EOS	DA44009-ENG-4873	\$99,850
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TITLE: Development of Lightweight Optically Accurate Replica Mirrors

DESCRIPTION: Research program to produce optically precision mirrors by replication technique and lightweight base structures.

RESULTS: Successful development of Nickel skin mirrors with lightweight aluminum backing up to 18" in diameter. Feasibility of precision mirrors for various applications established.

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
REMARKS: PROG: BMD - Optical Technology - Fabrication of Lightweight Mirrors REF: EOS Report 2110 (1963).					
275	0	0			\$12,403,000
TITLE: COMMAND CONTROL RSCH					
276	0	0			\$1,023,893
TITLE: WESTERN BERKNER-TYPE STATION					
277	0	0			\$137,046
TITLE: PROJECT GNOME					
278	0	0			\$1,609,447
TITLE: INTERCEPTION, GUIDANCE, AND CONTROL					
278	0	1	11/01/61 10/31/62 MARTIN	NONR-3625(00)	\$148,039
TITLE: AICB INTERCEPTOR GUIDANCE TECHNIQUES STUDY.					
DESCRIPTION: A STUDY OF GUIDANCE AND CONTROL TECHNIQUES WHICH COULD ENABLE AICBM-TYPE INTERCEPTORS TO FLY THE OPTIMUM INTERCEPTION TRAJECTORY.					
REMARKS: PROG: BMD - TECHNIQUES & DEVICES - INTERCEPTORS. REF: "GUIDANCE TECHNIQUES STUDY," FINAL REPORT, NOV 1962, REPORT NOS. OR 2878-1, -2, -3.					
278	0	2	10/16/61 06/15/62 NORTHROP	NONR-3641(00)	\$50,000
TITLE: AICBM INTERCEPTOR DYNAMICS STUDY.					
DESCRIPTION: INVESTIGATION OF THE INFLUENCE OF FUNDAMENTAL MISSILE DYNAMICS PROBLEMS ON THE GUIDANCE SYSTEM PERFORMANCE OF AICBM INTERCEPTORS.					
REMARKS: PROG: BMD - TECHNIQUES & DEVICES - INTERCEPTORS REF: "FINAL REPORT ON THE STUDY OF THE FUNDAMENTAL DYNAMICS OF BALLISTIC MISSILE INTERCEPT," NORT 62-147, DATE MAY 1962.					
279	0	0	09/30/67 COLUMBIA UNIV.	AF49(638)-1478	\$15,444,002
TITLE: PROJECT DEFENDER STUDIES					
REMARKS: PROG: BMD - Continuation of AO 27, AF30(602)-1971, expired 9/61. Extension of AF49(638)-1113.					
279	0	1	02/01/63 01/31/64 COLUMBIA UNIV.	AF49(638)-1113	\$301,000
TITLE: Anti-Satellite Studies.					

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: Contractor acted as the technical management of Anti-Satellite (Non-Nuclear Kill) study.

REMARKS: PROG: BMD - Techniques and Devices - Radar Studies.

280	0	0	09/22/61	04/01/62	NAV. ORD. LAB.	IN HOUSE	\$44,820
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TITLE: HIGH-SPEED GUNS FOR AICBM TERMINAL INTERCEPT APPLICATIONS.

DESCRIPTION: A PARAMETRIC STUDY OF HIGH-SPEED GUNS FOR AICBM TERMINAL INTERCEPT APPLICATIONS INCLUDING GUN WEIGHT, SIZE, COMPLEXITY AND COST.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - INTERCEPTORS.

MISC: COMPLETE PRELIMINARY DESIGN OF GUN COORDINATED WITH AIRBORNE INSTRUMENTS LAB INTERCEPTOR STUDY, AO 278, T4.

281	0	0	10/01/61	01/30/66	SR1	SD-103	\$2,219,312
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TITLE: Ballistic Missile Radar Scattering Phenomenology.

DESCRIPTION: Formulation of physical and theoretical models, computer simulation of ballistic missile phenomena, analysis of RF backscatter data, scattering properties of plasmas and investigation of discrimination potential of midcourse phenomena.

REMARKS: PROG: BMD - Missile Phenomenology - Experimental/Theoretical Model Development.

Continuation AO 52, DA-04-200-ORD-1009, expired 9/15/61.

282	0	0					\$199,000
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TITLE: STUDY OF COLLATERAL DAMAGE FROM NUCLEAR WEAPONS

283	0	0					\$54,000
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TITLE: COMBUSTION INSTABILITY COORDINATION PROGRAM

284	0	0					\$601,226
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TITLE: PHASED BACKSCATTER ARRAY TECHNIQUE

285	0	0					\$4,175,895
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TITLE: PROJECT AGILE-PROTOTYPE WEAPONS & DEVICES

285	0	1			NOTS	NA	\$553,000
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TITLE: Weapons Studies

DESCRIPTION: Specific tasks funded under this program were: weapons concepts studies, small, lightweight rifle, live round launched rifle grenade, strip bullets, unconventional warfare studies, liquid fuel air rifle, crossbow launched grenades.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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RESULTS: The studies determined that the weapon characteristics most needed are rapid response, high rate of fire and light weight, live round launched grenades, strip bullets, and cross-bow launched grenades were judged feasible.

285	0	2					\$20,000
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TITLE: Portable Public Address System

DESCRIPTION: This program was conducted to provide a general purpose, portable, public address system for loudspeaker operations that would provide the necessary range lacking in existing loudspeakers.

RESULTS: Two units, the MKI weighing about 65 pounds and the MKII weighing about 50 pounds were fabricated. Tests were conducted in the U.S., Thailand, and Vietnam. The unit was found to have a range of 400 meters in jungle and in excess of 1000 meters in open country.

REMARKS: AGILE - EQUIPMENT - PSYOP

285	0	3					\$0
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TITLE: See AO 285, Amendment 8

285	0	4			NOTS		\$25,000
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TITLE: Seismic Intrusion Detector.

DESCRIPTION: Funding was provided to develop a seismic intrusion detector which was small, light, lowcost and offered long battery life, high sensitivity and essentially no output in the absence of a seismic signal.

RESULTS: A detection device was developed that depends on the fact that men, animals, vehicles, and even aircraft produce vibrations in the earth by their motion. The signal from one or more geophones is amplified and applied to a trigger circuit, which converts the more-or-less sinusoidal signal to a square wave.

REMARKS: AGILE - DETECTOR

REF: "A Seismic Device for Detecting Moving Vehicles and Personnel (U)." Davis, F.H., U.S. Naval Ordnance Test Station, China Lake, California, Report No. NOTS-TP-3461. Prepared for Department of the Navy, Bureau of Naval Weapons (RMMO-324). NAVWEPS Report 8491, 4/64.

285	0	5			NRL		\$0
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TITLE: Evaluation of Composite Armor Materials.

DESCRIPTION: The objective of this program was to procure material and conduct tests and evaluation of beryllium-doron composites developed at NRL.

RESULTS: Tests were completed, results classified.

REMARKS: AGILE - MATERIALS - ARMOR

REF: "Ballistic Evaluations of Composite Armor Interim Report," (b)(6)

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
			(b)(6)	U.S. Naval Research Laboratory, Mechanics Division, Washington, D.C., 6/64.	

285	0	6			\$0
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TITLE: See 285, Amendment 4, Task 1.

285	0	7			\$0
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TITLE: See 285, Amendment 4.

285	0	8			\$0
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285	0	9			\$0
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285	2	0	03/01/64 NOTS/DUPONT	NA	\$558,000
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TITLE: TIARA (Target Illumination and Rescue Aid)

DESCRIPTION: Program conducted to develop luminescent material for use in grenades and shells for illuminating targets, marking air dropped bundles and for drop zone marking. Research involved mechanism of chemiluminescence of Dupont material Tetrakis (dimethylamind) ethylene and its weaponization.

RESULTS: Material severely toxic and incompatible with some explosives. TIARA markers were produced and exploited by Navy.

REMARKS: AGILE - Devices - Chemiluminescent - Markers

REF: Chemiluminescence, (b)(6)
(b)(6) 2/5/65.

See AO 299, Tasks 1 and 2.

Part of Marking, Tracking and Identification Program. See also AO 563, T1.

285	3	0	12/07/62 06/07/63 MBA SAN RAMON, CA SD 148		\$504,000
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TITLE: Microrockets

DESCRIPTION: Objective to develop, fabricate and test spin-stabilized caliber .49 micro-rockets and hand held weapons to fire against personnel targets.

RESULTS: Feasibility was established. Weapon would have accuracy, range and striking energy for most side-arm applications and could be inexpensively mass produced. Problem with erratic flight of projectiles.

REMARKS: AGILE - Weapons - Microrockets

REF: The Model 137 Rocket Hand Gun and Caliber .49 Gyrojet Ammunition,
(b)(6) MB Associates, 6/17/63.

Continued under AO 324.

285	4	0	10/15/62 06/28/65 NOTS LOVELACE FN		\$1,086,000
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TITLE: Fuel Air Explosive (FAX or FAE) Weapon

DESCRIPTION: This program was established to manufacture test quantities and assess the

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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lethality of a fuel air explosive weapon which was designed by the Navy for the purpose of clearing trees and other vegetation for helicopter landings.

RESULTS: Tests conducted in a variety of environments using animals and mannequins proved the effectiveness of the weapon in various configurations. Devices as large as 80 lb. were tested.

REMARKS: AGILE - Weapons - Testing - Fuel Air Explosive
 REF: "Proposed Technical Approach Fuel Air Explosive Weapon," Bureau of Naval Weapons, Washington, D.C., 3/65.
 Continued under AO 581-1.

285	4	1	12/01/62	07/01/65	NOTS	NA	\$687,000
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TITLE: Rock Mine (Cast PBX Destructive Devices).

DESCRIPTION: Program was designed to develop camouflaged antipersonnel land mines using cast plastic bonded explosives. Outside configuration was to resemble rock native to the Vietnamese terrain in which mine would be employed.

RESULTS: Moulded explosive mine with tremblor switch fuze designed. Fuze presented unresolved problem in safety; deteriorating or becoming active in storage.

REMARKS: AGILE - Weapons - Mines
 REF: Progress of Current Programs Under ARPA Order 285, Amendment 13,
 (b)(6) Naval Ordnance Test Station, China Lake, CA.
 11/8/63
 Continued under AO 598.

285	7	0	11/16/64	05/15/67	CDTC RDFU-V	NA	\$210,000
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TITLE: Helicopter Trap Weapon.

DESCRIPTION: Objective of this program was to develop an air deliverable weapon capable of clearing the stakes of a helicopter trap without leaving a crater.

RESULTS: Development of EX 115 from the mark 41 MODO continuous rod warhead of the Zuni air to air rocket. Tests suspended January 1966 because of fuzing difficulties.

REMARKS: AGILE - Devices - Ordnance - Land Clearing
 REF: Semiannual Report for the Period 1966 November 1 to 1967 May 15,
 Combat Development and Test Center, Republic of Vietnam Armed Forces -
 OSD ARPA R and D Field Unit - Vietnam.

285	8	0	10/11/63	05/01/66	BUWEPS WTWYEXPST	NA	\$316,000
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TITLE: Helicopter Landing Mats.

DESCRIPTION: Funding was provided for development and procurement of 3-inch landing mats that could be made into a helicopter landing pad measuring 62x90 ft. Aluminum, cellular-type landing mat panels filled with polyurethane foam were fabricated for use either on soft ground or water.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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RESULTS: Mat successfully withstood repeated landing and taxiing operations of UH 340 with loads ranging up to 13,000 lb. on both water and marsh area.

REMARKS: AGILE - Devices - Landing Mats - Mobility

REF: "Field Tests of AM 3 Landing Mat," Green, H.L., U.S. Army Engineer Waterways Experiment Station, Corps of Engineers, Vicksburg, MS 5/66.

286	0	0			\$95,985
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TITLE: GEOPHYSICS CORP. OF AMERICA, BATON

287	0	0			\$85,640
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TITLE: CRISIS RSCH. PROJECT

288	0	0			\$1,154,000
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TITLE: RSCH PROGRAM INTO NATURE OF SEISMIC PROPAGATION MECH.

289	0	0			\$310,000
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TITLE: RSCH IN MATERIALS SCIENCE

290	0	0			\$1,205,000
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TITLE: NATIONAL ACADEMY OF SCIENCES FOR MAB

291	0	0			\$1,116,000
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TITLE: ROCKET POWERED MHD GENERATOR

292	0	0			\$25,227,148
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TITLE: VELA-UNIFORM RSCH. PROGRAM

293	0	0			\$659,905
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TITLE: DEV. WIRE GUN, INFLUENCE FUSES, & CONCESSION KITS STND MUNTN

293	0	1	HARRY DIAMOND	NA	\$135,000
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TITLE: Delay Proximity Fuzes.

DESCRIPTION: A variety of delay proximity fuzing devices were developed, fabricated and tested, applications including the XM 914 fuze for use in jungle canopy, the use of doppler fuzes in AP mines, air-emplacable trip wire devices and a low-cost proximity fuze design.

RESULTS: The modified fuze XM 914 E1 was found to be effective in penetrating jungle foliage and was transferred to the Air Force.

REMARKS: AGILE - Ordnance - Delay Fuzes.

REF: Notes on Development Type Materiel Fuze Bomb - Nose, Proximity Delay

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
					XM 914 E1, (b)(6)	Harry Diamond Laboratories, AMC, 4/25/63.	
293	0	2		05/30/64	MELPAR	DA36034ORD-3698 RD	\$49,000

TITLE: Seismic Intrusion Detector.

DESCRIPTION: Program was established for the product engineering, fabrication, and field evaluation of 50 engineering models of a seismic, geophone-operated personnel/vehicle discriminator. Units were subjected to both environmental and field tests.

RESULTS: One component failed under temperature cycling. Field test results indicated that extreme differential triggering sensitivity existed between sites with unit amplifier gain held at fixed value, detracting from discriminatory capacity of original design.

REMARKS: AGILE - DEVICES - DETECTORS

293	0	3					\$25,000
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TITLE: Wire Gun.

DESCRIPTION: Support was provided to the Army for a hand-held wire gun for use against personnel. The concept for such a gun involved the winding of a flat, barbed steel tape under tension in a canister.

RESULTS: Even though the principle of operation was a sound one, it was judged that such a device had no practical application in combat operations.

REMARKS: AGILE - WEAPONS

REF: "Evaluation of the Hand-Held Wire Gun," Final Report, (b)(6)
(b)(6) Marine Corps Landing Force Development Center, Marine Corps
Schools, Quantico, Virginia.

293	1	0			MELPAR		\$49,000
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TITLE: Remote Fuzes for Anti-Personnel Mines

DESCRIPTION: Under this program, funds were provided for the development, testing, and delivery of remote fuzes for anti-personnel mines.

RESULTS: Work was performed as described, but GVN did not wish to employ the proposed defense system.

REMARKS: AGILE - WEAPONS

Work was to supplement village mine barrier project, AO 293, Amendments 3, 4.

293	3	0					\$45,000
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TITLE: Village Mine Barrier.

DESCRIPTION: This program explored a scheme for utilizing two obsolete shells, the 75-mm Skysweeper M344 shell and the 8-inch M103 shell, as components in a village perimeter defense system.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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RESULTS: Tests were conducted in which the effective radii of the two shells, specifications for back-blast mounds to afford protection to the villagers, and optimum positioning of the shells were determined.

REMARKS: AGILE - WEAPONS

REF: "A Plan for Perimeter Defense of a Village (U)." (b)(6)
 (b)(6) (et al.), Diamond Ordnance Fuze
 Laboratories, Report No. TR-1092.
 Funding also supplied under AO 293, Amendment 4.

293	7	0	03/30/64	PICATINNY	\$15,000
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TITLE: Radio Frequency Detonation of Mines - Feasibility Study.

DESCRIPTION: This program studied the feasibility of utilizing RF radiation as a means of prematurely detonating enemy mines encountered in Southeast Asia.

REMARKS: AGILE - DEVICES - WEAPONS

REF: "Investigation of RF Radiation as a Means for Premature Detonation of
 Enemy Mines," (b)(6) U.S. Army Picatinny Arsenal, Dover, N.J. for
 ARPA/OSD, Washington, D.C., 3/30/64.

293	8	0		SW RES. INST.	DA44009ENG-5003	\$83,000
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TITLE: Detection of Concealed Personnel, Border Intrusion and Concealed Munitions.

DESCRIPTION: This effort was initiated in response to a stated need for such a detection system for fixed installations.

RESULTS: A magnetic intrusion detection device was developed, which when combined with a loop of wire will amplify the small voltages generated in the wire when activated by a ferromagnetic object moving in the earth's magnetic field.

REMARKS: AGILE - DETECTION

REF: "Magnetic Loop Detection System (U)," Letter Report of Evaluation.
 (b)(6) Advanced Research Projects Agency, Research and
 Development Field Unit, APO San Francisco, California, 4/29/65.

293	8	1		ADVANCED TECH.	DA44009AMC-811T	\$77,000
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TITLE: Experimental Portable Hole and Tunnel Detectors.

DESCRIPTION: Three detectors, utilizing the electromagnetic wave principle, were assembled in breadboard fashion and tested with a selected variety of antennas to determine whether the back-scattering energy from full scale model cavities could be detected in the presence of a much larger reflection from the ground-air interface.

RESULTS: The experimental results showed that the cavity signal to background noise would be only marginal for identification of actual tunnels and holes encountered in the field.

REMARKS: AGILE - DETECTION

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REF: "Experimental Portable Hole and Tunnel Detectors (U)," Final Technical Report. (b)(6) Advanced Technology Corporation, Timonium, Maryland. Prepared for U.S. Army Engineer Research and Development Laboratories, Fort Belvoir, Virginia, 11/30/65.

293	8	2	QUANTUM ENG.	DA44009AMC-985T	\$22,000
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TITLE: Concealed Munitions Detector Research

DESCRIPTION: The goal of this study was to maximize the detection range of the magnetic loop detector while limiting the weight of the system to 50 pounds.

RESULTS: Two search heads, a two-coil model and a three-coil model, were constructed and tested for operating characteristics. The major factors limiting detection range were null balance instabilities, man-made noise, signal variation due to search head height variation, random atmospheric noise, and random noise.

REMARKS: AGILE -DETECTION
Funding completed under AO 293, Amendment 12.

293	8	3	TELEDYNE GT.	DA009-AMC-1331T	\$41,000
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TITLE: Passive Electromagnetic Concealed Munitions Detection Research.

DESCRIPTION: This program studied the feasibility, optimum design and probable performance of a passive metal detector utilizing ambient electromagnetic fields. A standard target, consisting of a 36-inch length of 3-inch steel water pipe, was used to represent a variety of munitions which must be located in caches buried as much as 12 feet below ground.

RESULTS: The study concluded that this passive electromagnetic method for detecting ferromagnetic targets could probably be made to work, using VLF (Very Low Frequency) radio fields, at ranges from 15 to 30 feet from the standard target.

REMARKS: AGILE -DETECTION
Funding completed under AO 293, Amendment 12.

293	10	0	06/16/64 10/15/65 TEXAS INSTR.	DA44009AMC657X	\$198,000
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TITLE: Railroad Sabotage Detection.

DESCRIPTION: A program established for design, fabrication and testing of a system for detecting railroad sabotage using the acoustic or vibration signals introduced into the rail. Research was also performed on the use of the rail itself for signal transmission.

RESULTS: The acoustic system designed by the contractor would require one operator per mile of railroad, yield a false alarm rate of less than one per day and could be effectively concealed. Use of the rail itself for simplex transmission of signals is feasible only when preliminary tests are run on the rails.

			Initial	Final		
AO	AMD	Task	Date	Date	Contractor	Contract Number
					Total Funds	

REMARKS: AGILE - Techniques and Devices - Detection - Acoustic

REF: Railroad Sabotage Detection Research, Final Report, Texas Instruments Inc., Dallas for U.S. Army Research and Development Laboratories, Ft. Belvoir, VA., 10/15/65.

294	0	0	06/14/62	10/01/67	RYAN	VARIOUS	\$4,364,000
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TITLE: Flex Wing Systems

DESCRIPTION: This program investigated several potential applications of the flexible wing system developed by Ryan Aeronautical Company including individual drop glider, precision drop glider, light utility glider, air cargo glider, towed universal glider, and XV-8A flexible wing aerial utility vehicle (FLEEP).

RESULTS: With the exception of Homing Flight System of the light utility glider, the systems investigated performed satisfactorily, with payloads of up to 2848 pounds in the cargo configuration. Controlled delivery of airborne infantrymen was demonstrated.

REMARKS: AGILE - Equipment - Aircraft - Mobility.

294	4	0	08/01/62	09/20/62	VARIOUS	NA	\$37,000
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TITLE: Armor Research - Ballistic Protection Survey Team.

DESCRIPTION: Team conducted a survey in VN of small arms threats and vulnerabilities of equipment, personnel, aircraft, convoy vehicles and boats to small arms fire.

RESULTS: On the basis of its findings, a statement of the problem of ballistic protection in VN was made along with the recommendations of the team.

REMARKS: AGILE - ARMOR

294	7	0		05/01/67	RYAN AERONAUTICS		\$300,000
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TITLE: Boundary Layer Control System on a YCV-2B Airplane.

DESCRIPTION: This program to investigate the feasibility of installing a high lift boundary layer control (BLC) system in a YCV-2B airplane involved development of a compressed air/gasoline fuel primary motor for driving the jet pump system and evaluation of the system and performance characteristics.

RESULTS: Studies showed the BLC could not be operated in the YCV-2B airplane with reasonable expectation of success.

REMARKS: AGILE - Mobility - Aircraft

REF: "Boundary Layer Control System for the YCV-2B Airplane," (b)(6)
Ryan Aeronautical Company, San Diego, CA. for U.S. Army Aviation Materiel Labs., Ft. Eustis, VA., 5/67.

295	0	0					\$5,000
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: EXPENSES OF U.S. DELEGATION TO CONGRESS OF PHYSIOLOGICAL SCI.

296	0	0	08/23/63		LOCKHEED ELEC.	DA30-069-ORD-358	\$150,984
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TITLE: RF Pulse Compression Techniques.

DESCRIPTION: To develop and evaluate pulse compression and expansion techniques applicable to ballistic missile defense radars.

REMARKS: PROG: BMD - Techniques & Devices - Radar.

297	0	0	03/22/62	02/28/64	G.D.	DA49186ORD984	\$130,000
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TITLE: Transient Radiation Effects on Electronics (TREE) - Displacement Effects.

DESCRIPTION: To study the displacement radiation effects on semiconductors using relativistic electrons (5-45 MEV), reactor neutrons, 14 ME neutrons and high energy gamma rays.

RESULTS: See referenced reports.

REMARKS: PROG: BMD - General Research - Nuclear Effects - Semiconductors.

REF: Final Rpt., GA-5088, 3/25/64.

A continuation of DA-49-186-ORD-822, Final Rpt., GA-3087, 4/1/62.
Work was continued on DA-49-186-AMC-65(X).

298	0	0			COOPER-MCDONALD	F.O. 10393	\$430,590
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TITLE: AR-15 RIFLE

DESCRIPTION: With SecDef approval, ARPA procured 1000 AR-15 rifles for evaluation by selected ARVN units. In-country tests were conducted during Feb-Jul 1962 and a test report was issued by the ARPA R&D Field Unit in Aug 1962 concluding that the weapon was ideally suited to the environment and the nature of the conflict.

RESULTS: The AR-15 subsequently became the US M-16 rifle and was widely procured and issued.

REMARKS: In addition to the DTIC report listed above useful references include APC/PP 385 dated 15 Dec 1961, APC/PP 411 dated 24 Jan 62, and especially a 'Summary of Completed Tasks' dated 22 Sep 65. These are located in Box 3 of 67-A-5074. The ARPA Order file is retired in Box 4 of 330-77-0018.

298	0	1					\$409,000
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TITLE: AR-15 Rifles, Procurement.

DESCRIPTION: As a means of providing a lightweight individual weapon, capable of high rates of automatic fire, that would be better suited to the small statured SEA soldier than the heavier M1 and BAR, late in 1961 ARPA/AGILE procured ten AR-15 rifles and sent them to RVN for firing demonstrations.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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RESULTS: After the evaluation of the AR-15 rifle by ARPA/AGILE, the US Services exhibited great interest in the weapon. The Air Force was the first Service to procure the rifles in quantity, designating it the M-16. The Army and other Services later procured this weapon.

REMARKS: AGILE - WEAPONS

REF: "Report of Task No. 13A: Test of Armalite Rifle, AR-15 (U)," Final Report. Research and Development Field Unit, ARPA, Office of the Secretary of Defense, 7/31/62.

Testing of rifles was accomplished under AO 245.

299	0	0	09/01/62 ACF INDUSTRIES	NONR 2507	\$114,000
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TITLE: High Frequency Skywave Propagation - Project YO-YO.

DESCRIPTION: Project designed to determine effects of jungle environment in SEA on high frequency (3-12 MC) sky-wave mode of propagation by measuring signal characteristics between two sites 5-30 km apart separated by jungle foliage and mountainous terrain.

RESULTS: Proved feasibility of employing HF sky-wave transmission from a low-powered transmitter and short YO-YO antenna as a means of providing a suitable tactical signaling system over terrain which precluded use of conventional communication systems.

REMARKS: AGILE - Communication Studies - Jungle Propagation

REF: "Project YO-YO Field Experiments," (b)(6) Electrophysics Laboratories, ACF Electronics Division, Hyattsville, Maryland for ONR, 9/13/62.

299	0	1			\$0
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TITLE: See AO 299, Amendment 3.

299	0	2			\$0
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TITLE: See AO 299, Amendment 6.

299	0	3			\$0
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TITLE: See AO 299, Amendment 2.

299	2	0	STEVENS INST.	NONR-26368	\$55,000
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TITLE: Water Power Generator.

DESCRIPTION: The Savonius rotor was investigated as a possible means of utilizing a low-speed stream (<4 mph) as a power source for a low-power generator.

RESULTS: Results indicated that the Savonius rotor is not as effective at extracting the available power from a stream of moving water of a given cross-sectional area as a conventional propeller-type windmill.

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: AGILE - COMMUNICATIONS

REF: "Power Generating Characteristics of Savonius Rotors," Letter Report.
(b)(6) Stevens Institute of Technology, Davidson Laboratory,
Hoboken, New Jersey, Report No. 1181. Prepared for Office of Naval
Research, Washington, D.C., 11/66.
See AO 386 and AO 484.

299	3	0	06/01/63	12/31/66	AMER. CYANAMID	NONR 4200 (00)	\$688,000
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TITLE: Chemiluminescence for Illumination and Marking Devices.

DESCRIPTION: Exploratory and mechanistic studies were carried out with the purpose of more efficient reactions and through better understanding of the mechanisms, to provide conditions for enhancement.

RESULTS: An efficient chemiluminescent reaction between electronegatively substituted oxalic esters, hydrogen peroxide, and fluorescent compounds providing quantum yields of 23 percent and light capacities of 105 lumen hours per liter.

REMARKS: AGILE - Chemiluminescence - Markers

REF: "Chemiluminescent Materials Final Report," (b)(6)
American Cyanamid Company, Stamford, CN. for ONR/ARPA, 5/31/67.
Part of Marking, Tracking and Identification Program.
See AO 563, Task 1.

299	6	0	06/01/64	05/31/66	MONSANTO	NONR 4511 (00)	\$198,000
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TITLE: Chemiluminescent Systems.

DESCRIPTION: The objective of this program was the discovery of bright chemiluminescent reactions through a screening program and enhancement of emission through reaction at a solid-liquid interface.

RESULTS: SKATOLE (3-Methylindole), a natural product proved to be the best system screened. Enhancement of emission through the use of solid substrates was studied with the conclusion that membrane reflectivity was the critical factor influencing total light emission.

REMARKS: AGILE - Chemiluminescence - Markers

REF: "Chemiluminescent Systems," Final Technical Report, (b)(6)
(b)(6) Monsanto Research Corporation, Everett, MA. for Office of
Naval Research/Advanced Research Projects Agency, 11/30/66.
Part of Marking, Tracking and Identification Program.
See AO 563, Task 1.

300	0	0					\$650,845
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TITLE: ELECTROCHEMISTRY

301	0	0					\$595,300
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TITLE: DECOMPOSITION KINETICS & SENSITIVITY OF FLUORINE NITROGEN

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
302	0	0					\$601,900

TITLE: ELECTROCHEMISTRY OF FUEL CELL ELECTRODES

303	0	0					\$153,100
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TITLE: INTERNAL SECURITY FORCES

304	0	0	03/28/62		BENDIX CORP.		\$0
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TITLE: Passive Radiation Experiment Platform (PREP) - WV-2 Aircraft.

DESCRIPTION: Under this AO the program was transferred to AFBSD.

RESULTS: Use of aircraft on Project PRESS was cancelled.

REMARKS: PROG: BMD - Missile Phenomenology - Optical Measurement.

See AO 127, Tasks 1, 2, 3, and 4.

ARPA was reimbursed \$1,500,000 of \$1,790,014 cited in AO 127, T 4.

305	0	0			NAMRU 2	IN HOUSE	\$102,000
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TITLE: Oral Cholera Treatment

DESCRIPTION: DARPA supplemented the funding of the Navy's Medical Research Unit #2 (Far East) to accelerate their search for an oral treatment for cholera since it seemed possible that this disease could become a problem in Vietnam.

RESULTS: While results of various treatments tested in hospitals in the Philippines seemed to show some value, no final treatment system had been developed when DARPA terminated its funding.

REMARKS: See remark under AO 580.

306	0	0	12/01/62	12/01/67	VARIOUS	VARIOUS	\$16,315,000
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TITLE: Laser Design Concept Studies

DESCRIPTION: To investigate the use of high-power lasers in missile and space defense. The research in Laser technology included materials, pumping sources, components and devices, advanced device design and optical radar.

REMARKS: PROG: BMD - General research - Lasers

Program included 92 contracts let and monitored by ONR.

307	0	0					\$340,000
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TITLE: IR DETECTOR; TREE EXPTS.; DELAYED GAMMA RAYS URANIUM FISSION

307	0	1	02/01/62	06/01/64	AFSWC	IN HOUSE	\$120,000
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TITLE: NUCLEAR RADIATION EFFECTS ON ELECTRONIC INSTRUMENTATION COMPONENTS (TREE EXPERIMENTS)

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: EXPERIMENTS ON THE EFFECTS OF TRANSIENT RADIATION ON INSTRUMENTATION COMPONENTS. INVOLVED IMPROVEMENT IN FLASH X-RAY SYSTEM, DIAGNOSTIC INSTRUMENTATION, TOTAL GAMMA DOSE SOURCE AND CONTINUATION OF EXPERIMENTS.

REMARKS: PROG: BMD - GENERAL RESEARCH ON NUCLEAR EFFECTS PERTINENT TO BALLISTIC MISSILE DEFENSE.

MISC: (1) CONTINUATION OF WORK STARTED UNDER AO 6, T22, FUNDS FROM AO6T22 FUNDED WORK 2/62-9/62.

307	0	2	05/01/62	11/01/63	GEN DYNAMICS	AF29(601)-5373	\$89,000
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TITLE: LABORATORY MEASUREMENT OF DELAYED GAMMA RAYS FOR URANIUM FISSION.

DESCRIPTION: (1) TO MEASURE THE DELAYED GAMMA RAY INTENSITIES AND DECAY RATES FROM URANIUM FISSION IN TIME FRAME (10 MICROSECONDS TO SEVERAL MILLISECONDS) FOLLOWING FISSION. (2) TO DEFINE THE SOURCE TERM RESPONSIBLE FOR SHARP GAMMA RADIATION PULSE FROM A NUCLEAR WEAPON DETONATION.

REMARKS: PROG: BMD - GENERAL RESEARCH ON NUCLEAR EFFECTS PERTINENT TO BALLISTIC MISSILE DEFENSE.

REF: FINAL REPORT, "RESEARCH ON DELAYED GAMMA RAYS FROM FISSION," RTD TDR-63-3072, GA-4525, NOV 1963.

MISC: (1) CONTINUATION OF WORK STARTED UNDER AO 6T22.

307	0	3	11/01/63	09/01/64	HUGHES AIRCRAFT	AF29(601)-6282	\$86,000
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TITLE: DEVELOPMENT OF A HARDENED READOUT INSTRUMENTATION (FOREST CIRCUITS)

DESCRIPTION: TO DEVELOP PROTOTYPES OF A RADIATION HARDENED READOUT INSTRUMENTATION FOR PROCESSING AND RECORDING TEST DATA DURING WEAPON EFFECTS TEST.

REMARKS: PROG; BMD - GENERAL RESEARCH ON NUCLEAR EFFECTS PERTINENT TO BALLISTIC MISSILE DEFENSE.

307	0	4	04/01/63	06/01/64	UNIV OF NEW MEX.	AF29(601)-5976	\$50,000
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TITLE: TRANSIENT RADIATION EFFECTS ON ELECTRONIC SYSTEMS (TREE) - FLASH X-RAY EXPERIMENTS

DESCRIPTION: SUPPORT OF THE AIR FORCE WEAPONS LABORATORY (AFWL) PROGRAM TO STUDY RADIATION EFFECTS DUE TO X-RAYS. SUPPORT INCLUDED PREPARING BIBLIOGRAPHY, DESIGN OF FLASH X-RAY EQUIPMENT, MEASUREMENT OF X-RAY SPECTRUM AND DEVELOPING THEORY OF EFFECTS.

REMARKS: PROG: BMD - GENERAL RESEARCH ON NUCLEAR EFFECTS PERTINENT TO BALLISTIC MISSILE DEFENSE.

REF: 1) AFWL TDR 64-36 (AD 442596), "MEASUREMENT OF CONTINUOUS X-RAY SPECTRA USING AN ABSORPTION METHOD", (b)(6) JUN 64 (UNCLASSIFIED); 2) AFWL TDR 64-38 (AD 442579), "TRANSIENT RADIATION EFFECTS ON HALL DEVICES", (b)(6) (b)(6) JUN 64 (UNCLASSIFIED); 3) AFWL TDR 64-37 (AD 442597), "A MONTE-CARLO CODE FOR TRANSIENT RADIATION EFFECTS", (b)(6) (b)(6) JUN 64 (UNCLASSIFIED).

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
308 0 0	02/01/62	04/30/63	AEROSPACE CORP.	AF04(695)-169	\$544,708

TITLE: BAMBI PHASE II SUPPORT STUDIES.

DESCRIPTION: Contractor provided technical direction to BAMBI PH II contractors, assisted in data model preparation, performed countermeasure evaluation, developed mathematical evaluation model and techniques, provided guide lines for applied research for the boost phase intercept technology requirements and general program planning.

RESULTS: See reports below.

REMARKS: PROG: BMD - Studies - BAMBI.

REF: "(U) Final Status and Evaluation Report BAMBI Phase II Study", Rpt. Nos TDR-169(3780)TN-3, SSD-TDR-63-38, 22 Feb. 1963, (S)

Other BAMBI Rpts: NOS. TDR-169(3780)TN-5, SSD-TDR-63-69, 31 Jan 63, (S); TDR-169(3780)TN-6, SSD-TDR-63-81, 15 Apr. 63 (S); TDR-169(3780)TN-4, SSD-TDR-63-55, 20 Feb. 1963, (S); TDR-169(3780)TN-7, SSD-TDR-63-110, 30 Apr. 63 (S/RD). See also AO 174, 176, 177. Extension of AF04(647)-930.

309 0 0					\$828,654
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TITLE: PLASMA TURBULENCE

309 0 5	04/01/62	01/01/66	GENERAL DYNAMICS AF	29(601)-6366	\$826,000
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TITLE: THEORETICAL/EXPERIMENTAL STUDY OF PLASMA TURBULENCE

DESCRIPTION: (A) THEORETICAL DEVELOPMENT OF NON-LINEAR TERMS OF THE VLASOV EQUATION GOVERNING TURBULENCE IN AN INFINITE AND FINITE PLASMA IN A MAGNETIC FIELD; (B) DESIGN AND FABRICATION OF EQUIPMENT TO VERIFY THEORY.

REMARKS: PROG: BMD - GENERAL RESEARCH ON NUCLEAR EFFECTS PERTINENT TO BALLISTIC MISSILE DEFENSE.

MISC: (1) EXTENSION OF AF 29(601)-5338

(2) DASA CONTRIBUTED \$84,000 TO THIS PROGRAM NOT INCLUDED IN FC.

310 0 0	02/12/62	07/01/62	DASA	IN HOUSE	\$2,152,490
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TITLE: Effects of Nuclear Burst on Operational Re-Entry Vehicles.

DESCRIPTION: An experimental program to determine the effects of a nuclear explosion on an operational re-entry vehicle during a nuclear test series.

RESULTS: No results were obtained. RV was not launched successfully.

REMARKS: PROG: BMD - General Research - Nuclear Effects - RV's

311 0 0					\$929,038
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TITLE: SOLID FLUORINE OXIDIZERS

312 0 0	06/12/62		G.E.	AF33(657)-8094	\$704,581
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: PROJECT MAD CAT

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - OTH PROGRAM

313	0	0					\$1,800,000
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TITLE: IMPULSIVE LOADING RSCH

313	0	1	02/26/62		GEN. ATOMIC	AF29(601)-5695	\$3,492,028
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TITLE: Laser Interactions.

DESCRIPTION: Investigation of high-intensity, short-pulse laser interactions. Apply and extend the opacity theory and interpret experimental results.

REMARKS: PROG: BMD - Techniques & Devices - Laser Research.

313	0	2	02/26/62		RCA		\$0
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TITLE: Laser Interactions.

DESCRIPTION: Investigation of high-intensity, short-pulse laser interactions. Apply and extend the opacity theory and interpret experimental results.

REMARKS: PROG: BMD - Techniques & Devices - Laser Research - Interaction.

313	0	3	02/26/62		AVCO		\$0
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TITLE: Laser Interactions.

DESCRIPTION: Investigation of high-intensity, short-pulse Laser interactions - Experimental measurements of re-radiation from surfaces and transmission of vapor.

REMARKS: PROG: BMD - Techniques & Devices - Laser Research - Interaction.

313	0	4	02/26/62		LEAR-SIEGLER		\$0
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TITLE: Laser Interactions

REMARKS: PROG: BMD - Techniques & Devices - Laser Research.

314	0	0					\$217,785
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TITLE: INORGANIC CHEMISTRY OF THE HIGHER FLUORINE OXIDES

315	0	0					\$147,899
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TITLE: THERMODYNAMICS OF BINARY METAL OXIDE SYSTEMS

316	0	0					\$674,214
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TITLE: EQUIPMENT GRANTS

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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317	0	0					\$2,602,712
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TITLE: COMBUSTION IRREGULARITIES IN SOLID PROPELLANTS

318	0	0					\$1,237,438
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TITLE: HIGH POWER TUBE WINDOWS

318	0	1		10/31/65	STANFORD RES.IN.	DA28043AMC-00215	\$490,000
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TITLE: Refractory Microwave Dielectric Window Material Research.

DESCRIPTION: Theoretical and experimental research on the properties of refractory microwave dielectric materials for windows in microwave tubes.

REMARKS: PROG: BMD - Techniques & Devices - Radar - High Power Tubes and Components.

REF: Final Report, "Research on Dielectrics for Microwave Electric Devices (U)", Report No. 13, February 1966 (U).

318	0	2		06/30/65	EITEL-MCCULLOUGH	DA36039-SC-90903	\$220,000
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TITLE: Tube Metal-Ceramic Seal Interface Study.

DESCRIPTION: A study on the composition and structure of fabricated ceramic radio frequency window-seals to understand factors influencing resistance, loss, etc.

REMARKS: PROG: BMD - Techniques & Devices - Radar - High Power Tubes and Components.

REF: "Metallurgical Research and Development for Ceramic Electron Devices" (U), Final Report, TR-77-1, January 1966 (U).

318	0	3		06/30/64	EITEL-MCCULLOUGH	DA36039-SC-90818	\$475,000
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TITLE: Waveguide Alumina Window Multipactor Suppression.

DESCRIPTION: Research on the application of thin film techniques for single surface multipactor suppression on cylindrical to plane waveguide windows of alumina and beryllia.

REMARKS: PROG: BMD - Techniques & Devices - Radar - High Power Tubes and Components.

Continued by Sperry Rand.
The funding cited includes Task 4.

318	0	4		06/30/64	EITEL-MCCULLOUGH	DA36039-SC-90818	\$475,000
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TITLE: Wave-Guide Quartz Window Multipactor Suppression.

DESCRIPTION: A theoretical and experimental study of multipactor on quartz wave-guide windows.

REMARKS: PROG: BMD - Techniques & Devices - Radar - High Power Tubes and Components.

Task 4 was continued by Sperry Rand.
The funding cited includes Task 3.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
318	0	5		09/15/65	SPERRY RAND	DA28043AMC00373(E)	\$189,120

TITLE: High Power Microwave Tube Window Research.

DESCRIPTION: (a) Theoretical and experimental investigation on materials to eliminate multipactoring on microwave windows.

REMARKS: PROG: BMD - Techniques & Devices - Radar - High Powered Tubes and Components.

REF: Final Report, "High-Power Microwave Tube Window Investigations (U)", September 1965 (U).

Funding includes Task 7.

318	0	6					\$0
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TITLE: High Power Microwave Tube Window Research.

DESCRIPTION: All information on Task 5.

REMARKS: See Task 5.

318	0	7		12/15/65	SPERRY RAND	DA28043AMC00373(E)	\$189,120
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TITLE: Brazing of Ferromagnetic Ceramic Materials to Metals.

DESCRIPTION: Investigation of the techniques of high temperature brazing of ferromagnetic ceramic materials to metals.

REMARKS: PROG: BMD -

REF: Sperry Rand Final Report, "Investigation of Brazing Techniques for Ferromagnetic Materials", SETD No. NJ-2769-0202-5, Feb. 16, 1966 (U).

Funding included in AO 318 Tasks 3 and 4.

319	0	0	06/01/62	01/30/65	YALE UNIV.	AF-AFOSR249-63	\$875,000
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TITLE: Radio Frequency and Optical Measurements of Atoms, Molecules and Plasmas.

DESCRIPTION: Determination of the properties of atoms, molecules, and plasma by radio-frequency, microwave, and optical (including maser and laser) techniques.

REMARKS: PROG: BMD - General research in support of launch, mid-course and re-entry physics. May have also supported Pen Aids.

This was jointly funded by ARPA and AFOSR as shown:

	ARPA	AFOSR
FY 62	400K	--
FY 63	275K	275K
FY 64	200K	200K

320	0	0					\$239,009
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TITLE: TEAR DROP

320	0	1	03/30/62	08/06/62	RAYTHEON CORP.	AF33(657)-9002	\$58,856
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TITLE: AIRBORNE HIGH POWERED PHASED ARRAY RADAR (PROJECT TEAR DROP)

		Initial	Final			
AO	AMD	Task	Date	Date	Contractor	Contract Number
						Total Funds

DESCRIPTION: STUDY TO DETERMINE THE FEASIBILITY OF INSTALLING A HIGH POWERED PHASED ARRAY RADAR IN A B-52 FOR REENTRY DISCRIMINATION MEASUREMENTS.

RESULTS: STUDIES SHOWED THAT A HIGH POWERED PHASED ARRAY RADAR COULD BE INSTALLED IN A B-52. AIR FORCE PROCEEDED WITH THE DESIGN, DEVELOPMENT AND INSTALLATION OF A \$15M FEASIBILITY DEMONSTRATION MODEL.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - RADAR - DISCRIMINATION MEASUREMENTS.
FOUR COMPETITIVE STUDIES WERE FUNDED; SEE AO320, TASK 2,3, AND 4.

320 0 2 04/04/62 08/06/62 GEN. DYNAMICS AF33(657)-9003 \$60,000

TITLE: AIRBORNE HIGH POWERED PHASED ARRAY RADAR (PROJECT TEAR DROP)

DESCRIPTION: STUDY TO DETERMINE THE FEASIBILITY OF INSTALLING A HIGH POWERED PHASED ARRAY RADAR IN A B-52 FOR REENTRY DISCRIMINATION MEASUREMENTS.

RESULTS: STUDIES SHOWED THAT A HIGH POWERED PHASED ARRAY RADAR COULD BE INSTALLED IN A B-52. AIR FORCE PROCEEDED WITH THE DESIGN, DEVELOPMENT AND INSTALLATION OF A \$15M FEASIBILITY DEMONSTRATION MODEL.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - RADAR - DISCRIMINATION MEASUREMENTS.
SEE ALSO AO 320 TASKS, 1, 3, AND 4.
MISC: RCA AND CHU ASSOCIATES ALSO ASSISTED GEN DYN. UNDER SUBCONTRACTS.

320 0 3 03/30/62 08/06/62 HUGHES AIRCRAFT AF33(657)-9004 \$59,921

TITLE: AIRBORNE HIGH POWERED PHASED ARRAY RADAR (PROJECT TEAR DROP)

DESCRIPTION: STUDY TO DETERMINE THE FEASIBILITY OF INSTALLING A HIGH POWERED PHASED ARRAY RADAR IN A B-52 FOR REENTRY DISCRIMINATION MEASUREMENTS.

RESULTS: STUDIES SHOWED THAT A HIGH POWERED PHASED ARRAY RADAR COULD BE INSTALLED IN A B-52. AIR FORCE PROCEEDED WITH THE DESIGN, DEVELOPMENT AND INSTALLATION OF A \$15M FEASIBILITY DEMONSTRATION MODEL.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - RADAR - DISCRIMINATION MEASUREMENTS.
SEE AO 320 TASKS 1, 2, AND 4.

320 0 4 03/15/62 08/15/62 GEN. ELECTRIC AF33(657)-9108 \$60,000

TITLE: AIRBORNE HIGH POWERED PHASED ARRAY RADAR (PROJECT TEAR DROP)

DESCRIPTION: STUDY TO DETERMINE THE FEASIBILITY OF INSTALLING A HIGH POWERED PHASED ARRAY RADAR IN A B-52 FOR REENTRY DISCRIMINATION MEASUREMENTS.

RESULTS: STUDIES SHOWED THAT A HIGH POWERED PHASED ARRAY RADAR COULD BE INSTALLED IN A B-52. AIR FORCE PROCEEDED WITH THE DESIGN, DEVELOPMENT AND INSTALLATION OF A \$15M FEASIBILITY DEMONSTRATION MODEL.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - RADAR - DISCRIMINATION MEASUREMENTS.
SEE AO 320 TASKS, 1, 2, AND 3.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
321	0	0	03/21/62	07/01/62	VARIOUS		\$900,000

TITLE: Low Altitude Nuclear Blackout Test on Radar (DOMINIC)

DESCRIPTION: To determine the effects of a low altitude nuclear burst on radar frequencies.

RESULTS: Degree of attenuation and spatial extent versus time were determined. This experiment contributed to the overall data base to formulate a nuclear effects model for evaluating weapon system performance.

REMARKS: BMD - Studies - Nuclear Weapon Effects.
Columbia Univ., Hughes A/C; U.S. Army Signal Missile Support Agency participated in test.

322	0	0					\$2,747,000
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TITLE: MISSILE PHENOMENOLOGY

322	0	1	09/01/62	06/01/66	UNIV CA/BERKLEY	NONR-222(45)	\$120,000
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TITLE: NEAR-WAKE STRUCTURE IN LOW REYNOLDS NUMBER HYPERSONIC FLOW

DESCRIPTION: THEORETICAL AND EXPERIMENTAL STUDY OF THE FLUID DYNAMICS OF THE NEAR-WAKE BEHIND BLUNT BODIES IN LOW REYNOLDS NUMBER HYPERSONIC FLOW. ALSO, EXAMINATION OF HIGH-ALTITUDE SHOCK AND FLOW-FIELD STRUCTURES.

REMARKS: PROG: BMD - GENERAL RESEARCH IN SUPPORT OF MISSILE PHENOMENOLOGY PROGRAM.

322	0	2	05/01/62	10/01/66	STANFORD UNIV.	NONR-225(65)	\$155,000
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TITLE: AERODYNAMIC WAKE MEASUREMENTS OF HYPERSONIC BODIES

DESCRIPTION: A STUDY OF THE AERODYNAMIC CHARACTERISTICS OF WAKE FLOWS BEHIND BLUFF BODIES AT MACH NUMBERS IN RANGE 15-20.

REMARKS: PROG: BMD - GENERAL RESEARCH IN SUPPORT OF THE MISSILE PHENOMENOLOGY.

322	0	3	06/01/62	06/01/68	BROWN UNIV.	NONR-562(35)	\$371,000
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TITLE: INVESTIGATION OF PHYSICAL PHENOMENA APPLICABLE TO DISCRIMINATION.

DESCRIPTION: INVESTIGATION OF BASIC PHYSICAL PHENOMENA THAT COULD BE USED FOR DETECTION AND DISCRIMINATION OF RV'S. BASIC PHENOMENA INCLUDED NONEQUILIBRIUM FLOW, GAS RADIATION, ELECTROGASDYNAMIC AND CONTINUUM PLASMA EFFECTS.

REMARKS: PROG: BMD - GENERAL RESEARCH IN SUPPORT OF MISSILE PHENOMENOLOGY PROGRAM.

322	0	4	09/01/62	06/01/66	YALE UNIV.	NONR-609(46)	\$100,000
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TITLE: NONEQUILIBRIUM GAS FLOW PHENOMENA

DESCRIPTION: EXPERIMENTAL AND ANALYTICAL INVESTIGATION OF NONEQUILIBRIUM GAS FLOW PHENOMENA.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - GENERAL RESEARCH IN SUPPORT OF MISSILE PHENOMENOLOGY PROGRAM.

322	0	5	09/01/62	06/01/67	NORTHWESTERN U.	NONR-1228(27)	\$149,000
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TITLE: RAREFIED GAS DYNAMICS AND PLASMA PHYSICS.

DESCRIPTION: BASIC RESEARCH ON RAREFIED GASES TO SOLVE BOLTZMANN EQUATION IN THE NEAR-COLLISIONLESS REGIME AND MATHEMATICAL TECHNIQUES FOR DETERMINING THE EFFECT OF COLLISIONS ON LANDAU DAMPING.

REMARKS: PROG: BMD - GENERAL RESEARCH IN SUPPORT OF MISSILE PHENOMENOLOGY.

322	0	6	06/01/62	06/01/68	MIT	NONR-1841(93)	\$909,000
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TITLE: PHYSICS OF ATMOSPHERIC REENTRY

DESCRIPTION: INVESTIGATION OF FLUID MECHANICAL PHENOMENA ASSOCIATED WITH BODIES ENTERING THE EARTH'S ATMOSPHERE AT HIGH SPEEDS AND STUDIES ON R/V STRUCTURAL RESPONSE TO IMPULSIVE LOADING.

REMARKS: PROG: BMD - GENERAL RESEARCH IN SUPPORT OF MISSILE PHENOMENOLOGY.

322	0	7	06/01/62	02/01/69	PRINCETON UNIV.	NONR-1858(37)	\$764,000
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TITLE: HYPERSONIC WAKE STUDIES

DESCRIPTION: MEASUREMENT OF NEAR AND FAR WAKES BEHIND VARIOUS SHAPED BODIES IN THE MACH 10-20 RANGE IN A MAGNETIC SUSPENSION SYSTEM.

REMARKS: PROG: BMD - GENERAL RESEARCH IN SUPPORT OF MISSILE PHENOMENOLOGY

322	0	8	01/01/63	08/01/66	U. OF CINCINNATI	NONR-2168(03)	\$115,000
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TITLE: RESEARCH ON HEAT AND MASS TRANSFER ON HYPERSONIC BOUNDARY LAYERS.

DESCRIPTION: INVESTIGATION OF HEAT AND MASS TRANSFER FOR HYPERSONIC BOUNDARY LAYERS WITH DISSOCIATION AND IONIZATION.

REMARKS: PROG: BMD - GENERAL RESEARCH IN SUPPORT OF MISSILE PHENOMENOLOGY.

322	0	9			ITT RES. INST.	NONR-3884(00)	\$99,000
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TITLE: SHOCK TUBE STUDIES OF THE CHARACTER AND INTENSITY OF STAGNATION POINT RADIATION

DESCRIPTION: EXPERIMENTAL PROGRAM TO MEASURE THE OVER-ALL RADIATION IN THE VISIBLE REGION INCIDENT UPON THE STAGNATION POINT OF A BLUNT BODY.

REMARKS: PROG: BMD - GENERAL RESEARCH IN SUPPORT OF MISSILE PHENOMENOLOGY.

322	0	10	09/01/62	04/01/65	CORNELL AERO LAB	NONR-3960(00)	\$125,000
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TITLE: ELECTROMAGNETIC PHENOMENA IN PLASMA FLOWS

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: INVESTIGATION OF NONEQUILIBRIUM IONIZATION IN EXPANDING FLOWS IN THE STRUCTURE OF STRONG SHOCK WAVES AND IN PLASMA BOUNDARY LAYERS.

REMARKS: PROG: BMD - GENERAL RESEARCH IN SUPPORT OF MISSILE PHENOMENOLOGY.
(1) CONTINUED UNDER AO665.

322	0	11	08/01/62	08/01/67	MIT	NONR-3963(03)	\$153,000
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TITLE: METHOD FOR MEASURING MOLECULAR VELOCITIES

DESCRIPTION: DESIGN AND CONSTRUCTION OF A DEVICE CAPABLE OF MEASURING THE STREAMWISE VELOCITY DISTRIBUTION OF A MOLECULAR BEAM IN THE THERMAL ENERGY RANGE.

REMARKS: PROG: BMD - GENERAL RESEARCH IN SUPPORT OF MISSILE PHENOMENOLOGY.

322	0	12	03/01/63	02/01/66	UNIV. TORONTO	NONR-4073(00)	\$90,000
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TITLE: ACCOMMODATION AT SURFACES OF CONTROLLED CLEANNESS

DESCRIPTION: THEORETICAL AND EXPERIMENTAL INVESTIGATION OF ACCOMMODATION PHENOMENA AT SURFACES OF CONTROLLED CLEANNESS AND OF HIGH SPEED, LOW DENSITY, IONIZED FLOWS.

REMARKS: PROG: BMD - GENERAL RESEARCH IN SUPPORT OF MISSILE PHENOMENOLOGY.

322	0	13	09/01/62	09/01/64	NEW YORK UNIV.	NONR-285(53)	\$100,000
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TITLE: SHOCK LAYER PHENOMENA DURING REENTRY

DESCRIPTION: AN INVESTIGATION OF THE STABILITY OF CURVED STREAMLINE FLOW IN A SHEAR LAYER, THE RESPONSE OF THE SUPERSONIC REGION OF A SHOCK LAYER TO UNSTEADY DISTURBANCES, THE EFFECT OF CHEMICAL REACTIONS ON SHOCK FRONT STABILITY, AND NON-LINEAR WAVE PROPAGATION IN NONHOMOGENEOUS MEDIA.

REMARKS: PROG: BMD - GENERAL RESEARCH IN SUPPORT OF MISSILE PHENOMENOLOGY.

322	0	14	10/01/62	11/01/63	UNIV. OF VA	NONR-474(10)	\$31,000
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TITLE: SURFACE CONDITIONS ON DRAG AT LOW DENSITIES.

DESCRIPTION: AN EXPERIMENTAL DETERMINATION OF THE INFLUENCE OF REPRODUCIBLE CHANGES IN SURFACE CONDITIONS ON TANGENTIAL MOMENTUM TRANSFER FOR A RANGE OF MOLECULAR SPECIES.

REMARKS: PROG: BMD - GENERAL RESEARCH IN SUPPORT OF MISSILE PHENOMENOLOGY.

322	0	15			VIDYNA, INC.	NONR-3997(00)	\$63,000
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TITLE: COMPRESSIBLE TURBULENT BOUNDARY LAYER WITH FOREIGN GAS MASS TRANSFER AT THE SURFACE.

DESCRIPTION: AN ANALYTICAL STUDY OF THE BEHAVIOR OF A TURBULENT BOUNDARY LAYER WHEN FOREIGN GAS INJECTION OCCURS AT THE SURFACE.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - GENERAL RESEARCH IN SUPPORT OF MISSILE PHENOMENOLOGY.

322	0	16	11/01/62	04/01/64	UNIV. OF COLO.		\$160,000
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TITLE: NON-ISOTROPIC TURBULENCE DURING REENTRY

DESCRIPTION: A THEORETICAL STUDY ON NON-ISOTROPIC TURBULENCE APPLICABLE TO BALLISTIC MISSILE REENTRY.

REMARKS: PROG: BMD - GENERAL RESEARCH IN SUPPORT OF MISSILE PHENOMENOLOGY.
MISC: (1) PART OF JILA PROGRAM, AO 492

322	0	17	04/01/64	08/01/65	NORTH AMER. AVIA NONR-4623(00)		\$40,000
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TITLE: OPTICAL RADIATION PROPERTIES OF GASES

DESCRIPTION: TO OBTAIN RELIABLE VALUES OF FRANCK-CONDON AND R-CENTROID FACTORS WITH SOLUTIONS OF THE SCHRODINGER EQUATION FOR MOLECULAR POTENTIALS. ALSO, THE DETERMINATION OF SPECTRAL ABSORPTION COEFFICIENTS OF ELECTRONIC TRANSISTORS IN DIATOMIC HYDRIDES.

REMARKS: PROG: BMD - GENERAL RESEARCH IN SUPPORT MISSILE PHENOMENOLOGY.
MISC: CONTINUED UNDER AO 665.

322	0	18			BROOKLYN POLYTEC NONR-839(39)		\$50,000
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TITLE: REENTRY BODY FLOW FIELDS

DESCRIPTION: RESEARCH ON THE FLOW FIELD AROUND INSTRUMENTED LARGE SCALE BODIES AT HYPER-SONIC SPEEDS.

REMARKS: PROG: BMD - GENERAL RESEARCH IN SUPPORT OF MISSILE PHENOMENOLOGY
MISC. (1) CONTINUED UNDER AO 529.

322	0	19	06/01/63	06/01/65	RCA-VICTOR, CAN. NONR-4596(00)		\$75,000
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322	0	20					\$0
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322	0	21					\$0
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322	0	22	01/01/66		GEN. DYN/CONVAIR		\$50,000
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TITLE: R/V and Interceptor Vulnerability.

DESCRIPTION: Task 1 - Perform analyses of pellet kill of R/V's.
Task 2 - Perform a critique of interceptor vulnerability to blast.

REMARKS: PROG: BMD - General Research - Missile Phenomenology.

322	0	23			GEN. DYNAMICS		\$0
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TITLE: Base Flow Computations.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: Development of a computer program for calculating the separated flow field behind a hypersonic conical body using the full Navier Stokes equation.

REMARKS: PROG: BMD - Gen. Research - Missile Phenomenology.
Terminated.

322	0	24	06/25/63	06/30/65	UNIV. ROCHESTER	NONR-668(20)	\$50,000
322	0	25	03/01/65	03/01/68	MIT	NONR-3963(12)	\$100,000
323	0	0					\$171,300

TITLE: UNILATERAL ARMS CONTROL

324	0	0	03/23/62		DRC		\$93,000
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TITLE: Guerilla Activity Detection Study

DESCRIPTION: Novel applications of advanced techniques for detecting guerilla activities were evaluated. Logical requirements were derived based on operational and environmental factors.

RESULTS: No particular military method of detection was found to give overwhelming advantage. Some IR, radar, acoustic and geophysical techniques are promising but technological and environmental data are sparse. Chemical tagging and passive IR techniques are not favorable.

REMARKS: Final Report: DRC Report No DRC-63-1236, 20 Feb. 1963.

324	0	1			JERED INDUS.		\$52,000
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TITLE: Viper

DESCRIPTION: Funds granted for procurement of two Viper vehicles, with a six-month supply of spare parts, reliability testing on one prototype and service of a technical representative for 60 days field testing in Thailand. The Viper was a 4x4 amphibious reconnaissance vehicle.

RESULTS: Tests were terminated prior to completion due to failure of the vehicle. It was unsatisfactory as a cargo carrier because of unreliable steering and braking control, excessive engine temperature, and inadequate water temperature.

REMARKS: AGILE -VEHICLE - MOBILITY

324	0	2			CDTC		\$4,000
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TITLE: M113 Capstans

DESCRIPTION: Funds were provided for procurement of 10 pairs of capstan modifications to the M113 Armored Personnel Carrier and shipment to DSD/ARPA, Saigon.

RESULTS: The capstans proved highly satisfactory during evaluation in Vietnam.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: AGILE - MOBILITY

324	0	3	MRDC		\$7,000
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TITLE: Tote Gote

DESCRIPTION: Funds were provided for procurement of six tote gote scooters with associated equipment along with the services of a company representative for 30 days of field testing in Thailand. The tote gote, a two-wheeled motor scooter designed for both on and off-road movement was evaluated as a small load carrying device.

RESULTS: The tote gote was vulnerable to soft soil and water, had a limited payload capability, poor stability in some conditions, and a configuration incompatible with the average user. It was not judged acceptable for military use.

REMARKS: AGILE - VEHICLE - MOBILITY

324	0	4	MBA		\$201,000
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TITLE: Micro Rockets

DESCRIPTION: See AO 285, Task 8

324	0	5	H.P. WHITE		\$1,000
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TITLE: Micro Rockets Test and Evaluation

DESCRIPTION: Test of micro rockets. See AO 285, Task 8.

324	0	6			\$0
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TITLE: See AO 324, Amendment 6, Task 3.

324	0	7			\$0
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TITLE: See AO 324 Amendment 6, Task 4.

324	0	8			\$0
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TITLE: See AO 324, Amendment 6, Task 5.

324	0	9	HYCOM		\$139,000
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TITLE: Firepower Parameters.

324	0	13			\$0
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TITLE: See AO 324, Amendment 7.

324	6	0	01/30/63 01/01/64 VARIOUS	NA	\$443,000
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TITLE: Stoner Weapons System.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: This program had as its objective the development of an improved family of lightweight individual and crew-served weapons capable of high rates of automatic fire. A joint-service test and evaluation program was conducted on the following members of the system - medium machine gun, fixed machine gun, light machine gun, assault rifle, and carbine.

RESULTS: Weapons tested were found to be generally reliable and accurate.

REMARKS: AGILE - Weapons - Testing - Guns.

324	6	3			CADILLAC GAGE		\$415,000
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TITLE: Stoner Weapon System

DESCRIPTION: Purchase of components of a family of weapons, i.e., rifle carbine, and light machine gun, with a number of interchangeable parts.

REMARKS: Part of DARPA Small Arms Program.

324	6	4			REMINGTON		\$24,000
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TITLE: Stoner Weapon System Ammunition

DESCRIPTION: Purchase a test quantity of military cal. .223 ammunition.

REMARKS: Part of DARPA Small Arms Program.

324	6	5			H.P. WHITE		\$4,000
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TITLE: Stoner Weapon System Test and Evaluation

DESCRIPTION: Test of the Stoner Weapon System

RESULTS: Interchangeability of parts of the various weapons in a typical infantry squad would reduce the types of spare parts currently required by one half.

REMARKS: Part of DARPA Small Arms System.

324	7	0	03/01/63	02/01/64	ASTROSYSTEMS INT SD 169		\$213,000
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TITLE: HIGH INTENSITY SOUND GENERATOR

DESCRIPTION: PROGRAM TO DEMONSTRATE FEASIBILITY OF USING AN INTERMITTENT GASEOUS DETONATION DEVICE TO GENERATE HIGH INTENSITY SOUND. DESIGN SELECTED WAS A PROPANE-AIR COMBINATION IN A STRAIGHT, THREE-FOOT CARBON STEEL TUBE WITH A 1.5 INCH DIAMETER.

RESULTS: A MULTITUBE UNIT OF 1024 TUBES IN MODULES OF 8 PRODUCED PEAK SOUND PRESSURES OF 184DB AND 91DB AT THE TUBE OUTLET AND AT 1000 FT RESPECTIVELY. EFFORT WAS NOT CONTINUED.

REMARKS: AGILE - DEVICES - SOUND GENERATOR

REFERENCE: "RESEARCH AND DEVELOPMENT PROGRAM TO DEMONSTRATE THE FEASIBILITY OF

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
324	15	0	01/05/65	JERED INDUS.			\$27,000

A HIGH INTENSITY SOUND GENERATOR," FINAL REPORT, (b)(6)
 (b)(6) ASTROSYSTEMS INTERNATIONAL, FAIRFIELD
 NJ, FOR OSD/ARPA, 6/3/64.

TITLE: ASP

DESCRIPTION: Fund granted for procurement of four ASP vehicles, with a 6 month supply of spare parts, reliability testing of one prototype, and the services of a technical representative for 60 days field testing in Thailand.

RESULTS: No shipment was made to Thailand because of vehicle unsuitability demonstrated in CONUS tests.

REMARKS: AGILE - VEHICLE - MOBILITY

REF: Memorandum: Vehicle Test for ARPA-AGILE, From: (b)(6)
 Special Warfare Division Headquarters, Department of the Army, Office of the Chief of R&D, Washington, D.C., To: ARPA, ATTN: Director for Remote Area Conflict, 1/5/65.
 Further tests scheduled under AO 353.

325	0	0					\$220,000
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TITLE: LOWERING STATIC GAS TEMPERATURE IN MHD GENERATORS

326	0	0					\$199,728
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TITLE: NOVEL SEEDING MATERIALS, RF, & DIRECT-DISCHARGE IONIZATION

327	0	0					\$549,500
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TITLE: ATOM EXCITATION

327	0	1	05/30/63	JERED INDUS.			\$49,000
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TITLE: Centipede

DESCRIPTION: Funds granted for testing and minor modifications of two centipede vehicles. The centipede was a pneumatic-tired 8x8 platform vehicle designed for cross-country movement in difficult mountainous terrain.

RESULTS: Field tests in SEA indicated the vehicle was unsuited for operations in that environment and that it was subject to repeated mechanical failures.

REMARKS: AGILE - VEHICLE - MOBILITY

REF: Letter Report for the period 1963 May 1 - 1963 May 31, (b)(6)
 (b)(6) Combat Development and Test Center, Thailand,
 6/1/63.

328	0	0					\$166,350
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TITLE: SYNTHESIS OF HIGH ENERGY COMPOUNDS

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
329	0	0					\$425,000

TITLE: OPERATIONS RSCH; USE OF SHOTGUNS-AGILE

329	0	1			RAC	DA44188AR01	\$425,000
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TITLE: Operations Research Studies.

DESCRIPTION: See AO 272, Task 1.

330	0	0	06/30/62	05/16/65	GCA	AF40(600)-1095	\$1,283,354
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TITLE: Chemical Operations Physics Investigation (CHEOPS)

DESCRIPTION: Experimental and analytical feasibility investigation to determine ability of chemical dust hypervelocity impact to aid in warhead discrimination.

RESULTS: See referenced report.

REMARKS: PROG: BMD - Studies - Hypervelocity Impact - Chemical Dust

REF: Final Report, "Project CHEOPS," Vol. I-III, AEDC-TR-66-151, 8/1/66 (S/NF).

331	0	0	03/15/65		MICROWAVE ASSOC.	DA39039AMC00076(E)	\$493,000
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TITLE: L- and C-Band Beam-Plasma Microwave Amplifiers.

DESCRIPTION: Investigation of the high power characteristics of beam-plasma microwave amplifiers and development of an amplifier capable of pulsed operation from L to C band with a 10% bandwidth and 30db gain.

REMARKS: PROG: BMD - Techniques & Devices - Radar - High Powered Tubes and Components.

REF: "High-Power Team-Plasma Amplifier (U)", Report No. 9, Final Report, March 15, 1965 (U).

332	0	0					\$180,291
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TITLE: DEFLAGRATION OF HIGH-ENERGY SOLID OXIDIZERS

333	0	0					\$210,000
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TITLE: ANTENNA ARRAY

334	0	0					\$494,320
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TITLE: BALLISTIC MISSILE RE-ENTRY SYSTEMS PROGRAM

335	0	0	04/19/62	12/01/62	HRB-SINGER	NONR-3851 (00)	\$14,100
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TITLE: VLF Phase Measurements on Fish Bowl (nuclear test).

DESCRIPTION: Fast phase and amplitude measurements at VLF frequencies were made during the Fish Bowl (Pacific nuclear test series)

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - Techniques & Devices - OTH Detection.

336	0	0			\$375,711
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TITLE: VLF FORWARD SCATTER EXPS.

337	0	0			\$3,979,200
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TITLE: HARD POINT DEFENSE CONCEPT

338	0	0			\$692,891
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TITLE: CRYSTAL GROWING

339	0	0			\$306,264
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TITLE: CRYSTAL PERFECTION

340	0	0			\$322,512
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TITLE: TWO-DIMENSIONAL HIGH RESOLUTION RADAR TECHNIQUE

341	0	0	05/28/62 09/30/65 GE	SD-134	\$1,330,820
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TITLE: Study and Evaluation of Combinations of Penetration Aids.

DESCRIPTION: The study and evaluation of combined penetration aids in a developed re-entry systems offense-defense engagement model.

RESULTS: This effort provided an initial data baseline for a penetration aids model which was later refined and updated for future studies. See report below.

REMARKS: PROG: BMD - General Research - Penetration Aid Studies and Analysis.

REF: GE Tempo Final Report, "Combinations of Penetration Aids (U)," RM 65TMP-30, July, 1965 (S).

342	0	0	05/25/62 07/15/66 AERONUTRONICS	SD-136	\$2,987,969
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TITLE: Advanced Penetration Aids Concepts.

DESCRIPTION: A variety of concepts to advance re-entry technology were formulated and evaluated. These included exoatmospheric decoys, fly-by discriminators, multiple warheads, wake additives, ECM, decoys for MRV's etc.

RESULTS: These studies were an initial data base for several important penetration and concepts. The multiple warhead concept was one of the important transfer items.

REMARKS: PROG: BMD - Penetration Aids - Advanced Studies.

Continued under AO 888 T2, AF 04 (694)-994.

See also AD-337 459 - RV hardening/Rayleigh decoy discrimination

AD-346 611 - Satellite Decoy Study.

AD-340 065; AD-346 612; AD-346 666; AD-428 245.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
343	0	0	06/18/62	01/27/66	KAMAN NUCLEAR	SD-135	\$1,084,120

TITLE: Nuclear Effects, Vulnerability, R/V Hardening, and Salvage Fuzing Studies.

DESCRIPTION: Major studies in the vulnerability of U.S. R/V's to nuclear effects; the design of nuclear test to obtain updated information for vulnerability studies; the methods and evaluation of R/V hardening and the feasibility and utility of salvage fuzing.

REMARKS: PROG: BMD - General Research - Studies.
Continued under AO 880.

344	0	0					\$676,252
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TITLE: STRATEGIC & POLITICAL FACTORS AFFECTING USE THREAT OF FORCE

345	0	0					\$0
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345	0	1	07/01/62	09/14/67	GEN. ELEC. CO.	DA30069AMC01666(E)	\$1,863,000
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TITLE: Multiple Beam Klystrons for Phased Array (U)

DESCRIPTION: (1) To demonstrate and evaluate the traveling-wave multiple-beam klystron (TWMBK) as a long-life broadband transmitting tube.
(2) To develop a hybrid MBK that exploits the best features of TWMBK and resonant features of the Multiple Beam Klystron (MBK).

REMARKS: This program complemented the single-beam super-power klystron development at Varian Associates - AO118.
Extension of DA-36-039-AMC-0007(E).

345	0	2	10/15/65	04/15/68	RAYTHEON	DA28043AMC01698(E)	\$319,000
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TITLE: Long Life Cold Cathode for Crossed-Field Tubes.

DESCRIPTION: To study secondary emission cold cathodes in the environment of self-modulating crossed-field, phased-array tubes to establish the design data base to develop tubes having life in excess of 10,000 hours.

REMARKS: PROG: BMD - Techniques & Devices - High Powered Tubes.

346	0	0					\$56,399
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TITLE: PREPARATION OF SPHERICAL NITRONIUM PERCHLORATE PARTICLES

347	0	0	06/29/62		GEN MOTORS	DA01021AMC11359(Z)	\$8,314,855
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TITLE: Characteristics of Flow Field and Wake of Hypervelocity Bodies.

DESCRIPTION: Development of detailed characteristics of the structure of the flow field and wake of hypervelocity bodies throughout re-entry regime as determined from optical and microwave observables. Theoretical and environmental gun measurements.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - Missile Phenomenology - Flow Field/Wake-Re-Entry.
 Extension DA-04-495-ORD-3567.
 Agent changed to AFBSD 6/1/67. Final Date 9/31/67.

348	0	0			\$170,985
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TITLE: THERMODYNAMIC PROPERTIES OF BERYLLIUM COMPOUNDS

349	0	0			\$208,778
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TITLE: NF & OF MOLECULAR SYSTEMS

350	0	0			\$558,800
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TITLE: REACTION CHEMISTRY OF CERTAIN COMPOUNDS

351	0	0	05/28/62 05/01/63	WTWY EXP STA NA	\$245,000
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TITLE: MOBILITY ENVIRONMENT RESEARCH STUDY

DESCRIPTION: THE SPECIFIC ENVIRONMENTAL FACTORS EVALUATED AS THEY RELATE TO MOBILITY ARE
 SOIL CLASSIFICATION, SOIL TRAFFICABILITY, VEGETATION, SURFACE GEOMETRY,
 HYDROLOGIC GEOMETRY, WEATHER AND CLIMATE.

RESULTS: SEASONAL CHANGES IN SEA DICTATED A LONGER TERM EFFORT IN ORDER TO PROPERLY
 DEFINE MOBILITY CHARACTERISTICS OF AREA.

REMARKS: AGILE - MOBILITY - TESTS
 CONTINUED UNDER AO 400.

351	1	0		UNIV.OF MICHIGAN DA27021-ENG9	\$30,000
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TITLE: Operation Tropicana

DESCRIPTION: This study was conducted in Puerto Rico to determine the detectability of heat
 sources of the type associated with guerilla activity in Vietnam.

RESULTS: The results proved that the use of an infrared thermal scanner to detect small
 ground fires obscured by a vegetative canopy is feasible.

REMARKS: AGILE - DETECTION

REF: "Infrared Detection of Heat Sources Obscured by Tropical Rain Forest
 Vegetation (U)", Final Report. Institute of Science and Technology,
 University of Michigan, Ann Arbor, Michigan; Cold Regions Research and
 Engineering Laboratory, U.S. Army Materiel Command, 4/63.

352	0	0			\$500,500
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TITLE: SYNTHESIS OF NEW OXIDIZERS FOR SOLID PROPELLANT APPLICATIONS

353	0	0			\$1,016,929
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TITLE: JIGER, GAMMA GOAT, TRACKMASTER VEHICLES

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
353	0	1					\$1,065,000

TITLE: Mobility Research Tests (MORT).

DESCRIPTION: The objective of this program was to conduct controlled tests over carefully defined courses on a variety of selected vehicles to determine their mobility and utility in the SEA environment and/or to determine performance in engineering terms to develop vehicle design criteria.

RESULTS: Individual items tested and evaluated were: Jiger, Gama Goat, Trackmaster, Nodwell 110J, Tote Gote, XM 561, M-274 Army Mule, Centipede, Dura-Kat, Dyna-Mite, Dodge Power Wagon, Thiokol Spryte, XM 571, M116, Viper, and ASP. Also covered were tests involved in mounting a machine-gun cupola on the M113.

REMARKS: AGILE - MOBILITY

REF: Test results and evaluations are covered in individual reports and ARPA Field Unit reports.

Additional AD numbers are: 354 669, 450 866, 465 565, 483 841, 667 927. Funding was provided by Amendments 1-18.

353	8	0	07/01/65	02/01/65	JRATA MACV	NA	\$134,000
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TITLE: M113 CUPOLAS

DESCRIPTION: THE PURPOSE OF THIS PROGRAM WAS TO PROCURE, INSTALL AND TEST CUPOLAS FOR THE M113 APC.

RESULTS: CUPOLAS TESTED WERE FOUND TO BE SATISFACTORY FOR USE IN SVN. OF TWO TESTED, LOWER COST ITEM WAS SELECTED FOR USE.

REMARKS: AGILE - EQUIPMENT - MOBILITY - ARMOR - CUPOLA.

REFERENCE - REPORT OF EVALUATION "CUPOLAS FOR THE M113 ARMORED PERSONNEL CARRIER," (b)(6) ARPA RDFU FOR JRATA, HQ MACV, 2/1/65.

354	0	0					\$73,487
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TITLE: NP COMPLEXES

355	0	0	06/24/62		C.H. LEAVELL	DA29-005-ENG-3386	\$1,993,933
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TITLE: Construction and Installation of AMRAD Phase I Radar.

DESCRIPTION: The construction and installation of the AMRAD Phase I Radar at the White Sands Missile Range.

REMARKS: PROG: BMD - Systems & Technical Requirements - AMRAD Radar.

356	0	0					\$3,937,000
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TITLE: LASER RESEARCH

356	2	0	05/15/59	02/28/66	TECH RES GROUP		\$4,279,819
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AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: ANALYTICAL AND EXPERIMENTAL RESEARCH ON LASERS

DESCRIPTION: BASIC RESEARCH ON LASERS INCLUDING ANALYTICAL STUDIES, DEVELOPMENT OF GAS AND SOLID STATE LASERS AND STUDY OF OUTPUT CONTROL.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - LASER RESEARCH
FUNDS APPLY TO ALL TOTAL AD.

356	3	0	02/28/66	TECH RES GROUP	AF 49(638)-673	\$4,279,819
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TITLE: ANALYTICAL AND EXPERIMENTAL RESEARCH ON LASERS

DESCRIPTION: BASIC RESEARCH ON LASERS INCLUDING: (1) DEVELOPMENT OF CW GAS LASER NOT SUBJECT TO SATURATION MECHANISM; (2) BROADBAND PHOTO-DISSOCIATIVE EXCITATION, AND (3) LUMMER - GEHRCKE Q-SWITCH AND MODE SELECTOR.

RESULTS: PROG: BMD - TECHNIQUES & DEVICES - LASER RESEARCH
WORK OUTLINED ABOVE WAS AMENDMENT #3, DEC 1963; AMENDMENT #4, FEB 1964.
FUNDS APPLY TO ORIGINAL AND ALL SUBSEQUENT AMENDMENTS.

356	4	0				\$0
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TITLE: Analytical and Experimental Research on Lasers.

DESCRIPTION: Same as AD 356, Amendment 3.

356	5	0	02/28/66	TECH RESEARCH GP	AF49(638)-673	\$4,279,819
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TITLE: ANALYTICAL AND EXPERIMENTAL RESEARCH ON LASERS.

DESCRIPTION: INVESTIGATION OF THE (1) FEASIBILITY OF HIGH POWER GAS LASERS, (2) LASER EXCITATION BY THERMAL NEUTRONS, (3) TWO STAGE LASERS, AND (4) ABSORPTION EFFECTS IN LASER MATERIALS.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - LASER RESEARCH.
FUNDS APPLY TO ORIGINAL AND ALL SUBSEQUENT AMENDMENTS.

357	0	0				\$116,600
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TITLE: ACOUSTICS OF SOLID PROPELLANT BURNING INSTABILITY

358	0	0				\$429,220
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TITLE: MARSH-SCREW VEHICLES

358	2	0	01/01/62	01/01/64	N0B54558	\$465,000
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TITLE: MARSH SCREW AMPHIBIAN PROGRAM.

DESCRIPTION: THIS PROGRAM WAS IMPLEMENTED TO DESIGN, PROCURE, AND TEST A MARSH SCREW AMPHIBIAN VEHICLE UNDER VARIOUS CONDITIONS OF TRAFFICABILITY TYPICAL OF SE ASIA.

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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RESULTS: THE VEHICLE PERFORMED BETTER ON WATER THAN MOST AMPHIBIANS, BUT NOT AS WELL AS BOATS, ITS SPEED AND PERFORMANCE WERE POOR ON SAND AND SOLID GROUND. ON SOFT, VERY WET SOILS, IT PERFORMED EXTREMELY WELL.

REMARKS: AGILE - MOBILITY - TESTING

REFERENCE - MARSH SCREW AMPHIBIAN FINAL TEST REPORT, (b)(6) CHRYSLER CORPORATION, DEFENSE ENGINEERING, DETROIT, MI, FOR CHIEF, BUSHIPS, WASHINGTON, D.C., 7/5/63.

359	0	0	01/17/63	FORD AERONUTR	DA04495AMC93(R)	\$193,000
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TITLE: PROJECTILE PENETRATION IN NON-METALLIC COMPOSITES

DESCRIPTION: THIS RESEARCH WAS CONDUCTED TO GAIN A QUANTITATIVE UNDERSTANDING OF THE EFFECTS OF MOLECULAR VARIABLES ON THE BEHAVIOR OF HETEROGENOUS COMPOSITE STRUCTURES UNDER BALLISTIC LOADING CONDITIONS.

RESULTS: A MATHEMATICAL MODEL WAS ESTABLISHED AND EQUATIONS OF MOTIONS WERE DERIVED TO PREDICT THE BEHAVIOR OF A BALLISTIC PROJECTILE PENETRATING NORMALLY INTO A COMPOSITE ARMOR MATERIAL. VELOCITY INDEPENDENT AND INERTIAL FORCES WERE CONSIDERED AS WELL AS PROJECTILE GEOMETRY.

REMARKS: AGILE - ARMOR - PROJECTILE PENETRATION

REFERENCE: "STUDY OF MECHANISMS OF ARMOR PENETRATION RESISTANCE," SECOND QUARTERLY TECHNICAL REPORT, (b)(6), FORD MOTOR COMPANY, AERONUTRONIC DIVISION FOR BALLISTIC RESEARCH LABORATORY, ABERDEEN PROVING GROUND, MD, 1/30/64.

360	0	0	06/29/62	06/01/68 HELIODYNE	DA01021AMC14520(2)	\$1,449,261
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TITLE: Base Flow and Wake Studies

DESCRIPTION: Theoretical development and experimental verification of a turbulent mixing model for the turbulent wake of reentry vehicles.

REMARKS: PROG: BMD - Missile Phenomonology - Wake Turbulent Studies.
Extension of DA-04-495-ORD-3574, DA-04-495-AMC-458(2),
DA-01-021-AMC-12727(2)

361	0	0				\$325,000
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TITLE: COUNTERMEASURES TO BMS DURING POWERED FLIGHT

362	0	0				\$3,303,000
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TITLE: UPGRADE MSMTS CAPABILITY OF RAMP AIRCRAFT

362	0	1	01/22/62	03/01/65 AEROJET-GENERAL	AF33(657)-13292*	\$2,900,000
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TITLE: Radiation Airborne Measurements Program (RAMP)

DESCRIPTION: Instrument an aircraft with high performance tracking radiometer to make measurements of ballistic missiles during powered flight.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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RESULTS: Extensive set of data obtained.

REMARKS: PROG: BMD - Missile Phenomenology - Airborne Launch Measurements.

* Ext. to AF04(695)-101 and AF33(657)-10563; see AO 238, Task 1.

362	0	2	09/13/63 08/01/67 GE	F33615-67C-1112	\$1,011,000
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TITLE: Maintenance and Operation of IRTV System (Smokey Joe)

DESCRIPTION: Operation, maintenance and data collection and analysis of IR vidicon camera plume data obtained with IRTV installed in U-2 aircraft.

RESULTS: Spectral radiance data obtained of missiles during powered flight.

REMARKS: PROG: BMD - Missile Phenomenology - Launch Phase/Background Measurements

REF: JMDR 4, 1966.

Ext. of AF33(615)-1059/3376; see AO 266, Task 15.

363	0	0			\$2,893,550
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TITLE: PICKABACK MSMTS PROGRAM

363	0	1	05/22/62 03/31/68 MULTIPLE	IN HOUSE	\$2,550,000
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TITLE: Piggyback Launch Measurements

DESCRIPTION: Drop-off probes to observe rocket plumes. Other efforts include ground based plume measurements, satellite measurements and Project Erase.

RESULTS: Excellent results obtained from this program and the many subcontracted efforts.

REMARKS: PROG: BMD - Missile Phenomenology - Target and Background Measurements.

REF: AD-635 883 (Utah State Univ.).

363	0	2	08/01/62 03/31/68 UN. OF DENVER	AF19(602)-5202	\$461,730
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TITLE: Radiation Through the Atmosphere.

DESCRIPTION: Flights of high altitude balloon with instrumentation package, solar spectrometer, sun tracker and relative humidity device, to about 100,000 ft. Spectral coverage with high resolution spectrometer covered up to 20 um. Program extended into 1972 under F19(628)-68-C-0233.

RESULTS: Unique set of data obtained to generate HITRAN code.

REMARKS: PROG: BMD - Missile Phenomenology - Atmospheric Transmission (Balloon)

REF: AD-744 851, 703 739, 702 017,698 891, 689 827, 676 279, 676 021, 635 883.

See Amendments 8, 9 and 12 of AO 30.

363	0	3	WEIZMANN INST.	AF61(052)-388	\$20,000
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AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: High Resolution Molecular Spectra

DESCRIPTION: Use of unique instrumentation to obtain high dispersion measurements of molecular gases yielding absorption data.

RESULTS: Data obtained on molecules of interest to Project DEFENDER.

REMARKS: PROG: BMD - Missile Phenomenology - Laboratory Transmission Measurements.

363	0	4	04/01/63	02/15/65	GD-ASTRO	AF19(628)-4360	\$400,000
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TITLE: Theoretical IR Radiance

DESCRIPTION: Broad theoretical and laboratory program to define infrared emission model of rocket exhausts. Included measurements at Tullahoma on scale systems.

RESULTS: The basic model of missile rocket exhaust-flow field and radiation emission developed under this contract.

REMARKS: PROG: Missile Phenomenology - Missile Plume Radiance (Theoretical & Experimental)

See AO 116; ext. of Contracts AF19(604)-5554 and AF19(628)-3629.

364	0	0					\$100,000
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TITLE: EQUIPMENT FOR BASIC RSCH

365	0	0	05/10/62	03/05/67	SRI	SD-66	\$1,703,812
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TITLE: Over-the-Horizon Data Collection and Analysis Center

DESCRIPTION: The Data Center provided a central focal point for the HF detection program including - distribution of missile trajectory data and ionospheric information to experimental contractor efforts; central library function; organization and documentation of data exchange meetings.

REMARKS: PROG: BMD - Techniques & Devices - OTH Radar.

See also AO 90, T6 and AO 989.

366	0	0					\$339,500
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TITLE: BORANE CHEMISTRY PROGRAMS

367	0	0	06/22/62	12/31/66	DEF.RES.CORP.	DA-49-083 OSA-3132	\$3,338,000
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TITLE: System Analysis - Missile Defense Concepts

DESCRIPTION: To evaluate various ballistic missile defensive and offensive concepts and systems by means of performing technical analysis and war gaming.

REMARKS: PROG: BMD - Systems & Technology Requirements
Continuation of SD-141, see also AO-958.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
368	0	0					\$490,000

TITLE: QUANTUM-MECHANICAL CALCULATION OF GASEOUS MOLECULES

368	1	0			U. OF CHICAGO	DA31124-AROD447	\$0
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TITLE: Quantum Mechanical Calculations

DESCRIPTION: Development of computer programs for quantum-mechanical calculations of basic functions for light atoms and molecules with emphasis on IR, optical and UV radiation, absorption spectra and intensity associated with missile launch and RV re-entry.

368	2	0	03/01/65	01/30/66			\$0
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TITLE: Quantum Mechanical Calculations

DESCRIPTION: Task 1 - Calculations with extended self-consistent field (SFC) codes of the dissociation processes, the correlation energy (inherent in electron pairing), potential energy curves, and general dipole polarizabilities.
Task 2 - Calculation of potential curves for auto-ionizing states involving H/2-, N/2-, and O/2-. Task 3 - Production runs using extended SCF codes including wave functions, potential curves, matrix elements and axial polariz.

REMARKS: This is Amendment 2 and 3.

368	5	0			UNIV. OF CHICAGO	DA31124ARO(D)-447	\$1,469,000
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TITLE: Quantum Mechanical Calculations.

DESCRIPTION: Developed atomic and molecular codes and used them to calculate selected atomic and molecular systems and compare results with experimental data; calculated transition probability for aluminum oxide; and calculated transition moments and other observable quantities using existing wave functions.

REMARKS: PROG: BMD - General Research - Fundamental data base for launch, mid-course and re-entry physics.

Continuation of DA-11-022-ORD-3119.

369	0	0					\$404,716
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TITLE: DISCRIMINATION TECHNIQUES FOR IMAGING DEVICES

369	0	1	07/16/62	12/01/66	TE CO.	NONR-5050(00)	\$435,428
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TITLE: Investigation of Discrimination Using Imaging Tubes

DESCRIPTION: Development of models to describe problem factors including non-linear processing. Optimization of target signal and resolution and minimization of false target signals. Experimental verification was performed.

RESULTS: Showed utility of micro-motion scanning and means to optimize signal/noise rate for real-time processing.

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - Optical Technology- Optical Techniques for Background Suppression
REF: Te Co Reports 2001 (1963); 2002 (1965).
Ext. of Nonr-3914(00) and Nonr 4570(00).

369	0	2	10/01/62	01/29/65	AEROJET-GEN	NONR-4556(00)	\$153,926
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TITLE: Investigation of Discrimination Techniques Using Image Tubes.

DESCRIPTION: Use of vidicon tubes for missile detection and background rejection via analytical and lab. studies.

RESULTS: Three vidicons were found credible for satellite use; 2-color discriminator for radiance discrimination; point-target indicator which selects object size and a spectrum analyzer for spatial discrimination. Filters schemes worked as expected.

REMARKS: PROG: BMD - Optical Technology - Device Development for Target Enhancements.
REF: AJG reports 2610 (1963); 2985 (1965); AD-416-390.
Ext. of Nonr 3895(00); AO 369, Amendment 2, 3 (64)

369	0	3	10/16/62	04/15/65	BLOCK ENGR.	NONR 3909(00)	\$30,757
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TITLE: Investigation of Discrimination Techniques Using Image Tubes

DESCRIPTION: Use of a zoom lens to preprocess signatures by separating point (target) sources from extended objects (backgrounds) and use of Fresnel zone plates were investigated. Image-scan code technique analyzed.

RESULTS: Very preliminary results achieved on Fresnel plate techniques and preprocessing via source techniques. Effort terminated.

REMARKS: PROG: BMD - Optical Technology - Discrimination - Techniques for Missile Detection.

369	0	4	11/01/62	05/01/65	MITHRAS	NONR-4594(00)	\$146,000
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TITLE: Investigations of RFD Concept.

DESCRIPTION: The use of the rotating field detector (RFD) as tracker-radiometer, using Ge: Cu and CdSe materials.

RESULTS: Research indicated wideband operation feasible and concept application to operational use practical.

REMARKS: PROG: BMD - Optical Technology - Device Development, Tracker.

369	0	5	08/01/65	11/01/67	TE CO.	NONR 5051(00)	\$125,543
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TITLE: Critical Survey of Multi-Detector IR Systems

DESCRIPTION: Survey of multi-detector scanning systems; radiant testing of infrared devices and survey and analysis of readout and presentation problems.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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RESULTS: Excellent studies of assigned tasks - identified noise sources and means to minimize.

REMARKS: PROG: BMD - Optical Technology - Device Development for Missile Studies.
REF: Te Co report 2004 (1966).

370	0	0			\$459,000
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TITLE: ENGINEERS SURVEY

371	0	0	06/10/62	06/15/64	\$415,000
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TITLE: Man Pack High Frequency Single Sideband Communications.

DESCRIPTION: Objective of this program was to evaluate high frequency single sideband voice radios for use in Vietnam.

RESULTS: The tests indicated that the Hughes type HC-162 Man Pack HF SSB transceiver was suitable for use in Vietnam while the AN/MRC-95 was not.

REMARKS: AGILE - Equipment - Communications
REF: Subject Evaluation Reports on AN/MRC-95, Memorandum from Marston, Morrill E., RDFU-V to Director for Remote Area Conflict, 5/14/64.

371	0	1	05/01/63	05/01/63	RCA	DA28043AMC00090(E)	\$312,000
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TITLE: Jungle Message Encoder/Decoder

DESCRIPTION: This program had as its objective developing, testing, and evaluating a device which could transmit messages by means of a 5-bit digital code for use with the AN/PRC-10 and AN/PRC-25 radios.

RESULTS: Operational tests of the encoder/decoder with the above radios were completed with positive results.

REMARKS: AGILE - Equipment - Communications
REF: Jungle Message Encoder - Decoder, Operators Manual, Radio Corporation of America, 6/7/65.

371	0	2	05/01/63	12/01/63	RCA	DA28043AMC00090E	\$36,000
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TITLE: AN/PRC-25 Amplifier

DESCRIPTION: The objective of this program was to develop an RF amplifier to extend the range of the AN/PRC-25 radio.

RESULTS: This program resulted in the development of a suitable amplifier in either a 15 or 30 watt configuration which was subsequently put into production by the Army.

REMARKS: AGILE - Equipment - Communications.

371	0	3			ATLANTIC RES.		\$6,171,000
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		Initial	Final			
AO	AMD	Task	Date	Date	Contractor	Contract Number
					Total Funds	

TITLE: Tropical Propagation Research.

DESCRIPTION: Objective was to collect theoretical and experimental data on the propagation of radio signals in tropical jungle environments. Such data were collected from actual representative environments as needed to meet those objectives.

RESULTS: A large quantity of valuable data was accumulated primarily measurements of path loss for several different frequencies for various types of signal modulation and propagation models.

371	0	4	09/01/62	02/15/70	VARIOUS	VARIOUS	\$7,397,000
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TITLE: Research Engineering and Support for Tropical Communications.

DESCRIPTION: The objective of this program was to determine basic communications requirements and communications problems in Southeast Asia. The work involved the testing of several types of radios and ionospheric sounding measurements to establish the ionospheric propagation characteristics of the area.

RESULTS: The program was successfully completed. The work resulted in the collection of a large quantity of data useful in solving the radio propagation problems encountered in Southeast Asia.

REMARKS: AGILE - COMMUNICATIONS

REF: "Research Engineering and Support for Tropical Communications," Final Report, for the period 1962 September 1 - 1970 February 15. Hagn, G.H.; Barker, G.E., Stanford Research Institute, Menlo Park, California. Prepared for U.S. Army Electronics Command, Fort Monmouth, New Jersey, 2/70.

371	0	5			SRI	DA36039AMC-00040E	\$36,000
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TITLE: AN/PRC-25 Amplifier

DESCRIPTION: The objective of this program was to develop an RF power amplifier to extend the range of the AN/PRC-25 radio.

RESULTS: The program resulted in the development of a suitable amplifier in either a 15 or 30 watt configuration. This amplifier was put into production for the U.S. Army.

REMARKS: AGILE - COMMUNICATIONS

REF: "Field Tests of VHF Man-Pack Radios," Shrauger, N.K., Stanford Research Institute, Menlo Park, California, Special Technical Report 8. Prepared for U.S. Army Electronics Laboratories, Fort Monmouth, New Jersey, 5/65.

371	0	6					\$785,000
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TITLE: Communications Test Equipment.

DESCRIPTION: The objective of this program was to design, construct, and procure equipment and supplies for a laboratory complex to be installed in Bangkok, Thailand.

		Initial	Final			
AO	AMD	Task	Date	Date	Contractor	Contract Number
					Total Funds	

RESULTS: The equipment was shipped to Bangkok in April of 1963.

REMARKS: AGILE - COMMUNICATIONS

REF: "Tropical Military Communications, USAELRDL," Semi-Annual Report No. 2 for the period ending 31 July 1963. To: Director, Advanced Research Projects Agency, Washington, D.C.

371	0	7			RYAN ELECTRONIC	DA36039AMC00010(E)	\$29,000
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TITLE: Concealed Alarm

DESCRIPTION: The objective of this program was to develop and evaluate a concealable radio alarm system.

RESULTS: The system was designed to be located in Vietnam villages so that an alarm could be transmitted to a control system. Tests of the alarm system indicated that the system was feasible.

REMARKS: AGILE - COMMUNICATIONS

REF: "Concealable Alarm Transmission System Ryan Model 525," Final Technical Report. Ryan Electronics, Ryan Aeronautical Company, San Diego, Calif., Report No. 52567-1, 6/10/63.

371	0	8	06/10/62	06/15/64			\$415,000
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TITLE: Man Pack High Frequency Single Sideband Communications.

DESCRIPTION: The objective of this program was to evaluate high frequency single sideband voice radios for use in Vietnam. Both man pack and compatible airborne radios were evaluated.

RESULTS: Test results indicated that the type HC-162 radio set was suitable for use in Vietnam. Results of tests have shown the AN/MRC-95 radio set was not suitable for use in Vietnam.

REMARKS: AGILE - COMMUNICATIONS

REF: "AN/MRC-95 Radio Set," Final Report. Schulke, Herbert A., Jr.; Co-Tan-Ho, Advanced Research Projects Agency, Research and Development Field Unit, Vietnam, 4/2/65.
"Final Report of Military Potential Test of Radio Set HC-162-D." U.S. Army Airborne, Electronics and Special Warfare Board, Fort Bragg, North Carolina, 3/1/65.

371	0	9					\$71,000
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TITLE: Special Purpose Communications.

DESCRIPTION: This program was set up to procure some special purpose communications equipment. The equipment was shipped to Bangkok during the first half of 1963.

REMARKS: AGILE - COMMUNICATIONS

REF: Subject: "Tropical Military Communications, USAELRDL," Semi-Annual Report No. 2, for the period ending 31 July 1963. To: Director, ARPA,

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
					Washington, D.C.		
371	0	10			ATLANTIC RES.	DA36039-SC90889	\$4,849,000

TITLE: RF Path Loss Measurements

DESCRIPTION: RF propagation measurements were made in jungle in Thailand (use of Vietnamese jungles was hazardous) to determine signal attenuation as a function of frequency polarization, antenna height, and amount of biomass in the propagation path.

RESULTS: Recommendations were made to the Army Signal Corps on the optimum procedure for small patrols to use for communicating with their bases in Vietnam.

REMARKS: PROG: TTO - Communications - Jungle Communications.
Under AO 371, Rolligon Corp. assisted in the field measurements - cost \$204,000.00 Contracts DA 28043-AMC00359E and DA 28043-AMC 03281E.

371	0	11			STANFORD RES IN	DA28043-AMC2201E	\$200,000
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TITLE: IRAN Communications Evaluation

DESCRIPTION: Analysis and evaluation of the requirements of the Government of Iran, under the Shah, for reliable communications throughout the country, and investigation of the optimum approach for providing such communications.

RESULTS: Recommendations were made to the Iranian Government for an interlocking. rf communications network, using both high power and low power radios, and the specific antennas to use, to bind the country together.

REMARKS: PROG: TTO - RF Communications - Assistance to IRAN.

371	0	12			STANFORD RES IN	DA039-AMC00040E	\$703,000
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TITLE: MRDC Electronics Laboratory.

DESCRIPTION: As part of the Thai Government Military Research and Deveopment Center, which was co-located with the ARPA Field Unit in Bangkok, ARPA provided electronics programs which gave the Thai military officers in electronics hands-on training.

RESULTS: Various Thai communications officers improved their techniques and learned how to utilize new electronic systems within the Thai military structure.

REMARKS: PROG: TTO - Counter-Insurgency Training - Assistance to the Thai Government. Also Contract DAA80768-C-0194.

372	0	0					\$154,300
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TITLE: PENETRABILITY STUDY

373	0	0					\$2,320,000
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TITLE: CRYSTAL GROWING & ANALYSIS

		Initial	Final			
AO	AMD	Task	Date	Date	Contractor	Contract Number
374	0	0				\$315,000

TITLE: HIT AB/TABSTONE PROGRAM

374	0	1	08/01/62	11/01/62	MCCORMACK & SONS NOTS SUB-CONTRACT	\$315,000
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TITLE: AMR Launch Facility for HITAB Project.

DESCRIPTION: Construction of a launch facility for HITAB (NOTS) rocket probes to observe missile plume signatures.

RESULTS: An excellent facility was constructed and built according to range safety regulations.

REMARKS: PROG: BMD - Optical Technology - Launch Facility
See AO 243.

375	0	0				\$455,905
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TITLE: RESOLUTION TRANSFORMER TECH.

376	0	0	06/28/62	02/01/69	IN-HOUSE	\$755,000
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TITLE: IR Measurements and Standards

DESCRIPTION: Measurement and development of standards and standard measurement procedures for IR optical materials.

RESULTS: Extensive set of data on transmittance, reflectance and emittance of materials and surfaces up to 22 um. Means to determine refractive indices from -180 degree C to 1000 degree C in the spectral region 1900 Angstroms to 50 um.

REMARKS: PROG: BMD - Optical Technology - Basic Material IR Properties.
REF: Numerous reports and IRIS papers published.

377	0	0				\$4,824,500
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TITLE: RADAR FOLIAGE PENETRATION RESEARCH

377	0	1	06/29/62	02/01/67	CALSPAN ET AL. AF30(602)3541	\$9,714,000
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TITLE: Project AMPIRT (ARPA Multiband Photographic and Infrared Reconnaissance Test).

DESCRIPTION: The broad objective was to improve aerial reconnaissance through enhanced detection of insurgency activity. Emphasis was placed upon penetration of forest canopies and on utilization of multiband spectral reflectance properties to improve image contrast.

RESULTS: A large quantity of data applicable to the solution of many aerial reconnaissance problems was accumulated. Techniques for using equipment and methods for interpreting imagery were developed.

REMARKS: Final Report: Calspan No. VE-2027-D-6, Vols. I-IV, RADC-TR-67-206, July 1,

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
			1967.				
			PROG: AGILE - Reconnaissance and Surveillance - Aerial Photography - Foliage Penetration.				
377	0	2			U. OF MICHIGAN	AF306024163	\$1,082,000

TITLE: Provost AMPIRT Dark Eagle

DESCRIPTION: The University of Michigan modified an AN/AAS-18 infrared line scanner to give a real time output in the aircraft, and flew it in Vietnam.

RESULTS: Real time observation of the AN/AAS-18 output enabled the operator to adjust the operating conditions of the sensor to obtain optimum target detection capability under the local background. These target detection capabilities were much better than the sensor performance with operating parameters fixed in the AN/AAS-18 before the aircraft took off, with no adjustment for target

REMARKS: (Results continued) and background signatures in flight.

PROG: AGILE - Reconnaissance and Surveillance - Night Time Target Detection - Infrared Line scanner - Real Time Reconnaissance.

377	0	3			U. OF MICHIGAN	AF306024202	\$745,000
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TITLE: MRDC ARL - Thai Military Research and Development Center Aerial Reconnaissance Laboratory.

DESCRIPTION: As part of the U.S. program to assist the Royal Thai Government in combating insurgencies in the North, Northeast, and South of Thailand, ARPA provided an AN/AAS-18 infrared line scanner for installing in a DC-3. ARPA also provided instruction and training in the use of 6 AAS-18 in reconnaissance and surveillance.

RESULTS: The Royal Thai Government set up the Aerial Reconnaissance Laboratory as a separate, operational part of its air force for use in counter-insurgency operations.

REMARKS: PROG: TIO - Aerial Reconnaissance and Surveillance - Counter-Insurgency Operations - Assistance to the Royal Thai Government.

When the University of Michigan refused to renew its contract to support the MRDC ARL, Texas Instruments took over the support contract. See AO 1230.

378	0	0					\$316,321
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TITLE: INTERACTIONS OF ARMS CONTROL & BMD

379	0	0	07/18/63		IN HOUSE		\$645,876
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TITLE: Target Booster Vehicles for AMRAD Tests.

DESCRIPTION: The procurement of six target booster vehicles (Athena) for evaluation of AMRAD radar.

RESULTS: The targets were provided by other ARPA-service sponsored programs so procurement was cancelled.

AD AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - Missile Phenomenology - Discrimination Measurements - Radar Test.
Original program to procure six target vehicles was estimated at \$2,500,000.
Cancellation reduced funding to figure shown \$645,876.

380	0	0			\$26,000
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TITLE: INTERNATIONAL SEMINAR ON SALT DEFORMATION

381	0	0			\$20,000
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TITLE: INDIAN OCEAN TRACKING STATION FOR PROJECT 698AM

382	0	0			\$50,000
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TITLE: TORES PROJECT

383	0	0			\$50,000
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TITLE: TORES PROJECT

384	0	0			\$151,683
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TITLE: TORES PORJECT

385	0	0	10/22/62	AF04(694)-18	\$3,123,153
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386	0	0			\$561,255
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386	0	1	SCOPE, INC.	N60059835 60061514	\$36,000
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386	0	2	RCA	N60062983	\$157,000
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TITLE: Breakwire Detector BD 200A and BD 200B.

DESCRIPTION: Development of a simple device which would signal that an intruder was penetrating at a specific path. Device should be simple and cheap, and should not warn the intruder.

RESULTS: A very compact D battery operated device was developed. It had a spool of a pair of No. 40 wires, about 6000 feet long (?) in it. The pair of No. 40 wires, with the outside ends connected (fuzed together), was strung across potential intruder paths. The inside ends of the wire pair was connected to a circuit which would activate a buzzer when the outside wire was broken. The

REMARKS: (Results continued) Army Signal Corps developed this device as a standard intrusion detector for Army troop use, as the AN/GSS-9.

PROG: TTO - Intrusion Detection - Perimeter Defense.

Also Contno: N600 61514.

386	0	3			\$50,000
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TITLE: Jungle Squad Radio.

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: The objective of this program was to develop a lightweight and rugged VHF-FM radio to provide squad combat communication.

RESULTS: This program resulted in the development of an experimental FM radio transceiver to be mounted in the hollowed stock of a rifle.

REMARKS: AGILE - COMMUNICATIONS

REF: "Project AGILE, Remote Area Conflict," ARPA Quarterly Report, QR-10 (U)", for the period 1963 April 1 - 1963 June 30.

386	0	4	THERMO ELECTRON	N60062753	\$50,000
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TITLE: Light Weight Steam Engine for Small Electrical Generators

DESCRIPTION: The objective of the program was to design, develop, fabricate, and test three 100-watt power units. The units were to be capable of being fueled with a variety of solid fuels and be powered by a closed cycle reciprocating steam engine.

RESULTS: This program was satisfactorily completed with the delivery of three prototype units to the U.S. Army Engineer Research and Development Laboratories. The units weighed about 39 pounds each.

REMARKS: AGILE - COMMUNICATIONS

REF: "Fabrication of Three Prototype 100-Watt Steam Power Units for Field Service Tests," Fourth Quarterly Progress Letter. (b)(6)
Thermo Electron Engineering Corporation, Waltham, Massachusetts,
Report No. 38-66, 12/65.
See remark at AO 299.

386	0	5	FORD AEROSPACE	N60061797	\$100,000
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TITLE: Rankine Cycle Engine for Small Electrical Generators

DESCRIPTION: The objective of the program was to analyze, design, fabricate, endurance test and deliver two silent power units. The electric output of each unit was to be 100 watts (later modified to 65 watts) continuous at 12 volts. The weight of the unit was to be 9 pounds and it was to be inaudible to the human ear at a distance of 25 meters.

RESULTS: Test units of this power system operated satisfactorily. The final weight was about 16 pounds.

REMARKS: AGILE - COMMUNICATIONS - POWER UNIT

REF: "Lightweight Silent Power Unit," Monthly Progress Report. (b)(6)
(b)(6) Aeronutronic. Contract No. N600-61797, 12/12/66.
See remarks at AO 299.

386	0	6	SCOPE, INC.	N60059835 60061514	\$36,000
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386	0	7	KENYON INSTRUM.	N60061068	\$12,000
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TITLE: Stabilized Binocular (Kenyon Stabilizer)

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: The objective of this program was to perform an operational evaluation and assess the performance of the Kenyon Stabilizer as a device to enhance an observer's visual discrimination range when used with binoculars, fixed wing aircraft, and tracked vehicles.

RESULTS: The evaluation resulted in the findings that the stabilizer improved the discrimination range of an observer in a helicopter 123.5%, an observer in wheeled vehicles by 36.7% and an observer in an observation aircraft such that he detected a significantly larger number of targets.

REMARKS: AGILE - DETECTION - TARGET ACQUISITION

REF: "Operational Evaluation of Kenyon Stabilizer," Final Report. (b)(6)
 (b)(6) OSD/ARPA R&D Field Unit. Combat Development and Test Center, Republic of Vietnam Armed Forces, 4/25/64.

386	0	8			\$0
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TITLE: See AO 386, Amendment 7.

386	0	9			\$0
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TITLE: See AO 386, Amendment 1

386	0	10	SCOPE, INC.	N60059835 60061514	\$36,000
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TITLE: BreakWire Detector BD 200A and BD 200B.

DESCRIPTION: Development of a simple device which would signal that an intruder was penetrating at a specific path. Device should be simple and cheap, and should not warn the intruder.

RESULTS: A very compact D battery operated device was developed. It had a spool of a pair of No. 40 wires, about 6000 feet long (?) in it. The pair of No. 40 wires, with the outside ends connected (fuzed together), was strung across potential intruder paths. The inside ends of the wire pair was connected to a circuit which would activate a buzzer when the outside wire was broken. The

REMARKS: (Results continued) Army Signal Corps developed this device as a standard intrusion detector for Army troop use, as the AN/GSS-9.

PROG: TIO - Intrusion Detection - Perimeter Defense.

REF: "Evaluation of the Multipurpose Concealed Intrusion Detector (U)," JRATA Project No. 2G-301.0. Advanced Research Projects Agency, Research and Development Field Unit, 4/15/65.

386	1	0	AERONUTRONIC	N60063637	\$247,000
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TITLE: Olfactory Transducers.

DESCRIPTION: The objective of this program was to assess the applicability of biological olfactory transducers, specifically the antennae and antennal nerves of the fly, to the detection of airborne molecules emanating from human beings and their associated equipment.

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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RESULTS: Significant contribution to basic science pool. No operational utility.
Task terminated due to Aerospace article which had humorous implication.

REMARKS: AGILE - BASIC - DETECTION

REF: "Applicability of Olfactory Transducers to the Detection of Human Beings," Semi-Annual Technical Report, for the period 1965 August 1 - 1966 January 31. (b)(6) Aeronutronic, Newport Beach, California, Report No. U-3482. Prepared for ARPA/AGILE; Navy Purchasing Office, Washington, D.C.

Funding completed under AO 386, Amendment 15.

386	7	0	3M	N60061325	\$54,000
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TITLE: Thermoelectric Generator

DESCRIPTION: The objective of this program was the development, fabrication and delivery of a lightweight, portable thermoelectric generating system which would utilize solid fuels such as charcoal for a heat source.

RESULTS: This program resulted in the production of 6 prototype thermoelectric generators each measuring 19 1/4 inches x 11 3/8 inches x 11 1/2 inches and weighing 24 1/4 pounds. The generators met the requirements of the electrical specification.

REMARKS: AGILE - COMMUNICATION - POWER UNIT

REF: "Solid-Fuel Thermoelectric Power System," Final Report, (b)(6) Minnesota Mining and Manufacturing Company, St. Paul, Minnesota, 6/4/64. See AO 299.

386	13	0	02/28/66 AM CYANAMID	N60063109	\$70,000
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TITLE: Water Marker System

DESCRIPTION: The objective of this program was to study the feasibility of chemically marking boats moving through flowing water and subsequently unequivocally identifying the marked boat at another location. Required to have 72-hour persistence.

RESULTS: The most significant result obtained from this program was the demonstration that objects and personnel could be marked by aerial spraying from an altitude of 500 feet with low concentrations of marker.

REMARKS: AGILE - MARKING - DETECTION

REF: "ARPA Water Marker (U)," Final Technical Report, for the period 1965 November 9 - 1966 February 28. (b)(6) American Cyanamid Company, 3/22/66.

See AO 563, Task 1.

387	0	0			\$148,781
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TITLE: INVESTIGATION OF METAL HYDRIDES

388	0	0			\$1,900,000
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: SUPERPOWER AMPLITRON DEVELOPMENT

388	0	1	01/01/60	08/01/64	RAYTHEON	AF30(602)-2205	\$1,500,000
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TITLE: Super-Power S-Band Amplitron

DESCRIPTION: Design and development of a 400kw S-band amplitron and a 350kw average (50mw peak) S-band pulsed amplitron.

RESULTS: The CW-amplitron was successfully developed and represented a breakthrough in the state of the art. The development of the pulsed amplitron was not successful and the program was reoriented (see Task 2).

REMARKS: PROG: BMD - Techniques & Devices - High Powered Tubes.
 REF: "Ultra High Power Amplitron (U)," Final Report, RADC-TDR-64-389, May 1965.
 Previous funding was \$5.76M by DDRE and \$0.6M by AF.
 RADC continued pulsed amplitron development under AF30(602)-3449.

388	0	2	06/23/64	08/31/65	RAYTHEON	AF30(602)-3441	\$400,000
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TITLE: High Powered Tube Anode Cooling Program.

DESCRIPTION: A life test program to study the effects of high pulse peak power dissipation on various anode vane test materials using magnetic diodes as test vehicles.

RESULTS: Test facility was designed and evaluated for levels of 400kw/cm²; materials for test were selected and materials were evaluated. With platinum it was shown that thousands of hours were possible at power levels of 250kw/cm² before surface stress cracking occurred.

REMARKS: PROG: BMD - Techniques & Devices - High Powered Tubes.
 REF: Raytheon Final Report, "High Efficiency Cooling and Facility Maintenance (U)," December 1965 (U).

389	0	0	11/01/62	01/31/63	KAHN & CO. INC.	DA20064-ENG-4317	\$49,000
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TITLE: Architectural and Engineering Phase - Project AMOS.

DESCRIPTION: Contract for architectural and engineering services on observatory at Maui.

RESULTS: Services provided on structure for observatory.

REMARKS: PROG: BMD - Missile Phenomenology.
 See AO 236, Task 2; also AO 236, Amendment 3 and 5.

390	0	0					\$220,000
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TITLE: EVALUATION OF MATERIALS FOR BALLISTIC PROTECTION

390	0	1			USADPS	IN HOUSE	\$218,000
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TITLE: Project STAR

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: See AO 272, Task 2.

390	0	2			BRL		\$55,000
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TITLE: Armor Research - Ballistic Research Laboratories

DESCRIPTION: This program established a quick reaction capability to conduct a standardized test and evaluation program for new materials or concepts for ballistic protection as referred by ARPA.

RESULTS: Under this program a number of armor materials were tested, including ceramic, steel, and fiber-glass. The applications included armor vest inserts and air-crewman protective armor.

REMARKS: AGILE - ARMOR

REF: Numerous letters and memoranda from BRL to ARPA.

391	0	0					\$4,790,300
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TITLE: BASIC STUDIES IN CCR

392	0	0	09/12/62		OAR-PAFB	IN-HOUSE	\$450,000
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TITLE: Logistic Support of ARPA-AMR Projects.

DESCRIPTION: To provide support to ARPA measurement projects at AMR and HITAB at Walker Cay

RESULTS: Satisfactory performance.

REMARKS: PROG: BMD - Missile Phenomenology - Launch Support
See AO 374; AO 30.

393	0	0		03/30/66	GEN. DYNAMICS	DA01021AMC12050	\$812,000
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TITLE: RE-ENTRY PHYSICS RESEARCH

DESCRIPTION: (a) Experimental and analytical studies to understand the chemical kinetics of carbon monoxide in air; (b) design of a low resolution multi-channel spectrometer for studies of time-resolved spectra of contaminated air.

REMARKS: PROG: BMD - General Research in support of launch, mid-course and re-entry physics.

Continuation of AO 39 T2 dated 9/61. DA-04-495-ORD-1660 6/59-6/60
DA-04-495-ORD-3112 6/60-8/61
DA-04-495-ORD-3383 9/61-9/62.

394	0	0					\$15,787,000
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TITLE: PROJECT DRIBBLE

395	0	0					\$210,000
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TITLE: STRUCTURE OF NITROGEN FLUORINE

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
396	0	0	12/03/62	01/01/68	GASAL	DA-49-083-OSA-3135	\$4,820,614

TITLE: Aerodynamic Studies Related to Reentry Vehicles.

DESCRIPTION: A wide variety of theoretical studies on reentry missile phenomenology including maneuvering problems, ablation, shock propagation, near wake and base flow.

REMARKS: PROG: BMD - Missile Phenomonology.

REF: "Technical Report No. 589, Annual Summary Report", Tech. Rpt.640.
Annual Summary Report to ARPA Missile Phenomonology Studies (U)",
1/10/67 (S).
Continuation of SD-149.

397	0	0					\$0
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TITLE: TESTS OF CARIBOU AIRCRAFT

REMARKS: CANCELLED

398	0	0					\$207,700
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TITLE: RSCH ON SOLID OXIDIZERS

399	0	0					\$319,000
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TITLE: RSCH IN THE AREA OF HIGH ENERGY OXIDIZERS

400	0	0					\$2,741,000
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TITLE: MOBILITY ENVIRONMENT RSCH

400	1	0		12/30/64	USA TRANS. RES.		\$42,000
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TITLE: Vickers-Armstrong's Hovertruck Performance Evaluation.

DESCRIPTION: Two Land Rovers modified to employ the air-cushion principle were procured for test evaluation. The vehicle, designated as the Vickers Hovertruck Mark 2, was evaluated in Thailand in rice paddies and over obstacles. Tests included measurement of drawbar pull, fuel consumption and vibration encountered in the cab.

RESULTS: The use of a separate engine to drive the lift fans resulted in a 2600-lb. weight increase, reduced cargo space, and excessive fuel consumption. The Hovertruck was therefore not considered suitable for off-road operation.

REMARKS: AGILE - MOBILITY

REF: "Vickers-Armstrongs Hovertruck Performance Evaluation," Laboratory Report, (b)(6) Engineering Sciences Laboratory Group, U.S. Army Mobility Command. Prepared for U.S. Army Transportation Research Command, Fort Eustis, Virginia, 12/64.

400	4	0			WES/TECOM		\$36,000
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: Marsh Screw Amphibian Tests

DESCRIPTION: This program tested the performance of the Marsh Screw Amphibian vehicle. The Marsh Screw Amphibian's performance was most efficient and attains its greatest loaded speed (12.4 mph) when operated in extremely soft, liquified mud.

RESULTS: It was recommended that if a military requirement exists for a vehicle capable of operating only in open and heavily vegetated water, and in extremely soft mud, the Marsh Screw Amphibian's deficiencies should be corrected and further tests conducted.

REMARKS: AGILE - MOBILITY

REF: "Military Potential Test of Marsh Screw Amphibian (Plan A - M113," Final Report. U.S. Army General Equipment Test Activity, Fort Lee, Virginia, 12/64.

Funding completed under AO 400, Amendment 6.

401	0	0			\$1,026,000
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TITLE: FUEL RESEARCH

402	0	0			\$1,488,232
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TITLE: RSCH IN THE AREA OF HIGH ENERGY OXIDIZERS

403	0	0	RYAN/LFE		\$640,000
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TITLE: Doppler Navigation Equipment

DESCRIPTION: Three Ryan AV-1V navigation sets and anallary equipment were purchased, installed and field tested in Southeast Asia. An LFE doppler navigator was tested near Fort Rucker, Alabama.

RESULTS: First units delivered experienced reliability difficulties due to severe climatic conditions. After rework exceptional reliability and accuracy were demonstrated over more than 100 flight hours. LFE system did not meet military specifications.

404	0	0	11/16/62	AFSC	IN HOUSE	\$353,223
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TITLE: Aircraft for Project PRESS

DESCRIPTION: Support of KC-135 aircraft used for airborne measurements on Project PRESS. Support included travel, mess surcharge, maintenance overtime and support of PRESS detachment.

REMARKS: PROG: BMD - Missile Phenomenology - Re-entry Measurements - Airborne. See also AO 110, 121, 453, 559, 600.

405	0	0			\$1,414,800
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TITLE: SOLID PROPELLANT RSCH

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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406	0	0					\$2,095,222
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TITLE: SOLID PROPELLANT RSCH

407	0	0					\$443,700
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TITLE: RSCH ON SUPERHYDRIDES

408	0	0					\$0
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TITLE: TATUM DOME MINERAL RIGHTS FOR PROJECT DRIBBLE

REMARKS: CANCELLED

409	0	0					\$875,000
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TITLE: COMBAT SURVEILLANCE & TARGET ACQUISITION R & D PROGRAM

409	1	0	07/01/64	12/31/66	RADIATION	DA28043AMC00263(E)	\$785,000
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TITLE: Reflection and Doppler Characteristics of Targets and Clutter.

DESCRIPTION: Extensive measurement program was conducted to determine RCS and doppler characteristics of man, weapons and clutter. Measurements increase RCS of man with weapons, man alone and weapons alone at 120MHz to 24GHz isolated from background. Various combinations of men, dogs and clutter were made at 225MHz to 10.8 GHz.

REMARKS: Results may be found in series of semi-annual reports culminating in Final Summary Report, RAD INC Report No. 4 (ECOM-00263-F), July 1967.

410	0	0					\$123,318
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TITLE: EXPLOSION LIMITS OF SELECTED NR-COMPOUNDS

411	0	0					\$10,000
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TITLE: STUDY OF PROBLEM OF SUCCESSION IN USSR

412	0	0					\$76,125
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TITLE: RSCH STUDY-HARVARD

413	0	0	03/15/63	06/01/64	GEN. ELECTRIC	AF33(657)-11009	\$38,000
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TITLE: RESEARCH ON THE GENERATION AND ENHANCEMENT OF REENTRY NOISE APPLICABLE TO PENETRATION AIDS

DESCRIPTION: INVESTIGATE THE GENERATION OF AN RF NOISE SPECTRUM BY THE PLASMA SURROUNDING REENTRY FLIGHT OBJECTS AND METHODS OF ENHANCING THIS RADIATION TO SERVE AS AN AID IN PENETRATION OF DEFENSE SYSTEMS.

REMARKS: PROG: BMD - GENERAL RESEARCH - PENETRATION AIDS

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REF: "FINAL REPORT ON REENTRY NOISE INVESTIGATIONS (U)," REPORT NO. 5552-49-5
2 JULY 1964 (\$)

414	0	0	01/01/63 07/30/64	NAVAL SUR WPN. IN-HOUSE	\$50,000
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TITLE: Hall-Effect Magnetometer

DESCRIPTION: The objective of this program was to fabricate and test prototype magnetometers based on the Hall effect for detection of buried weapons.

RESULTS: The magnetometers as fabricated could be used to detect magnetic fields as small as $10E-5$ oe in spite of large magnetic field gradients and in spite of the large bias provided by the earth's magnetic field. However, they were useful only for fixed station operation.

REMARKS: AGILE - DETECTION

REF: "Thin-Film Hall-Effect Magnetometer," Final Report, for the period 1963 January - 1964 July. Naval Ordnance Laboratory, Corona, California, 10/1/64.

415	0	0	09/15/67	UNIV. OF DENVER DA31124ARO-079	\$1,122,000
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TITLE: Project DUTY

DESCRIPTION: This program was designed to develop methodology for systematic collection, classification, and analysis of physical environmental data, emphasizing the military significance of the environment.

RESULTS: The system was tested through investigation of a specific region in terms of specific military question. The report on that study serves as an example of one type of report that could be prepared systematically by use of the Duty methodology.

REMARKS: PROG: AGILE - ENVIRONMENTAL

REF: "Project Duty; Volume I: A Methodological Study of the Physical Environment," Final Report. (b)(6) Principal Investigator, University of Denver, Department of Geography, Denver, Colorado, 9/15/67.

416	0	0			\$145,000
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TITLE: THERMODYNAMICS OF ORGANIC DERIVATIVES OF LIGHTER ELEMENTS

417	0	0			\$587,548
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TITLE: OXIDIZER RSCH PROGRAM

418	0	0			\$926,000
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TITLE: PREPARATION & CHARACTERIZATION OF PURE MATERIALS

419	0	0			\$99,750
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TITLE: HEATS OF FORMATION OF B-C-N-H FUELS

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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420	0	0					\$452,550
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TITLE: SPECTROSCOPIC STUDY IN SEEDED NOBLE-GAS SYSTEMS

421	0	0					\$624,907
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TITLE: MATERIALS PREPARATION

422	0	0					\$290,056
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TITLE: TIME-SHARING OF COMPUTERS CCR

423	0	0			USA BIOL. LAB.		\$760,000
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TITLE: Oconus Defoliant Test Program.

DESCRIPTION: This test program was conducted in Thailand in 1964 and 1965 by the U.S. Army Biological Laboratory, Fort Detrick, Maryland, to determine the effectiveness of aerial applications of Purple, Orange, and other candidate chemical agents in defoliation of upland jungle vegetation representative of Southeast Asia on duplicate 10-acre plots.

RESULTS: Purple, Orange, Pink, Dinoxol, and Tordon were effective for long-term defoliation; Cacodylic acid and diquat were effective desiccants for rapid, short-term defoliation; Dicamba gave marginal but generally ineffective defoliation.

REMARKS: AGILE - DEFOLIATION

REF: "Oconus Defoliation Test Program," (b)(6)
(b)(6) U.S. Army Biological Center, Fort Detrick, Frederick, Maryland, Technical Report 79, 7/66.

423	0	1	63		USABIOLABS	IN HOUSE	\$696,845
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TITLE: DEFOLIATION - THAILAND DEFOLIATION TEST PROGRAM

DESCRIPTION: Utilizing rigidly controlled conditions a series of aerial spray tests were carried out on carefully defined plots at the Royal Thai Army base at Pranburi. Mixtures of 2,4-D and 2,4,5-T plus other selected herbicides were tested for seasonal variation, application rate, persistence of effect and combination effect against representative vegetation of Southeast Asia.

RESULTS: The research report was a model of conciseness and provided the first scientifically based series of operational parameters relating season and spray rate to speed and persistence of defoliation. Quantitative vertical and horizontal visibility improvements were also included.

REMARKS: Section III-E of Project AGILE Program Completion Report on Defoliation date January 1981 gives a detailed summary of this effort.

424	0	0					\$1,320,000
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TITLE: Control and Defoliation of Tropical and Subtropical Vegetation.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: An evaluation of botanical information was made early in this program to determine the reaction selectivity of various phytotoxic chemicals. A correlation was made between vegetation indigenous to the Continental United States, Puerto Rico and Southeast Asia. Field studies were conducted in Texas and Puerto Rico during the entire funding period.

RESULTS: Contributions included: evaluation of promising chemicals to determine their killing or defoliating properties on woody plants and screening of potential herbicides; development of methods to apply and use promising herbicides; and study of secondary succession of vegetation following different treatments as to effects on visibility and military activities.

REMARKS: AGILE - DEFOLIATION

REF: "Response of Tropical and Subtropical Woody Plants to Chemical Treatments," Research Report. (b)(6) U.S. Department of Agriculture, Agricultural Research Service, Crops Research Division, Report No. CR-13-67, 1/68.

424	0	1	63	USDA	IN HOUSE	\$1,320,000
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TITLE: DEFOLIATION - TROPICAL & SUBTROPICAL VEGETATION TESTS

DESCRIPTION: Using teams located in Puerto Rico and Texas basic data on effects of various herbicides, season & secondary growth were determined. Basic botanical data for Texas, Puerto Rico and Southeast Asia was also gathered and correlated as was vertical and horizontal obscuration data.

RESULTS: The research results tended to be rather basic in nature and were disappointing in view of the time and funding involved. The principal finding of DoD interest was the confirmation of the equal effectiveness of Tordon/Picloram compared to Agent ORANGE.

REMARKS: Section III-F of Project AGILE Program Completion Report on Defoliation dated January 1981 gives a detailed summary of this effort.

425	0	0	05/24/63	05/23/64	SPERRY	SD-180	\$210,817
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TITLE: Penetrability Study of Re-Entry Vehicle Antennas.

DESCRIPTION: (1) A study of the general requirements for survivability of antennas used on re-entry vehicles. (2) A general study on antennas for ECM, terminal self location, homing, and target damage assessment.

RESULTS: See report below.

REMARKS: PROG: - BMD - General Research - Penetration Aids - Active ECM.

REF: "Special Purpose Antennas for Re-Entry Vehicles," Final Technical Report, EB-5291-0330-4, May 1, 1964.

426	0	0	04/30/66	ELCON LAB.	DA36039AMC02364(E)	\$211,970
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TITLE: High Power Magnetically Confined Gas Duplexers.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: Theoretical and experimental investigation for high powered gas duplexers using Penning gas mixture and a confining magnetostatic field.

RESULTS: A S-band TR tube with 40MW peak, 40KW average, and loss of .02db and recovery time of 300 microseconds was developed.

REMARKS: PROG: BMD - Techniques & Devices - Radar - High Powered Tubes and Components.
REF: Elcon Laboratory Final Report, "High Power Magnetically Confined Plasma Duplexer," 31 August 1965 (U).

427	0	0			\$602,500
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TITLE: RSCH ON FOREIGN COMMUNICATIONS & DEFENSE

428	0	0			\$303,750
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TITLE: COMPUTER AIDS

429	0	0			\$38,500
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TITLE: SUPPORT FOR PROJECT MICHELSON

430	0	0			\$549,000
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TITLE: REFORMER FUEL CELL UNITS

431	0	0			\$95,375
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TITLE: PSYCHOLOGICAL ASPECTS OF SIGNAL DETECTION

432	0	0			\$55,000
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TITLE: TATUM DOME MINERAL RIGHTS

433	0	0			\$8,477,700
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TITLE: COMPUTER SYSTEMS

434	0	0			\$110,000
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TITLE: HUMAN INFO.-PROCESSING AND DECISION-MAKING BEHAVIOR

435	0	0	TEXAS INSTR.	NOM72717	\$25,000
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TITLE: Seismic Intrusion Detector System Model X-100.

DESCRIPTION: This program called for the design and development of six engineering prototype seismic intrusion detectors. The stated purpose was to determine the feasibility of such a detector for field use.

RESULTS: The system as originally designed consisted of standard, commercial seismometers connected to a central monitoring unit containing amplifier circuits, loudspeaker, control circuits, headphone, warning light with adjustable

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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threshold and variable frequency filter. The unit was subsequently evaluated by both the UK and the ARPA Field Unit with favorable results.

REMARKS: AGILE - DETECTORS

REF: "Seismic Intrusion Detector System, Model X-100," Final Technical Report. Texas Instruments Incorporated, Dallas, Texas. Prepared for United States Marine Corps, Quantico, Virginia, 6/63.
"Surveillance Program in Thailand," (b)(6) Advanced Research Projects Agency, Research and Development Field Unit, 6/20/63.

436	0	0	04/01/67 LITTON INDUS.	DA28043AMC00253(E)	\$321,000
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TITLE: High Power Electrostatic Focused Klystron.

DESCRIPTION: Exploratory development of high power electrostatically focused klystrons toward achieving 1MW peak, 5KW, average, 10% bandwidth and 36db gain at S-band for phased array AICBM application.

RESULTS: A 1MW, 30db gain, 3% bandwidth and 1MW peak power at S-band was demonstrated.

REMARKS: PROG: BMD - Techniques & Devices - Radar - High Power Tubes and Components.

REF: Final Report, "Study of High-Power Electrostatically Focused Klystron (U)", ECOM-03348-E, August 1, 1966 (U).
Extension DA36-039-AMC-03348(E).

437	0	0			\$140,000
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TITLE: ELECTROCHEMISTRY

438	0	0			\$58,500
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TITLE: AIRCRAFT FOR TACTICAL AIR MISSIONS

439	0	0			\$3,767
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TITLE: LIQUID NITROGEN

440	0	0	02/28/63 04/30/64 SEDCO SYSTEMS	DA36039AMC03361(E)	\$95,000
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TITLE: High Power Electromechanical Phase Shifter.

DESCRIPTION: Design and development of a digital electromechanical high power phase shifter based on a short two-position squeeze waveguide section.

RESULTS: X-band phase shifter (9-9.5 KMC) was developed with 4-bit (22.5 degrees, 45 degrees, 90 degrees, 180 degrees), switching time 1-2 milliseconds, 250KW peak power and 500 watts CW power.

REMARKS: PROG: BMD - Techniques and Devices - Radar - High Power Tubes and Components

441	0	0	05/16/63 06/01/69 AVCO	AF04(694)-956	\$3,584,729
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TITLE: Advanced Decoy Technology Program (ADTECH)

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: A broad theoretical and experimental program to develop the necessary data base for designing decoy that match any given R/V and evaluating those designs in actual field test.

RESULTS: Advanced decoy designs were developed and verified through flight tests; a computer program for solving decoy problems was successfully implemented. The data base developed under ADTECH reduced the time and cost for developing decoys for the services specific programs.

REMARKS: PROG: BMD - Penetration Aids - Advanced Decoys

REF: (1) ADTECH Program Final Report, RAD-TR-65-4, BSD-TR-283, 5/30/65(\$/RD)
"Advanced Decoy Technology Program - ADTECH II (U)," Final Report,
AVMSD-0109-66-RR, BSD-TR-66-192, 5/1/66 (\$).

(2) "Advanced Decoy Technology Program, ADTECH IV, Final Report,"(U),
AVMSD-0465-68-RR, June 1969.

Extension of AF04(694)-593 and AF04(694)-778).

442	0	0			\$85,091
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TITLE: OXIDIZER RESEARCH

443	0	0			\$9,850
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TITLE: CONFERENCE ON PROBLEMS OF HEMISPHERE SECURITY

444	0	0			\$144,271
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TITLE: CRYSTAL GROWTH

445	0	0			\$130,300
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TITLE: RSCH ON COMBUSTION OF SOLID PROPELLANTS

446	0	0			\$740,400
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TITLE: RSCH ON ELECTRONICALLY ACTIVE MATERIALS

447	0	0			\$310,985
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TITLE: MATERIALS PREPARATION

448	0	0			\$29,900
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TITLE: STUDY ON "LAW IN LIMITED INTERNATIONAL CONFLICT"

449	0	0			\$402,600
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TITLE: OPTICAL TECHNIQUES & DEVICES

449	0	1	10/01/64 10/11/65 HRC - BOSTON	AF 33(615)-1772	\$79,000
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TITLE: IR Leading Edge Tracker

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: Development of leading edge tracker; analytical and experimental.

RESULTS: Leading edge tracker can be utilized.

REMARKS: PROG: BMD - Optical Technology - Launch Phase Tracker
REF: AD-355 620.

449	0	2	11/01/63 07/31/64	MITHRAS	AF 33(615)-1114	\$210,000
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TITLE: Centroid Tracker

DESCRIPTION: Develop centroid tracker using RFD concept was to be built and delivered to AFSC.

RESULTS: All laboratory goals achieved.

REMARKS: PROG: BMD - Optical Technology - Missile Trackers.
REF: Mithras report MC 63-81-R1 (July 1964).

449	0	3	03/01/64 12/01/65	LOWELL TECH.	AF 33(615)-1515	\$258,944
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TITLE: Precision Airborne Tracking

DESCRIPTION: Determine limitations of airborne precision trackers against very high speed target at extended ranges.

RESULTS: Data collected and analyzed.

REMARKS: PROG: BMD - Optical Technology - Analysis of IR Tracker
REF: Lowell Tech. Study of Cost Relationships vs Tracking Accuracy of Airborne IR Trackers (2 vols), December 1965.

449	0	4	10/14/64 10/15/65	WESTINGHOUSE	AF 33(615)-2247	\$78,000
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TITLE: Image Tubes for Ballistic Missile Tracker (Position Designation)

DESCRIPTION: Analytical and experimental investigation to use IO, vidicons, etc. for position location to high accuracy.

RESULTS: Study was prepared.

REMARKS: PROG: BMD - Optical Technology - Visible Precision Trackers.

449	0	5	07/10/67	LOWELL TECH.	F33615-67C-3116	\$43,050
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TITLE: Airborne Instrumentation Mounts

DESCRIPTION: Overall study of mount capabilities for precision optical instruments, e.g., GLINT, etc.

RESULTS: Limitations established on mount capabilities

REMARKS: PROG: BMD - Optical Technology - Device Analysis.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
449	0	6	04/14/66		AFAL	IN-HOUSE	\$40,000

TITLE: Daylight Tracking by Image Devices.

DESCRIPTION: Deferred.

REMARKS: See AO 449, Task 7.

449	0	7	04/14/66		AJG	AF 33(615)-1046	\$62,000
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TITLE: Long Wavelength Tracking

DESCRIPTION: Study of LWIR tracking in exoatmospheric and early re-entry considering concepts defined with AO 449 and AMOS tracker. Ground and airborne system limitations to be defined.

RESULTS: Provided analysis for a LWIR tracking device.

REMARKS: PROG: BMD - Optical Technology - LWIR Tracker.

449	0	8	04/14/66		AFAL	IN-HOUSE	\$3,000
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TITLE: In-House Investigations.

450	0	0					\$407,100
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TITLE: OPTICAL TECHNIQUES & DEVICES

450	0	1	02/01/63	01/31/67	UTAH STATE UNIV	AF 19(628)-3825	\$100,000
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TITLE: Optical Resolution Studies

DESCRIPTION: Analytical and experimental investigations to establish the imaging limits of finite objects at visible and infrared wavelengths: Simple shape and variable surface brightness patterns.

RESULTS: Statistical analyses of pattern signals were performed satisfactorily as well as recognizing patterns in unknown positions. A Fourier Transform Synthesize was built and used.

REMARKS: PROG: BMD - Optical Technology - Geometric Pattern Recognition Techniques.

REF: AD-604 656, 610 712, 653 200, 649 261, 630 590, 636 789, 635 263, 614 272.

450	0	2	09/01/63	02/28/65	BLOCK ENGR.	AF 19(628)-3314	\$0
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TITLE: Interferometric Techniques

DESCRIPTION: Establish Limitations of Interferometric Techniques for body size meteors. Fabricate device, 14-cm telescope with wavefront folding interferometer and camera, for testing on ROTI tracker at AFWTR.

RESULTS: Prototype tests were performed but tracker accuracy inadequate for device

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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sensitivity, therefore no positive results.

REMARKS: PROG: BMD - Optical Technology.

REF: AFCRL-66-94 (1965).

See AO 450, Task 2 (Tech Ops). Contract funds not separated.

450	0	3	11/15/63 01/31/65 TECH OPS	AF 19(628)-3871	\$125,000
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TITLE: Interferometric Techniques

DESCRIPTION: Establish limitations of interferometric techniques to measure finite bodies.

RESULTS: Merits of Michelson Stellar Fizeau double-slit and folded interferometers investigated analytically and experimentally. Found interferometers gave better results in turbulence but absolute size of body not possible.

REMARKS: PROG: BMD - Optical Technology - Measurement Techniques.

REF: AFCRL-65-179 (1965).

See AO 450, Task 2 (Block Eng'g.)

450	0	4	03/21/63 09/01/65 BLOCK ENGR.	AF 19(628)-3315	\$40,000
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TITLE: Capabilities of Velocity Spectrograph

DESCRIPTION: Laboratory study to determine body velocity with speeds less than 10 km/sec using spectral line doppler shift.

RESULTS: Techniques at that time indicated insufficient spectral resolution, a limitation non-existent in 1980 period.

REMARKS: PROG: BMD - Optical Technology - Laboratory Study for Velocity Discrimination

450	0	5	10/01/63 04/15/65 IDEALAB	AF 19(628)-3831	\$29,135
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TITLE: Optical Technique Studies.

DESCRIPTION: Analytical and laboratory studies to increase optical system resolution by spatial frequency heterodyning in object space using coherent radiation.

RESULTS: Feasibility of heterodyning technique demonstrated; that is target information extracted outside of system spatial bandpass.

REMARKS: PROG: BMD - Optical Technique - Technique to Extend Optical Device Capability

450	0	6	10/01/64 10/01/67 U.OF READING/LON	AF 61(052)-833	\$135,000
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TITLE: Research on Multilayer Filters

DESCRIPTION: Perform research on multilayer interference filters of extreme resolution in 0.8um to 100 um and fabricate filters in <20 um.

RESULTS: Outstanding research performed, filters made line-width in 14 um region.

REMARKS: PROG: BMD - Missile Phenomenology - Optical Technology - Filter Technology

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REF: Two volume report published on filter technology.

450	4	6	10/17/66	11/16/77	TECH OPS	F 19(628)-6760082	\$62,000
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TITLE: Extended Dynamic Range Method

DESCRIPTION: Study nature, control and performance of the expanded dynamic range of film.
Study developing processes of film.

RESULTS: Kodak films examined in 10E+4 exposure range, Tech Ops XDR gave much lower granularity than standard developers. This could provide greater detectivity at lower density and gamma.

REMARKS: PROG: BMD - Optical Technology.
See AO 450, Task 9.

450	4	7	05/07/66	02/07/67	TECH OPS	AF 19(618)-5145	\$40,000
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TITLE: Daylight Tracking Study

DESCRIPTION: Study unconventional techniques for tracking small objects in high background levels.

RESULTS: Study focused on range detector for Michelson Interferometer established improvements of 30 dB.

REMARKS: PROG: BMD - Optical Technology - Tracking Device Study.
REF: AD-644 243.

450	4	8	01/02/67	01/02/68	BLOCK ENG'G.	F19628-67C-0167	\$20,000
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TITLE: Dynamic Range Limitation in Fourier Transform Spectroscopy

DESCRIPTION: Perform laboratory investigations to extend dynamic range of Fourier spectroscopic devices.

RESULTS: Dynamic range extended by 15 dB using chirp techniques with minor signal distribution.

REMARKS: PROG: BMD - Optical Technology - Device Improvement.

450	7	9	07/01/67	06/30/68	EG&G	F19628-67C-0389	\$98,000
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451	0	0					\$3,600
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TITLE: INTERNATIONAL SYMPOSIUM ON HIGH TEMPERATURE TECHNOLOGY

452	0	0					\$35,000
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TITLE: INTERAGENCY ADVANCED POWER GROUP

453	0	0					\$2,286,930
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TITLE: PRECISION OPTICAL MSMTS

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
453	0	1	03/27/63	03/31/67	PERKIN-ELMER	DA01021AMC11992(Z)	\$2,330,541
453	0	2	11/22/65	10/31/67	GE	DA01021AMC13812(Z)	\$1,756,308

TITLE: Project GLOW

DESCRIPTION: Field operations of GLOW at WSMR & KTS including data analysis and instrument integration.

RESULTS: Performed excellently. Extensive data obtained and analysis.

REMARKS: PROG: BMD - Missile Phenomenology - Re-Entry Measurements

REF: AD-394 994L; 394 098L; 391 477L; 390 902L; 390 252L; 850 886; 845 977; 500 525L.

See AO 559; Also contract DAAH01-68-C-0680 (11-1-67 to 10-31-68).

453	0	3			BARNES ENG'G.	DA01021AMC12789(Z)	\$0
453	0	4	02/13/64	08/01/64	MITHRAS	DA19020AMC003255(Z)	\$131,000
453	0	5	03/27/63	03/31/67	PERKIN-ELMER	DA01021AMC11992(Z)	\$2,330,541
454	0	0					\$287,000

TITLE: HUMAN INTERACTION AND COMMUNICATION

455	0	0					\$400,000
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TITLE: OPTICAL & IR MASERS

455	0	1	06/01/63	09/30/65	COLUMBIA UNIV.	NONR-266(93)	\$115,000
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TITLE: LASER RESEARCH - ENERGY TRANSFER FROM NEON METASTABLE ATOMS TO MOLECULAR HYDROGEN

DESCRIPTION: EXPLORATION OF STIMULATED EMISSION AT OPTICAL AND INFRARED FREQUENCIES. A STUDY OF THE ENERGY TRANSFER FROM NEON METASTABLE ATOMS TO MOLECULAR HYDROGEN.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - LASER RESEARCH

REF: "CONTROL OF METASTABLES BY OPTICAL METHODS AND ITS APPLICATION TO GASEOUS LASERS (U)," FINAL REPORT (JUNE 1963 - OCT 1966), BY (b)(6) COLUMBIA UNIV., OCT 1, 1966.

455	0	2	05/31/65		HARVARD UNIV.	NONR-1866(49)	\$40,000
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TITLE: LASER RESEARCH - HARMONIC PRODUCTION IN RUBY CRYSTALS.

DESCRIPTION: INVESTIGATION OF HARMONIC PRODUCTION IN RUBY CRYSTALS.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - LASER RESEARCH

REF: "FINAL TECHNICAL REPORT (1 JUNE 1963 - 1 JUNE 1965), BY (b)(6) HARVARD UNIV., FEB 1966 (U).

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
455	0	3		05/31/83	MITHRAS INC.	NONR-4243(00)	\$120,100

TITLE: LASER RESEARCH - LIGAND FIELD MASERS

DESCRIPTION: INVESTIGATION OF LIGAND FIELD MASERS

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - LASER RESEARCH

455	0	4		05/31/66	NEW MEX. ST UNIV	NONR-3531(04)	\$91,000
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TITLE: LASER RESEARCH - VARIATION OF REFRACTIVE INDEX DURING LASER OPERATION

DESCRIPTION: INVESTIGATION OF THE VARIATION OF REFRACTIVE INDEX DURING LASER OPERATION.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - LASER RESEARCH

455	0	5		08/16/65	VARIAN ASSOC.	NONR-4244(00)	\$75,000
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456	0	0					\$755,000
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TITLE: STRUCTURAL & MATERIAL FATIGUE

457	0	0					\$420,000
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TITLE: HEURISTIC PROGRAMMING AND THEORY OF COMPUTATION

458	0	0					\$125,400
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TITLE: OPTICAL SPECTRA OF LIGHT METAL COMBUSTION PRODUCTS

459	0	0					\$7,587,000
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TITLE: ACTIVE ELECTRONIC COUNTERMEASURES

459	0	1	06/01/63	10/01/65	PHILCO-FORD	DA01021AMC10041(2)	\$7,600,000
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TITLE: Precursor ECM Experimental Program (U).

DESCRIPTION: To design, develop and evaluate precursor ECM devices as missile penetration aids.

REMARKS: PROG: BMD - General Research - Penetration Aids
 "Precursor ECM Experimental Program (U)", Final Tech. Rpt.(6/63-10/65),
 S-3481, 4/8/61.
 Funding includes Amend. 2.

459	0	3	10/01/65	10/01/66	PHILCO-FPRD	DA01021AMC11776(2)	\$550,000
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459	1	0	11/01/65	10/01/65	PHILCO-FORD	DA01021AMC13964(2)	\$0
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TITLE: Precursor ECM Flight Test Program (PECM).

DESCRIPTION: To design, development and evaluation of an active adaptive ECM package.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
REMARKS: PROG: BDM - General Research - Penetration Aids. REF: "Precursor ECM Flight Test Program"(U), Final Tech. RPT., S-3782, Oct.26, 1966 (S). PECM was a continuation of DA-01-021-AMC-10041(Z). DA-01-021-AMC-12852(Z) also applies but was cancelled Oct. 65.							
459	3	0					\$0
459	3	2	10/01/65	10/01/66	PHILCO-FORD	DA01021AMC11776(Z)	\$550,000
459	4	0					\$0
TITLE: Transmitting Tube Research for Penetration Aids.							
DESCRIPTION: To develop breadboard working models of high-powered tubes for penetration aids.							
REMARKS: PROG: BMD - Gen. Research - Penetration Aids. Philco-Ford subcontracted with Raytheon and SFD Labs for specific tube developments.							
460	0	0					\$494,701
TITLE: HYPERSONIC INTERCEPTOR CONTROL RESEARCH							
461	0	0					\$826,150
TITLE: HUMAN PERFORMANCE RELATED TO INFO. PROCESSING FUNCTIONS							
462	0	0					\$600,000
TITLE: ORGANIC CRYSTALLINE MATERIALS							
463	0	0					\$241,065
TITLE: HIGH POWER TRANSMITTER TECHNIQUES							
464	0	0		12/31/63	COMPUTER CONTRLS AF30(602)-3186		\$46,000
TITLE: CORRELATION RADAR STUDY							
DESCRIPTION: To evaluate the proposed cross correlation radar concept for BMD application.							
REMARKS: PROG: BMD - Techniques and Devices - Radar.							
465	0	0					\$200,000
TITLE: WORLD SEISMIC COMPUTAION PROJECT							
466	0	0					\$449,000
TITLE: INTERP. ANALYSIS & REDUCTION OF DATA OBTAINED PROJ. FISHBOWL							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
467	0	0					\$200,000

TITLE: CAPTURE TEXTUAL TECH. INFO. IN MACHINABLE FORM

468	0	0					\$450,000
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TITLE: RSCH IN BEHAVIORAL SCIENCES

469	0	0					\$130,000
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TITLE: PENETRABILITY STUDY

470	0	0					\$190,850
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TITLE: OXIDIZER RESEARCH

471	0	0					\$1,724,500
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TITLE: COMPUTER NETWORK & TIMESHARING RESEARCH

472	0	0					\$300,000
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TITLE: METABOLIC ASPECTS OF BRAIN PROCESSES

473	0	0	06/15/63	03/31/67	BENDIX	NONR-4219(00)	\$680,169
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TITLE: Signal Recognition Techniques for O-T-H Detection.

DESCRIPTION: Design and development of automatic signal recognition techniques for detection and identification of missile and background signatures obtained on certain O-T-H detection programs

RESULTS: A six-channel Adaptive Signal Processor was developed and used on several field programs to provide a real time capability.

REMARKS: PROG: BMD - Techniques & Devices - OTH Detection.

474	0	0	09/30/64	S-F-D LABS.		DA36039AMC03304(E)	\$197,129
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TITLE: X-Band High Power Crossed-Field Amplifier.

DESCRIPTION: Investigation of the feasibility of developing a crossed-field power generation in multi-wave length structures controlled by the circular electric mode at 9 KMC with 100 megawatts peak power.

REMARKS: PROG: BMD - Techniques & Devices - Radar - High Power Tubes and Components.

REF: "Feasibility Study for High Power Crossed-Field Amplifiers (U)", SFD-620, Report No. 5, Final Report, June 1963-September 1964,

(b)(6)

Extension of AD 130.

475	0	0	04/29/63	01/01/64	VARIOUS	VARIOUS	\$2,618,330
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TITLE: ANTI-SATELLITE STUDIES

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: A comprehensive group of anti-satellite studies including operational analyses, ephemerides, countermeasures, arming and fuzing and system studies.

REMARKS: PROG: BMD - Studies - Anti-Satellite

Participants included AD Little SD-176; RCA SD-173; Aeronutronics SD-174; Hughes SD-175; Ling-Temco-Vought SD-172; STL SD-177; Boeing SD-178; Douglas SD-192; Western Electric SD-191; and Ford Instrument SD-190.

476	0	0			\$125,000
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TITLE: HIGH-ALTITUDE TETHERED BALLOON SYSTEM

477	0	0			\$30,000
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TITLE: SPIN LATTICE RELAXATION

478	0	0			\$399,988
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TITLE: PHYSICO-CHEMICAL STUDY OF ELECTRODE FUEL REACTIONS

479	0	0			\$1,240,000
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TITLE: ATMOSPHERIC LAUNCHED BOOST INTERCEPT

479	0	1	05/01/63 12/31/67 APL	NOW620604C, TASK Z	\$2,298,387
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TITLE: Atmospheric Launched Boost Intercept (ALBIS) (U).

DESCRIPTION: Preliminary studies, theoretical and experimental research, strategic and tactical analyses, system analyses and related efforts concerned with the atmospheric interception of ballistic missiles during launch phase by means of air or surface-launched guided missiles.

REMARKS: PROG: BMD - System Studies and Requirements.

REF: "Final ALBIS Program Summary (U)", APL/JHU Rpt. TG 470-3, May 1964 plus TG 470-3A (APL/JHU); TG 470-3B (Bendix), and TG 470-3C (Hughes).

479	1	2	05/01/63 12/31/67 APL/JHU	NOW620604C, TASK Z	\$0
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TITLE: Advanced Atmospheric Launched Boost Intercept System.

DESCRIPTION: (1) Intercept of SLBMs during launch phased using atmospheric intercept system.
(2) Investigate long-range system concepts.
(3) Theoretical and experimental determination of cross-sections.

REMARKS: PROG: BMD - System Studies & Requirements.

REF: "Advanced ALBIS, Vol. I & II, Final Rpt., (b)(6) TG 490-3
"ALBIS Program Ballistic-Missile Radar Cross-Section Measurements", (U)
by (b)(6) TG-588-3, Sept. 1966 (S).
See AO 479 original for funding.

479	2	0	05/01/63 12/31/67 APL/JHU	NOW620604C, TASK Z	\$0
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: Nuclear Effects - X-ray Damage Studies.

DESCRIPTION: Participated in nuclear effects test and performed X-ray damage studies.

REMARKS: PROG: BMD - Studies -
Tasks 2, 4, 5 - Funding original AO covers all tasks.

479	7	0	05/01/63 12/31/67 APL/JHU	NOW620604C,TASK 2	\$0
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TITLE: Survey for Over-the-Horizon Radar - Big Push.

DESCRIPTION: Performed the site surveys for the installation of an advanced HF radar.

REMARKS: PROG: BMD - Techniques & Devices - OTH Detection.
See original AO.

480	0	0	AMAZONIA FOUND.		\$36,000
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TITLE: Infrared and Ultraviolet Airborne Techniques in Tropical Mountainous Areas.

DESCRIPTION: The purpose of this task was to show the capability of IR and UV airborne methods to identify surface and subsurface features, such as vehicle tracks, small fires, camp sites, cave openings and interior outlines.

RESULTS: The aerial photo-reconnaissance program was conducted in the Bolivian Andes from the end of July through October, which is the dry season in the Andes. The results were considered promising and further research on this technique was recommended.

REMARKS: AGILE - RECONNAISSANCE
REF: "Investigation of Infrared and Ultraviolet Airborne Techniques in Tropical Mountainous Areas." Amazonia Foundation, Inc., New York, 1/15/64,

480	1	0	07/01/63 06/30/66 ATLANTIC RES.	SD 243	\$656,000
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TITLE: Acoustic and Seismic Combat Surveillance and Target Acquisition Research Program in Southeast Asia.

DESCRIPTION: Principal aim was to collect and analyze fundamental data for improving the design and performance of acoustic and seismic systems for use in combat surveillance and target acquisition. Field measurements were recorded at 14 widely differing sites in Thailand.

RESULTS: A set of preliminary specifications was established for an intrusion detector optimized for detecting human footsteps.

481	0	0	FAIRCHILD HILLER AF086353782		\$400,000
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TITLE: A/A45Y-2 Defoliant Dispenser, Pressurized.

DESCRIPTION: An internal spray tank unit constructed of stainless steel for corrosion resistance was designed, fabricated, and tested. The system was intended for

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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mounting in the cargo compartments of C-123 and C-130 aircraft to dispense defoliants.

RESULTS: Despite several operational problems, this study proved that large volumes of liquid can be moved by air; however, this design presented serious aircraft compatibility problems.

REMARKS: AGILE - SPRAY SYSTEM

REF: "Final Report of the A/A 45Y-2 Internal Defoliant Dispenser System," Aircraft-Missiles Division, Fairchild Hiller Corporation, Hagerstown, Maryland, 10/64.

481	0	1	63	FAIRCHILD-STRAT. AF 08(635)3782	\$398,364
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TITLE: DEFOLIATION - A/A 45Y-2 SPRAY SYSTEM

DESCRIPTION: As part of the continuing research to upgrade operational spray capabilities in RVN, ARPA and AFSC entered a joint task to develop prototypes of a 1000 gallon prepressurized internal spray system for use on C-123/C-130 aircraft. ARPA funded the hardware buy and AFSC funded the testing and calibration.

RESULTS: While the test of the equipment met the contract requirements the system showed several deficiencies. In a parallel development AFSC had funded the development of the pump-driven A/A 45Y-1 system which became the operational spray system for defoliation missions in RVN.

REMARKS: Section III-D of Project AGILE Program Completion Report on Defoliation dated January 1981 gives a detailed summary of this effort.

482	0	0	01/16/64 06/01/65	ASSO-ENG.& CONTR DA94612-ENG364	\$806,947
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TITLE: AMOS - Construction

DESCRIPTION: The effort was to construct observatory structure per plans (AO 389).

RESULTS: Structure was properly done under Army Corp of Engineers' supervision.

REMARKS: PROG: BMD - Missile Phenomenology.
See AO 236, Task 2; AO 389.

483	0	0	06/03/63		\$197,000
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TITLE: Air America

DESCRIPTION: Air America was enlisted to provide aircraft support to ARPA units in South-east Asia beginning in June 1963. The aircraft were to be utilized for project officer participation in field tests. The support was to include necessary operations, maintenance, and logistics.

REMARKS: Also Funded: AO 496 - 2,603,000
AO 1271- 744,000
AO 1742- 105,000
AO 1496- 233,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
484	0	0			SYLVANIA		\$1,500,000

TITLE: RS-100 Special Forces Radio

DESCRIPTION: Design and prototype a lightweight clandestine radio transceiver for use in Vietnam.

RESULTS: The prototype of the RS-100 radio delivered represented a distinct improvement over the then standard issue clandestine transceiver.

REMARKS: The agent, within a matter of a few months, released the RS-101 version which was a clear improvement over the RS-100. There was some suspicion that the agent had already funded the RS-100 & used the ARPA funding for the RS-101.

REF: "Status Report - RS-100, Project Mudpack," for the period 1964 April 20-1964 May 20. Sylvania Electronic Defense Laboratories.

484	0	1			GE		\$140,000
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TITLE: Magnesium Air Fuel Cell

DESCRIPTION: Determine feasibility of using such a cell for power generation.

RESULTS: The agent stated the concept was not feasible.

REMARKS: See remark at AO 299.

484	1	0			GEN. ELECTRIC		\$140,000
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TITLE: Magnesium-Air Fuel Cell

DESCRIPTION: Under this program, five-watt magnesium-air fuel cell power packs with DC-to-DC converters were fabricated and tested. Ten modules were furnished for evaluation. One battery module and one converter were designed and prepared for use for AN/PRC-10, AN/PRC-25, AN/PRC-35, and HC-21. Two units were prepared for the HC-162.

REMARKS: AGILE - COMMUNICATIONS - POWER UNIT

REF: "Development of Magnesium-Air Cell Power Packs and Fabrication of Prototype Units - Task 89," Final Report. (b)(6) General Electric Company, 8/31/65.

485	0	0					\$500,000
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TITLE: INTERPRETATIVE ATLASES OF THE SINO-SOVIET BLOC

486	0	0					\$294,319
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TITLE: CONTINUATION OF REFLECT. VARIATION CAUSED BY VEGETATION DAMAGE

487	0	0	11/13/62	10/01/63			\$150,000
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TITLE: Shotgun Research

DESCRIPTION: Funds were transferred from AO 329 to develop an improved shotgun and ammuni-

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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tion for use in SEA in village defense.

RESULTS: Shotguns and ammunition were developed and tested and shipped to Vietnam in the proper amounts. However, the program was terminated in September 1963 short of completion of the other parts of the objective.

REMARKS: AGILE - WEAPONS

REF: "Final Report of Advanced Research Projects Agency Shotgun Development Program (U)," for the period 1962 November 13 - 1963 October 1. Research and Development Directorate, Headquarters, U.S. Army Weapons Command, Rock Island, Illinois, 11/63.

488	0	0	06/01/63 RICA	IN HOUSE	\$113,000
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TITLE: SALVO Squeeze Bore .50-.30 Caliber Barrels and Ammunition.

DESCRIPTION: 11.040 squeeze-bore rounds were fabricated, tested and evaluated; half being tinned and waxed, the other half bonded with a vinyl agent. A variety of tests were administered.

RESULTS: The SALVO Squeeze-bore principle was shown to be sound, but advantages over existing or other approaches is minimal. Rounds with only wax or vinyl bonding are unsafe.

REMARKS: Started on AO 351

488	0	1	BISSETT-BERMAN	DA04495AMC184R	\$90,000
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TITLE: Bissett-Berman Airborne Acoustic Detector for Ground Fire.

DESCRIPTION: System consisted of five acoustical sensors with their associated amplifiers and logic circuitry designed to indicate passage of a supersonic bullet.

RESULTS: System failed to meet the specifications outlined in the contract.

REMARKS: Started on AO 351.

488	2	0	THICKOL		\$60,000
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TITLE: Airborne Bullet Alarm System.

DESCRIPTION: Two alarm systems were procured and flight testing in UH-1, OV-1, O-1 (L-19) and Col-21 aircraft.

RESULTS: Test performance was not totally successful. Higher accuracy was obtained in homing tests than in flying tests.

REMARKS: Final Report: Thickol Report No. R-111-7, Jan. 29, 1965.

489	0	0			\$0
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TITLE: CLASSIFIED PROJECT

REMARKS: CANCELLED

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
490	0	0					\$1,155,262

TITLE: PROJECT CLOUD GAP

491	0	0					\$2,292,650
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TITLE: FEASIBILITY STUDIES

492	0	0	08/01/63	08/30/70	UNIV. OF COLO.	DA31124AR0(D)-139	\$3,521,000
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TITLE: Fundamental Theoretical and Experimental Research in Astrophysics.

DESCRIPTION: A broad interdisciplinary theoretical and experimental research program in spectroscopy, high speed aerodynamics, plasma physics, astro physics and atomic physics.

REMARKS: PROG: BMD - General research in support of launch, mid-course and re-entry physics.

493	0	0					\$283,400
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TITLE: POST ATTACK RECOVERY PROG.

494	0	0					\$16,800
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TITLE: STUDY ON INTERNATIONAL CONTROL COMMISSION IN LAOS & VIETNAM

495	0	0					\$9,000
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TITLE: AIR DEFENSE REQUIREMENTS FOR FAR EAST

496	0	0					\$402,000
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TITLE: FY 64 F. U. SUPPORT

497	0	0					\$140,000
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TITLE: FU F. U. SUPPORT

498	0	0	07/01/63	06/30/67	MIT-LL	AF19(628)-5167	\$26,333,000
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TITLE: RADAR DISCRIMINATION TECHNOLOGY PROGRAM

DESCRIPTION: A radar discrimination program that focused on radar system studies, array-radar technology, wave form devices and signal processing and wide-band observables. Specific radars involved Advanced Design Array Radar (ADAR) and ARPA Lincoln C-band Observables Radar (ALCOR)

RESULTS: This program had a major impact in advancing the state of the art of high powered high resolution radar technology.

REMARKS: PROG: BMD - Techniques & Devices - Radar - Discrimination
Extension of AF 19(628) - 500

AD	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
498	0	1		06/30/69	MIT-LL	AF196285167	\$728,000

TITLE: Camp Sentinel Radar (MTI Foliage Penetrating Personnel Detection Radar).

DESCRIPTION: A foliage penetration radar capable of automatically detecting personnel attempting to intrude into an encampment surrounded by dense windblown foliage was developed and field tested.

RESULTS: Field tests indicated a capability of detecting a single slow moving person in foliage at a relatively long range. Because of this success, the Army procured six additional systems.

REMARKS: Some work (\$8000) done under AD 1352.

Final Report: MIT-LL Report No. 472 (ESD-TR-69-332).

PROG: TTD - Reconnaissance and Surveillance Program - Intrusion Detection Radar.

REF: AD-503 469, MIT Lincoln Laboratory, "The Camp Sentinel Radar," June 1969 by (b)(6) Report No. TN-1969-36. AD-502 287, "Airborne Foliage Penetrating Personnel Detection Radar Concept. Part of Lincoln Lab program.

498	0	2					\$0
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TITLE: SEE AD 498, Task 1.

499	0	0					\$100,000
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TITLE: DETECTION OF HIGH ALTITUDE NUCLEAR TESTS

500	0	0					\$2,604,500
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TITLE: ON-SITE INSPECTION PROG.

501	0	0	09/01/63	06/30/66	BROWN UNIV.	DA31124ARO(D)-163	\$180,150
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TITLE: Research in Chemical Reaction Kinetics.

DESCRIPTION: (a) Surveyed the reactions by the measurement of elastic and reactive scattering in crossed beams; (b) study of various K reactions: K+CBR/4, K+Sn BR/4, K+HCL, etc.; (c) design and construction of a new molecular beam apparatus.

REMARKS: PROG: BMD - General Research in support of launch, mid-course, and re-entry physics.

502	0	0					\$99,700
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TITLE: FUEL RESEARCH

503	0	0					\$49,961
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TITLE: TECH. APPLYING QUANTATIVE ESTIMATES OF MILT. VAL. INCT. CONT.

AD	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
504	0	0					\$32,300

TITLE: INTERDEPARTMENTAL ENERGY STUDY

505	0	0					\$1,280,833
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TITLE: WIDE-BASELINE CORRELATION INTERFEROMETER EQUIPMENT

505	0	1	11/18/63	06/30/68	CAL	AF30(602)-3289	\$4,607,000
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TITLE: Distributed Radar Concepts and Techniques (Project DISTRAT)

DESCRIPTION: Design, installation and evaluation of radar correlation enterferometer using a high powered illuminator and four receiving sites for space object identification.

REMARKS: Prog BMD - Techniques & Devices - Radar.
Initially known as PROJECT TERF

505	0	2	11/11/65	06/11/66	CAL	AF30(602)-4027	\$0
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TITLE: Propagation Effects on Very Wideband Signals

DESCRIPTION: Design of experiment to determine propagation effects on very wideband signals 3 KMC to 10 KMC under undisturbed and disturbed environment.

REMARKS: PROG: BMD - Techniques & Devices - Radar - Propagation
REF: "Propagation Effects on Wideband Signals(U)", Final Report,
RADC - TR-66-349, Col. I & II, 7/6/66 S/RD
Funds not separated. Task 1 plus Task 2 equals \$4,607,000.

506	0	0	08/08/63				\$250,000
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TITLE: White Sands Missile Range AMRAD Measurements Program Support.

DESCRIPTION: Funds provided to WSMR for AMRAD measurement program support.

REMARKS: PROG: BMD - Missile Phenomenology - Discrimination Measurements - Radar Test.
AMRAD measurement program was initially under direction MIT-LL but changed to Columbia Univ. Electronics Research Lab (CUERL).

507	0	0					\$39,000
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TITLE: DRIBBLE

508	0	0					\$298,800
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TITLE: AVAILABILITY OF SCI. INFO. TO TECH. PERSONNEL IN DEFENSE ACT.

509	0	0					\$145,000
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TITLE: DAWEE BUILDING-JOINT LAB & OFFICE FACILITY (MRDC BLDG.)

510	0	0					\$16,545,000
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: HIBEX

510	7	0	06/29/66	03/01/67	HERCULES PD. CO.	DA01021AMC15550(Z)	\$192,000
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TITLE: HIBEX Propellant Formulation and Process.

DESCRIPTION: To define the growth potential of FDN-type propellants and develop a safer method for its manufacture.

REMARKS: PROG: BMD - Missile Technology - Advanced Interceptors - Propellants.

511	0	0	10/11/63		APGC	IN-HOUSE	\$475,000
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TITLE: Project TRUMP

DESCRIPTION: Launch of 21 NIKE-Javelin rockets to observe targets and background in launch phase. Other efforts of little value.

RESULTS: Excellent data obtained by this program.

REMARKS: PROG: BMD - Missile Phenomenology - Target/Background Signatures

REF: J. Missile Defense Res. 4, 102 (196)

See AO 511, Task 2.

512	0	0					\$1,390,000
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TITLE: MONITORING SEISMOLOGICAL OBSERVATORIES

512	0	1	10/06/67	MIT-LL		AF19(628)-5167	\$0
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TITLE: GEODAR

DESCRIPTION: A radar for detecting existing tunnels. Measurements were made of soil properties in situ, and a tunnel detection breadboard was assembled, using a specially designed, non-ringing antenna.

RESULTS: Three GEODAR systems were assembled on a priority basis, and sent to Vietnam. The system detected tunnels and other anomalies in the earth. It was used for perimeter surveillance tests of COMUSMACV and the U.S. Ambassador's residence. One set was sent to Korea, where tunnels have been dug under the DMZ by North Korea.

REMARKS: PROG: TTD - Tunnel Detection - Radar System

Part of ARPA Lincoln Lab. program on seismological studies. Funds not broken out.

513	0	0	04/11/66	09/11/68	HUGHES AIRCRAFT	AF30(602)-4240	\$2,298,244
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TITLE: ADVANCED DESIGN ARRAY RADAR (ADAR)

DESCRIPTION: DESIGN, DEVELOPMENT AND DEMONSTRATION OF A PIECE OF THE ADAR PROTOTYPE SUB-SYSTEM

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - TECHNIQUES & DEVICES - RADAR - ADVANCED DESIGN ARRAY RADAR
 REF: "ADAR SEMIANNUAL TECHNICAL SUMMARY REPORT VOL. I-FULL
 SCALE SYS; VOL. II-ADVANCED COMPONENT DEVELOPMENT; VOL. III-PROTOTYPE
 SYSTEM DEVELOPMENT (U)", (10/11/66-3/15/67). FR67-14-133, (S)

513	0	1		03/31/66	LITTON INDUSTRS.	AF30(602)-3592	\$542,342
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TITLE: High Power Transmitter Tube for ADAR Radar.

DESCRIPTION: The design, development and testing of the high power transmitter tubes
 (L-3968 Dematron) for the ADAR (Advanced Design Array Radar) modules.

REMARKS: PROG: BMD - Techniques & Devices - Radar - High Power Tubes and Components.
 REF: "Production Development of the h-3968 Dematron (U)", Final Report,
 9 March 1966 (U).

A parallel development on ADAR was carried out by two teams Hughes/RCA and
 GE/Bendix. The funds under this AO supported the GE/Bendix effort.

513	10	0			RAYTHEON CO.		\$205,000
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TITLE: High Power Transmitter Tube for ADAR - Second Source.

DESCRIPTION: The development of a linear format self-modulated cross-field forward-wave
 amplifier for the ADAR (Advanced Design Array Radar) radar.

REMARKS: PROG: BMD - Techniques & Devices - Radar High Power Tubes and Components.

514	0	0					\$25,000
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TITLE: NUCLEAR CROSS SECTION MSMTS

515	0	0		09/25/68	NBS	IN HOUSE	\$1,875,000
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TITLE: RADAR STANDARDS PROGRAM

DESCRIPTION: To establish radar standards and measurement procedures including power,
 noise, and antenna pattern measurements.

REMARKS: PROG: BMD - Techniques and Devices - Radar.
 REF: "Radar Standards Program, Annual Report (U)", NBS Rpt. 9200, Mar. 1966
 and Second Annual Report, NBS Rpt. 9272, Jan. 1967 (U).

516	0	0					\$2,250,000
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TITLE: HARDPOINT DEFENSE DEMONSTRATION RADAR

516	0	1	06/12/64	06/30/67	SPERRY	DA01021AMC15611(Z)	\$3,815,950
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TITLE: Hard Point Defense Demonstration Radar (HAPDAR)

DESCRIPTION: Design, development and evaluation of a hard point defense demonstration
 radar at White Sands.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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RESULTS: Radar was developed and evaluated as a hard point defense radar. In addition its transmitter was used on radar interferometer (Project PONDO). The radar also was used to evaluate radar techniques.

REMARKS: PROG: BMD - Techniques & Devices - Radar - Hardpoint Demonstration.
 REF: "ARPA Project HAPDAR (U)", Final Engineering Report, RD-5289-0865, May, 1967 (S).
 Transmitter contr. DA-01-021-AMC-12363(2), 6/2/65 - 4/1/66.

517	0	0	11/15/69	ION PHYSICS CORP DA28043AMC00394(E)	\$1,500,000
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TITLE: HIGH VOLTAGE DC VACUUM BREAKDOWN

DESCRIPTION: Investigation of factors that influence the breakdown in a vacuum when high voltage is applied between isolated metal electrodes. Applicable to high powered amplifier and modulator tubes of BMD radars, vacuum gyroscopes, linear tubes of BMD radars, vacuum gyroscopes, linear accelerators and space electronics.

REMARKS: PROG: BMD - Techniques & Devices - Radar - High Powered Tubes.
 Funds included support of \$50,000 per year in house program for Army Electronics Command.

518	0	0	11/08/63		\$750,000
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TITLE: Travel for ARPA Personnel.

DESCRIPTION: Funding of the travel of ARPA personnel engaged in technical administration, review, and monitoring of ARPA projects.

REMARKS: PROG: BMD - Travel.

519	0	0			\$39,955
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TITLE: LOCAL SEISMIC CHARACTERISTICS

520	0	0			\$3,032,200
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TITLE: RE-ENTRY WAKE CHARACTERISTICS

520	0	1	06/30/64 06/30/68 SRI	DA01021AMC11224(Z)	\$1,650,000
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TITLE: Design and Analysis of Radar Interferometer Experiment (Project RONDO)

DESCRIPTION: Design of equipment specifications, design of experiment, and analysis of interferometer experiment.

REMARKS: PROG: BMD - Techniques & Devices - Radar Interferometer.
 See also AO 520 T 2,3.

520	0	2	05/24/64 06/02/68 SYLVANIA	DA19020AMC425(Z)	\$3,884,000
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TITLE: Equipment and Operation of Radar Interferometer Experiment (Project RONDO).

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: Design, fabrication of checkout and operation of interferometer equipment.

REMARKS: PROG: BMD - Techniques & Devices - Radar Interferometer.
See AO 520 T 1,3. Final Tech. Rpt. F-213-1, "RONDO Operation and Maintenance"(U).
Extension of DA-19-020-AMC-11860; DAA-H01-67-C1581 also applies.

520	0	3	06/30/64	02/01/66	WESTERN ELEC.	DA01021AMC11140	\$150,000
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TITLE: Signal Processing for Radar Interferometer Experiment.

DESCRIPTION: Design and development of signal processing equipment for an interferometer experiment (Project RONDO).

RESULTS: Equipment was designed and furnished GFE to prime contractor (Sylvania).

REMARKS: PROG: BMD - Techniques & Devices - Radar Interferometer.
See also AO 520 T-1 & 2.
Also contract DA-01-021-AMC-12049(Z) 10/17/65.

521	0	0					\$50,000
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TITLE: FACILITY CONSTRUCTION

522	0	0					\$150,400
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TITLE: NATIONAL LANGUAGE THEORY

523	0	0					\$50,000
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TITLE: CLOUD GAP

524	0	0	03/31/64	11/01/64	VARIOUS	VARIOUS	\$1,297,000
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TITLE: Study of ABM Systems Optimized for Defense Against Small Attacks.

DESCRIPTION: A study of ABM systems for the defense of urban population of the U.S. against a limited ballistic missile attack. The included characteristics, cost, and effectiveness as a function of severity.

REMARKS: PROG: BMD - Studies - ABM Systems for Limited Attacks.
Contractors: RCA SD-246, \$375,000; Raytheon SD-249, \$264,000; Douglas Aircraft SD-247, \$410,576; Boeing Co. SD-248, \$247,000.

525	0	0	01/01/64	10/31/67	AVCO	DA01021AMC12005(Z)	\$3,989,000
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TITLE: Research in Hypervelocity Flow Phenomena and Optical Discrimination.

DESCRIPTION: Task 1 - Experimental and theoretical studies of hypervelocity flow phenomena.
Task 2 - Theoretical and experimental investigation of optical discrimination techniques.

REMARKS: PROG: BMD - Missile Phenomenology - Re-entry Physics - Flow Studies/

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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optical disc.

REF: "Research in Re-entry Physics (U)", Final Tech. Summary Report, AVCO
Everett Rsch Lab, AFRL 65-29, DA-19-020-AMC-0210, 3/1/65.

Continuation of AO 39T6.

Continuation of DA-19-020-AMC-0210.

526	0	0	07/01/64	06/30/65	U. OF CALIF.(SD) AF-AFOSR650-64 GRT	\$39,000
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TITLE: Investigation of Oscillator Strengths of Metals and Metallic Compounds.

DESCRIPTION: Theoretical and experimental research in the spectroscopy of metals and metallic compounds at elevated temperatures to determine f-numbers, population temperatures and relaxation times. Metals such as chromium, titanium, aluminum, and beryllium and their oxides were studied.

REMARKS: PROG: BMD -
Program continued under AO 570.

527	0	0				\$25,000
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TITLE: SURFACE MANIFESTATIONS UNDERGROUND NUC. EXPL. AND EARTHQUAKES

528	0	0				\$250,000
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TITLE: ENVIRONMENTAL TEST & EVALUATION OF SELECTED WEAPONS

529	0	0	01/01/64	08/31/69	POLYTECHNIC INST NONR-839(38)	\$2,659,856
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TITLE: THEORETICAL AND EXPERIMENTAL STUDIES ON PLASMA AERODYNAMICS, ELECTROMAGNETIC SCATTERING AND PLASMAS.

DESCRIPTION: A BROAD, INTERDISCIPLINARY THEORETICAL AND RESEARCH PROGRAM IN PLASMA AERODYNAMICS, ELECTROMAGNETIC SCATTERING THEORY, AND EXPERIMENTAL PLASMA RESEARCH.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - BASIC RESEARCH - REENTRY PHYSICS.

530	0	0				\$100,626
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TITLE: ACOUSTIC MEASUREMENTS

531	0	0				\$105,300
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TITLE: STABILIZING HYDROGEN PEROXIDE

532	0	0				\$350,000
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TITLE: PROJECT CLOUD GAP

533	0	0				\$616,800
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TITLE: SEISMOLOGICAL RESEARCH

534	0	0				\$200,000
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		Initial	Final				
AO	AMD	Task	Date	Date	Contractor	Contract Number	Total Funds

TITLE: SLBM PROBLEM STUDY

535	0	0	06/01/64	09/30/65	MULTIPLE	MULTIPLE	\$668,000
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TITLE: Heat Flux Weapons

DESCRIPTION: A series of contracts thru Edgewood Arsenal to design improved flame throwers, both hand-held and vehicle mounted.

RESULTS: Some interesting designs resulted but no operational use was made.

REMARKS: In the early sixties it was thought that flame weapons might be useful in Vietnam. In the event little use was made other than napalm.

535	0	1	07/01/64	07/30/65	AMOCO	DA18035AMC-264A	\$88,000
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TITLE: Heat Flux Weapon Research.

DESCRIPTION: The combustion optimization of hydrocarbon flame thrower fuels, was explored including precombustion and combustion reactions of model hydrocarbon-oxygen mixtures; the effects of additives on these precombustion regions; and the combustion of gelled gasoline by exploiting the experimental findings of the above studies.

RESULTS: Research efforts demonstrated that the combustion of hydrocarbon flame thrower fuels may be optimized by the addition of certain chemicals, i.e., acetic anhydride, benzyl bromide, and dioxane; and/or blending heavier hydrocarbon substances with gasoline.

REMARKS: AGILE - FLAME WEAPONS

REF: "Combustion Optimization of Hydrocarbon Flame Thrower Fuels," Final Report, for the period 1964 July - 1965 July. (b)(6)
(b)(6) (et al.), American Oil Company, Whiting Laboratories, Whiting, Indiana, Report No. M65-210. Prepared for U.S. Army Edgewood Arsenal, Chemical Research and Development Laboratories, Edgewood Arsenal, Maryland, 11/65.

535	0	2	06/01/64	12/30/65	ETHYL CORP.	DA18035-AMC285A	\$150,000
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TITLE: Heat Flux Weapon Research.

DESCRIPTION: This study was intended to improve the heat flux of thickened hydrocarbon flame thrower fuels by investigating the effect of propellant-like materials, delayed ignition by use of air-sensitized catalysts, additives to improve the heat transfer characteristics of combustion products and by evaluating the concept of flame shape factors.

RESULTS: One fuel, 90203-LPHN-2, in both calorimetric and field tests transferred about 40 percent more heat to the target than M-1 gelled gasoline.

REMARKS: AGILE - FLAME WEAPONS

REF: "Improved Heat Flux Hydrocarbon Fuels," Final Report, for the period 1964 June - 1965 December. (b)(6)

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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(et al.). Ethyl Corporation, Ferndale, Michigan, Report No. GR-66-43.
Prepared for Chemical Research Laboratory, Research Laboratories,
Edgewood Arsenal, Maryland, 2/66.

535	0	3	06/01/64	10/30/65	BLOCK ENG.	DA18035-AMC262A	\$175,000
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TITLE: Heat Flux Weapon Research.

DESCRIPTION: Macro-calorimetry studies were made of benzene, normal hexane, and napalm test solvent (NTS).

RESULTS: The studies determined that the effective emissivity of the flame above an eleven inch napalm test solvent (NTS) gel pan fire was found to decrease from 0.75 at a wavelength of one micron to 0.20 at 5 microns. Absorption measurements showed the effective flame temperature to be 1400K + 100K.

REMARKS: AGILE - FLAME WEAPONS

REF: "Field Calorimetry/IR Instrumentation," Final Technical Report, for the period 1964 June 19 - 1965 October 30. (b)(6) Block Engineering, Inc., Cambridge, Massachusetts. Prepared for U.S. Army Edgewood Arsenal, Chemical Research and Development Laboratories, Edgewood Arsenal, Maryland, 1/26/66.

535	0	4	07/01/64	03/30/66	SHELL OIL	DA18035-AMC283A	\$100,000
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TITLE: Heat Flux Weapon Research.

DESCRIPTION: The effects of various additives on conventional napalm-hydrocarbon systems were studied.

RESULTS: Additives studied were powdered metals or alloys to increase luminosity and flame radiation effects; carbon black and metal oxides and carbides to increase and extend the intensity of radiation; inorganic oxidizers; ferrocene derivatives and micro-powder iron as burning rate catalysts; and pyrophoric igniting agents.

REMARKS: AGILE - FLAME WEAPONS

REF: "Composite-Hydrocarbon Flame Thrower Fuels," Final Report, for the period 1964 July - 1966 March. (b)(6) Shell Development Company, Emeryville, California, Report No. 6. Prepared for Chemical Research Laboratory, Research Laboratories, Edgewood Arsenal, Maryland, 7/28/66.

535	0	5			MULTIPLE	MULTIPLE	\$356,000
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TITLE: Advanced Flame Agents

DESCRIPTION: A series of contracts thru Edgewood Arsenal to identify both new fuels and hypersonic chemicals for use in flame weapons.

RESULTS: A number of chemical formulations of interest were identified and further investigated by the Army.

REMARKS: See remarks at AO 535.

			Initial	Final			
AO	AMD	Task	Date	Date	Contractor	Contract Number	Total Funds
535	1	1	05/01/65	05/31/66	AMER. CYANIMID	DA18035AMC353A	\$50,000

TITLE: Investigation of CYANO Compounds as Flame Agents.

DESCRIPTION: A formulation was developed leading to a new improved gelled flame agent.

RESULTS: The formulation has good viscoelastic properties and superior fuel characteristics.

REMARKS: Final Report: American Cyanimid Report No. 4.
See other tasks of this amendment.

535	1	2	05/01/65	05/31/66	THIOL	DA18035AMC349A	\$50,000
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TITLE: Investigation of Flame-Explosion Agent System.

DESCRIPTION: A combined flame-explosion couple and a flame-splatter couple were developed and investigated.

RESULTS: Both formulations gave satisfactory performance. Neither formulation detonates when shocked prior to ignition.

REMARKS: Final Report: Thiokol Report No. 4.
See other tasks of this amendment.

535	1	3	05/01/65	05/31/66	ATLANTIC RES.	DA18035AMC352A	\$50,000
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TITLE: Investigation of Slurry Flame Agents.

DESCRIPTION: Metal/hydrocarbon slurries were investigated as improved incendiary agents with lithium used to promote combustion of other metals.

RESULTS: Compared to other agents in use at the time, metal powder/hydrocarbon slurries have satisfactory ignition, combustion, stability and dissemination characteristics giving significantly increased target damage due to higher conductive heat transfer.

REMARKS: Final Report: Atlantic Research Report No. 43-5310-F.
See other tasks of this amendment.

535	1	4	05/01/65	05/31/66	ROCKETDYNE	DA18035AMC348A	\$0
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TITLE: Investigation of Oxidizers as Flame Agents.

DESCRIPTION: Various oxidizers were studied in combination with hydrazines and boranes as fuels. Corner board studies were performed on plywood targets. Known amount of liquid agents were placed in an aluminum dish and ignited with a natural gas jet.

REMARKS: Final Report: Rocketdyne Report No. R-6609.
See other tasks of this amendment.

535	1	5	05/01/65	05/31/66	11TRI	DA18035AMC354	\$25,000
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: Investigation of Liquid Ammonia Solutions as Flame Agents.

DESCRIPTION: Flame temperature burning rate, heat of combustion and performance efficiency were determined for several flame agents in liquid ammonia solutions.

RESULTS: Ammonia quickly vaporized and caused spastic burning and cooling. The additives showed more promise in hydrazine and ethylene diamine.

REMARKS: Final Report: IITRI Report No. IITRI-C606411.
See other tasks of this amendment.

535	1	6	05/01/65	05/31/66	AEROJET-GENERAL	DA18035AMC361A	\$63,000
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TITLE: Investigation of Oxygenated Compounds as Flame Agents.

DESCRIPTION: A test method was developed to provide reliable calorimetric data for evaluation of several oxygenated compounds as flame agents. Extension target-burning tests were performed.

RESULTS: Several gels appeared to be substantially more effective flame agents than gelled gasoline. Some gels showed desirable visioelastic properties.

REMARKS: Final Report: Aerojet-General Report No. 3223.
See other tasks of this amendment.

536	0	0	01/20/64		IDA	DAHC15-67-C-0011	\$26,000
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TITLE: Journal of Missile Defense Research (JMDR).

DESCRIPTION: Funding of the printing of the Journal of Missile Defense Research.

REMARKS: PROG: BMD - JMDR.

537	0	0					\$41,000
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TITLE: NUCLEAR WEAPON EFFECTS

538	0	0					\$925,583
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TITLE: COUNTER-GUERRILLA SURVEILLANCE PROCESSES

539	0	0			NSMR	IN HOUSE	\$500,000
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TITLE: HIBEX FACILITIES CONSTRUCTION

DESCRIPTION: CONSTRUCTION OF HIBEX FACILITIES AT WHITE SANDS MISSILE RANGE.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - INTERCEPTOR DEVELOPMENT.
BOEING WAS LISTED AS CONTRACTOR BUT WSMR PROBABLY DID CONSTRUCTION UNDER SUBCONTRACT.

540	0	0	02/01/64		ITT		\$0
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AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: SATELLITE PROTECTION SYSTEMS

DESCRIPTION: STUDY OF SATELLITE PROTECTION SYSTEMS - CANCELLED.

541	0	0			\$190,000
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TITLE: VELA CLOUD GAP

542	0	0			\$50,400
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TITLE: STABILITY OF OXIDIZERS

543	0	0	07/01/63 08/31/66 AEROJET-GENERAL	AF086354458	\$520,000
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TITLE: ANTI-PERSONNEL BOMBLET

DESCRIPTION: The objective of this program was to develop an aircraft-dispensed anti-personnel munition capable of penetrating jungle foliage and detonating on or near ground level. The BLU-24/B munition was fabricated for this purpose.

RESULTS: In the first phase flight tests a performance record of 60 percent with significant fuze arming malfunctions at lower speeds. The fuze design was modified on the second phase to improve reliability. The munition qualified for field use with a functioning rate in excess of 99 percent.

REMARKS: Final Report: Aerojet-General Report No. 0887-02(01)FP (AFATL-TR-67-166), Oct. 1967.

544	0	0	US DEPT OF AGRI. IN HOUSE		\$112,000
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TITLE: Firescan Phase I

DESCRIPTION: The Forest Service of the U.S. Department of Agriculture conducted an investigation to determine whether an infrared reconnaissance system, installed in a small aircraft, could be used to detect incipient forest fires at an early stage, when the fire could be easily controlled.

RESULTS: The Forest Service found that even very small fires, about 2 ft. in diameter could be detected by the infrared system. They retained the infrared line scanner, and planned to use it as a standard instrument for detecting and locating fires in the national forests under Department of Agriculture supervision.

REMARKS: PROG: TIO - Reconnaissance and Surveillance - Airborne Infrared.
AO 636 - Firescan Phase II achieved the results above. Similar to program to provide the Government of Thailand with an operational airborne infrared reconnaissance system.

544	0	1	04/01/64 12/31/64 IN HOUSE		\$0
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TITLE: Project Fire Scan 1 - Evaluation of Airborne IR Mapper as a Tool for Detecting and Measuring Fires - Task 1.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: The probability of detection of small charcoal fires by an IR scanner in a fixed elevated position was determined for vertical angles up to 60 degrees.

RESULTS: Detection ability of the IR scanner was good for vertical angles up to 50 degrees but probability of detection dropped to 0.10 at 60 degrees.

REMARKS: See Tasks 2 and 3. Funding for all three was \$111,900.00.

544	0	2	04/01/64	12/31/64	USDA-IN HOUSE	\$0
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TITLE: Project Fire Scan 1 - Evaluation of Airborne IR Mapper as a Tool for Detecting and Measuring Fires - Task 2.

DESCRIPTION: The probability of detection of small charcoal fires in a coniferous forest by a Convair T-29 aircraft using a modified fire mapping scanner and doppler navigation system was determined.

RESULTS: During flight testing, the method was successful when the equipment functioned properly. The flight tests, however, were plagued by poor equipment performance.

REMARKS: See Tasks 1 and 3. Funding for all three tasks was \$111,900.00.

544	0	3	04/01/64	12/31/64	USDA-IN HOUSE	\$0
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TITLE: Project Fire Scan 1 - Evaluation of Airborne IR Mapper as a Tool for Detecting and Measuring Fires - Task 3.

DESCRIPTION: A test flight with the Convair T-29 aircraft was made to determine if navigation by doppler radar and IR imagery-aerial photography comparison technique was feasible.

RESULTS: Results were highly satisfactory with aircraft position being precisely determined at all times.

REMARKS: See Tasks 1 and 2. Funding for all three tasks was \$111,900.00.

545	0	0				\$962,900
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TITLE: PROPELLANT SCALE-UP STUDIES

546	0	0	08/20/64	08/01/68	PHYSICS INTERNAT DA04200AMC796(X)	\$1,071,492
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TITLE: High Explosive Gun for Re-entry Simulation.

DESCRIPTION: Development of an implosion gun to accelerate projectiles in the 5 to 10 pound class to velocities in the order of 20,000 ft/sec.

REMARKS: PROG: BMD - Missile Phenomenology - Re-entry Simulation.

REF: "Explosive Gas Gun for Re-Entry Simulation (U)", Final Report
PIFR-024, 10/24/65 (U)

E-40 is "Missile Phenomenology." This was listed as E-70 which is "System Vulnerability" - All write-up indicates E-40.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: The probability of detection of small charcoal fires by an IR scanner in a fixed elevated position was determined for vertical angles up to 60 degrees.

RESULTS: Detection ability of the IR scanner was good for vertical angles up to 50 degrees but probability of detection dropped to 0.10 at 60 degrees.

REMARKS: See Tasks 2 and 3. Funding for all three was \$111,900.00.

544	0	2	04/01/64	12/31/64	USDA-IN HOUSE	\$0
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TITLE: Project Fire Scan 1 - Evaluation of Airborne IR Mapper as a Tool for Detecting and Measuring Fires - Task 2.

DESCRIPTION: The probability of detection of small charcoal fires in a coniferous forest by a Convair T-29 aircraft using a modified fire mapping scanner and doppler navigation system was determined.

RESULTS: During flight testing, the method was successful when the equipment functioned properly. The flight tests, however, were plagued by poor equipment performance.

REMARKS: See Tasks 1 and 3. Funding for all three tasks was \$111,900.00.

544	0	3	04/01/64	12/31/64	USDA-IN HOUSE	\$0
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TITLE: Project Fire Scan 1 - Evaluation of Airborne IR Mapper as a Tool for Detecting and Measuring Fires - Task 3.

DESCRIPTION: A test flight with the Convair T-29 aircraft was made to determine if navigation by doppler radar and IR imagery-aerial photography comparison technique was feasible.

RESULTS: Results were highly satisfactory with aircraft position being precisely determined at all times.

REMARKS: See Tasks 1 and 2. Funding for all three tasks was \$111,900.00.

545	0	0				\$962,900
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TITLE: PROPELLANT SCALE-UP STUDIES

546	0	0	08/20/64	08/01/68	PHYSICS INTERNAT DA04200AMC796(X)	\$1,071,492
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TITLE: High Explosive Gun for Re-entry Simulation.

DESCRIPTION: Development of an implosion gun to accelerate projectiles in the 5 to 10 pound class to velocities in the order of 20,000 ft/sec.

REMARKS: PROG: BMD - Missile Phenomenology - Re-entry Simulation.

REF: "Explosive Gas Gun for Re-Entry Simulation (U)", Final Report
PIFR-024, 10/24/65 (U)

E-40 is "Missile Phenomenology." This was listed as E-70 which is "System Vulnerability" - All write-up indicates E-40.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
547	0	0			PLANNING RES.	DA31124AROD263	\$84,000

TITLE: FLEX-WING ANALYSIS

DESCRIPTION: Cost-effectiveness of several versions of flex-wing aircraft in support of civic action and counterinsurgency operations performed by indigenous forces of undeveloped nations was evaluated. Self-powered and towed flex-wing configurations were compared to planned or existing U.S. Army rotary and light fixed wing aircraft.

RESULTS: The large increment in drag imposed on a towing aircraft by the towed flex-wing configuration renders that arrangement prohibitive except for the occasional requirement to haul oversize loads. For some military roles the powered flex-wing utility vehicle has advantages over the more conventional aircraft.

548	0	0					\$50,000
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TITLE: VELA CLOUD GAP

549	0	0			MULTIPLE	MULTIPLE	\$2,522,000
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TITLE: High Terrestrial Altitude Medical Research

DESCRIPTION: Since insurgency is a way of life in South America and U.S. troops have had little exposure to operations at high altitudes, DARPA provided funding for a major series of studies which in part gathered data from a major U.S. troop exercise in the Andes.

RESULTS: Numerous publications were produced and circulated and were said to have improved the U.S. understanding of potential problems of troops operating at high altitudes.

REMARKS: See remark under AO 580.

550	0	0					\$495,000
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TITLE: HIGH POWER PHASE SHIFTERS

550	0	1	06/25/64	02/01/68	SPERRY MICRO EL.	AF30(602)-4122	\$290,000
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TITLE: Ferromagnetic Materials for Digital Phase Shifters.

DESCRIPTION: The improvement and evaluation of ferrite and garnet materials for digital phase shifters at L,S,C and X bands with emphasis on peak power of 100KW and low insertion loss.

REMARKS: PROG: BMD - Techniques and Devices - Radar.
Extension AF30(602)-3490.

550	0	2	06/30/64	07/31/65	GEN. ELECTRIC	AF30(602)-3482	\$150,000
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TITLE: Ferrite Phase Shifters - C and X Band.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: (a) Development of remanent type X-band ferrite phase shifters with peak power handling capacity exceeding 10kw. (b) Development of slab-line C and X-band phase shifter with peak power capacity exceeding 10KW.

REMARKS: PROG: BMD - Techniques and Devices - Radar.

REF: "Investigation of Ferrite Phase Shifters at C and X-band"(U), Final Report, July 1965.

550	0	3	07/01/64	07/31/65	ADVANCED TECH.C. AF30(602)-3495	\$149,780
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TITLE: High Power Ferrite Phase Shifters.

DESCRIPTION: Design and develop experimental X and C band ferrite phase shifters capable of peak powers 100KW, average powers 1KW, switching time 10 micro seconds and loss below 1db.

REMARKS: PROG: BMD - Techniques and Devices - Radar.

REF: "High Power Ferrite Phase Shifter (U)", Final Technical Report, 10/65.

550	0	4	07/01/64	03/31/65	WESTERN MICR LAB AF30(602)3496	\$68,000
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TITLE: Digital Ferrite Phase Shifters.

DESCRIPTION: Development of digital (4-bit) ferrite phase shifter (9000 MHZ, 10% bandwidth, 10KW peak, 100 watts average, switching time less than 10 micro seconds).

REMARKS: PROG: BMD - Techniques and Devices - Radar.

REF: "Ferrite and Semi-Conductor Microwave Devices. Development of a Fast Switching, High Power Digital Phase-Shifter at X-band (U)", (b)(6) Final Report, June 1965.

550	0	5	12/22/65	04/01/68	SYRACUSE U.RES. F30602-67-C0378	\$50,000
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TITLE: Ferrite Phase Shifter Research.

DESCRIPTION: Research on ferrite phase shifters with applications to phased-array systems with specific application to the HAPDAR radar system (Hard Point Defense Array Radar).

REMARKS: PROG: BMD - Techniques and Devices - Radar.

Extension of AF30(602)-4280.

551	0	0			SYLVANIA ELECTR. DA28043AMC01661(E)	\$627,000
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TITLE: Long Range Detection Experiment - Project SUGAR TREE.

DESCRIPTION: The design, development and evaluation of an over-the-horizon detection concept.

RESULTS: Concept was designed, developed and evaluated. Program was transferred to the Army Security Agency. They implemented a follow-on field demonstration system.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - Techniques & Devices - Over-the-Horizon Radar.
AO 551 Amend. 3 provided for update of experimental field equipment with an improved receive and AFC loop.
Funds shown are for AO 551 Amend. 3 only.

552	0	0			\$350,000
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TITLE: HYPERVELOCITY IMPACT & ENERGY COUPLING

552	0	1	03/31/64 03/31/65 BRL	IN HOUSE	\$200,000
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TITLE: HYPERVELOCITY IMPACT EXPERIMENTS.

DESCRIPTION: HYPERVELOCITY IMPACT DAMAGE EXPERIMENTS WITH FRAGMENT MASS IN EXCESS OF 1 GRAM AND VELOCITIES IN THE RANGE 10 TO 20 KM/SEC.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - KILL MECHANISMS - NON NUCLEAR.

552	0	2	03/31/64 03/31/65 BRL	IN HOUSE	\$150,000
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TITLE: PELLET - TARGET ENERGY COUPLING

DESCRIPTION: STUDY OF THE ENERGY COUPLING BETWEEN PELLETS AND TARGET AS A FUNCTION OF MULTIPLE HITS VERSUS SINGLE HIT, PELLET GEOMETRY AND TRADE-OFF BETWEEN VELOCITY AND MASS.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - KILL MECHANISMS - NON-NUCLEAR.
BRL REPORTED QUARTERLY UNDR TITLE, "STRESS WAVES IN BOUNDED MEDIA."

553	0	0			\$720,000
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TITLE: MATERIALS RESEARCH

553	0	1	05/01/64 05/30/65 GE(SPACE SC.LAB) DA31124ARO(D)-214		\$125,000
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TITLE: Studies of Chemistry of Sodium and Other Alkali Metals.

DESCRIPTION: Experimental and analytical study of sodium and other alkali metals including low pressure burner properties, optical and thermodynamic properties of alkali metal oxides, and sodium under re-entry conditions.

REMARKS: PROG: BMD - General Research - Pertaining to re-entry physics applicable to penetration aids.

553	0	2	05/01/64 05/30/65 AVCO(R&A DEV.DV) DA31124ARO(D)-218		\$120,000
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TITLE: Studies of Contaminated Flow Fields.

DESCRIPTION: (1) Shock tube studies of kinetics and decomposition and reaction (with heated air species) of contaminant species from ablation including tetrafluoroethylene - air and formaldehyde - air systems. (2) Kinetics of wake ionization, recombination and electron attachment reactions from alkali metal-seeded ballistic range measurements.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - General Research pertaining to re-entry physics applicable to penetration aids.

553	0	3	06/01/64	03/30/67	UNITED AIRCRAFT	DA31124ARO(D)-221	\$240,000
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TITLE: Measurement of Low Energy Electron, Ion, and Neutral Particle Interactions.

DESCRIPTION: Measurement of low energy electron, ion, and neutral beam particles including (a) collision frequency of low-energy (0.1-0.5 ev) electrons with neutral and ionic species, (b) interaction between low-energy electrons and metal halides, oxides and hydroxides, and (c) atom-ion charge transfer cross sections (0.1 ev-0.05 ev range), (d) electron molecule collision frequency.

REMARKS: PROG: BMD - General Research related to re-entry physics.

REF: "Investigation to Determine Collision Frequencies of Typical Re-Entry Wake Contaminants (U)", Final Report, March 1966-March 1967, F-920440-6, April 11, 1967.

553	0	4	05/01/64	03/30/69	STANFORD RES.IN.	DA31124ARO(D)-446	\$204,000
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TITLE: Studies of Metastables in Atomic and Molecular Beams.

DESCRIPTION: Experimental study of production and de-excitation of metastable and other excited species in atomic and molecular beams pertinent to active and passive optical discrimination of re-entry events.

REMARKS: PROG: BMD - General Research pertinent to discrimination techniques during re-entry phase applicable to penetration aids.

REF: "Research on Metastable Species in Atomic and Molecular Beams Produced by Charge Transfer (U)," Semi-Annual Report 10/31/66.
Continuation of DA-31-124-ARO(D)-220.

553	0	5	06/01/64	06/30/65	PIB	DA31124ARO(D)-278	\$30,000
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TITLE: Low Observable Re-Entry Vehicle Materials.

DESCRIPTION: Establish the basic parameters for new materials (polymeric materials) which reduce the optical emission and electron densities in the post-body flow field of RV's traveling at 7 km/sec.

REMARKS: PROG: BMD - General Research - Pertinent to re-entry physics applicable to penetration aids.

Program was continued under AO 529.

553	0	6	06/01/64	06/30/65	MONSANTO CHEM.CO	DA31124ARO(D)-279	\$170,000
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TITLE: Low Observable Re-Entry Vehicle Materials.

DESCRIPTION: (1) Study of decomposition mechanisms and products formed in ablation of various materials during re-entry. Relate mechanisms and products to chemical virgin material and effects of additives. (2) Investigate radiation and electron densities in plasma jet during ablation process.

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - General Research related to re-entry physics applicable to penetration aids.
Continued under AO 768.

553	0	7	03/11/66	03/10/68	THIOLKOL CHEM.CO. DA31124ARO(D)-441	\$90,000
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TITLE: Study of Radiative Recombination Reactions.

DESCRIPTION: (a) Study the radiative recombination reactions of NO+O and CO+O and their kinetic processes. (b) Measure f-numbers of metal oxides in flames.

RESULTS: Data provided , interesting results for NO+O reactions.

REMARKS: PROG: BMD - General Research pertinent to re-entry physics applicable to penetration aids.

REF: (1) "Laboratory Measurements of the Rate and Spectral Distribution of the Radiative Combination of Atomic Oxygen and Nitric Oxide (U)," First Semi-annual Tech. Rpt., Mar-Sept. 1966, RMD 5524 SA-1, Oct. 25, 1966. (2) "Study of Re-Entry Observables (U)," Annual Tech. Rpt., 4/11/67.

See AO 553, Task 7, Amendment 3.

553	7	0	05/01/68	05/30/69	WARNER & SWASEY	\$55,000
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TITLE: Measurement of Transition Probabilities of the Rotational Lines in the Electronic Bands of CN

DESCRIPTION: Study of transition probabilities of individual lines in electronic bands of free radicals by optical spectroscopy.

REMARKS: PROG: BMD - General Research pertinent to optical re-entry discrimination techniques applicable to penetration aids.

553	7	1	05/01/68		SPACE SCIENCES	\$50,000
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TITLE: Liquid Additive Modification of Plasma Sheaths.

DESCRIPTION: To investigate techniques for modifying re-entry plasma sheaths by using rapidly liquid additives.

REMARKS: PROG: BMD - General Research pertinent to re-entry physics applicable to penetration aids.

554	0	0				\$200,000
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TITLE: VELA CLOUD GAP

555	0	0	05/14/64	06/30/65	IN HOUSE	\$159,000
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TITLE: Riverine Mine Countermeasures.

DESCRIPTION: Four models of the AN/PQS-1 sonar modified to permit detection of approaching swimmers were fabricated, installed and tested against swimmers and mine.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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The use of electromagnetic energy to detonate enemy moored underwater mines remotely was studied.

RESULTS: Some success in detecting approaching swimmers was attained under the right conditions. The modified AN/PQS-1 sonar provided minimal mine detection capability. It was concluded that the requirements for electromagnetic emission to detonate mines was beyond the state of the art.

REMARKS: Final Report: U.S. Navy Mine Defense Laboratory Report No. 365.

555	2	0	07/01/64	08/01/68	IN HOUSE	\$210,000
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TITLE: Mine Sonar Research.

DESCRIPTION: Several existing and new sonars were tested to determine if any of them could provide a riverine mine hunting capability. An acoustic lens sonar was designed specifically to meet this need.

RESULTS: The acoustic lens sonar and another sonar concurrently developed by the Navy performed significantly better than the existing sonars, but neither met the requirements for a riverine mine hunting sonar.

REMARKS: An additional reference is U.S. Navy Mine Defense Laboratory Report No. C2807, Aug. 1968.

556	0	0				\$30,000
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TITLE: TV LIGHT AMPLIFIER MSMTS

557	0	0	07/01/64	01/31/66	TRW	SD-254	\$778,000
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TITLE: PENETRATION SYSTEMS STUDY

DESCRIPTION: The study of three concepts to aid R/V penetration (Task 1) feasibility of fragmenting final stage, (Task 2) lofting versus maneuvering, and the use of a fluid ejection decoy.

RESULTS: The feasibility and effectiveness of final tank detonation to generate false targets was established. Lofting technique did not offer any advantages over minimum energy trajectories. The feasibility of fluid ejection decoys was demonstrated. These concepts provide a data base for design of future pen aid systems.

REMARKS: PROG: BMD - Penetration Aids - System Studies.

558	0	0				\$176,500
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TITLE: THIN FILM RADAR ABSORBING MATERIALS

559	0	0				\$750,000
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TITLE: OPTICAL DEVICES

559	0	1	10/19/64	12/01/67	AEROJET DELFT	DA01021AMC11511(Z)	\$206,238
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AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: Long Focal Length Telescope with II and TV Camera System

DESCRIPTION: Fabrication of image intensified orthicon system with 800" telescope.

RESULTS: System accuracy and resolution precluded testing at GLOW, plans for Kwajalein did not materialize. No field test.

REMARKS: PROG: BMD - Missile Phenomenology - Re-Entry Measurement Device.
REF: AD-493 339; Aerojet Delft report 2004 (1970).

559	0	2	08/25/64	02/01/67	GE-MSD	DA01021AMC11253(Z)	\$354,315
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TITLE: Improved Image Orthicon Camera System

DESCRIPTION: High performance IO television system (12"-36"flgf/3) was to be built using diffraction limited optics for use at GLOW site. Also camera was to be supplied to Aerojet Delft.

RESULTS: Although partially successful equipment changes were made - filters, improved video tracker. After initial testing system purpose changed to a tracking aid instead of primary data system. Automatic beam control was marginally useful.

REMARKS: PROG: BMD - Missile Phenomenology - Re-Entry Measurements.
REF: G.J. Rayl GE Report 6750 4215 (1967).
For total FC see AO 559, Task 3; 12-1-66 to 11-1-67. Also contract DAAH01-67-C-0926X.

559	0	3	04/03/65	11/01/65	BENDIX	DA01021AMC11549(Z)	\$354,315
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TITLE: Improved Image Orthicon Camera System

DESCRIPTION: Provide a video tracker to support the GLOW instrumentation consisting of high performance IO camera and data recording system.

RESULTS: Target brightness variations caused major tracking errors.

REMARKS: PROG: BMD - Missile Phenomenology - Re-Entry Measurement Device
Total for AO 559, Tasks 2 and 3 \$354,315.00.

559	0	4	04/03/64	12/01/66	BLOCK ENG'G.	DA01021AMC11241(Z)	\$60,000
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TITLE: Black Folded Interferometer

DESCRIPTION: Procurement of a folded interferometer to measure an angular dimension stellar diameters.

RESULTS: Program cancelled on basis of feasibility review by AFCRL and IDA and ARPA.

REMARKS: PROG: BMD - Missile Phenomenology - Re-Entry Device Development.
See AO 450.

559	0	5	12/15/65	07/01/67	BLOCK ENG'G.	DA01021AMC11648(Z)	\$159,941
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: Line Intensity Measuring Instrument

DESCRIPTION: Development and fabrication of interferometer device to detect line spectra in high backgrounds.

RESULTS: A device was successfully built with a capability to detect at S/N ratio of 1/30.

REMARKS: PROG: BMD - Missile Phenomenology - Device Construction, Re-Entry
REF: AD-804 948.

559	0	6	06/24/65	01/15/66	HUGHES	DA01021AMC12657(2)	\$100,200
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TITLE: BLIP Radiometer (Project GLINT)

DESCRIPTION: A blip condition radiometer was constructed for the 5.3um region with D*-10" cm (Hg) E1/2/W.

RESULTS: Results showed that bandwidth be restricted to 4.5 to 4.8 um region and this gave an NEI = 8×10^{15} W/cmE2.

REMARKS: PROG: BMD - Missile Phenomenology - Re-Entry Measurement Device.

559	0	7	10/17/66	04/30/67	GE	DAAH0167C-0487	\$40,082
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TITLE: Blip Radiometer (Project GLINT)

DESCRIPTION: Integration of Hughes Blip radiometer into GLOW for test.

RESULTS: Contractor performed required task.

REMARKS: PROG: BMD - Missile Phenomenology - Re-Entry Measurement Device.
REF: Blip Radiometer (Project GLINT) Final Report 2200-PR (1966).

559	0	8			DALMO-VICTOR		\$0
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TITLE: IO Camera System

DESCRIPTION: N O C O N T R A C T

559	0	9	02/05/65		E.H. PLESSET		\$50,000
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TITLE: Special Re-Entry Measurements

DESCRIPTION: Correlation of several measurements during atmospheric re-entry with Task 4 (Block Eng'g) data.

559	0	10			PERKIN-ELMER	DAAH0167C-0069	\$0
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TITLE: Integration of Devices in GLOW System

DESCRIPTION: Block Interferometer, Dalmo-Victor AC Radiometer & IO and Tracking Gate System.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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560	0	0	04/22/64	11/01/67	GEN. MOTORS,DRL	DA49146-X2-322	\$585,100
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TITLE: Response of Re-entry Vehicle Materials and Structures to Nuclear Blast.

DESCRIPTION: Theoretical and experimental program to study the response of materials and structures of typical re-entry vehicles to nuclear weapon blast.

REMARKS: PROG: BMD - System Vulnerability - R/V Damage to Nuclear Blast.

REF: "Response of Materials and Structures to Suddenly Applied Stress Loads (U)"
(PH.I), G.M. Defense Lab., Rpt. DASA-1716, GM/DRL TR-65-69; Oct. 65.

560	0	1	04/22/64	11/01/67	GEN. MOTORS	DA43-146X2-322	\$585,100
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TITLE: Response of Materials and Structures to Suddenly Applied Loads.

DESCRIPTION: Task 1 - A study of strain rates and stress loads to predict the vulnerability and structural hardening necessary to protect a re-entry vehicle against a nuclear blast.

Task 2 - Determine dynamic stress - strain curves for selected structures and ablative materials. Task 3 - Determine method of predicting the large deformation response of materials as determined by Task 1 and 2.

REMARKS: PROG: BMD - System Vulnerability - nuclear blast.

Classified pages must be reviewed to complete this 560-2 and 560-3.

561	0	0	07/01/64	03/31/68	SYRACUSE U.RES.C	AF30(602)-4258	\$1,227,573
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TITLE: ECM/ECCM Techniques for Ballistic Missile Engagements.

DESCRIPTION: The study of electronic countermeasures and electronic counter countermeasures techniques applicable to IRBM and ICBM engagements including systems, system tactics, advance ECM/ECCM techniques and diversity techniques.

REMARKS: PROG: BMD - Penetration Aids - ECM/ECCM Techniques.

Continuation of AF 30 (602)-3523.

562	0	0					\$50,500
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TITLE: FLOW FIELD CALCULATIONS

562	0	1	12/01/64	06/01/65	GENERAL DYNAMICS	NONR-4747(00)	\$50,500
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TITLE: MISSILE TRAIL FLOW FIELD CALCULATION.

DESCRIPTION: A FLOW FIELD CALCULATION TO ESTIMATE THE ELECTRON DENSITY DISTRIBUTION IN THE VICINITY (UP TO 20KM FROM TRAJECTORY AXIS) OF A MISSILE DURING FINAL BURNING STAGES.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - OTH DETECTION.

REF: "HIGH ALTITUDE ROCKET PLUME STRUCTURE (U)," FINAL REPORT GD/C-DBE65-023, SEPT 1965 (U).

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
562	0	2	01/01/66	06/01/66	ASTROPHYSICS RES	NONR 429(00)	\$75,563

TITLE: Theoretical Studies of Missile Trail Phenomenology

REMARKS: PROG: BMD - Techniques and Devices - OTH Detection.

563	0	0			WESTINGHOUSE	AF086355262	\$293,000
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TITLE: Anisotropic Liquid Detectors

DESCRIPTION: Firing a rifle causes sub-dermal bruising of the shoulder which raises the body temperature in that area. Flexible thin film "pads" containing a suitable anisotropic liquid which would change color to indicate sub-dermal changes were envisioned.

RESULTS: While the increased body temperature areas could be found using extremely sensitive laboratory instruments, no thin film anisotropic detector with sufficient sensitivity was devised.

REMARKS: Part of Marking, Tracking and Identification Program.
See AO 563, Task 1.

563	0	1	07/06/64	08/15/66	WESTINGHOUSE	AF086354425	\$192,000
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TITLE: Anisotropic Liquids for Detection of Contaminants.

DESCRIPTION: Approximately 100 anisotropic liquid (AL) systems were studied for responsiveness to essential oil vapors. Quantitative and qualitative analyses were made of components of gaseous products from fired rifle ammunition followed by evaluation of AL techniques for detection of residues best represented by the nitro group compounds.

RESULTS: Best results came from combinations of AL systems but this yielded only approximately 50 percent response. The search for an alternate for oleal cholesteryl carbonate in AL compositions yielded two systems worthy of further investigation.

REMARKS: Final Report: Air Force Armament Laboratory Report, AFATL-TR-67-38, Volumes I and II, March 1967.

563	0	2	07/17/64	03/20/65	WESTINGHOUSE	AF086354423	\$25,000
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TITLE: Thermal Detection of Underground Tunnels - I.

DESCRIPTION: Experiments were conducted to determine the usefulness of anisotropic liquids in detecting occupied underground tunnels. A liquid crystal film was moved along the soil surface above a simulated tunnel with a heat source to detect and measure temperature changes at the tunnel boundaries.

RESULTS: The technique worked very well with a tunnel eight or nine inches below the surface. With a tunnel 12 inches below ground spurious effects due to natural temperature differences created serious difficulties.

REMARKS: See Task 3.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
563	0	3	06/29/65	07/29/66	WESTINGHOUSE	AF086355262	\$74,000

TITLE: Thermal Detection of Underground Tunnels - II.

DESCRIPTION: Experiments were conducted to determine the usefulness of anisotropic liquids in detecting occupied underground tunnels. A liquid crystal film was moved along the soil surface above a simulated tunnel containing a heat source to detect and measure temperature changes at the tunnel boundaries.

RESULTS: The technique worked very well with a tunnel eight or nine inches below the surface. With a tunnel 12 inches below ground, spurious effects due to natural temperature differences created serious difficulties.

REMARKS: See Task 2.

563	0	4					\$0
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TITLE: Chemical Marking, Tracking & Identification of Insurgents

DESCRIPTION: The problem of identifying insurgents hidden in a civilian population, while not new, engaged U.S. attention during the full course of the Vietnamese experience. Millions were spent on R&D covering the gamut from the most sophisticated aerial electronic systems to improving the time honored practice of putting smoke in an area from which hostile fire had already been received.

RESULTS: One sub-program investigated by ARPA and the Services was Chemical Marking, Tracking and Identification.

REMARKS: See AO 256, 267, 285, 386, 563, 649, and 882.

564	0	0					\$181,200
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TITLE: COMPUTER-AIDED TEACHING SYSTEMS

565	0	0	04/16/64	06/30/66			\$100,000
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TITLE: Pyrotechnic Penetration Aids

DESCRIPTION: Investigation of the use of pyrotechnics to mask or generate false targets as a penetration aid.

RESULTS: Various pyrotechnic compositions were examined. Reflection and absorption measurements were made at low frequencies to select the best composition. Small charges presented large cross-sections at VHF frequencies.

REMARKS: PROG: BMD - General Research - Penetration Aids - Radar Targets.
REF: "Pyrotechnics Penetration Aids Research (U)," Final Report, 8/1/66 (S).

566	0	0					\$300,000
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TITLE: FUEL CELL RESEARCH

567	0	0	05/01/64		NOL	IN HOUSE	\$297,000
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AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: STUDIES AND EXPERIMENTS ON NOVEL CONFIGURATION RE-ENTRY BODIES

DESCRIPTION: SUPPORT BY NAVAL ORDNANCE LABORATORY FOR A STUDY BY NATIONAL ENGINEERING SCIENCE CO. ON THE CHARACTERISTICS AND APPLICATIONS OF NOVEL CONFIGURED REENTRY BODIES.

REMARKS: PROG: BMD - GENERAL RESEARCH
MISC: (1) SEE AD 579.

568	0	0	06/01/64	12/01/67	UNIV. OF ARIZONA NONR-2173(12)	\$624,000
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TITLE: Optical Technology of Precision Mirrors

DESCRIPTION: Experimental and theoretical research on factors affecting front surface mirrors exceeding 36-in.

RESULTS: New optical polishing technique developed, contribution to large telescope mirror performance evaluation.

REMARKS: PROG: BMD - Missile Phenomenology - Optical Technology.
REF: Contribution to "Telescopes" - Introduction to the Design of Astronomical Telescopes, A Stationary Table Optical Polisher (1965).

569	0	0	09/01/64	09/01/66	DOUGLAS AIRCRAFT AFD4(694)-787	\$993,000
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TITLE: Maneuvering Re-Entry Control and Ablation Studies (MARCAS)

DESCRIPTION: This program investigated new techniques for controlling maneuvering R/V's. The program included initial studies of several potential techniques, additional theoretical studies and laboratory experiments to optimize the most promising, and flight test to prove the concepts.

REMARKS: PROG: BMD - Missile Technology - MARCAS

570	0	0	07/01/64	08/30/70	UNIV. OF CALIF. DA31124ARO(D)-257	\$4,436,000
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TITLE: Research in Radiation Physics and Aerodynamics.

DESCRIPTION: Theoretical and experimental investigation in high speed hydrodynamics, atomic and molecular processes, transport processes, plasmas, high-intensity laser radiation interaction with surfaces and turbulence phenomena.

REMARKS: PROG: BMD - General research in support of launch, mid-course and re-entry physics.
MISC: (1) A reference, "Research in Radiation Physics and Aerodynamics," Semi-Annual Tech. Summary for period ending March 31, 1967.

571	0	0				\$50,000
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TITLE: FEASIBILITY SECURITY STUDY

571	2	0	02/01/65	05/01/65	SCOPE INC. DA44009-AMC899T	\$10,000
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: Railroad Sabotage Detection Research.

DESCRIPTION: The first phase of this program conducted a feasibility study of the application of a bifilar wire loop and transducer sensory techniques to rail security.

RESULTS: The program was halted at the completion of the first phase because work on ARPA Order 293-12, which was being carried on concurrently with phase one of this program, was considered more appropriate.

REMARKS: AGILE - DETECTION

REF: "Railroad Sabotage Detection Research, Preliminary System Design Report" for the period 1965 February 1 - 1965 May 1. (b)(6)
(b)(6) SCOPE Incorporated, Falls Church, Virginia. Prepared for U.S. Army Engineer Research and Development Laboratories, Fort Belvoir, Virginia.

572	0	1	62	USABIOLABS	IN HOUSE	\$84,675
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TITLE: DEFOLIATION - HERBICIDAL BOMBLET CLUSTERS

DESCRIPTION: Procure/evaluate bomblet clusters for herbicidal application to 'small plot' targets.

RESULTS: Two bomblet cluster configurations were dropped and evaluated. Ground coverage was adequate but not uniform. The clusters were judged to be a high cost special application munition suitable for extremely difficult targets.

REMARKS: Section III-C of Project AGILE Program Completion Report on defoliation dated January 1981 gives a detailed summary of this effort.
Also see AO 256, Amd 8 for initial funding of this effort.FORT.

572	1	0				\$85,000
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TITLE: Herbicide Bomblets.

DESCRIPTION: This program provided for the fabrication and shipping of 100 E-138 herbicide bomblets, 100 E-155 cluster bombs, 100 E-156 cluster bombs, and necessary tools, jigs, and manuals for test evaluation.

REMARKS: AGILE - HERBICIDE

REF: This hardware was designed under a previous program funded under ARPA Order 256-8. The funding included the TDY expenses of a technical representative to assist in field testing.

573	0	0				\$100,000
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TITLE: SECURITY STUDIES

574	0	0		SRI/WESTWOOD	NONR-419400	\$80,000
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TITLE: Coastal Inland Waterways.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: Studies were made on mobility conditions in the Mekong Delta area of Southeast Asia and the delta area of East Pakistan. Comparisons are made between the two areas as related to mobility of forces by small craft, amphibians, GEMS, and other types of vehicles available to operating forces.

RESULTS: Specific recommendations are given regarding vehicles for use in each area to improve mobility.

REMARKS: AGILE - MOBILITY

REF: "Special Study of Mobility in the Mekong Delta Area of South Vietnam," Final Report. Brinton, George; Clare, Kenneth; Dow, Irving, Southern California Laboratories, Stanford Research Institute, South Pasadena, CA. "A Review of Conditions of Mobility in the Delta Area of East Pakistan", Addendum Rpt. (b)(6) Westwood Research, Inc., Los Angeles, CA. Prepared for Office of Naval Research, Washington, D.C.

575	0	0			\$300,000
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TITLE: HARD POINT DEFENSE

576	0	0			\$80,600
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TITLE: RE-ENTRY VEHICLES STABILITY

577	0	0	05/01/64	U. OF PITTSBURGH OGDOS6348(SUB48126	\$26,000
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TITLE: PUBLIC OPINION ON BALLISTIC MISSILE DEFENSE

DESCRIPTION: PROVIDED FUNDS FOR A PUBLIC OPINION SURVEY ON BALLISTIC MISSILE DEFENSE.

REMARKS: PROG: BMD - GENERAL RESEARCH

REF: "PUBLIC OPINION AND BALLISTIC MISSILE DEFENSE, REPORT OF AN EXPLORATORY SURVEY (U)," RM 64TMP-5, 30 SEP 64.

578	0	0			\$280,000
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TITLE: BIO-ECOLOGICAL STUDY IN TROPICAL LATITUDES

579	0	0	07/13/64 11/30/65	NAT'L ENG.SCN.CO NOSP65037C(FBM)	\$371,201
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TITLE: Characteristics and Application of Novel Configuration Re-Entry Bodies.

DESCRIPTION: To evaluate theoretically and experimentally novel configuration re-entry bodies and explore their system application. Specific areas include gas dynamic theoretical studies; evaluation of aerodynamic characteristics, and study of control techniques.

REMARKS: PROG: BMD - Novel Re-entry Bodies - Penetration Aids/Maneuvering RV's.

REF: "Characteristics and Application of Novel Configuration Re-entry Bodies (U)", Final Tech. Rpt., SN-201-CR4, 12/12/65 (S). "Studies of the Hypersonic Flow Field and Re-entry Radar Cross Section of the NESCO Novel Configuration (U)", by (b)(6) SN 201-TR 8/17, 2/14/66.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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See also AO 567.

580	0	0			MULTIPLE	MULTIPLE	\$3,034,000
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TITLE: WORLD NUTRITIONAL DISEASES & RATIONS RESEARCH

DESCRIPTION: A somewhat unfocussed series of basic research grants selected by NIH areas emphasized were Latin America and Africa with some minor effort on Asia.

RESULTS: A large number of publications were produced and distributed. So far as can be determined no direct benefit beyond a contribution to basic knowledge accrued.

REMARKS: In early 1964 AGILE established a general basic research program for worldwide biomedical research as it might apply to counterinsurgency. This AO funded one major activity.
See also AO's 305, 549, and 761.

581	0	0			MRDC-T		\$60,000
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TITLE: MODULAR AUDIO VISUAL UNIT (MAVU).

DESCRIPTION: The objective of the MAVU program was to develop a man portable audio-visual system that could provide a means for showing movies and a capability for providing audio presentations to audiences as large as 2500 persons.

RESULTS: Field tests indicated that the MAVU was suitable for use. Production units were supplied to PSYOPS teams in Thailand and to similar units in Vietnam.

REMARKS: AGILE - PSYOPS

581	0	1			NOTS	IN HOUSE	\$299,000
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TITLE: Fuel Air Explosive

DESCRIPTION: See AO 285, Task 7.

582	0	0					\$91,000
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TITLE: STUDY OF CAPABILITY OF RADIOGRAPHIC METHODS

583	0	0					\$350,000
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TITLE: AICBM CONSTRAINTS

584	0	0					\$3,130
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TITLE: AMRA PARTICIPATION

585	0	0	06/16/64		NOTS/SUBS		\$405,000
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TITLE: Research in UV & IR Filter-Detector Technology

DESCRIPTION: R&D on filter and filtered detector technology in UV/OPT/IR spectral regions.

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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Several subcontractors were used - OCLI, HRC, EDS & Pacific Union College.

RESULTS: Unique UV filters were produced (solar blind); the circular variable filter was developed under OCLI subcontract.

REMARKS: PROG: BMD - Missile Phenomenology - Optical Technology.

586	0	0			\$274,200
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TITLE: BEHAVIOR IN INTERNAT'L SYSTEMS 274

587	0	0			\$42,900
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TITLE: PATTERN RECOGNITION & PROBLEM SOLVING PROCESSES

588	0	0	08/01/64 12/31/65 UCLA	SD-262	\$165,520
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TITLE: SUMMER DEFENSE SCIENCE SEMINAR

DESCRIPTION: Logistic support of summer defense science seminar.

REMARKS: PROG: BMD - Studies - Summer Defense Science Seminar.

589	0	0			\$277,100
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TITLE: TEACHING & LEARNING RESEARCH PROGRAM

590	0	0	07/10/64 02/10/65 HAC	DA01021AMC11229(Z)	\$182,859
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TITLE: Study of Ballistic Missile Defense Using Chemical Atmospheres.

DESCRIPTION: Assessment of CHEOPS concept application to anti-ballistic missile defense systems.

RESULTS: See reference below.

REMARKS: PROG: BMD - Studies - Chemical Atmospheres.

REF: "Applications of Chemical Operations to Ballistic Missile Defense (U)",
(b)(6) Final Report, SDN 5-79086/2-2, SSD 5095 R, March 65.

591	0	0			\$53,000
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TITLE: DETECTION & CLASSIFICATION OF SEISMIC EVENTS

592	0	0			\$252,000
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TITLE: COUNTERINSURGENCY INFO. ANALYSIS CENTER

593	0	0			\$0
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TITLE: REFUND OF MISC. TRANS. CHARGES

594	0	0	06/01/64 06/01/65 NOTS	IN-HOUSE	\$35,000
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AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: TETHERED AEROLOGICAL BALLOON SYSTEM

DESCRIPTION: DEVELOPMENT AND FLIGHT EVALUATION OF TETHERED BALLOONS FOR HIGH ALTITUDES (60,000 FEET PLUS).

RESULTS: BALLOONS WERE DEVELOPED AND FLOWN. HIGHEST ALTITUDE WAS 5800 FT. ATTEMPT TO LAUNCH 65,000 FEET FAILED AT 500 FEET. FURTHER TEST FLIGHTS WERE POSTPONED.

REMARKS: PROG: ADVANCE SENSORS

REF: "TETHERED AEROLOGICAL BALLOON SYSTEM (U)," PROGRESS RPT. 398, NOTS TP 3830.

595	0	0	08/24/64	03/24/65	BOEING	DA01021AMC11322(Z)	\$615,000
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TITLE: UPPER STAGE ACCELERATION AND GUIDANCE EXPERIMENT (PROJECT UPSTAGE)

DESCRIPTION: EXPERIMENTS TO IDENTIFY THE GUIDANCE AND CONTROL PROBLEM AREAS AND TO DETERMINE THE REQUIRED TECHNOLOGY OF TERMINAL INTERCEPTORS TO COUNTER MANEUVERABLE REENTRY VEHICLES.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - INTERCEPTOR TECHNOLOGY.

596	0	0					\$750,000
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TITLE: ANTI-SATELLITE PROGRAM

596	0	1	11/01/64	08/31/67	MITRE CORP.	AF19(628)-5165	\$2,064,000
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TITLE: Anti-Satellite Program - Technical Support.

DESCRIPTION: Technical assistance to ARPA in the management of the satellite identification and protection program including system studies, scattering matrix, and analyses of field measurements.

REMARKS: Extension of AF 19 (628)-2390.

596	0	2	08/01/65	08/01/65	MITRE CORP.	AF19(628)-5165	\$400,000
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TITLE: Over-the-Horizon Detection Program - Technical Support.

DESCRIPTION: Analysis and evaluation of OHD systems, analysis, test, and evaluation of components and techniques; and study of ECM/ECCM techniques.

REMARKS: PROG: BMD - Techniques & Devices - Over-The-Horizon Detection.
Extension of AF 19 (628)-2390.

596	0	3	10/01/66	10/01/67	MITRE CORP.	AF19(628)-5165	\$865,000
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TITLE: Boost Phase and Exoatmospheric BMD - Technical Support

DESCRIPTION: Investigation of concepts for missile defense such as CASABA/HOWITZER, hi-temp x-ray weapons, lasers, chemical dispensing systems and satellite surveillance systems to extend defense capabilities.

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - Techniques & Devices - Boost Phase and Exoatmospheric Studies.
Extension of AF 19 (628)-2390.

596	0	5	11/01/66	05/01/67	MITRE CORP.	AF19(628)-5165	\$131,260
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TITLE: Radar Capabilities Improvement Study.

DESCRIPTION: Review and assessment of US radar sensors to obtain foreign BMD information. Recommendation for updating sensors and integrating with optical sensors to obtain an increased capability.

REMARKS: PROG: BMD - Techniques & Devices - Radar - Studies.
Extension of AF 19 (628)-2390.

597	0	0					\$10,000
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TITLE: SUPPORT SERVICES

598	0	0		01/31/66	IN HOUSE		\$256,000
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TITLE: HELICOPTER TRAP WEAPON

DESCRIPTION: A reliable fuze configuration was developed for the previously designed weapon. The system was then tested.

RESULTS: The weapon proved successful in clearing scrub-trees, heavy brush and elephant grass on hard ground. When the fuze proved unreliable on soft ground, a more sensitive fuze was developed and modified for low-speed, low-altitude arming.

REMARKS: REF: NOTS Report No. NOTS-TP-3906, Aug. 1965.

598	0	1					\$30,000
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TITLE: Rock Mine

DESCRIPTION: See AO 285, Task 6.

599	0	0					\$500,000
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TITLE: VELA LARGE ARRAY

600	0	0	07/01/64	06/30/68	MIT-LL	AF19(628)-5L67	\$59,372,000
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TITLE: Project PRESS and Re-entry Physics Program

DESCRIPTION: Project PRESS: To obtain information on re-entry and late mid-course phenomenology of full-scale RV's pertaining
Re-entry Physics Program: Investigation of physical phenomena associated with re-entry into the atmosphere of bodies traveling at high speeds.

REMARKS: PROG: BMD - Missile Phenomenology -

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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This AO combined the work started under AO 13 Re-entry Physics and AO 166 Project PRESS into one.

See also AO 13 (\$24,943,764); AO 166 (\$51,811,000).

Extension AF 19 (628)-500.

600	1	0	02/08/65	RCA	AF19(628)-5167	\$700,000
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TITLE: Project PRESS: Studies and Analyses of Radar Data.

DESCRIPTION: Theoretical studies and analyses of ballistic missile radar data including preparation of compendia of field data, development of radar scattering model consistent with field observations, and preparation of handbook on typical radar re-entry data at UHF, L and C bands.

REMARKS: PROG: BMD - Missile Phenomenology - Radar - Data Analysis & Compilation. Sub-contract to MIT.

601	0	0				\$51,000
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TITLE: Nyquist Single Frequency Repeater.

DESCRIPTION: The program objective was to develop a small battery operated single frequency repeater for use in extending the range of VHF tactical radios AN/PRC 6, AN/PRC 10, and AN/PRC 25 in jungle communications.

RESULTS: Five systems were delivered to LWL in April, 1965. These units weighed 4.5 pounds, have a volume of 100 cu. in., and a 24 hr. battery life.

REMARKS: AGILE - COMMUNICATIONS

602	0	0				\$40,000
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TITLE: ELECTROLYTIC RECORDING TECHNIQUES

603	0	0		RDFU-V		\$40,000
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TITLE: Colored Smoke Markers

DESCRIPTION: Under this program, 100 units each of red, yellow, and white smoke producing markers were fabricated for field evaluation in Southeast Asia.

RESULTS: The signals are lanyard actuated and are hand launched from helicopters or light OV type aircraft. Field evaluation was conducted with reasonable success in rice paddies, rivers, wet tall grass, dense jungle, and dry ground.

REMARKS: AGILE - TARGET MARKING

REF: "Modified MK 29 Marine Location Marker, JRATA Project No. 2L-505.1," Final Report. (b)(6) (RDFU-V); (b)(6) (CDTC).

Advanced Research Projects Agency, Research and Development Field Unit - Vietnam; Combat Development and Test Center, Republic of Vietnam Armed Forces, 12/65.

604	0	0				\$25,000
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: MATERIALS PROVIDED BY AF MATERIALS LABORATORY

604	0	1			AFSC	IN HOUSE	\$23,000
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TITLE: Project STAR

DESCRIPTION: See AO 272, Task 2.

605	0	0					\$131,000
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TITLE: SATELLITE SURVIVABILITY

606	0	0	08/24/64		OWR	IN HOUSE	\$5,285
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TITLE: Security for Summer Defense Science Seminar.

DESCRIPTION: Provide funds for the security administration of the Summer Defense Science Seminar at UCLA.

REMARKS: PROG: BMD - Studies - Summer Defense Science Seminar.
See also AO 588.

607	0	0			LOCKHEED CA	NOBS4868	\$70,000
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TITLE: Lockheed Hydro-Ski Test and Evaluation for Remote Area Water.

DESCRIPTION: The hydro-ski vehicle is a variable geometry planing hull designed for high speed operation in a seaway. A 25-foot test craft, equipped with aluminum skis, was tested at sea under the following environmental conditions: smooth water; rough water at headings of 0, 45, 90, 135, and 190 degrees relative to the sea; weed-infested waters simulating conditions found in Southeast Asia, and surf penetration and landings.

RESULTS: When operating in weed-infested waters at low power and low speed, the inlet to the waterjet system was consistently clogged by the kelp. At high power and high speed the craft was able to go through the kelp bed. All other phases of the test program were completed successfully.

REMARKS: AGILE - MOBILITY

REF: "Lockheed Hydro-Ski Test and Evaluation," Final Report, Lockheed-Calif. Company, Burbank, Calif., Report No. 19135-1, 12/65.

607	0	1	12/30/65		LOCKHEED CALIF.	NOBS92486	\$100,000
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TITLE: Weed Ingestion and Fouling of Marine Waterjet Propulsion Systems.

DESCRIPTION: A waterjet propulsion system was designed for use in a marine surface vehicle of very shallow draft, capable of operations in river, delta, and coastal waters, and which will successfully penetrate heavy weed concentrations.

RESULTS: The most successful configuration for weed penetration consisted of an alternate water intake in lieu of a bottom mounted flush scoop, a weedcutting device, and a reduced area discharge nozzle. A 4-bladed rotor plus a 1-bladed

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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stator was the best combination of cutting devices tested.

REMARKS: AGILE - MOBILITY

REF: "Investigation of Waterjet Fouling", Final Report, Lockheed-California Company, Burbank, California, Report No. 19196. Prepared for Bureau of Ships, Navy Department, Washington, D.C., 12/65, (PA 25,050).

608	0	0	10/01/64	03/29/65	IN HOUSE	\$297,000
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TITLE: Hypervelocity Cluster Warhead Anti-Personnel Weapon.

DESCRIPTION: This study was conducted to determine the aerodynamic and thermal characteristics, aerodynamic interaction between and methods of dispersing large numbers of small sub-missiles at hypervelocities from helicopters and low performance aircraft. A mathematical model was developed to refine the operational characteristics.

RESULTS: The study concentrated on optimizing a 50 pound rocket, the specifics of which are classified.

609	0	0	03/01/65	04/30/66	AERONUTRONIC	N60063357	\$91,000
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TITLE: ION-SPECIFIC PERMEABLE MEMBRANES

DESCRIPTION: This program was initiated to develop an ion-specific permeable membrane for improving the shelf life of radio battery components.

RESULTS: It was demonstrated that self-organizing membranes, using specifically oriented molecules, are capable of attaining very high degrees of ionic specificity.

REMARKS: AGILE - COMMUNICATIONS - POWER UNITS

REF: "Ion-Specific Permeable Membranes," Final Report, for the period 1965 March 1 - 1966 April 30. (b)(6) Aeronutronic, Newport Beach, California, (PA 22,433).

610	0	0				\$200,000
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TITLE: VELA UNDERWATER RESEARCH

611	0	0				\$575,000
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TITLE: UNMANNED SEISMOLOGICAL OBSERVATORY (USO)

612	0	0				\$174,000
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TITLE: RESEARCH ON AFTERSHOCK SEQUENCES

613	0	0				\$10,877
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TITLE: SENSITIVITY FUNDAMENTALS OF NF COMPOUNDS

614	0	0				\$217,600
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: BEANY

615	0	0					\$95,400
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TITLE: TRITIATED BIFLUORIDE SINGLE CRYSTALS

616	0	0	09/04/64	01/11/65	AMICOM	IN HOUSE	\$17,259
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TITLE: AMRAD Target Payloads.

DESCRIPTION: For the management and procurement of targets for the AMRAD radar.

RESULTS: Because of the targets planned and provided by the Services the requirement of the AMRAD targets planned by ARPA were not needed. All funds (except those already spent by AMICOM) were withdrawn.

REMARKS: PROG: BMD - Discrimination Studies - Radar.
Initially \$1,110,825 was provided for the program. \$110,825 for AMICOM and \$1,000,000 for Space Tech Labs. - All but amount shown above was withdrawn.

617	0	0					\$604,500
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TITLE: BATTLEFIELD ILLUMINATION

618	0	0					\$10,000
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TITLE: REMOTE SENSING OF ENVIRONMENT

619	0	0		12/31/66	BLASS ANTENNA	AF30(602)-3643	\$248,060
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TITLE: Antenna Prismatic Compensation Multiplex Feed Concept.

DESCRIPTION: (a) Develop the theory and investigate the technical feasibility of a prismatic compensation multiplex feed concept. (b) Provide short-pulse to test system concept.

RESULTS: A passive switched array having prismatically compensated feed system permitting wide bandwidth operation was developed.

REMARKS: PROG: BMD - Techniques & Devices - Radar - Phased Arrays.

620	0	0					\$675,000
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TITLE: VELA SEISMOLOGICAL RESEARCH

621	0	0					\$250,000
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TITLE: VELA SEISMOLOGICAL RESEARCH

622	0	0			ATLANTIC RES.	AF086354201	\$107,000
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TITLE: KONTAX INCENDIARY

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: Laboratory and field testing of the incendiary agent KONTAX was accomplished. KONTAX can be initiated by water, fire, an electric spark or a standard fuze.

RESULTS: Field tests were conducted by Eglin Air Force Base personnel. The ground tests of small samples of KONTAX on flat boards demonstrated that it was more effective than WESTCO and about equal to napalm-B.

REMARKS: REF: "Feasibility Test of KONTAX (Incendiary Agent) (U)," (b)(6)
Deputy for Test Operations, Air Proving Ground Center, Air Force Systems Command, U.S. Air Force, Eglin Air Force Base, Florida, Report No. APGC-TR-65-40, 6/65 (PA 17,876).

623	0	0			\$10,000
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TITLE: PANAMA

624	0	0			\$7,250,000
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TITLE: VELA-UNIFORM

625	0	0			\$50,000
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TITLE: REX CROSS SECTION MEASUREMENTS

626	0	0	03/01/65 08/30/66 NORTHROP	AF086355068	\$301,000
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TITLE: 2.75-INCH WARHEAD

DESCRIPTION: The objective of this program was to develop the 2.75-inch FFAR Flechette Warhead from a conceptual to a production status.

RESULTS: Qualification tests were run and the reliability and effectiveness were demonstrated through both contractor and Air Force tests. A 98 percent reliability level was demonstrated. First production deliveries on the warhead were made in June 1966.

REMARKS: AGILE - WEAPONS

REF: "Development of 2.75-Inch FFAR Antimateriel Warhead (U)," (b)(6)
Nortronics, Northrop Corporation, Anaheim, California. Prepared for Air Force Armament Laboratory, Air Force Systems Command, Eglin Air Force Base, Florida, AFATL-TR-67-200, 11/67 (PA 35,062).

627	0	0			\$181,300
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TITLE: BILATERAL COMMUNICATION BETWEEN MEN AND MACHINES

628	0	0			\$251,500
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TITLE: COMPUTERIZED MATHEMATICAL LAB

629	0	0			\$0
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TITLE: CHARGES FROM THE ARMY MGMT. FUND (MILITARY CONSTRUCTION)

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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630	0	0					\$5,000
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TITLE: STUDY-RADIATION TRAPPED IN THE EARTH'S MAGNETIC FIELD

631	0	0					\$150,000
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TITLE: AIR FLUORESCENCE DETECTION RES.

632	0	0	01/14/65	05/30/69	GRC	DA31124-ARO D312	\$870,000
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TITLE: Communications System Design.

DESCRIPTION: The purposes of this program were to assess AGILE communications programs, develop improved theoretical basis for jungle radio propagation, and test utility of modeling techniques.

RESULTS: This program resulted in the development of several computer models of tactical communication operations. Two of the models can generate the instantaneous positions and typical message requirements of combat units engaged in field operations.

REMARKS: AGILE - COMMUNICATIONS

REF: "Study of AGILE Communications Research Requirements," Final Summary Report. (b)(6) General Research Corporation, Santa Barbara, California. Report No. CR-312-7, 5/69 (PA 36,232).

633	0	0					\$109,220
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TITLE: TACTICAL INFO. SYSTEMS

634	0	0					\$200,000
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TITLE: ATMOSPHERIC TRANSMISSION

635	0	0					\$123,300
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TITLE: MAGNETOHYDRODYNAMIC WAVE PROPAGATION IN THE IONOSPHERE

636	0	0			US DEPT.OF AGR1. IN HOUSE		\$593,000
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TITLE: Firescan Phase II

DESCRIPTION: Continuation of Firescan Phase I, AO 544, to provide an operational capability for the U.S. Forest Service to detect incipient forest fires, at remote locations, by using an airborne infrared line scanner.

RESULTS: The Forest Service retained the infrared line scanner, and planned to use it as a standard sensor for detecting and locating forest fires, so that they could be extinguished easily and quickly, with limited personnel.

REMARKS: PROG: TTO - Reconnaissance and Surveillance - Airborne Infrared.
AO 544 initiated this fire detection program.

AD	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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637	0	0					\$92,600
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TITLE: ON-LINE COMPUTER STUDIES OF BARGAINING & NEGOTIATION BEHAVIOR

638	0	0					\$100,000
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TITLE: ATMOSPHERIC TRANSMISSION

639	0	0	06/29/65	01/31/66	SIERRA RESEARCH	DA28043AMC01408E	\$278,000
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TITLE: Helicopter Station Keeping Radar

DESCRIPTION: The objective of this program was to develop and test a radar applicable to solving the problem of helicopter stationkeeping during formation flying.

RESULTS: It was demonstrated that helicopter stationkeeping can be maintained with the test equipment and a PPI-type display under straight and level conditions.

REMARKS: AGILE - HELICOPTER NAVIGATION

REF: "Helicopter Station-Keeping System, SNS-64/2-A," Final Report, for the period 1965 June 29 - 1966 January 31. (b)(6)
Sierra Research Corporation, Buffalo, New York, Report No. 1. Prepared for U.S. Army Electronics Command, Fort Monmouth, New Jersey, ECOM-01408-F. 12/66 (PA 25,676).

640	0	0					\$83,000
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TITLE: RSCH. MAGNETOHYDRODYNAMIC WAVES DUE HIGH ALTI. NUCL. EXPL.

641	0	0					\$200,000
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TITLE: REPORTS FROM OPEN FOREIGN LITERATURE

642	0	0					\$17,876
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TITLE: SEISMOLOGICAL EXPERIMENTS OFF THE COAST OF ALASKA

643	0	0					\$34,000
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TITLE: PROPELLANT CHEMISTRY

644	0	0					\$45,340
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TITLE: PROPELLANT CHEMISTRY

645	0	0					\$19,775
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TITLE: PROPELLANT CHEMISTRY

646	0	0					\$100,500
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TITLE: PROPELLANT CHEMISTRY

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
647	0	0					\$82,780

TITLE: PROPELLANT CHEMISTRY

648	0	0	12/10/64	06/01/67	IN HOUSE	AF04(694)-858	\$8,300,000
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TITLE: ARPA/Army Re-entry Measurements Program

DESCRIPTION: Continuation of re-entry experiments on certain type of RV's.

REMARKS: PROG: BMD - Missile Phenomenology - Re-entry Measurements.

649	0	0	04/12/65	05/30/67	TEXAS AM FOUND.	AF296017211	\$250,000
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TITLE: Area Surveillance and Personnel Identification.

DESCRIPTION: This research program was conducted to determine the feasibility of neutron activation analysis (NAA) as a means of performing personnel identification and area surveillance.

RESULTS: A portable neutron activation analysis system was developed and design improvements based on experience during its operation were recommended.

REMARKS: REF: "Area and Personnel Surveillance System (U)," Final Report, for the period 1965 April 12 - 1966 April 12. (b)(6)
(b)(6) (et al.), Texas A&M Research Foundation, Texas A&M University, College Station, Texas, Report No. 4, 2/68 (PA 31,689).
Continued under AO 882.

649	0	1			TEXAS A&M	DA18035AMC364A	\$255,000
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TITLE: Neutron Activation Analysis

DESCRIPTION: See AO 882.

REMARKS: Part of Marking, Tracking & Identification Program.
See AO 563, Task 1.

650	0	0					\$131,000
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TITLE: VLF-HF PROPAGATION STUDIES

651	0	0	12/18/64	12/01/65	NBS	IN-HOUSE	\$35,000
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TITLE: Spectral Emissivity of H2O and CO2.

DESCRIPTION: Determination of spectral emissivity of H2O and CO2 in varying proportions at temperatures 500K to 2000K in 1.9 and 2.7 micron region.

RESULTS: Data published added to high resolution spectra needed for modeling.

REMARKS: PROG: BMD - Missile Phenomenology - Basic Measurements

652	0	0					\$90,000
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AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: RADIOLABELED SORPTION STUDIES ON AN ACTIVE ELECTRODE

653	0	0			\$10,000
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TITLE: SURVEYING THE SALMON SITE

654	0	0			\$10,000
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TITLE: BARGAINING AND NEGOTIATION

655	0	0			\$555,300
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TITLE: RESEARCH ON COMPUTER CONSTRUCTION

655	0	2	05/31/66 RCA-VICTOR MONT. NONR 4596(00)		\$75,000
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TITLE: Study of Seeded Plasmas.

DESCRIPTION: Development of equipment and conduction of experiments of (a) efficiency of various electron-attaching species in electron removal, (b) electrical probe and optical emission of active pure nitrogen and nitrogen seeded with SF/6 under supersonic and subsonic flow conditions.

REMARKS: PROG: BMD - General research.

Extension of AO 322, Amend. 3. Funds provided by AO 322, Amend. 3.

656	0	0			\$75,565
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TITLE: INVST. SPECTRA, STRCT. RCTS. OF SIMPLER NF & OF BONDED MOLC.

657	0	0			\$55,400
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TITLE: DEVELOP A LANGUAGE FOR USE WITH A REACTIVE TYPEWRITER

658	0	0			\$3,000
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TITLE: GRANT TO PROF. WM. J. GEDNEY STUDY OF THAI SPEAKING PEOPLES

659	0	0			\$227,700
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TITLE: LIGHTNING RESEARCH AT NMIMT

660	0	0	01/01/65 08/01/67 NRL		\$1,950,000
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TITLE: LASER RESEARCH PROGRAM

661	0	0			\$700,000
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TITLE: BALLISTIC MISSILE RADAR DATA

662	0	0			\$251,800
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TITLE: OPERATIONS ANALYSIS IN THE FIELD OF COMMUNICATIONS

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
662	4	0			BOOZ ALLEN	DA31124ARO D404	\$202,000

TITLE: Village Alarm System -- Thailand.

DESCRIPTION: This program examined the operational requirements for a Village Alarm System, the technical characteristics required for equipment for a VAS, the effects of the physical environment upon the design of a radio-based Village Alarm System and proposed a concept Village Alarm System using commercial components.

RESULTS: Substantiating data were collected including a summary of the physical and cultural geography of Changwad Nakhon Phanom, the prototype province. Appropriate reference tables for computing technical requirements for a Very High Frequency (VHF) radio alarm system were furnished.

REMARKS: AGILE - COMMUNICATIONS

REF: "A Village Alarm System for Thailand (U)," Phase I, Booz-Allen Applied Research, Inc., Washington, D.C., 3/31/69 (PA 36,659).
"A Village Alarm System for Thailand (U)," Phase II, Booz-Allen Applied Research, Inc., Washington, D.C., 3/31/69 (PA 36,661).

663	0	0					\$200,000
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TITLE: NUCLEAR EFFECTS ON ADAR

664	0	0					\$179,300
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TITLE: EMP DATA SUMMARY PROGRAM

665	0	0					\$91,150
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TITLE: MISSILE PHENOMENOLOGY

665	0	1	08/15/66	N.A.AVIATION	NONR 4623(00)		\$40,000
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TITLE: Theoretical Study of Optical Radiative Properties of Gases.

DESCRIPTION: (1) Determination of more reliable values of Franck-Condon and r-centroid factors solving the Schrodinger Equation for molecular potentials.
(2) Determination of spectral absorption coefficients of electronic transistors in diatomic hydrides.

REMARKS: Continuation of AO 322. (Funds were provided by AO 322, and 3.

665	0	2	06/01/65	05/01/66	RCA-VICTOR CAN.	NONR 4596(00)	\$75,000
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TITLE: Study of Seeded Plasmas

DESCRIPTION: Development of equipment and conduction of experiments of (a) Efficiency of various electron-attaching species in electron removal. (b) Electrical probe and optical emission of active pure nitrogen and nitrogen seeded with SF₆ under supersonic and subsonic flow conditions

REMARKS: PROG: BMD - General Research

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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Extension of AO 322, Amend. 3.
Funds provided by AO 322, Amend. 3.

665	0	3	06/30/67 CORNELL AERONAU.	NONR 3960(00)	\$60,000
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TITLE: Recombination Rates and Collision Cross Sections.

DESCRIPTION: A study of recombination rates and collision cross sections with emphasis on nonequilibrium ionization in expanding flows, in the structure of strong shock waves and in plasma boundary layers.

REMARKS: PROG: BMD - General research.
Continuation AO 322, Amend. 3. AO 665 T3 was merged into AO 665 T5.
Fund provided by AO 322, Amend. 3.

665	0	4	GE	NONR-4869(00)	\$120,000
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TITLE: Flow Field Around Arbitrary Slender Pointed Cone - Computer Program.

DESCRIPTION: The development of a computer program for determining the non-diabetic compressible, axisymmetric, viscous flow field around an arbitrary slender pointed cone, for an ideal gas, and high Reynolds number, utilizing the complete time-dependent Navier-Stokes equations.

REMARKS: PROG: BMD - Missile Phenomenology - Flow Field Slender Cone.

665	0	5	04/24/65 06/30/67 CAL	NONR-3960(00)	\$165,150
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TITLE: Study of Thermal Plasmas Associated with Hypersonic Re-Entry.

DESCRIPTION: Experimental measurements and theoretical analyses on the physical and chemical properties of hypersonic air flows about re-entry vehicles. Specifically experimental measurements of radiation associated with NO2 and experiments to investigate the mechanism and rates of electronic excitation and relaxation of diatomic molecules of air.

REMARKS: PROG: BMD - Missile Phenomenology - Physical and Chemical Properties of Hypersonic Flow.

666	0	0			\$1,500
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TITLE: CCMRD SAMPLING STUDIES

667	0	0			\$25,000
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TITLE: FILM-ENGINEERS CAN RETRIEVE INFORMATION

668	0	0	06/30/65 07/01/68 SYLVANIA ELEC PR	DA01021AMC12640(Z)	\$19,681,000
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TITLE: PRESS UHF/VHF RADAR - ALTAIR

DESCRIPTION: Sylvania acted as the prime contractor on the design, development and installation of the UHF/VHF radar (ALTAIR) at Roi-Namur in support of Project PRESS.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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RESULTS: Radar was designed, developed and installed for acceptance test in 1968.
It served as the primary UHF/VHF radar for obtaining re-entry signatures.

REMARKS: PROG: BMD - Missile Phenomenology - Re-entry Measurements - UHF/VHF.

669	0	0			\$500,000
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TITLE: HIT FEASIBILITY DEMONSTRATION

670	0	0			\$49,200
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TITLE: STUDY OF LASA SIGNAL PROCESSING

671	0	0			\$42,221
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TITLE: JANAF THERMOCHEMICAL TABLES

672	0	0	04/01/67 GEORGIA TECH.	DA36039AMC03759(E)	\$46,363
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TITLE: BIBLIOGRAPHY OF RADAR REFLECTION CHARACTERISTICS

DESCRIPTION: The amendment of the "Bibliography of Radar Reflection Characteristics" to include missiles and space vehicles of interest to ballistic missile defense.

REMARKS: PROG: BMD - Techniques and Devices - Radar.

673	0	0	03/01/65 07/30/67 EDGEWOOD ARS.		\$234,000
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TITLE: LIGHTWEIGHT MAN PORTABLE FLAMETHROWER

DESCRIPTION: The objective of this effort was to provide at least 20 E36-7 Portable Flamethrowers (modified standard M9-7) for operational evaluation Vietnam.

RESULTS: The test flamethrower compared favorably with the M9-7 and the M2A1-7 with respect to safety and functional performance and was superior with respect to refueling and recharging time and was also more portable.

REMARKS: AGILE - FLAME WEAPONS

REF: "Development Report of the E36-32R2 and E36R1-M7 Portable Flamethrowers, Including the E15 Supply Kit," for the period 1965 March - 1967 July.
Alter, Frederic W., Department of the Army, Edgewood Arsenal, Weapons Development and Engineering Laboratories, Ground Munitions Laboratory, Edgewood Arsenal, Maryland, Report No. EATR-4168, 2/68 (PA 32,423).

674	0	0			\$1,500,000
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TITLE: OPTICAL SYSTEMS STUDIES FOR TERMINAL DEFENSE

675	0	0			\$370,000
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TITLE: LASER RESEARCH

676	0	0			\$500,000
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: LASER SYSTEMS ANALYSES

676	0	1	08/23/65	01/31/67	HAC-SSD	AF29(601)-7051	\$0
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677	0	0					\$160,610
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TITLE: ADVANCED SENSORS-ITEK AND AMERICAN OPTICAL

678	0	0					\$110,000
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TITLE: AIR FLUORESCENCE DETECTION

679	0	0					\$600,000
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TITLE: Development of Negative Grid Power Amplifier for Penetration Aid Jammer.

DESCRIPTION: The development of a compact, lightweight CW broadband, negative-grid amplifier in the kilowatt range for use with penetration and jammers.

REMARKS: PROG: BMD - Pen Aids - Radar Jammers - Amplifiers.

679	0	1				SEE AO 679, T4.	\$0
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679	0	2				SEE AO 679, T 10.	\$0
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679	0	3	11/01/65	10/31/68	GE	DA28043AMC01719(E)	\$321,800
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TITLE: High Current Density, Short Life Cathodes for Linear Beam Tubes for Pen Aid Jammers.

DESCRIPTION: The development of cathodes for linear beam tubes that can provide 30A./cm/2 for a duration of three minutes.

REMARKS: PROG: BMD - Penetration Aids - Jammer - Cathodes

679	0	4	02/08/66	05/07/69	GE	DA28043AMC02033(E)	\$391,100
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679	0	5	02/10/66	02/09/68	RAYTHEON	DA28043AMC02032(E)	\$233,500
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679	0	6	06/10/67	12/09/68	WATKINS-JOHNSON	DAAB07-67-C-0513	\$150,000
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TITLE: High Efficiency Traveling - Wave Tubes

DESCRIPTION: Investigation of the mechanisms limiting the efficiency of traveling wave tubes and means of overcoming them; computer design optimization for high efficiency and experimental verification of the design.

RESULTS: A design of a TWT having 50% efficiency was achieved.

REMARKS: PROG: BMD - Penetration Aids - Jammers - Tubes

679	0	7	08/15/67	06/30/69	SFD LABS	DAAB07-68-C-0159	\$623,000
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
679	0	8					\$0
679	0	9					\$0
679	0	10	12/01/65	11/30/68	RAY	DA28043AMC01848(E)	\$594,200
679	0	11	02/10/66	02/09/68	RAYTHEON	DA28043AMC02032(E)	\$233,500

TITLE: Distributed Ferrite Research

DESCRIPTION: Application of distributive ferrites to improved gain and bandwidth in CFA and oscillators.

REMARKS: PROG: BMD - Penetration Aid - Ferrites.

680	0	0					\$150,000
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TITLE: LIQUID AMMONIA BATTERIES

681	0	0					\$62,000
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TITLE: COUNTERINSURGENCY GAME DESIGN FEASIBILITY & EVALUATION STUDY

681	3	0			ABT ASSOC.	DA490830SA3244	\$19,000
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TITLE: A Research Design and Feasibility Determination of Social Science Field Research in Thailand.

DESCRIPTION: A pilot study and on-site survey was conducted to establish a plan for a feasible social science field research project in Northeast Thailand Villages.

RESULTS: Interviews were conducted in Bangkok and Northeast Thailand with about 50 knowledgeable persons, military and civilian, concerning the study feasibility. A preliminary research plan resulted from this study.

REMARKS: AGILE - ENVIRONMENT

REF: "Pilot Study and Feasibility Determination of Social Science Field Research in Thai Villages," ABT Associates, Inc., Cambridge, Massachusetts, 8/31/66 (PA 23,745).

682	0	0					\$250,000
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TITLE: PHASE II OF USER NEED STUDY

683	0	0	06/25/65	08/01/66	CHRYSLER CORP.	DA01021AMC12187(2)	\$0
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TITLE: Redstone Missiles for ARPA Flight Test Programs.

DESCRIPTION: The refurbishment, storage and delivery of Redstone missiles. Also, ground support of launch operations, plus post-flight analysis for flights of ALBIS and SPARTA.

REMARKS: PROG: BMD - Missile Phenomenology - Launch Vehicles.

REF: "Project DAT 371. Refurbishment of Redstone Missiles and GSE

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TR-DAT-1-66, AD 487 621L."

"Inventory and Shipment of Selected Redstone Material," TR-DAT-2-66, 7/1/66.

Also contract DA-01-021-AMC-12668(Z).

684	0	0			\$86,482
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TITLE: RADIATION DETECTION DEVICES

685	0	0			\$27,383
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TITLE: DETECTION OF SUBSURFACE ANOMALIES

686	0	0	12/06/65	BUNKER RAMO	AF086355520	\$424,000
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TITLE: Landing and Drop Zone

DESCRIPTION: The objectives of this program were to develop and fabricate three airborne interrogator/receivers with ancillary aircraft instrumentation and 10 beacon transponders with a voice modulation capability.

RESULTS: Installation on the C-123, B-26, and A1E aircraft was investigated.

REMARKS: REF: "Project Peace Pipe," Monthly Progress Reports No. 12 - No. 13, for the period 1966 November 1 - 1967 January 1. Bunker-Ramo Corporation. Prepared for Department of the Air Force, Headquarters 1st Combat Applications Group (TAC), Eglin Air Force Base, Florida, 2/08/67 (PA 26,168).

687	0	0			\$95,000
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TITLE: ISOLATING THE GUERRILLA (HERO)

688	0	0	06/01/65	03/30/69	SOUTHWEST RES.	DAAK267C0625	\$306,000
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TITLE: Magneto Absorption Mine Detector.

DESCRIPTION: The objective of this program was to design, develop, and test a detector for buried nonmetallic objects using magnetoabsorption detection.

RESULTS: As a result of this work, detection heads were designed, constructed, and tested which gave essentially equivalent signals from both magnetoabsorption and direct induction outputs.

REMARKS: DEFENDER - DETECTION

REF: "Hidden Object Detection by Magnetoabsorption and Direct Induction Techniques (U)," Final Report, for the period 1967 June 30 - 1969 March 30. (b)(6) Southwest Research Institute, 10/23/69.

689	0	0		SCOPE INC.	DAHC1567C0087	\$411,000
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TITLE: Find and Tell

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: Classified

RESULTS: Classified

REMARKS: DEFENDER - DETECTION

REF: "Audio Countermeasures Development (U)," Final Report. Scope, Inc.
Contract No. SD-305, ARPA Order No. 689, SECRET.

690	0	0			\$88,710
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TITLE: DETECTION AND NULLIFICATION TECHS.

691	0	0			\$645,000
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TITLE: GRAPHIC CONTROL AND DISPLAY PROCESS

692	0	0			\$200,000
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TITLE: BULK SEMICONDUCTOR MICROWAVE GENERATION

692	0	1	12/31/68 IBM CORP.	DA28043AMC01550(E)	\$368,000
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TITLE: Bulk Semi-Conductor Microwave Generation.

DESCRIPTION: Experimental and theoretical program on the materials and physical construction of semi-conductor devices for high power, large bandwidth microwave pulse and CW power generation.

REMARKS: PROG: BMD - Techniques & Devices - Radar - High Powered Tube and Devices.

692	0	2	10/01/65 01/31/68 HEWLETT-PACKARD	DA28043AMC01758(E)	\$266,000
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TITLE: Gunn Effect Devices.

DESCRIPTION: Theoretical and experimental program to establish design procedures and develop practical microwave devices, oscillators and amplifiers using the "Gunn Effect."

REMARKS: PROG: BMD - Technique and Devices - Radar - High Power Tubes and Components.

692	0	3	SYLVANIA ELEC.	DAAB0767-C-0671	\$300,000
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TITLE: Microwave Generation from Avalanche-Transit Time Diodes.

DESCRIPTION: To design and develop microwave avalanche diode oscillators and amplifiers, and to investigate techniques for paralleling such devices on a single substrate.

RESULTS: A 1 watt CW X-band oscillator having 10% efficiency, a 6 watt CW X-band parallel oscillator, and several high gain broadband amplifiers at X-band were developed. The effort was important in developing the data base for solid state array radars.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - Techniques & Devices - Radar - High Power Tubes and Components.
REF: "Microwave Generation from Avalanche Transit Time Diodes," ECOM-0671F.

692	0	21	01/25/68 HEWLETT-PACKARD	DA28043AMC01758(E)	\$266,000
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TITLE: Gunn Effect Devices.

DESCRIPTION: Theoretical and experimental program to establish design procedures and develop practical microwave devices, oscillators and amplifiers using the "Gunn Effect."

REMARKS: PROG: BMD - Techniques & Devices - Radar - High Power Tubes and Components.

693	0	0			\$260,000
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TITLE: ECM ANTENNA PERFORMANCE

693	0	1	07/15/65 07/15/66 SPERRY	AF19(628)-5531	\$169,500
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TITLE: Re-Entry Plasma Effects on ECM Antenna Performance.

DESCRIPTION: Analytical study of plasma effects on antenna pattern and impedance; design of antennas to operate in plasma environment; evaluation of antenna/transmitter combination against postulated threat; and experimental evaluation of antennas.

RESULTS: A defense system threat was postulated, antenna requirements for a re-entry ECM system were developed and its maximum theoretical capability for power and bandwidth were developed. This analyses showed that the power handling capabilities seriously limited the ECM capability.

REMARKS: PROG: BMD - Penetration Aids - ECM Antennas
AO 693 Task 1 thru 6 are all related to ECM antennas.

693	0	2	07/16/65 07/19/66 RAY	AF19(628)-5519	\$82,460
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TITLE: Re-Entry Plasma Effects on ECM Antenna Performance

DESCRIPTION: The requirements for microwave antenna systems during re-entry were determined. Detailed design was made for a small ECM vehicle. Tests were performed on several antenna configurations.

RESULTS: Experimental tests showed that the VSWR increased to 4.5 due to the plasma sheath on slot antennas. High powers caused the plasma to be sustained and VSWR's of 7.5.

REMARKS: PROG: BMD - Penetration Aids - ECM Antennas
AO 693 Task 1 thru 6 are all related to ECM antennas.

693	0	3	04/01/67 04/01/68 GE	F19628-67-C210	\$110,000
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TITLE: Design Data for Re-Entry ECM Antenna Systems

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: To develop the data base for designing high-power transmitting antennas for re-entry jammers compatible slender-body vehicles.

RESULTS: Analysis showed that antenna breakdown was the most important and least understood problem.

REMARKS: PROG: BMD - Penetration Aids - ECM Antennas
AO 693 Task 1 thru 6 are all related to ECM antennas.

693	0	4	03/01/67	03/01/67	CAL	F19628-67-C-0189	\$77,000
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TITLE: Study of ECM Antenna Voltage Breakdown in a Shock Tube Tunnel.

DESCRIPTION: Experimental investigation of antenna breakdown as a function of power, pressure and type of modulation.

RESULTS: Antenna breakdown power versus pressure were obtained for CW and pulse RF antenna excitation.

REMARKS: PROG: BMD - Penetration Aids - ECM Antennas - Voltage Breakdown

693	0	5	06/01/67	06/01/68	LITTON	F19628-68-C-0001	\$100,000
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TITLE: Experimental Study of Microwave and VHF Jammer Antenna Characteristics

DESCRIPTION: Experimental investigation of jammer x-band slot antennas and VHF antennas mounted in nose cones of re-entry vehicles.

RESULTS: Patterns, power handling capabilities and impedance were determined for both cold gas and re-entry plasma conditions.

REMARKS: PROG: BMD - Penetration Aids - ECM Antennas

693	0	6			AFCL	IN HOUSE	\$23,000
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TITLE: ECM Antenna Performance - High Pressure Static Shear Test.

DESCRIPTION: Static shear tests on candidate metallic elements to 150K bar pressures and temperatures of 600 degree C.

REMARKS: PROG: BMD - Penetration Aids - ECM Antennas.

694	0	0			PAGE COMM.	DAAB0767C006	\$269,000
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694	0	1				SEE AO 694, T 3.	\$0
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694	0	2				SEE AO 694, T 4.	\$0
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694	0	3	04/01/65	02/09/66	MOTOROLA	DA28043AMC01228E	\$19,000
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694	0	4	06/15/67		RCA	DAAB0767CC-0536	\$51,000
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694	1	0				SEE AO694,AM.1,T1.	\$0
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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694	1	1	07/01/67	11/20/68	AIRBORNE INSTR.	DAAB0767C630	\$35,000
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695	0	0					\$200,000
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TITLE: BEAM-PLASMA HIGH POWER INTERACTIONS

695	0	1		12/15/68	SPERRY RAND RES.	DA28043AMC01821(E)	\$223,228
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TITLE: Investigation of High-Power Beam Plasma Interactions.

DESCRIPTION: Theoretical and experimental investigation of the fundamental process involved in transverse-wavebeam plasma interactions applicable to the design of plasma-generation systems.

REMARKS: PROG: BMD - Techniques & Devices - Radar - High Powered Tubes and Components.

695	0	2		02/28/69	STANFORD UNIV.	DA28043AMC02041(E)	\$266,181
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TITLE: Fast-Wave Transverse Beam Plasma Interaction.

DESCRIPTION: Theoretical and experimental investigation of the fundamental involved fast-wave transverse-wave beam plasma interaction applicable to the design of plasma-generation systems.

REMARKS: PROG: BMD - Techniques and Devices - Radar - High Powered Tubes & Components.

696	0	0					\$67,000
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TITLE: USE OF IBM M-44 COMPUTER

697	0	0					\$133,600
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TITLE: SOCIAL CHANGE AND COMMUNITY DEVELOPMENT

698	0	0					\$24,900
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TITLE: LAW ENFORCEMENT IN DEVELOPING NATIONS

699	0	0					\$459,100
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TITLE: CRYSTAL GROWTH AND ANALYSIS LAB

700	0	0					\$226,690
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TITLE: CRT-AIDED SEMIAUTOMATIC MATHEMATICS

701	0	0					\$98,000
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TITLE: DEVELOP SECURE TELEPHONE INSTRUMENT

702	0	0					\$1,100,000
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TITLE: MODIFICATIONS ON NIKE TARGET TRACK RADAR NO. 4

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
703	0	0		08/30/68	IN HOUSE		\$695,000

TITLE: Chemical Kinetics, Atomic and Molecular Studies.

DESCRIPTION: (a) Collection, evaluation and publication of laser, atomic, and molecular constants pertinent to Project DEFENDER. (b) Experimental studies of atomic and molecular transition probabilities, photo-detachment of electrons from negative ions, and experimental plasma rate coefficients. (c) Cross-beam scattering experiments.

REMARKS: PROG: BMD - General research in support of launch, mid-course and re-entry physics.

REF: (a) NBS National Standards Reference Data System NBS-4; (b) Miscellaneous Publication 278.

Task (b) and (c) were continuations of work initiated under AO 125.

704	0	0					\$34,000
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TITLE: DATA REDUCTION AND ANALYSIS PROGRAM

705	0	0					\$100,000
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TITLE: ECM POWER SOURCES

706	0	0	05/24/65	06/15/66	GEN. MOTORS DRL	DA49092AR0107	\$97,000
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TITLE: Evaluation of Counterinsurgency Mobility

DESCRIPTION: The purpose of this program was to examine and evaluate counterinsurgency mobility in relation to environment.

RESULTS: The use of a computer program and practical techniques for estimating the mobility of vehicles were examined, and comparative evaluations were performed for various vehicles in different environments.

REMARKS: AGILE - MOBILITY

REF: "Evaluation of Counterinsurgency Mobility in Relation to Environment," Final Report, for the period 1965 May 24 - 1966 June 15. (b)(6)
(b)(6) (et al.), GM Defense Research Laboratories, Santa Barbara, California, Report No. GM-DRL-TR-66-25, 6/66.

707	0	0	03/25/65		WESTERN ELEC.	DA030069-AMC333(Y)	\$2,147,496
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TITLE: Modification of NIKE Radar at Kwajalein Atoll.

DESCRIPTION: Modification of NIKE target track radar No 4 at Kwajalein Atoll with increased sensitivity and coherence.

REMARKS: PROG: BMD - Missile Phenomenology - Re-entry Measurements.

708	0	0					\$35,000
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: RVN DATA BASE SYSTEM

709	0	0			\$5,000,000
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TITLE: SPECIAL ICBM RE-ENTRY TESTS AT WOOMERA (SPARTA)

709	0	1	04/12/65 09/12/67 TRW	DA01021AMC13094(Z)	\$21,953,894
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TITLE: Special Re-Entry Tests at Woomera - Proj. SPARTA.

DESCRIPTION: Overall direction and participation in special re-entry vehicle tests at Woomera, Australia.

REMARKS: PROG: BMD - Missile Phenomenology - Re-Entry Tests.
See also AO 703 T2.

709	0	2	04/12/65 12/31/67 RCA	DA01021AMC13095(Z)	\$0
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TITLE: Special Re-Entry Test at Woomera - Proj. SPARTA

DESCRIPTION: Data analysis of special re-entry vehicle tests at Woomera, Australia - Project SPARTA.

REMARKS: PROG: BMD - Missile Phenomenology - Re-entry Tests.
See also AO 703 T1.

710	0	0			\$61,000
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TITLE: PROJECT CLOUD COVER

711	0	0			\$102,700
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TITLE: MASKER

712	0	0	ELECTRO OPT SYS	DAAE1567-C0030	\$620,000
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TITLE: Airborne Night Vision Eyeglass

DESCRIPTION: Development of a passive low light level night time motion stabilized imaging system. The output of the low level optical detector was displayed on a large cathode ray tube.

RESULTS: A helicopter borne system was demonstrated, in which the motion and vibration of the helicopter was balanced by varying the voltages on the deflection plates of the cathode ray tube. Thus, a reasonably stable image was presented to the observer. However, the equipment was large, and awkward to use.

REMARKS: PROG: TTO - Night Vision - Motion Stabilized Viewing System.
Farrand Optical Company was funded at \$83,000, under ARPA Order 712 to work on this program.

713	0	0	04/01/65 BU/Y&D		\$187,000
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: ADDITIONAL OFFICE SPACE ARECIBO IONOSPHERIC OBSERVATORY

DESCRIPTION: PROVIDED FOR THE CONSTRUCTION OF ADDITIONAL OFFICE SPACE AT THE ARECIBO IONOSPHERIC OBSERVATORY, PUERTO RICO.

RESULTS: OFFICE SPACE WAS COMPLETED IN 1967.

REMARKS: PROG: BMD - GENERAL RESEARCH ON THE IONOSPHERE IN SUPPORT OF LAUNCH, MID-COURSE AND REENTRY PHYSICS.

MISC: SEE ALSO AO106, A122 AND AO270.

714	0	0	04/02/65	MULTIPLE	MULTIPLE	\$3,428,000
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TITLE: Optical Equipment

DESCRIPTION: Grants to 28 universities to upgrade equipment for research in modern optics oriented for defense needs.

RESULTS: Many important research papers published and graduate level training.

REMARKS: PROG: BMD - Sensor/Optical Sciences.

715	0	0				\$100,000
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TITLE: EXPERIMENTAL COMMUNICATIONS LAB

716	0	0				\$512,100
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TITLE: CONVERSATIONAL USE OF COMPUTERS

717	0	0				\$68,500
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TITLE: CRYO-SURFACE AIR SAMPLERS

718	0	0				\$2,000,000
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TITLE: COMPOSITES (COUPLING PROGRAM)

719	0	0				\$2,746,445
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TITLE: COMPOSITES (COUPLING PROGRAM)

720	0	0				\$1,007,500
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TITLE: COMPOSITES (COUPLING PROGRAM)

721	0	0	04/01/65	03/01/66 GE/ TEMPO	SD-313	\$33,000
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TITLE: BALLISTIC MISSILE DEFENSE ENGAGEMENT MODELLING.

DESCRIPTION: A STUDY USING THE STEM (STRATEGIC ENGAGEMENT MODEL) TO EXAMINE AND EVALUATE THE OUTCOME OF STRATEGIC MISSILE EXCHANGES USING VARIOUS TERMINAL AND AREA DEFENSE COMBINATION.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - ALTHOUGH THIS WAS DONE UNDER GENERAL RESEARCH IT WAS REALLY
SYSTEM ANALYSIS.

REF: "STRATEGIC IMPLICATIONS OF BALLISTIC MISSILE DEFENSE (U)," FINAL REPORT
GE-TEMPO, 66 TMP-3, JUNR 40, 1966.(S)

722	0	0			\$98,540
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TITLE: TEST PLAN FOR BLUE ROCK EVENTS

723	0	0	07/19/66 SYLVANIA ELECTR.	AF30(602)-3886	\$101,000
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TITLE: Surface Wave Behavior in Phased Arrays.

DESCRIPTION: To determine causes, effects and techniques for controlling cumulative
coupling (surface waves) between elements in large, planar, phased arrays.

REMARKS: PROG: BMD - Techniques & Devices - Radar - Phased Arrays.

REF: "Surface Wave Behavior in Phased Arrays (U)", S66-12, RADC-TR-66-663,
November 1966.

724	0	0			\$0
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TITLE: PHYSICS MEASUREMENTS

REMARKS: CANCELLED

725	0	0			\$100,000
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TITLE: MINES AND MINE COUNTERMEASURES IN UNCONVENTIONAL WARFARE

726	0	0			\$65,000
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TITLE: THEORETICAL ANALYSIS & EXPT. MESTS. RELEVANT REMOTE SENSING

727	0	0			\$453,000
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TITLE: NUCLEAR INTERFERENCE STUDIES

728	0	0			\$18,825
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TITLE: EXTRAPOLATION OF SOCIAL SCIENCE TO INTERNAT'L ANALYSIS

729	0	0			\$98,750
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TITLE: SURFING MECHANISM INVT. SCI. & TECH. INFO. SYST. ANAL. ASST.

729	1	0	VEH RES. CORP.	N0001466C0369	\$97,000
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TITLE: Preliminary Experimental Investigation of the VRC Surfing Lift Mechanism for
High Speed Ocean Transport.

DESCRIPTION: Models were tested in the free surface water tunnel at the California
Institute of Technology; the models were mounted on a strain gage balance to

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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measure forces and moments, and a specially designed mount providing freedom in heave to more closely simulate actual operating conditions.

RESULTS: Preliminary test results at a Froude number of 3 provided lift to drag ratios for surfing in excess of 25, as compared to around 5 for planing.

REMARKS: AGILE - MOBILITY

REF: "Surfing Lift Mechanism for High Speed Ocean Transport," Quarterly Technical Summary Report No. 2. Vehicle Research Corporation, Pasadena, California, 12/31/66 (PA 26,069).

730	0	0			\$110,000
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TITLE: TECHNICAL INFORMATION SYSTEMS ANALYSIS ASSISTANCE

731	0	0			\$40,000
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TITLE: GEODETIC ACCURACY

732	0	0			\$3,000
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TITLE: TELEPHONE SUPPORT & OFFICE SUPPLIES FOR JASON SUMMER STUDIES

733	0	0	04/27/65 12/31/65 NAVAL MISSILE CR IN HOUSE		\$200,000
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TITLE: CORPORAL Missiles for ARPA Test Programs.

DESCRIPTION: Procurement of eight CORPORAL missiles and one set of ground support equipment. Refurbishment and launch in support of joint Navy-ARPA experiment DAT 371. Missiles were launched from Pt. Mugu.

RESULTS: Missiles were launched. Test objectives of DAT 371 experiment were met.

REMARKS: PROG: BMD - Navy-ARPA joint experiment.

734	0	0			\$112,840
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TITLE: ACOUSTIC SENSORS

735	0	0			\$40,300
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TITLE: HUSH I PROGRAM

736	0	0			\$1,262,000
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TITLE: COMPARATIVE RES. ON BEH. CHANGE IN DEVELOPING SOCIETIES

737	0	0			\$234,000
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TITLE: SOCIAL BASES OF STABLE RULE

738	0	0			\$206,800
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TITLE: ETHNOLOGY & ECOGY. LUA & S'KAW KAREN HILL PEOPLE OF NW THAIL

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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739	0	0					\$121,400
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TITLE: PHYSICS MEASUREMENTS

740	0	0					\$250,000
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TITLE: ENVIRONMENTAL DATA BASE FOR REGIONAL STUDIES IN HUMID TROPICS

741	0	0	06/15/65		LMSC	NOSP-65023	\$55,000
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TITLE: Bus Design For Delivery of Variety RV & Decoys For B-8 Upper Stage.

DESCRIPTION: The preliminary design and theoretical evaluation of bus for the delivery of various types of RV and decoys for the upper stage of B-8. The evaluation included the complete system concept with resultant delivery accuracy.

REMARKS: PROG: BMD - Penetration Aids - Bus Design.

742	0	0					\$40,000
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TITLE: RADIOLOGICAL DETECTION TECHNIQUES

743	0	0					\$196,450
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TITLE: INSTRUMENTATION SUPPORT FOR VEHICLE TESTING IN TROPICAL ENVMT.

744	0	0					\$1,000
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TITLE: ADVANCED ANGLE SENSOR

745	0	0					\$110,000
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TITLE: OPTICAL INSTRUMENTATION RESEARCH

746	0	0	06/01/66	06/01/67	UNIV. MICHIGAN	AF 33(615)-3588	\$200,000
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TITLE: LASER RADAR

DESCRIPTION: 1) DESIGN, CONSTRUCTION AND TEST OF AN OPTICAL LASER RADAR.
2) THEORETICAL ANALYSIS ON ULTIMATE POTENTIAL OF SOLID STATE LASERS FOR HIGH POWER CONTINUOUS PULSE OPERATION FOR LASER RADAR OPERATION.

747	0	0	06/30/65	04/30/66	GCA CORP.	AF40(600)-1095	\$200,000
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TITLE: Chemical Enhancement of Signals (CHESS)

DESCRIPTION: The enhancement of observables of a threat cloud by chemical means to air detection and discrimination.

REMARKS: PROG: BMD - Optical - Chemical Enhancement - Detection and Discrimination.

748	0	0					\$265,000
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: COUNTERINSURGENCY POLICY ISSUES

749	0	0					\$47,450
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TITLE: ANALYSIS OF LOW LATITUDE D AND E REG-

750	0	0					\$15,000
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TITLE: STUDIES OF POTENTIAL UNDERGROUND

751	0	0					\$251,900
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TITLE: PROGRAM IN ATMOSPHERIC ACOUSTICS

752	0	0					\$100,000
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TITLE: SALARIES & CERTAIN EXP. OF OVERSEAS UNITS-PROJECT AGILE

753	0	0	01/01/66	09/01/67	IBM	F3361567C1642	\$339,000
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TITLE: Radio Frequency Space Mirror

DESCRIPTION: Exploration of techniques for the repetition of complex radar signals to simulate echoing targets at ranges and angles different from repeaters or other decoys as a pen aid device.

RESULTS: System was derived theoretically and confirmed by laboratory experiments to generate the desired false signals.

REMARKS: PROG: BMD - Penetration Aids - Radio Frequency Space Mirror
Some initial programs in penetration aids were done under E20 prior to the formation of the PC code E50.
Continuation of AF 33 (615)-3552.

754	0	0			SANDIA LAB	AT/29 1/789	\$2,537,000
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TITLE: SEISMIC DETECTORS

DESCRIPTION: Development of seismic detectors, which could detect individual infiltrators coming down a trail, or trucks coming down a road or a trail. The individual seismic detectors then emitted coded radio frequency signals, which thus identified the present position of the infiltrator or truck.

RESULTS: Many Patrol Seismic Intrusion Detectors (PSIDs), in sets of four, were provided to our patrols in Vietnam. The Defense Communications Planning Group purchased over one billion dollars of such Sandia developed seismic detection systems for interdicting truck traffic on the Ho Chi Minh Trail.

REMARKS: REF: "Seismic Sensors (U)," CONFIDENTIAL. (b)(6) Sandia Laboratories, Albuquerque, New Mexico. Journal of Defense Research, Vol. 18, No. 3, pp. 273-279 (1969 Fall) (PA 37,219.3).
PROG: TTD - Reconnaissance and Surveillance - Border Control - Counter-Insurgency.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
754	0	1			SANDIA		\$81,000

TITLE: Patrol Locator System Feasibility.

DESCRIPTION: Sandia Corporation proposed a Remote Transponder System using Distance Measuring Equipment (DME) as a possible means of accurately determining the position of field personnel operating in hostile territory.

RESULTS: During a field demonstration of the concept, remote transponders were located to an accuracy of plus or minus 50 meters.

REMARKS: AGILE - POSITION LOCATION

REF: "Remote Transponder Locating System," Development Report. (b)(6)
 (b)(6) Sandia Laboratories, Albuquerque, New Mexico,
 Report No. SC-DR-68-540, 9/68 (PA 33, 876).
 Additional work performed under AO 1399.

755	0	0					\$150,000
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TITLE: HIGH ALTITUDES TETHERED BALLOON RES.

756	0	0					\$160,000
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TITLE: HIGH ALTITUDES TETHERED BALLOON RES.

757	0	0					\$10,000
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TITLE: LOW LEVEL RADIATION EQUIPMENT EXPERIMENTS

758	0	0					\$147,000
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TITLE: METHODS FOR ACHIEVING PHYSICAL SECURITY IN ROOMS

759	0	0					\$6,000
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TITLE: EQUIPMENT FOR USGS

760	0	0			AM. UNIV.	DA49083-OSA3068	\$10,000
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TITLE: Rural Pacification in Vietnam

DESCRIPTION: This program involved the description and analysis of the rural pacification program in South Vietnam in the 1962-1965 time frame.

RESULTS: A detailed treatment of this topic was achieved, and a model was suggested which would enhance program implementation through the application of the Program Evaluation and Review Technique (PERT) to the management problems involved in pacification.

REMARKS: AGILE - ENVIRONMENT

REF: "Rural Pacification in Vietnam: 1962-1965," Doctoral Thesis.
 (b)(6) The American University, Washington, D.C.,
 5/66 (PA 24,585).

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
761	0	0			IRSAC	DAARO4909266G117	\$72,000

TITLE: Disease Vectors & Reservoirs - Central Africa

DESCRIPTION: DARPA funding for a basic study of disease vectors.

RESULTS: Survey results published and circulated widely in U.S. and international health community.

REMARKS: See remark under AO 580.

761	0	1			UNIVERSITY ASSOC	DAHC49092AR0130	\$166,000
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TITLE: World Distribution of Infection

DESCRIPTION: DARPA's share of funding for a multi-funded study.

RESULTS: Study published and circulated widely in U.S. and international health communities.

REMARKS: See remark under AO 580.

762	0	0					\$1,018
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TITLE: TRANSPORTING 50 PARTICIPANTS OF UCLA SUMMER STUDIES

763	0	0					\$390,000
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TITLE: METEOR & METEORITE

764	0	0	12/30/65	05/01/69	BELL AERO SYS.	DA23204AMC03712T	\$3,034,000
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TITLE: Jet Belt Individual Lift Device.

DESCRIPTION: Lift device for individual soldiers to provide airborne mobility for several hundred yards.

RESULTS: Using a Williams WR-19 jet engine, with thrust channeled through two nozzles, the device was flown distances of up to 860 feet at speeds of 60 mph and altitudes of 80 feet. Eventual range was estimated at 10 miles. These devices were never procured because of the easy targetability of the airborne soldiers.

REMARKS: AGILE - DEVICES - MOBILITY

REF: "Individual Lift Device," Report No. 39, Bell Astrosystems, Buffalo, New York, 4/25/69.

764	0	1					\$2,010,000
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TITLE: Jet Belt

DESCRIPTION: Individual lift device for individual soldiers, to provide airborne mobility for several hundred yards.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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RESULTS: Trained contractor operator flew several hundred yards. Gen. Westmoreland, COMUSMACV, requested that a number of jet belts be procured. They never were, as a slow, low flying soldier would be an easy target for snipers. Fliers hands required to control system, so he could not aim or shoot rifle while in the air.

REMARKS: PROG: TTO - Mobility - Airborne - Individual Soldier.

765	0	0			\$2,469,000
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TITLE: PROJECT PRESTAGE

766	0	0			\$78,000
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TITLE: CATHODE RAY TUBE CONSOLE

767	0	0			\$89,000
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TITLE: INVT. SEISMIC TECH. LOC. & DELINEATING UNDGRND NUC. EXPL. CAV

768	0	0			\$0
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TITLE: See AO 768, Task 2.

768	0	1	12/01/65 11/01/66 MONSANTO RSCH.	AF33(615)-3463	\$150,000
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TITLE: Effects of Chemical Composition on the Observability of Ablating Polymers of Heat Shields.

DESCRIPTION: The laboratory investigation of various candidate heat shield materials having reduced optical and radar observable characteristics.

RESULTS: Measurements techniques for electron density and optical emission of polymers under ablative conditions were developed. Various polymers were studied experimentally to select low observable material.

REMARKS: PROG: BMD - Penetration Aids - Heat Shield Materials.

REF: "Effects of Chemical Composition on the Observability of Ablative Polymers" (U), by (b)(6) AFML-TR-66-216, AD 488 212L, 8/1/66 and second report same name and authors 2/1/67
See also AO 553, T6; DA-31-124-ARO(D)-279; also under AF33(615)-3574.

768	0	2	01/01/66 04/01/67 AVCO	AF33(615)-3574	\$475,000
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TITLE: Heat Shield Materials for the Control of RV Observables.

DESCRIPTION: To design, develop and evaluate new heat shield materials capable of enhancing or reducing radar or optical observables.

REMARKS: PROG: BMD - Penetration Aids - Heat Shield Materials and Seeding.

769	0	0			\$170,000
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: RESEARCH IN REMOTE MONITORING

770	0	0	06/01/66	06/01/68	AVCO	AF 29(601)-7177	\$600,000
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TITLE: Dynamic Interaction of Nose Cones Penetrating Dense Media.

DESCRIPTION: An experimental measurement program to determine the dynamics of vehicles penetrating concrete and secondarily penetrating earth.

REMARKS: PROG: BMD - Penetration Aids - Concrete/Earth Penetration Dynamics
See also AO 771.

771	0	0	10/01/65	10/01/66	NOL	IN HOUSE	\$200,000
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TITLE: Study of RV Penetration into Concrete.

DESCRIPTION: An experimental investigation of the penetration of nose cones into concrete as a function of nose cone shape, penetration angle and velocity.

RESULTS: Six different shaped nose cones were evaluated in 20 experimental tests.
Results are given in above DTIC references.

REMARKS: PROG: BMD - Penetration Aids - Concrete Penetration.
See also AO 770.

772	0	0					\$70,525
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TITLE: CABLED OCEAN-BOTTOM SYSTEM STUDY

773	0	0					\$2,346,000
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TITLE: IPT-CCR

774	0	0			U. OF MICHIGAN	DA44009AMC1494T	\$1,138,000
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TITLE: Night Vision Laboratory and Counterinsurgency Night Vision Center.

DESCRIPTION: The objective of this program was to establish and operate a center for the study and evaluation and to conduct research related to the enhancement of night vision aids for counterinsurgency ground forces.

RESULTS: During this program several night vision devices and techniques were studied and evaluated. The work included a year long vision survey of the Middle East population in conjunction with the American University in Beirut.

REMARKS: AGILE - DETECTION

REF: "Night Vision Aids for Counterinsurgency (U)," Final Report, for the period 1968 March 3 - 1969 March 2. Infrared Physics Laboratory, Willow Run Laboratories, Institute of Science and Technology, The University of Michigan, Ann Arbor, Michigan, Report No. 7919-43-F, 9/69 (PA 36,342).

774	0	1			U. OF MICHIGAN	DA44009AMC1494T	\$25,000
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: Scotopic Vision.

DESCRIPTION: The objective of this program was to study scotopic and photopic vision and dark adaptation of observers. The study was to provide basic information for design and use of night vision devices.

RESULTS: The study resulted in the development of a visual testing technique and useful data for night vision research and development.

REMARKS: AGILE - DETECTION

REF: "Some Tests of Night and Day Vision," (b)(6) Infrared Physics Laboratory, Willow Run Laboratories, Institute of Science and Technology, The University of Michigan, Ann Arbor, Michigan, Report No. 7919-32-T, 11/68 (PA 34,604).

774	0	2	AMER U. BEIRUT	DAJA3769-C1316	\$25,000
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TITLE: Scotopic Vision Study

DESCRIPTION: A team of ophthalmologists measured the visual acuity of the patients who came to the eye clinic of the American University in Beirut, Lebanon, to determine if there were any difference in the dark adapted eyes between Europeans and Arabs, and between people living at sea level and those living about 5000 feet above sea level.

RESULTS: No differences in scotopic visual acuity were found, based on ethnic background or altitude of residence.

REMARKS: PROG: TIO - Vision Studies - Dark Adapted Eyesight.

775	0	0			\$620,000
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TITLE: REMOTE VIDEO CONSOLES WITH CENTRALIZED VISUAL DATA PROCESSING

776	0	0			\$126,500
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TITLE: STUDY OF TRACER TECHNIQUES

777	0	0			\$150,000
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TITLE: ADVANCED TURBO-ALTERNATOR POWER SYSTEMS

778	0	0			\$188,000
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TITLE: VELA ON-SITE INSPECTION FIELD EXERCISES

779	0	0			\$500,000
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TITLE: FEASIBILITY STUDY OF HIGH POWER JAMMERS

779	0	1	06/14/66 06/12/67 RAYTHEON	DA01021AMC15397(Z)	\$147,660
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TITLE: Feasibility Study of Active ECM Penetration Aids Concept (Project STAPLE).

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: A system study to evaluate the feasibility of an all ECM penetration aids payload operating in the exoatmospheric stand off mode for the 1967-1972 postulated threat.

RESULTS: Results of study showed it was a cost effective system compared to other types of pen aids.

REMARKS: PROG: BMD - Penetration Aids - System Study - Standoff ECM Payload.
See also AD-383 935; AD-380 379; AD-378 250.
See also AO 779 T2 for competing study and AO 779 T1 for cost effective comparison.

779	0	2	SPERRY	DA01021AMC15396(Z)	\$238,398
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TITLE: Feasibility Study of Active ECM Penetration Aids Concept (Project STAPLE).

DESCRIPTION: A system study to evaluate the feasibility of an all ECM penetration aid payload operating in the exoatmospheric stand off mode for the 1967-1972 postulated threat.

RESULTS: Results of the study showed it was a cost effective system compared to other types of penetration aids.

REMARKS: PROG: BMD - Penetration Aids - System Study - Standoff ECM Payload.
See also AD-376 966; see also AO 779 T1 for competing study and AO 779 T3 for cost effectiveness comparison.

779	0	3	05/16/67 08/16/67 GRC	DAAH0167C2026	\$62,400
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TITLE: Cost Effectiveness of Active ECM Penetration Aids Concept (Project STAPLE).

DESCRIPTION: To evaluate the cost effectiveness of the all ECM penetration aids stand off concept.

RESULTS: The study determined the cost as a function of boosters to achieve a specific ground damage of the two studies made by Raytheon (AO 779 T1) and Sperry (AO 779 T2).

REMARKS: PROG: BMD - Penetration Aids - System Study - Standoff ECM Payload.
See also AO 779 T 1 and AO 779 T2.

780	0	0	09/30/67 WESTERN ELECTRIC	DAAHC0167C0311	\$2,628,000
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TITLE: Discrimination Radar (DR) and Target Tracking Radar (TTR).

DESCRIPTION: Provided for operation and maintenance of discrimination radar (DR) and Target Tracking Radar (TTR) at the White Sands Missile Range.

REMARKS: PROG: BMD - Techniques & Devices - Radar - Discrimination Experiments.
Continuation of DA-30-069-AMC-333(Y). Funds include \$50,000 for AMICOM technical and administrative support.

781	0	0			\$5,000,000
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: ISEP FOR IRBM FIELD TEST MEASUREMENTS

782	0	0			\$58,500
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TITLE: SPECIAL SEISMIC MEASUREMENTS BY C&GS

783	0	0			\$32,200
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TITLE: ANTI MATERIAL AGENT

784	0	0			\$40,800
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TITLE: AERIAL OPERATIONAL SUPPORT, VELA-ON-SITE INSPECTION FIELD EXERCISE

785	0	0	A.A.I.		\$168,000
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TITLE: Defense Mechanism (CDM-1A) Claymorette Counterambush Weapon System, Convoy.

DESCRIPTION: Five systems containing 2,392 munitions with mounts for 2 1/2 ton convoy trucks were shipped to Vietnam for operational evaluation in November, 1966.

RESULTS: The system was not acceptable for employment on wheeled vehicles in Vietnam because of tactical convoy movement procedures used at the time of system completion.

REMARKS: AGILE - WEAPONS - COUNTERAMBUSH

REF: "Claymorette Counter Ambush Weapon System (U)," Final Report, Department of the Army, Army Concept Team in Vietnam, APO San Francisco, California. ACTIV Project No. ACG-10F, 7/22/67 (PA 29,630).

785	0	1	LWL	IN HOUSE	\$168,000
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TITLE: Claymorette

DESCRIPTION: Develop and ship to Vietnam miniature Claymore mines which can be mounted on and fired from trucks without serious damage to said trucks. See AO 256, Task 7.

RESULTS: Claymorettes proved useful in convoy counter ambush defenses and by long-range patrols.

REMARKS: Part of counter ambush program.

786	0	0	GEN. ELECTRIC	DA20113AMC09225T	\$653,000
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TITLE: Quadruped Transporter

DESCRIPTION: In an attempt to create a vehicle which could travel over terrain too rough for even tracked vehicles, General Electric built a mechanical horse, each leg of which was independently controlled.

RESULTS: Lack of success in solving the locomotion problems with four independently controlled legs, over very rough terrain, caused termination of the program.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: TTD - Mobility - Land Locomotion.

REF: "Development of an Ambulating Quadruped Transporter," Mechanical Equipment Branch, Mechanical Technology Laboratory, Research and Development Center, General Electric Company, Schenectady, New York, 2/25/67, Joint Program, TARADCOM/ARPA.

787	0	0			\$867,000
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TITLE: HARD POINT SYSTEM REDEFINITION

788	0	0			\$2,005,000
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TITLE: PARALLEL PROCESSING

789	0	0	02/02/66 10/30/67 HSR	DA49092ARO131	\$431,000
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TITLE: Population Movement - RVN

DESCRIPTION: This program investigated refugee groups in RVN, their movement patterns in different regions, and their motivations and needs in order to identify those aspects of the refugee problem which are most significant for military and civil purposes.

RESULTS: The findings contributed to the efficient management of the refugee population in South Vietnam.

REMARKS: AGILE - ENVIRONMENT

REF: "The Refugee Situation in Dinh Tuong Province," Field Research Memorandum No. 6. (b)(6) Human Sciences Research Inc., McLean, Virginia, HSR-TN-67/2-Aa, 10/67 (PA 32,305).

790	0	0	ETHYL CORP.	DA18001AMC923X	\$20,000
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TITLE: Flame Projectors, Portable, One-Shot, Hand-Held, Expendable

DESCRIPTION: This program supplied 100 of the 1135 units that were constructed and delivered by the Ethyl Corp., Ferndale, Mich., to the U.S. Army Limited War Laboratory for testing and evaluation.

RESULTS: The flame projector employs pyrophoric fuel. The major components are a launcher and a canister, each equipped with fuzes, propellants, and safety interlocks.

REMARKS: AGILE - FLAME - WEAPONS

REF: "Flame Projector, Expendable, One-Shot (U)," Final Report. (b)(6)
(b)(6) Ethyl Corporation, Research Laboratories, Ferndale, Michigan. Prepared for U.S. Army Limited War Laboratory, Aberdeen Proving Ground, Maryland, LWL-CR-02C63, 6/68 (PA 33,926).

791	0	0			\$77,000
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TITLE: PROJECT PANDORA

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
792	0	0					\$115,000
TITLE: PROJECT PANDORA							
793	0	0					\$200,600
TITLE: GRANT FOR MAGNET FACILITY							
794	0	0					\$100,000
TITLE: OPTICAL TRANSMISSION EXPERIMENT							
795	0	0					\$43,600
TITLE: RADAR BLACKOUT DATA RETRIEVAL SEARCH							
796	0	0					\$300,000
TITLE: WIDE-BAND RECORDING TECHNIQUES							
797	0	0					\$18,700
TITLE: BIOLOGICAL EFFECTS OF MICROWAVE							
798	0	0			JOHNS HOP.U.APL	NDW620604C	\$135,000
TITLE: Tunnel Detection, Phase I							

DESCRIPTION: The Johns Hopkins University Applied Physics Laboratory modified a sonar system to try to develop a tunnel detector.

RESULTS: When inserted into the ground to make good acoustic contact with the earth, the system did detect the acoustic echoes from inhomogeneities in the soil. However, all inhomogeneities, such as rocks, large roots different types of soil all returned signals, causing a high "noise" level, also, good sonar contact was required, so explanation of a suspected area for tunnels was very

REMARKS: (Results con't) slow. The technique was abandoned, as not useful in S.Vietnam
REF: "Acoustic Detection of Underground Tunnels (U)," Task Q Report. Johns Hopkins University, Applied Physics Laboratory, Silver Spring, Maryland, Report No. QM-68-019, 5/68 (PA 33,186).

799	0	0	05/18/61	11/16/65	NOTS	IN-HOUSE	\$38,000
TITLE: HITAB							

DESCRIPTION: Target and background rocket probe measurements for launch phase (final funding).

RESULTS: Significant data obtained in launch phase and background data.

REMARKS: PROG: BMD - Missile Phenomenology - Measurements of Rocket Plumes/Background
See AO 243.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
800	0	0					\$655,000

TITLE: FUNDING FOR LASA PROGRAM OFFICE

801	0	0					\$10,000
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TITLE: PROJECT PANDORA

802	0	0			TRG-WEST, INC.	DA01021AMC14209(Z)	\$23,000
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TITLE: Calibration Satellite Cross Section Scattering Calculations.

DESCRIPTION: The calculation of the scattering cross sections of two and three dimensional bodies of calibration satellites.

REMARKS: PROG: BMD - Techniques & Devices - Radar - Calibration.

803	0	0	06/01/66	06/01/67	CONDUCTRON CORP	AF19 (628)-6149	\$200,000
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TITLE: RV Radar Cross Section Reduction by Impedance Loading.

DESCRIPTION: A theoretical and experimental program to investigate the feasibility of reducing the cross section of a cone sphere under various aspects and over a broad frequency range by impedance loading.

RESULTS: The RV cross section was successfully reduced in accordance with the theory.

REMARKS: PROG: BMD - Penetration Aids - RV Cross Section Reduction.

804	0	0					\$50,000
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TITLE: IMPROVE PACKAGING CONFIGURATIONS OF LARGE EXPLOSIVE CHARGES

805	0	0					\$200,000
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TITLE: ADAR BACK-UP PROGRAM

806	0	0					\$250,000
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TITLE: SRI WORK VIA NASA

807	0	0			AUTONETICS DIV.	AF33(615)-5244	\$250,000
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TITLE: Epitaxial Growth and Characterization of Single Crystal Ferromagnetic Garnets

DESCRIPTION: Research in the epitaxial growth and characterization of single-crystal ferromagnetic garnets in thin-film form for application to miniaturized microwave systems.

REMARKS: PROG: BMD - Techniques & Devices - Radar - High Powered Tubes and Components.

808	0	0					\$57,600
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TITLE: DETECTION OF SUB-SURFACE ANOMALIES

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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809	0	0					\$250,000
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TITLE: INVESTIGATION OF AIRBORNE TV TECHNIQUES

810	0	0	01/02/66	02/20/68	LOCKHEED ELEC.	DA2H043AMC01972E	\$475,000
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TITLE: Airborne Wire Detector (Helicopter Borne).

DESCRIPTION: The mines under the roads in Vietnam were detonated by Viet Cong, who closed the switch to detonate the mine from distances of 100 to 500 yards. Lockheed investigated an approach to determine if a helicopter mounted radio frequency system could locate the wires leading from the mine to the Viet Cong.

RESULTS: In flight tests, the system did detect wires from an altitude of 25 feet, and detected wire fences from several thousand feet. However, difficulties in balancing the rif detection system with the moving helicopter parts led to program termination.

REMARKS: PROG: TTO - Reconnaissance and Surveillance - Counter-Insurgency Warfare
REF: "Airborne Wire Detector (U)," Final Report, Phase I, for the period 1966 January - 1967 February. (b)(6)
Lockheed Electronics Company, Plainfield, New Jersey, 5/67 (PA 28,903).
Funding completed under AO 810, Amendments 1-4.

811	0	0					\$23,900
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TITLE: BEHAVIORAL SCIENCES RESEARCH

812	0	0		12/01/65	PENTAGON INHOUSE		\$11,000
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TITLE: COMPUTER TIME IN SUPPORT OF PROJECT DEFENDER

DESCRIPTION: PROVIDED FUNDS FOR THE PENTAGON'S IBM 7094 COMPUTER TIME IN SUPPORT OF PROJECT DEFENDER (BALLISTIC MISSILE DEFENSE) PROBLEMS.

REMARKS: PROG: BMD - GENERAL RESEARCH

813	0	0					\$495,100
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TITLE: MICROPOWER-ELECTRONICS

814	0	0					\$2,550,000
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TITLE: ISOTOPE FIELD SAMPLING

815	0	0	03/01/66	05/29/68	GRC	DA31124ARO-D437	\$548,000
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TITLE: Surveillance Systems Study PH II

DESCRIPTION: The purpose of this study was to analyze and model the airborne, night, real-time reconnaissance and strike operation, concentrating on the detection and subsequent destruction of man-sized targets.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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RESULTS: The study resulted in two separate computerized models - a strike model and a reconnaissance model.

REMARKS: AGILE - SURVEILLANCE

REF: "Computer Model for the Real-Time Night Reconnaissance/Strike Process" (U), Final Report, for the period 1967 September - 1968 April.

(b)(5) (et al.), General Research Corporation, Santa Barbara, California, 5/68 (PA 33,949).

816	0	0	CONDUCTRON	DA01021-AMC11003Z	\$2,683,000
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TITLE: Radar Recce Strike Dancing Dolls

DESCRIPTION: Under AO 816 Conductron initiated its effort to develop an airborne foliage penetration radar for detecting targets on the ground, under jungle canopy, in Vietnam.

RESULTS: This program was continued under AO 983. The program was terminated because of lack of success of Conductron in developing a satisfactory target detection system.

REMARKS: PROG: AGILE - Foliage Penetration Radar - Counter-Insurgency - Counter Infiltration.

817	0	0			\$19,120
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TITLE: A FORMAL ANALYSIS OF NATURAL ORAL VERBAL INTERACTION

818	0	0	USDA FS	IN HOUSE	\$1,332,000
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TITLE: Fire Research - Project EMOTE

DESCRIPTION: Determine optimum conditions for starting and maintaining a forest fire in a tropic environment. Collect, analyze and evaluate all environmental factors as they exist in South Vietnam.

RESULTS: Massive data collection and analysis carried out. Best situation scenario prepared.

REMARKS: At DDR&E insistence, ARPA carried out this effort. Since U.S. and RVN forces were continually at risk in Zone D and the Boiloi woods, a DoD decision was made to try to burn them down. USDA scenario was not hopeful, but PINK ROSE operation was launched. USAF dropped every incendiary in stock but was unable to get a forest fire started.

819	0	0	07/01/66 07/01/68 RCA	AF33(615)-5370	\$198,619
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TITLE: Integrated Wideband Ultra High Frequency Power Amplifier.

DESCRIPTION: Development of a 30 percent bandwidth UHF power amplifier (100 watts) at 400 MHZ using integrated multi-chip technology.

REMARKS: PROG: BMD - Penetration Aids - Wideband Amplifier.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REF: AFAL-TR-69-183.

820	0	0					\$200,000
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TITLE: ATMOSHERIC EFFECTS ON ELECTROMAGNETIC RAD.

821	0	0					\$100,600
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TITLE: PSYCHO-PHYSICAL EFFECTS OF NON-IONIZING RADIATION

822	0	0					\$90,000
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TITLE: MANSON HF RECEIVERS & SYNTHESIZERS for Missile Detection (MANSON RECEIVER)

DESCRIPTION: The development of a narrow-band, low noise receiver for use in forward-scatter path detection of Ionispheric disturbances caused by missile passage.

RESULTS: Reciever represented a state-of-the-art improvement over existing receivers. It was used in many research programs to establish the technology data base.

REMARKS: (1) BMD-OHD - Early Warning
(2) DTIC

823	0	0					\$98,700
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TITLE: ORS-III DATA REDUCTION

824	0	0					\$48,200
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TITLE: A GENERALIZED INSTRUCTIONAL LANGUAGE FOR COMPUTER-AIDED TEACHING

825	0	0	06/30/67	HRB SINGER	NONR479400		\$52,000
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TITLE: Communications Effectiveness

DESCRIPTION: This program was intended to develop, refine, and pilot test a descriptive model of communications effectiveness and produce data of practical value for the design and implementation of information programs in remote areas.

RESULTS: The program comprised four separate studies: the development of a rating scale for community development in the Philippines; the role of mass media in social change; the psychological impact of social change in the Philippines; and, communications effectiveness in developing countries.

REMARKS: AGILE - BEHAVIORAL

REF: "Communications Effectiveness in Developing Countries," for the period 1966 June 30 - 1967 June 30. (b)(6) (HRB-S); (b)(6) (b)(6) (PSU); (b)(6) (IPC). The Pennsylvania State University, University Park, Pennsylvania; Institute of Philippine Culture, Ateneo de Manila, Republic of the Philippines. HRB-Singer, Inc., State College, Pennsylvania, 6/30/67 (PA 30,440).

826	0	0	04/30/68	U. OF PITTSBURGH	DA31124AR(D)-440		\$555,000
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: Research on Atomic and Molecular Processes.

DESCRIPTION: Study of atomic and molecular processes associated with re-entry physics and nuclear environments in the upper atmosphere.

REMARKS: PROG: BMD - General research in support of launch, mid-course and re-entry physics. Also, this work contributed to understanding and simulating certain nuclear environments in the ionosphere.

827	0	0			\$1,799,000
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TITLE: RESEARCH IN INFORMATION PROCESSING BY CARNEGIE INST. OF TECH.

828	0	0	DTMB		\$3,000
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TITLE: Surfing Lift Theory

DESCRIPTION: The David W. Taylor Model Basin acted as Technical Consultant to Vehicle Research Corp., Pasadena, Calif., during the design, fabrication, and testing of the two-dimensional models of the Surfing Lift Mechanism for high speed ocean transports.

RESULTS: See AO 729

REMARKS: ARPA - MOBILITY
See AO 729, Amendment 1.

829	0	0			\$260,000
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TITLE: GRAPHICAL MAN-MACHINE COMMUNICATION

830	0	0			\$1,850,000
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TITLE: SYSTEMS ANALYSIS IN MISSILE DEFENSE

831	0	0			\$69,900
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TITLE: A THEORY OF SELECTIVE COMMUNICATION

832	0	0	AFBSD	IN HOUSE	\$100,000
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TITLE: Contractor Support of ARPA Tests.

DESCRIPTION: Funds for Aerospace personnel for their support to ARPA tests.

REMARKS: PROG: BMD - Tests - Aerospace personnel support funds.

833	0	0			\$92,800
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TITLE: INNOVATIONS IN THE MEASUREMENT OF HUMAN PERFORMANCE

834	0	0			\$81,000
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: BEHAVIORAL SCIENCES RESEARCH BARGAINING AND NEGOTIATION

835	0	0					\$100,500
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TITLE: STUDY OF DISPERSED HARD POINT DEFENSE

836	0	0					\$29,100
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TITLE: TRANSLATION & FIRST-STAGE FORMAL ANALYSIS OF NATURAL CONVS.

837	0	0		05/23/67	WESTINGHOUSE EL.	AF30(602)-4287	\$230,500
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TITLE: Optical Processor for Synthetic Spectrum Radar.

DESCRIPTION: The contractor provide test tapes from simulated point scatterers and experimental radar track data to be evaluated of Univ. of Michigan's optical processor.

REMARKS: PROG: BMD - Techniques and Devices - Radar.

REF: Final Report, "Optical Processor for Synthetic Spectrum Data (U)",
MDE 2142, May 1967, (U).

837	0	1		04/20/69	UNIV. OF MICH.	F3060267-C-0329	\$420,534
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TITLE: Optical Data Processing for Radar Satellite Object Identification.

DESCRIPTION: Research on optical data processing for use by ground radar to obtain two-dimensional imaging and cross range resolution of satellites.

REMARKS: PROG: BMD - Techniques and Devices - Radars.

REF: "Optical Data Processing for S01 Radar and Related Problems (U)",
First Semi-Annual Technical Report (April-Oct 1966), (b)(6)
(b)(6) 7995-B-P, March 1967 (S).

Extension of AF30(602)-4208.

838	0	0					\$450,000
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TITLE: LRL EVASION RESEARCH

839	0	0					\$47,000
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TITLE: SOCIO-ECONOMIC APPROACH TO POLITICAL INTEGRATION/THAI-ISLAM

840	0	0					\$5,000
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TITLE: DEFENSE DOCUMENTATION CENTER (DDC)

841	0	0					\$100,000
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TITLE: GROUND MOBILITY PROGRAM

842	0	0					\$769,000
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AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: Big Ear

DESCRIPTION: The objective of the program was to develop and evaluate a system capable of monitoring enemy activity and relaying realtime acoustic information from deployed microphones over a distance as large as 20 miles.

RESULTS: The program was terminated because of lack of Army interest.

REMARKS: REF: "Quarterly Project Status Report (U)." Combat Development and Test Center, Vietnam, Republic of Vietnam Armed Forces; Research and Development Field Unit, Vietnam, Advanced Research Projects Agency, 4/71 (PA 39,221).

843	0	0	05/03/67	STANFORD RES.	AF30(602)-4266	\$177,137
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TITLE: HF-UHF High Power Spark Transmitter

DESCRIPTION: (a) To develop an HF spark transmitter capable of 100-1000MW at 20 MHZ with a pulse length of one microsecond. (b) To develop a UHF spark transmitter having a 1MW peak power at 200 MHZ with a 50 nanosecond pulse.

REMARKS: PROG: BMD - Techniques & Devices - QHD Radar - Transmitters.

844	0	0		PLAN RES. CO.	DA31124AROD461	\$136,000
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TITLE: Vietnam Research Studies

DESCRIPTION: Under this program two studies were conducted to determine operational requirements in Vietnam. Task I was a study of warfare in the Plain of Reeds. Task II was a study of route security, the objective being to discover ways to secure land lines of communication so as to minimize the effects of Viet Cong.

RESULTS: Recommendations are related to the four functional areas of combat, these being firepower, reconnaissance intelligence, mobility, and command and control.

REMARKS: AGILE - ANALYSIS AND REQUIREMENTS

845	0	0	03/12/66 04/01/68	AVCO/MSD	AF04 (694)-936	\$675,000
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TITLE: Radar Target Concealment Program (RATCON II).

DESCRIPTION: Theoretical and experimental investigation of the feasibility of hiding RV's from long range radars using absorbing clouds.

RESULTS: Using unique cloud particles theoretical predictions and experimental tests showed the concept was feasible.

REMARKS: PROG: BMD - Penetration Aids - Radar Target Concealment.

846	0	0				\$60,500
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TITLE: INSTALLATION OF ACOUSTIC ARRAYS FOR RESEARCH

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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847	0	0					\$18,000
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TITLE: USGS LAKE SUPERIOR EXPERIMENT

848	0	0					\$200,000
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TITLE: BERYLLIUM FUNDAMENTALS

849	0	0					\$700,000
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TITLE: SYNTHETIC SPECTRUM SATELLITE OBSERVATIONS

850	0	0		09/30/69			\$104,000
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TITLE: Operations Analysis -- Naval Post Graduate School.

DESCRIPTION: This program was funded to provide support for faculty members and students at the Naval Post Graduate School to perform research into general systems studies in counterinsurgency.

RESULTS: Among the areas investigated were: tunnel detection; target modeling; project selection in developing countries; and, transportation systems.

REMARKS: AGILE - ANALYSIS AND REQUIREMENTS

851	0	0	02/24/66	10/01/66	GATES		\$150,000
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TITLE: PROCUREMENT OF HF TRANSMITTERS AND DRIVERS

DESCRIPTION: THE PROCUREMENT OF FOUR MODIFIED HFL-20,000X TRANSMITTERS AND M6525 DRIVERS FOR USE IN EXPERIMENTAL OVER-THE-HORIZON DETECTION PROGRAM.

RESULTS: TRANSMITTERS WERE PROCURED AND USED ON SEVERAL EXPERIMENT PROGRAMS INCLUDING REENTRY MEASUREMENTS, AURORAL STUDIES, AND SURFACE WAVE STUDIES.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - OTH DETECTION PROGRAM.

852	0	0					\$131,500
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TITLE: INSTITUTIONAL OBSTACLES TO INDUSTRIAL DEVELOPMENT IN PERU

853	0	0					\$2,225,000
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TITLE: FIELD TEST PROGRAM

854	0	0	11/01/70		NRL	IN HOUSE	\$225,000
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TITLE: NON-NUCLEAR KILL - HYPERVELOCITY FIELD TEST PROGRAM

REMARKS: PROG: BMD - KILL MECHANISMS - HYPERVELOCITY IMPACT.

855	0	0					\$334,000
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: IMPACT OF MODERNIZATION IN THE PHILIPPINES

856	0	0					\$12,200
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TITLE: APPLICATIONS OF THE THEORY OF GAMES IN BEHAVIORAL SCIENCES

857	0	0					\$78,600
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TITLE: TERMINATION OF INTERNAL REVOLUTIONARY CONFLICT

858	0	0					\$248,852
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TITLE: CROSS-CULTURAL RESEARCH ON NON-VERBAL COMMUNICATION

859	0	0					\$300,000
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TITLE: PROJECT BARREL QUICK FIX

860	0	0					\$606,300
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TITLE: PROJECT DUCK

861	0	0	04/01/66	03/30/67	SIMULMATICS	DA49092AR0146	\$31,000
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TITLE: Demographic Study

DESCRIPTION: This program sought to determine basic population parameters for various significant sub-populations in South Vietnam; to determine the structure of the population with respect to various demographic criteria; to establish differentials with respect to socio-economic factors.

RESULTS: The study was based on and summarized existing data, and it was concluded that further study of these data would yield minimal returns.

REMARKS: AGILE - ANALYSIS AND REQUIREMENTS

REF: "A Population Survey in Vietnam," Final Report. The Simulmatics Corporation, Cambridge, Massachusetts, Report No. SIM/CAM/10/67. Sponsored by Advanced Research Projects Agency, Washington, D.C.; Monitored by Army Research Office, 3/31/67 (PA 30,625).

862	0	0					\$30,000
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TITLE: PROJECT TINY TOT

863	0	0					\$35,000
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TITLE: EVALUATION OF DRILLING TECHNIQUES

864	0	0					\$58,150
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TITLE: URBAN WAR GAME (URB-INS)

865	0	0					\$750,500
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: COMPUTER GRAPHICS

866	0	0	06/22/66	06/22/67	BOEING CO.	DA01021AMC15150(Z)	\$475,000
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TITLE: Rocket External Burning Phenomena.

DESCRIPTION: Theoretical analysis and wind tunnel test program in external burning phenomenon.

REMARKS: PROG: BMD - Missile Technology - External Burning.

867	0	0					\$51,800
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TITLE: UNDERGROUND DETONABLE-GAS EXPLOSIONS

868	0	0			TRG-WEST		\$75,600
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TITLE: Scattering Calculations in Support of the Satellite Object Identification.

DESCRIPTION: CANCELLED

RESULTS: CANCELLED

REMARKS: PROG: BMD - Techniques & Devices - Radar.

This program was cancelled because the qualified personnel capable of doing this work left TRG-West.

869	0	0					\$300,000
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TITLE: PRONG TONG PROGRAM

870	0	0					\$200,000
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TITLE: GAS LASER RESEARCH

871	0	0					\$100,000
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TITLE: COMPUTERIZED LIBRARY PROJECT(INTREX)

872	0	0					\$110,000
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TITLE: NAS ADVISORY COMMITTEE ON GOV'T PROGRAMS

873	0	0					\$650,000
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TITLE: RADAR HOMING GUIDANCE INTERCEPTOR STUDY (RHOGI)

873	0	1	06/25/67		SYSTEM ASSC.	DAAH01-67C-2155	\$550,000
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TITLE: Radar Homing Guidance Interceptor Study (RHOGI II) - Phase II System Study.

DESCRIPTION: Operations analysis to develop role of non-nuclear radar homing interceptor and its cost, complexity, etc.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - Missile Technology - Interceptors - Radar Homing Guidance.
Funding represents total of all four tasks. Phase I consisted of AO 873
Tasks 1A, 2A, and 3A; Phase II consisted of AO 873 Tasks 1B, 2B, 3B, and 4B.
Check these tasks Nos. since we do not have A,B, etc.

873	0	2	05/31/66 11/30/66	RAYTHEON	DA01021AMC15144(Z)	\$197,606
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TITLE: Radar Homing Guidance Interceptor Study (RHOGI)- Phase I.

DESCRIPTION: Study to investigate radar homing guidance for interceptors for ballistic missile defense.

REMARKS: PROG: BMD - Missile Technology - Interceptors - Radar Homing Guidance.
REF: "RHOGI Final Report" (U), BR-4044, 1/1/67.
One of these study contracts to investigate radar homing guidance.
See also AO 873, Task 1 and 3. (check task nos.)

873	0	3	06/30/67	RAYTHEON	DAAH01-67-C-2155	\$0
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TITLE: Radar Homing Guidance Interceptor Study (RHOGI-II)-Phase II.

DESCRIPTION: Refinement of engagement model developed under Phase I and assessment of the implications on RHOGI performance.

REMARKS: PROG: BMD - Missile Technology - Interceptor - Radar Homing Guidance.
AO 873 Amend 1, 5/4/67 funded Tasks 1B, 2B, 3B and 4B. (check tasks nos.)
Under FC: See AO 893 T1B. (check task nos.)

873	0	4	06/09/66 12/08/66	GEN. DYNAMICS	DA01021AMC15180(Z)	\$204,000
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TITLE: Radar Homing Guidance Interceptor Study (RHOGI)-Phase I.

DESCRIPTION: Study to investigate radar homing guidance for interceptors for ballistic missile defense.

REMARKS: PROG: BMD - Missile Technology - Interceptors - Radar Homing Guidance.
See also AO 873, Task 1 and 2.

873	0	5		HUGHES AC		\$0
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TITLE: Radar Homing Guidance Interceptor Study (RHOGI-II)-Antenna.

DESCRIPTION: Preliminary design study of forward looking electronically scanned antenna.

REMARKS: PROG: BMD - Missile Technology - Interceptors - Radar Homing Guidance Antenna
See also AO 873 Tasks 1A, 2A, 3A, 1B, 2B, and 4B. (check tasks nos.)

873	0	6		WESTINGHOUSE		\$0
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TITLE: Radar Homing Guidance Interceptor Study (RHOGI-II)-Glint Definition.

DESCRIPTION: To measure and determine the presence of glint and its influence on miss distance and to determine glint avoidance or suppression techniques.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - Missile Technology - Interceptors - Radar Homing Guidance.
See also AO 873 Tasks 1A thru 3A, 1B thru 3B. (check task nos.)

874	0	0	01/31/68 TRW SYSTEMS	DAAH01-67-C0875	\$1,058,000
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TITLE: Radar Calibration Target Satellites.

DESCRIPTION: To design and develop two differently configured target vehicles for suitable placement in orbit for exercising and calibrating ground-based radar systems.

REMARKS: PROG: BMD - Techniques & Devices - Radar - Calibration.
REF: "RADCAT Program Volume I Design Report (U)", Phase I Technical Summary Report, (b)(6) February 1967, TRW No. 08281-0002-T0-00.

875	0	0			\$99,550
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TITLE: UCLA/ARPA DEFENSE SCIENCE SEMINAR

876	0	0			\$2,007,500
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TITLE: MATERIALS COUPLING

877	0	0	06/14/66 05/01/67 SIMULMATICS	DA49092AR0152	\$285,000
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TITLE: CHIEU HOI STUDY RVN

DESCRIPTION: This study of ralliers under the Chieu Hoi Program in South Vietnam examined the reasons the Viet Cong appealed to them, why they rallied to the South Vietnamese side, how these ralliers might be reabsorbed into the South Vietnamese society.

RESULTS: Specific recommendations are made for increasing the rate of rallying and improving the life of those who do rally.

REMARKS: AGILE - BEHAVIORAL RESEARCH
REF: "Improving the Effectiveness of the Chieu Hoi Program: A Summary," Volume I, Revised Final Report, for the period 1966 June 14 - 1967 May 1. The Simulmatics Corporation, Cambridge, Massachusetts, Report No. SIM/CAM/9/67, Vol. I, 9/67 (PA 31,842).

877	1	0	09/30/67 SIMULMATICS	DA49092AR0152	\$421,000
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TITLE: RF/PF Study RVN

DESCRIPTION: This program was designed to investigate the needs, aspirations, frustrations, and values of the Regional Forces and the Popular Forces and to recommend a program for enhancing their effectiveness.

RESULTS: Specific prevalent factors were identified which contributed to ineffectiveness of the Regional and Popular Forces and a series of recommendations was made for the improvement of these forces.

REMARKS: AGILE - BEHAVIORAL RESEARCH

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
					REF: "A Socio-Psychological Study of Regional/Popular Forces in Vietnam"; Part I: Conclusions, Recommendations, Discussion, Final Report (Preliminary Draft). (b)(6) (b)(6) (et al.), The Simulmatics Corporation, New York, New York, 9/67 (PA 30,024).		
878	0	0					\$3,900,000
					TITLE: RESEARCH COUPLING ON CORROSION		
879	0	0			FAIRCHILD	AF336155416	\$24,000
					TITLE: Sail Wing Test		
					DESCRIPTION: Full scale wind tunnel investigations were run on two sail wings of different aspect ratio.		
					RESULTS: It was concluded that no future research and little development effort would be needed for low-speed drone applications.		
					REMARKS: AGILE - ADVANCED TECHNOLOGY		
					REF: "Sailwing Wind Tunnel Test Program," Final Technical Report. (b)(6) (b)(6) Fairchild Hiller Corporation, Hagerstown, Maryland, Report No. R540A-002, 9/66 (PA 24,125).		
880	0	0					\$221,000
					TITLE: NUCLEAR EFFECTS STUDIES		
881	0	0					\$46,350
					TITLE: PHENOMENA OF LEARNING, REMEMBERING AND FORGETTING		
882	0	0			TEXAS A&M	AF296017211	\$202,000
					TITLE: Neutron Activation Analysis		
					DESCRIPTION: Conceived that the difference in diet and water between different geographic areas might change body chemistry enough to make identification of newcomers possible. Hair selected as medium and incoming class at West Point selected as test group.		
					RESULTS: Results did not show useful identifiable differences.		
					REMARKS: Part of Marking, Tracking & Identification Program. See AO 563, Task 4.		
883	0	0					\$46,500
					TITLE: CLINICAL STUDIES OF REVOLUTIONARY SITUATIONS		
884	0	0	03/31/66	12/01/67	SRI	DA01021AMC14875(2)	\$326,000
					TITLE: U.S. Strategic Force Alternatives.		

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: A study to evaluate U.S. strategic force alternatives.

REMARKS: PROG: BMD - System Studies.

885	0	0			\$487,000
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TITLE: OPTICAL MATERIALS STUDY PROGRAM

886	0	0			\$151,200
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TITLE: CETACEANS RESEARCH

887	0	0			\$258,200
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TITLE: STRATEGIC ANALYSIS OF EXTRA-LEGAL INTERNAL POLITICAL CONFLICT

888	0	0			\$820,000
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TITLE: PENETRATION SYSTEMS STUDIES

888	0	1	07/01/66 09/30/67 TRW SYSTEMS	AF 04(694)-992*	\$2,010,000
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TITLE: Penetration System Studies.

DESCRIPTION: To obtain information on re-entry phenomenology and apply results to the advancement of re-entry technology.

RESULTS: An advanced defense model based on velocity and position discrimination was formulated. Design-optimization studies were updated for a mass removal decoy. Aerodynamic behavior of mass removal decoy was verified by experiment.

REMARKS: PROG: BMD - Penetration Aids - Re-entry Phenomenology
Extension of contract SD-254, AO 557.

*Also, F04 701-68-C-0041; F04 701-69-C-0119; F04 701-70-C-0152; F04 701-71-C-0040.

888	0	2	07/16/66 10/16/67 AERONUTRONICS	F04701-68-C-0032	\$490,000
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TITLE: Advanced Penetration Problems.

DESCRIPTION: Studies to resolve penetration problems and establish a design data base for generating new concepts for future systems. These included determination of wake structure, analysis of observable diversification, and evaluation of a fly by discriminator concept including it's countermeasures.

REMARKS: PROG: BMD - Penetration Aids - Advanced Problems
Contract Nos F04701-69-C-0118; F04701-70-C-0130; F04701-71-C-0035 also apply.
Contract No. AF04(694)-994 not verified, no reports found under this contract number.

888	0	3	02/01/67 10/01/67 TRW	AF04(694)-992	\$500,000
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TITLE: Penetration System Studies - Defense Radar Degradation System (DRADS).

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: BMD - Penetration Aids - Penetration System Studies - Defense Radar Degradation System (DRADS).

889	0	0			\$292,200
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TITLE: OPTICAL MATERIALS

890	0	0			\$200,000
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TITLE: RESEARCH ON SECOND-LANGUAGE LEARNING

891	0	0	05/01/67 04/30/68 NAT.BU. STDS	IN-HOUSE	\$650,000
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TITLE: HIGH POWER LASER STANDARDS PROGRAM

DESCRIPTION: (a) The establishment of a 3-year program for a high-power laser standards.
(b) Measurements and characterization of optically active materials and
(c) Data collection and analysis for laser transitions of gases and solid-state materials.

REMARKS: PROG: BMD - Techniques & Devices - Lasers.

892	0	0			\$50,000
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TITLE: SUPPORT FOR COSATI TASK GROUP ON NATIONAL SYSTEM(S)

893	0	0	05/20/66		\$573,600
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TITLE: Restoration of Radford Arsenal

DESCRIPTION: The restoration of facilities at Radford Arsenal after damage resulting from the manufacture of HIBEX propellant.

894	0	0			\$225,000
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TITLE: TECH. ASPECTS OF COMM. & ITS ROLE IN BARGAINING & WAR FIGHTING

895	0	0			\$50,000
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TITLE: SUPPORT FOR COSATI TASK GROUP ON NATIONAL SYSTEM(S)

896	0	0	07/01/66 06/30/67 CATHOLIC UNIV.	N00017-67-C-0008	\$65,000
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TITLE: Aerodynamic Flow Around a Slender Cone Shaped Hypersonic Vehicle.

DESCRIPTION: Analytical investigation of the aerodynamic characteristics with heat transfer with and without ablation, of a slender cone inclined to hypersonic stream (Mach 15, alt up to 100,000 feet, and 60 degree angle of attack).

REMARKS: PROG: BMD - Missile Technology - Hypersonic Interceptors.

897	0	0			\$62,200
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: MECHANISMS OF ATTITUDE CHANGE PRODUCED BY FORCED COMPLIANCE

898	0	0			\$44,538
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TITLE: FISSION PRODUCT BACKGROUND LEVELS OF THE BARENTS & KARA SEAS

899	0	0			\$61,000
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TITLE: Swamp Tank (Marginal Terrain Armored/Combat Vehicle Program).

DESCRIPTION: The objective was to design, build, test, and evaluate the 1-1/2 ton SWAMP TANK concept utilizing the "Airoll" propulsion and suspension principle.

RESULTS: Shortly after contract award, it was found that the similar USMC XM759 had encountered extreme difficulty in negotiating wet, slippery slopes and the program was terminated.

REMARKS: AGILE - ADVANCED TECHNOLOGY

900	0	0	05/22/66 05/22/68 LAMBDA CORP.	DA01021AMC15575(2)	\$1,271,892
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TITLE: Deployment Strategy and Interceptor Commitment Tactics.

DESCRIPTION: Modeling and optimizing the tactics for a hard point defense system consisting of integrated high and low altitude systems with two kinds of interceptors.

REMARKS: PROG: BMD - System Studies - Hard Point Defense.

901	0	0			\$30,000
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TITLE: MEASURING THE IMPACT OF HEALTH ACTIVITIES ON COMMUNITIES

902	0	0			\$1,000
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TITLE: PHOTOGRAPHIC IMAGERY ANALYSIS

903	0	0	11/01/66 07/01/67 NAT'L ENG SC.CO.	N00030-67-C-0125	\$194,455
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TITLE: Development and Evaluation of R Chaff System.

DESCRIPTION: To develop a chaff system that provides a high radar cross section over a very wide frequency spectrum (1:16) using a minimum weight system.

RESULTS: A development was undertaken that included fabrication techniques, achieving the electrical length, bonding to delay opening, dispersion and dispensing techniques and testing. A unique chaff system was developed and demonstrated.

REMARKS: PROG: BMD - Penetration Aids - Chaff Systems.

904	0	0			\$267,000
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TITLE: RURAL SECURITY SYSTEMS PROJCT

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
905	0	0	06/13/66	06/12/67	US NOL	IN HOUSE	\$255,000

TITLE: Experimental Investigation of Aerodynamic Flow Around a Slender Cone Shaped Hypersonic Vehicle.

DESCRIPTION: Experimental investigation using a hypersonic wind tunnel to determine the aerodynamic flow around a 5 degree slender cone as a function of MACH number and attack angle.

REMARKS: PROG: BMD - Missile Technology - Hypersonic Interceptors.

906	0	0					\$600,000
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TITLE: VILLAGE INFORMATION SYSTEM IN THAILAND

907	0	0	06/01/66	06/01/69	AEC-OAKRIDGE	IN HOUSE	\$750,000
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TITLE: Civil Defense Related to Ballistic Missile Defense.

DESCRIPTION: Study of civil defense and its relation to ballistic missile defense.

REMARKS: PROG: BMD - System Studies - Civil Defense.

908	0	0					\$121,000
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TITLE: BLAST GENERATION-GATX

909	0	0					\$198,000
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TITLE: PROVINCIAL AREA HANDBOOK

910	0	0					\$33,000
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TITLE: STATUS DISPLAYS, GAME AND SIMULATION FACILITIES IN THAILAND

911	0	0					\$75,000
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TITLE: SEROLOGICAL AND EXTOPARASITE SURVEY OF MIGRATORY BIRDS

912	0	0					\$105,000
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TITLE: X-RAY SIMULATION TECHNIQUES

913	0	0					\$20,000
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TITLE: FLIGHT TEST PROJECT (APL)

914	0	0					\$60,000
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TITLE: FLIGHT TEST PROJECT (GRUMMAN)

915	0	0					\$47,600
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TITLE: STUDY OF NERVE MEMBRANES

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
916 0 0					\$37,000

TITLE: THE CHEMISTRY OF ADVANCED SENSORS

917 0 0	01/01/67		ASRC	DAJB2967C0122	\$1,485,000
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TITLE: TREND (Tropical Environmental Data), Basic Environmental Data - Thailand.

DESCRIPTION: An interdisciplinary study was conducted of the environments in two tropical forests of Thailand. Data were collected on environmental factors relating to deterioration of materials and to interaction of meteorological, hydrological, and biological factors, including soils and vegetation.

RESULTS: Findings were related to problems of pest and disease control, to problems relating to health and welfare, and to problems of management, conservation, and regeneration.

REMARKS: AGILE - ANALYSIS AND REQUIREMENTS

REF: "Tropical Environmental Data (TREND): Cooperative Research Programme No. 27," Semiannual Report No. 2, for the period 1967 July 1 - 1967 December 31. Applied Scientific Research Corporation of Thailand, 1968.

918 0 0					\$25,000
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TITLE: FOREIGN AREA RESEARCH COORDINATION GROUP(FAR)

919 0 0					\$108,000
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TITLE: Tunnel Portal Research

DESCRIPTION: The objective of this program was to demonstrate the feasibility of detecting tunnel portals by means of conventional remote sensing methods.

RESULTS: Field data were collected in Vietnam in March and April 1967 on tunnel geometry, surface composition, microclimate, vegetation, and visual appearance and reflectivity.

REMARKS: AGILE - ANALYSIS AND REQUIREMENTS

REF: "Implementation of ARPA Order No. 919 (U)." (b)(6) Deputy for Technical Plans and Operations, Department of the Air Force, Headquarters Air Force Cambridge Research Laboratories, Bedford, Massachusetts, 8/5/66 (PA 23,425).

920 0 0	09/19/66	07/01/68	TRW	F04694-67-C-0024	\$3,000,000
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TITLE: HARD POINT DECOY (HAPDEC) PROGRAM

DESCRIPTION: Investigate the feasibility of developing extra-light credible decoy for hard-point defense systems.

RESULTS: Decoy systems were designed, developed and evaluated. The program established a data base for hard-point decoy design.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
REMARKS: PROG: BMD - Penetration Aids - Hard-Point Decoys.							
921	0	0					\$150,400
TITLE: REMOTE SENSING (RADS)							
922	0	0					\$12,500
TITLE: ALLOY SURFACES OF LOW ENERGY ELECTRON DIFFRACTION							
923	0	0					\$253,100
TITLE: CRUSTAL CALIBRATION OF THE LASA							
924	0	0					\$60,500
TITLE: SPARK TRANSMITTER TECHNIQUES FOR EM PULSE SIMULATION							
925	0	0					\$152,000
TITLE: CHARGED PARTICLE BEAM RESEARCH							
926	0	0					\$284,964
TITLE: HIMALAYAN BORDER COUNTRIES							
927	0	0					\$5,250
TITLE: SERVICES BY DSASC							
928	0	0					\$34,700
TITLE: MONO LAKE TEST SERIES							
929	0	0					\$2,300,000
TITLE: FLIGHT EXPERIMENTS FOR MR/V CONTROL (MARCAS III)							
930	0	0			HSR	DAHC19670014	\$392,000
TITLE: Rural Value Systems RVN							

DESCRIPTION: This study was intended to identify, describe, and classify the value systems of selected, representative rural population groups in South Vietnam.

RESULTS: A series of value profiles associated with either demographic groups or topics were developed.

REMARKS: AGILE - BEHAVIORAL RESEARCH

REF: "An Analysis of Values Systems of Selected Populations in Rural Vietnam." Human Sciences Research, Inc., McLean, Virginia, Report No. HSR-TN-67/1(a)-Vs, 6/7/67 (PA 30,830).

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
931	0	0			PLAN RES. CO	DAAH0167C0403	\$506,000

TITLE: MACV Logistics Analysis Support

DESCRIPTION: This program had as its objective to collect, organize, and correlate consumption and activity level data for the development of broad consumption planning factors useful at joint command levels.

RESULTS: This program produced SVN consumption planning factors, consumption planning factor comparisons, and port productivities.

REMARKS: AGILE - ANALYSIS AND REQUIREMENTS

REF: "Development of Logistics Planning Factors in South Vietnam (Log Plan-V)," Volume I, (b)(6)
(et al.), Planning Research Corporation, Los Angeles, California, Report No. PRC-R-1240.

932	0	0					\$700,000
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TITLE: HIGH ALTITUDE NUCLEAR DETECTION STUDIES (HANDS)

933	0	0					\$30,000
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TITLE: JASON EAST KEY HARDWARE DEMONSTRATION

934	0	0					\$61,000
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TITLE: TERRAIN ATLAS PROJECT SUPPORT STUDY

935	0	0			BATTELLE		\$200,000
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TITLE: Sensor, Target, and Background Characteristics.

DESCRIPTION: The principal objectives of this program were to produce a sourcebook which would summarize the present knowledge of sensor, target, and background characteristics in a logical and consistent manner.

RESULTS: While not all of the original purposes were accomplished, several reports were issued and the program is now no longer active except for a sensors file which is part of the TACTEC data base.

REMARKS: AGILE - ANALYSIS - SENSOR

REF: "Sensor System Analysis: Requirements, Selection and Development (U)",
(b)(6) et al.
Project AGILE, ARPA, Washington, D.C., 7/69, (PA 36,285).

936	0	0	03/01/67	03/01/68	MB ASSOCIATES	F04694-67-C-0066	\$350,000
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TITLE: Log Periodic Radar Reflectors for Chaff and Decoy Applications

DESCRIPTION: To investigate the feasibility of developing log periodic array devices that could be used for chaff and decoys against ballistic missile defense applications.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
REMARKS: PROG: BMD - Penetration Aids - Log Periodic Arrays.							
937	0	0					\$59,000
TITLE: ENHANCED DIFFUSION IN NON-METALLIC COMPOUNDS							
938	0	0					\$177,000
TITLE: PLANT SHOCK RESEARCH							
939	0	0					\$6,015
TITLE: TIME-SHARING SYSTEMS SUPPORT							
940	0	0					\$70,252
TITLE: AUTOMATIC DATA PROCESSING STUDY FOR MACV							
941	0	0					\$34,000
TITLE: ARPA/CARDE ATMOSPHERIC TRANSMISSION							
941	0	1	10/25/66			IN-HOUSE	\$34,000
TITLE: Engineering Liaison Support for System Installation.							
DESCRIPTION: Provide support to CARDE airborne atmospheric transmission measurements.							
RESULTS: Excellent data obtained by CARDE, USAF support made this possible.							
REMARKS: PROG: BMD - Missile Phenomenology - Solar Spectra							
REF: CARDE Study available.							
See AO 30.							
941	2	2	06/26/67	12/01/67			\$90,000
TITLE: B57 Window Studies							
DESCRIPTION: Perform studies for installation of high performance devices in LWIR region and establish technical problems. Conduct flight tests.							
RESULTS: Delivered product and results satisfactory							
REMARKS: PROG: BMD - Missile Phenomenology.							
942	0	0					\$36,483
TITLE: NEGOTIATION IN LEADER AND DELEGATE GROUPS							
943	0	0		03/31/68	SYRACUSE UNIV.	F3060267-C-0138	\$845,000
TITLE: Sidelobe Cancellation for Radar.							

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: (a) Design, develop and evaluate radar sidelobe cancellation techniques for radar. (b) Fabricate and evaluate a 16 loop system on the HAPDAR radar.

REMARKS: PROG: BMD - Techniques and Devices - Radar.

943	1	0	SYRACUSE UNIV.	F3060267-C-0138	\$0
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TITLE: Antenna Design and Modeling for Over-the-Horizon Radar.

DESCRIPTION: Model and evaluate simplified arrays applicable to a proposed research over-the-horizon (HF) radar.

REMARKS: PROG: BMD - Techniques and Devices - Over-the-Horizon Radar.

944	0	0			\$9,300
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TITLE: WORK BREAKDOWN STRUCTURE PILOT TEST

945	0	0			\$60,000
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TITLE: PROJECT PANDORA

946	0	0			\$18,100
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TITLE: SOUNDER PROGRAM

947	0	0	BATTELLE MEM INS DAAH0167C-1089		\$2,234,000
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TITLE: RACIC (Remote Area Conflict Information Center)

DESCRIPTION: RACIC was established at the Battelle Memorial Institute Columbus Labs as a DoD sponsored information and analysis center, to store and analyze the results of all the research done on insurgency and counter-insurgency warfare. RACIC was funded initially by AGILE, so that all AGILE contractors and DoD agencies requiring information from RACIC could utilize the results of prior effort.

RESULTS: In the early 1970's the Defense Logistics Agency decided that using contractors should pay for each use of RACIC capabilities, so that costs could be allocated properly to each program. RACIC remains the principal resource for all research into counter-insurgency warfare, and the history of DoD efforts during the Vietnam war.

REMARKS: PROG: AGILE - Remote Area Conflict Information Center - Counter-Insurgency Warfare - DoD Information and Analysis Center.

947	0	1	RAC	DAAH0167C1089	\$3,106,000
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TITLE: Operations Research Studies.

DESCRIPTION: See AO 272, Task 2.

948	0	0	05/01/67 05/01/68 GEN. MOTORS	N60921-67-C-0323	\$240,000
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AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: L1-CL/2 Primary Cells for ECM Penetration Aid Devices.

DESCRIPTION: To design, develop and evaluate a high-rate L1-CL/2 primary cell concept for ECM penetration aid devices.

RESULTS: A L1-CL/2 primary cell concept was developed that met or exceeded the desired specifications.

REMARKS: PROG: BMD - Penetration Aids - Power Supply.

949	0	0			\$38,000
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TITLE: PROJECT RED FLAME

950	0	0			\$1,110
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TITLE: PROJECT RED FLAME

951	0	0			\$39,000
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TITLE: THE GENESIS OF CIVIL VIOLENCE

952	0	0			\$102,000
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TITLE: COMPUTER-AIDED TEACHING AND LEARNING

953	0	0			\$8,000
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TITLE: COLUMBIA MILITARY INDUSTRIAL STUDY

954	0	0			\$41,268
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TITLE: INTERACTION OF MOLECULES WITH SURFACES OF CLEAN REFRACTORY MT

955	0	0			\$0
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TITLE: USA/AUSTRALIAN RESEARCH FACILIYT

956	0	0			\$179,400
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TITLE: RATE-CONTROLLED SPEECK IN SECOND LANGUAGE LEARNING

957	0	0			\$200,000
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TITLE: OSD SYSTEMS STUDY

958	0	0			\$798,000
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TITLE: TERMINAL BALLISTIC MISSILE ATTACK GAMING

959	0	0			\$110,800
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TITLE: MODES OF ORGANIZING & PRESENTING COMPLEX INSTRUCTIONAL MAT.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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960	0	0			\$4,109,616
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TITLE: INSTITUTE FOR DEFENSE ANALYSES

961	0	0			\$99,500
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TITLE: PROJECT TRITON II

962	0	0			\$28,700
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TITLE: SHOCK WAVE DAMAGE IN QUARTZ

963	0	0	LOCKHEED	DAAH0170C0309	\$100,000
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TITLE: Sensor Integration/Display Subsystem.

DESCRIPTION: This study, as an integral part of a base perimeter defense system, assessed the technical merits and applicability of various sensors, display techniques and their interfaces; also included were cost effectiveness evaluations.

RESULTS: The concept recommended by the study was based on the development of four items of electronic equipment: an operator/monitor display unit, sensor integrator-processor, data link transceiver, and power supply.

REMARKS: AGILE - ANALYSIS - SENSOR

REF: "Sensor Integration/Display Subsystem," Final Report, for the period 1969 October - 1970 June. Lockheed Palo Alto Research Laboratory, Lockheed Missiles and Space Company, Palo Alto, California, Report No. LMSC-A791215, 5/70, (PA 38,046).

963	0	1	LMSC	DAAH0167C1384	\$706,000
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TITLE: Evolutionary Base Defense.

DESCRIPTION: This study considered the design and evaluation of evolutionary system concepts for the defense of major U.S. and allied bases located in the subversive insurgency environment of Southeast Asia.

RESULTS: Both general and specific defense recommendations resulting from field observations of the environments, threats, constraints, facilities, and operations at bases throughout Vietnam and Thailand were made.

REMARKS: AGILE - ANALYSIS AND REQUIREMENTS

REF: "Evolutionary Base Defense," Volume I, Phase One Final Report. Lockheed Missiles and Space Company, Sunnyvale, California, Report No. LMSC-B095482, Vol. I. Prepared for ARPA Division, Research and Development Directorate, U.S. Army Missile Command, Redstone Arsenal, Alabama, 11/67 (PA 31,695).

964	0	0			\$32,000
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TITLE: VILLAGE ATTITUDE STUDY

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
965	0	0			GRC	DAHC0468C0018	\$153,000

TITLE: ECHO--RVN

DESCRIPTION: This program was intended to evaluate ECHO methodology as a tool for gathering information about behavioral norms and feelings of specific Vietnamese populations, and to generate hypotheses regarding those norms and feelings which might form the basis for future research.

RESULTS: It was concluded that ECHO was a useful technique.

REMARKS: AGILE - BEHAVIORAL

REF: "Project ECHO", Final Report, (b)(6) General Research Corporation, Santa Barbara, California, Report No. CR-0018-2, 11/68, (PA 37,629).

966	0	0					\$510,000
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TITLE: CODING SYSTEMS IN PRECEPTION & COGNITION

967	0	0					\$581,000
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TITLE: EQUIPMENT FOR IPT RESEARCH AT SRI

968	0	0					\$89,000
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TITLE: HUGONIOTS & DYNAMIC PROPERTIES OF FROZEN EARTH MATERIALS

969	0	0					\$500,000
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TITLE: PASSPORT

970	0	0					\$293,299
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TITLE: STRAT-X PROJECT SYSTEMS OPTIMIZATION STUDY

970	0	1	02/01/67	07/01/67	TRW SYSTEMS	F04694-67-C-0070	\$293,290
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TITLE: STRAT-X Project Support - Systems Optimization Study.

DESCRIPTION: Study to determine optimal conceptual system design of surveillance systems for 1975-85 time period for location and identification of an enemy first strike on U.S. Information must supply detailed, timely and accurate information for counter on land, surface and air systems.

REMARKS: PROG: BMD - Studies - STRAT-X - Surveillance System for Countering First Strike.

970	0	2	02/13/67	08/01/67	PRC	F04694-67-C-0072	\$91,168
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TITLE: STRAT-X Project Support - Cost and Resource Analysis Support.

DESCRIPTION: Support of the STRAT-X studies being managed by IDA. Contractor provide cost and resource analysis using statistical regression analysis, modeling

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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and analytical techniques.

REMARKS: PROG: BMD - Studies - STRAT-X - Cost and Resource Analysis.

970	0	3	02/13/67	06/01/67	RESOURCE MGR. CO FD4694-67-C-0073	\$82,308
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TITLE: STRAT-X Project Support - Cost Analysis.

DESCRIPTION: Completion of system descriptions, identification of major cost-driving parameters, estimation of system costs including R&D cost, N-year operating costs, etc.

REMARKS: PROG: BMD - Studies - STRAT-X - Cost Analysis.

971	0	0				\$598,801
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TITLE: PROJECT STRAT-X (VARIOUS CONTRACTORS)

972	0	0				\$125,083
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TITLE: PROJECT STRAT-X (GD/QUINCY DIVISION)

973	0	0				\$94,105
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TITLE: PROJECT STRAT-X (DRC, INC.)

974	0	0				\$20,000
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TITLE: PROJECT STRAT-X (AGBABIAN-JACOBSEN ASSOCIATES)

975	0	0				\$30,000
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TITLE: PROJECT STRAT-X (LOCKHEAD)

976	0	0				\$21,787
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TITLE: PROJECT STRAT-X (BOOZ-ALLEN)

977	0	0				\$29,685
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TITLE: PROJECT STRAT-X (IIT RESEARCH INSTITUTE)

978	0	0				\$54,966
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TITLE: PROJECT STRAT-X (HUGHES AIRCRAFT CO.)

979	0	0	02/27/67	06/01/67	SANDERS	\$30,162
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TITLE: STRAT-X Project Support - Technological and Operational Analysis.

DESCRIPTION: Technological and operational study analysis support of STRAT-X project.

REMARKS: PROG: BMD - Studies - STRAT-X - Technological and Operational Analysis.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
980	0	0					\$400,000
TITLE: LIGHT WEIGHT ARMOR RESEARCH PROGRAM							
981	0	0					\$430,000
TITLE: HIGH-TEMPERATURE MATERIALS							
982	0	0					\$157,500
TITLE: IONOSPHERIC DISTURBANCE EXPERIMENT							
983	0	0		12/30/69	CONDUCTRON CORP.	DAAH0168C1072	\$415,000
TITLE: Radar Recce Strike Dancing Dolls							
<p>DESCRIPTION: Under ARPA Order 983 Conductron was to complete its effort begun under ARPA Order 816, to develop an airborne foliage penetration radar, which would present an optical image of the returned radar signals for detection of targets on the ground, hidden by the trees in Vietnam.</p> <p>RESULTS: Lack of success of Conductron in achieving the desired target detection resulted in termination of the program.</p> <p>REMARKS: AGILE - Reconnaissance and Surveillance - Airborne Foliage Penetration Radar REF: "High-Resolution Analog/Digital Airborne Radar (U)", Final Technical Report, for the period 1967 December 29 - 1969 January 11. Conductron Corporation, Ann Arbor, Michigan, Report No. D5511-951-TR18, 12/69, (PA 37,293). Also, Under AO 816, Conductron received \$2,683,000 for its early work on this program.</p>							
984	0	0	06/01/67	06/01/68	CONDUCTRON	F33615-68-C-1011	\$372,500
TITLE: Development of Radar Absorbing Materials for Penetration Aid.							
<p>DESCRIPTION: To develop and measure the use of radar absorbing materials for aid re-entry vehicles penetrate ballistic missile defense systems.</p> <p>RESULTS: Ferrites and thin ferromagnetic films were investigated theoretically and measured experimentally.</p> <p>REMARKS: PROG: BMD - Penetration Aids - Radar Absorbers.</p>							
985	0	0					\$203,200
TITLE: MATERIAL BEHAVIOR IN HIGH SPEED IMPACT							
986	0	0					\$7,000
TITLE: NASA SUPPORT OF CIRADS							
987	0	0					\$450,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: MANEUVERING DECOY PROGRAM

988	0	0			AEDC	IN HOUSE	\$120,000
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TITLE: WAKE MEASUREMENTS USING MAGNETIC-MODEL SUSPENSION SYSTEM

DESCRIPTION: MEASUREMENTS IN THE BASE FLOW AND NEAR WAKE CONDITIONS USING A MAGNETIC-MODEL SUSPENSION SYSTEM ON BLUNT AND SLENDER BODIES.

REMARKS: PROG: BMD - GENERAL RESEARCH IN SUPPORT OF REENTRY PHYSICS PHENOMENOLOGY.
MISC: SEE ALSO AO 133 T1, 2, 3; AO 205, AO 322.

989	0	0					\$201,500
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TITLE: OVER-THE-HORIZON DATA COLLECTION & ANALYSIS CENTER

990	0	0					\$61,650
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TITLE: INFORMATION PROCESSING FIELD STUDY

991	0	0					\$675,000
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TITLE: RADAR MEASUREMENTS PROGRAM

992	0	0	03/06/67		RCA		\$292,337
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TITLE: Anti-Simulation Techniques

DESCRIPTION: Evaluation of techniques for anti-simulation.

REMARKS: PROG: BMD - Penetration Aids - Anti-Simulation.

993	0	0					\$29,685
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TITLE: PROJECT STRAT-X (IITRI)

993	1	0	03/01/67		CAL		\$45,548
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TITLE: STRAT-X Project Support - Vulnerability Studies.

DESCRIPTION: A two month study analyzing the vulnerability of advanced ballistic missile concepts and deployments to sabotage.

REMARKS: PROG: BMD - Studies - STRAT-X - Vulnerability Studies.

994	0	0	05/03/67	10/27/67	LOCKHEED	DAAJ0267C0083	\$200,000
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TITLE: Prize Crew (QT-2 Aircraft)

DESCRIPTION: The QT-2 was a quiet aircraft developed by the Lockheed "skunk works" as a slow, low performance reconnaissance aircraft for use in Vietnam.

RESULTS: The fixed wing aircraft, with a wooden propeller was so quiet that the pilot,

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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from an altitude of 1500 feet, was able to observe Viet Cong planting a mine under a road in South Vietnam at night. The Viet Cong were not aware of the aircraft overhead.

REMARKS: PROG: AGILE - Reconnaissance and Surveillance - Quiet Airborne Platforms
 REF: "Design, Development, and Test Demonstration of the QT Vehicle Concept" (U), Final Report, for the period 1967 May 3 - 1967 October 27, (b)(6) Lockheed Missiles and Space Company, Sunnyvale, California, Report No. LMSC-685116, 5/69.

995	0	0	08/01/68	04/30/69	MARK SYSTEMS	\$200,000
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TITLE: Stabilized Binoculars I and II (Mark Systems Inc.)

DESCRIPTION: This motion stabilized binocular system incorporated a small gyro-stabilized prism within the optical system. The internal gyroscope could be powered by the battery of the jeep, helicopter, or aircraft, or by three small 4 volt batteries. The optical system had two selectable magnifications, 10X or 20X. This gyro-stabilized design was invented by Luis Albarez.

RESULTS: 200 sets of binoculars were procured at a cost of \$800,000. They proved excellent for stabilized viewing from moving vehicles, small riverine craft, and helicopters. COMUSMACV Abrams used a set in his helicopter.

REMARKS: TTD - Reconnaissance and Surveillance-Vision Aids-Motion Stabilized Binoculars
 REF: Test and Evaluation of the MARK Systems Model 1610 Stabilized Binocular, Memorandum Report, (b)(6) USAF, OSD/ARPA Research and Development Center, Bangkok, Thailand, Rpt. No. 69-004, 5/66, (PA 36,333).
 Under ARPA Order 995, MARK Systems combined its motion stabilization binocular system with a night viewing system.

996	0	0				\$52,450
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TITLE: VIETNAMESE VOCABULARY STUDY

997	0	0			PTAI (CDC)	DAAH0167C1732	\$3,500,000
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TITLE: Pacification Analysis and Programming Support to MACV CORDS.

DESCRIPTION: This program provided direct on-site support to MACV CORDS in the area of processing, storing, and analyzing by means of computers the data assembled in connection with pacification programs in Vietnam.

RESULTS: Among the numerous systems included in this program are the Hamlet Evaluation System (HES), The Terrorist Incidents Reporting System (TIRS), and the Refugee Management System (REF).

REMARKS: AGILE - PSYOPS - ANALYSIS.
 REF: Systems Development and Modifications to the MACV Civil Operations and Rural Development Support (CORDS) Program, Final Technical Report. Control Data Corp., MACV Project, Hq. Military Assistance Command, Vietnam, CORDS/RAD, 11/71 (PA 40,312).
 Completed under contract No. DAAH0171C0009 (CDC).

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
997	0	1			PTAI	DAAH0168C1659	\$495,000

TITLE: Research Capability in Support of Pacification

DESCRIPTION: This program provided a field research capability for MACV CORDS. The research tasks were assigned on the basis of the needs and priorities determined by MACV CORDS.

RESULTS: Several specific tasks were completed under the two contracts. These dealt with land reform, refugee attitudes, village development, and PSYOPS effectiveness.

REMARKS: AGILE - ANALYSIS
Part of work done under contract No. DAAH0170C0325.

998	0	0					\$32,000
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TITLE: M-1 CARBINE CONVERSION

999	0	0					\$55,000
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TITLE: ADVISOR AND COUNTERPART RELATIONS/THAILAND

1000	0	0					\$420,000
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TITLE: PROJECT BIG PUSH

1001	0	0					\$75,000
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TITLE: ENVIRONMENTAL SYNTHESSES OF SELECTED AREAS IN SEA, ME, & AFRICA

1002	0	0					\$320,000
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TITLE: PROBLEM ANALYSIS-SIMULMATICS

1003	0	0					\$160,000
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TITLE: LIQUID CRYSTAL DEVICES RESEARCH

1004	0	0					\$130,000
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TITLE: LASA DATA SERVICE

1005	0	0					\$100,000
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TITLE: ANIMAL PENETRATORS

1006	0	0					\$250,000
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TITLE: CLANDESTINE UNDERGROUND NUCLEAR TEST

1007	0	0					\$600,000
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: BORDER CONTROL SYSTEM

1008	0	0					\$150,000
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TITLE: ENVIRONMENTAL RESEARCH

1009	0	0					\$271,000
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TITLE: ATOMIC AND MOLECULAR PHYSICS PROGRAM

1009	0	1		09/30/70	DREXEL INST.	DAHC0467C-0072	\$112,000
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TITLE: Re-Entry Vehicle Radar Cross-Section Calculations.

DESCRIPTION: Compute the monostatic and bistatic radar cross section of a re-entry vehicle in the under-dense to over-dense transition regime.

REMARKS: PROG: BMD - General research in support of re-entry physics applicable to discrimination.

1009	0	2	06/01/67	06/30/68	GEN. ELECTRIC	DAHC04-67C-0065	\$167,000
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TITLE: Non-Continuum Radar Observables and Optical Energy Transfer.

DESCRIPTION: A study of the mechanisms leading to the ionization and population distributions in certain metal atoms and molecules during re-entry and chemical release programs.

REMARKS: PROG: BMD - General research in support of re-entry physics and chemical release programs.

1009	0	3	05/01/67	05/30/68	UNIV. OF CALIF.	DAHC04-67C-0060	\$56,000
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TITLE: Diagnosis of Plasma Density Fluctuations by Radar Scattering.

DESCRIPTION: Study of methods of using incoherent backscatter and field-aligned irregularities to determine the plasma characteristics associated with wake turbulence and barium chemical releases.

REMARKS: PROG: BMD - General research in support of re-entry physics and chemical release programs.

MISC: Related to chemical release program (Project SECEDE).

1009	0	4			UNIV. OF CALIF.	DAHC04-67C-0070	\$60,000
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TITLE: Hamiltonian Formulation - Studies of Radiation Processes from Hot Gases.

DESCRIPTION: Study of relativistic effects in heavy atoms, calculation of dissociative recombination and atom-to-ion charge-transfer reactions.

REMARKS: PROG: BMD - General research in support of launch, mid-course and re-entry physics.

			Initial	Final		
AO	AMD	Task	Date	Date	Contractor	Contract Number
1009	0	5	03/01/70	03/30/72	UNIV. OF COLO.	\$66,000

TITLE: Research in Inhomogeneous Wake Flow

DESCRIPTION: Theoretical research on the entrainment process in hypersonic turbulent flow.

REMARKS: PROG: BMD - General research in support of re-entry physics.

MISC: This research was part of the STO program. Project DEFENDER (BMD) ended in approximately 1968.

1010	0	0	03/01/67	03/01/69	SYRACUSE UNIV.	F30602-68-C-0067	\$2,491,208
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TITLE: PHASED ARRAY ANTENNA OPTIMIZATION CRITERIA

DESCRIPTION: INVESTIGATION OF THE OPTIMIZATION OF PHASED ARRAY ANTENNA DESIGN CONSIDERING SPECIFIC BALLISTIC MISSILE TARGETS, DECOYS AND JAMMERS.

RESULTS: THIS WAS FUNDAMENTAL THEORETICAL WORK THAT FORMED AN INPUT FOR THE DEVELOPMENT OF PHASED ARRAY TECHNIQUES FOR BALLISTIC MISSILE DEFENSE.

REMARKS: PROG: BMD - TECHNIQUES & DEVICES - RADAR - PHASED ARRAYS.

REPORTS: TR1 "SPACING PERTURBATION TECHNIQUES FOR ARRAY OPTIMIZATION,"
RADC-TR-68-19, 11/67, AD-826 483.

TR2 "ARRAY OPTIMIZATION CRITERIA," RADC-TR-68-579, 11/67, AD-846 700.

TR3 "BEAM SYNTHESIS TECHS. FOR LG. CIRCULAR ARRAYS WITH MANY DIRECTIVE ELEMENTS, RADC-TR-68-411, 10/69, AD-862 735.

TR4 "SIDE-LOBE-REDUCTION & INTERFERENCE-SUPPRESSION TECHS FOR PHASED ARRAYS USING DIGITAL PHASE SHIFTER," RADC-TR-70-51, 2/70, AD-809 318.

1011	0	0					\$190,000
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TITLE: ATOMIC AND MOLECULAR PHYSICS PROGRAM

1011	0	1	06/01/67	06/30/69	PRINCETON UNIV.	F44620-67C-0110	\$50,000
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TITLE: Atomic and Molecular Lifetime Measurements.

DESCRIPTION: Measurements of electron-beam excitation in a low pressure gas of selected oxides; measurements of branching ratios, and lifetime of short optical transitions.

REMARKS: PROG: BMD - General research in support of re-entry physics.

1011	0	2			YALE UNIV.	AFOSR1324-67(GRT)	\$188,000
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TITLE: Atomic and Molecular Physics Relative to Optical Spectroscopy and Breakdown Phenomena.

DESCRIPTION: Studies of electron-time-of-flight spectroscopy (10E-2 to 1-ev energy range); time-of-flight studies of molecular-dissociation processes, and low-energy and inelastic collisions in O/2, NO, and SF/6 to determine cross sections.

REMARKS: PROG: BMD - General research in support of re-entry physics.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1011	0	3	06/01/67	06/30/69	UNIV. OF PENN.	F44620-67C-0106	\$100,000

TITLE: Energy Transfer Mechanisms in Optical Observables.

DESCRIPTION: (a) Experimental determination of rate constants for processes responsible for optical emissions from Na, Fe and other metals. (b) Studies to identify energy-transfer mechanisms of metals [listed in (a)] that relate to optical observables in a re-entry environment.

REMARKS: PROG: BMD - General research in support of re-entry physics.

1012	0	0					\$125,230
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TITLE: ION BEAM OPTICAL FIGURING

1013	0	0					\$500,000
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TITLE: ADVANCED STRATEGIC AIR WARFARE STUDY

1014	0	0					\$15,500
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TITLE: HAMLET EVALUATION SYSTEM (HES)

1015	0	0					\$150,000
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TITLE: NON-COHERENT SIGNAL PROCESSING

1016	0	0					\$100,000
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TITLE: RESEARCH ON MILITARY SELECTION & CLASSIFICATION FOR DEV. CULT

1016	0	1			AM INST F RES	DAHC1967C0041	\$250,000
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TITLE: Qualification Testing Iran

DESCRIPTION: Develop qualification tests for applicants and trainees of the Imperial Iranian Gendarmerie.

RESULTS: Tests completed and accepted.

1017	0	0					\$250,000
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TITLE: OPTICS PROGRAM IN MIDCOURSE AND EARLY RE-ENTRY

1018	0	0					\$800,000
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TITLE: RED FLAME

1019	0	0			RCA	F04701-68C-0158	\$281,000
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TITLE: Radar Backscattering Studies

DESCRIPTION: Analysed radar backscattering data obtained on re-entry field measurements used code developed that takes into account polarization effects in radar

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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scattering.

REMARKS: PROG: BMD - General research in support of detection, tracking and discrimination studies for ballistic missile defense and penetration aids.

1020	0	0	06/30/69 USNRDL		\$70,000
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TITLE: Excited Species and Wake Chemistry From R/V Ablation Products.

DESCRIPTION: Determine heat loadings and air pressures that produce optical emissions from RV ablator materials under simulated re-entry conditions.

REMARKS: PROG: BMD - General research in support of re-entry physics.

MISC: Related to work being done by SRI (Dr. Young).

Contract No: Interservice Transfer of Funds.

1021	0	0			\$19,200
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TITLE: MAC-V PSYCHOLOGICAL OPERATIONS STUDY

1022	0	0			\$11,250
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TITLE: PROJECT STRAT-X (GOODYEAR)

1023	0	0			\$73,000
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TITLE: PROJECT GAS BUGGY

1024	0	0			\$1,273,000
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TITLE: Portable Laser Camera System.

DESCRIPTION: The objective of this program was to design, develop, and test a portable integrated-long range night photographic system.

RESULTS: Tests indicated that the system was capable of night photography.

REMARKS: ADVANCED SENSORS

REF: "Raytheon Photographic System Model LES-134 (U)", Test Report, (b)(6)

(b)(6) 11/15/67.

1024	0	1	DYNA SCIENCES CP		\$319,000
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TITLE: Stabilized Optics (DynaLens Applications).

DESCRIPTION: Advanced Sensors sent several sets of Dyna Sciences "DynaLens" motion stabilized binoculars to Vietnam for airborne testing. The DynaLens system used a liquid filled prism wedge to adjust the optical path in front of the binoculars. The glass front and back faces of the wedge were controlled by two separate servo systems, which adjusted the angles between the two faces to correct for the vertical and azimuthal components of the binocular motion.

RESULTS: Based on the success of the Vietnam tests, the Army bought 500 sets of DynaLens motion stabilized binoculars. In order to meet the competitive

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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price of the Mark System motion stabilized binoculars, which were funded by AGILE, Dyna Sciences lowered the price of its binoculars from \$8000 each to \$4250 each.

REMARKS: Advanced Sensors-Reconnaissance and Surveillance-Motion Stabilized Binoculars
 REF: "DynaLens Model S-023", Final Report, Dept. of the Army, Army Concept Team in Vietnam, APO San Francisco, California, ACTIV Project No. ACA-20/681, 3/8/68, (PA 32,262).
 ARPA Order 995 funded some of the Mark Systems effort.

1024	0	2	CDTC-V		\$1,145,000
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TITLE: TOC High-Resolution Color Conversion System

DESCRIPTION: The program objectives were to develop and evaluate a photographic system that translates the color components of a scene into three primary color-coded images that are transmitted along with the black and white image to conventional black and white film.

RESULTS: The system was evaluated to determine whether or not it offered a unique advantage over other photographic processes. Test results indicated that the TOC system is of little operational value in Vietnam.

REMARKS: REF: "Quarterly Project Status Report (U)." Combat Development and Test Center, Vietnam, Republic of Vietnam Armed Forces; Research and Development Field Unit, Vietnam, Advanced Research Projects Agency, 12/31/69 (PA 38,002).

1025	0	0			\$470,000
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TITLE: RED FLAME II

1026	0	0			\$5,055
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TITLE: OPTICAL SCINTILLATION EXPERIMENT

1027	0	0			\$241,000
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TITLE: AREA TRANSPORTATION SYSTEMS STUDY

1028	0	0	TRW	DAAH0167-C1922	\$352,000
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TITLE: PROJECT EGG ROLL

DESCRIPTION: Installation of a disturbance detection system on the chain link fence along the Korean DMZ, in the sector patrolled by the U.S. Eighth Army. The sensors of the disturbance detection system would localize the attempted intrusion to a small section of the fence, and alert the local sentry.

RESULTS: When initially installed the system did provide alerting signals and intrusion localization. North Korean infiltrators approached the fence at night, during its installation to try to determine its purpose.

REMARKS: PROG: AGILE - Border Control - Intrusion Detection and Localization

AD	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
Also Contno: DAAH0169-C1531.							
1029	0	0					\$247,300
TITLE: THREE-AXIS LONG PERIOD SEISMOGRAPH							
1030	0	0					\$24,663
TITLE: PROJECT STRAT-X (GENERAL ELECTRIC)							
1031	0	0					\$97,000
TITLE: ARTIFICIAL STIMULATION OF EARTHQUAKES							
1032	0	0					\$348,000
TITLE: TAXONOMY OF HUMAN PERFORMANCE							
1033	0	0					\$238,000
TITLE: THE CHANGING PATTERNS IN MIDDLE EASTERN SOCIETY							
1034	0	0					\$124,000
TITLE: NEW MATERIALS FOR ELECTROLUMINESCENCE							
1035	0	0					\$125,000
TITLE: PROVINCIAL ATLAS							
1036	0	0			CALSPAN	DAAH0167C2165	\$2,492,000

TITLE: Systems Research on Rural Security.

DESCRIPTION: The overall objective of this research was to extend systems research techniques beyond the physical sciences to encompass the economic, political, and social sciences in a broad approach to problems of rural security and counter-insurgency.

RESULTS: The contractor provided a team in Thailand to handle ad hoc research problems on a task basis.

REMARKS: AGILE - SYSTEMS INTEGRATION

REF: "Systems Research on Rural Security (U)", Final Technical Report, for the period 1967 June 1 - 1969 November 30. (b)(6)
Cornell Aeronautical Laboratory, Inc., Systems Research Group, Bangkok, Thailand, Report No. VY-2466-H-10, 1/70, (PA 38,489).

1037	0	0					\$186
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TITLE: STACK SAMPLING STUDIES TO DETECT AND IDENTIFY SIGNATURES

1038	0	0					\$44,914
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: PROJECT STRAT-X (DOUGLAS AIRCRAFT)

1039	0	0					\$0
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1040	0	0					\$240,000
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TITLE: MANAGEMENT DATA CENTER

1041	0	0					\$376,000
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TITLE: SPECIAL PROJECTS FOR MACV(NIGHT VISION LAB)

1042	0	0					\$40,000
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TITLE: MOBILIZATION PLAN (IRAN)

1042	0	1			RES TRI INSTIT.		\$432,000
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TITLE: Iran Mobilization.

DESCRIPTION: Develop a military mobilization plan for the Government of Iran.

RESULTS: Mobilization plan completed and approved by Iranian Prime Minister Mofeyda.

1043	0	0					\$75,000
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TITLE: HIGH RESOLUTION INFRARED SCANNER AIRCRAFT

1044	0	0					\$225,000
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TITLE: OPTICS COUNTERMEASURE STUDY

1045	0	0					\$4,000
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TITLE: INTERNATIONAL SYMPOSIUM ON HIGH TEMPERATURE TECHNOLOGY

1046	0	0					\$10,000
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TITLE: NATO CONFERENCE ON OPERATIONAL RESEARCH

1047	0	0	07/01/66	06/30/69			\$107,000
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TITLE: Flat Sheet Agent Communication System

DESCRIPTION: The objective of this program was to develop a small lightweight radio transmitter in a flat or sheet like configuration.

RESULTS: The application of thin film technology and microminiaturized circuitry were utilized to produce 2-20 watt concealable agent radio transmitters.

REMARKS: ADVANCED SENSORS

1048	0	0					\$35,000
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: BORDER CONTROL SYSTEM PROGRAM (THAILAND)					
1049	0	0			\$100,000
TITLE: QUANTUM INTERFEROMETER					
1050	0	0			\$136,000
TITLE: THAI ADP STUDY					
1051	0	0			\$10,000
TITLE: CHASE VI					
1052	0	0			\$2,400
TITLE: TECHNICAL SYMPOSIA (OSI)					
1053	0	0			\$59,000
TITLE: LASER DETECTION SYSTEM STUDY					
1054	0	0			\$80,000
TITLE: TOW OF CHASE VI HULK TO DETONATION SITE					
1055	0	0			\$214,500
TITLE: UNIVERSITY OF ALASKA ACOUSTICS PROGRAM					
1056	0	0			\$90,000
TITLE: VALIDITY AND RELIABILITY OF POLYGRAPH TECHNIQUES					
1057	0	0			\$55,000
TITLE: PROJECT SECEDE					
1058	0	0			\$0
TITLE: INTELLIGENT AUTOMATA					
1059	0	0	ACTIV		\$131,000

TITLE: Silent Joe I

DESCRIPTION: To develop balloon carried sensor devices for acquiring intelligence information in Vietnam. Four acoustic sensors were suspended at varying angles from a frame under the balloon and could be individually selected and controlled for sensitivity.

RESULTS: Field tests conducted with Silent Joe I indicated that the system in the form tested was not effective for obtaining acoustic intelligence. It was con-

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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cluded that the system was prematurely deployed to Vietnam.

REMARKS: ADVANCED SENSORS

REF: "Silent Joe (U)", Final Report. Dept. of the Army, Army Concept Team in Vietnam, APO San Francisco, California. ACTIV Project No. ACA-15/681, 2/20/69, (PA 36,128).

1060	0	0			\$403,000
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TITLE: PROJECT THEMIS (UNIV. OF FLA. AT GAINESVILLE)

1061	0	0			\$17,000
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TITLE: ANALYSIS OF RED FLAME I FILM

1062	0	0			\$251,000
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TITLE: IMAGE RESTORATION RESEARCH

1063	0	0			\$275,000
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TITLE: DIMENSIONALITY OF NATIONS PROJECTS(DON)

1064	0	0			\$61,700
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TITLE: THE MURA SYNCHROTRON

1065	0	0			\$60,177
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TITLE: ARPA-AEC GAS INJECTION TEST

1066	0	0			\$166,250
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TITLE: WORLD EVENT INTERACTION SURVEY (WEIS)

1067	0	0			\$156,200
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TITLE: WORLD POLITICAL DATA AND ANALYSIS PROGRAM (WPD)

1068	0	0	EARI		\$99,000
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TITLE: ACCELERATED DEVELOPMENT OF THE PLAIN OF REEDS

DESCRIPTION: This study investigated and reported on the agricultural potential of the Plain of Reeds, the problems that would be involved in reclaiming it at an earlier date than it would be under the Mekong Development Project.

RESULTS: It was concluded that waiting for upstream development was not justified and prompt implementation of the suggested development approach was recommended.

REMARKS: AGILE - ANALYSIS

REF: "Accelerated Development Plain of Reeds," Dept. of Defense, Engineer Agency for Resources Inventories, Washington, D.C., 7/68, (PA 37,222).

AD	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1068	0	1					\$0
1069	0	0					\$75,900

TITLE: FLUORESCENT-LAMP TECHNIQUES

1070	0	0			AM INST. F. RES. DAHC1968C0005		\$26,000
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TITLE: Qualification Testing - RVN

DESCRIPTION: The objective of this program was to develop a step-by-step operational plan for a study of testing of Indo-Chinese ethnolinguistic groups.

REMARKS: AGILE - SYSTEMS INTEGRATION.

1071	0	0					\$400,000
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TITLE: PROJECT THEMIS-UNIV OF KANSAS

1072	0	0					\$46,900
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TITLE: DIFFUSION OF OXYGEN IN OXIDES

1073	0	0					\$157,783
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TITLE: TECHNICAL SURVEILLANCE COUNTERMEASURES OPERATION ANALYSIS

1074	0	0					\$131,356
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TITLE: ROCK MECHANICS RESEARCH

1075	0	0					\$464,000
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TITLE: TIME-SHARED COMPUTER SYSTEM (DARTMOUTH)

1076	0	0					\$300,000
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TITLE: OPERATIONS RESEARCH CAPABILITY TO IIAG

1076	0	1					\$300,000
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1077	0	0					\$200,000
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TITLE: STUDY ON ETHIOPIAN CONSUMABLES

1077	0	1					\$0
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1078	0	0			NOAA		\$150,000
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TITLE: Propagation Modeling - Jungle Propagation Research.

DESCRIPTION: The objective of this research was to analyze wave propagation over a smooth cylindrical surface of constant curvature when the boundary impedance is specified for application to short-range radio communications where line-of-

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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sight transmission is not possible.

RESULTS: High frequency approximations are introduced which permit a universal plot of the diffraction loss as a function of a hill height parameter. The results are extended to allow for the presence of a knife-edge obstacle located on the crest of the rounded hill.

REMARKS: AGILE - ANALYSIS - COMMUNICATIONS

REF: "Jungle Propagation Research", Final Report, (b)(6)
 (b)(6) ESSA Research Laboratories, Boulder, Colorado.

1079	0	0			\$400,000
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TITLE: PROJECT THEMIS/UNIVERSITY OF KANSAS

1080	0	0			\$29,000
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TITLE: ANTENNA RADAR CROSS SECTION

1081	0	0			\$10,000
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TITLE: OPERATION CROSS-FERTILIZE

1081	0	1			\$0
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1082	0	0			\$100,000
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TITLE: INFRARED STUD. OF MATRIX-IMPURITY INTERACTIONS, OPT. & MAGN. ETC

1083	0	0			\$15,000
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TITLE: RESEARCH DATA MGMT LANG. ON-LINE QUERY & UPDATE COMP.STORED INFO

1084	0	0			\$102,000
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TITLE: DEFECTS & MASS TRANSPORT IN SINGLE CRYSTALS OF REFRACTORY OXIDES

1085	0	0			\$36,000
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TITLE: TRANSNATIONAL WORKING GROUP ON DYNAMICS OF CONFLICT

1086	0	1	68	68	MIDWEST RES INST DAHC15-68-C-0119 \$62,026
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TITLE: DEFOLIATION - STUDY OF ECOLOGICAL EFFECTS OF HERBICIDES

DESCRIPTION: This study of the ecological effects of extensive or repeated use of herbicides was ordered by DDR&E for use at a meeting of the NAS in December 1967. Utilizing 7 MRI scientists and 3 consultants a total of 147 knowledgeable individuals were interviewed and their contributions evaluated, merged and edited to produce the report in the required 3 1/2 month time frame.

RESULTS: The report represented a MAJOR contribution to the literature and even in 1982 represents a useful compendium of herbicidal data for the pre-1967 era. Major chapters include civilian use, military use, toxicology, persistence

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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of residues and projected ecological consequences.

REMARKS: Section III-G of Project AGILE Program Completion Report on Defoliation dated January 1981 gives a detailed summary of the effort.

1087	0	0		DAAH0168C0490	\$57,000
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TITLE: CORRELATION DETECTOR

DESCRIPTION: The objective of this program was to develop an ignition detection system to sense and count passing ground vehicles from a distance of about 100 feet.

RESULTS: The project resulted in the production of five workable prototypes of the system.

REMARKS: ADVANCED SENSORS

REF: "Correlation Detector Final Report," Kress, J.W., 7/31/68.

1088	0	0			\$6,044,545
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TITLE: PROJECT DEFENDER STUDIES (FOLLOW-ON)

1088	0	1			\$0
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1089	0	0			\$95,000
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TITLE: A STATUS-VALUE THEORY OF DISTRIBUTIVE JUSTICE

1090	0	0			\$400,000
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TITLE: PROJECT THEMIS/NORTH CAROLINA STATE

1091	0	0			\$150,000
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TITLE: INTELLIGENCE COLLECTION SYSTEM-SEA

1092	0	0			\$1,100,000
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TITLE: RE-ENTRY PHYSICS RESEARCH (FORMERLY AO 525)

1093	0	0			\$120,000
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TITLE: ANALYTIC SUMMARY OF US NAT'L SECURITY ISSUES FOR ED. & RSCH PRPS

1094	0	0			\$80,000
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TITLE: GAS BUGGY-USGS

1095	0	0			\$43,057
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TITLE: GAS BUGGY-ESSA

1096	0	0			\$17,000
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AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: STUDY OF STABLE ISOTAPE RATIOS & GAS TRANSPORT					
1097 0 0					\$750,000
TITLE: COUNTERINFILTRATION SYSTEMS STUDY					
1097 0 1					\$0
1098 0 0					\$75,000
TITLE: ETHIOPIAN MILITARY RATIONS					
1098 0 1					\$0
1099 0 0					\$0
1100 0 0					\$200,000
TITLE: HEAD AIMED TV (HAT)					
1101 0 0			BROOKLYN POLY.	DAAB0768C0222	\$10,000
1101 0 1					\$0
1102 0 0					\$500,000
TITLE: MILITARY CIVIC ACTION					
1102 0 1					\$0
1103 0 0					\$400,000
TITLE: ADVISOR SELECTION AND TRAINING					
1103 0 1					\$0
1104 0 0					\$300,000
TITLE: RSSP LOCAL SECURITY SYSTEM, PHASE I					
1104 0 1					\$0
1105 0 0					\$50,000
TITLE: ZAP CHANNEL					
1106 0 0					\$0
1106 0 1					\$0
1106 0 2				SEE AO 1106,AM.1.	\$0
1106 1 0			GEN. ATRONICS	DAAB0768C0222	\$1,090,000

AD	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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1107	0	0					\$160,000
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TITLE: MILITARY MASTER PLANNING, ETHIOPIA

1107	0	1					\$0
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1108	0	0			GRC	DAAH0168C0953	\$422,000
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TITLE: Village Defense Study - Vietnam

DESCRIPTION: The program objectives were to develop a village security system concept that would be adaptable to village defense in the three general regions of South Vietnam (delta, highlands, coastal plains).

RESULTS: Specific conclusions and recommendations were made for the improved security of rural population centers in South Vietnam.

REMARKS: AGILE - SYSTEMS INTEGRATION

REF: "Village Defense Study - Vietnam (U)", Volume 1: Executive Report. General Research Corporation, Santa Barbara, California, Report No. CR-0953-2, Vol. 1, 11/68, (PA 34,595).

1108	0	1					\$0
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1109	0	0					\$50,000
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TITLE: AIRBORNE RADIO RELAY SYSTEM

1110	0	0					\$450,000
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TITLE: RECCE/SURVEILLANCE DEVICES (U) - BINOCULAR

1110	0	1					\$0
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1111	0	0					\$84,000
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TITLE: RECCE/SURVEILLANCE DEVICES - MAPPER

1111	0	1					\$0
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1112	0	0					\$418,000
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1113	0	0					\$23,850
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TITLE: TSCC R&D TEST FACILITY

1114	0	0					\$5,000
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TITLE: INTERNATIONAL CONFERENCE ON METAL-NONMETAL TRANSITION

1115	0	0				SEE AO 1115, AM 1	\$0
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1115	0	1				SEE AO 1115, T 3.	\$0
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1115	0	2			TRW	DAAH0168-C1418	\$447,000

TITLE: Korean Counterinfiltration Systems Study

DESCRIPTION: A study was made of the possible land, sea and air routes that North Korea could use to infiltrate saboteurs into South Korea. Various possible border control and infiltration detection systems were analyzed in terms of effectiveness and cost.

RESULTS: The system recommended using a night illumination system for the Demilitarized Zone, a string of small radars along the coast to detect small boats, fast patrol boats to investigate "fishing boats" which were suspect, and local area militias for attacking infiltrators who landed in South Korea. The system was briefed to CINCLUNK and the Korean military. The lighting system was

REMARKS: (Results cont'd) later installed along the DMZ patrolled by the U.S. Eighth Army by DARPA, acting through the Army Night Vision Lab.
 PROG: TTD - Border Control - Infiltration Detection.
 Also Contno: DAAH0169-C-0985.

1115	0	3			TRW SYSTEMS	DAAH0170C1137	\$767,000
1115	0	4			TRW SYSTEMS	DAAH0170C0271	\$100,000

TITLE: Sensor Integration/Display System I (SINDIS)

DESCRIPTION: The gross objective of this study was to develop a conceptual design of a sensor integration and display system (SINDIS) which would optimize use of data provided through processing and presentation.

RESULTS: The instrumented area of concern was to be some nominal length of international boundary. SINDUS, as developed consists of an Integrator/Multiplexor Unit, a Data Link, and Data Processor/Display Units.

REMARKS: REF: "Sensor Integration/Display System (SINDIS)", Final Report, TRW Systems Group, Redondo Beach, California, Report No. 13891-6002-RO-00, 6/3/70.
 (PA 37,938)

1115	1	0			TRW SYSTEMS	DAAH0170C0271	\$1,379,000
1116	0	0					\$100,000

TITLE: PLASMA DISPLAY TECHNOLOGY

1117	0	0					\$179,835
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TITLE: EGG APPLE

1118	0	0					\$28,000
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TITLE: ACOUSTIC MONITORING DEVICE - G. T. SCHJELDAHL CO.

1119	0	0					\$200,000
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: Firewatch

DESCRIPTION: The object of the program was to develop and test a set of infrared, acoustical and visual sensors grouped in a single system for the purpose of detecting and locating muzzle flashes of hostile weapons and of correcting the fire of friendly weapons.

RESULTS: Although the Firewatch system has some shortcomings, it showed a capability for detecting and locating hostile weapons as well as other targets such as troop movement, ground or vehicle lights, bunkers, vehicles etc.

REMARKS: DEFENDER - SYSTEMS - SENSORS

REF: "Engineering Evaluation of CONUS Tests of Firewatch (U)", for the period 1968 April 22 - 1968 May 22. (b)(6) United States Army Electronics Command, Fort Monmouth, New Jersey, Report No. ECOM-3158, 8/69, (PA 37,422).

1120	0	0			\$221,600
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TITLE: HAND-HELD IMAGE-TRANSDUCER CAMERAS

1121	0	0			\$25,000
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TITLE: PROJECT BLOW HOLE

1122	0	0	OPTRONIX		\$80,000
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TITLE: Ultraviolet Light Detection System

DESCRIPTION: The use of a filtered ultraviolet light source, which could not be detected visually, was investigated to determine if the visible fluorescence of the human eye, caused by the ultraviolet light source, could be used to detect infiltrators.

RESULTS: While the fluorescence of the eye could be observed, it was decided that the ultraviolet light source - fluorescence system could not be used effectively in Vietnam.

REMARKS: PROG: AGILE - Infiltrator Detection - Perimeter Defense - Ultraviolet Detection System.

1122	0	1			\$0
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1123	0	0			\$35,822
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TITLE: EVALUATION OF EQUATION-OF-STATE DATA (CIT)

1124	0	0			\$180,000
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TITLE: EQUATION-OF-STATE RESEARCH (LASL)

1125	0	0			\$49,944
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: PEEPERSCOPE							
1126	0	0					\$100,500
TITLE: CENTER OF EXCELLENCE IN IMAGE FORMING DEVICES							
1127	0	0					\$100,000
TITLE: ENEMY ARTILLERY/MORTAR FIRE							
1127	0	1					\$0
1128	0	0					\$350,000
TITLE: AEROSPACE SUPPORT FOR DEFENDER							
1129	0	0					\$225,600
TITLE: RESEARCH PROJECTS-PURDUE AND NORTHWESTERN UNIVERSITIES							
1130	0	0					\$99,800
TITLE: TRANSPORT PROCESSES IN CERAMIC OXIDES							
1131	0	0					\$8,623
TITLE: TSCM R&D SUBCOMMITTEE HOUSING SPACE							
1132	0	0					\$45,000
TITLE: PROJECT ELK RIVER - PHASE 1A							
1133	0	0					\$12,350
TITLE: BIRD PENETRATION SYSTEM							
1134	0	0					\$75,000
TITLE: HERMAN KAHN & JOHN THOMAS-HUDSON INST.-ZAP CHANNEL-ADV. TO MAC-V							
1135	0	0					\$100,000
TITLE: RML/ETR SEA PROJECT SUPPORT							
1136	0	0					\$23,500,000
TITLE: PROJECT UPSTAGE							
1137	0	0					\$19,800
TITLE: COMPUTER NETWORK DESIGN PARAMETERS							
1138	0	0					\$1,500

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: CARDE PROGRAM

1139	0	0					\$350,000
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TITLE: ANNIE OAKLEY - ZAP CHANNEL

1140	0	0					\$147,500
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TITLE: INFRARED RIFLESCOPES

1140	0	1					\$0
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1141	0	0					\$80,000
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TITLE: PROJECT SECEDE I TEST SERIES

1142	0	0	05/29/71	HONEYWELL	DAAK0268C0384		\$587,000
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TITLE: NIGHTSCOPE

DESCRIPTION: Funds were provided for development, procurement, and evaluation of the Nightscope, a lightweight, completely passive, far infrared night vision device, designed for use with the M-16 rifle in total darkness or in a variety of surveillance situations.

RESULTS: During the course of the program improvements in the Nightscope included: brighter display, increased scanner efficiency resulting in longer operating times, and extension of scanner temperature operating limits beyond the requirements.

REMARKS: AGILE - ADVANCED TECHNOLOGY - SENSORS

REF: "The Nightscope: A Lightweight Weapon Sight (U)", Final Report. Honeywell, Radiation Center, Lexington, Massachusetts. Prepared for Night Vision Laboratories, U.S. Army Electronics Command, Ft. Belvoir, Virginia, 5/71, (PA 40 109).

1142	0	1					\$0
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1143	0	0					\$100,000
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TITLE: HEAD CONTROLLED TV

1144	0	0					\$357,000
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TITLE: CHIROLOGY

1145	0	0					\$60,000
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TITLE: TWO QUICK-ERECT TOWERS-ZAP CHANNEL

1146	0	0					\$20,000
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TITLE: MINISCOPES-ZAP CHANNEL

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1147	0	0					\$2,017
TITLE: HIGH RESOLUTION GAMMA-RAY SPECTROMETER							
1148	0	0					\$60,000
TITLE: MARQUETTE UNIV. CRYSTAL RESEARCH							
1149	0	0					\$274,000
TITLE: RADAR FLY-BY DISCRIMINATOR							
1150	0	0					\$214,424
TITLE: REVISION OF ON-SITE INSPECTION MANUALS							
1151	0	0					\$40,500
TITLE: ATMOSPHERIC NUCLEAR TEST DETECTION							
1152	0	0					\$121,579
TITLE: SMU ATMOSPHERIC ACOUSTICS RESEARCH							
1153	0	0					\$280,000
TITLE: OPTICAL DIAGNOSTIC RESEARCH							
1154	0	0					\$100,000
TITLE: ANNIE OAKLEY-JOHNS HOPKINS U.							
1155	0	0					\$80,000
TITLE: ADVANCED CONCEPTS EVALUATION STUDY							
1156	0	0					\$30,000
TITLE: PAYLOAD CONFIGURATION STUDIES							
1157	0	0					\$49,000
TITLE: DR. ROBERT C. PRIM							
1158	0	0					\$14,590
TITLE: COMMUNICATIONS LINES TO SANTA MONICA							
1159	0	0					\$20,000
TITLE: ACDA CONTRACT WITH RAC							
1160	0	0					\$800

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: JAMMING EQUIPMENT - ZAP CHANNEL					
1161	0	0			\$174,700
TITLE: TARGET DESTRUCTION TESTS					
1162	0	0			\$95,000
TITLE: SNOOPY - ZAP CHANNEL					
1163	0	0			\$50,000
TITLE: ETR ACOUSTIC LOCATION PROGRAM					
1164	0	0			\$30,500
TITLE: TEST-X					
1165	0	0			\$87,000
TITLE: TEST-X					
1166	0	0			\$121,000
TITLE: TEST-X					
1167	0	0			\$139,000
TITLE: EVALUATION OF D-10A					
1168	0	0			\$40,000
TITLE: EVALUATION OF D-10A					
1169	0	0			\$350,000
TITLE: PROGRAM IMPACT EVALUATION PROJECT					
1169	0	1			\$0
1170	0	0			\$27,000
TITLE: LIGHTWEIGHT BOATS					
1171	0	0			\$70,000
TITLE: ENEMY COMBAT EFFECTIVENESS					
1172	0	0			\$6,050
TITLE: TETHERED BALLON SYSTEMS - ONR ZAP CHANNEL					
1173	0	0			\$121,000

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: TETHERED BALLON SYSTEMS - AFSC ZAP CHANNEL					
1174	0	0			\$76,000
TITLE: RESEARCH ON HIGH TEMPERATURE SUPER CONDUCTIVITY					
1175	0	0			\$16,500
TITLE: WRIST COMPASSES - ZAP CHANNEL					
1176	0	0			\$100,000
TITLE: PROJECT RICKSHAW - ZAP CHANNEL					
1177	0	0			\$0
1178	0	0			\$39,292
TITLE: CONTINUATION OF OHD LIBRARY AT BMI					
1179	0	0			\$100,750
TITLE: REENTRY PHYSICS SUPPORT STUDIES AT ATL					
1180	0	0			\$151,125
TITLE: HIGH POWER ELECTRIC-DISCHARGE LASER					
1181	0	0			\$201,500
TITLE: CAMEL RADAR - PHASE I					
1182	0	0			\$105,000
TITLE: CAMEL RADAR - PHASE II					
1183	0	0			\$5,000
TITLE: CHIROLOGY					
1184	0	0			\$103,000
TITLE: MASS TRANSPORT IN OXIDES					
1185	0	0			\$300
TITLE: TRANSPORTATION CHARGES FOR PACK HOWITZERS					
1186	0	0			\$158,000
TITLE: BIG SCREEN					

DESCRIPTION: The objective of the program was to evaluate the capability of the Librascope

AD AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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Night Optical System as a covert night viewing device for use by ground, air, and water based units in Southeast Asia.

RESULTS: The results of the program indicated that the "Big Screen" Night Viewer is acceptable for military use in Southeast Asia.

REMARKS: ADVANCED SENSORS - NIGHT VISION

REF: "General Precision Night Viewing Device (U)", Exploratory Final Report, 1967 November 13 - 1967 November 21. (b)(6)

(b)(6) Dept. of the Air Force, Headquarters 1st Combat Applications Group (TAC), Eglin Air Force Base, Florida, TAC Test 67-1-K-1, 2/23/68, (PA 37,899).

1187	0	0	SANDIA		\$369,200
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TITLE: Unusual Weapons

DESCRIPTION: The objective of this program was to investigate munitions or special weapons for destroying cable suspension bridges.

RESULTS: As a result of the investigation, the clustered cable cutter concept was chosen as the best weapon for cable cutting.

REMARKS: ADVANCED SENSORS - WEAPONS

REF: "Preliminary Study of Special Munitions for Destroying Cable Suspension Bridges (U)", Sandia Laboratories, Albuquerque, New Mexico, 8/68.

1188	0	0			\$130,000
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TITLE: COUPLING & DECOUPLING OF UNDERGROUND NUCLEAR EXPLOSIONS

1189	0	0			\$140,000
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TITLE: SPECIAL EQUIPMENT FOR SEA (ZAP CHANNEL)

1190	0	0			\$150,000
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TITLE: UTILITY OF FORWARD-BASED SYSTEMS

1191	0	0			\$50,536
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TITLE: OPTRONIX INFRARED TRANSCIVERS

1192	0	0			\$95,000
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TITLE: SMALL ARMS LUBRICANTS

1193	0	0			\$43,000
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TITLE: TEST-X

1194	0	0			\$230,000
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TITLE: CONTINUATION OF OFF-LINE RESEARCH (WHITE BIRCH)

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1195	0	0					\$12,000

TITLE: BATTLEFIELD TV RECONNAISSANCE

1196	0	0			CDTC-V		\$274,000
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TITLE: Light Weight (10 lb.) Radar, AN/PPS-10

DESCRIPTION: The objective of this program was to evaluate the AN/PPS-10 lightweight, tactical ground surveillance radar.

RESULTS: Test results indicated that the AN/PPS-10 radar was not completely satisfactory for use in Southeast Asia because of its limited range.

REMARKS: ADVANCED SENSORS - SURVEILLANCE

REF: "Evaluation of Lightweight Battlefield Surveillance Radar, AN/PPS-10,"
Final Report. U.S. Marine Corps Development Center, Marine Corps
Development and Education Command, Quantico, Virginia, 12/68,
(PA 36,099).

1197	0	0					\$32,000
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TITLE: HANDBOOK & CASEBOOK FOR PRACTICAL EVALUATORS

1198	0	0					\$98,000
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TITLE: LONG RANGE STUDY OF DOD MATERIALS NEEDS

1199	0	0					\$502,000
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TITLE: Big Light

DESCRIPTION: The objective of the program was to produce and determine the effectiveness of a tower mounted xenon arc lamp in the overt and covert mode for intrusion detection and physical security.

RESULTS: Results of tests of the "Big Light" determined that it was not suitable for use in Vietnam in its present form and it was sent back to Ft. Belvoir, Va.

REMARKS: ADVANCED SENSORS - NIGHT VISION

REF: Subject: Final Letter Report - "Evaluation of the ARPA Motorized Big
Light (U)". From: (b)(6) Dept. of the Army, Army Concept
Team in Vietnam, APO San Francisco, California. To: Commanding
General, U.S. Army, Vietnam, ATTN: AVHGC-DST, APO San Francisco, CA.,
undated, received 2/71, (PA 38,788).
Work completed under AO 1216 and AO 1709.

1200	0	0					\$112,000
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TITLE: NIGHT PANTHER

DESCRIPTION: The objective of the program was the development and evaluation of a drone helicopter battlefield surveillance system for both daylight and nighttime

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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operation.

RESULTS: Tests of the Nite Panther system proved that the helicopter drone is an excellent vehicle for real-time battlefield surveillance and target acquisition, and for supporting arms fire. The Nite Panther program was a parallel program to Nite Gazelle.

REMARKS: DEFENDER - SYSTEMS - SURVEILLANCE

REF: "Worldwide USAF Aeronautical Reconnaissance Review (U)", for the period 1968 October 8-9. Deputy for Reconnaissance, Aeronautical Systems Division, Wright-Patterson AFB, Ohio, Report No. 68ASRS-1342, 2/20/69, (PA 36,128).

1201	0	0			\$10,500
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TITLE: ADVANCED PROPELLANT CHEMISTRY OPEN CONTRACTS

1202	0	0			\$369,000
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TITLE: MACV OPERATIONAL REPORTING SYSTEM

1203	0	0			\$174,750
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TITLE: PROJECT NIGHT-FOX

1204	0	0			\$149,988
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TITLE: SENSITIVE IR SENSOR

1205	0	0			\$100,000
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TITLE: NUCLEAR DISCRIMINATION STUDY

1206	0	0			\$75,440
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TITLE: FLUORESCENCE DIAGNOSTIC RESEARCH

1207	0	0			\$40,500
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TITLE: SHORT PULSE INVESTIGATION OF IONOSPHERIC STRUCTURES

1208	0	0			\$15,000
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TITLE: CATION AND ANION SELF DIFFUSION IN ZNO

1209	0	0			\$39,893
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TITLE: BIOLOGICAL DETECTION METHOD

1210	0	0			\$10,000
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TITLE: HF CROSS SECTION ANALYSIS

1211	0	0	EDGERTON	F0860669C0004	\$1,192,000
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: Project BLOW HOLE

DESCRIPTION: The objective of this program was to develop and evaluate a laser target marking and acquisition system for use on a QH-500 DASH helicopter armed with AIM-9B missiles modified to home on the laser spot.

RESULTS: This program indicated that a drone system capable of hunting and killing high priority targets in Vietnam was feasible.

REMARKS: ADVANCED SENSORS

REF: "Worldwide USAF Aeronautical Reconnaissance Review (U)", 1968 October 8-9. Deputy for Reconnaissance, Aeronautical Systems Division, Wright-Patterson Air Force Base, Ohio, Report No. 68ASRS-1342, 2/20/69, (PA 36,128).

1212	0	0			\$50,934
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TITLE: RESEARCH & ANALYSIS OF UNCONVENTIONAL NUCLEAR THREAT

1213	0	0	USATOBYHANNA	IN HOUSE	\$90,000
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TITLE: Breakwire Intrusion Detectors

DESCRIPTION: Modification of Army Signal Corps breakwire detector AN/GSS-9 to permit use of Army field wire to bring leads across paths and on roads traversed by vehicles, without affecting the sensitive breakwire detection element at the desired detection areas. Tobyhanna constructed adapters so that the spool of paired No. 40 breakwire could be taken out of the container, and be connected with the buzzer indicator with paired field wire.

RESULTS: A number of systems (1000) were sent to the US 8th Army in Korea. The breakwire element was intertwined with the chain link fence at the south of the DMZ, and Army field wire was then run across the road to the Infantry observation post. Field wire use eliminated the false alarm problem caused by moving branches breaking the field wire.

REMARKS: PROG: TTD - Perimeter Control - Intrusion Detection

Modification of Breakwire Detection Developed by Scope, Inc. See AO 386.

1214	0	0			\$39,500
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TITLE: JOINT VIETNAMESE, KOREAN, & U.S. SOCIAL SCIENCE RESEARCH

1215	0	0			\$65,000
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TITLE: GENERAL STRUCTURAL ANALYSIS PROG. FOR ILLIAC IV

1216	0	0			\$90,000
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TITLE: PROJECT BIG LIGHT

1217	0	0			\$102,000
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: PROJECT LITTLE ROCK							
1218	0	0					\$66,000
TITLE: HIGH ALTITUDE ACOUSTIC SIGNAL GENERATION STUDIES							
1219	0	0					\$100,000
TITLE: PACIFICATION SYSTEMS PROGRAM (NFEC)							
1220	0	0					\$200,000
TITLE: CACHE MARKER PROGRAM							
1221	0	0					\$35,000
TITLE: HAVE FIDDLE							
1222	0	0			SDC	DAHC0469C0010	\$410,000
TITLE: Quick Reaction Capability in Support of the Pacification Program							
DESCRIPTION: A systematic program of applied research was formulated to provide effective and continuing support for the pacification objectives.							
RESULTS: The specific studies which were performed as part of this larger program included: Police Techniques in Pacification; Revolutionary Development Cadre Attrition; Criteria of RD Cadre Effectiveness; CORDS Public Opinion Poll Project; RVN Communications; Project VICEX.							
REMARKS: AGILE - SYSTEMS INTEGRATION							
REF: "Applied Research in Southeast Asia", Final Report. (b)(6) System Development Corporation, Falls Church, Virginia, Report No. TM(V)-013, 7/25/70, (PA 38,143).							
1223	0	0					\$37,200
TITLE: SYNTHETIC APERTURE RADAR DATA							
1224	0	0					\$16,050
TITLE: ARPA PROJECT ADMINISTRATION (ARO(D))							
1225	0	0					\$231,750
TITLE: A&M SUPPORT OF PROJECT SECEDE							
1226	0	0					\$65,500
TITLE: HYDRODYNAMIC COMPUTER CODES							
1227	0	0					\$126,114

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: ACANIA EMP MEASUREMENTS

1228	0	0					\$126,000
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TITLE: MACHINE INDEPENDENT SOFTWARE PROGRAMMING

1229	0	0					\$116,305
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TITLE: AN/APQ 102XA2 RADAR

1230	0	0			TEXAS INSTRUMTS	F3060269-C0022	\$597,000
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TITLE: MRDC ARL Thai Government Military Research and Development Center Aerial Reconnaissance Laboratory.

DESCRIPTION: When the University of Michigan refused to continue support and training for the MRDC ARL, TIO arranged for Texas Instruments, which built the AN/AAS-18 Infrared Line Scanner used on the ARL, to hire the two University of Michigan employees who provided the support within Thailand.

RESULTS: The Thai Air Force and MRDC personnel assigned to the ARL learned to use the AAS-18 to detect night time activities of the Cong Thai (Thai Communists) insurgents in Northern and Northeastern Thailand, and in Southern Thailand along the border with Malaysia.

REMARKS: PROG: TIO - Reconnaissance and Surveillance - Border Control - Counter-Insurgency Warfare - Infrared Sensor.
MRDC ARL established and previously supported under AO 377.

1231	0	0			TRW	DAAH0168-C2107	\$1,108,000
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TITLE: Iran Counterinfiltration Systems Study

DESCRIPTION: Develop a system for improving the ability of the Imperial Iranian Gendarmerie and the Imperial Iranian Air Force to counter infiltration into Iran from the Persian Gulf and across its land borders.

RESULTS: Various intrusion detection sensors and night vision equipment were provided to the Iranian government, and detachments of the Gendarmerie were trained in the use of the equipment. The Gendarmerie applied the training in preventing smuggling into Iran.

REMARKS: PROG: TIO - Border Control - Counterinfiltration - Assistance to Friendly Nations - Counterinsurgency.

1232	0	0					\$10,000
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TITLE: IR SEEKER FOR HERCULES

1233	0	0					\$185,800
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TITLE: PROJECT WASP

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1234	0	0					\$100,000

TITLE: ATOMIC & MOLECULAR PHYSICS PROGRAM

1235	0	0					\$156,000
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TITLE: COMPUTER LABORATORY - THAILAND

1236	0	0	01/30/69		LOCKHEED ELECT.	DAAB0769C0015	\$45,000
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TITLE: Project DORBO (Detection of Receivers by Overloading)

DESCRIPTION: The objective of this program was the investigation of the detection and location of ordnance pieces which contain electrical nonlinearities.

RESULTS: Systems were designed for manpack, vehicle, helicopter, and fixed wing aircraft operation.

REMARKS: ADVANCED SENSORS - DETECTORS

REF: "Material Detection Techniques (U)", Final Technical Report. (b)(6)
(b)(6) Lockheed Electronics Company, Plainfield, New Jersey. Prepared for U.S. Army Electronics Command, Fort Monmouth, New Jersey, ECOM-0015-F, 1/69.

1237	0	0	06/30/69				\$46,000
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TITLE: Determination of LORAN-C Applicability to Tactical Warfare

DESCRIPTION: The objective of this program was to investigate through field tests how well LORAN-C could determine a geographic location, how well this information could be transmitted through a data link to a remote point and then how well personnel at a point over the horizon could control the LORAN-C unit.

RESULTS: The system was to be used as a part of the control system for the DASH helicopter and Silent Joe systems.

REMARKS: ADVANCED SENSORS - NAVIGATION

REF: Subject: "Determination of LORAN-C Applicability to Tactical Warfare," Memorandum. From: (b)(6) Director, Advanced Sensors. To: Director, Program Management, Advanced Research Projects Agency, 5/1/68.

1238	0	0					\$94,000
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TITLE: HIGH-SENSITIVITY SHOCK TRANSDUCER

1239	0	0	07/01/67	06/30/70	OSDB&F		\$34,000
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TITLE: Academic Studies, RVN

DESCRIPTION: Funds were provided for travel and per diem for faculty and staff members of the military academics while conducting research projects on temporary duty in Vietnam.

REMARKS: AGILE - ADVANCED TECHNOLOGY

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1240	0	0					\$100,000
TITLE: LASL RESEARCH ON ELECTROMAGNETIC LOCATORS							
1241	0	0					\$669,922
TITLE: PROJECT BALRAD							
1242	0	0					\$0
1243	0	0					\$118,500
TITLE: NONDESTRUCTIVE TESTING (NSSC)							
1244	0	0					\$173,000
TITLE: NONDESTRUCTIVE TESTING (AFSC)							
1245	0	0					\$100,500
TITLE: NONDESTRUCTIVE TESTING (AMC)							
1246	0	0					\$44,750
TITLE: NONDESTRUCTIVE TESTING (AMC)							
1247	0	0					\$70,500
TITLE: NONDESTRUCTIVE TESTING (NASC)							
1248	0	0					\$18,000
TITLE: INFRARED INTRUSION DETECTORS							
1249	0	0					\$400,000
TITLE: SPECIAL AIRBORNE WEAPON SYSTEMS (SAWS)							
1250	0	0					\$79,633
TITLE: DIGITAL COMMUNICATIONS PROBLEMS							
1251	0	0	07/01/67	06/30/68	MIRADCOM		\$32,000
TITLE: Quick Reaction Procurements							

DESCRIPTION: Funds were provided to U.S. Army Missile Command to procure material and services on a quick reactive basis for direct support of ARPA research in Vietnam.

RESULTS: These procurements were in direct support of combat effectiveness and were given highest administrative authority.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: AGILE - ADVANCED TECHNOLOGY

1252	0	0			\$20,000
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TITLE: STORAGE OF REDSTONE MISSILES

1253	0	0			\$475,000
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TITLE: IMPROVED INTERCEPTOR PERFORMANCE STUDY

1254	0	0			\$21,000
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TITLE: ARPA RESEARCH IN REPUBLIC OF VN

1255	0	0			\$945,000
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TITLE: SILENT JOE II-PHASE I

1256	0	0			\$400,000
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TITLE: EIGHTH CARD

1257	0	0	VERTEX	DAAH0169C0675	\$4,507,000
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TITLE: Small Independent Action Forces

DESCRIPTION: The SIAF Program was a systems engineering approach to the problem of maximizing the effectiveness of U.S. and Allied small combat elements conducting independent operations in an insurgency environment.

RESULTS: This program has established a model of a SIAF to include the variables and important interrelationships. Data were collected on SIAF-type operations in RVN and these data were used to verify the model. The model was optimized and a test and evaluation environment was developed based on this optimization.

REMARKS: AGILE - SYSTEMS INTEGRATION

REF: "SIAF Model Development, Validation and Implementation," Volume 1, Final Report, Small Independent Action Forces Program, for the period 1970 August 17 - 1971 August 31. TRW Systems Group, Redondo Beach, California, Report No. 16905-6012-R0-00, 7/31/71, (PA 39,736).
Work also done under AO 1572 AO 1600, AO 1693, AO 1701, and AO 1704.

1257	0	1	VERTEX	DAAH0170C0606	\$141,000
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TITLE: SIAF Data Base

DESCRIPTION: Develop and maintain a data base of Small Independent Action Forces organization, sizes, equipment, weapons, uniforms, special equipment, etc., and results of all DARPA SIAF Program activities.

RESULTS: Data accumulated from WW II, Korea and Vietnam on US, UK, and Vietnamese SIAF's.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: Task 1 of Small Independent Action Forces Program.

1257	0	2	HUMRRO	DAAH0170C0488	\$0
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TITLE: Selection & Training.

DESCRIPTION: Develop selection methods and training programs for the selection and training of personnel for Small Independent Action Forces.

RESULTS: Mental and physical aptitude selection tests devised. Training programs and tests developed covering the major individual training requirements; such as patrolling, map and compass use, weapons, communications, etc. Methods and programs used in varying degrees by U.S. Army and USMC.

REMARKS: Task 2 of SIAF Program.

1257	0	3	ECOM NVLAR		\$93,000
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TITLE: RVN Patrol Package

DESCRIPTION: Using advanced material technology and improved designs, provide materials and designs for improved lighter weight uniforms and load-bearing equipment (packs, belts, etc.) to Vietnam.

RESULTS: Small Independent Action Forces equipped with the lighter weight, more comfortable, and more climate protective uniforms and equipment were found to have increased mobility, increased effectiveness, and higher morale.

REMARKS: Results led to U.S. Armed Forces improved uniforms and equipment. Task 3 of SIAF Program.

1257	0	4	ILC	DAAG0169C0987	\$11,000
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TITLE: Pneumatic Boats

DESCRIPTION: Purchase and ship to Vietnam two- and four-man portable boats for SIAF mobility evaluation.

RESULTS: Mobility of SIAF's improved, but need for similar but lighter weight boats demonstrated.

REMARKS: Task 4 of SIAF Program.

1257	0	5	SILVA INC.	DAAH0169H0267	\$2,000
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TITLE: Patrol Compass

DESCRIPTION: Produce and ship to Vietnam 200 waterproof, shock-resistant wrist compasses for evaluation by U.S. Army and USMC Small Independent Action Forces.

RESULTS: Compasses proved to be superior to standard Army and Marine Corps issue compasses.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: Task 5 of SIAF Program.

1257	0	6	VERTEX	DAAH01169C0675	\$28,000
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TITLE: Sensors Test Preparation

DESCRIPTION: Select those man-portable sensors in the U.S. military inventory which may have application to Small Independent Action Forces and design a field test to evaluate the selected sensors use and application in various SIAF missions.

RESULTS: Suitable acoustic and seismic devices selected and field test designed.

REMARKS: Task 6 of SIAF Program.

1257	0	7	VERTEX	DAAH0169C0675	\$481,000
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TITLE: Sensors Test Support

DESCRIPTION: Conduct a field test to evaluate the military value of U.S. military inventory sensors in SIAF operations.

RESULTS: Lightweight hand-held radar proved most useful under various mission categories. Need established for more readily implantable seismic and acoustic devices.

REMARKS: Task 7 of SIAF Program.

1257	0	8	VARIOUS		\$28,000
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TITLE: Sensors Test Procurement

DESCRIPTION: See Task 7, AO 1257.

1257	0	9	GEN. DYNAMICS	DAAH0170C0380	\$96,000
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TITLE: Radar Purchase.

DESCRIPTION: See Task 7, AO 1257. Hand-held, man-portable radars.

1257	0	10	USAR HAW	IN HOUSE	\$144,000
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TITLE: Sensors Test Support.

DESCRIPTION: See Task 7, AO 1257.

1257	0	11	USMC	IN HOUSE	\$20,000
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TITLE: Sensors Test Support.

DESCRIPTION: See Task 7, AO 1257.

1257	0	12	TOPOCOM	IN HOUSE	\$61,000
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AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: Sensors Test Support.

DESCRIPTION: See Task 7, AO 1257.

1257	0	13			\$99,000
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TITLE: Grenade Launcher Test.

DESCRIPTION: Design and conduct a test to determine the advantages/disadvantages of the U.S. 40mm grenade launcher and rifle launched grenade systems in the context of SIAF missions.

RESULTS: Rifle launched grenade systems proved more advantageous. Test results indicated increased advantage could be achieved with improved designed rifle launchers.

REMARKS: Task 13 of SIAF Program.

1257	0	14	ALLIED RESEARCH	DAAH0170C0260	\$26,000
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TITLE: Grenade Launcher Purchase.

DESCRIPTION: Purchase of rifle grenade launchers and grenades for grenade launcher test. See Task 13, AO 1257.

REMARKS: Rifle grenade launchers and grenades for the M16 rifle were not in U.S. military inventory at this time.

1257	0	15	MIRADCOM	IN HOUSE	\$39,000
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TITLE: Grenade Launcher Test Purchase.

DESCRIPTION: See Task 13, AO 1257.

1257	0	16	VERTEX	DAAH0169C0675	\$39,000
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TITLE: Hand Grenade Test.

DESCRIPTION: Design and conduct a test to evaluate the effectiveness of mini-hand grenades (30mm).

RESULTS: Smaller and lighter than the standard U.S. issue M26 hand grenade, the mini-grenade offered distinct advantages in SIAF missions where bulk and weight are primary considerations. Effectiveness (PK-Probability of hit/kill) acceptable.

1257	0	17	DA&A	DAAH0170H172	\$2,000
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TITLE: Mini-Grenade Purchase.

DESCRIPTION: Purchase test quantity of mini-grenades. See Task 16, AO 1257.

1257	0	18	DUKE UNIV.	DA31124AR009	\$50,000
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: SIAF Consultants I.

DESCRIPTION: Provide consultants to evaluate the developing SIAF mathematical model.

1257	0	19			AEC	IN HOUSE	\$25,000
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TITLE: SIAF Consultants II.

DESCRIPTION: See Task 18, AO 1257.

1258	0	0					\$300,000
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TITLE: PROJECT HAVE DAGGER

1259	0	0					\$20,000
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TITLE: REIMBURSEMENT FOR EVALUATION OF SEARCH-LIGHT

1260	0	0					\$563,000
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TITLE: INTERFACE MESSAGE PROCESSORS (IMPS)

1261	0	0					\$184,000
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TITLE: MORE EFFECTIVE INDIVIDUAL INSTRUCTION

1262	0	0					\$842,000
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TITLE: MIRACLE PLAY

1263	0	0					\$46,920
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TITLE: DIG HARD

1264	0	0					\$25,000
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TITLE: MACSA/RDFU-V ZAP FUNDS

1265	0	0					\$78,000
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TITLE: GUNFIRE-LOCATING INFRARED SYSTEM (GLIR)

1266	0	0					\$500,000
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TITLE: AN/PPS GROUND SURVEILLANCE RADAR

1267	0	0					\$50,000
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TITLE: LOW COUPLING MEDIA IN WESTERN U.S.

1268	0	0					\$180,000
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TITLE: COMPRESSED GAS ILLUMINATION SYSTEM

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1269	0	0					\$154,000
TITLE: INDIVIDUAL DIFFERENCES & INSTRUCTIONAL STRATEGIES							
1270	0	0					\$1,000,000
TITLE: RDC-T OPERATING FUNDS							
1271	0	0					\$750,000
TITLE: AIR SUPPORT CONTRACT - RDC-T & RDFU-V							
1272	0	0					\$175,000
TITLE: RESEARCH CONTRACTS - RDC-T							
1272	0	1			RDC-THAILAND	IN-HOUSE	\$9,000
TITLE: MRDC PSID							
DESCRIPTION: The DARPA Research and Development Center, Thailand, provided a number of Patrol Seismic Intrusion Detection Sensors to the Thai Army, and trained Thai patrols in the use of the PSID to detect infiltrators moving along trails.							
RESULTS: The effective detection radius for the PSID in the jungles of Thailand, which are similar to the jungles of Vietnam, was between 8 and 30 feet for a man, and about 100 feet for a vehicle.							
REMARKS: PROG: TTO - Reconnaissance and Surveillance - Intrusion Detection - Seismic Detectors.							
Seismic detectors developed by the Sandia Corp. under AO 754.							
1273	0	0					\$50,000
TITLE: OPERATING EXPENSES - RDFU-V							
1274	0	0					\$50,000
TITLE: OPERATIONAL SUPPORT - RDO(ME)							
1275	0	0					\$0
1276	0	0					\$550,000
TITLE: PHASED ARRAY DATA PROCESSING STUDY							
1277	0	0					\$25,000
TITLE: RADIO COMMUNICATION EQUIPMENT - ZAP CHANNEL							
1278	0	0					\$125,000
TITLE: ADMINISTRATIVE & TRAVEL EXPENSES FOR ARPA PROJECTS							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1279	0	0					\$175,000
TITLE: ARPA/RADC OPTICAL RADAR PROGRAM							
1280	0	0					\$32,000
TITLE: UV IONIZATION							
1281	0	0					\$385,000
TITLE: FIELD EFFECT MONITOR & PASSIVE ADVANCED IR SYSTEM							
1282	0	0					\$300,000
TITLE: DATA ANALYSIS PROGRAM							
1283	0	0					\$350,000
TITLE: NITE GAZELLE							
1284	0	0					\$750,000
TITLE: APRA'S SHARE OF RML OPERATING EXPENSES							
1285	0	0					\$59,990
TITLE: CHEMICAL VAPOR DEPOSITION							
1286	0	0					\$20,000
TITLE: INCAPACITATING AGENT DISPENSING DEVICES ZAP CHANNEL							
1287	0	0			RML		\$237,000

TITLE: Coherent Optical Fingerprint Identification System (COFIDS)

DESCRIPTION: The objective of this program was to develop and evaluate a system for maintaining internal security control and the identification of personnel at DoD installations.

RESULTS: It was concluded that the COFIDS would be an effective auxiliary security system for any size installation provided sufficient time is allowed for operator training.

REMARKS: ADVANCED SENSORS

REF: "Coherent Optical Fingerprint Identification System (COFIDS)", Final Technical Report. Range Measurements Laboratory, Patrick Air Force Base, 11/15/71.

1288	0	0					\$300,000
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TITLE: BMD DATA PROCESSING STUDY

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1289	0	0					\$200,000
TITLE: SECEDE III							
1290	0	0					\$300,000
TITLE: STUDIES OF WARTIME DEVELOPMENT PROJECTS FOR VIETNAM							
1291	0	0					\$60,000
TITLE: LASER HOLOGRAM							
1292	0	0					\$203,000
TITLE: ADVANCED TECHNOLOGY PROGRAM (949)							
1293	0	0					\$150,000
TITLE: NUCLEAR TECHNOLOGY SUMMER STUDY							
1294	0	0					\$196,000
TITLE: IR SILICON VIDICON FEASIBILITY DEMONSTRATION							
1295	0	0					\$2,000,000
TITLE: ALASKAN LONG PERIOD ARRAY (ALPA)							
1296	0	0					\$750,000
TITLE: PROJECT HAVE DAGGERITE							
1297	0	0					\$137,955
TITLE: BASIC PROCESSES IN PERSUASION							
1298	0	0			ERDL		\$28,000
TITLE: Night Vision Sights							
DESCRIPTION: Funds were provided to the U.S. Army Night Vision Laboratory to procure and ship to Vietnam two crew served weapons night vision sights with tripod adapter kits and two medium range night vision observation devices with tripods.							
REMARKS: AGILE - ANALYSIS - NIGHT VISION							
1298	0	1					\$0
1299	0	0					\$0
1300	0	0					\$25,600
TITLE: LAUNCHING SMALL PRE-INFLATED BALLOONS (ZAP CHANNEL)							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1301	0	0					\$40,054
TITLE: PROJECT STRAT-X (GENERAL DYNAMICS)							
1302	0	0					\$165,546
TITLE: MTI RADAR ON QH-50D HELICOPTER							
1303	0	0					\$0
1304	0	0					\$185,800
TITLE: PROJECT WASP (ALSO SEE AO#1233)							
1305	0	0			GREENWICH INT.	DAAH0169C0261	\$29,000

TITLE: RVNAF Effectiveness

DESCRIPTION: SEER (System for the Evaluation of the Effectiveness of the Republic of Vietnam Armed Forces) is designed to provide structured evaluations adaptable to machine analysis. This program called for a review of main processing methods as well as the validity of the content of SEER's questionnaire and performance data.

RESULTS: From field studies performed in the fall of 1968 using statistical analysis it was concluded that the SEER questionnaire is valid.

REMARKS: AGILE - ANALYSIS

REF: "SEER Revision," Final Report. (b)(6)
(b)(6) Greenwich International, Inc., New York, N.Y., 6/26/69,
(PA 36,287).

1306	0	0					\$28,200
TITLE: DRONE TESTING OF IR SCANNER (DRAGONFLY)							
1307	0	0					\$118,828
TITLE: TETHERED BALLON SYSTEM							
1308	0	0			SANDIA		\$488,300

TITLE: Unusual Weapons

DESCRIPTION: The objective of this program was to determine the feasibility of developing a special weapon for the destruction of caves.

RESULTS: The project resulted in the finding that the proposed concept was feasible.

REMARKS: ADVANCED SENSORS - WEAPONS

REF: "A Feasibility Study of a Cave Attack Munition," Sandia Laboratories,
Albuquerque, New Mexico, Report No. SC-RR-69-34, 6/69.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1309	0	0					\$197,033
TITLE: SMALL ARMS SYSTEMS STUDY							
1310	0	0					\$205,000
TITLE: REENTRY PHENOMENOLOGY RESEARCH							
1311	0	0					\$35,000
TITLE: RADC ADMINISTRATIVE AND TRAVEL EXPENSES FOR ARPA PROJECTS							
1312	0	0					\$49,000
TITLE: PLAMA STUDIES							
1313	0	0					\$80,000
TITLE: PAHLAVI NUTRITION RESEARCH PROJECT, IRAN							
1314	0	0					\$316,000
TITLE: FORWARD BASED SYSTEMS STUDY							
1315	0	0					\$69,749
TITLE: IRBM STUDIES							
1316	0	0					\$600,000
TITLE: ATMOSPHERIC ACOUSTIC RESEARCH							
1317	0	0					\$75,636
TITLE: SRI-DYNAMIC STRAIN TESTS OF LARGE ROCK							
1318	0	0					\$16,400
TITLE: AFOAR ADMINISTRATIVE & TRAVEL EXPENSES FOR ARPA PROJECTS							
1319	0	0					\$50,000
TITLE: AFDAR ADMINISTRATIVE & TRAVEL EXPENSESE FOR ARPA PROJECTS							
1320	0	0					\$80,000
TITLE: INVESTIGATION OF ACOUSTIC GRAVITY WAVES							
1321	0	0					\$320,000
TITLE: ARPA QUIET HELICOPTER PROGRAM (BELL CO.)							
1322	0	0					\$175,000

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: ARPA QUIET HELICOPTER PROGRAM (KAMAN)					
1323	0	0			\$375,000
TITLE: ARPA QUIET HELICOPTER PROGRAM (SIKORSKY)					
1324	0	0			\$299,055
TITLE: PROJECT HAVE FIDDLE					
1325	0	0			\$22,302
TITLE: AMOS DATA LINK WITH WTR					
1326	0	0			\$44,000
TITLE: LASER PROPAGATION STUDIES					
1327	0	0			\$1,370,891
TITLE: COMPUTER-AIDED COMMAND RESEARCH					
1328	0	0			\$100,000
TITLE: YOUNG SCIENTISTS & ENGINEERS IN ADVISORY SERVICES TO GOV'T.					
1329	0	0			\$60,000
TITLE: AFTAC ADMINISTRATIVE AND TRAVEL EXPENSES FOR ARPA PROJECTS					
1330	0	0			\$252,000
TITLE: In House Research					
DESCRIPTION: This program provides funds to the OSD/ARPA R&D Field Unit for research contracts or grants for local research tasks within RVN.					
REMARKS: AGILE - ANALYSIS					
REF: "Quarterly Project Status Report," for the period 1971 October 1- 1971 December 31. Combat Development and Test Center, Vietnam, Republic of Vietnam Armed Forces; Research and Development Field, Vietnam, 1/5/72, (PA 40,374).					
1331	0	0			\$31,000
TITLE: TERRAIN MASKING STUDY					
1332	0	0			\$55,482
TITLE: ISOFLAK STUDY					
1333	0	0	LMSC	DAAH0169C-0550	\$217,000

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: THAI AIR BASE DEFENSE STUDY

DESCRIPTION: Under the treaty between the Govt. of Thailand and the U.S., the Thai were responsible for the security of the Thai air bases which Thailand permitted us to use. While Thailand permitted some U.S. security measures on the bases, it prohibited any U.S. defensive measures off the bases.

RESULTS: The Lockheed Missiles & Space Corp. analyzed the problems involved in providing protection for U.S. personnel and equipment at these bases, and provided a set of perimeter defense measures, using U.S. assets, that we could use, within the limitations established by the Thai government.

REMARKS: PROG: AGILE - Base Defense - Perimeter Defense - Remote Area Conflict - Weapons Detection - Return of Hostile Fire.

1334	0	0			\$50,000
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TITLE: DDR&E (THREAT ASSESSMENT OFFICE) SUPPORT

1335	0	0	HONEYWELL	DAAK0270C0023	\$75,000
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TITLE: Multipurpose Concealed Intrusion Detector (MCID) Radio Frequency Link/ccc.

DESCRIPTION: The Army Multipurpose Concealed Intrusion Detector, MCID, uses a field wire link to connect the MCID to the infantry command post. Honeywell was contracted to develop a radio link to the sensor, so that deployment of the MCID system would be performed in much less time, and without a telltale wire leading away from the MCID.

RESULTS: Models of the radio link were tested at the Mobility Equipment Research and Development Center at Fort Belvoir, Virginia.

REMARKS: PROG: TTD - Perimeter Security - Intrusion Detection Sensor.

1336	0	0			\$21,984
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TITLE: ACCESS TO SDC TIME-SHARING COMPUTER

1336	0	1	SYS. DEV. CORP.	DAHC1569C0137	\$124,000
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TITLE: AGILE Data Management System.

DESCRIPTION: This contract funded access to the Q-32 system and its associated DMS capabilities.

RESULTS: The fiscal data base was useful and led to much bigger things.

REMARKS: In the mid-60's Favor (IPT) and Edwards (TTD) began to design and implement funding data bases for their Offices using the SDC system. At a budget review Dr. Herzfeld saw the runs in use and directed an ARPA system be established. The ARPA system was a once-a-month batch system so IPT and TTD continued their on-line efforts until ARPA/MIS was established.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1337	0	0					\$200,000
TITLE: ADMINISTRATIVE AND TRAVEL EXPENSES FOR AMC							
1338	0	0					\$27,500
TITLE: ADMINISTRATIVE AND TRAVEL EXPENSES FOR ECOM							
1339	0	0					\$10,000
TITLE: ADMINISTRATIVE AND TRAVEL EXPENSES FOR ARO(A)							
1340	0	0					\$190,000
TITLE: WATERBORNE TRAFFIC ANALYSIS OF PERSIAN GULF							
1341	0	0					\$1,800,000
TITLE: HYPERVELOCITY RANGE RESEARCH							
1342	0	0					\$232,686
TITLE: SENSOR/WEAPON PLATFORM DEVELOPMENT							
1343	0	0					\$320,000
TITLE: SPECIAL SENSING EQUIPMENT TO MACSA ZAP CHANNEL							
1344	0	0					\$15,000
TITLE: DIRECTIONAL ACOUSTIC DETECTION SYSTEM							
1345	0	0	11/01/68	09/01/70	CONTROL DATA	DAAH0169C0547	\$520,000

TITLE: Military Assistance Command, Science Advisor (MACSA) and Military Assistance Command Evaluation (MACEVAL) Task Force.

DESCRIPTION: The purposes of this program were to provide scientific and technical consultant services in tasks involving earth sciences and natural resources development related to activities of the MACV Science Advisor.

RESULTS: The contributions to original research include a comprehensive summary of the occurrence of ground-water resources in the Republic of Vietnam, a description of geomorphic provinces of the Republic based upon the latest available topographic and geologic data, and a summary of basic data sources.

REMARKS: AGILE - ANALYSIS

REF: "Basic Data Sources in the Republic of Vietnam Related to Civil Works," Final Report. (b)(6) Control Data Corporation. Prepared for the Office of the Science Advisor, Headquarters, MACV; Sponsored by the U.S. Military Assistance Command, Vietnam (USMACV); Monitored by the U.S. Army Missile Command, 1/15/70, (PA 37,997).

Work completed under DAAH070C0326.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1346	0	0					\$75,000
TITLE: HUDSON INSTITUTE RESEARCH IN VIETNAM							
1347	0	0					\$300,000
TITLE: RUSSET/DRILL STEM REENTRY AND RECOVERY							
1348	0	0					\$200,000
TITLE: ADVANCED MARINE TECHNOLOGY PROGRAM							
1349	0	0					\$24,000
TITLE: TRAVEL AND ADMINISTRATIVE FUNDS IN SUPPORT OF SIAF							
1350	0	0					\$599,757
TITLE: PROJECT EARSHOT SUPPORT TASK							
1351	0	0					\$24,589
TITLE: FIELD EVALUATION OF FLASH BLINDING CONCEPT (ZAP CHANNEL)							
1352	0	0					\$8,496
TITLE: GEODAR SYSTEM IN VIETNAM							
1353	0	0					\$144,000
TITLE: BORDER CONTROL							
1354	0	0					\$96,000
TITLE: OPERATIONS RESEARCH							
1355	0	0					\$160,000
TITLE: VILLAGE INFORMATION SYSTEMS THAILAND							
1356	0	0					\$150,000
TITLE: NATURAL-LANGUAGE COMMUNICATION WITH COMPUTERS							
1357	0	0					\$211,077
TITLE: INFRASONIC RESEARCH BY EARTH SCIENCES DIVISION, TELEDYNE							
1358	0	0					\$50,671
TITLE: INVESTIGATION OF AURORAL WAVE SOURCES							
1359	0	0					\$345,000

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: STRATEGIC REENTRY TECHNOLOGY (STREET)					
1360	0	0			\$320,000
TITLE: USE RIGHTS ON ROI AND NIMUR ISLANDS					
1361	0	0			\$350,000
TITLE: DIAGNOSTICS OF NUCLEAR TESTS					
1362	0	0			\$24,510
TITLE: INFRASONIC RESEARCH					
1363	0	0			\$52,218
TITLE: INFRASONIC RESEARCH - UNIV OF MICH.					
1364	0	0			\$120,000
TITLE: NULCEAR INTERFERENCE ON LWIR SYSTEMS					
1365	0	0			\$168,819
TITLE: 100 WATT CW ARGON ION LASER					
1366	0	0			\$4,715,000
TITLE: TOM MEASUREMENTS PROGRAM					
1367	0	0	MANSUBCO	DAAH0169-C1433	\$293,000

TITLE: ELECTRICAL INDICATOR SYSTEM

DESCRIPTION: Mansubco had developed and electrically operated, several strand fence, operated from a central command post. The system indicated the location of penetration attempts through the fence, either by cutting the wires, or by separating the wires so that infiltrators could squeeze under or through the fence, or by pushing the top wire down in climbing over it.

RESULTS: Under the contract all of the components were procured for installing an infiltration detection fence along the Korean DMZ. Mansubco also provided technical instruction and training by constructing a fence, demonstrating its capability, and instructing a team of TRW personnel, who then constructed the infiltration detection fence along the DMZ.

REMARKS: PROG: AGILE - Border Control - Perimeter Defense - Base Defense - Korean DMZ - Infiltrator Detection and Localization.
ARPA Order 1457 - TRW installed the Mansubco fence.

1368	0	0			\$249,899
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TITLE: FISSION PRODUCT RESEARCH

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1369	0	0					\$30,000
TITLE: CROSSED COCHLEA EFFECT STUDY							
1370	0	0					\$150,000
TITLE: NUCLEAR PROLIFERATION RESEARCH AT LRL							
1371	0	0					\$32,166
TITLE: EMP PROPAGATION CALCULATIONS							
1372	0	0					\$347,000
TITLE: PROJECT LOGOS							
1373	0	0					\$308,300
TITLE: NUCLEAR PROLIFERATION RESEARCH AT SANDIA							
1374	0	0					\$5,000
TITLE: PROJECT ELM TEA							
1375	0	0					\$89,106
TITLE: PROJECT DRAGON LILY							
1376	0	0					\$115,000
TITLE: MILITARY ADVISORY SYSTEMS RESEARCH							
1377	0	0					\$2,000,000
TITLE: PROJECT SEESAW							
1378	0	0					\$5,000
TITLE: ARPA OSA DECOUPLING PANEL							
1379	0	0					\$25,000
TITLE: EXPLOSIVE AUTOFRETTAGE OF GUN TUBES							
1380	0	0					\$229,300
TITLE: COMPUTER NETWORK MODELING & MEAS.							
1381	0	0					\$150,000
TITLE: EXPERIMENTAL WAKE STUDIES							
1382	0	0					\$418,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: BLOW HOLE II							
1383	0	0					\$320,000
TITLE: TANK SURVIVABILITY STUDY							
1384	0	0					\$117,000
TITLE: MILITARY CIVIC ACTION							
1384	0	1					\$0
1385	0	0					\$401,000
TITLE: CONSTRUCTION-MRDC BUILDING							
1386	0	0					\$89,538
TITLE: CASE WESTERN DIAMONDS							
1387	0	0					\$120,000
TITLE: ADVANCED OPTICAL TECHNOLOGY PROGRAM							
1388	0	0					\$50,000
TITLE: ADVANCED OPTICAL TECHNOLOGY PROGRAM							
1389	0	0					\$900,000
TITLE: ADVANCED OPTICAL TECHNOLOGY PROGRAM							
1390	0	0					\$70,000
TITLE: ADVANCED OPTICAL TECHNOLOGY PROGRAM							
1391	0	0					\$72,300
TITLE: USAMICOM FEES FOR LEVEL II SUPPORT							
1392	0	0					\$259,670
TITLE: INFRARED INTRUSION ALARM SYSTEM							
1393	0	0					\$10,790
TITLE: STUDY-CALIFORNIA EARTHQUAKE							
1394	0	0					\$115,770
TITLE: EXPMT. PRGM. TO INVESTIGATE PROB. RELEVANT TO DECOUPLING METHODS							
1395	0	0					\$327,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: SURFACE-TO-SURFACE INTERDICTION STUDY

1396	0	0					\$35,000
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TITLE: PHASE "O" NEW DIRECTIONS-EARTHQUAKE CONTROL

1397	0	0					\$100,000
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TITLE: RES. ON MECHANICAL PROP. OF ROCK

1398	0	0					\$200,000
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TITLE: AIRBORNE INTRUDER DETECTION SYSTEM

1399	0	0	10/30/70	ITT AERO/OPT	DAAH0170C0782		\$937,000
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TITLE: Portable Precision Location System.

DESCRIPTION: Prior to integrating the PPLS concept into an operation system ARPA agreed to sponsor development of a field portable demonstration system for user testing and evaluation.

RESULTS: The original equipment, consisting of a control center, aircraft transponder, and patrol transponder were factory tested in September 1970. Later field testing at Hunter Liggett Military Reservation showed no significant equipment failure but some operational weaknesses.

REMARKS: AGILE - ANALYSIS - NAVIGATION

REF: "Portable Precision Location System (U)," Environmental and Field Test Report. ITT, Aerospace/Optical Division, Defense-Space Group, Aerospace Laboratories, San Fernando, California, 10/8/71, (PA 39,787).

1400	0	0					\$10,000
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TITLE: NIGHT FOX

1401	0	0					\$3,000,000
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TITLE: DIAMOND DUST

1402	0	0					\$277,000
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TITLE: LOW MAINTENANCE RIFLE PROGRAM

1402	0	1		TRW	DAAD0571C0260		\$960,000
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TITLE: Low Maintenance Rifle

DESCRIPTION: Using advanced materiel and lubricant technology, design and develop an experimental rifle emphasizing a cost and use effective reduction in maintenance during weapon storage and use.

RESULTS: Use of self-lubricating metals eliminates need for special coverings during

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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storage. Increased attention to advanced materiel technology and reduction, through initial rifle design, of close tolerances in moving parts would reduce rifle malfunctions and jamming.

1402	0	2			ASASA	IN HOUSE	\$10,000
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TITLE: ASASA Technical Support.

DESCRIPTION: See Task 1, AO 1402.

1403	0	0					\$794,176
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TITLE: SURFACE EFFECT VEHICLES

1404	0	0					\$99,906
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TITLE: GAMMA RAY SPECTROSCOPY FROM SATEL

1405	0	0					\$38,285
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TITLE: MERIDIAN DIAGNOSTIC RESEARCH, SRI

1406	0	0					\$66,743
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TITLE: SILENT JOE II CONCEPT ANALYSIS

1407	0	0					\$34,000
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TITLE: DIAMOND DUST

1408	0	0					\$24,466
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TITLE: RESEARCH IN WAVE PROPAGATION/EARTH-WATER

1409	0	0			TEXAS INSTRUMENT		\$265,000
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TITLE: PROJECT EGG ROLL

DESCRIPTION: An advanced, very high resolution infrared system was installed in an aircraft and local nationals were trained to operate the equipment.

RESULTS: The capability of the system was demonstrated. It provided a real time capability to detect infiltrators crossing country borders, in areas not protected by foliage canopies. The passive infrared detection system enabled the aircraft crew to alert ground counter-infiltration personnel, and inform them of the number and location of the infiltrators.

REMARKS: PROG: Overseas Defense Research (formerly Project AGILE) - Border Control-Infiltration Detection - Base Defense - Passive Infrared Personnel Detection.

1410	0	0					\$120,000
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TITLE: SLIPPERY EEL (S)

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1411	0	0					\$500,000
TITLE: UNIV OF MICH/SCTY DATA ARCHIVE & ANALYSIS CENTER							
1412	0	0					\$60,000
TITLE: SEISMIC WAVES FROM IMPULSIVE SOURCES							
1413	0	0					\$25,000
TITLE: STRAT MSLS IN NON-NUCLEAR ROLES							
1414	0	0					\$48,700
TITLE: UNDERSEA LIGHT PROPAGATION							
1415	0	0					\$99,800
TITLE: UNDERWATER OPTICAL IMAGING							
1416	0	0					\$55,500
TITLE: SATELLITE-BORN GAMMA RAY DETECTOR							
1417	0	0					\$91,000
TITLE: HIGH AVERAGE POWER FREQUENCY							
1418	0	0					\$110,000
TITLE: SUPER SNIPER COVERT PENETRATION							
1419	0	0					\$78,000
TITLE: UNDERWATER IMAGERY							
1420	0	0					\$178,676
TITLE: EMP DIAGNOSTICS							
1421	0	0					\$160,000
TITLE: MERLIN							
1422	0	0					\$238,000
TITLE: IONOSPHERIC MODIFICATION PROGRAM							
1423	0	0					\$130,000
TITLE: INNOSPHERIC MODIFICATION PROGRAM							
1424	0	0					\$850,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: UNDERGROUND DIAGNOSTICS							
1425	0	0					\$9,747
TITLE: FRENCH LESSONS LEARNED IN I-CHINA WAR							
1426	0	0					\$94,800
TITLE: VIETNAMESE CROSS FERTILIZATION							
1427	0	0					\$610,000
TITLE: COMPUTER LABORATORY-THAILAND							
1428	0	0					\$45,000
TITLE: CLANDESTINE TESTING							
1429	0	0					\$116,000
TITLE: FISSION PRODUCT YIELD & DECAY CHARACTERISTICS							
1430	0	0					\$75,611
TITLE: USER-SYSTEM INTERACTION VIA ARPA COMPUTER NETWORK							
1431	0	0					\$50,000
TITLE: SYSTEM APPLICATION STUDIES OF SPEC WPNS							
1432	0	0					\$114,700
TITLE: GENERAL ELECTRIC							
1433	0	0					\$200,000
TITLE: NUCLEAR INTERFERENCE ON IR SYSTEM							
1434	0	0					\$169,925
TITLE: DAMAGE THRESHOLD STUDIES IN RUBY LASERS							
1435	0	0					\$29,600
TITLE: SEISMOLOGICAL RESEARCH BY WASHINGTON U.							
1436	0	0					\$48,000
TITLE: NUCLEAR WEAPONS MONITORING SURVEY							
1437	0	0					\$995,000
TITLE: LASA OPERATION & MAINTENANCE							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1438	0	0					\$144,000
TITLE: STRESS WAVE EFFECTS							
1439	0	0					\$2,071,000
TITLE: CAM							
1440	0	0					\$25,000
TITLE: COVERT ILLUMINATION SYSTEM							
1441	0	0					\$209,000
TITLE: NEODYMIUM DOPED GLASS DAMAGE STUD.							
1442	0	0					\$134,000
TITLE: API PROGRAM AT PIB							
1443	0	0					\$1,700,000
TITLE: AMOS							
1444	0	0					\$187,000
TITLE: MILITARY CIVIC ACTION							
1445	0	0					\$250,000
TITLE: ORDNANCE FUZE STUDY							
1446	0	0					\$79,563
TITLE: APDUCK (C)							
1447	0	0					\$144,946
TITLE: HIGH DENSITY DIS RECORDING DEVELOP.							
1448	0	0					\$50,000
TITLE: ALASKAN EARTHQUAKE REPORTS							
1449	0	0					\$13,275
TITLE: ALASKAN EARTHQUAKE REPORT							
1450	0	0					\$50,000
TITLE: ALASKAN EARTHQUAKE REPORT							
1451	0	0					\$114,000

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: IMAGING WITH SYNTHETIC ARRAYS					
1452	0	0			\$102,000
TITLE: DETECTION SYSTEM					
1453	0	0			\$222,500
TITLE: RAND ASSISTANCE TO NSC STAFF					
1454	0	0			\$539,931
TITLE: SEV STUDIES					
1455	0	0			\$324,818
TITLE: PROJECT AZOTED					
1456	0	0			\$5,000
TITLE: NAVAL WAR COLLEGE - DSB SUMMER STUDY					
1457	0	0	TRW	DAAH0169-C1703	\$1,137,000
TITLE: Electric Log					
DESCRIPTION: An electrified fence, which indicated the location of infiltration attempts through it, was tested and then installed just inside the chain link fence at the western end of the Korean DMZ.					
RESULTS: The U.S. Eighth Army, which mans the western 25 kilometers of the Korean DMZ, found that North Korean infiltrators were very curious about the electric fence. The fence worked very well in fairly level terrain, but there were installation and operational problems in the rugged terrain at the eastern part of the U.S. sector.					
REMARKS: PROG: Overseas Defense Research (ODR) - Border Control - Infiltration Detection and Localization - Perimeter Defense. ARPA Order No. 1367 - Mansubco - procured the fence system. Also Contract DAAH0171-C-0247.					
1458	0	0			\$50,000
TITLE: PROJECT MAY BELL					
1459	0	0			\$806,255
TITLE: PROJECT MAY BELL					
1460	0	0			\$199,290
TITLE: (C) FLEA VEHICLE					

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1461	0	0					\$10,000
							TITLE: CAMP SENTINEL RADAR II
1462	0	0					\$250,000
							TITLE: SHELTER TECHNOLOGY
1463	0	0					\$74,544
							TITLE: ANOMALOUS WATER- TYCO LABS.
1464	0	0					\$141,398
							TITLE: ERBIUM DOPED LASER GLASS
1465	0	0					\$188,000
							TITLE: SPUTTERED MATERIALS-BATTELLE
1466	0	0					\$89,814
							TITLE: HIGH TEMP ELECTROCHEM. RES.
1467	0	0					\$201,000
							TITLE: INFRARED LASER COMPONENTS
1468	0	0					\$101,535
							TITLE: TRW/HOLOGRAPHIC STUDY OF STRAIN IN ROCK MATERIALS
1469	0	0					\$316,400
							TITLE: MECHANISM OF TRIGGERING EARTHQUAKE
1470	0	0					\$131,734
							TITLE: NON-ATTRIBUTABLE COVERT NUCLEAR TESTS
1471	0	0					\$20,000
							TITLE: SEISMIC DATA FROM 250-TONALEUTIAN EXP.
1472	0	0					\$127,000
							TITLE: PSYCHOLOGICAL OPERATIONS TEAMS
1473	0	0					\$218,000
							TITLE: CONSTRUCTION OF PORTABLE STRAINMETERS
1474	0	0	09/02/69	06/30/71	HUM. SCI. RESCH. DAAH0170C0217		\$664,000

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: PSYOP Quick Response Team

DESCRIPTION: This program was directed toward: meeting research needs considered primary and urgent by the PSYOP community; using obtained data to feed into the development of a broad theoretical structure for PSYOP; improving effectiveness of programs determined to be critical.

RESULTS: Studies were completed in the following areas: Obstacles to defection; enemy vulnerabilities; psychology of the enemy soldier; factors affecting support for the GVN; JUSPAO publications evaluation; film evaluation process; and effect of Cambodian incursion on the enemy soldier.

REMARKS: AGILE - ANALYSIS - PSYOPS

REF: "Psychological Operating Studies - Vietnam," Volume 1, Final Technical Report, for the period 1969 September - 1971 June. (b)(6)
(b)(6) Human Sciences Research, Inc., McLean, Virginia, Report No. HSR-RR-71/6-Wn., 5/25/71, (PA 39,802).

1475	0	0	NIGHT VISION LAB IN-HOUSE	\$30,000
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TITLE: Reflector Lighting System

DESCRIPTION: The U.S. Eighth Army in Korea, requested assistance in keeping North Koreans from penetrating the chain link fence at the southern edge of the DMZ. After the Eighth Army approved the ARPA proposal for a specially designed lighting system, \$700,000 was added to the Army Night Vision Lab budget for procurement of the lighting system and for its installation at the DMZ.

RESULTS: The Eighth Army stated that this lighting system which illuminated the DMZ up to 100 meters from the chain link fence, and which provided the minimum illumination required by U.S. sentries for patrolling along the fence, was the best intrusion preventative and intrusion detector it had ever deployed.

REMARKS: PROG: TTO - Reconnaissance and Surveillance - Border Control - Perimeter Security - Intrusion Detection.

1476	0	0		\$14,300
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TITLE: THAI OPERATIONS RESEARCH TRAINING

1477	0	0		\$62,000
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TITLE: CALIBRATION AND SIMULATION

1478	0	0		\$99,914
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TITLE: PROJECT CLOUD COVER

1479	0	0		\$375,000
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TITLE: ATOMIC AND MOLECULAR PROGRAM

1480	0	0		\$103,000
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AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: HYPERSONIC FLOW FIELD APPLIC.					
1481	0	0			\$93,000
TITLE: SPRINT TESTS					
1482	0	0			\$1,463,919
TITLE: ATOMIC AND MOLECULAR PROGRAM					
1483	0	0			\$6,360
TITLE: PROGRAM FORMULATION STUDIES					
1484	0	0			\$90,000
TITLE: ULTRA-STABLE SEISMOMETERS					
1485	0	0			\$25,000
TITLE: PROJECT SECEDE					
1486	0	0			\$178,000
TITLE: HARBRIDGE HOUSE					
1487	0	0			\$135,000
TITLE: PROJECT SECEDE					
1488	0	0			\$763,000
TITLE: CCBS					
1489	0	0			\$100,000
TITLE: AERICIBO IONOSPHERIC OBSERVATORY					
1490	0	0			\$1,000,000
TITLE: EGYPTIAN GOOSE					
1491	0	0			\$385,000
TITLE: GRAND VIEW					
1492	0	0			\$258,000
TITLE: VIETNAMESE CROSS-FERTILIZE TR.					
1493	0	0			\$150,000
TITLE: PROJECT WASP					

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1494	0	0					\$1,612,000
TITLE: HOSPITAL STUDIES							
1495	0	0					\$50,000
TITLE: LONG SHOT SITE							
1496	0	0					\$190,000
TITLE: AIR SUPPORT FOR RDFU-V RESEARCH							
1497	0	0					\$75,000
TITLE: AMERICAN EMBASSY-BEIRUT							
1498	0	0					\$635,000
TITLE: MILROW							
1499	0	0					\$500,000
TITLE: RESEARCH ON INTELLIGENT AUTOMATA							
1500	0	0					\$20,000
TITLE: OPERATING EXPENSES							
1501	0	0					\$0
1502	0	0					\$74,919
TITLE: ACOUSTIC/GRAVITY WAVES BY NUC. DETON.							
1503	0	0					\$65,000
TITLE: LASER MAPPING							
1504	0	0					\$32,000
TITLE: TRUST FUND BALANCE							
1505	0	0					\$417,000
TITLE: NEW RESEARCH PROJECT							
1506	0	0					\$93,000
TITLE: THAI TRAINING							
1507	0	0					\$160,000
TITLE: ARPA STO PROGRAMS							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1508	0	0					\$350,000
							TITLE: PANDORA
1509	0	0					\$835,000
							TITLE: RACIC
1510	0	0					\$150,000
							TITLE: FACTORS IN CULTURAL CHANGE
1511	0	0					\$285,000
							TITLE: MICRO-ELECTRONIC UHF TRANSMITTER
1512	0	0					\$140,000
							TITLE: FERRIMAGNETIC FILMS
1513	0	0					\$1,270,000
							TITLE: VERY LONG PERIOD SEISMOMETERS
1514	0	0					\$19,040
							TITLE: ATMOSPHERIC PRESSURE WAVES FROM NUCLEAR EXPLOSIONS
1515	0	0					\$151,000
							TITLE: MEASUREMENT OF IN-SITU MODULUS
1516	0	0					\$10,275
							TITLE: VOLUNT. IMPROVEMENT/INDIV. PERFOR.
1517	0	0					\$92,816
							TITLE: RARE EARTHS IN LUMINESCENT APPLICATIONS
1518	0	0					\$151,880
							TITLE: RARE EARTH CHALCOGENIDES
1519	0	0					\$91,500
							TITLE: OPTICAL CONTRAST TRACKER
1520	0	0					\$0
1521	0	0					\$173,400
							TITLE: TETHERED BALLON PROGRAM

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1522	0	0					\$149,503
TITLE: PRIME ARGUS							
1523	0	0					\$69,320
TITLE: NETWORK ANALYSIS							
1524	0	0					\$10,000
TITLE: ROCK MECHANICS							
1525	0	0					\$45,112
TITLE: FROZEN SOIL AND EARTH MATERIALS							
1526	0	0					\$112,000
TITLE: LONG PERIOD EXPERIMENT							
1527	0	0					\$700,000
TITLE: DEFENSE RES. STUDIES IN THAILAND							
1528	0	0					\$480,000
TITLE: BLOW LOW							
1529	0	0		03/30/70	ALWL		\$5,000
TITLE: Gunflash Detector							

DESCRIPTION: The objective of this program was to conduct tests to demonstrate the performance characteristics of the G.E. Infrared Flash Detector System and determine its operational suitability for use as a muzzle flash detector for various small arms.

RESULTS: Tests indicated that the probability of detection of small arms fire at 175 yards was between 0.78 and 0.89, depending upon the weapon and background conditions. Marginal performance for the detection of small arms was experienced at 600 yards.

REMARKS: ADVANCED SENSORS - DETECTION

REF: "Gun Flash Detector," Final Report, (b)(6) Communications and Electronics Branch, U.S. Army Land Warfare Laboratory, Aberdeen Proving Ground, Maryland, Report No. 70-03, 3/70, (PA 37,739).

1530	0	0					\$270,000
TITLE: BLOW LOW							
1531	0	0					\$600,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: ARECIBO							
1532	0	0					\$40,280
TITLE: TELESEISMIC DATA FOR RULISON							
1533	0	0					\$203,000
TITLE: M / V ACANIA OPERATIONS							
1534	0	0					\$231,000
TITLE: SMALL ARMS PROGRAM							
1535	0	0					\$10,000
TITLE: IDA/OEP STUDIES							
1536	0	0					\$480,000
TITLE: GAMMA SPECTROMETRY							
1537	0	0					\$298,054
TITLE: LIPS							
1538	0	0					\$110,000
TITLE: UNDERWATER EXPLOSION RESEARCH							
1539	0	0					\$150,000
TITLE: EMP AND OPTICAL EXPERIMENTS							
1540	0	0					\$0
1541	0	0					\$655,000
TITLE: CONTINUATION OF ANALYTICAL ACTIVITIES							
1542	0	0					\$79,500
TITLE: REFURBISH SH-3A BUNO 148042							
1543	0	0			RDFU-V		\$175,000
TITLE: RVN Operations Research Training.							

DESCRIPTION: Funds were provided for use by the Department of the Navy to support an ARPA program to train Vietnamese officers in operations research at the U.S. Naval Postgraduate School, Monterey, California.

RESULTS: The graduates were assigned to the Combat Development and Test Center for at

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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least six years each upon their return to Vietnam.

REMARKS: AGILE - ANALYSIS

REF: "Quarterly Project Status Report," for the period 1972 January 1 - 1972 March 31. Advanced Research Projects Agency, Research and Development Field Unit-Vietnam, APO San Francisco, California; Combat Development and Test Center, Republic of Vietnam Armed Forces, Vietnam, 4/6/72, (PA 40,718).

1544	0	0	STANFORD RES.INS DAAH0170-C-0550	\$394,000
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TITLE: MRDC Electronics Laboratory

DESCRIPTION: Stanford Research Institute provided electronics experts to the Royal Thai Government Military Research and Development Center, in Bangkok, who provided guidance and training to Thai signal corps officers.

RESULTS: As part of the Overseas Defense Research program, the ODR Thailand Field Unit assisted the Thai military establishment in developing its own capability to do electronics research and development. The trained Thai officers then were able to adapt electronic equipment for use in the Thailand environment.

REMARKS: PROG: Overseas Defense Research - Counterpart Training - ARPA Thailand Field Unit - Royal Thai Military Research and Development Center Electronics Laboratory.

1545	0	0		\$250,000
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TITLE: TECHNICAL ASSESSMENT

1546	0	0		\$57,500
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TITLE: IMMUNOLOGICAL IDENTIFICATION

1547	0	0		\$16,000
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TITLE: POSITION LOCATION MARKER

1548	0	0		\$16,000
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TITLE: QT-2 SUPPORT

1549	0	0		\$0
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1550	0	0		\$0
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1551	0	0		\$45,000
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TITLE: SEV ANALYSIS

1552	0	0	ITT ELECTRO LABS F3060271C0014	\$100,000
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TITLE: High Power HF Transmitter Amplifier Module

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: Development of high power, (PEAK PWR. 3.2 MW, AV. PWR. 200kw), Broadband Linear Untuned Amplifier for HF Radar (1A).

RESULTS: The module was developed and used on HF radar experiments as part of Chapel Bell radar. (1A)

REMARKS: (1) STO-OHD Program - General HF radar component development.
(2) DTIC - AD-905 034L

1553	0	0			\$103,000
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TITLE: PROJECT SECEDE

1554	0	0			\$153,013
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TITLE: FORTRAN FOR ILLIAC IV

1555	0	0			\$20,000
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TITLE: TECHNICAL SUPPORT FOR HAVE CHARITY

1556	0	0			\$20,000
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TITLE: ARCTIC SEV PROGRAM

1557	0	0			\$0
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1558	0	0			\$395,026
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TITLE: OHD FIELD EXPERIMENTS

1559	0	0	MIT - LL		\$1,000,000
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TITLE: Long Range Foliage Penetration Radar

DESCRIPTION: MIT expanded the effort, begun under the CAMP SENTINEL RADAR program to develop a long range foliage penetration radar, by linking the radar to a sophisticated computer. The radar had high range resolution and high angular resolution.

RESULTS: A phased array antenna was developed, which could provide a narrow, electrically scanned radiation pattern. Target detection and target motion was tracked by the associated computer. Both personnel and vehicular detection was demonstrated at the Lincoln Laboratory. Because of projected high complexity and cost, the program was not funded in FY'72.

REMARKS: PROG: Overseas Defense Research - Foliage Penetration Radar - Base Defense - Perimeter Defense.

ARPA Order 498 - CAMP SENTINEL RADAR.

1560	0	0			\$775,000
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TITLE: NIGHT SPOT

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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1561	0	0					\$500,000
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TITLE: IN-HOUSE SUBMARINE SONAR EXPERIMENTS

1562	0	0					\$600,000
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TITLE: AMORPHOUS SEMICONDUCTOR RESEARCH

1563	0	0					\$800,000
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TITLE: SMALL ARMS PROGRAM

1563	0	1			HDL	IN HOUSE	\$50,000
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TITLE: Trade-Off Analysis I.

DESCRIPTION: Conduct a trade-off analysis of the fuzing systems in the M40 grenade, current Army rifle grenade concepts, and the proposed Ring Airfoil grenade.

RESULTS: Ring Airfoil Grenade fuzing system requires extreme re-design to meet Army safety standards.

REMARKS: Ring Airfoil Grenade uses a circular airfoil concept which offers potential for increased range, increased accuracy, and flatter trajectory.

1563	0	2			USA WPNS CMD	IN HOUSE	\$50,000
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TITLE: Trade-Off Analysis II.

DESCRIPTION: Conduct a trade-off analysis of the M40, current Army rifle grenade concepts and the proposed Ring Airfoil Grenade systems; emphasis on grenades and launchers.

RESULTS: Ring Airfoil Grenade offers greater range (+100 meters) and flatter trajectory. Flatter trajectory will increase accuracy and provide increased ability to engage targets currently screened from high angle fire.

1563	0	3			PICAT	IN HOUSE	\$300,000
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TITLE: System Exploratory Development I.

DESCRIPTION: Design and produce test quantities of the body and filler (explosive inert) of the Ring Airfoil Grenade.

RESULTS: 100 explosive and 200 inert grenades produced.

REMARKS: See Tasks 1, 2, and 7, AO 1563.

1563	0	4			CRDL	IN HOUSE	\$100,000
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TITLE: System Exploratory Development II.

DESCRIPTION: Design and produce a grenade launcher for the Ring Airfoil Grenade.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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RESULTS: Prototype launchers (separate and attachment to M16 rifle) produced.

REMARKS: See Tasks 1, 2, and 7, AO 1563.

1563	0	5			HDL	IN HOUSE	\$240,000
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TITLE: Fuzing.

DESCRIPTION: Develop and provide test quantities of a fuzing system for the Ring Airfoil Grenade.

RESULTS: Test quantities of a safety certified fuze produced.

REMARKS: See Tasks 1, 2, and 7, AO 1563.

1563	0	6			USA WPNS CMD	IN HOUSE	\$50,000
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TITLE: Ring Airfoil Grenade.

DESCRIPTION: Provide technical support and guidance to PICAT, CRDL, and HDL in the design and development of the Ring Airfoil Grenade.

RESULTS: See Tasks 3, 4, and 5, AO 1563.

1563	0	7			EDGEWOOD	IN HOUSE	\$365,000
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TITLE: Ring Airfoil Grenade.

DESCRIPTION: Complete the development and test of the prototype Ring Airfoil Grenade.

RESULTS: Tests proved advantages of Ring Airfoil design over 40mm and other prototype launched grenades; i.e., increased range, flatter trajectory, and improved accuracy. Deficiencies in fuzing system and launcher not insurmountable.

REMARKS: Transferred to U.S. Army.

1563	0	8			AERO	DAAD0572C0103	\$25,000
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TITLE: Ring Airfoil Grenade.

DESCRIPTION: Provide technical assistance to Edgewood Arsenal in development and test of the Ring Airfoil Grenade.

RESULTS: See Task 7, AO 1563.

1563	0	9			ASASA	IN HOUSE	\$30,000
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TITLE: ASA Technical Support.

DESCRIPTION: Provide technical support for the DARPA Small Arms Program.

1563	0	10			PICAT	IN HOUSE	\$50,000
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: 30mm Grenade Development

DESCRIPTION: Design a 30mm grenade and grenade launcher for the M16 rifle.

RESULTS: Design approved and further development undertaken by U.S. Army.

REMARKS: Part of DARPA Small Arms Program.

1564	0	0			\$26,500
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TITLE: INDIVIDUAL LIFT MOBILITY STUDY

1565	0	0			\$255,005
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TITLE: OVERDRIVEN EXPLOSIONS

1566	0	0			\$275,000
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TITLE: PROJECT MAYBELL

1567	0	0			\$145,300
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TITLE: OPTICALLY TRANSPARENT CERAMIC MATL

1568	0	0			\$48,000
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TITLE: SMALL CRAFT PROPULSION SYSTEM

1569	0	0	WEITZMAN INST		\$0
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TITLE: Magnetic Detector

DESCRIPTION: The Weitzman Institute, Rehoboth, Israel, had developed a sensitive magnetic detector. Tests showed that an infiltrator, holding a rifle above his head, would be detected crossing over the buried detector. A sample system was obtained for tests in the U.S.

RESULTS: The Mobility Equipment Research and Development Center, at Fort Belvoir, Va. tested the system, and found that the non-militarized indicator and control system did not pass the stringent Army reliability and maintainability tests.

REMARKS: PROG: TTO - Reconnaissance and Surveillance - Perimeter Control - Infiltrator Detection.

1570	0	0			\$474,032
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TITLE: AMORPHOUS SEMICONDUCTORS

1571	0	0			\$85,438
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TITLE: X-RAY PRODUCTION IN FISSION PROCESSES

1572	0	0			\$178,504
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: SIAF COMMUNICATION SUBSYSTEM

1572	0	1			GRC	DAAH0170C0893	\$177,000
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TITLE: Communications Sub-Systems.

DESCRIPTION: Study a U.S., UK, and Australian communications (radio) systems to determine their applicability to Small Independent Action Forces requirements.

RESULTS: No communications system met SIAF requirements. Deficiencies included: excess weight, range limitations, bulk, and power supply life. Need for new family of man-to-man and SIAF to base radios documented.

1573	0	0					\$650,000
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TITLE: AMORPHOUS SEMICONDUCTOR DEVICE

1574	0	0					\$190,000
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TITLE: PROJECTED WEAPONS NEEDS

1574	0	1			OPS RES ASSOC	DAAD0570C0282	\$210,000
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TITLE: Future Small Arms Needs.

DESCRIPTION: Review US and foreign weapons developments and isolate those areas wherein the US may be deficient in meeting small arms needs in a 1980-1990 battlefield scenario.

RESULTS: Deficiencies cited: Projectile penetration of increased battlefield individual armor protection; probability of a hit/kill (PK) with single projectile bullets; limitation of flat trajectory small arms to engage and inflict injury on covered targets; and decline in military small arms developers in US industry.

REMARKS: Task of DARPA Small Arms Program.

1574	0	2			ASASA	IN HOUSE	\$3,000
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TITLE: ASASA Technical Support.

DESCRIPTION: Provide technical support for the DARPA Small Arms Program.

1575	0	0					\$150,000
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TITLE: SMALL ARMS TRAVEL

1575	0	1			PULSEPOWER SYS	DAAD0573C0317	\$707,000
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TITLE: Liquid Propellant Rifle.

DESCRIPTION: Design and develop a prototype rifle to evaluate the feasibility of using liquid explosives as a projectile propellant. Use standard cal. .223 pro-

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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jectiles.

RESULTS: Two rifles developed. Feasibility confirmed. Advantages included: increased muzzle velocity (~6000 fps vs 3300 fps of M16); reduced muzzle signature; no cartridge case; magazine contains 200 projectiles and propellant in same size/weight magazine as 30 round M16 magazine; and greatly reduced deterioration of barrel from propellant residue.

REMARKS: DARPA Small Arms Program Task
Transferred to U.S. Army.

1575	0	2	NOSC	IN HOUSE	\$60,000
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TITLE: Liquid Propellant Purchase.

DESCRIPTION: Purchase of a quantity of a Navy classified torpedo fuel mix as the propellant for the Liquid Propellant Rifle task.

RESULTS: See Task 1, AO 1575.

REMARKS: Fuel used was not optimum desired but only fuel safety certified to determine feasibility of liquid propellants in a hand-held weapon.

1575	0	3	BRL	IN HOUSE	\$30,000
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TITLE: Liquid Propellant Studies.

DESCRIPTION: Determine if a Navy classified torpedo fuel was best currently available fuel for evaluation of a liquid propellant rifle and safety certify the fuel for test purposes.

RESULTS: Torpedo fuel not optimum but best available. Safety certification provided.

REMARKS: See Task 2, AO 1575.

1575	0	4	REMINGTON	DAAD0571C0306	\$99,000
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TITLE: Plastic Case Ammo.

DESCRIPTION: Basic research on plastic case ammunition.

RESULTS: Little insight into probability of success with plastic case ammunition.

REMARKS: See Task 5, AO 1575.

1575	0	5	REMINGTON		\$153,000
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TITLE: Plastic Case Ammunition

DESCRIPTION: Determine if a plastic cartridge case can be used to replace the standard brass cartridge case of military cal. .223 ammunition.

RESULTS: Plastic proved unsatisfactory in standard cartridge case design. Deficiencies were: separation of case from brass base; scaring and burring of case in

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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magazine stripping and chambering; and chamber sticking from chamber heat.

REMARKS: DARPA Small Arms Program task.

1575	0	6			VEHICLE RES COR	DAAD0572C0296	\$160,000
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TITLE: Hollow Cylinder Projectile.

DESCRIPTION: Basic research on the potential of hollow cylinder projectiles for small arms systems.

RESULTS: Potential values: Stable trajectory; flatter trajectory; high penetration value; and cheap and easy to manufacture. Potential problem areas. Muzzle velocity of standard small arms; sabot disconnect; disfigurement of leading edge.

REMARKS: Part of DARPA Small Arms Program. Requires more extensive internal and external ballistics research.

1575	0	7			GEN APPLD SCI	DAAD0572C0020	\$54,000
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TITLE: 3D Flechettes

DESCRIPTION: Basic research on 3 dimensional flechettes.

RESULTS: Research indicated 3 D flechettes offered a potential in resolving the serious instability problem of dart type flechettes which the Army was desirous of developing for small arms.

REMARKS: Part of DARPA Small Arms Program. See Task 8, AO 1575.

1575	0	8			GEN APPLIED SCI.	DAAD0573C0086	\$57,000
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TITLE: 3-D Flechettes.

DESCRIPTION: Design a 3-D flechette cluster, sabot, and cartridge case for cal. .223 military weapons.

RESULTS: Stability of flechettes in flight resolved. Requires testing and evaluation of manufacturing process.

REMARKS: Part of DARPA Small Arms Program.

1575	0	9			FA	IN HOUSE	\$9,000
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TITLE: 3-D Flechettes

DESCRIPTION: Technical support to DARPA. See Task 8, AO 1575.

REMARKS: Part of DARPA Small Arms Program.

1575	0	10			ASASA	IN HOUSE	\$45,000
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TITLE: ASASA Technical Support.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: Technical support for DARPA Small Arms Program.

1575	0	11	MB ASSOC.	DAAD0571C0077	\$36,000
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TITLE: Controlled Response Device.

DESCRIPTION: Design, manufacture and encapsulate in 40mm grenade cases 200 non-lethal, riot control stun bags.

RESULTS: 200 completed rounds delivered. Provided U.S. Army for evaluation. See Task 12, AO 1575.

REMARKS: Part of DARPA Small Arms Program. Device marketed as Stun Gun for use by Police and other agencies. Very effective in riot control.

1575	0	12	CRDL	IN HOUSE	\$66,000
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TITLE: CRD Lethality Tests.

DESCRIPTION: Test of the Controlled Response Device for use in riot control.

RESULTS: Very effective. Improved accuracy over British rubber bullet, with less potential for eye damage.

REMARKS: See Task 11, AO 1575. Part of DARPA Small Arms Program.

1575	0	13	THIOL	DAAD0571C0294	\$32,000
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TITLE: Caseless Ammunition

DESCRIPTION: Basic research to determine a method of bonding gunpowder to form a cartridge case.

RESULTS: Bonding methodology not useful.

REMARKS: Part of DARPA Small Arms Program.

1576	0	0			\$99,525
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TITLE: EFFECTS OF CRACK PROPAGATION

1577	0	0			\$596,388
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TITLE: OHD FIELD EXPERIMENTS

1578	0	0			\$364,318
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TITLE: MILITARY GEOPHYSICS PROGRAM

1579	0	0			\$297,552
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TITLE: RESEARCH IN ROCK MECHANICS

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1580 0 0					\$66,347
TITLE: EARTHQUAKE GENERATION RESEARCH					
1581 0 0					\$35,000
TITLE: NON-LETHAL PERSONNEL INCAPACITATION					
1582 0 0					\$185,000
TITLE: ADVANCED PLASMA PANEL					
1583 0 0					\$500,000
TITLE: HELICOPTER R. F. LOCATION & IDENTIFIC. SYS.					
1584 0 0					\$765,996
TITLE: MILITARY GEOPHYSICS PROGRAM					
1585 0 0					\$250,000
TITLE: RESEARCH ON SEMICONDUCTOR HETEROEPITAXITY					
1586 0 0					\$25,000
TITLE: SMALL ARMS PROGRAM-TRAVEL					
1587 0 0					\$99,500
TITLE: NEODYMIUM DOPED YTTRALOX CERAMIC					
1588 0 0					\$331,017
TITLE: RARE EARTH COMPOUNDS					
1589 0 0					\$39,400
TITLE: ARPA FENCE ALARM (C)					
1590 0 0					\$208,000
TITLE: PRIME ARGUS DIAGNOSTICS					
1591 0 0					\$100,000
TITLE: NATIONAL ACADEMY OF SCIENCES STUDY					
1592 0 0					\$206,000
TITLE: NON DESTRUCTIVE TESTING					
1593 0 0					\$59,000

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: WATER WAVES BY UNDERWATER EXPLOSIONS					
1594	0	0			\$54,895
TITLE: FUNDS FOR BATTELLE MEMORIAL INSTITUTE					
1595	0	0			\$624,620
TITLE: IMPROVEMENT OF INDIVIDUAL PERFORMANCE					
1596	0	0			\$40,000
TITLE: IMPROVEMENT OF INDIVIDUAL PERFORMANCE					
1597	0	0			\$283,470
TITLE: SEMICONDUCTOR RESEARCH					
1598	0	0			\$590,000
TITLE: ANTENNA FOR WHITE HOUSE SITE					
1599	0	0			\$200,000
TITLE: GRAND VIEW //BIG EAGLE					
1600	0	0			\$271,356
TITLE: SIAF DATA COLLECTION					
1601	0	0			\$0
1602	0	0			\$1,450,000
TITLE: HYPERVELOCITY RANGE PROGRAM					
1603	0	0			\$26,000
TITLE: BUILDING ADDITION TO AMOS FACILITY					
1604	0	0			\$468,000
TITLE: EGYPTIAN GOOSE I AND GRAND VIEW					
1605	0	0			\$17,695
TITLE: SEISMIC MEASUREMENTS OF D/DUST					
1606	0	0			\$0
1607	0	0	SCRIPPS IN.OF OC		\$1,600,000
TITLE: Floating Platforms					

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: Design of a stable, transportable floating platform, which could be towed to a trouble spot anywhere in the world which is accessible by sea. It would be a logistics support base in an area where the U.S. does not have one, and could land small aircraft. It would be anchored in international waters, and would thus be, in effect, a floating island.

RESULTS: A small scale model was built and tested by Scripps Institute of Oceanography and plans and a cost study for a full scale platform were developed. Program was ended because platform might not be survivable in SEA states 5 and higher.

REMARKS: PROG: Advanced Engineering - Logistics Support - Ocean Engineering.

1608	0	0			\$233,000
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TITLE: RAPID QUENCHING OF LIQUID METALS

1609	0	0			\$30,000
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TITLE: HYPERSONIC SHEAR FLOWS

1610	0	0			\$111,000
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TITLE: DAMAGE PROPERTIES OF RUTILE

1611	0	0			\$291,276
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TITLE: EARTHQUAKE TRIGGERING PHENOMENA

1612	0	0			\$65,834
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TITLE: LARGE UNDERGROUND NUCLEAR TESTS

1613	0	0			\$232,700
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TITLE: SUPPORT SERVICES - ARCTIC SEV

1614	0	0			\$300,000
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TITLE: SURFACE EFFECT VEHICLE

1615	0	0			\$2,100,000
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TITLE: ARCTIC EFFECTS VEHICLE PROGRAM

1616	0	0			\$350,000
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TITLE: NET TECHNICAL ASSESSMENT

1617	0	0			\$467,000
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TITLE: RARE-EARTH HI-PERF. MAGNETIC MTLs

1618	0	0			\$0
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AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: BROADBAND ACCELERAMETER					
1619	0	0			\$78,624
TITLE: STUDY OF GAS TRANSPORT MECHANISMS					
1620	0	0			\$0
TITLE: LARGE ARRAY PROGRAM					
1621	0	0			\$106,800
TITLE: HARD BASED DETERRENT SYSTEMS					
1622	0	0			\$60,422
TITLE: SOVIET AND CHINESE LITERATURE					
1623	0	0			\$172,000
TITLE: BEHAVIOR AND SYSTEMS RES. LAB.					
1623	0	1			\$0
1624	0	0			\$334,000
TITLE: SECURE COMPUTER SYSTEM					
1625	0	0			\$125,898
TITLE: UNDERGROUND NUCLEAR EVENTS					
1626	0	0			\$92,000
TITLE: SOVIET "PLOWSHARE" EXPLOSIONS					
1627	0	0			\$155,338
TITLE: MAGNETIC RARE EARTH COMPOUNDS					
1628	0	0			\$184,586
TITLE: GAAS AND MIXED CRYSTALS					
1629	0	0			\$600,000
TITLE: ADVANCED OPTICAL PROGRAM					
1630	0	0			\$200,000
TITLE: MIDCOURSE OPTICAL TECHNOLOGY PROG.					
1631	0	0			\$50,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: COLD OPTICS DESIGN RESEARCH							
1632	0	0					\$435,337
TITLE: LWIR WEAPON SITE							
1633	0	0					\$0
1634	0	0					\$25,000
TITLE: PLASMA CHROMATOGRAPH							
1635	0	0					\$92,430
TITLE: SURFACE EFFECTS OF RARE EARTHS/METALS							
1636	0	0					\$61,500
TITLE: CALCOPYRITE CRYSTALS							
1637	0	0					\$120,080
TITLE: MELT-GROWN OXIDE-METAL COMPOS.							
1638	0	0					\$468,000
TITLE: EGYPTIAN GOOSE I&II/GRAND VIEW							
1638	0	1					\$0
1639	0	0					\$230,000
TITLE: LRL EVASION PROGRAM							
1640	0	0					\$316,000
TITLE: FIELD TEST PROGRAM							
1641	0	0					\$209,465
TITLE: PHASE I LASER TARGET DESIGNATOR DESIGN							
1642	0	0					\$228,601
TITLE: MATERIALS RESEARCH ON RARE EARTHS							
1643	0	0					\$100,000
TITLE: SYNTHESIS OF MATERIALS AND COMPOS							
1644	0	0					\$184,141
TITLE: MATERIALS AND DEVICE APPLICATIONS							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1645	0	0			GOODYEAR TIRE	N1470-C0361	\$512,000

TITLE: Inflatable Platform

DESCRIPTION: As part of the Floating Platform program, Goodyear was asked to design a rubberized fabric platform, that could be flown to the desired location in an aircraft, dropped into the sea, and then inflated. The inflatable platform should be strong enough so that light aircraft could land and take off, and the platform would be a floating logistics center for the U.S. armed forces.

RESULTS: The rapidly deployable Goodyear platform concept lost out to the Scripps Institution concrete towable platform. Neither would have been survivable in heavy seas, so programs were terminated.

REMARKS: PROG: Advanced Engineering - Floating Platforms - Rapidly Deployable by Air
AO 1348 covers the Scripps Institution of Oceanography floating platform concept.
Also Contno: N1472-C0477.

1646	0	0					\$317,832
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TITLE: TERMINAL GUIDANCE SYSTEMS

1647	0	0					\$1,000,000
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TITLE: HIGH POWER LASER APPLICATIONS

1648	0	0					\$90,000
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TITLE: LONG RANGE PATROL COMMUNICATIONS

1649	0	0					\$295,000
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TITLE: IVY OWL

1650	0	0					\$75,000
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TITLE: AMM SYSTEMS EVALUATION

1651	0	0					\$100,000
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TITLE: NITE GAZELLE/BIG EAR TESTING, NELLIS

1652	0	0					\$350,000
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TITLE: TACTICAL WARNING RESEARCH

1653	0	0					\$110,000
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TITLE: TEST OF LO-CATE TL-2M VEHICLE

1654	0	0					\$75,000
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AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: VALUE OF FIRE SUPPORT SYSTEMS					
1655	0	0			\$90,000
TITLE: CONUS/HAWAII EXPERIMENTS					
1656	0	0			\$500,000
TITLE: IONOSPHERIC RESEARCH PROGRAM					
1657	0	0			\$350,000
TITLE: GENERAL ATRONICS					
1658	0	0			\$75,000
TITLE: NQ MINE DETECTOR					
1659	0	0			\$148,500
TITLE: REMODELING AND REHAB OF RDFU-V					
1660	0	0			\$50,000
TITLE: NAT'S ACADEMY OF SCIENCE SUMMER STUDY FOR DOR&E					
1661	0	0			\$72,900
TITLE: GEOPHYSICAL APPLICATIONS					
1662	0	0			\$130,000
TITLE: COMPUTER TECH. NAT'L WAR COLLEGE					
1663	0	0			\$120,000
TITLE: VELA DATA TRANSMISSION SYSTEM					
1664	0	0	U OF WASH-SEATTLE	N1470-C0385	\$54,000

TITLE: COBB Seamount Research

DESCRIPTION: COBB seamount is an underwater peak, off the coast of Washington. The Oceanographic Institute of the University of Washington investigated the use of the seamount as a fixed installation for testing sonar systems and ocean acoustic properties, as part of the DARPA Anti-Submarine Warfare Program.

RESULTS: The investigation of the use of COBB seamount was terminated after detailed examination of the problems involved in installing sonar systems on the seamount, and later retrieval of the equipment, showed them to be quite severe.

REMARKS: PROG: Advanced Engineering - Ocean Properties - Sonar Investigation.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1665	0	0					\$236,552
TITLE: SMALL ROCKET WEAPON							
1666	0	0					\$40,000
TITLE: TETHERED BALLOON SYSTEM							
1667	0	0					\$40,000
TITLE: TETHERED BALLOON SYSTEM							
1668	0	0					\$238,093
TITLE: ARCTIC TECHNOLOGY							
1669	0	0					\$250,000
TITLE: STUDY SMALL ARMS FOR SUPPRESSIVE FIRE							
1669	0	1			LITTON INDUS.	DAAD0571C0066	\$263,000
TITLE: Suppressive Fire							
DESCRIPTION: Study and field test to determine characteristics of suppressive fire.							
RESULTS: Most important characteristics: implied or known lethality; projectile signature; and weapon accuracy.							
REMARKS: 50 cal. machine gun proved most feared weapon. M16 highest ranked of rifles. Part of DARPA Small Arms Program.							
1670	0	0					\$204,895
TITLE: CONTINUED WORK AT GENERAL ATRONICS							
1671	0	0					\$10,000
TITLE: SURVEY OF PHYSICS							
1672	0	0					\$58,100
TITLE: SUPPORT FOR DYNAMICS OF MILITARY BALANCE							
1673	0	0			WHOI	N1475-C-0681	\$1,716,000
TITLE: Alvin Studies/Hardware/Operation							

DESCRIPTION: Development and utilization of a deep sea submergence vehicle which could be used for both metric research, for recovering objects lost at sea, and for submarine rescue operations. Alvin has a titanium sphere, which houses the operators, surrounded by the rest of the submersible, which is not pressurized and houses the power supply, the manipulator arms, and the propulsion system.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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RESULTS: Alvin, operated by Woods Hole, is a manned deep submergence vehicle, which with its mother ship, can be taken to ocean areas for recovery operations or for deep sea research.

REMARKS: PROG: Advanced Engineering, then transitioned to TTO - Deep Sea Submergence - Ocean Monitoring - Ocean Research.

1673	0	1			WHOI	N1471-C-0234	\$26,000
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TITLE: Small Boat Handling

DESCRIPTION: Woods Hole Oceanographic Institute tried to develop the techniques for handling small boats at sea, so that Navy personnel could then be trained with the required skills.

RESULTS: This small effort was not continued. Small boats are not survivable in high sea states on the open ocean.

REMARKS: PROG: TTO - Ocean System Studies - Small Boats.

1674	0	0					\$325,000
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TITLE: MODIFICATION OF SK5

1675	0	0					\$536,745
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TITLE: TRANSFER OF TASK FORCES FOR MACSA

1676	0	0			NAVY		\$2,900,000
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TITLE: Surface Effects Vehicle

DESCRIPTION: Study of surface effects vehicle for use by Navy. Air cushion under vehicle keeps it above ocean. It could land on beaches, or travel on ice fields. High speed capability.

RESULTS: Designs for 100 ton and 500 ton ships were developed by the David Taylor Naval Ship Research and Development Center.

REMARKS: PROG: Adv. Engineering - Mobility - High Speed - Ice Field and Beach Capability.

AD 1551, 1614, 1403, 1755, 1683, 2076, 2077, 2086.

1677	0	0					\$12,100
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TITLE: U.S. SHARE OF NATO SPECIAL FUNDS

1678	0	0					\$150,000
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TITLE: SALARIES PAID FROM RDT&E FUNDS

1679	0	0					\$170,000
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AD	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: COMBAT AND LOGISTICAL VEHICLES							
1680	0	0					\$3,000
TITLE: 2 MOD KITS FOR NIGHT OBSERV. DEVICE							
1681	0	0					\$201,000
TITLE: STUDY OF HIGH TEMPERATURE/SUPER CONDUCTORS							
1682	0	0					\$1,000,000
TITLE: POCKET VETO PROGRAM							
1683	0	0					\$25,000
TITLE: SEV CAPABILITIES FOR NORBHER OPERATIONS							
1684	0	0					\$186,000
TITLE: NCER COSTS							
1685	0	0					\$108,434
TITLE: RESEARCH ON RARE EARTH METALS							
1686	0	0					\$65,000
TITLE: OPTOELECTRONIC EMITTER							
1687	0	0					\$17,000
TITLE: INCREASED COSTS-6% PAY RAISE							
1688	0	0					\$0
1689	0	0					\$121,702
TITLE: EXPERIMENTS ON DYNAMIC TRIGGERING OF FAULTING							
1690	0	0					\$51,220
TITLE: RAPID EXCAVATION OF ROCK							
1691	0	0					\$75,000
TITLE: MEINEL BAND RESEARCH							
1692	0	0					\$446,451
TITLE: INFILTRATION PROBLEMS IRAN'S PERSIAN GULF							
1693	0	0					\$590,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: SYSTEMS ANALY & MODELING EFFORT-TRW

1693	0	1			TRW	DAAH0171C0100	\$590,000
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TITLE: Collection/Analysis/Modeling III.

DESCRIPTION: Develop a SIAF mathematical model for evaluation of changes in SIAF size, equipment, weapons, communications, sensors, etc. under varying terrain, climatic conditions, and mission requirements.

RESULTS: Mathematical model with appropriate sub-models completed.

REMARKS: Part of Small Independent Action Forces Program.

1693	0	2			TRW	DAAH0171C1115	\$138,000
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TITLE: External Fire Support.

DESCRIPTION: Develop an external fire support sub-model for the SIAF System Mathematical Model.

RESULTS: Sub-model completed. See Task 1, AO 1693.

REMARKS: Part of DARPA SIAF Program.

1693	0	3			TRW	DAAH0173C0222	\$20,000
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TITLE: USMC Computer Program Transfer.

DESCRIPTION: Software and instructional materiel of SIAF Mathematical Model for use by USMC.

RESULTS: USMC uses to support Force Reconnaissance Programs.

1694	0	0					\$30,000
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TITLE: INTELLIGENCE COMPUTER NETWORK STUDY

1695	0	0					\$88,389
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TITLE: YTTERBIUM STRESS TRANSDUCERS

1696	0	0					\$700,000
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TITLE: ADVANCED SUBMARINE CONCEPTS

1697	0	0					\$900,000
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TITLE: NATURAL COMMUNICATION W/COMPUTERS

1698	0	0					\$100,000
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TITLE: AIR WARFARE PANEL 71-1 ZAP(DDR&E)

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1699	0	0					\$20,000
TITLE: ARCTIC ASSESSMENT STUDY							
1700	0	0					\$300,000
TITLE: MAN AS A WEAPON SYSTEM							
1700	0	1			LITTON INDUS.	DAAH0171C0771	\$220,000
TITLE: Man as an Individual Weapon System - ODDR&E							
DESCRIPTION: Determine those needs which can measurably improve the individual infantry man's battlefield capabilities.							
RESULTS: Major needs cited: improved accuracy and PK (probability of hit/kill) of individual weapons; lightweight, improved protection clothing; and inter- and intra-squad communications.							
REMARKS: ODDR&E request.							
1701	0	0					\$133,734
TITLE: SIAF PROGRAM							
1702	0	0					\$500,000
TITLE: CAD RESEARCH PROGRAM							
1703	0	0					\$0
1704	0	0					\$436,485
TITLE: FIELD TEST FOR SIAF SYSTEMS							
1704	0	1			VERTEX	DAAH0171C0265	\$436,000
TITLE: System Verification Test.							
DESCRIPTION: Field exercise to test the SIAF Mathematical Model.							
RESULTS: SIAF Mathematical Model proven outstanding. System transferred to USMC and U.S. Army.							
REMARKS: Part of SIAF Program. See Task 1, AO 1693.							
Modified SIAF model used as part of training of Company Grade Officers, Advanced Infantry Course, Ft. Benning, GA.							
1705	0	0					\$39,165
TITLE: SEISMOLOGICAL RESEARCH AT GWUNIV							
1706	0	0					\$546,462

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: PICTURE PROCESSING							
1707	0	0					\$300,000
TITLE: SUPPORT OF DEEP LOOK PROGRAM							
1708	0	0					\$106,799
TITLE: ANALYSIS OF NTD CAPABILITIES							
1709	0	0					\$18,000
TITLE: BIG LIGHT REQUISITION							
1710	0	0					\$98,100
TITLE: NAVAL U/WATER SYSTEMS CTR RESEARCH							
1711	0	0					\$5,000
TITLE: INTERAGENCY COUNCIL FOR MATERIALS							
1712	0	0					\$198,102
TITLE: OTH EMP RESEARCH BY SRI							
1713	0	0					\$1,765,000
TITLE: DIAMOND MINE							
1714	0	0					\$1,835,000
TITLE: VELA-UNIFORM RESEARCH PROGRAM							
1715	0	0					\$0
1716	0	0					\$149,000
TITLE: MARINE TECHNOLOGY PROGRAM							
1717	0	0					\$29,300
TITLE: DATA GATHERED ON RADAR RETURNS							
1718	0	0					\$417,000
TITLE: RAND CONTRACT							
1719	0	0					\$71,120
TITLE: FUNDING OF UNDERWATER SYSTEMS, INC.							
1720	0	0					\$52,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: THEORY OF GLOBAL CLIMATE							
1721	0	0					\$70,970
TITLE: ATMOSPHERIC FLOW CALCULATIONS							
1722	0	0					\$586,334
TITLE: LARGE SHOT SEISMICITY							
1723	0	0					\$50,000
TITLE: USE OF LASERS IN WEAPONS EFFECTS							
1724	0	0					\$80,000
TITLE: TELEMETRY INTERCEPTS FROM ABM VEHICLE							
1725	0	0					\$25,000
TITLE: SCALE MODEL CONSTRUCTION							
1726	0	0					\$186,287
TITLE: HORIZONTALLY POLARIZED SURFACE WAVES							
1727	0	0					\$250,000
TITLE: SOVIET ASW CAPABILITIES							
1728	0	0					\$599,000
TITLE: NET TECHNICAL ASSESSMENT							
1729	0	0					\$18,870
TITLE: STRATEGIC ARMS LIMITATION TALKS							
1730	0	0					\$288,000
TITLE: ROUGHNESS OF THE OCEAN SURFACE							
1731	0	0					\$230,000
TITLE: NETWORK DATA HANDLING SYSTEM							
1732	0	0					\$490,000
TITLE: IVORY CORAL							
1733	0	0					\$152,000
TITLE: IVORY CORAL							

AD	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1734	0	0					\$325,000
TITLE: PRESS NKC-135 AIRCRAFT							
1735	0	0		01/30/72	BOOZ ALLEN	DAAM0171C0487	\$569,000
TITLE: RVNAF Middle Management Training Development Program.							
DESCRIPTION: The objective of this program was to provide a capability to Republic of Vietnam Armed Forces to enable them to train officers in management of technical service projects and programs.							
RESULTS: One hundred and seventy-five officer graduates were trained while simultaneously translating the course content into Vietnamese, training instructors, and transferring course control to Vietnamese authorities.							
REMARKS: AGILE - ANALYSIS							
REF: "Final Technical Report of RVNAF Middle Management Training Development Program," Booz-Allen Applied Research, Inc., Washington, D.C. Prepared for Office of the Secretary of Defense, Advanced Research Projects Agency, Research and Development Field Unit-Vietnam, 1/72, (PA 40,807).							
1736	0	0					\$1,500
TITLE: RAND CORP.							
1737	0	0					\$175,000
TITLE: DEEP LOOK							
1738	0	0					\$30,000
TITLE: RESEARCH ON OPTICAL DAMAGE TO THIN FILMS							
1739	0	0					\$6,176
TITLE: PURCHASE OF CALCULATOR & WRITER							
1740	0	0					\$0
1741	0	0					\$251,000
TITLE: CONTINUATION OF OHD PROGRAMS							
1742	0	0					\$35,000
TITLE: FLYING SERVICES - RDFU.V							
1743	0	0					\$160,000
TITLE: MILITARY WEAPONS SYSTEMS							
1744	0	0					\$35,000

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: ILLIAC IV USERS GROUP					
1745	0	0			\$75,000
TITLE: CONVER. OF MONTE CARLO TO ILLIAC					
1746	0	0			\$30,000
TITLE: RESEARCH RESULTS IN CHEMISTRY					
1747	0	0			\$1,800,000
TITLE: ORBITING GAMMA SPECTROMETER					
1748	0	0			\$150,000
TITLE: NILE BLUE RESEARCH - UNIV ILL.					
1749	0	0			\$100,000
TITLE: RUBY LASER					
1750	0	0			\$22,000
TITLE: COMPUTER SCIENCES CONTRACT					
1751	0	0			\$130,000
TITLE: HUMAN FACTORS RESEARCH					
1752	0	0			\$200,000
TITLE: NILE RES. CONT. WITH S, S, & S					
1753	0	0			\$25,000
TITLE: JAPANESE REARMAMENT					
1754	0	0			\$155,000
TITLE: PRIME ARGUS OPTICS EXPERIMENT					
1755	0	0			\$495,000
TITLE: SURF. EFF TAKE-OFF AND LAND. SYS					
1756	0	0			\$1,700,000
TITLE: COMPUTER METHODS FOR ANAL. & MOD. OF COMPLEX SYSTEMS					
1757	0	0			\$360,000
TITLE: SIAF SYSTEM VERIF. TEST					

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1758	0	0					\$35,000
TITLE: GOV'T SUPPORT FOR SER. BY DEVELOCO							
1759	0	0					\$120,000
TITLE: EMP RESEARCH							
1760	0	0					\$300,000
TITLE: SLBM THREAT							
1761	0	0					\$38,000
TITLE: ANPPS-10 LIGHTWEIGHT SURV. RADAR							
1762	0	0					\$306,000
TITLE: MAT ZAP - SUBCALLIBER ARTILLERY							
1763	0	0					\$442,000
TITLE: IMAGE RESTORATION FACILITY							
1764	0	0					\$692,000
TITLE: HYDRODYNAMIC RESEARCH							
1765	0	0					\$1,615,000
TITLE: POLAR FOX II EX/ PROG.							
1766	0	0					\$15,000
TITLE: NETWORKS STANDARDS REV. BY NBS							
1767	0	0					\$500,000
TITLE: SK-5 VEHICLE							
1768	0	0					\$100,000
TITLE: ADDITIONAL FUNDS FOR ILLIAC IV							
1769	0	0					\$176,000
TITLE: ARCTIC OPERATIONS							
1770	0	0			BENDIX	DAHC1571C0222	\$25,000
TITLE: ANALYSIS OF VIETNAMIZATION							

DESCRIPTION: This program had as its objective the analysis of the process of Vietnamiza-

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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tion, with the stress on policy-relevant issues in the withdrawal of U.S. combat forces from the Republic of Vietnam.

RESULTS: Models have been developed to show the types of conflicts being waged in RVN and the proportionate distribution of resources which might be allocated to the appropriate military forces of RVN.

REMARKS: AGILE - ANALYSIS - VIETNAMIZATION

REF: "Analysis of Vietnamization: A Description of the War, 1967-70 (U),"
 (b)(6) Social Sciences Department, Bendix Aerospace Systems
 Division, Ann Arbor, Michigan, Report No. BSR-3252, 11/71, (PA 40,663).

1771	0	0			\$100,000
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TITLE: ENDORSEMENT OF RDC-T REQUEST

1772	0	0			\$111,000
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TITLE: ARCTIC OPERATIONAL TECHNOLOGY

1773	0	0			\$0
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REMARKS: CANCELLED

1774	0	0			\$295,000
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TITLE: SUPPORT - COLUMBIA UNIV.

1775	0	0			\$60,000
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TITLE: OPTICAL INSTRUMENT DEVICE

1776	0	0			\$25,000
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TITLE: SPACE EXPERIMENT ARPA-501

1777	0	0			\$90,000
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TITLE: DOD NON-THERAPEUTIC DRUG USAGE

1778	0	0			\$225,000
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TITLE: ANALYZE NIXON DOCTRINE & ANAL. SUMMARY

1779	0	0			\$63,873
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TITLE: ACOUSTIC MAPPING OF AN ARCTIC OCEAN REGION

1780	0	0			\$80,000
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TITLE: CLANDESTINE TEST STUDIES

1781	0	0			\$200,000
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AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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TITLE: EMP EXPERIMENT

1782	0	0					\$530,000
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TITLE: PACIFIC SEA ICE MARGINAL ZONE

1783	0	0	12/31/72	GEN.MOTORS-DELCO	N1471-C0357		\$66,000
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TITLE: Remote Automatic Station

DESCRIPTION: Development of an automatic weather station, complete with its own fuel supply, which would measure air and water temperature, wind speed, etc., and broadcast the data on a radio frequency link. A one-year unattended life was desired.

RESULTS: The desired life expectancy appeared not to be achievable, for use in the Arctic Ocean, so the study was allowed to terminate.

REMARKS: PROG: Advanced Engineering - Ocean Monitoring.

1784	0	0	08/01/72	SANDIA CORP.			\$70,000
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TITLE: Sea Ice Penetrometer

DESCRIPTION: Development of an instrument to determine the thickness of ice in the Arctic. The capability of a submerged submarine to punch its way through the ice pack to the surface is critically dependent on the thickness of the layer of ice.

REMARKS: PROG: TTO - Ocean Studies.

1785	0	0					\$75,000
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TITLE: NETWORK MODELS OF CRYSTALS

1786	0	0					\$49,918
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TITLE: NILE BLUE

1787	0	0					\$240,000
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TITLE: ACOUSTICS IN SEA ICE MARGINAL ZONE

1788	0	0					\$120,000
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TITLE: ATLANTIC SEA ICE MARGINAL ZONE

1789	0	0					\$100,000
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TITLE: ADV. CONCEPTS FOR AIR & MISSILE DEF.

1790	0	0			BEUKERS		\$352,000
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TITLE: LOCATE

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: Development of a small electronic passive transceiver, that could be interrogated by a special transmitter. The location of the transceiver could then be determined.

RESULTS: Tests of the small transceiver showed that its location could be determined, at reasonable ranges, both in open areas and in urban areas.

REMARKS: PROG: TTO - Surveillance - Personnel Tracking.
Also see AO 1791, same contractor.

1791	0	0	BEUKERS		\$443,000
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TITLE: Small Area Loran

DESCRIPTION: Development of a low power, small Loran transmitter, with two repeaters, that could be installed in a remote area not covered by a large Loran network.

RESULTS: Tests indicated that the concept would work, and that a vehicle could determine its location quite accurately.

REMARKS: PROG: - TTO - Determination of Own Location in a Remote Area
ARPA Order No. 1790 carried out by the same contractor.

1792	0	0			\$158,000
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TITLE: OPTICAL TELESCOPE AND LLTV SYS.

1793	0	0			\$62,000
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TITLE: THORIUM AND URANIUM NUCLIDES

1794	0	0			\$50,000
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TITLE: TENEX COMPUTER SYSTEM

1795	0	0			\$218,000
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TITLE: SEISMIC RESEARCH

1796	0	0			\$163,000
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TITLE: WAKE DETECTION EXPERIMENT PROG.

1797	0	0			\$100,000
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TITLE: SUBMARINE TRAILING DEVICE

1798	0	0			\$75,000
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TITLE: SUBMARINE WAKE DETECTION

1799	0	0			\$100,000
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AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: NUCLEAR SUBMARINE ESCAPE FLUX.					
1800	0	0			\$410,000
TITLE: SYSTEMS TO COUNTERMEASURE AN IR GUIDED SURFACE-TO-AIR-MISSILE					
1801	0	0			\$105,000
TITLE: NUMERICAL CODE DEVELOPMENT					
1802	0	0			\$74,461
TITLE: RESPONSE TO NUCLEAR WEAPON THREATS					
1803	0	0			\$245,000
TITLE: MINI COPTERS, AUTOGYRO FLIGHT					
1804	0	0			\$164,817
TITLE: ACOUSTIC/SEISMIC HELICOPTER ACQUISITION					
1805	0	0			\$50,000
TITLE: IVORY CORAL					
1806	0	0			\$1,360,000
TITLE: LASER RESEARCH PROGRAM					
1807	0	0			\$1,500,000
TITLE: PULSED ELECTRIC LASER R&D PROGRAM					
1808	0	0			\$0
1809	0	0			\$515,000
TITLE: MAYBELL II PROGRAM					
1810	0	0			\$200,000
TITLE: LASER PROGRAM					
1811	0	0			\$203,000
TITLE: OTH TECHNOLOGY					
1812	0	0			\$95,000
TITLE: STRATEGIC TECHNICAL ANALYSIS					
1813	0	0			\$403,200

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: SUBSURFACE WASTE EMPLACEMENT RSCH							
1814	0	0					\$0
1815	0	0					\$40,000
TITLE: CRYSTAL DEVELOPMENT							
1816	0	0					\$158,000
TITLE: RESEARCH IN ON-LINE COMPUTATION							
1817	0	0					\$359,000
TITLE: TECHNICAL & RESEARCH SUPPORT TO ODDR&E							
1818	0	0					\$349,159
TITLE: DRAGON LILY							
1819	0	0					\$50,000
TITLE: PIEZOELECTRIC POLYMER STUDY							
1820	0	0					\$100,000
TITLE: INSTITUTIONAL RESEARCH PROGRAM							
1821	0	0					\$50,000
TITLE: INSTITUTIONAL RESEARCH PROGRAM							
1822	0	0					\$125,000
TITLE: ADVANCED STRATEGIC CONCEPTS ANALYSIS							
1823	0	0					\$245,000
TITLE: DEV. OF PROTOTYPE HIGHER PERFORMANCE 1.06 IMAGE INTENSIFIER							
1824	0	0					\$150,263
TITLE: GLASSY CARBONS							
1825	0	0					\$0
1826	0	0					\$50,000
TITLE: TAX PAYER							
1827	0	0					\$105,000
TITLE: EARTHQUAKE TRIGGERING PHENOMENA							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1828	0	0					\$82,388
TITLE: REMOTE SPECTROMETER STUDIES							
1829	0	0					\$80,000
TITLE: GLASSY CARBONS							
1830	0	0					\$113,000
TITLE: GLASS LIKE CARBONS							
1831	0	0					\$100,000
TITLE: EMPLOYMENT/UNEMPLOYMENT STATUS OF U.S. SCIENTISTS AND ENGINEERS							
1832	0	0					\$113,000
TITLE: INTELLIGENCE COLLECTION EQUIPMENT							
1833	0	0					\$425,000
TITLE: ADVANCED OPTICS SITE							
1834	0	0					\$300,000
TITLE: COLLECTION TECHNOLOGY							
1834	0	1					\$0
1835	0	0					\$500,000
TITLE: FINE LOOK PROGRAM							
1835	0	1					\$0
1836	0	0					\$200,000
TITLE: DIAGNOSTIC RESEARCH PROGRAM							
1837	0	0					\$60,929
TITLE: MERGER OF SASC AND SDL							
1838	0	0					\$450,000
TITLE: MOTION ISOLATION GRAVITY GRADIMETER							
1839	0	0					\$120,000
TITLE: TENSOR CODE CONVERTED TO ILLIAC IV							
1840	0	0					\$120,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: ADVANCED PATROL SENSOR SYSTEM							
1841	0	0					\$100,000
TITLE: BLUENOSE RESEARCH SUPPORT							
1842	0	0					\$95,145
TITLE: VISUAL AND ACOUSTIC DELAY TECHNIQUE							
1843	0	0					\$550,000
TITLE: DIAGNOSTIC RESEARCH PROGRAM							
1844	0	0					\$330,000
TITLE: STOIAC							
1845	0	0					\$5,000
TITLE: MONITORING OF USSR BEHAVIORAL SCIENCE							
1846	0	0					\$153,000
TITLE: COMPOUND SEMICONDUCTORS AS NUCLEAR DETECTION DEVICES							
1847	0	0					\$114,373
TITLE: PRIME ARGUS EVASION PROGRAM							
1848	0	0					\$250,000
TITLE: TACTICAL NUCLEAR DELIVERY SYS. STY							
1849	0	0					\$300,000
TITLE: BRITTLE MATERIALS DESIGN							
1850	0	0					\$232,000
TITLE: ILLIAC IV COMPUTER SYSTEM							
1851	0	0					\$148,575
TITLE: NAVAL TACTICAL NUCLEAR DELIVERY SYS.							
1852	0	0					\$1,600,000
TITLE: NORSAR COMPUTER							
1853	0	0			JOHNS HOPKINS U.		\$330,000
TITLE: Synthetic Aperture Sonar							

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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DESCRIPTION: Johns Hopkins University Applied Physics Laboratory developed specialized instrumentation to determine whether the acoustic properties of the ocean are sufficiently stable so that the sonar analogue of a synthetic aperture radar is feasible.

RESULTS: A series of measurements made at the Atlantic Undersea Test and Evaluation Center, off Andros Island, demonstrated that a synthetic sonar system is feasible. This makes possible high resolution sensing of objects in the ocean and on the ocean floor.

REMARKS: PROG: Advanced Engineering and Tactical Technology Office - Ocean Monitoring.

1854	0	0			\$72,000
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TITLE: HAND HELD NIGHT VIEWER

1855	0	0			\$125,000
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TITLE: IVY OWL

1856	0	0			\$155,000
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TITLE: PLUME OBSERVABLES & COUNTERMEASURES

1857	0	0			\$175,000
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TITLE: PLUME OBSERVABLES & COUNTERMEASURES

1858	0	0			\$299,939
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TITLE: TACTICAL NUCLEAR WARFARE

1859	0	0			\$19,727
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TITLE: MEINEL BAND RESEARCH

1860	0	0			\$47,653
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TITLE: OPTIMIZING DESIGN OF GAMMA-RAY

1861	0	0			\$114,980
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TITLE: CARBON RESEARCH

1862	0	0			\$400,000
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TITLE: FOG CUTTER

1863	0	0			\$495,000
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TITLE: SYNTHETIC APERTURES

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1864	0	0					\$1,055,000
							TITLE: DEEP LOOK
1865	0	0					\$120,000
							TITLE: SATELLITE FEASIBILITY STUDY
1866	0	0					\$150,265
							TITLE: DEPENDENCE OF TELESEISMIC AMPLITUDES
1867	0	0					\$150,123
							TITLE: FOREIGN NUCLEAR TESTING
1868	0	0					\$99,000
							TITLE: RARE EARTH DOPED YLF AS LASER HOST
1869	0	0					\$250,000
							TITLE: ACOUSTIC & ELECTROMAGNETIC SUBMARINE COMMUNICATION
1870	0	0					\$692,000
							TITLE: AYMARA (CLASSIFIED TITLE)
1871	0	0					\$100,000
							TITLE: OPTICS SUBMARINE COMMUNICATION
1872	0	0					\$250,000
							TITLE: ENVIRONMENTAL INFLUENCES ON SUBMARINE COMM.
1873	0	0					\$30,000
							TITLE: CLIMATE MOD. PROGRAM
1874	0	0					\$256,152
							TITLE: DEV. OF FIELD ANALYSIS SYSTEM
1875	0	0					\$5,000
							TITLE: EARTH'S PARTICLES & FIELDS
1876	0	0					\$405,000
							TITLE: CEFAR YONDER
1877	0	0					\$162,239

AD	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: CIVIL THREATS FROM WEAPONS OF MASS DESTRUCTION							
1878	0	0					\$50,000
TITLE: SUPPORT TO DIA SENIOR LANCE PROG.							
1879	0	0					\$274,627
TITLE: NUCLEAR TEST BAN EVASION STY							
1880	0	0					\$45,000
TITLE: UNDERWATER IMAGING SYSTEM							
1881	0	0					\$900,000
TITLE: TRIM LINE PROGRAM							
1882	0	0					\$0
1883	0	0					\$200,000
TITLE: NIGHT OWL							
1884	0	0					\$44,613
TITLE: AREA INTRUSION DETECTION SCANNER							
1885	0	0					\$44,320
TITLE: NUCLEAR LOGISTICS SAFETY STY							
1886	0	0					\$240,000
TITLE: DESIGN STY-INFRARED STY							
1887	0	0					\$10,000
TITLE: INFRARED STUDY							
1888	0	0					\$0
TITLE: COMPUTATIONAL LOGIC							
1889	0	0					\$54,000
TITLE: BONDING TECHNOLOGY							
1890	0	0					\$54,000
TITLE: SPACE EVASION STY							
1891	0	0					\$30,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: AYMARA							
1892	0	0					\$344,000
TITLE: AYMARA							
1893	0	0					\$5,000
TITLE: LOGISTICS SUPPORT OF ISOTOPES							
1894	0	0					\$126,411
TITLE: TACTICAL AIR DEFENSE STY							
1895	0	0					\$365,000
TITLE: USER SUPPORT PROCESSOR FOR ILLIAC IV							
1895	0	1					\$0
1896	0	0					\$10,000
TITLE: STY OF HERBICIDES & MILITARY OPS							
1897	0	0					\$0
1898	0	0					\$500,000
TITLE: COASTAL PATROL & INTERDICTION CRAFT							
1899	0	0					\$0
TITLE: PARALLEL COMPUTATION							
1900	0	0					\$55,000
TITLE: PROJ. MAYBELL							
1901	0	0					\$100,000
TITLE: PROJ. KEBBIE							
1902	0	0					\$25,000
TITLE: WEAPON SYSTEM ACCURACY GROWTH THREAT IMPLICATION							
1903	0	0					\$140,000
TITLE: FBM SURVIVABILITY ANALYSIS							
1904	0	0					\$270,000
TITLE: TOP SHOT							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1905	0	0					\$240,000
							TITLE: TOP SHOT
1906	0	0					\$143,000
							TITLE: INTERNAL SURFACE WAVE INTERACTIONS
1907	0	0					\$47,000
							TITLE: 1971 SUMMER TOWER EXPERIMENTS
1908	0	0					\$10,000
							TITLE: SALT SUPPORT GROUP
1909	0	0					\$200,000
							TITLE: ASW MANAGEMENT
1910	0	0					\$125,000
							TITLE: ADV. SUBMARINE DETECTION
1911	0	0					\$55,000
							TITLE: ADV. SUBMARINE DETECTION
1912	0	0					\$30,000
							TITLE: ADV. SUBMARINE DETECTION
1913	0	0					\$100,000
							TITLE: RDTE SALARIES & AIR SUPPORT
1914	0	0					\$90,000
							TITLE: RARE EARTH COLBALT MAGNETIC MATLS
1915	0	0					\$54,736
							TITLE: LOCATING DIVERTED NUCLEAR WEAPONS
1916	0	0					\$200,000
							TITLE: NON CRYOGENIC FLIR IMAGING DETECTOR
1917	0	0					\$68,000
							TITLE: UNDERWATER EXPLOSION EFFECTS SY
1918	0	0					\$600,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: NITE GAZELLE							
1919	0	0					\$8,000
TITLE: PAVE MACE							
1920	0	0					\$69,000
TITLE: 1971 SUMMER TOWER EXPERIMENT							
1921	0	0					\$397,000
TITLE: EMP EXPERIMENT							
1922	0	0					\$25,000
TITLE: STYD OF DEEP LEVELS OF DETECTOR-GRADE GERMANIUM							
1923	0	0					\$60,000
TITLE: AGENT ADMINISTRATIVE COSTS							
1924	0	0					\$12,000
TITLE: AGENT ADMINISTRATIVE COSTS							
1925	0	0					\$15,000
TITLE: AGENT ADMINISTRATIVE COSTS							
1926	0	0					\$30,000
TITLE: AGENT ADMINISTRATIVE COSTS							
1927	0	0					\$11,000
TITLE: AGENT ADMINISTRATIVE COSTS							
1928	0	0					\$19,000
TITLE: AGENT ADMINISTRATIVE COSTS							
1929	0	0					\$17,000
TITLE: AGENT ADMINISTRATIVE COSTS							
1930	0	0					\$25,000
TITLE: AGENT ADMINIISTRATIVE COSTS							
1931	0	0					\$3,000
TITLE: AGENT ADMINISTRATIVE COSTS							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1932	0	0					\$1,000
							TITLE: AGENT ADMINISTRATIVE COSTS
1933	0	0					\$17,000
							TITLE: AGENT ADMINISTRATIVE COSTS
1934	0	0					\$2,000
							TITLE: AGENT ADMINISTRATIVE COSTS
1935	0	0					\$3,000
							TITLE: AGENT ADMINISTRATIVE COSTS
1936	0	0					\$10,000
							TITLE: AGENT ADMINISTRATIVE COSTS
1937	0	0					\$9,000
							TITLE: AGENT ADMINISTRATIVE SUPPORT COSTS
1938	0	0					\$150,000
							TITLE: PHOTON IMAGING DEVICES
1939	0	0					\$115,000
							TITLE: OPT1-ACOUSTIC PHENOMENOLOGY
1940	0	0					\$6,000
							TITLE: AGENT ADMINISTRATIVE COSTS
1941	0	0					\$29,994
							TITLE: STAFFING & ASSISTANCE TO CONDUCT SIMINAR
1942	0	0					\$10,000
							TITLE: TRAVEL EXP. INCURRED BY HERBICIDES ST.
1943	0	0					\$968,528
							TITLE: ARTIFICIAL INTELLIGENCE & SPEECH UNDERST.
1944	0	0					\$161,892
							TITLE: DEVELOP AN OPTICAL SPECTRUM ANALYZER
1945	0	0					\$18,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: AGENT ADMIN SUPPORT COSTS							
1946	0	0					\$11,479
TITLE: ARPA SUPPORT OF U. HAWAII SYMPOSIUM							
1947	0	0					\$297,599
TITLE: GE SPACE STUDY							
1948	0	0					\$40,500
TITLE: BIOCYBERNETICS							
1949	0	0					\$140,000
TITLE: DECISION MAKING UNDER STRESS							
1950	0	0					\$75,000
TITLE: SOLID STATE LENS F/SHADOWGRAPH SONAR							
1951	0	0					\$90,000
TITLE: DEVELOP A SONO-OPTICAL IMAGING SYSTEM							
1952	0	0					\$2,000
TITLE: AGENT ADMIN SUPPORT COSTS							
1953	0	0					\$1,480,000
TITLE: REENTRY PHYSICS PROGRAM							
1954	0	0					\$10,000
TITLE: ARPA COMPUTER MAINTENANCE							
1955	0	0					\$0
1956	0	0					\$530,000
TITLE: RANDOM ACCESS COMPUTER COM. NET.							
1957	0	0					\$51,500
TITLE: STUDY OF HOLOGRAM OPTICAL ELEMENTS							
1958	0	0					\$70,000
TITLE: WAKE STEERING OF SUBMERSIBLES							
1959	0	0					\$93,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
							TITLE: STUDY AND EXPER. IN MICROWAVE HOLOG.
1960	0	0					\$2,000
							TITLE: PURCHASE OF LASER TECH. REPORT
1961	0	0					\$265,000
							TITLE: PSYOPA LESSONS LEARNED
1962	0	0					\$56,841
							TITLE: ILLIAC IV RADIATION TRANSPORT PROGRAM
1963	0	0					\$150,000
							TITLE: X-RAY HARDENING
1964	0	0					\$150,000
							TITLE: NILE BLUE (NMR PROJECT)
1965	0	0					\$400,000
							TITLE: HIGH RESOLUTION ELECTRIC CAMERA
1966	0	0					\$200,000
							TITLE: RESEARCH ON SUPERCONDUCTING MACHINERY
1967	0	0					\$25,000
							TITLE: RE EXTENDER FOR LASER TARGET DESIGN
1968	0	0					\$423,000
							TITLE: ROK INTEGRATED COMM. CMD & CONTROL
1969	0	0					\$169,628
							TITLE: ANALYTICAL STUD. OF IR WINDOW MATLS
1970	0	0					\$82,382
							TITLE: OBTAIN INFO RE: UNDER/GROUND EXPL.
1971	0	0					\$50,000
							TITLE: ARPA AGENT ADMIN SUPPORT
1972	0	0					\$759,000
							TITLE: PROJECT AXILLARY

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1973	0	0					\$100,000
TITLE: CONVERT DRAGNET CODE TO RUN ILLIAC IV							
1974	0	0					\$10,000
TITLE: ARPA ADMIN SUPPORT (AGENT)							
1975	0	0					\$0
1976	0	0					\$0
1977	0	0					\$39,770
TITLE: STUDY OF APPLICATION OF MATLS TO HULLS							
1978	0	0					\$1,000
TITLE: SUBSCRIPTION FOR FY 72 SVIC SERVICES							
1979	0	0					\$4,000
TITLE: ARPA AGENT ADMIN SUPPORT							
1980	0	0					\$75,000
TITLE: SELECTED MILIATRY SYSTEMS							
1981	0	0					\$10,000
TITLE: EARLY IOC ASLBM DEF. EFFECT. STUDY							
1982	0	0					\$0
1983	0	0					\$100,000
TITLE: HIGH ALTITUDE PLATFORM							
1984	0	0					\$1,000
TITLE: ARTIFICIAL INTELLIGENCE							
1985	0	0					\$25,000
TITLE: SUPPORT OF TRIPART. TECH. COOPERATION							
1986	0	0					\$30,000
TITLE: SPEECH PARAMETERIZATION							
1987	0	0					\$100,000
TITLE: LARGE AREAS IR PHOTOEMITTER DEVEL.							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
1988	0	0					\$725,000
							TITLE: IMPROVED IMAGE INTENSIFIER TUBES
1989	0	0					\$435,581
							TITLE: SONAR SIGNAL PROCESSING
1990	0	0					\$73,496
							TITLE: REVIEW & EVALUATE SIAF PROGRAM
1991	0	0					\$604,120
							TITLE: LONG RANGE LASER TARGET DESIG
1992	0	0					\$35,539
							TITLE: ANALYTIC SOLUTION OF COUPLED MODE EQUAT.
1993	0	0					\$205,000
							TITLE: COMPUTER BASED LANGUAGE TR. SYSTEM
1994	0	0					\$22,074
							TITLE: PLUME OBSERVABLES AND COUNTERMEASURES
1995	0	0					\$199,000
							TITLE: BATTERY RESEARCH
1996	0	0					\$54,000
							TITLE: GRADIENT POLYMERS
1997	0	0					\$96,377
							TITLE: SPEECH AND PICTURE PROCESSING
1998	0	0					\$150,000
							TITLE: FAULT TOLERANT COMPUTING
1999	0	0					\$127,323
							TITLE: MAGNETIC BUBBLE MATERIALS
2000	0	0					\$425,000
							TITLE: REMOTE VIBRATION SENSING SYSTEM
2001	0	0					\$100,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: PROJECT LAMBOA							
2002	0	0					\$141,177
TITLE: STUDY OF DISPLAYS FOR PILOTED VEHICLES							
2003	0	0					\$20,000
TITLE: AMMUNITION DEVELOP & PRODUCTION							
2004	0	0					\$140,000
TITLE: UNDERGROUND PROPAGATION MEAS.							
2005	0	0					\$120,000
TITLE: ON LINE GROUP CONFERENCING							
2006	0	0					\$0
2007	0	0					\$150,000
TITLE: ADV. MIDCOURSE OPTICAL TECHNOLOGY							
2008	0	0					\$185,000
TITLE: STUDY SOLID STATE MICRO-COMPONENTS							
2009	0	0					\$66,000
TITLE: ILLIAC IV PROGRAMMING TECHNIQUES							
2010	0	0					\$40,000
TITLE: ANALYSIS OF THE STRESS ON PHENOMES							
2011	0	0					\$64,983
TITLE: LAND MINE DETECTION SYSTEM							
2012	0	0					\$75,000
TITLE: IONOSPHERIC MODEL RESEARCH							
2013	0	0					\$0
2014	0	0					\$65,000
TITLE: HALIDE SUPERALLOYS FOR HIGH POWER LASER WINDOWS							
2015	0	0					\$99,850
TITLE: GENERAL STRUCTURAL ANALYSIS FOR ILLIAC IV							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2016	0	0					\$100,000
TITLE: LASER MATERIALS DAMAGE MEASUREMENT							
2017	0	0					\$0
2018	0	0					\$175,000
TITLE: PROGRAM IMPACT EVALUATIONS							
2019	0	0					\$120,000
TITLE: IONOSPHERIC MODEL DEVELOPMENT							
2020	0	0					\$60,000
TITLE: AIR CHEMISTRY STUDY							
2021	0	0					\$80,000
TITLE: TRACE CHEMICAL ANALYSIS							
2022	0	0					\$37,000
TITLE: NUMERICAL & ANALYTICAL FLUID DYNAMICS							
2023	0	0					\$0
2024	0	0			SANDIA CORP.		\$500,000
TITLE: LOW FREQUENCY, HIGH POWER SOUND SOURCE							
DESCRIPTION: A low frequency, very high power, underwater sound source was developed by Sandia Corp.							
RESULTS: Tests of the acoustic source in the very deep Idaho lake at Coeur d'Alene established the success of the development program. The low frequency acoustic waves travel much further in the ocean than high frequency sonar signals.							
REMARKS: PROG: Advanced Engineering - High Power, Low Frequency Underwater Sound Source.							
2025	0	0					\$44,384
TITLE: PROTOTYPE ANALYSIS OF THE COMM SYS DEV & PROD POTENTIAL OF ROK							
2026	0	0					\$39,000
TITLE: PTOTOTYPE ANALYSIS OF THE TANK AUTOMOTIVE SYS DEVELOP & PROD POT							
2027	0	0					\$33,980

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: PRODUCTION POTENTIAL OF ROK							
2028	0	0					\$110,000
TITLE: DETECTION OF EFFLUENTS							
2029	0	0					\$85,000
TITLE: CHEMISTRY AND PHYSICS OF GLASS							
2030	0	0					\$55,000
TITLE: CODE CONVERSION TO ILLIAC IV							
2031	0	0					\$75,000
TITLE: AKALI HALIDE WINDOWS							
2032	0	0					\$236,137
TITLE: HIGH POWER GAS LASERS							
2033	0	0					\$97,937
TITLE: INTRINSIC GERMANIUM CRYSTALS							
2034	0	0					\$64,000
TITLE: FEASIBILITY STUDY FOR DESIGN OF BIOCYBERNETIC COMM SYSTEM							
2035	0	0					\$145,000
TITLE: SUBMARINE WAKE DETECTION							
2036	0	0					\$0
TITLE: NUCLEAR MATERIALS DETECTION							
2037	0	0					\$380,000
TITLE: DETECTOR COOLING SYSTEM							
2038	0	0					\$0
REMARKS: CANCELLED							
2039	0	0					\$200,000
TITLE: GROUND TACTICAL WARFARE SYSTEMS APPLICATIONS							
2040	0	0					\$2,200,000
TITLE: SCOOP							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2041	0	0					\$150,000
							TITLE: AMOT
2042	0	0					\$88,314
							TITLE: LASER SURFACE DAMAGE OF OPTICAL MATLS
2043	0	0					\$100,000
							TITLE: POLYMETAL PHOSPHINATES
2044	0	0					\$4,600,000
							TITLE: IOL TRANSFER
2045	0	0					\$152,000
							TITLE: SOV RADAR TECH
2046	0	0					\$225,000
							TITLE: SLIDING BREECH MACHING GUN
2047	0	0					\$525,000
							TITLE: HI ZOOM FLIR
2048	0	0					\$305,742
							TITLE: ANAL OF AREA FIRE VS PT FIRE FLAT TRJTY SM ARMS WEAPON SYS
2049	0	0					\$6,650
							TITLE: COASTAL PATROL ANALYSIS
2050	0	0					\$109,151
							TITLE: DAMAGE IN HIGH ENERGY DENSITY GLASS LASERS
2051	0	0					\$76,134
							TITLE: RESEARCH ON THE DEVL. OF AN INSULATING ORGANIC FERROMAGNET
2052	0	0					\$37,000
							TITLE: CADMIUM TELLURIDE DETECTORS
2053	0	0					\$68,764
							TITLE: SINGLE CRYSTAL THIN FILM SILICON
2054	0	0					\$504,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: IBM MULTI-STATION ARRAY EXPERIMENT							
2055	0	0					\$271,950
TITLE: MATERIALS FOR IR LASER WINDOWS							
2056	0	0					\$425,000
TITLE: MINI-LASER SENSOR/DESIGNATOR SYSTEM							
2056	0	1					\$0
2057	0	0					\$60,000
TITLE: SHIPBORNE AND AIRBORNE VERSION OF OPTICAL DEVICE							
2058	0	0					\$75,000
TITLE: SEMICONDUCTOR NEUTRON DET							
2059	0	0					\$0
2060	0	0					\$273,000
TITLE: USGS SITE SELECTION AND IDENTIFICATION							
2061	0	0					\$0
2062	0	0					\$1,200,000
TITLE: LASER RESEARCH PROGRAM							
2063	0	0					\$150,000
TITLE: MAYBELL II							
2064	0	0					\$200,000
TITLE: HIGH POWER GAS LASERS							
2065	0	0					\$120,000
TITLE: PROTRACTED NUCLEAR WAR CAPABILITIES PROBLEMS							
2066	0	0					\$51,094
TITLE: ANALYTICAL APPROACH TO MODERN REVOLUTIONARY WARFARE							
2067	0	0					\$256,969
TITLE: QUANTITATIVE METHODS FOR LONG RANGE STRATEGIC FORECASTING							
2068	0	0					\$49,984

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: GRAMMAR FOR SPOKEN ENGLISH							
2069	0	0					\$150,000
TITLE: NUMERICAL METHODS							
2070	0	0					\$2,500
TITLE: AGENT ADMIN SUPPORT FOR NASC							
2071	0	0					\$40,000
TITLE: DEVL NW THALLIUM-CONT. CHALCOGENIDE NONLIN. OPT CRYSTAL NONLIN OPT							
2072	0	0					\$75,000
TITLE: WIDE LINE WIDTH LASER MATERIALS							
2073	0	0					\$86,000
TITLE: HI TEMPERATURE PHASE CHANGE MATERIALS							
2074	0	0					\$122,000
TITLE: INTEGRATED OPTICAL CIRCUITS							
2075	0	0					\$50,000
TITLE: SOLID STATE LASER ILLUMINATOR							
2076	0	0					\$100,000
TITLE: INHOUSE EFFORT ON SHIRT MATERIALS							
2077	0	0					\$460,000
TITLE: ARCTIC SEV PROGRAM							
2078	0	0					\$65,000
TITLE: ARPA TEAL WING							
2079	0	0					\$200,000
TITLE: SMOOTH LEDGE							
2080	0	0					\$450,000
TITLE: SPACE OBJECT SURVEILLANCE & IDENTIFICATION							
2081	0	0					\$250,000
TITLE: SPACE DEFENSE PROGRAM							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2082	0	0					\$145,000
							TITLE: TACTICAL WARFARE STUDY
2083	0	0					\$120,000
							TITLE: 3-D COMPUTER CODES
2084	0	0					\$110,000
							TITLE: STY OF VIETNAM DRUG USERS
2085	0	0					\$25,000
							TITLE: STUDY OF CHINA POLITICAL & MILITARY FACTIONS
2086	0	0					\$30,000
							TITLE: ANALYSIS OF SEV MISSIONS
2087	0	0					\$150,000
							TITLE: PROJECT SEATIDE
2088	0	0					\$0
2089	0	0					\$48,848
							TITLE: GLOBAL WEATHER, MODELING WITH VECTOR SPHERICAL HARMONICS
2090	0	0					\$0
							TITLE: DOCUMENTATION OF RELATIONAL STRUCTURES SYSTEM
2091	0	0					\$240,000
							TITLE: TAILORED RESPONSE TO LOW LEVEL CONFT. & FRGN INT'L STBLTY. SIT.
2092	0	0					\$685,000
							TITLE: UNATTENDED GROUND SENSORS DEVELOP
2093	0	0					\$75,000
							TITLE: STUDY LOCATING ELECTRONIC EMITTERS
2094	0	0					\$465,000
							TITLE: MICRO-AUTOMATION
2095	0	0					\$2,300,000
							TITLE: AUTOMATIC PROGRAMMING AND NATURAL COMMUNICATION

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2096	0	0					\$123,000
TITLE: ACOUSTIC DTRM. OF NEAR SURFACE STRUCTURE OF PERMAFROST & ICE							
2097	0	0					\$300,000
TITLE: GROUND BASED NUCLEAR MONITORING SYS.							
2098	0	0					\$72,875
TITLE: INTERFACE CENTER FOR COMPUTER BASED BEHAVIORAL STUDIES							
2099	0	0					\$94,000
TITLE: ADV. MILLIMETER WAVE RESEARCH							
2100	0	0					\$50,000
TITLE: HARDENED COMMUNICATIONS							
2101	0	0					\$291,504
TITLE: ADV. ACOUSTIC ARRAY DATA PROCESSING DEVELOPMENT & EVALUATION							
2102	0	0					\$75,000
TITLE: 3-D SIESMIC CODE							
2103	0	0					\$1,750,000
TITLE: MINE DUST							
2104	0	0					\$93,000
TITLE: MINE DUST & HE EVENTS							
2105	0	0					\$80,000
TITLE: TECHNOLOGY OF INTERFERENCE & DECISION							
2106	0	0					\$118,000
TITLE: EXTENDED RANGE ARTILLERY SPOTTING TECHNIQUES							
2107	0	0					\$140,000
TITLE: MOBILITY-MILITARY OPERATIONS IN BUILT-UP AREAS							
2108	0	0					\$116,000
TITLE: ADV. DISPLAY TECHNIQUES							
2109	0	0					\$45,000

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: CIVIL INTERACTION-MILITARY OPERATIONS IN BUILT-UP AREAS					
2110	0	0			\$112,000
TITLE: VIETNAMESE TECH. LEXICON					
2111	0	0			\$0
TITLE: ADMINISTRATIVE SUPPORT					
2112	0	0			\$98,000
TITLE: TEAL GREEN					
2113	0	0			\$377,000
TITLE: LASERS					
2114	0	0			\$75,000
TITLE: EARLY WARNING TECHNOLOGY					
2115	0	0			\$100,000
TITLE: LASER PROPULSION					
2116	0	0			\$300,000
TITLE: PLUME OBSERVABLES AND COUNTER MEASURES					
2117	0	0			\$260,000
TITLE: STRATEGIC TECHNICAL ASSESSMENT					
2118	0	0			\$160,000
TITLE: 2" ISOCON CAMERA DEVEL.					
2119	0	0			\$114,856
TITLE: TACTICAL NUCLEAR WEAPONS					
2120	0	0			\$349,016
TITLE: ADVANCED SIGNAL PROCESSING SYS.					
2121	0	0			\$500,000
TITLE: SETOLS TEST					
2122	0	0			\$48,000
TITLE: REMOTE GRAPHICS					

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2123	0	0			\$132,000
TITLE: EVALUATION KARIG FEHER CYCLY					
2124	0	0			\$50,000
TITLE: ADVANCED SURVEILLANCE TECHNOLOGY					
2125	0	0			\$178,000
TITLE: STRATEGIC TECHNICAL ANALYSIS CTR					
2126	0	0			\$160,000
TITLE: ADVANCED STRATEGIC DETECTION					
2127	0	0			\$100,000
TITLE: ADVANCED STRATEGIC DETECTION					
2128	0	0			\$59,000
TITLE: BEHAVIOR OF DRUG USERS					
2129	0	0			\$65,000
TITLE: BEHAVIORAL EFFECTS OF DRUG USERS					
2130	0	0			\$30,000
TITLE: DEEP LOOK					
2131	0	0			\$11,000
TITLE: SUPPORT FINNISH RSCH AT NORSAR					
2132	0	0			\$41,000
TITLE: EQUATORIAL IONOSPHERE					
2133	0	0			\$192,000
TITLE: SUBMARINE DETECTOR					
2134	0	0			\$656,969
TITLE: BROAD BAND SENSORS					
2135	0	0			\$217,000
TITLE: SUBMARINE DETECTION					
2136	0	0			\$100,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: STRATEGIC TECHNICAL ASSESSMENT							
2137	0	0					\$95,000
TITLE: STACK EFFLUENTS							
2138	0	0					\$71,000
TITLE: IR LASER WINDOWS							
2139	0	0					\$107,000
TITLE: ASW DATA PROC. EXPERIMENT							
2140	0	0					\$50,000
TITLE: PHASE O STUDY							
2141	0	0					\$169,820
TITLE: PLASMA INJECTION							
2142	0	0					\$74,000
TITLE: SONAR DATA COLLECTION SYSTEM							
2143	0	0					\$110,000
TITLE: SPREAD SPECTRUM RADAR PROGRAM							
2144	0	0					\$100,000
TITLE: HETEROJUNCTION PHOTOCATHODE DEVELOPMENT							
2145	0	0					\$150,000
TITLE: CENSUS DATA USE AND ACCESS							
2146	0	0					\$193,000
TITLE: ADVANCED INSTRUCTIONAL SYSTEMS FOR FIELD USE							
2147	0	0					\$358,000
TITLE: ANALYSIS OF COLLATERAL DAMAGE AND ITS REDUCTION							
2148	0	0					\$400,000
TITLE: BUILT-UP AREAS							
2149	0	0					\$329,000
TITLE: TACTICAL WEAPONS							

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2150	0	0			\$535,000
TITLE: ADVANCED PROPULSION SYSTEMS					
2151	0	0			\$66,000
TITLE: IMPLEMENTATION OF NLS ON MINI COMPUTER					
2152	0	0			\$38,000
TITLE: ADVANCED STRATEGIC DETECTION					
2153	0	0			\$84,000
TITLE: ADVANCED STRATEGIC DETECTION					
2154	0	0			\$150,000
TITLE: RPV COMMAND AND CONTROL COMM.					
2155	0	0			\$350,000
TITLE: LOW VISIBILITY LAND COMBAT					
2156	0	0			\$400,000
TITLE: LASL FUNDING FOR DIRECTOR'S SUPPORT PROG.					
2157	0	0			\$18,000
TITLE: UNDERGROUND NUCLEAR TESTS					
2158	0	0			\$105,000
TITLE: INTEGRATED OPTICAL CIRCUITS					
2159	0	0			\$66,000
TITLE: NILE BLUE					
2160	0	0			\$364,000
TITLE: MILITARY SYSTEMS VULNERABILITY					
2161	0	0	LOS ALAMOS SCLAB IN HOUSE		\$293,000
TITLE: EXPLOSIVES FLUX COMPRESSION DEVICES					

DESCRIPTION: Development of a system for developing very high radio frequency field strengths using the chemical energy in explosives.

RESULTS: The Los Alamos Scientific Laboratory developed a system for using explosives to generate a high field strength radio frequency system, and demonstrated

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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it in measurements at Los Alamos. The results were given to the Navy and the Army.

REMARKS: PROG: TTD - Radio Frequency System Development.

2162	0	0			\$98,031
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TITLE: ACOUSTIC COMMUNICATION SYSTEMS

2163	0	0			\$70,000
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TITLE: MILITARY OPERATIONS IN BUILT UP AREAS

2164	0	0			\$107,342
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TITLE: FAST FREQUENCY HOPPING

2165	0	0			\$281,000
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TITLE: LASER BACKSCATTER MEASUREMENTS

2166	0	0			\$800,000
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TITLE: COUNTER SYSTEM CERTIFICATION

2167	0	0			\$30,000
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TITLE: VARIABLE AFFINITY PHOTOCATHODE

2168	0	0			\$0
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2169	0	0			\$100,000
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TITLE: METHODS AND APPLICATIONS OF FRACTURE CONTROL

2170	0	0			\$100,000
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TITLE: INVESTIGATION OF NAT'L SECURITY IMPLICATIONS

2171	0	0			\$373,000
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TITLE: PURCHASE OF 2 COMPUTERS FOR SAAC

2172	0	0			\$77,000
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TITLE: POLYCRYSTALLINE HALIDES FOR USE IN HIGH POWER LASER WINDOWS

2173	0	0			\$75,000
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TITLE: R F SPUTTERING OF SEMI-CONDC. & HIGH DIELC. CONST. OXIDE FILMS

2174	0	0			\$320,000
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TITLE: HOMOPOLAR TORQUE CONVERTER

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2175	0	0					\$250,000
TITLE: IMPROVE MIRRORS IN HIGH POWER GAS LASERS							
2176	0	0					\$235,000
TITLE: BALLOON TECHNOLOGY							
2177	0	0					\$175,000
TITLE: IMPROVED BALLOON MATERIALS							
2178	0	0					\$40,000
TITLE: SOLID STATE HYDROGEN GAS GENERATOR							
2179	0	0					\$100,000
TITLE: BALLOON TECHNOLOGY							
2180	0	0					\$197,000
TITLE: RELIABILITY OF INTEGRATED CIRCUITS							
2181	0	0					\$150,000
TITLE: HIGH TEMPERATURE CERAMIC GAS							
2182	0	0					\$291,809
TITLE: PHOTOCATHODE FOR NITE VISION IMAGE INTENSIFIERS							
2183	0	0					\$107,000
TITLE: BLOCK BROAD BAND ACCELEROMETER							
2184	0	0					\$150,000
TITLE: MECHANICS OF BRITTLE MATERIALS							
2185	0	0					\$660,000
TITLE: ADVANCED STRATEGIC DETECTION							
2185	0	1					\$0
2186	0	0					\$100,000
TITLE: MATERIAL AND REFRIGERATION COMPONENTS							
2187	0	0					\$94,000
TITLE: TREATY VERIFICATION FOR BW-CW AGENTS							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2188	0	0					\$60,000
TITLE: ADVANCED STRATEGIC DETECTION							
2189	0	0					\$164,000
TITLE: ADVANCED TRAINING TECHNOLOGY							
2190	0	0					\$112,000
TITLE: BIOCYBERNETICS							
2191	0	0					\$420,000
TITLE: LONG APERTURE EXPERIMENTAL ARRAY							
2192	0	0					\$100,000
TITLE: PYROELECTRIC DETECTOR RESEARCH							
2193	0	0					\$120,000
TITLE: ANTI BLOOMING SILICON INTENSIFIER							
2194	0	0					\$100,000
TITLE: ADVANCED STRATEGIC DETECTION							
2195	0	0					\$119,735
TITLE: IMPACT OF DOD ON ENVIRONMENT							
2196	0	0					\$67,000
TITLE: DAMAGE PROFILES IN SILICON							
2197	0	0					\$33,000
TITLE: TECHNICAL SUPPORT FOR MATERIALS							
2198	0	0					\$60,000
TITLE: NOVEL SURFACE ACOUSTIC WAVE TRANSDUCER TECHNIQUES							
2199	0	0					\$324,000
TITLE: NON ACOUSTIC ASW							
2200	0	0					\$249,000
TITLE: CRYOGENIC SYSTEM AND SUPERCONDUCTIVE POWER							
2201	0	0					\$100,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: SALT SUPPORT GROUP							
2202	0	0					\$120,000
TITLE: ADAPTING 3D COMPUTER CODES FOR DESIGN OF							
2203	0	0					\$2,000
TITLE: AGENT ADMINISTRATIVE SUPPORT							
2204	0	0					\$9,000
TITLE: DRUG ABUSE							
2205	0	0					\$65,000
TITLE: PAVE MACE EQUIPMENT							
2206	0	0					\$28,945
TITLE: AMMUNITION DEVELOPMENT							
2207	0	0					\$70,000
TITLE: MOBILITY SUBMARINES							
2208	0	0					\$80,000
TITLE: REFINED DELPHI JUDGMENT TECHNIQUES							
2209	0	0					\$300,000
TITLE: ANALYTICAL ACTIVITIES							
2209	0	1					\$0
2210	0	0					\$20,000
TITLE: AURORAL OPTICAL EXPERIMENT							
2211	0	0					\$72,000
TITLE: TRACKING GUIDANCE TECHNOLOGY							
2212	0	0					\$85,000
TITLE: DEEP LOOK ADV. LASER R&D							
2213	0	0					\$7,000
TITLE: INT'L UNION OF PURE & APPLIED PHYSICS							
2214	0	0					\$50,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: PROJECT EXCEDE							
2215	0	0					\$30,000
TITLE: UNATTENDED GROUND SENSORS							
2216	0	0					\$111,000
TITLE: ELECTRO-OPTICAL TACTICAL THREAT ANALYSIS							
2217	0	0					\$75,000
TITLE: SUBMARINE COMMUNICATIONS							
2218	0	0					\$25,000
TITLE: IN-HOUSE SUPPORT							
2219	0	0					\$5,000
TITLE: REMOTE DETECTION OF ILLICIT DRUG MANUFACTURING FACILITY							
2220	0	0					\$35,000
TITLE: MISSILE DEFENSE IN SUPPORT OF ODDR&E							
2221	0	0					\$160,060
TITLE: NILE BLUE							
2222	0	0					\$14,850
TITLE: SYTHETIC APERTURE SONAR							
2223	0	0					\$50,000
TITLE: AUTOMATIC PROGRAMMING							
2224	0	0					\$25,000
TITLE: ODDR&E SALT SUPPORT							
2225	0	0					\$25,000
TITLE: MICROPULSATION STUDY							
2226	0	0					\$32,000
TITLE: METHODS OF TECHNICAL COMMUNICATIONS							
2227	0	0					\$25,000
TITLE: IN-HOUSE RESEARCH							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2228	0	0					\$50,776
TITLE: MISSION ANALYSIS FOR TACTICAL NUC WEAPONS							
2229	0	0					\$200,000
TITLE: REV & EVAL OF ADV BEH SCIENCE TECH							
2230	0	0					\$170,000
TITLE: PROJECT COMPASS TRIP							
2231	0	0					\$400,000
TITLE: SPECIAL SATELLITE GROUND ACTIVITIES							
2232	0	0					\$45,000
TITLE: ILLIAC IV							
2233	0	0					\$0
2234	0	0					\$150,000
TITLE: SUPPORT COSTS							
2235	0	0					\$1,500
TITLE: SUPPORT OF COMMITTEE ON TUNNELING RES AND TECH							
2236	0	0					\$200,000
TITLE: SIAF MODEL							
2237	0	0					\$99,478
TITLE: CONCEPT FOR A FUTURE RIFLE SYSTEM							
2238	0	0					\$400,000
TITLE: TACTEC							
2239	0	0					\$249,000
TITLE: ADVANCED STRATEGIC DETECTION							
2240	0	0					\$72,000
TITLE: APPLICATION OF ANALYTICAL TECHNIQUES TO DOD RSCH INTEREST							
2241	0	0					\$125,000
TITLE: IDL'S							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2242	0	0					\$3,000
TITLE: TECHNICAL SECURITY SERVICES							
2243	0	0					\$175,000
TITLE: DEVELOPMENT OF INSTRUMENT TO MEASURE LOW EMISSITIVITIES							
2244	0	0					\$15,000
TITLE: COMPUTER BASED SYSTEMS							
2245	0	0					\$602,320
TITLE: PLATO IV COMPUTER BASED EDUCATOR'S SYS							
2246	0	0					\$30,000
TITLE: ANALYSIS OF OVI-18 SATELLITE DATA							
2247	0	0					\$42,000
TITLE: CONVERSION OF MAZE 2 CODE TO ILLIAC IV							
2248	0	0					\$180,000
TITLE: SOVIET STRATEGY FOR MIDEAST & NORTH AFRICA							
2249	0	0					\$1,000
TITLE: SUBSCRIPTION FOR FY 73 SVIC SERVICES							
2250	0	0					\$2,100
TITLE: AGENT ADMIN SUPPORT FOR DIA							
2251	0	0					\$650,000
TITLE: ARCTIC SEV PROGRAM							
2252	0	0					\$99,292
TITLE: MAGNETOHYDRODYNAMIC LASER INVESTIGATION							
2253	0	0					\$50,000
TITLE: SPEED SPACE MEASUREMENT THEORY							
2254	0	0					\$1,500,000
TITLE: ON-LINE GRAPHIC COMPUTATION							
2255	0	0					\$300,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: PRECISION SATELLITE RADAR ALTIMETRY SYS.							
2256	0	0					\$700,000
TITLE: TOP SEA							
2257	0	0					\$44,675
TITLE: EVALUATE METHODS PURSUED BY STO CONTRACTORS							
2258	0	0					\$31,000
TITLE: NETWORK MANAGEMENT							
2259	0	0					\$243,000
TITLE: RESEARCH ON SEMI-CONDUCTOR MATLS & DEVICES							
2260	0	0					\$75,000
TITLE: MAGNETOSPHERIC WAVE PARTICLE INTERACTION RESEARCH							
2261	0	0					\$25,000
TITLE: DETECTION OF LOW LEVEL RADIATION							
2262	0	0					\$100,000
TITLE: IONOSPHERIC MODEL							
2263	0	0					\$300,000
TITLE: IMPROVED NUCLEAR RADIATION DETECTORS							
2264	0	0					\$400,000
TITLE: ADV. NITE MINE LASER DESIGNATOR SYS.							
2265	0	0					\$250,000
TITLE: ADV NIGHT MINI-LASER DESIGNATOR							
2266	0	0					\$131,685
TITLE: IONOSPHERIC MODEL							
2267	0	0					\$631,239
TITLE: FERROUS DIE CASTING							
2268	0	0					\$52,000
TITLE: ENERGY PROGRAM PLANNING							

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2269 0 0					\$160,000
TITLE: OPTICAL HOLOGRAPHY					
2270 0 0					\$70,000
TITLE: MILITARY APPLICATIONS FOR LITHOSPHERIC WAVES					
2271 0 0					\$82,000
TITLE: DECISION THEORY					
2272 0 0					\$285,000
TITLE: INTEGRATED AMPLIFIER THERMAL IMAGING SENSOR					
2273 0 0					\$15,000
TITLE: INTERGRATED AMPLIFIER THERMAL IMAGING SENSOR					
2274 0 0					\$549,000
TITLE: OPTICAL COUNTERMEASURES					
2275 0 0					\$150,000
TITLE: COHERENT ACTIVE SONAR SOURCE					
2276 0 0					\$150,000
TITLE: DEPENDENCY ANALYSIS FOR US IN DEFENSE OVERSEAS					
2277 0 0					\$72,022
TITLE: SMALL INDEPENDENT ACTION FORCE REVIEW					
2278 0 0					\$94,393
TITLE: BATTLEFIELD SUPPORT TARGETTING					
2279 0 0					\$50,000
TITLE: LEOPARD TANK VULNERABILITY STY					
2280 0 0					\$64,000
TITLE: ACOUSTIC SIGNATURE SHIPS					
2281 0 0					\$2,406
TITLE: RRI RESEARCH TASKS AND STUDIES					
2282 0 0					\$150,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: COVERT COMMUNICATIONS							
2283	0	0					\$18,080
TITLE: SEAMEWS							
2284	0	0					\$350,000
TITLE: COUNTER-AIDED INSTRUCTION (CAI)							
2285	0	0					\$100,000
TITLE: ADAPTIVE ARRAY ANTENNA PROGRAM							
2286	0	0					\$422,745
TITLE: LARGE SCALE NETWORK DESIGN & ANALYSIS							
2287	0	0					\$566,078
TITLE: RESOURCES MGT & ANALYSIS OF MILITARY SYS							
2288	0	0					\$1,312,713
TITLE: SONAR PROCESSING FACILITY							
2289	0	0					\$549,948
TITLE: ALTERNATIVES FOR US R&D STRATEGIES							
2290	0	0					\$91,783
TITLE: REMOTE CONFERENCING BY ARPANET							
2291	0	0					\$54,000
TITLE: ADVANCED LIGHTWEIGHT LASER DESIGNATOR/RANGER							
2292	0	0					\$10,000
TITLE: HERBICIDE STUDIES							
2293	0	0					\$0
2294	0	0					\$2,325,000
TITLE: RAND (TECHNICAL STUDIES)							
2295	0	0					\$170,000
TITLE: TECHNICAL PARAMETERS FOR DETECTION OF SSBM							
2296	0	0					\$189,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: INVESTIGATION OF DIGITAL PROCESSING OF MULTISILA SONAR DATE							
2297	0	0					\$8,000
TITLE: TRANSLATION OF 2 SOVIET HANDBOOKS ON CIVIL DEFENSE							
2298	0	0					\$66,000
TITLE: STY FOR FUTURE SEISMIC DATA COMM. WORLD WIDE							
2299	0	0					\$80,000
TITLE: HISTORICAL CLIMATOLOGY							
2300	0	0					\$146,000
TITLE: GENERATION OF SHEAR WAVES FROM UNDERGROUND EXPLOSIONS							
2301	0	0					\$186,000
TITLE: ELECTRO OPTICAL ANALYSES							
2302	0	0					\$200,044
TITLE: PACKET SWITCHING TECHNIQUES & NETWORKS							
2303	0	0					\$125,000
TITLE: VIDEO BANDWIDTH COMPRESSION							
2304	0	0					\$0
2305	0	0					\$200,000
TITLE: PACKET SWITCHED DIGITAL COMMICATION STY							
2306	0	0					\$585,000
TITLE: ODDR&E (STRATEGIC SYSTEMS) SUPPORT							
2307	0	0					\$255,000
TITLE: CLUSTER BUSTER							
2308	0	0					\$0
TITLE: LARGE APERTURE MARINE BASIC DATA ARRAY							
2309	0	0					\$500,000
TITLE: COMPUTER AIDED INSTRUCTION							
2310	0	0					\$195,000

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: COMPUTER AIDED INSTRUCTION					
2311	0	0			\$172,000
TITLE: COMPUTER AIDED INSTRUCTION					
2312	0	0			\$172,000
TITLE: STATIC VOLTAGE STABILIZATION SYSTEM					
2313	0	0			\$249,000
TITLE: ARPA NETWORK TERMINAL SYSTEM					
2314	0	0			\$87,326
TITLE: SECURITY SYSTEMS PROJECTIONS					
2315	0	0			\$150,000
TITLE: CO2 LASER HETERODYNE SENSORS					
2316	0	0			\$618,524
TITLE: MILLIMETER WAVE SPACE OBJECT IMAG SYS					
2317	0	0			\$120,000
TITLE: TRANSFER OF ARPANET					
2318	0	0			\$250,000
TITLE: STO STRATEGIC ANALYSIS PROGRAM					
2319	0	0			\$383,000
TITLE: PROJECT TEAL WING					
2320	0	0			\$445,133
TITLE: SPACE OBJECT IMAGING AND SATELLITE TARGET STY					
2321	0	0			\$200,000
TITLE: PROJECT TALL MOON					
2322	0	0			\$200,000
TITLE: WIDE BAND HOLOGRAPHIC RECORDER					
2323	0	0			\$177,000
TITLE: INT'L SECURITY ANALYSIS PROJECT					

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2324	0	0					\$150,000
TITLE: PARAMETRIC STUDY OF UNDERWATER IMAGING SYS							
2325	0	0					\$161,000
TITLE: MATS RESEARCH IN HIGH ENERGY GAS PHASE SYSTEMS							
2326	0	0					\$169,940
TITLE: ADV. ACOUSTIC PROCESSING STUDIES							
2327	0	0					\$510,000
TITLE: INFRARED INTEGRATED OPTICS							
2328	0	0					\$10,000
TITLE: ADMIN SUPPORT COSTS							
2329	0	0					\$4,000
TITLE: AGENT ADMIN SUPPORT							
2330	0	0					\$0
2331	0	0					\$3,500
TITLE: AGENT ADMIN SUPPORT FOR DIA							
2332	0	0					\$60,000
TITLE: MAYBELL II							
2333	0	0					\$910,000
TITLE: MAYBELL II							
2334	0	0					\$65,000
TITLE: SALT IMPLICATIONS STUDY							
2335	0	0					\$14,000
TITLE: GEOMAGNETIC MICROPULSATION							
2336	0	0					\$59,835
TITLE: ULTRA LOW FREQUENCY WAVES AS SUBMARINE COMM							
2337	0	0					\$177,000
TITLE: EARLY WARNING TECHNOLOGY							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2338	0	0					\$86,000
TITLE: NOVEL MATERIALS FOR POWER SYSTEMS							
2339	0	0					\$181,000
TITLE: ENERGY RESOURCES							
2340	0	0					\$77,942
TITLE: ADV. CONCEPTS IN STRUCTURAL MATERIALS & TESTING							
2341	0	0					\$260,000
TITLE: MATS RESEARCH COUNCIL							
2342	0	0					\$125,000
TITLE: COUNTER EVASION TECHNIQUES FOR UNDERGROUND NUCLEAR TESTS							
2343	0	0					\$30,000
TITLE: OPERATING EXPENSES							
2344	0	0					\$57,000
TITLE: ARPANET HOST COMPUTERS							
2345	0	0					\$64,000
TITLE: UTILIZATION OF BEHAVIORAL SCIENCE IN LONG RANGE FORECASTING & PLANING.							
2346	0	0					\$62,000
TITLE: STRATEGIC FORECASTING & PLANNING							
2347	0	0					\$45,000
TITLE: ADAPTIVE COMPUTER AIDING IN DYNAMICS DECISION PROCESSES							
2348	0	0					\$125,000
TITLE: SHORT SEA-TV UNDERWATER CABLE (UWT)							
2349	0	0					\$428,000
TITLE: AREA/POINT FIRE WEAPON							
2350	0	0					\$90,096
TITLE: OPTIMAL PROCESSING OF COMPACT ARRAYS/LAMINAR BODY PROGRAM							
2351	0	0					\$1,600,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: TIP & IMP DEVELOPMENT (ARPANET)							
2352	0	0					\$174,058
TITLE: IR POLARIZATION SIGNATURE FEASIBILITY							
2353	0	0					\$470,125
TITLE: TACTICAL WARFARE STUDIES							
2354	0	0					\$61,000
TITLE: SPCL. APP. TECH. PHASED ARRAY SINGLE SITE RADIOLOCATION PROG.							
2355	0	0					\$250,000
TITLE: ANTI-SUBMARINE WARFARE							
2356	0	0					\$50,000
TITLE: PLUME PHYSICS & OBSERVABLES PROG.							
2357	0	0					\$535,000
TITLE: HIGH POWER ELECTRICAL LASER DEVELOP.							
2358	0	0					\$100,000
TITLE: SPACE DEFENSE PROGRAM							
2359	0	0					\$274,000
TITLE: SPEECH SIGNAL PROCESSING							
2360	0	0					\$28,000
TITLE: STUDY OF BENEFITS FROM WARRANTY USE							
2361	0	0					\$104,963
TITLE: FIELD RELIABILITY OF LOW COST ELECTRONICS							
2362	0	0					\$1,100
TITLE: SEISMIC ARRAY							
2363	0	0					\$1,100
TITLE: NONE							
2364	0	0					\$98,000
TITLE: DEVL. LRG. LOW ABSORPTION CDA CRYSTALS FOR HIPWR. 2ND HARMN GEN.							

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2365 0 0					\$37,000
TITLE: MULTI-STATION ABF					
2366 0 0					\$100,000
TITLE: DEVL. & IMPLEMENTATION OF RIBBON WIRE BONDING					
2367 0 0					\$150,000
TITLE: ADVANCED ARMOR CONCEPTS					
2368 0 0					\$300,000
TITLE: HI-ALTITUDE ACQUISITION & DESIGNATION					
2369 0 0					\$100,000
TITLE: RPV COMMAND & TELEMETRY LINKS					
2370 0 0					\$2,000
TITLE: AGENT ADMIN SUPPORT COSTS					
2371 0 0					\$51,000
TITLE: COMPARATIVE ASSESSMENT OF SELECTED MATS TECH. OF US & USSR					
2372 0 0					\$61,000
TITLE: TEAL WING					
2373 0 0					\$50,000
TITLE: CLOSE-COUPLED MAN-MACHINE SYSTEMS					
2374 0 0					\$24,000
TITLE: INTELLECTIVE LOAD THRESHOLD IN SYS. OPERATORS					
2375 0 0					\$50,000
TITLE: SPECIAL PURPOSE SENSOR INVESTIGATION					
2376 0 0					\$85,000
TITLE: COST STUDY OF MIL-SPEC EQUIPMENT					
2377 0 0					\$61,000
TITLE: TEAL WING					
2378 0 0					\$75,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: EXPLOSIVE ACOUSTIC SOURCE							
2379	0	0					\$300,000
TITLE: BASIC & APPLIED RESEARCH IN MATS-IDL'S							
2380	0	0					\$425,000
TITLE: STUDY OF SEMICONDUCTOR & METAL SURFACES, INTERFACES & FILMS							
2381	0	0					\$140,000
TITLE: DEVELOPMENT OF SODIUM SULFUR CELL							
2382	0	0					\$99,000
TITLE: NORTH TEXAS LONG PERIOD SEISMIC ARRAY							
2383	0	0					\$250,000
TITLE: NEW SOLID ELECTROLYTE MATERIALS							
2384	0	0					\$80,000
TITLE: HI ENERGY LASER TECHNOLOGY							
2385	0	0					\$85,000
TITLE: TWO DIMENSIONAL ADAPTIVE ANTENNA ARRAYS							
2386	0	0					\$152,000
TITLE: STO PROJECT ARIENNE.							
2387	0	0					\$370,000
TITLE: STO ENERGY LASER TECHNOLOGY							
2388	0	0					\$50,000
TITLE: LOW LIGHT LEVEL INTERCEPTOR PROGRAM							
2389	0	0					\$33,000
TITLE: ADVANCED CONCEPTS TECHNOLOGY							
2390	0	0					\$100,000
TITLE: STO SPECIAL APPLICATION'S							
2391	0	0					\$60,000
TITLE: MODULAR AVIONICS							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2392	0	0					\$94,441
TITLE: ADVANCED SIGNAL PROCESSOR							
2393	0	0					\$48,540
TITLE: HI PURITY GERMANIUM DETECTOR ARRAYS							
2394	0	0					\$99,000
TITLE: SOSUS SIGNALS							
2395	0	0					\$74,000
TITLE: DETECTOR MATERIALS RESEARCH PROJECT.							
2396	0	0					\$206,999
TITLE: LONG PERIOD HI=GRAIN SEISMOLOGICAL STATIONS							
2397	0	0					\$100,000
TITLE: SEMICONDUCTOR COMPONENT RELIABILITY IMPRVMT. BY PROCESS CONTROL							
2398	0	0					\$300,000
TITLE: LOW REACTION HYPERVELOCITY BALLISTICS							
2399	0	0					\$120,000
TITLE: TECHNICAL IMP OF RELAXING TRADE CONTROLS							
2400	0	0					\$100,000
TITLE: ADVANCED COUNTERMEASURES							
2401	0	0					\$125,000
TITLE: US SOVIET TECHNOLOGY TRANSFER POLICY ISSUES							
2402	0	0					\$57,000
TITLE: SPECIAL APPLICATIONS TECHNOLOGY							
2403	0	0					\$138,000
TITLE: ADV STRATEGIC ANALYSES							
2404	0	0					\$68,590
TITLE: ADV CONCEPTS TECHNOLOGY							
2405	0	0					\$50,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: STO SPECIAL APPLICATIONS TECHNOLOGY							
2406	0	0					\$94,000
TITLE: SECURE OPERATING SYS. & AUTOMATIC PROCESSING							
2407	0	0					\$20,000
TITLE: PILOT RELAXATION TRAINING (NEW)							
2408	0	0					\$0
2409	0	0					\$0
2410	0	0					\$100,000
TITLE: BIOCYBERNETICS							
2411	0	0					\$25,000
TITLE: PYROELECTRIC DETECTOR RESEARCH							
2412	0	0					\$80,000
TITLE: SIGNAL ANALYSIS & CLASSIFICATION FOR SURVEILLANCE SYSTEMS							
2413	0	0					\$10,000
TITLE: 35 VS TON TANK-COST IMPLICATION STUDY							
2414	0	0					\$0
2415	0	0					\$470,000
TITLE: IMPROVED IR LASER OPTICS							
2416	0	0					\$55,120
TITLE: NOVEL TECH FOR COATING ALKALI HALIDE OPTICS TO PREVENT WATER DMG							
2417	0	0					\$75,000
TITLE: ANTIREFLECTIVE COATINGS OF IR LASER OPTICS							
2418	0	0					\$5,000
TITLE: BASELINE INTERFEROMETRY EXPERIMENT							
2419	0	0					\$55,000
TITLE: DRILLING TECHNOLOGY							
2420	0	0					\$122,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: SONUS							
2420	0	1					\$0
2421	0	0					\$115,000
TITLE: ALTERNATIVES TO ALKALI HALIDE WINDOW MATS FOR HI PWRED IR LASER							
2422	0	0					\$49,975
TITLE: ELECTROMAGNETIC DETECTION							
2423	0	0					\$50,000
TITLE: PUBLICATION OF THE JOURNAL OF DEF RES							
2424	0	0					\$40,000
TITLE: OWNERSHIP COSTS OF SELECTED WEAPONS SYS							
2425	0	0					\$99,000
TITLE: SURFACE SHIP AUTOMATION							
2426	0	0					\$370,000
TITLE: LARGE APERTURE SONAR ARRAY							
2427	0	0					\$93,000
TITLE: ARPA DATA MANAGEMENT SYSTEM							
2428	0	0					\$100,000
TITLE: STRATEGIC TECHNICAL ANALYSIS							
2429	0	0					\$255,000
TITLE: ARPA TEAL WING							
2430	0	0					\$65,000
TITLE: STD SPACE DEFENSE							
2431	0	0					\$0
2432	0	0					\$0
2433	0	0					\$81,000
TITLE: EGG APPLE 11							
2434	0	0					\$100,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: BICOYBERNETICS-EEG COUPLING							
2435	0	0					\$62,000
TITLE: LIGHT CABLE							
2436	0	0					\$260,000
TITLE: LAB MEASUREMENTS AND ANALYSIS							
2437	0	0					\$75,000
TITLE: PHOTOMETRIC ANALYSIS TECHNIQUES							
2438	0	0					\$25,000
TITLE: STO HIGH ENERGY LASERS							
2439	0	0					\$525,000
TITLE: H1 ENERGY LASER TECH, PROPAGATION AND VULNERABILITY							
2440	0	0					\$160,000
TITLE: MAT'S SCIENCES RES/IDL'S							
2441	0	0					\$59,000
TITLE: EVALUATION OF UNMANNED SEISMIC OBSERVATORY CONCEPT							
2442	0	0					\$100,000
TITLE: IDL IN SUPPORT OF 4 MATERIAL PROBLEMS							
2443	0	0					\$36,000
TITLE: CHALCOGENIDE GLASSES							
2444	0	0					\$154,757
TITLE: METAL SILICON SCHOTTKY BARRIERS							
2445	0	0					\$42,000
TITLE: DIODE WORKING FIELD INDUCT TRAPPING							
2446	0	0					\$1,500,000
TITLE: LINCOLN LAB							
2447	0	0					\$150,000
TITLE: 35 MM LIQUID PROPELLANT GUN PHASE I							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2448	0	0					\$99,000
TITLE: CODING SUP & COMPREHENSIVE OF INSTRUCTIONAL MATS							
2449	0	0					\$145,000
TITLE: QUAN DECISION ANALYSIS AND THEORY							
2450	0	0					\$75,000
TITLE: QUANTITATIVE DECISION ANALYSIS METHODS							
2451	0	0					\$97,000
TITLE: NET TECHNICAL ASSESSMENT IN DOD							
2452	0	0					\$100,000
TITLE: NET ASSESSMENT OF STRATEGIC FORCE							
2453	0	0					\$123,000
TITLE: TECHNICAL ANALYSIS SPACE CONTROL FACILITIES							
2454	0	0					\$50,000
TITLE: STRATEGIC TECHNICAL ANALYSIS							
2455	0	0					\$149,846
TITLE: MICRO-AUTOMATION							
2456	0	0					\$105,000
TITLE: DEF SUPPRESSION RPV SYSTEM							
2457	0	0					\$150,000
TITLE: JOINT ARPA/ECOM RPV PROGRAM							
2458	0	0					\$61,000
TITLE: SPACE DEFENSE							
2459	0	0					\$30,000
TITLE: ENERGY SCENARIOS							
2460	0	0					\$100,000
TITLE: SOVIET SENSORS							
2461	0	0					\$150,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: ARMS-CONTROL STUDIES							
2462	0	0					\$50,000
TITLE: ADVANCED BALLOON TECHNOLOGY							
2463	0	0					\$200,000
TITLE: FREE RADICAL FILM							
2464	0	0					\$100,000
TITLE: EVOLVING PACOM PROBLEMS AND NEEDS							
2465	0	0					\$25,000
TITLE: SYMBOLIC MANIPULATION IN FIELD THEORY VERIFICATION							
2466	0	0					\$845,000
TITLE: SPEECH UNDERSTANDING AND INTELLIGENT SYS							
2467	0	0					\$141,000
TITLE: ENERGY SYSTEMS ON NAVAL BASES							
2468	0	0					\$12,000
TITLE: SPIDER							
2469	0	0					\$425,000
TITLE: (5 SPECIFIC TASK PROPOSALS)							
2470	0	0					\$265,000
TITLE: (3 YEAR PROPOSED PROGRAM IDL)							
2471	0	0					\$24,000
TITLE: LOW TEMP PHYSICS LAB							
2472	0	0					\$50,000
TITLE: DIGITIZED AVIONICS MODULE							
2473	0	0					\$70,000
TITLE: ACOUSTIC IN NATURAL SPEECH							
2474	0	0					\$50,000
TITLE: AIRBORNE TETHERED PLATFORM							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2475	0	0					\$75,000
TITLE: SPECIAL EFFECT RADIATION COUPLING							
2476	0	0					\$50,000
TITLE: DESIGN STUDY FOR AN ADV. MULTI-PURPOSE INFRARED SYS.							
2477	0	0					\$553,000
TITLE: SENSORY INFORMATION PROCESSING & SYMBOLIC COMPUTATION							
2478	0	0					\$55,000
TITLE: THERMA, IMAGING FIRE CONTROL SYSTEMS							
2479	0	0					\$60,000
TITLE: INFRA-RED TERMINAL GUIDANCE SYS SIMULATION AND SIGNATURES							
2480	0	0					\$100,000
TITLE: DUAL MODE TERMINALLY GUIDED							
2481	0	0					\$300,000
TITLE: MECHANICS AND OPTICS OF MATERIALS							
2482	0	0					\$68,000
TITLE: LAMELLAR COMPOSITES FORMED BY SPUTTER DEPOSITION							
2483	0	0					\$111,000
TITLE: CATALYSIS FOR ENERGY PRODUCTION							
2484	0	0					\$82,000
TITLE: NEW FUELS NEEDED BY DOD FOR ADV. SYS.							
2485	0	0					\$22,000
TITLE: STRESS CORROSION CRACKING							
2486	0	0					\$250,000
TITLE: SPACE DEFENSE							
2487	0	0					\$100,000
TITLE: DIAMOND & BORAZON COMPACT CUTTING TOOL TECHNOLOGY							
2488	0	0					\$550,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: IDL RESEARCH FOR 12 MONTH PROGRAM							
2489	0	0					\$139,000
TITLE: GALLIUM ARSENDIE							
2490	0	0					\$7,000
TITLE: TEST EQUIPMENT FOR AFCRL IN-HOUSE							
2491	0	0					\$30,000
TITLE: ARPA CLIMATE DYNAMICS PROGRAM							
2492	0	0					\$57,000
TITLE: CLOSE-IN DISCRIMINANT PROBLEM							
2493	0	0					\$250,000
TITLE: STO SPECIAL APPLICATIONS TECHNOLOGY							
2494	0	0					\$715,000
TITLE: ARTIFICIAL INTELLIGENCE, HEURISTIC PROGRAM							
2495	0	0					\$100,145
TITLE: FORECAST MODEL DEVELOPMENT							
2496	0	0					\$208,000
TITLE: COMPUTER NETWORK RESEARCH							
2497	0	0					\$90,000
TITLE: RPV ADAPTIVE ARRAY ANTENNA DESIGN							
2498	0	0					\$45,000
TITLE: NETWORK B6700: SERVICE							
2499	0	0					\$0
2500	0	0					\$0
2501	0	0					\$0
2502	0	0					\$200,000
TITLE: EXPLOSIVES DEVELOPMENT TECHNOLOGY							
2503	0	0					\$1,000

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: ADMINISTRATIVE SUPPORT COSTS					
2504	0	0			\$150,000
TITLE: JASON STUDIES					
2505	0	0			\$20,000
TITLE: ILLIAC IV					
2506	0	0			\$56,000
TITLE: NOISE DISTORTION OF BROAD BAND					
2507	0	0			\$20,000
TITLE: MGT. FOR ARPA ACOUSTIC RESEARCH CENTER					
2508	0	0			\$65,000
TITLE: MEASUREMENT OF TRITIUM IN AIR & WATER					
2509	0	0			\$125,000
TITLE: IMPORTANCE OF EVASION UNDER A COMPREHENSIVE NUCLEAR TEST BAN TRT					
2510	0	0			\$7,000
TITLE: ROC COUNTERPART SYSTEMS ANALYSIS TRAINING					
2511	0	0			\$90,000
TITLE: NARROW BAND TIME OF ARRIVAL MEASUREMENT					
2512	0	0			\$150
TITLE: REVIEW OF 5-YEAR COORDINATED PLAN FOR ARCTIC RESEARCH					
2513	0	0			\$10,000
TITLE: 35 VS. 58 TON TANK-COST IMPLICATION STUDY					
2514	0	0			\$69,000
TITLE: LEARNING OF AUTONOMIC BEHAVIOR					
2515	0	0			\$35,000
TITLE: PREPARATION OF HISTORICAL ANALYSIS OF ARPA MNGT. OF R&D PROJECTS					
2516	0	0			\$0
TITLE: INTERNATIONAL USE OF ARPANET					

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2517	0	0					\$26,734
TITLE: A TUTOR MINICOMPUTER SYSTEM							
2518	0	0					\$75,000
TITLE: THREAT PROCESSES RECOGNITION & ANALYSIS							
2519	0	0					\$50,000
TITLE: NATIONAL ATTRIBUTES TO SECURITY PLANNING IMPLICATIONS							
2520	0	0					\$180,000
TITLE: NATIONAL SEC. POLICY RESEARCH SUPPORT-PHASE I							
2521	0	0					\$95,000
TITLE: SOVIET SCIENCE POLICY MAKING INFRA-STRUCTURE							
2522	0	0					\$50,000
TITLE: LONG RANGE R&D PROGRAM							
2523	0	0					\$5,000
TITLE: CHIEF OF ENG. DEVELOP SURVEILLANCE CONCEPT CHART/MAP TASK ARMY							
2524	0	0					\$25,000
TITLE: LONG RANGE R&D PROGRAM							
2525	0	0					\$5,000
TITLE: ARMY MATERIALS AND MECHANICS RESERCH CENTER							
2526	0	0					\$50,000
TITLE: LONG RANGE R&D PROGRAM							
2527	0	0					\$50,000
TITLE: LONG RANGE R&D PROGRAM (TARP)							
2528	0	0					\$150,000
TITLE: OBSERVABLE MEASUREMENTS (MINI-RPV'S)							
2529	0	0					\$0
2530	0	0					\$0
2531	0	0					\$75,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: DEFENSE SCIENCE BOARD SUMMER STUDY							
2532	0	0					\$70,000
TITLE: INVESTIGATION OF MECHANISMS RESULTING IN GENERATION OF WEAR PART							
2533	0	0					\$100,000
TITLE: IMPULSE TARGET RESPONSE							
2534	0	0					\$35,000
TITLE: 2-YEAR PROGRAM OF WEAR BY FRICTION							
2535	0	0					\$0
2536	0	0					\$67,000
TITLE: A PROTOTYPE REFRIGERATOR BASED UPON ELECTROCALORIC							
2537	0	0					\$161,500
TITLE: MESOSCALE PHENOMENA							
2538	0	0					\$10,000
TITLE: DYNAMIC TOMOGRAPHIC TECHNOLOGY							
2539	0	0					\$507,500
TITLE: MITRE SUPPORT							
2540	0	0					\$24,000
TITLE: STO ADVANCED SURVEILLANCE TECHNOLOGY							
2541	0	0					\$300,000
TITLE: DISTRUBUTED OFFICE WORKSHOP							
2542	0	0					\$22,000
TITLE: TEAL PHALAROPE SOFTWARE PROGRAM							
2543	0	0					\$200,000
TITLE: COMPUTER NETWORK RESEARCH & SERVICES							
2544	0	0					\$367,000
TITLE: SPACETRACK AUGMENTATION SENSOR EVALUATION PROGRAM							
2545	0	0					\$60,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: NETWORK CDC 6600/7600 PROGRAMMING & COMPUTER TIME							
2546	0	0					\$36,900
TITLE: ARPA REGIONAL OFFICE-PACIFIC OPERATING EXPENSES							
2547	0	0					\$0
2548	0	0					\$122,000
TITLE: LIMITED MOBILITY SUBMARINE							
2549	0	0					\$28,000
TITLE: COMMAND & CONTROL INFORMATION FLOW							
2550	0	0					\$20,000
TITLE: INFRARED & LASER TECHNOLOGY TRI-SERVICE RESEARCH							
2551	0	0					\$1,150
TITLE: VELA SEISMOLOGICAL CENTER							
2552	0	0					\$99,000
TITLE: USE OF RARE EARTH-NICKEL HYDRIDES FOR STORAGE OF HYDROGEN							
2553	0	0					\$40,000
TITLE: STORAGE OF HYDROGEN IN SOLID HYDRIDES IN BROOKHAVEN							
2554	0	0					\$330,000
TITLE: ARMOR ARRAYS, SHPED CHRG HYDYNMCS. LIQ. PRPLNT. CONT. SMT SDF WP							
2555	0	0					\$15,000
TITLE: NOISE ABATEMENT & INT'L VBRT ABSORPTION PTENAL. STRUC. MATLS.							
2556	0	0					\$25,000
TITLE: INT'L COORDINATION OF CLIMATE DYNAMICS PROGRAM							
2557	0	0					\$2,500
TITLE: ADMINISTRATIVE SUPPORT EXPENSES							
2558	0	0					\$504,000
TITLE: PROGRAM ASSESSMENT & CONCEPT EVALUATION							
2559	0	0					\$990,000

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: LAMINAR FLOW BODY RSCH & HYDRODYNAMICS TEST PROGRAM (PHASE I)					
2560	0	0			\$150,000
TITLE: DEVELOPMENT OF MULTIPLE PULSE LASER TARGET DESIG.					
2561	0	0			\$50,000
TITLE: ELECTROSTATIC STABILIZATION FOR TERRAIN AVOIDANCE(NEW)					
2562	0	0			\$156,000
TITLE: HOSTILE WEAPON LOCATION					
2563	0	0			\$199,000
TITLE: SAL-II STUDIES(SUPPORT TO DIRC., SALT SUPPORT GROUP, DDR&E)					
2564	0	0			\$0
2565	0	0			\$900,000
TITLE: LONGER RANGE MINI-RPV/DESIGNATOR SYSTEM (NEW)					
2566	0	0			\$325,000
TITLE: IMAGE MODELLING & ANALYSIS					
2567	0	0			\$394,000
TITLE: COMMAND & CONTROL AUTOMATION RESEARCH (KEYDATA)					
2568	0	0			\$300,000
TITLE: AUTOMATIC PROGRAMMING & NETWORK TECHNIQUES					
2569	0	0			\$657,000
TITLE: LOW TEMP. PROPERTIES OF STRUCTURAL MATERIALS					
2570	0	0			\$150,000
TITLE: SUPERCONDUCTIVITY IN ORGANIC COMPOUNDS					
2571	0	0			\$80,000
TITLE: ARPA RESEARCH CENTER					
2572	0	0			\$390,000
TITLE: HIGH-PURITY GERMANIUM DETECTOR PACKAGE					
2573	0	0			\$73,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: STUDY FOR MPYROELECTRICITY FOR BASIC UNDRSTD EFFECT PEROVAKITES							
2574	0	0					\$160,000
TITLE: APPLICATION OF VERY HARD COATINGS FOR MACHINE TOOLS							
2575	0	0					\$135,000
TITLE: PERMANENT FACILITY SUPPORT TO ARPA ACOUSTIC RESEARCH CENTER							
2576	0	0					\$17,500
TITLE: AGENT ADMINISTRATIVE COSTS							
2577	0	0					\$175,000
TITLE: CALERE II SIGHT DESIGN, INTEGRATION & TEST							
2578	0	0					\$8,000
TITLE: AGENT ADMINISTRATIVE SUPPORT							
2579	0	0					\$46,000
TITLE: CONTRACT & TECHNICAL SUPPORT FOR ICIS							
2580	0	0					\$150,000
TITLE: ANALYSIS OF TACTICAL INTELLIGENCE EXPERIENCE IN SE ASIA							
2581	0	0					\$150,000
TITLE: DISCRETE INFO. SYSTEMS THEORY							
2582	0	0					\$103,700
TITLE: LAMBDA							
2583	0	0					\$50,000
TITLE: HEAVY BOMBER DEFINITION							
2584	0	0					\$100,000
TITLE: ARMS CONTROL CONCEPTS & THEIR IMPLICATIONS							
2585	0	0					\$160,000
TITLE: SOVIET ECONOMETRIC MODEL (NEW)							
2586	0	0					\$100,000
TITLE: LASER DESIGNATOR CM SYSTEM (NEW)							

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2587	0	0			\$100,000
TITLE: WARSAW PACT AIR DEFENSE					
2588	0	0			\$30,000
TITLE: SUBMARINE ANTI-HELICOPTER DEFENSE					
2589	0	0			\$75,000
TITLE: HOLOGRAM ELEMENTS FOR MISSILE SEEKERS					
2590	0	0			\$19,000
TITLE: U.S. EUROPEAN COOPERATIVE RESEARCH ON DEVELOPMENT & PROCUREMENT					
2591	0	0			\$100,283
TITLE: OCEAN/ATMOSPHERIC BOUNDARY LAYERS					
2592	0	0			\$30,666
TITLE: TWO-DIMENSIONAL GLOBAL CLIMATIC MODEL					
2593	0	0			\$700,000
TITLE: STO IMAGING & REMOTE TECHNOLOGY					
2594	0	0			\$162,300
TITLE: RSCH & PREP. OF ANAL. OF MNGMT. OF RSCH & DEVL. PROJ. BY ARPA					
2595	0	0			\$171,000
TITLE: STO LASER SYSTEMS APPLICATION STUDIES					
2596	0	0			\$200,000
TITLE: STO SURVEILLANCE TECHNOLOGY					
2597	0	0			\$490,000
TITLE: MAYBELL II (TRUE COURSE)					
2598	0	0			\$20,000
TITLE: SUPPORTS DDR&E TASKING BY TEAL BEAK					
2599	0	0			\$49,300
TITLE: STO SURVEILLANCE TECHNOLOGY					
2600	0	0			\$17,500

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: STO SURVEILLANCE TECHNOLOGY, MICROPULSATIONS							
2601	0	0					\$70,000
TITLE: TEAL BEAK/POSITION LOCATION PROGRAMS							
2602	0	0					\$15,000
TITLE: SECRETARIAT SUPPORT TO HELRG							
2603	0	0					\$216,000
TITLE: STO SPECIAL APPLICATIONS TECHNOLOGY							
2604	0	0					\$245,000
TITLE: STO ADVANCED STRATEGIC DETECTION TECH.							
2605	0	0					\$600,000
TITLE: STO SPACE DEFENSE, IMG. & REMOTE SENSING TECH.; SHDW IMAGE II PR							
2606	0	0					\$60,000
TITLE: SPEECH UNDERSTAND-PROSODIC ANALYSIS OF SPEECH							
2607	0	0					\$600,000
TITLE: STO HI ENERGY LASER TECH; HI PWR CHEMICAL LASER DEVELOPMENT							
2608	0	0					\$58,000
TITLE: STO SPECIAL APPLICATIONS TECH. TEAL CREST PROG.							
2609	0	0					\$50,000
TITLE: OROGRAPHIC-SURFACE EFFECTS ON GLOBAL CLIMATE							
2610	0	0					\$607,000
TITLE: DEEP LOOK							
2611	0	0					\$70,000
TITLE: AMBIENT TEMP. LITHIUM, SOLUBLE DEPOLARIZER RECHARGEABLE BATTERY							
2612	0	0					\$62,000
TITLE: GROW HALIDE LASER WINDOWS							
2613	0	0					\$678,000
TITLE: ARCHIVAL MASS STORAGE FACILITY FOR SEISMIC DATA							

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2614	0	0			\$25,000
TITLE: CHEMICAL LASER AT MICOM FOR EVLTN. OF LASER WINDOW MATERIALS					
2615	0	0			\$325,000
TITLE: HYDROGEN ENERGY SYSTEMS FOR NAVY APPLICATIONS					
2616	0	0			\$98,129
TITLE: SCC PRIMER					
2617	0	0			\$129,800
TITLE: HIGH-GAIN, LONG-PERIOD SEISMOGRAPH STATIONS					
2618	0	0			\$275,000
TITLE: TECH PHYSICS INFRARED RECTIFIER & FREQUENCY (SEEAO=2619)					
2619	0	0			\$12,000
TITLE: MIXER PT CNT DIODES MCRPHM & DATA FRM TH HGLP SESMIC					
2620	0	0			\$511,000
TITLE: OPTICAL MATERIALS CHARACTERIZATION					
2621	0	0			\$73,000
TITLE: TARGET ACTIVATED SENSORS (NEW)					
2622	0	0			\$19,000
TITLE: POTENTIAL POLITICO-MILITARY CONSQNS. U.S. LOW LVL. MIL. ACT.					
2623	0	0			\$108,000
TITLE: POCKET VETO PROGRAM TRANSER TO AF					
2624	0	0			\$50,000
TITLE: DEVL. OF A PSEUDONOISE FRQNCY. HOPPED CHIRP MODLTN. SYSTEM					
2625	0	0			\$73,000
TITLE: ECM/ECCM FOR RADAR LOCATION SYSTEMS					
2626	0	0			\$150,000
TITLE: SECRTY. DIMENSION OF WORLD-WIDE ECONOMIC & POLITICAL TRENDS					
2627	0	0			\$0

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2628	0	0					\$0
2629	0	0					\$330,000
TITLE: CLOSED CYCLE ENGINE SYSTEM(BRAYTON ENGINE)							
2630	0	0					\$321,500
TITLE: NEW ENERGY SOURCE DEVL. UTILIZATION & PRACTICAL APPLICATION							
2631	0	0					\$450,000
TITLE: STO HIGH ENERGY LASER TECH.							
2632	0	0					\$395,000
TITLE: STO HIGH ENERGY LASER TECH; FIELD LASER EXPERIMENTS							
2633	0	0					\$83,000
TITLE: VECTOR SPHERICAL HARMONICS							
2634	0	0					\$100,000
TITLE: SPACE DEFENSE ANALYSIS							
2635	0	0					\$0
2636	0	0					\$72,300
TITLE: EVLUTN. OF RSCRCS. MGMT. & ADV. TECH. FOR INDCTNS & WARNING							
2637	0	0					\$100,000
TITLE: STO ADV. CONC. TECH; ADV. STRATEGIC DETECTION TECHNOLOGY							
2638	0	0					\$10,000
TITLE: ARPA PACIFIC UNIT AUSTRALIA INITIAL FY 74 OPERATING EXPENSES							
2639	0	0					\$0
2640	0	0					\$200,000
TITLE: AIR VEHICLES OBSERVABLES PROGRAM, PHASE 1							
2641	0	0					\$200,000
TITLE: MULTICS SECURITY							
2642	0	0					\$70,000
TITLE: STO SPECIAL APPLICATIONS TECHNOLOGY FOG CUTTER							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2643	0	0					\$350,000
TITLE: TEAL AMBER I							
2644	0	0					\$420,000
TITLE: TEAL AMBER II							
2645	0	0					\$420,000
TITLE: TEAL BEAK							
2646	0	0					\$490,000
TITLE: STO SPACE DEFENSE IMAGING & REMOTE SYSTEM TECHNOLOGY							
2647	0	0					\$2,250
TITLE: ECB FOR ADMINISTRATIVE SUPPORT EXPENSES							
2648	0	0					\$75,000
TITLE: IFF FOR INFRARED WEAPONS							
2649	0	0					\$226,000
TITLE: FORWARD-LOOKING INFRARED IMAGING SENSOR							
2650	0	0					\$100,000
TITLE: ICBM CONCEPTS ANALYSIS							
2651	0	0					\$125,000
TITLE: COORDINATION & FACILITATION OF INSTRC. RSCH COMP-BASED SYST.							
2652	0	0					\$110,000
TITLE: STO ADV STRATEGIC CONC. & STRATEGIC TECH. ANALYSIS							
2653	0	0					\$35,000
TITLE: ARPA NONLINEAR ACOUSTIC TECH. PROGRAM							
2654	0	0					\$35,000
TITLE: ARPA NONLINEAR ACOUSTIC TECH. PROGRAM							
2655	0	0					\$30,000
TITLE: ARPA NONLINEAR ACOUSTIC TECH. PROGRAM							
2656	0	0					\$754,000

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: REORIENTATION OF PLIME PHYSICS & OBSERVABLES PROGRAM					
2657	0	0			\$30,000
TITLE: PLRZBLE PIEZOELECT. PLYHDPHNE ELEMT. TOWED ARY SRVL. SYS					
2658	0	0			\$125,000
TITLE: SURFACE WAVE REMITE SENSOR READOUT TECH.					
2659	0	0			\$149,000
TITLE: STO SPECIAL APPLICATIONS TECHNOLOGY					
2660	0	0			\$6,000
TITLE: ANOMALOUS SIGNAL PROPAGATION PHENOMENA					
2661	0	0			\$79,000
TITLE: CEDIS					
2662	0	0			\$49,700
TITLE: STRATEGIC TECHNICAL CONCEPTS					
2663	0	0			\$50,000
TITLE: DYNAMICAL & THERMAL BALANCES AT THE AIR-SEA INTERFACE					
2664	0	0			\$75,000
TITLE: STO SPECIAL APPLICATIONS TECHNOLOGY					
2665	0	0			\$250,000
TITLE: ILLIAC IV FORTRAN COMPILER					
2666	0	0			\$5,000
TITLE: AGENT ADMINISTRATIVE SUPPORT COSTS					
2667	0	0			\$61,000
TITLE: IDENTIFICATION & MEASUREMENT OF U.S. INTERESTS ABROAD					
2668	0	0			\$45,000
TITLE: STO ADV. CONCEPTS TECHNOLOGY; LABORATORY & THEORY					
2669	0	0			\$55,000
TITLE: RATHEON DEVL. HALIDE & FLORIDE ALLOYS LASER WNDWS THRU CST TEC					

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2670	0	0					\$0
2671	0	0					\$98,000
TITLE: RADAR WIRE DETECTOR & DISPLAY TECH. FOR HELICOPTERS							
2672	0	0					\$200,000
TITLE: BREADBOARD SPREAD SPECTRUM RADAR PROCESSOR							
2673	0	0					\$60,000
TITLE: INDIUM ANTIMONIDE INFRARED MOSAIC DETECTOR							
2674	0	0					\$160,000
TITLE: SHIP DEPLOYABLE TACTICAL RPV'S							
2675	0	0					\$19,000
TITLE: CONFERENCE ON HYDROGEN ENERGY SYSTEMS AT U. OF MIAMI							
2676	0	0					\$35,000
TITLE: CONTROLLED INVERSION DEV. HI RELIABILITY SEMICONDUCTOR MEM.							
2677	0	0					\$0
2678	0	0					\$75,000
TITLE: FLIR ARRAYS							
2679	0	0					\$90,000
TITLE: ARMY AERIAL SURVEILLANCE CAPABILITY USING A EUROPEAN SENARIO							
2680	0	0					\$63,000
TITLE: RECCE-STRIKE NAVIGATIONAL GRID INTEROPERABILITY							
2681	0	0					\$55,000
TITLE: DECT. NUC. WEAPONS OR MATLS. BY ATMOSPHERIC EXCITATION							
2682	0	0					\$74,649
TITLE: DOD MANPOWER DATA ANALYSIS							
2683	0	0					\$60,000
TITLE: INSTITUTIONAL RESEARCH							
2684	0	0					\$90,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: INSTITUTIONAL RESEARCH							
2685	0	0					\$125,000
TITLE: INSTITUTIONAL RESEARCH							
2686	0	0					\$90,000
TITLE: INSTITUTIONAL RESEARCH							
2687	0	0					\$355,000
TITLE: LARGE-SCALE DATA UTILITY SYSTEM							
2688	0	0					\$100,000
TITLE: SPECIAL APPLICATIONS TECHNOLOGY							
2689	0	0					\$34,000
TITLE: RELIABILITY OF ELECTRO-PHOTOGRAPHIC INFO.							
2690	0	0					\$100,000
TITLE: STUDY PALESTINIAN GUERILLAS							
2691	0	0					\$20,000
TITLE: RAMAN SPECTROMETRY AT THE ELECTRODE-ELECTROLYTE INTERFACE							
2692	0	0					\$68,000
TITLE: DECOUPLING OF NUCLEAR BURSTS WITH EXPLOSIVELY FORMED CAVITIES							
2693	0	0					\$48,000
TITLE: HARDWARE FOR USGS ALBUQUERQUE SEISMOLOGICAL CENTER							
2694	0	0					\$323,000
TITLE: SOFT-X-RAY LASERS							
2695	0	0					\$28,000
TITLE: TEMPEST							
2696	0	0					\$90,000
TITLE: PHOTO GALVANIC CELL & A LOW TEMPERATURE SOLID ELECTROLYTE							
2697	0	0					\$20,000
TITLE: IMPROVEMENT OF HIGH TEMPERATURES PROPERTIES							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2698	0	0					\$30,000
TITLE: SINTERED CERAMICS POSSIBLE. APP. AS SEMI-CONDUCT., THERML.							
2699	0	0					\$50,000
TITLE: TO ATTACH CERAMIC BLADES TO A WROUGHT ALLOY TURBINE ROTOR.							
2700	0	0					\$120,731
TITLE: INVEST & STUDY COMPTONAL. TECH. DESIGN & FABRCTN. LG. SCL. IN							
2701	0	0					\$56,000
TITLE: FLIR DESIGN SUITABLE FOR HAND-HELD & OPTIMUM MODULAR FLIR DSGN							
2702	0	0					\$23,000
TITLE: AGENT ADMINISTRATIVE COST							
2703	0	0					\$200,000
TITLE: HOT SPOT SEEKER FOR PRECISION GUIDED MUNITIONS							
2704	0	0					\$80,000
TITLE: ARPA'S SHARE STUDY ON TACTICAL NUCLEAR WEAPONS							
2705	0	0					\$80,000
TITLE: DEVELOPMENT OF COMPENSATION ARRAY SUBSYSTEM							
2706	0	0					\$67,000
TITLE: TARGET IDENTIFICATION ENHANCEMENT TECHNIQUES							
2707	0	0					\$50,000
TITLE: NOISE & VIBRATION CHARACTERISTICS TEST OF WANKEL ENGINE							
2708	0	0					\$225,000
TITLE: LASER RADAR DEMONSTRATION PROGRAM PHASE I							
2709	0	0					\$100,000
TITLE: ELECTRIC PROPULSION FOR MINI-RPV'S							
2710	0	0					\$100,000
TITLE: EXP INVTN ENVL CYC DSCRPTN IMPRV. ACRCY. LORAN SYS							
2711	0	0					\$32,000

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: ZONALLY AVERAGED CLIMATIC MODEL					
2712	0	0			\$212,000
TITLE: OPERABILITY FACTORS IN INTERACTIVE NETWORK					
2713	0	0			\$50,000
TITLE: DEVL. & EVALUATION OF A LOW RADAR OBSERVABLES MINI-RPV					
2714	0	0			\$14,400,000
TITLE: SELF-INITIATED ANTI-AIRCRAFT MISSILE (SIAM)					
2715	0	0			\$70,000
TITLE: AUSTRALIAN ARMY FIELD TEST & EVALUATION OF ARPA/SINDIS					
2716	0	0			\$9,000
TITLE: AUSTRALIAN ARMY FIELD TEST & EVALUATION OF THE ARPA MIRS					
2717	0	0			\$141,000
TITLE: ANALYSIS OF TARGET DEVELOP PROCESS & SYSTEMS					
2718	0	0			\$136,000
TITLE: BEAM RIDER GUIDANCE TECHNIQUE INVESTIGATION					
2719	0	0			\$100,000
TITLE: TECHNOLOGY IMPLICATIONS					
2720	0	0			\$8,000
TITLE: AGENT ADMINISTRATIVE SUPPORT					
2721	0	0			\$55,000
TITLE: PHOTOCHEMICAL CONVERSION OF SOLAR ENERGY					
2722	0	0			\$200,000
TITLE: RANDOM ACCESS CID COLOR CAMERA FOR MINI-RPV'S					
2723	0	0			\$25,000
TITLE: SURVEILLANCE AND MARINE REVIEW (NEW)					
2724	0	0			\$0
2725	0	0			\$70,000

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: ACOUSTO-OPTICAL IMAGING					
2726	0	0			\$30,000
TITLE: EVALUATION OF NEW LASER GUIDED SHELL CONCEPT					
2727	0	0			\$85,000
TITLE: BATTLEFIELD ILLUMINATION MODELING STUDY					
2728	0	0			\$25,000
TITLE: AVID GUARDIAN					
2729	0	0			\$185,000
TITLE: STO SPECIAL APPLICATIONS TECHNOLOGY					
2730	0	0			\$50,000
TITLE: JET PLUME MEASUREMENTS FROM A U-2 AIRCRAFT					
2731	0	0			\$50,000
TITLE: LOW ALTITUDE ENGAGEMENT EXPERIMENT DESIGN					
2732	0	0			\$86,000
TITLE: STO ADV. STRAT. DETECTION TECHNOLOGY					
2733	0	0			\$0
2734	0	0			\$30,000
TITLE: TANGE CONTOUR TECHNIQUE EVALUATION					
2735	0	0			\$190,000
TITLE: ADV. FIREPOWER TECH. DEVL. FOR MILT. OPRTS. IN BUILD-UP AREAS					
2736	0	0			\$100,000
TITLE: LPI COMMUNICATION INTERCEPTION					
2737	0	0			\$50,000
TITLE: INTERDICTION MINI-RPV COST EFFECT ANALYSIS					
2738	0	0			\$25,000
TITLE: SENSOR COMMUN. SYSTEM PATH LOSS MEASUREMENT & ANALYSIS					
2739	0	0			\$60,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: FESIBTY. DEMSRT. DSGN. DEF. OF MINI-RPV EMITTER LOCATION							
2740	0	0					\$50,000
TITLE: ASSMNT. ON INST. & TECH. FACTORS AFFCT. SYNTHETIC PETROLEUM							
2741	0	0					\$225,000
TITLE: SURVEILLANCE COMMUNICATIONS TECHNOLOGY							
2742	0	0					\$51,000
TITLE: SOFTWARE FOR DECISION ANALYSIS							
2743	0	0					\$19,000
TITLE: CRISIS MANAGEMENT							
2744	0	0					\$25,000
TITLE: TIME DIFRNC. ARVAL. CORLTN. TECH. UNCOOPRTVE. EMITTER LOCTN.							
2745	0	0					\$192,000
TITLE: SPECIAL RPV SOLAR POWERED EXPERIMENTS							
2746	0	0					\$219,000
TITLE: ALTERNATE COMMUNICATIONS SYSTEMS							
2747	0	0					\$66,000
TITLE: GEOTHERMAL ENERGY RESEARCH PROGRAM							
2748	0	0					\$0
2749	0	0					\$30,000
TITLE: DEVL. OF NEW PROCEDURE FOR EVAL. WATER, AIR & INTERFACE VHCL.							
2750	0	0					\$33,000
TITLE: ADAPTIVE REAL TIME FI/FI RELAY							
2751	0	0					\$32,000
TITLE: LASER/ACOUSTIC SYSTEMS ASSESSMENT							
2752	0	0					\$600,000
TITLE: HOWLS-SYS. INTEGRATION-AIRBORNE MTI & MINI-RPV RADAR							
2753	0	0					\$40,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: HOWLS ACOUSTIC WEAPONS LOCATION							
2754	0	0					\$55,000
TITLE: HOWLS-SEISMIC ARTILLERY LOCATION							
2755	0	0					\$118,000
TITLE: ENCRYPTION DEVICES JOINT NMR & DIS							
2756	0	0					\$70,000
TITLE: DEEP LOOK/UNDERWATER IMAGING							
2757	0	0					\$50,000
TITLE: HOWLS							
2758	0	0					\$48,000
TITLE: ANALYTICAL TASKS IN SUPPORT OF ARPA ENERGY PROG.							
2759	0	0					\$150,000
TITLE: TACTICAL TECHNICAL ANALYSIS							
2760	0	0					\$150,000
TITLE: EVALUATION OF SMALL ARMS EFFECTIVENESS CRITERIA							
2761	0	0					\$250,000
TITLE: HIGH POWER CHEMICAL LASER DEVICES							
2762	0	0					\$55,000
TITLE: SPECIAL COMMUNICATIONS TECHNOLOGY							
2763	0	0					\$60,000
TITLE: GRAPHIC INTERACTIVE SYS FOR DECISION THEORETIC ANALYSIS							
2764	0	0					\$22,000
TITLE: STOCHASTIC MODELLING FOR CLIMATE PREDICTION							
2765	0	0					\$88,000
TITLE: EXPERIMENTS IN TEXTURE PERCEPTION							
2766	0	0					\$281,000
TITLE: AIRBORNE/MOBILE DATA ACCESS & EXPLOITATION							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2767	0	0					\$37,000
TITLE: WARNING ATTACK SURFACE-TO-AIR OR AIR-TO-AIR MISLS (IR-RADAR)							
2768	0	0					\$40,000
TITLE: WEAPON MICROGUIDANCE							
2769	0	0					\$90,000
TITLE: DSGN. FABRCTN & TEST WIDE-BAND OPTCL. COMMUN. LINK							
2770	0	0					\$50,000
TITLE: MINI-RPV SYSTEM GROUND ANTENNA STUDY							
2771	0	0					\$50,000
TITLE: SPREAD SPECTRUM COMMUNICATIONS MODEMS							
2772	0	0					\$100,000
TITLE: SYNTHESIS OF METHANDL FROM ORGANIC WASTE							
2773	0	0					\$50,000
TITLE: ANAL OF STRATEGIC PLNING OPTIONS & DEFENSE MISIONS. RLAT ENRG							
2774	0	0					\$75,000
TITLE: NUMERICAL METHODS IN CLIMATOLOGY							
2775	0	0					\$0
2776	0	0					\$80,000
TITLE: SURFACE WAVE PROPAGATION TECHNOLOGY							
2777	0	0					\$25,000
TITLE: STO WARNING TECHNOLOGY/ADVANCED APPL.							
2778	0	0					\$84,777
TITLE: SCANNING OF OPTICAL IMAGES							
2779	0	0					\$48,000
TITLE: SCHEMES FOR THE PRODUCTION							
2780	0	0					\$21,000
TITLE: CHRZTN OF SURFACES ATOMIC SCALE FIELD IONIZATION ENGY SPECTRA							

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2781 0 0					\$25,600
TITLE: CHEMICAL DIFFUSION ON SOLID SURFACES					
2782 0 0					\$140,000
TITLE: RSCH STY TECHNQ GENRT COHERENT VAC ULTVI. & SOFT X-RAY RADITN					
2783 0 0					\$80,000
TITLE: HYDROSTATIC EXTRUSION OF HARD, HIGH STRENGTH MATS					
2784 0 0					\$70,000
TITLE: HIGH VAPOR PRESSURE ZINC LASER					
2785 0 0					\$49,048
TITLE: FLEET DEFENSE AIDS					
2786 0 0					\$87,700
TITLE: SUBMARINE LOW-FREQUENCY TARGET STRENGTH TESTS					
2787 0 0					\$65,000
TITLE: THEATER-LEVEL MODELING DTRMN. COST-EFFECTIVENESS ADV. TECH.					
2788 0 0					\$75,000
TITLE: WAVE FRONT DISTORTION					
2789 0 0					\$7,000
TITLE: TEST SUPPORT FRO APL SEV EFFORT					
2790 0 0					\$306,000
TITLE: SOVIET R&D					
2791 0 0					\$37,000
TITLE: RESISTIVE COUPLED ANTENNA TECHNOLOGY					
2792 0 0					\$38,245
TITLE: SOFTWARE TOOLS FOR CLIMATE SIMULATION					
2793 0 0					\$489,315
TITLE: INTERACTIONS & DYNAMICS OF MOLECULES & SURFACES					
2794 0 0					\$55,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: MOSFET							
2795	0	0					\$26,000
TITLE: DISTRIBUTION OF TRACE CONSTITUENTS							
2796	0	0					\$100,000
TITLE: SMALL AUTOGYRO/DESIGNATOR RPV							
2797	0	0					\$30,000
TITLE: IMPACT ON US SECURITY WORLD-WIDE AGRICULTURE SHORTAGES							
2798	0	0					\$67,000
TITLE: MID-INFRARED LASER TARGET DESIGNATOR							
2799	0	0					\$45,000
TITLE: MID-INFRARED LASER TARGET DESIGNATOR							
2800	0	0					\$66,000
TITLE: HEAT FLOW AT COSO GEOTHERMAL AREA CHINA LAKE, CALIFORNIA							
2801	0	0					\$30,000
TITLE: IMPACT OF ALTNTVE. INT'L. ECONC. POLCIS. ON U.S. DEFNS. INT							
2802	0	0					\$24,740
TITLE: INTERLISP LANGUAGE FOR B6700							
2803	0	0					\$3,000
TITLE: INSTALL DATA TERMINALS & COMMUN. LINKS FOR DIR. OF ENERGY OSD							
2804	0	0					\$400,000
TITLE: SYNTHETIC APERTURE RADAR PHENOMENOLOGY							
2805	0	0					\$35,795
TITLE: COMPARATIVE PERFORM. HI EFFIC. SHIP PRPULS. SYS DEST. TYPE HL							
2806	0	0					\$149,000
TITLE: TESTING HIGH POWER LASER WINDOWS							
2807	0	0					\$140,000
TITLE: MULTI-STATION EXPERIMENT ALGORITHM							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2808	0	0					\$52,407
TITLE: ISSUES IN BIOLOGICAL SCIENCE							
2809	0	0					\$375,000
TITLE: CENTERVILLE LINE							
2810	0	0					\$300,000
TITLE: STO NEW LASER DEVELOPMENT							
2810	0	1					\$0
2811	0	0					\$15,000
TITLE: STO ADV. STRAT. CONCEPTS							
2812	0	0					\$45,000
TITLE: KIRLIN PHOTOGRAPHY							
2813	0	0					\$50,000
TITLE: DSB SUMMER STUDY							
2814	0	0					\$0
2815	0	0					\$0
2816	0	0					\$120,000
TITLE: BIOCYBERNETICS CONTROL OF MAN-MACHINE INTERACTIONS							
2817	0	0					\$0
TITLE: LOOP NETWORK SECURITY							
2818	0	0					\$50,443
TITLE: INTERNATIONAL BEHAVIOR ANALYSIS							
2819	0	0					\$72,000
TITLE: PSYCHOLOGICAL & SOCIOLOGICAL DIMENSIONS OF CRISIS MNGT.							
2820	0	0					\$77,000
TITLE: MILITARY FORCES AS A POLITICAL INSTRUMENT							
2821	0	0					\$76,000
TITLE: MANPOWER DATA ANALYSIS							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2822	0	0					\$50,000
TITLE: ELECTROCHROMIC DISPLAY DEVICES							
2823	0	0					\$73,000
TITLE: COHERENT TRACKING & LOCALIZATION ALGORITHMS AT NUC							
2824	0	0					\$11,000
TITLE: CONFERENCE ON IR LASER WINDOWS							
2825	0	0					\$50,000
TITLE: STY OF EFFECTS OF SEISMOMETER DISTORT. BROADBAND SEISMIC DATA							
2826	0	0					\$50,000
TITLE: TEMP. COMPENSATED PREZOELECTRIC MATERIALS							
2827	0	0					\$68,219
TITLE: ACOUSTIC RIDGE WAVEGUIDE TECHNOLOGY							
2828	0	0					\$357,000
TITLE: INTERDISCIPLINARY PROG. FOR QUANTITATIVE FLAW DEFINITION							
2829	0	0					\$110,000
TITLE: NETWORK TENEX RESOURCES							
2830	0	0					\$173,879
TITLE: QUANTITATIVE INDICATORS							
2831	0	0					\$430,898
TITLE: STO HIGH ENERGY LASER TECH.-FIELD EXPERIMENTS							
2832	0	0					\$709,269
TITLE: NATIONAL SOFTWARE WORKS							
2833	0	0					\$125,000
TITLE: PLATO COMMUN. LINES							
2834	0	0					\$50,000
TITLE: STO SPECIAL APPLIC. TECH; ANALYTICAL TECHNIQUES							
2835	0	0					\$15,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: INDICATORS OF TRANSACTION FLOWS							
2836	0	0					\$108,500
TITLE: STO SPECIAL APPLICATIONS TECH; SPECIAL COMMUN.							
2837	0	0					\$825,000
TITLE: ARPA MAUI OPTICAL STATION (AMOS) PHASE III							
2838	0	0					\$440,000
TITLE: TEXT INDICATORS ANALYSIS & CONSISTENT SYSTEM SOFTWARE							
2838	0	1					\$0
2839	0	0					\$150,820
TITLE: CONTINGENCY PLANNING & LONG RANGE FORECASTING							
2840	0	0					\$300,000
TITLE: UNIVERSITY LASER RESEARCH							
2841	0	0					\$43,000
TITLE: GROUP JUDGMENT TECHNOLOGY							
2842	0	0					\$77,000
TITLE: OPERATION OF NETWORK INFO. CENTER							
2843	0	0					\$860,000
TITLE: MILLIMETER WAVE TECHNOLOGY EFFORT							
2844	0	0					\$0
2845	0	0					\$200,000
TITLE: EGG APPLE 3							
2846	0	0					\$36,000
TITLE: CRISIS MANAGEMENT MODELS							
2847	0	0					\$535,000
TITLE: SEVEN ELEMENT LP ARRAY IRAN							
2848	0	0					\$55,000
TITLE: ULF NOISE MEASUREMENT EXPERIMENT							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2849	0	0					\$135,000
TITLE: EVALUATION OF SELECTED TECHNOLOGY DEVL. IN THE FREE WORLD							
2850	0	0					\$170,000
TITLE: DESIGN, DEVL. & INSTALLATION OF SEISMIC RSCH OBSERVATORIES							
2851	0	0					\$40,000
TITLE: ORGANIZATIONAL COMMUNICATION & DECISION-MAKING IN CRISES							
2852	0	0					\$125,000
TITLE: INTELLIGENT TERMINAL EXPLORATORY STUDIES							
2853	0	0					\$415,000
TITLE: ACQUISITION & OPERATION OF SRI-ARC-PDP10 TENEX FACILITY							
2854	0	0					\$99,461
TITLE: TACTICAL SEA SURVEILLANCE DEMONSTRATION							
2855	0	0					\$132,587
TITLE: ECM/ECCM FOR COMMUNICATIONS LOCATORS							
2856	0	0					\$200,000
TITLE: ANALYTICAL SUPPORT CENTER							
2857	0	0					\$285,000
TITLE: MODELS/ANALYSIS OF SOVIET TECHNOLOGICAL APPLICATIONS							
2858	0	0					\$420,817
TITLE: SIAM,UGS SYST. STYS.RPV COMM.SYST.GRID INTPRBLTY.WARSAW PAD							
2859	0	0					\$120,000
TITLE: SOVIET STRATEGIC FACTORS							
2859	0	1					\$0
2860	0	0					\$60,000
TITLE: SAR DIGITIZATION & TACTICAL DISPLAY							
2861	0	0					\$1,225,000
TITLE: CHEMICAL LASER TECHNOLOGY							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2862	0	0					\$296,000
TITLE: PURCH. EQUIP & SERV. TO UPGRD. VROUS. VERY LNG PD. EXP. STATNS							
2863	0	0					\$80,000
TITLE: SHORT-TERM INDICATOR FORECASTING							
2864	0	0					\$39,000
TITLE: A DECISION ANALYTIC ASSESSMENT OF VALUE OF INTELLIGENCE							
2865	0	0					\$120,000
TITLE: STUDY ON NON-FUEL STRATEGIC RESURCS. AS RELT. TO NAT'L. SEC.							
2866	0	0					\$17,000
TITLE: PROJECT FAN							
2867	0	0					\$5,000
TITLE: CHINESE-ENGLISH TRANSLATION ASSISTANCE DICTIONARY							
2868	0	0					\$49,000
TITLE: SEISMIC COUPLING FOR NTS EVENTS							
2869	0	0					\$70,000
TITLE: ANAL OF NEEDS OF DOD CRITICAL MATLS REST. EMRG.U.S.INDST.TECH							
2870	0	0					\$20,000
TITLE: MOLECULAR RECTIFIERS							
2871	0	0					\$850,000
TITLE: TEAL RUBY							
2872	0	0					\$300,000
TITLE: THEORETICAL INVESTIGATION OF AUTORESONANT ACCELERATOR CONCEPT							
2873	0	0					\$72,000
TITLE: DECISION & EVENTS IN CRISES							
2874	0	0					\$193,000
TITLE: TTO MOBA PROGRAM							
2875	0	0					\$48,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: TTO MOBA PROGRAM							
2876	0	0					\$169,000
TITLE: TTO MOBA PROGRAM							
2877	0	0					\$75,000
TITLE: TTO MOBA PROGRAM							
2878	0	0					\$130,000
TITLE: TACTICAL SAR PROCESSING EXPERIMENTS							
2879	0	0					\$180,000
TITLE: INTERACTIVE SAR PROCESSING IMPLEMENTATION							
2880	0	0					\$30,000
TITLE: INTERACTIVE SAR INTERPRETATION ANALYSIS							
2881	0	0					\$150,000
TITLE: HF/VHF DIRECTION FINDING ARRAY							
2882	0	0					\$0
2883	0	0					\$100,000
TITLE: RADAR VULNERABILITY STUDY							
2884	0	0					\$331,418
TITLE: ILLIAC IV SECURITY							
2885	0	0					\$82,000
TITLE: SMALL WARHEAD DEVELOPMENT							
2886	0	0					\$100,000
TITLE: SYSTEM ANALYSIS OF INFO. PROCESSING PROBLEMS & TECHNIQUES							
2887	0	0					\$75,000
TITLE: JOINT ARPA/ARI EFFORT							
2888	0	0					\$274,985
TITLE: STO WARNING TECHNOLOGY-AUSTRALIAN OTHR SUPPORT							
2889	0	0					\$50,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: PERCEPTUAL FACTORS IN COMPUTER GRAPHICS							
2890	0	0					\$64,400
TITLE: DEVELOP POSITION LOCATION TECHNOLOGY							
2891	0	0					\$100,000
TITLE: AN OFFENSE/DEFENSE INTERACTION TECHNOLOGY							
2892	0	0					\$10,000
TITLE: COMPARISON OF DIESEL ELECTRIC & LI-SEAWATER POWER SYSTEMS							
2893	0	0					\$427,020
TITLE: MULTI-SPECTRAL IMAGE PROCESSING							
2894	0	0					\$750,837
TITLE: ARTIFICIAL INTELLIGENCE-RESEARCH & APPLICATIONS							
2895	0	0					\$550,000
TITLE: SATELLITE RADAR ALTIMETRY & DMA GEODETIC EXPERIMENT							
2896	0	0					\$13,000
TITLE: SOVIET MILITARY THOUGHT							
2896	0	1					\$0
2897	0	0					\$400,000
TITLE: SPECIAL DATA COLLECTION SYS.							
2898	0	0					\$69,681
TITLE: SYNTHESIS OF SINGLE CRYSTAL TYPE 2 DIAMONDS							
2899	0	0					\$265,000
TITLE: DEVELOP FIBRE-OPTIC UNDERSEA CABLE							
2900	0	0					\$93,000
TITLE: POTASSIUM BROMIDE FOR HIGH POWERED IR LASER WINDOWS							
2901	0	0					\$290,000
TITLE: DISTRIBUTED COMPUTATION & TENEX RELATED ACTIVITY							
2901	0	1					\$0

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2902	0	0					\$2,471,000
TITLE: HIGH POWER LASER BEAM PROPAGATION EXPERIMENTS							
2903	0	0					\$225,000
TITLE: SPEECH UNDERSTANDING RESEARCH							
2904	0	0					\$730,000
TITLE: SPEECH UNDERSTANDING SYSTEMS							
2905	0	0					\$180,000
TITLE: PITCH & EXCITATION STUDY							
2906	0	0					\$80,000
TITLE: MAINTENANCE OF INTERLISP							
2907	0	0					\$33,000
TITLE: VOL. REGULATION OF EXTREMITY TEMP. UNDER CLO AMBIENT CON							
2908	0	0					\$273,250
TITLE: MID-IR SENSOR ARRAY							
2909	0	0					\$175,000
TITLE: AIRCRAFT UNDERWATER SOUND EXPERIMENT							
2910	0	0					\$430,760
TITLE: NON-LINEAR ACOUSTICS							
2911	0	0					\$49,000
TITLE: NON-LINEAR ACOUSTICS							
2912	0	0					\$250,000
TITLE: ADVANCED DAY/NIGHT DESIGNATOR PAYLOAD							
2913	0	0					\$662,000
TITLE: ELECTRO-OPTICAL COUNTERMEASURES PROGRAM							
2914	0	0					\$150,000
TITLE: STABILIZED LENS							
2915	0	0					\$99,886

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: NAVSTAR MISSILE GUIDANCE SIMULATIONS					
2916	0	0			\$220,000
TITLE: EXPERIMENTAL RESEARCH AT CCBS					
2917	0	0			\$419,562
TITLE: TRIPLE CAPABILITY RIFLE DEVL. & PERSONAL DEFENSE WPN. DEVL.					
2918	0	0			\$150,000
TITLE: ANAL OF DATA TAKEN W/LG APERTURE ACOUSTIC ARRAY IN MED.					
2919	0	0			\$237,000
TITLE: INTGRT. ACOUS. SRVLNCE. EXP. & INITN. L,L,T,HRDWR.&SFTWR.EFTS					
2920	0	0			\$654,000
TITLE: FLEET DEFENSE AIDS PROGRAM					
2921	0	0			\$200,000
TITLE: DEVELOPMENT OF LIGHTWEIGHT MINI-RPV ECM PAYLOAD					
2922	0	0			\$475,000
TITLE: MINI-RPV INTEGRATED COMMUNICATIONS & NAVIGATION SYSTEMS					
2923	0	0			\$42,000
TITLE: TECH. & SYSTEMS ANALYSIS IN ADVANCED SONAR SYSTEMS AREA					
2924	0	0			\$79,000
TITLE: NUMERICAL SIMULATION OF BOUNDARY LAYER TRANSITION					
2925	0	0			\$40,000
TITLE: BOUNDARY LAYER SUCTION TESTS					
2926	0	0			\$100,000
TITLE: ALTERNATIVE FORCES FOR MILITARY CRISIS MGMT.					
2927	0	0			\$0
2928	0	0			\$42,000
TITLE: CRISIS INVENTORY AND DIMENSION					
2929	0	0			\$355,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: ACOUSTIC CONVOLVERS & C3 SYSTEMS PLANNING							
2930	0	0					\$150,000
TITLE: MAN-MACHINE COMMUNICATION PROCESS RESEARCH							
2931	0	0					\$194,986
TITLE: ARPANET MACHINE CONNECTIONS FOR NATIONAL SOFTWARE WORKS							
2932	0	0					\$109,745
TITLE: TRAIDEX							
2933	0	0					\$142,000
TITLE: RESEARCH ON COMPUTER-AIDED INSTRUCTION							
2934	0	0					\$200,000
TITLE: ADVANCED SPACE DEFENSE APPLICATION STUDY							
2935	0	0					\$450,000
TITLE: SECURE SPEECH COMPRESSION & PACKET RADIO SYSTM							
2935	0	1					\$0
2936	0	0					\$71,000
TITLE: LONG-RANGE FORECASTING MODEL							
2937	0	0					\$140,000
TITLE: ADVANCED SPACE BASED STRATEGIC CONCEPT STUDY							
2938	0	0					\$66,400
TITLE: DEVELOP POSITION LOCATION TECHNOLOGY							
2939	0	0					\$94,131
TITLE: CRISIS WARNING & MANAGEMENT							
2940	0	0					\$201,000
TITLE: PROGRAM & POLICY IMPLEMENTATION IN DOD							
2941	0	0					\$462,000
TITLE: PROJECT HALO							
2942	0	0					\$164,000

AO AND Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: HARASSMENT DRONE					
2943	0	0			\$100,000
TITLE: WIDEBAND EMITTER LOCATION					
2944	0	0			\$100,000
TITLE: LOW TEMPERATURE MHD					
2945	0	0			\$384,000
TITLE: LIQUID PROPELLANT PHENOMENOLOGY PROGRAM					
2946	0	0			\$73,390
TITLE: SANCTUARY RADAR ANALYSES					
2947	0	0			\$48,000
TITLE: UTILITY OF VHF-UHF RCS REDUCTION					
2948	0	0			\$41,000
TITLE: ELECTRONIC COUNTERMEASURE					
2949	0	0			\$30,000
TITLE: SUPPORT OVERWATER EXPERIMENT					
2950	0	0			\$99,275
TITLE: B-1 THREAT INTERACTION STUDY					
2951	0	0			\$50,000
TITLE: FEASIBILITY DEMONSTRATION OF BROADBAND CHEMICAL LASER					
2952	0	0			\$48,000
TITLE: CONTINUOUS TERMINAL HOMING PROGRAM					
2953	0	0			\$15,000
TITLE: ANALYTIC-NUMERICAL INVESTIGATIONS OF TURBULENCE					
2954	0	0			\$150,000
TITLE: TEAL JADE					
2955	0	0			\$25,000
TITLE: CONTINUOUS TERMINAL HOMING PROGRAM					

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2956	0	0					\$15,000
TITLE: CONTINUOUS TERMINAL HOMING PROGRAM							
2957	0	0					\$250,000
TITLE: PREP. OF DSGN. HANDBK ON DEVL. OF GAU-7, 25MM TELESCOPED AMUN							
2958	0	0					\$165,000
TITLE: PRELIM. DSGN, ANAL. & MECH. 25MM-35MM LIQUID. PRPLANT MODUL. GUN							
2959	0	0					\$35,000
TITLE: OWEX SUPPORT							
2960	0	0					\$22,000
TITLE: OWEX PROGRAM "GENERATION OF INT'L WAVES BY TURBULENCE"							
2961	0	0					\$51,000
TITLE: OWEX PRGM. "MODELING THRMAL MICROSTRUCT. & EVAL. LASER SNS CONC							
2962	0	0					\$160,000
TITLE: OWEX PROGRAM SUPPORT							
2963	0	0					\$124,000
TITLE: SPANISH STABILIZATION EXPERIMENT							
2964	0	0					\$60,000
TITLE: DESIGN STUDY & FLIGHT TEST OF A MODIFIED SMALL BOAT RADAR							
2965	0	0					\$0
2966	0	0					\$80,000
TITLE: UNDERWATER ACOUSTIC TRANSIENT SIGNALS							
2967	0	0			BDM, INC.	DNA00175-C0220	\$45,000
TITLE: EUCOM Survivability Study.							

DESCRIPTION: EUCOM requested DARPA assistance, on an urgent basis, in evaluating the survivability of the design for the planned wartime EUCOM headquarters.

RESULTS: Experts from BDM were provided by means of AO 2967, to consult with EUCOM and overpressure experts, to examine the survivability of the new headquarters design.

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
REMARKS: PROG: TTD - Response to Requests from CINCEUR or CINCPAC, Through the DARPA Overseas Offices.							
2968	0	0					\$50,000
TITLE: ADVANCED LASER APPLICATION STUDY							
2969	0	0					\$280,000
TITLE: STO-SPECIAL SIGNAL TRANSFER							
2970	0	0					\$75,000
TITLE: DESIGN ADVANCED STRATEGIC SUBMERSIBLE SYSTEMS							
2971	0	0					\$141,000
TITLE: COHERENT LIGHT VALVE (CLV) OPTICAL PROCESSOR							
2972	0	0					\$52,000
TITLE: VIBRATION ISOLATION TECH.							
2973	0	0					\$30,000
TITLE: COMPTV. TESTING & ANAL PERFORM. SEV. SPRD. SPCTRM. MOD. TECH							
2974	0	0					\$49,000
TITLE: AIRCRAFT UNDERWATER SOUND EXPERIMENT							
2975	0	0					\$105,000
TITLE: MILLIMETER WAVE PHENOMENOLOGY							
2976	0	0					\$1,028,000
TITLE: LARGE APERTURE SURVEILLANCE MEASUREMENTS PROGRAM							
2977	0	0					\$60,000
TITLE: LARGE APERTURE SURVEILLANCE MEASUREMENTS PROGRAM							
2978	0	0					\$105,000
TITLE: LARGE APERTURE SURVEILLANCE MEASUREMENTS PROGRAM							
2979	0	0					\$67,000
TITLE: MEASURE TARGET & PROJECTILE SIGNATURES							
2980	0	0					\$16,484

AD AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: LARGE BODY TRANSITION CALCULATIONS					
2981	0	0			\$112,000
TITLE: STRUCTURAL & SUPERCONDUCTING PROPERTIES OF METALS					
2982	0	0			\$84,000
TITLE: ASW DEVICES & MODULATED MICROSTRUCTURE					
2983	0	0			\$40,000
TITLE: MATERIALS SCIENCE					
2984	0	0			\$75,609
TITLE: NLS-SCHOLAR APPLICATION					
2985	0	0			\$358,000
TITLE: COMPUTER AIDED ENGINEERING OF INTEGRATED CIRCUITS					
2986	0	0			\$52,000
TITLE: ARPANET DOCUMENTATION					
2987	0	0			\$40,000
TITLE: SPECIAL INTERCEPT DISPLAY TECH. (TEAKWOOD)					
2988	0	0			\$21,000
TITLE: RANDOM SIGNAL FLAW DETECTION					
2989	0	0			\$72,000
TITLE: TNW ATTACK OF FIXED TARGETS					
2990	0	0			\$60,000
TITLE: SAM RADAR DISCRIMINATION					
2991	0	0			\$90,000
TITLE: COUNTERMEASURE VULNERABILITY SIMULATION					
2992	0	0			\$40,000
TITLE: KEY RESEARCH AREAS IN FUEL AIR EXPLOSIVES					
2993	0	0			\$45,000
TITLE: ADV. WARHEAD TECHNOLOGY-(PENETRATING WARHEAD EXPERIMENTS)					

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
2994	0	0					\$116,000
TITLE: ELECTRONIC AND MECHANICAL PROPERTIES IN MATS							
2995	0	0					\$50,000
TITLE: NTA BASIC RSCH & EXPLORATORY DEVL. WARHEAD COMPONENTS							
2996	0	0					\$0
2997	0	0					\$50,000
TITLE: PHOTON ENGINE							
2998	0	0					\$50,000
TITLE: ADV. WARHEAD DEVL.-(EFFECTS OF FREE RDICL. SHCK INITN. EXPL.)							
2999	0	0					\$1,300
TITLE: ADMIN. FUNDS FOR DEFENSE MAPPING AGENCY							
3000	0	0					\$500,000
3001	0	0					\$0
3002	0	0					\$60,000
TITLE: HIGH STEALTH AIRCRAFT							
3003	0	0					\$20,000
TITLE: GUN SYSTEM ACQUISITION REVIEW							
3004	0	0					\$25,000
TITLE: SELECTED OPTICAL STUDIES ON ADVANCED MATERIALS RESEARCH							
3005	0	0					\$38,000
TITLE: FUEL CELLS & SOLID ELECTROLYTES							
3006	0	0					\$41,000
TITLE: C2 MESSAGE TEST AND EVALUATION							
3007	0	0					\$75,000
TITLE: AUTOMATIC NATURAL LANGUAGE PROCESSING							
3008	0	0					\$90,000
TITLE: OPTIMIZING DATA REPRESENTATIONS							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
3009	0	0					\$138,000
TITLE: SEMICONDUCTOR LUMINESCENCE & RECOMBINATION PROCESSES & LIQUIDS							
3010	0	0					\$139,000
TITLE: SURFACE SCIENCE AMORPHOUS STATES							
3011	0	0					\$25,000
TITLE: LITHOSPHERIC PROPAGATION EXPERIMENT DESIGN							
3012	0	0					\$100,000
TITLE: SHOCK INITIATED CW HF/DF LASER STUDY							
3013	0	0					\$35,000
TITLE: PLANNING, ASSESSMENT, AND COORDINATION							
3014	0	0					\$200,000
TITLE: HIGH ENERGY LASER PROGRAM FOR SLTDP							
3015	0	0					\$400,000
TITLE: SPECIAL LASER TECHNOLOGY DEVELOPMENT PROG.							
3016	0	0					\$400,000
TITLE: SPECIAL LASER TECHNOLOGY DEVELOPMENT PROG.							
3017	0	0					\$80,000
TITLE: BASIC & APPLIED RESEARCH IN MATERIALS							
3018	0	0					\$53,000
TITLE: LONG RANGE MATERIALS RESEARCH							
3019	0	0					\$124,000
TITLE: RESEARCH IN SELECTED AREAS OF MATERIALS SCIENCE							
3020	0	0					\$20,000
TITLE: EFFICIENT COUPLING OF FIBERS TO GAS WAVEGUIDES							
3021	0	0					\$0
3022	0	0					\$36,000
TITLE: IONOSPHERIC IRREGULARITY MEASUREMENT EXPERIMENT							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
3023	0	0					\$203,350
TITLE: INTERLISP/TENEX EFFECTIVENESS							
3024	0	0					\$50,000
TITLE: SKY BUOY							
3025	0	0					\$23,000
TITLE: AGENT ADMINISTRATIVE SUPPORT							
3026	0	0					\$0
3027	0	0					\$12,000
TITLE: TRANSITION PREDICTION CALCULATIONS							
3028	0	0					\$40,000
TITLE: RESISTIVITY MEASUREMENTS IN SOIL							
3029	0	0					\$110,000
TITLE: ADVANCED ANTENNA TECHNOLOGY							
3030	0	0					\$22,000
TITLE: TECH. SUPPORT-FOR S-TANK & RVT-2 TEST PROGRAM							
3031	0	0					\$30,000
TITLE: LONG ROD KINETIC ENERGY PENETRATOR ANALYSIS							
3032	0	0					\$50,000
TITLE: FOREIGN COMMAND & CONTROL COMMUNICATIONS STUDY							
3033	0	0					\$500,000
TITLE: AF HARASSMENT DRONE							
3034	0	0					\$39,500
TITLE: SEAKEEPING TESTS							
3035	0	0					\$50,000
TITLE: X-WING WIND TUNNEL TESTS							
3036	0	0					\$100,000
TITLE: DOD DATA LINK REQUIREMENTS							

AD	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
3037	0	0					\$0
3038	0	0					\$0
3039	0	0					\$0
3040	0	0					\$8,000
							TITLE: AGENT ADMIN. COSTS
3041	0	0					\$73,045
							TITLE: MULTI-REGIONAL INPUT-OUTPUT TABLES FOR USSR
3042	0	0					\$10,000
							TITLE: MILITARY BALANCE-PERCEPTIONS & SPECIAL PLANS
3043	0	0					\$18,688
							TITLE: MILITARY BALANCE-DECISION STRUCTURE
3044	0	0					\$20,000
							TITLE: MILITARY BALANCE-EUROPEAN PERCEPTIONS
3045	0	0					\$223,400
							TITLE: COMMAND & CONTROL NETWORK RELIABILITY
3046	0	0					\$0
3047	0	0					\$99,853
							TITLE: APPLICATION OF ARTIFICIAL INTELL. ELECTRONIC WARFARE
3048	0	0					\$90,062
							TITLE: SURVEY OF ARTIFICIAL INTELL. APPLICATIONS OF ELECTRN. WARFARE
3049	0	0					\$10,000
							TITLE: SCT OVERWATER MONITORING TEST
3050	0	0					\$112,000
							TITLE: ATMSPHC. SPATIAL & TEMPORAL FLURTN. IN 4-SUM INFRARED SPCT RG
3051	0	0					\$51,000
							TITLE: PGM DATA ANALYSIS ARPA-301
3052	0	0					\$1,183

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
							TITLE: DEVELOP OF ADVANCED DECISION TECH.
3053	0	0					\$650,000
							TITLE: VOCABULARY OF BRAIN POTENTIALS
3054	0	0					\$75,000
							TITLE: APPLICATIONS OF QUANTITATIVE METHODS OF SCENARIO GENERATION
3055	0	0					\$120,000
							TITLE: TARGETING-INDUSTRIAL SECTORS IMPACT
3056	0	0					\$160,000
							TITLE: THEORETICAL STUDY OF LASER TARGET INTERACTION
3057	0	0					\$50,000
							TITLE: TACTICAL THREAT ASSESSMENT
3058	0	0					\$106,400
							TITLE: MICHELSON INTERFEROMETER STUDY
3059	0	0					\$150,000
							TITLE: TECH. DEVELOP, FOR SINTERED CERAMICS
3060	0	0					\$500,000
							TITLE: AMICOM TECHNICAL SUPPORT
3060	0	1					\$0
3061	0	0					\$450,000
							TITLE: NSW SYSTEM SOFTWARE
3062	0	0					\$131,013
							TITLE: ATLANTIC SATELLITE EXPERIMENTS
3063	0	0					\$400,000
							TITLE: STUDY TO DEFINE A SPACE TEST PROGRAM
3064	0	0					\$6,000
							TITLE: THE ROLE OF MILITARY IN COMMUNISTS SOCIETIES
3065	0	0					\$588,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: BIOCYBERNETICS INTEGRATION							
3066	0	0					\$35,500
TITLE: LOW-ABSORPTION LASER WINDOWS							
3067	0	0					\$200,000
TITLE: PYROELECTRIC VIDICONS							
3068	0	0					\$295,000
TITLE: CONTINUOUS TERMINAL HOMING PROGRAM							
3069	0	0					\$224,985
TITLE: KC-135A RE-ENGINE STUDY FOR ODDR&E							
3070	0	0					\$684,235
TITLE: UNCONVENTIONAL DEFENSE THREAT & SYSTEM ANALYSIS							
3071	0	0					\$0
3072	0	0					\$3,500
TITLE: AGENT ADMIN. COSTS (IN SUPPORT OF PROJECT SIAM)							
3073	0	0					\$0
3074	0	0					\$705,500
TITLE: SIGNAL PROCESSING ALGORITHM RSCH & EXPERIMENTATION							
3075	0	0					\$200,000
TITLE: NAVSTAR MISSILE GUIDANCE DESIGN/COSTING STUDY							
3076	0	0					\$99,000
TITLE: ALTERNATIVE CBT SYSTEMS							
3077	0	0					\$690,000
TITLE: HYBRID OPTICAL COMMUNICATION DEMONSTRATION							
3078	0	0					\$85,564
TITLE: SUBMARINE OPERATIONS STUDY FOR ODDR&E							
3079	0	0					\$250,000
TITLE: PROGRAM MANIPULATION SYSTEMS							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
3080	0	0					\$360,000
TITLE: OPTICAL DISC. RECORDER							
3081	0	0					\$302,000
TITLE: SYSTEM DESIGN LAB. DEMONSTRATION							
3082	0	0					\$30,000
TITLE: NTA EXPLOSIVES - THEORY - MODELS							
3083	0	0					\$0
3084	0	0					\$625,000
TITLE: LOITER MINE SEEKERS							
3085	0	0					\$0
3086	0	0					\$0
3087	0	0					\$155,000
TITLE: ACOUSTIC TRANSIENTS EXPLOITATION PROG.							
3088	0	0					\$125,000
TITLE: ADV. WARHEAD TECH.-FAE CHEMICAL STUDIES							
3089	0	0					\$194,000
TITLE: ADV. WARHEAD TECH.-FAE INT. & CHRCT/FAE DSP. & MOD							
3090	0	0					\$125,000
TITLE: ADV. WARHEAD TECH-PENTRTR. FAILURE MECH./KE PENTRTR. FAILURE M							
3091	0	0					\$778,000
TITLE: INTELLIGENT TERMINAL PROJECT							
3092	0	0					\$187,000
TITLE: NETWORK ENCRYPTION DEVICE DEVELOPMENT							
3093	0	0					\$64,000
TITLE: ADVANCED COMMUNICATIONS PROCESSOR							
3094	0	0					\$99,000
TITLE: ADVANCED MEMORY CONCEPTS MEETING							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
3095	0	0					\$85,000
TITLE: ARPA NATIONAL SOFTWARE WORKS PROGRAM							
3096	0	0					\$0
3097	0	0					\$250,000
TITLE: SOVIET CHINESE R&D							
3097	0	1					\$0
3097	0	2					\$0
3097	0	3					\$0
3098	0	0					\$30,000
TITLE: AD HOC VS. ESTABLISHED GROUPS IN CRISIS MANAGEMENT							
3099	0	0					\$250,000
TITLE: MONITORING & VERIFI. OF SHALLOW PEACEFUL NUC EXPL (PNE) TTBT							
3100	0	0					\$20,000
TITLE: REMOTE SENSOR TECHNOLOGY							
3101	0	0					\$29,490
TITLE: NTA EXPLOSIVES THEORY-MODELS							
3102	0	0					\$4,000
TITLE: ADMIN. COSTS FOR DCA							
3103	0	0					\$0
3104	0	0					\$60,000
TITLE: ADAPTIVE CODING CONCEPTS STUDY							
3105	0	0					\$100,000
TITLE: LOW-RATE CONVOLUTIONAL CODE							
3106	0	0					\$125,000
TITLE: DEFORMATION ARRAY LIGHT MODULATOR							
3107	0	0					\$210,000
TITLE: LIQUID CRYSTAL LIGHT VALVE							

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
3108	0	0					\$62,000
TITLE: ADV. ELECTRO-OPTICAL PROC. TECH.							
3109	0	0					\$69,100
TITLE: ADVANCED SENSOR TESTING CAPABILITY							
3110	0	0					\$200,000
TITLE: PRESSURE RECOVERY PROGRAM FOR CHEMICAL LASERS							
3111	0	0					\$200,000
TITLE: PRESSURE RECOVERY PROGRAM FOR CHEMICAL LASERS							
3112	0	0					\$44,000
TITLE: SYMPOSIUM ON MANPOWER TECH							
3113	0	0					\$132,880
TITLE: ANALYSIS OF INFO. PROC. TECHNIQUES							
3114	0	0					\$152,000
TITLE: VERY LARGE DATA BASE ACCESS & PRESENTATION							
3115	0	0					\$213,259
TITLE: KNOWLEDGE-BASED CAI							
3116	0	0					\$75,000
TITLE: PARALLEL & FILTER-BANK SPREAD SPECTRUM CONCEPTS							
3117	0	0					\$6,730
TITLE: FRENCH PERCEPTIONS OF US-USSR MILITARY & NAVAL BALANCE							
3118	0	0					\$70,000
TITLE: INTERFERENCE EXCISION ANALYSIS							
3119	0	0					\$450,000
TITLE: IMAGE UNDERSTANDING & IMAGE PROCESSING							
3120	0	0					\$90,000
TITLE: ADV. WARHEAD TECH-FOLDED LINEAR EXPND. PRECISION SHAPED CHRG							
3121	0	0					\$45,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: ADV. WARHEAD TECH-ESTIM. DENS. N SLD. & LQD. EXPL. GRP. ADD.							
3122	0	0					\$125,000
TITLE: ADV. WARHEAD TECH-MATLS. SPPT. KE PENTR. PRJ./MUNITIONS DSGN.							
3123	0	0					\$94,000
TITLE: LAMINAR FLOW VHCL-LRG BODY EXP. LOW DRAG BODY DESIGN							
3124	0	0					\$30,000
TITLE: LAMINAR FLOW VCHL PRG-LRG VCHL EXP-LOW DRAG BODY ANALYSIS							
3125	0	0					\$0
3126	0	0					\$99,000
TITLE: MINI-RPV EMITTER LOCATION SYSTEM							
3127	0	0					\$319,000
TITLE: MINI-RPV EMITTER LOCATION SYSTEM							
3128	0	0					\$9,128
TITLE: SMALL SUBMERSIBLES ANALYSIS							
3129	0	0					\$2,337,000
TITLE: HIMAG							
3130	0	0					\$23,337,000
TITLE: HIMAG							
3131	0	0					\$1,500,000
TITLE: EXPERIMENTAL SURVIVABLE AIRCRAFT							
3132	0	0					\$50,000
TITLE: KOREAN ATMOSPHERIC OPTICS MEASUREMENTS							

DESCRIPTION: A measurements program in Korea, similar to a set of measurements in several NATO countries, of atmospheric transmission in the visible and at several infrared wave lengths, using lasers. Also included were measurements of temperature, precipitation, and cloud cover. Measurements to cover a full year.

RESULTS: Data were obtained to determine the effectiveness of optical and infrared detection and homing missile systems in Korea.

AO AMD Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
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REMARKS: PROG: TTO - Atmospheric Transmission - Visible and Infrared - Korean Weather Data.

3133	0	0			\$15,000,000
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TITLE: EXPERIMENTAL SURVIVABLE AIRCRAFT

3134	0	0			\$150,000
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TITLE: RDP MATERIAL PROP. DEPENDENCE

3135	0	0			\$125,000
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TITLE: SPEECH AUTHENTICATION

3136	0	0			\$452,000
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TITLE: ILLIAC IV

3137	0	0			\$60,000
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TITLE: III-V HETEROJUNCTION STRUCTURES FOR LONG WAVELENGTH LASERS

3138	0	0			\$240,000
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TITLE: LASER PROPULSION INVESTIGATION

3138	0	1			\$0
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3139	0	0			\$90,000
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TITLE: TEAL WING

3140	0	0			\$100,000
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TITLE: ATOMIC STANDARD CLOCK

3141	0	0			\$86,000
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TITLE: ADV. NEAR & INTERMED.-FIELD COMPUTER CODE FLOW FIELD SUB. BODY

3142	0	0			\$60,213
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TITLE: PROCURE & DELV. ENCRYPTION DEV. REQ. SEC. OF ARC DATA CIRCUIT

3143	0	0			\$198,000
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TITLE: DEVL. TECH. OF A LIGHTWEIGHT STABILIZED OPTICAL SIGHT ATAADS

3144	0	0			\$230,000
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TITLE: HARASSMENT DRONE EVALUATION

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
3145	0	0					\$75,000
TITLE: APPLICATIONS FOR LOW POWER, MID & THERMAL IR LASERS							
3146	0	0					\$0
3147	0	0					\$0
3148	0	0					\$0
3149	0	0					\$46,800
TITLE: SMALL SUBMERSIBLE CONCEPTS							
3150	0	0					\$417,000
TITLE: AIR SURVEILLANCE EXPERIMENTS							
3151	0	0					\$30,000
TITLE: INVESTIGATION OF SULFOSALT SAW MATERIALS							
3152	0	0					\$50,000
TITLE: APPLICATIONS OF RAPIDLY SOLIDIFIED SUPERALLOYS							
3153	0	0					\$200,000
TITLE: ADVANCED CURRENT COLLECTION RESEARCH							
3154	0	0					\$334,000
TITLE: LASER WINDOW TECH. VALIDATION PROGRAM							
3155	0	0					\$2,078,167
TITLE: CERAMIC TURBINE DEMONSTRATION							
3156	0	0					\$0
3157	0	0					\$80,000
TITLE: PYROELECTRIC VIDICON THERMAL IR, IMAGING SYSTEM							
3158	0	0					\$60,000
TITLE: TEAL BEAK							
3159	0	0					\$90,000
TITLE: AUTOMATIC VERY LARGE DATABASE CHECKING							
3160	0	0					\$100,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: ALCM SCALABILITY ANALYSIS							
3161	0	0					\$200,000
TITLE: MAILSYS DEVELOPMENT							
3162	0	0					\$71,000
TITLE: DEDUCTIVE INFERENCE FOR VERY LARGE DATA BASES							
3163	0	0					\$37,000
TITLE: TESTBED SECURITY DEVICES							
3164	0	0					\$45,000
TITLE: FIELD ELECTRON & FIELD ION SOURCES							
3165	0	0					\$24,000
TITLE: AUTO IMAGE SCREEN & THRESHOLD							
3166	0	0					\$139,000
TITLE: HEURISTIC REQUEST EVALUATOR							
3167	0	0					\$150,000
TITLE: HUMAN FACTORS IN COMMAND CONTROL & COMM.							
3168	0	0					\$26,000
TITLE: COMBAT SELECTION							
3169	0	0					\$92,000
TITLE: TARGET RESONANCE IDENTIFICATION & CLASSIFICATION							
3170	0	0					\$53,000
TITLE: MODELLING OF CHEMICALLY REACTING TURBULENT FLOWS							
3171	0	0					\$60,000
TITLE: TECHNOLOGY IMPLICATIONS OF NEW MIL PROBLEMS							
3172	0	0					\$0
3173	0	0					\$75,000
TITLE: PRIVATE LINE INTERFACE DEVELOPMENT							
3174	0	0					\$30,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: STUDIES & APP. OF ADAPTIVE DECISION AIDING IN ANTI-SUB. WARFRE							
3175	0	0					\$235,000
TITLE: AFCCT PROG. SPT. NAVELEX AFCCT SPT.							
3176	0	0					\$40,000
TITLE: STUDY OF PULSED LASER PROPULSION							
3177	0	0					\$100,000
TITLE: BIOCYBERNETIC FACTORS IN HUMAN PERCEPTION AND MEMORY							
3178	0	0					\$68,000
TITLE: ENHANCING LEARNING STRATEGIES							
3179	0	0					\$99,000
TITLE: COMPUTERIZED ADAPTIVE PERFORMANCE EVALUATION							
3180	0	0					\$193,000
TITLE: CMD,CONTROL & COMM RESEARCH PLAN							
3181	0	0					\$70,000
TITLE: DELAY OF FEEDBACK AND CMI							
3182	0	0					\$76,000
TITLE: ESTIMATING THE OUTCOMES OF WAR							
3183	0	0					\$96,295
TITLE: CC NET ENGINEERING							
3184	0	0					\$0
3185	0	0					\$30,000
TITLE: LASER IPULSE APPLICATIONS RES.							
3186	0	0					\$130,000
TITLE: ENCRYPTION CONTROL SOFTWARE							
3187	0	0					\$73,000
TITLE: EVALUATION STRATEGIES FOR COMPUTER BASED TRAINING							
3188	0	0					\$70,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: ULF GENERATED BY A SATELLITE EMITTED BEAM							
3189	0	0					\$240,000
TITLE: LITHOSPHERIC EXPERIMENTATION							
3190	0	0					\$120,000
TITLE: PNE AND TEST BANS							
3191	0	0					\$82,000
TITLE: CMI							
3192	0	0					\$129,000
TITLE: UBITRON ANALYSIS/GYROTRON ANALYSIS							
3193	0	0					\$0
3194	0	0					\$246,000
TITLE: ADVANCED ARCHIVAL BEAM MEMORY							
3195	0	0					\$4,370
TITLE: ADTC AGENT ADMIN SUPPORT							
3196	0	0					\$55,000
TITLE: DEVL. OF A CRISIS EARLY WARNING PROTOTYPE SYSTEM							
3197	0	0					\$0
3198	0	0					\$4,000
TITLE: DEUTERIUM GAS							
3199	0	0					\$103,000
TITLE: EVALUATION OF AN AUTHOR SUPPORT FACILITY							
3200	0	0					\$32,000
TITLE: APP. OF ADAPT. MODELS DYNAM. OF INFO. FLOW C3 SYS.							
3201	0	0					\$80,000
TITLE: HUMAN FACTORS PROB. IN COMM., CONT. & COMMUN. IN 1990'S							
3202	0	0					\$0
3203	0	0					\$78,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: PIEZOELECTRIC/PYROELECTRIC TRANSDUCERS							
3204	0	0					\$67,000
TITLE: ENHANCED LEARNING STRATEGIES							
3205	0	0					\$0
3206	0	0					\$126,000
TITLE: ALGORITHMS & HARDWARE TECH FOR IMAGE RECOGNITION							
3207	0	0					\$450,000
TITLE: ADVANCED OPTICS TECH. PROGRAM							
3208	0	0					\$63,000
TITLE: PERFORMANCE MODELS FOR IMAGE REGISTRATION							
3209	0	0					\$45,000
TITLE: MILITARY SIGNIFICANCE OF NEW WEAPONS TECH.							
3210	0	0					\$75,000
TITLE: TARGETING & WAR TERMINATION							
3211	0	0					\$30,000
TITLE: NUC COMP. OF EXTRINSIC SILICON FOR HI, UNIFORM INFRARED DTEC.							
3212	0	0					\$0
3213	0	0					\$97,000
TITLE: TEACHING ELABORATION SKILLS							
3214	0	0					\$160,000
TITLE: ATLANTIC PACKET SATELLITE EXPERIMENT							
3215	0	0					\$0
3216	0	0					\$26,640
TITLE: COPPER LOADED CER-VIT STUDY							
3217	0	0					\$450,000
TITLE: ALASKAN LONG PERIOD ARRAY							
3218	0	0					\$16,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
							TITLE: TEAL WING
3219	0	0					\$30,000
							TITLE: CHARCT. OF ELECT. ACTIVE DEFECTS IN SILIC. USE CCD IMGE SENSRS
3220	0	0					\$29,000
							TITLE: COATING STRESS MEASUREMENT
3221	0	0					\$30,000
							TITLE: ULTRA-HIGH RESOLUTION ION BEAM PROCESSES
3222	0	0					\$32,000
							TITLE: PACKET RADIO PROGRAM
3223	0	0					\$400,000
							TITLE: HALO ADVANCED DESIGN STUDIES
3224	0	0					\$40,000
							TITLE: SCREENING ANALYSIS
3225	0	0					\$67,000
							TITLE: VM 370 SECURITY
3226	0	0					\$50,000
							TITLE: TRANSMISSION & DETECTION
3227	0	0					\$0
3228	0	0					\$90,000
							TITLE: ADAPTIVE MODELS FOR COMPUTER-BASED TRAINING SYSTEM
3229	0	0					\$0
3230	0	0					\$98,000
							TITLE: EVALUATION OF A SYSTEM DESIGN TECHNIQUE
3231	0	0					\$44,000
							TITLE: DAMAGE PROFILES IN SILICON
3232	0	0					\$0
3233	0	0					\$137,000

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
TITLE: NATIONAL SECURITY FORECASTING							
3234	0	0					\$73,000
TITLE: SATELLITE CMI							
3235	0	0					\$3,000
TITLE: SATELLITE CMI							
3236	0	0					\$35,000
TITLE: METAL-MATRIX COMPOSITES FOR CURRENT COLLECTION							
3237	0	0					\$550,000
TITLE: DSGN FABRC. & FLIGHT DEMO LOW PROB. OF INTCPT. AIRCRAFT FR CT							
3238	0	0					\$455,000
TITLE: AIR-TO-AIR MISSILE							
3239	0	0					\$251,000
TITLE: ADV. FIRE & FORGET SENSOR TECH.							
3240	0	0					\$75,000
TITLE: TACTICAL WARFARE PROGRAM							
3241	0	0					\$0
3242	0	0					\$35,000
TITLE: FLUORIDE POLISHING & TEST EFFORT							
3243	0	0					\$65,000
TITLE: PACKET SPEECH PROGRAM							
3243	0	1					\$0
3244	0	0					\$0
TITLE: TECH SUPPORT FOR OMAT							
3245	0	0					\$29,000
TITLE: TOUCH SENSITIVE DISPLAYS							
3246	0	0					\$0
3247	0	0					\$0

AO	AMD	Task	Initial Date	Final Date	Contractor	Contract Number	Total Funds
3248	0	0					\$58,000
TITLE: ELECTRON BEAM MODECULAR MEMORY							
3249	0	0					\$249,750
TITLE: PASSIVE SPACE ARRAY INTEGRATION							
3250	0	0					\$13,500
TITLE: INTF. TECH CONNC. ELECTRON BEAM MEM. TIME SHR. NET AS ARPANET							
3250	0	1					\$0
3251	0	0					\$0
3252	0	0					\$0

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