

TITLE IV

RESEARCH, DEVELOPMENT, TEST AND EVALUATION

Funds appropriated under this title provide the resources required to conduct a program of research, development, test and evaluation, including research in basic science, applied research, advanced technology development, demonstration and validation, engineering and manufacturing development, and operational systems development.

The President's fiscal year 2018 budget requests a total of \$82,691,636,000 for research, development, test and evaluation appropriations.

SUMMARY OF COMMITTEE ACTION

The Committee recommends research, development, test and evaluation appropriations totaling \$85,967,322,000 for fiscal year 2018. This is \$3,275,686,000 above the budget estimate.

Committee recommended research, development, test and evaluation appropriations for fiscal year 2018 are summarized below:

SUMMARY OF RESEARCH, DEVELOPMENT, TEST AND EVALUATION APPROPRIATIONS

[In thousands of dollars]

Account	2018 budget estimate	Committee recommendation	Change from budget estimate
Research, Development, Test and Evaluation:			
Research, Development, Test and Evaluation, Army .....	9,425,440	9,860,343	+ 434,903
Research, Development, Test and Evaluation, Navy .....	17,650,035	17,628,000	- 22,035
Research, Development, Test and Evaluation, Air Force .....	34,914,359	36,587,419	+ 1,673,060
Research, Development, Test and Evaluation, Defense-Wide .....	20,490,902	21,680,660	+ 1,189,758
Operational Test and Evaluation, Defense .....	210,900	210,900	.....
Total .....	82,691,636	85,967,322	+ 3,275,686

REPROGRAMMING GUIDANCE FOR ACQUISITION ACCOUNTS

The Secretary of Defense is directed to continue to follow the reprogramming guidance as specified in the report accompanying the House version of the Department of Defense appropriations bill for fiscal year 2008 (House Report 110-279). Specifically, the dollar threshold for reprogramming funds will remain at \$20,000,000 for procurement and \$10,000,000 for research, development, test and evaluation.

Also, the Under Secretary of Defense (Comptroller) is directed to continue to provide the congressional defense committees quarterly, spreadsheet-based DD Form 1416 reports for service and defense-wide accounts in titles III and IV of this act. Reports for titles III and IV shall comply with guidance specified in the explanatory statement accompanying the Department of Defense Appropria-

tions Act for Fiscal Year 2006. The Department shall continue to follow the limitation that prior approval reprogrammings are set at either the specified dollar threshold or 20 percent of the procurement or research, development, test and evaluation line, whichever is less. These thresholds are cumulative from the base for reprogramming value as modified by any adjustments. Therefore, if the combined value of transfers into or out of a procurement (P-1), or a research, development, test and evaluation (R-1) line exceeds the identified threshold, the Secretary of Defense must submit a prior approval reprogramming to the congressional defense committees. In addition, guidelines on the application of prior approval reprogramming procedures for congressional special interest items are established elsewhere in this report.

RESEARCH, DEVELOPMENT, TEST AND EVALUATION OVERVIEW

*Department of Defense Laboratory Alternative Governance Assessment Pilot Program.*—The Committee encourages the Assistant Secretary of Defense for Research, Development and Engineering to conduct a study evaluating alternative governance models for Department of Defense laboratories. This review should build upon previous work and may result in a pilot program that permits the laboratories selected to implement new management approaches and governance methods that improve autonomy, decision-making and technology transfer opportunities.

RESEARCH, DEVELOPMENT, TEST AND EVALUATION, ARMY

Appropriations, 2017 .....	\$8,332,965,000
Budget estimate, 2018 .....	9,425,440,000
Committee recommendation .....	9,860,343,000

The Committee recommends an appropriation of \$9,860,343,000. This is \$434,903,000 above the budget estimate.

COMMITTEE RECOMMENDED PROGRAM

The following table summarizes the budget estimate for this appropriation, the Committee recommendation, and the Committee recommended adjustments to the budget estimate:

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
	RESEARCH, DEVELOPMENT, TEST & EVAL, ARMY			
	BASIC RESEARCH			
1	IN-HOUSE LABORATORY INDEPENDENT RESEARCH .....	12,010	12,010	.....
2	DEFENSE RESEARCH SCIENCES .....	263,590	273,590	+ 10,000
3	UNIVERSITY RESEARCH INITIATIVES .....	67,027	67,027	.....
4	UNIVERSITY AND INDUSTRY RESEARCH CENTERS .....	87,395	102,395	+ 15,000
	TOTAL, BASIC RESEARCH .....	430,022	455,022	+ 25,000
	APPLIED RESEARCH			
5	MATERIALS TECHNOLOGY .....	29,640	58,640	+ 29,000
6	SENSORS AND ELECTRONIC SURVIVABILITY .....	35,730	81,230	+ 45,500
7	TRACTOR HIP .....	8,627	8,627	.....
8	AVIATION TECHNOLOGY .....	66,086	73,586	+ 7,500
9	ELECTRONIC WARFARE TECHNOLOGY .....	27,144	34,144	+ 7,000
10	MISSILE TECHNOLOGY .....	43,742	53,742	+ 10,000
11	ADVANCED WEAPONS TECHNOLOGY .....	22,785	27,785	+ 5,000

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
12	ADVANCED CONCEPTS AND SIMULATION .....	28,650	28,650	.....
13	COMBAT VEHICLE AND AUTOMOTIVE TECHNOLOGY .....	67,232	77,232	+ 10,000
14	BALLISTICS TECHNOLOGY .....	85,309	85,309	.....
15	CHEMICAL, SMOKE AND EQUIPMENT DEFEATING TECHNOLOGY ...	4,004	4,004	.....
16	JOINT SERVICE SMALL ARMS PROGRAM .....	5,615	5,615	.....
17	WEAPONS AND MUNITIONS TECHNOLOGY .....	41,455	76,455	+ 35,000
18	ELECTRONICS AND ELECTRONIC DEVICES .....	58,352	84,352	+ 26,000
19	NIGHT VISION TECHNOLOGY .....	34,723	34,723	.....
20	COUNTERMINE SYSTEMS .....	26,190	26,190	.....
21	HUMAN FACTORS ENGINEERING TECHNOLOGY .....	24,127	24,127	.....
22	ENVIRONMENTAL QUALITY TECHNOLOGY .....	21,678	34,678	+ 13,000
23	COMMAND, CONTROL, COMMUNICATIONS TECHNOLOGY .....	33,123	33,123	.....
24	COMPUTER AND SOFTWARE TECHNOLOGY .....	14,041	14,041	.....
25	MILITARY ENGINEERING TECHNOLOGY .....	67,720	104,920	+ 37,200
26	MANPOWER/PERSONNEL/TRAINING TECHNOLOGY .....	20,216	20,216	.....
27	WARFIGHTER TECHNOLOGY .....	39,559	44,559	+ 5,000
28	MEDICAL TECHNOLOGY .....	83,434	83,434	.....
	TOTAL, APPLIED RESEARCH .....	889,182	1,119,382	+ 230,200
	ADVANCED TECHNOLOGY DEVELOPMENT			
29	WARFIGHTER ADVANCED TECHNOLOGY .....	44,863	53,363	+ 8,500
30	MEDICAL ADVANCED TECHNOLOGY .....	67,780	75,780	+ 8,000
31	AVIATION ADVANCED TECHNOLOGY .....	160,746	165,746	+ 5,000
32	WEAPONS AND MUNITIONS ADVANCED TECHNOLOGY .....	84,079	107,079	+ 23,000
33	COMBAT VEHICLE AND AUTOMOTIVE ADVANCED TECHNOLOGY ...	125,537	150,537	+ 25,000
34	SPACE APPLICATION ADVANCED TECHNOLOGY .....	12,231	39,731	+ 27,500
35	MANPOWER, PERSONNEL AND TRAINING ADVANCED TECHNOLOGY .....	6,466	6,466	.....
36	TRACTOR HIKE .....	28,552	28,552	.....
37	NEXT GENERATION TRAINING & SIMULATION SYSTEMS .....	16,434	16,434	.....
39	COMBATING TERRORISM, TECHNOLOGY DEVELOPMENT .....	26,903	43,903	+ 17,000
40	TRACTOR NAIL .....	4,880	4,880	.....
41	TRACTOR EGGS .....	4,326	4,326	.....
42	ELECTRONIC WARFARE TECHNOLOGY .....	31,296	34,296	+ 3,000
43	MISSILE AND ROCKET ADVANCED TECHNOLOGY .....	62,850	117,850	+ 55,000
44	TRACTOR CAGE .....	12,323	12,323	.....
45	HIGH PERFORMANCE COMPUTING MODERNIZATION PROGRAM ...	182,331	221,331	+ 39,000
46	LANDMINE WARFARE AND BARRIER ADVANCED TECHNOLOGY ....	17,948	18,948	+ 1,000
47	JOINT SERVICE SMALL ARMS PROGRAM .....	5,796	5,796	.....
48	NIGHT VISION ADVANCED TECHNOLOGY .....	47,135	47,135	.....
49	ENVIRONMENTAL QUALITY TECHNOLOGY DEMONSTRATIONS .....	10,421	29,421	+ 19,000
50	MILITARY ENGINEERING ADVANCED TECHNOLOGY .....	32,448	94,648	+ 62,200
51	ADVANCED TACTICAL COMPUTER SCIENCE & SENSOR TECHNOLOGY .....	52,206	52,206	.....
52	COMMAND, CONTROL, COMMUNICATIONS ADVANCED TECHNOLOGY .....	33,426	33,426	.....
	TOTAL, ADVANCED TECHNOLOGY DEVELOPMENT .....	1,070,977	1,364,177	+ 293,200
	DEMONSTRATION & VALIDATION			
53	ARMY MISSILE DEFENSE SYSTEMS INTEGRATION .....	9,634	23,634	+ 14,000
55	AIR AND MISSILE DEFENSE SYSTEMS ENGINEERING .....	33,949	35,949	+ 2,000
56	LANDMINE WARFARE AND BARRIER—ADV DEV .....	72,909	72,909	.....
57	SMOKE, OBSCURANT AND TARGET DEFEATING SYS-ADV DEV .....	7,135	7,135	.....
58	TANK AND MEDIUM CALIBER AMMUNITION .....	41,452	41,902	+ 450
59	ARMORED SYSTEM MODERNIZATION—ADV DEV .....	32,739	42,739	+ 10,000
60	SOLDIER SUPPORT AND SURVIVABILITY .....	10,157	10,157	.....
61	TACTICAL ELECTRONIC SURVEILLANCE SYSTEM—AD .....	27,733	27,733	.....
62	NIGHT VISION SYSTEMS ADVANCED DEVELOPMENT .....	12,347	10,947	- 1,400
63	ENVIRONMENTAL QUALITY TECHNOLOGY .....	10,456	10,456	.....
64	NATO RESEARCH AND DEVELOPMENT .....	2,588	2,588	.....
65	AVIATION—ADV DEV .....	14,055	10,055	- 4,000
66	LOGISTICS AND ENGINEER EQUIPMENT—ADV DEV .....	35,333	30,833	- 4,500
67	MEDICAL SYSTEMS—ADV DEV .....	33,491	35,491	+ 2,000

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
68	SOLDIER SYSTEMS—ADVANCED DEVELOPMENT .....	20,239	40,239	+ 20,000
69	ROBOTICS DEVELOPMENT .....	39,608	39,608	.....
70	ANALYSIS OF ALTERNATIVES .....	9,921	9,921	.....
71	LOWER TIER AIR MISSILE DEFENSE (LTAMID) SENSOR .....	76,728	59,828	– 16,900
72	TECHNOLOGY MATURATION INITIATIVES .....	115,221	150,221	+ 35,000
73	MANEUVER—SHORT RANGE AIR DEFENSE (M-SHORAD) .....	20,000	.....	– 20,000
74	TRACTOR BEAM .....	10,400	10,400	.....
75	ASSURED POSITIONING, NAVIGATION AND TIMING (PNT) .....	164,967	134,967	– 30,000
76	SYNTHETIC TRAINING ENVIRONMENT REFINEMENT AND PROTOTYPING .....	1,600	1,600	.....
77	INDIRECT FIRE PROTECTION CAPABILITY INCREMENT 2-INTERC .....	11,303	11,303	.....
78	CYBERSPACE OPERATIONS FORCES AND FORCE SUPPORT .....	56,492	56,492	.....
79	ARMY SPACE SYSTEMS INTEGRATION .....	20,432	20,432	.....
	TOTAL, DEMONSTRATION & VALIDATION .....	890,889	897,539	+ 6,650
	ENGINEERING & MANUFACTURING DEVELOPMENT			
80	AIRCRAFT AVIONICS .....	30,153	30,153	.....
81	ELECTRONIC WARFARE DEVELOPMENT .....	71,671	71,671	.....
83	MID-TIER NETWORKING VEHICULAR RADIO .....	10,589	.....	– 10,589
84	ALL SOURCE ANALYSIS SYSTEM .....	4,774	4,774	.....
85	TRACTOR CAGE .....	17,252	30,252	+ 13,000
86	INFANTRY SUPPORT WEAPONS .....	87,643	91,992	+ 4,349
87	MEDIUM TACTICAL VEHICLES .....	6,039	6,039	.....
88	JAVELIN .....	21,095	21,095	.....
89	FAMILY OF HEAVY TACTICAL VEHICLES .....	10,507	10,507	.....
90	AIR TRAFFIC CONTROL .....	3,536	3,536	.....
92	LIGHT TACTICAL WHEELED VEHICLES .....	7,000	7,000	.....
93	ARMORED SYSTEMS MODERNIZATION (ASM)—ENG DEV .....	36,242	36,242	.....
94	NIGHT VISION SYSTEMS—SDD .....	108,504	126,004	+ 17,500
95	COMBAT FEEDING, CLOTHING, AND EQUIPMENT .....	3,702	8,702	+ 5,000
96	NON-SYSTEM TRAINING DEVICES—SDD .....	43,575	53,575	+ 10,000
97	AIR DEFENSE COMMAND, CONTROL AND INTELLIGENCE -SDD .....	28,726	36,726	+ 8,000
98	CONSTRUCTIVE SIMULATION SYSTEMS DEVELOPMENT .....	18,562	18,562	.....
99	AUTOMATIC TEST EQUIPMENT DEVELOPMENT .....	8,344	8,344	.....
100	DISTRIBUTIVE INTERACTIVE SIMULATIONS (DIS)—SDD .....	11,270	11,270	.....
101	BRILLIANT ANTI-ARMOR SUBMUNITION (BAT) .....	10,000	10,000	.....
102	COMBINED ARMS TACTICAL TRAINER (CATT) CORE .....	18,566	18,566	.....
103	BRIGADE ANALYSIS, INTEGRATION AND EVALUATION .....	145,360	145,360	.....
104	WEAPONS AND MUNITIONS—SDD .....	145,232	149,410	+ 4,178
105	LOGISTICS AND ENGINEER EQUIPMENT—SDD .....	90,965	91,023	+ 58
106	COMMAND, CONTROL, COMMUNICATIONS SYSTEMS—SDD .....	9,910	9,910	.....
107	MEDICAL MATERIEL/MEDICAL BIOLOGICAL DEFENSE EQUIPMENT .....	39,238	39,238	.....
108	LANDMINE WARFARE/BARRIER—SDD .....	34,684	25,884	– 8,800
109	ARMY TACTICAL COMMAND & CONTROL HARDWARE & SOFTWARE .....	164,409	162,909	– 1,500
110	RADAR DEVELOPMENT .....	32,968	32,968	.....
111	GENERAL FUND ENTERPRISE BUSINESS SYSTEM (GFEB) .....	49,554	49,554	.....
112	FIREFINDER .....	45,605	45,605	.....
113	SOLDIER SYSTEMS—WARRIOR DEM/VAL .....	16,127	16,127	.....
114	SUITE OF SURVIVABILITY ENHANCEMENT SYSTEMS -EMD .....	98,600	92,900	– 5,700
115	ARTILLERY SYSTEMS .....	1,972	3,972	+ 2,000
116	INFORMATION TECHNOLOGY DEVELOPMENT .....	81,776	74,576	– 7,200
117	INTEGRATED PERSONNEL AND PAY SYSTEM-ARMY (IPPS-A) .....	172,361	189,744	+ 17,383
118	ARMORED MULTI-PURPOSE VEHICLE .....	199,778	191,778	– 8,000
119	INTEGRATED GROUND SECURITY SURVEILLANCE RESPONSE CAPABILITY (IGSSR-C) .....	4,418	4,418	.....
120	JOINT TACTICAL NETWORK CENTER (JTNC) .....	15,877	15,877	.....
121	JOINT TACTICAL NETWORK (JTN) .....	44,150	44,150	.....
122	TRACTOR TIRE .....	34,670	113,570	+ 78,900
123	GROUND-BASED OPERATIONAL SURVEILLANCE SYSTEM-EXPENDITARY (GBOSS-E) .....	5,207	5,207	.....
124	TACTICAL SECURITY SYSTEM (TSS) .....	4,727	4,727	.....
125	COMMON INFRARED COUNTERMEASURES (CIRCM) .....	105,778	79,378	– 26,400

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
126	COMBATING WEAPONS OF MASS DESTRUCTION (CWMD) .....	6,927	6,927	.....
127	EVIDENCE COLLECTION AND DETAINEE PROCESSING .....	214	214	.....
128	NUCLEAR BIOLOGICAL CHEMICAL RECONNAISSANCE VEHICLE ....	16,125	16,125	.....
129	DEFENSIVE CYBER TOOL DEVELOPMENT .....	55,165	38,165	- 17,000
130	TACTICAL NETWORK RADIO SYSTEMS (LOW-TIER) .....	20,076	11,337	- 8,739
131	CONTRACT WRITING SYSTEM .....	20,322	20,322	.....
132	MISSILE WARNING SYSTEM MODERNIZATION (MWSM) .....	55,810	13,000	- 42,810
133	AIRCRAFT SURVIVABILITY DEVELOPMENT .....	30,879	30,879	.....
134	INDIRECT FIRE PROTECTION CAPABILITY INC 2—BLOCK 1 .....	175,069	143,169	- 31,900
135	GROUND ROBOTICS .....	70,760	59,730	- 11,030
137	AMF JOINT TACTICAL RADIO SYSSTEM .....	8,965	18,965	+ 10,000
138	JOINT AIR-TO-GROUND MISSILE (JAGM) .....	34,626	19,726	- 14,900
140	ARMY INTEGRATED AIR AND MISSILE DEFENSE [AIAMD] .....	336,420	330,420	- 6,000
143	NATIONAL CAPABILITIES INTEGRATION .....	6,882	9,382	+ 2,500
144	JOINT LIGHT TACTICAL VEHICLE ENG AND MANUFACTURING .....	23,467	23,467	.....
145	AVIATION GROUND SUPPORT EQUIPMENT .....	6,930	6,930	.....
146	PALADIN INTEGRATED MANAGEMENT [PIM] .....	6,112	6,112	.....
147	TROJAN—RH12 .....	4,431	4,431	.....
150	ELECTRONIC WARFARE DEVELOPMENT .....	14,616	14,616	.....
151	TRACTOR BEARS .....	17,928	17,928	.....
	TOTAL, ENGINEERING & MANUFACTURING DEVELOPMENT .....	3,012,840	2,985,140	- 27,700
	RDT&E MANAGEMENT SUPPORT			
152	THREAT SIMULATOR DEVELOPMENT .....	22,862	31,862	+ 9,000
153	TARGET SYSTEMS DEVELOPMENT .....	13,902	13,902	.....
154	MAJOR T&E INVESTMENT .....	102,901	114,901	+ 12,000
155	RAND ARROYO CENTER .....	20,140	20,140	.....
156	ARMY KWAJALEIN ATOLL .....	246,663	246,663	.....
157	CONCEPTS EXPERIMENTATION PROGRAM .....	29,820	29,820	.....
159	ARMY TEST RANGES AND FACILITIES .....	307,588	317,588	+ 10,000
160	ARMY TECHNICAL TEST INSTRUMENTATION AND TARGETS .....	49,242	49,242	.....
161	SURVIVABILITY/LETHALITY ANALYSIS .....	41,843	41,843	.....
162	AIRCRAFT CERTIFICATION .....	4,804	4,804	.....
163	METEOROLOGICAL SUPPORT TO RDT&E ACTIVITIES .....	7,238	7,238	.....
164	MATERIEL SYSTEMS ANALYSIS .....	21,890	21,890	.....
165	EXPLOITATION OF FOREIGN ITEMS .....	12,684	12,684	.....
166	SUPPORT OF OPERATIONAL TESTING .....	51,040	51,040	.....
167	ARMY EVALUATION CENTER .....	56,246	56,246	.....
168	ARMY MODELING AND SIMULATION X—CMD COLLABORATION AND INTEG .....	1,829	1,829	.....
169	PROGRAMWIDE ACTIVITIES .....	55,060	55,060	.....
170	TECHNICAL INFORMATION ACTIVITIES .....	33,934	37,934	+ 4,000
171	MUNITIONS STANDARDIZATION, EFFECTIVENESS AND SAFETY .....	43,444	57,444	+ 14,000
172	ENVIRONMENTAL QUALITY TECHNOLOGY MGMT SUPPORT .....	5,087	5,087	.....
173	MANAGEMENT HEADQUARTERS (RESEARCH AND DEVELOPMENT) .....	54,679	54,679	.....
174	MILITARY GROUND-BASED CREW TECHNOLOGY .....	7,916	7,916	.....
175	RONALD REAGAN BALLISTIC MISSILE DEFENSE TEST SITE .....	61,254	61,254	.....
176	DEFENSE MILITARY DECEPTION INITIATIVE .....	1,779	1,779	.....
	TOTAL, RDT&E MANAGEMENT SUPPORT .....	1,253,845	1,302,845	+ 49,000
	OPERATIONAL SYSTEMS DEVELOPMENT			
178	MLRS PRODUCT IMPROVEMENT PROGRAM .....	8,929	8,929	.....
179	TRACTOR PULL .....	4,014	4,014	.....
180	ANTI-TAMPER TECHNOLOGY SUPPORT .....	4,094	4,094	.....
181	WEAPONS AND MUNITIONS PRODUCT IMPROVEMENT PROGRAMS .....	15,738	15,738	.....
182	TRACTOR SMOKE .....	4,513	4,513	.....
183	LONG RANGE PRECISION FIRES (LRPF) .....	102,014	88,014	- 14,000
184	APACHE PRODUCT IMPROVEMENT PROGRAM .....	59,977	57,877	- 2,100
185	BLACKHAWK RECAP/MODERNIZATION .....	34,416	34,416	.....
186	CHINOOK HELICOPTER PRODUCT IMPROVEMENT PROGRAM .....	194,567	170,317	- 24,250
187	FIXED WING AIRCRAFT .....	9,981	9,981	.....
188	IMPROVED TURBINE ENGINE PROGRAM .....	204,304	147,504	- 56,800

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
189	EMERGING TECHNOLOGIES FROM NIE .....	1,023	1,023	.....
190	LOGISTICS AUTOMATION .....	1,504	.....	- 1,504
191	AVIATION ROCKET SYSTEM PRODUCT IMPROVEMENT AND DEVELOPMENT .....	10,064	10,064	.....
192	UNMANNED AIRCRAFT SYSTEM UNIVERSAL PRODUCTS .....	38,463	38,463	.....
193	FAMILY OF BIOMETRICS .....	6,159	.....	- 6,159
194	PATRIOT PRODUCT IMPROVEMENT .....	90,217	78,867	- 11,350
195	AEROSTAT JOINT PROJECT OFFICE .....	6,749	.....	- 6,749
196	JOINT AUTOMATED DEEP OPERATION COORDINATION SYSTEM .....	33,520	33,520	.....
197	COMBAT VEHICLE IMPROVEMENT PROGRAMS .....	343,175	321,175	- 22,000
198	MANEUVER CONTROL SYSTEM .....	6,639	6,639	.....
198	155MM SELF-PROPELLED HOWITZER IMPROVEMENTS .....	40,784	40,784	.....
200	AIRCRAFT MODIFICATIONS/PRODUCT IMPROVEMENT PROGRAMS .....	39,358	39,358	.....
201	AIRCRAFT ENGINE COMPONENT IMPROVEMENT PROGRAM .....	145	145	.....
202	DIGITIZATION .....	4,803	4,803	.....
203	MISSILE/AIR DEFENSE PRODUCT IMPROVEMENT PROGRAM .....	2,723	28,723	+ 26,000
204	OTHER MISSILE PRODUCT IMPROVEMENT PROGRAMS .....	5,000	5,000	.....
205	TRACTOR CARD .....	37,883	37,883	.....
207	MATERIALS HANDLING EQUIPMENT .....	1,582	1,582	.....
208	ENVIRONMENTAL QUALITY TECHNOLOGY—OPERATIONAL SYSTEM .....	195	195	.....
209	LOWER TIER AIR AND MISSILE DEFENSE [AMD] SYSTEM .....	78,926	72,426	- 6,500
210	GUIDED MULTIPLE-LAUNCH ROCKET SYSTEM [GMLRS] .....	102,807	97,807	- 5,000
213	SECURITY AND INTELLIGENCE ACTIVITIES .....	13,807	35,652	+ 21,845
214	INFORMATION SYSTEMS SECURITY PROGRAM .....	132,438	106,438	- 26,000
215	GLOBAL COMBAT SUPPORT SYSTEM .....	64,370	46,987	- 17,383
217	WWMCCS/GLOBAL COMMAND AND CONTROL SYSTEM .....	10,475	10,475	.....
220	COMBINED ADVANCED APPLICATIONS .....	1,100	1,100	.....
222	TACTICAL UNMANNED AERIAL VEHICLES .....	9,433	9,433	.....
223	AIRBORNE RECONNAISSANCE SYSTEMS .....	5,080	5,080	.....
224	DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS .....	24,700	24,700	.....
225	MQ-1 SKY WARRIOR A UAV (MQ-1C GRAY EAGLE UAS) .....	9,574	.....	- 9,574
226	RQ-11 UAV .....	2,191	2,191	.....
227	RQ-7 UAV .....	12,773	12,773	.....
228	BIOMETRICS ENABLED INTELLIGENCE .....	2,537	2,537	.....
229	WIN-T INCREMENT 2—INITIAL NETWORKING .....	4,723	.....	- 4,723
230	END ITEM INDUSTRIAL PREPAREDNESS ACTIVITIES .....	60,877	85,677	+ 24,800
231	SATCOM GROUND ENVIRONMENT (SPACE) .....	11,959	11,959	.....
232	JOINT TACTICAL GROUND SYSTEM .....	10,228	10,228	.....
	TOTAL, OPERATIONAL SYSTEMS DEVELOPMENT .....	1,040,285	1,021,750	- 18,535
9999	CLASSIFIED PROGRAMS .....	7,154	7,154	.....
	TOTAL, RESEARCH, DEVELOPMENT, TEST & EVAL, ARMY .....	9,425,440	9,860,343	+ 434,903

## COMMITTEE RECOMMENDED ADJUSTMENTS

The following table details the adjustments recommended by the Committee:

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
2	Defense Research Sciences .....	263,590	273,590	+ 10,000
	Program increase: Collaborative research in the human dimension .....	.....	.....	+ 10,000
4	University and Industry Research Centers .....	87,395	102,395	+ 15,000
	Basic research program increase .....	.....	.....	+ 15,000
5	Materials Technology .....	29,640	58,640	+ 29,000
	Program increase .....	.....	.....	+ 24,000
	Program increase: High end materials for military applications .....	.....	.....	+ 5,000
6	Sensors and Electronic Survivability .....	35,730	81,230	+ 45,500

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
	Program increase: Advanced space data exploitation and integration program .....			+ 7,500
	Program increase: Agile manufacturing materials processing .....			+ 23,000
	Program increase: Tactical space—small satellite technology development .....			+ 15,000
8	Aviation Technology .....	66,086	73,586	+ 7,500
	Program increase .....			+ 2,500
	Program increase: Aviation and missile technology transfer and innovation .....			+ 5,000
9	Electronic Warfare Technology .....	27,144	34,144	+ 7,000
	Program increase .....			+ 7,000
10	Missile Technology .....	43,742	53,742	+ 10,000
	Program increase: Composites research—air vehicle development and sustainment .....			+ 10,000
11	Advanced Weapons Technology .....	22,785	27,785	+ 5,000
	Program increase: Army aerophysics research .....			+ 5,000
13	Combat Vehicle and Automotive Technology .....	67,232	77,232	+ 10,000
	Program increase .....			+ 10,000
17	Weapons and Munitions Technology .....	41,455	76,455	+ 35,000
	Program increase: Composite barrel technology .....			+ 10,000
	Program increase: Railgun weapon technology .....			+ 25,000
18	Electronics and Electronic Devices .....	58,352	84,352	+ 26,000
	Program increase: Protective and anti-tamper technologies for electronic attack .....			+ 10,000
	Program increase: Silicon carbide electronics research .....			+ 16,000
22	Environmental Quality Technology .....	21,678	34,678	+ 13,000
	Program increase: Coatings technology .....			+ 3,000
	Program increase: Environmental containment sensors .....			+ 6,000
	Program increase: UAS for UXO detection .....			+ 4,000
25	Military Engineering Technology .....	67,720	104,920	+ 37,200
	Program increase: Advanced blast load simulator .....			+ 4,500
	Program increase: Construction materials .....			+ 7,000
	Program increase: Engineered resilient systems .....			+ 10,000
	Program increase: Lightweight high performance materials .....			+ 10,000
	Program increase: M1 Abrams tank track system .....			+ 1,600
	Program increase: Smart runway program .....			+ 2,100
	Program increase: Bio-inspired functionally graded composites for hazard mitigation .....			+ 2,000
27	Warfighter Technology .....	39,559	44,559	+ 5,000
	Program increase: Expeditionary mobile base camp technology .....			+ 5,000
29	Warfighter Advanced Technology .....	44,863	53,363	+ 8,500
	Program increase: Maneuver support .....			+ 6,000
	Program increase: Non-centroidal helmets for warfighters .....			+ 2,500
30	Medical Advanced Technology .....	67,780	75,780	+ 8,000
	Program increase: Peer-reviewed military burn research program .....			+ 8,000
31	Aviation Advanced Technology .....	160,746	165,746	+ 5,000
	Program increase: Rotary wing development .....			+ 5,000
32	Weapons and Munitions Advanced Technology .....	84,079	107,079	+ 23,000
	Program increase: High energy laser research .....			+ 15,000
	Program increase: High energy laser rotorcraft integration .....			+ 8,000
33	Combat Vehicle and Automotive Advanced Technology .....	125,537	150,537	+ 25,000
	Program increase .....			+ 5,000
	Program increase: Advanced materials development .....			+ 10,000
	Program increase: Combat vehicle weight reduction initiative .....			+ 10,000
34	Space Application Advanced Technology .....	12,231	39,731	+ 27,500

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
	Program increase: Tactical small launch .....			+ 20,000
	Program increase: Global communications research ..			+ 7,500
39	Combating Terrorism—Technology Development .....	26,903	43,903	+ 17,000
	Program increase: Lightweight, low-power radar systems .....			+ 6,000
	Program increase: Long endurance UAV research .....			+ 8,000
	Program increase: Open source ISR research .....			+ 3,000
42	Electronic Warfare Technology .....	31,296	34,296	+ 3,000
	Program increase: PACOM multi-domain battle exercise capabilities .....			+ 3,000
43	Missile and Rocket Advanced Technology .....	62,850	117,850	+ 55,000
	Program increase .....			+ 45,000
	Program increase: Land-based anti-ship missile—development and integration .....			+ 10,000
45	High Performance Computing Modernization Program .....	182,331	221,331	+ 39,000
	Program increase .....			+ 39,000
46	Landmine Warfare and Barrier Advanced Technology .....	17,948	18,948	+ 1,000
	Program increase: Explosive hazard detection research .....			+ 1,000
49	Environmental Quality Technology Demonstrations .....	10,421	29,421	+ 19,000
	Program increase: Autonomous transport innovation .....			+ 5,000
	Program increase: Depleted uranium cleanup .....			+ 4,000
	Program increase: Rapid safe carbon nanotechnology research .....			+ 10,000
50	Military Engineering Advanced Technology .....	32,448	94,648	+ 62,200
	Program increase .....			+ 7,000
	Program increase: Additive manufacturing/3-D printing .....			+ 2,000
	Program increase: Advanced polymer development .....			+ 5,000
	Program increase: Bathymetric-topographic LiDAR research .....			+ 8,000
	Program increase: Demonstration of ultra-high efficiency natural gas technologies .....			+ 4,000
	Program increase: Emerging natural gas technologies .....			+ 10,000
	Program increase: Energy efficient window insulation research .....			+ 5,000
	Program increase: Heavy vehicle simulator research .....			+ 8,200
	Program increase: Inferential sensing on tactical wheeled vehicles .....			+ 5,000
	Program increase: Reliable distributed generation in austere environments .....			+ 3,000
	Program increase: Sensor protection from underground threats .....			+ 5,000
53	Army Missile Defense Systems Integration .....	9,634	23,634	+ 14,000
	Program increase: Integrated environmental control and power .....			+ 14,000
55	Air and Missile Defense Systems Engineering .....	33,949	35,949	+ 2,000
	Program increase: Interoperability of integrated air and missile defense .....			+ 15,000
	Restoring acquisition accountability—Lack of directed requirement .....			– 13,000
58	Tank and Medium Caliber Ammunition .....	41,452	41,902	+ 450
	Program increase .....			+ 8,000
	Program increase: Next generation of expendable countermeasures .....			+ 2,450
	Restoring acquisition accountability: EU1 Enhanced Lethality Cannon Munitions funding duplication ..			– 10,000
59	Armored System Modernization—Adv Dev .....	32,739	42,739	+ 10,000
	Program increase .....			+ 10,000
62	Night Vision Systems Advanced Development .....	12,347	10,947	– 1,400
	Improving funds management: Prior year carryover ..			– 1,400
65	Aviation—Adv Dev .....	14,055	10,055	– 4,000
	Improving funds management: AoA delay .....			– 4,000



[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
66	Logistics and Engineer Equipment—Adv Dev .....	35,333	30,833	- 4,500
	Improving funds management: Prior year carryover ...			- 4,500
67	Medical Systems—Adv Dev .....	33,491	35,491	+ 2,000
	Program increase: Body armor .....			+ 2,000
68	Soldier Systems—Advanced Development .....	20,239	40,239	+ 20,000
	Program increase: Next generation squad weapon ...			+ 20,000
71	Lower Tier Air Missile Defense [LTAMD] Sensor .....	76,728	59,828	- 16,900
	Restoring acquisition accountability: Contract delay .....			- 16,900
72	Technology Maturation Initiatives .....	115,221	150,221	+ 35,000
	Program increase: Multi-mission high energy laser research .....			+ 35,000
73	Maneuver—Short Range Air Defense [M-SHORAD] .....	20,000		- 20,000
	Restoring acquisition accountability: Efforts previously funded .....			- 20,000
75	Assured Positioning, Navigation and Timing [PNT] .....	164,967	134,967	- 30,000
	Improving funds management: Prior year carryover ...			- 30,000
83	Mid-tier Networking Vehicular Radio [MNVR] .....	10,589		- 10,589
	Program termination: Network modernization strategy .....			- 10,589
85	TRACTOR CAGE .....	17,252	30,252	+ 13,000
	Program increase: Classified cyber capabilities .....			+ 13,000
86	Infantry Support Weapons .....	87,643	91,992	+ 4,349
	Program increase .....			+ 6,000
	Program increase: Squad designated marksman rifle .....			+ 2,949
	Improving funds management: EW4 prior year carry-over .....			- 4,600
94	Night Vision Systems—Eng Dev .....	108,504	126,004	+ 17,500
	Program increase: Develop and qualify thermal weapon sights .....			+ 17,500
95	Combat Feeding, Clothing, and Equipment .....	3,702	8,702	+ 5,000
	Program increase .....			+ 5,000
96	Non-System Training Devices—Eng Dev .....	43,575	53,575	+ 10,000
	Program increase: Combined arms center threat integrated air defense system .....			+ 10,000
97	Air Defense Command, Control and Intelligence—Eng Dev .....	28,726	36,726	+ 8,000
	Program increase: All digital radar .....			+ 8,000
104	Weapons and Munitions—Eng Dev .....	145,232	149,410	+ 4,178
	Program increase: Develop 40mm low velocity M320 door breaching cartridge .....			+ 4,178
105	Logistics and Engineer Equipment—Eng Dev .....	90,965	91,023	+ 58
	Program increase: Improved camouflage net system .....			+ 2,000
	Restoring acquisition accountability: Engine driven generators schedule delay .....			- 1,942
108	Landmine Warfare/Barrier—Eng Dev .....	34,684	25,884	- 8,800
	Restoring acquisition accountability: DLBS test funding ahead of need .....			- 1,000
	Restoring acquisition accountability: RCIS schedule delay .....			- 7,800
109	Army Tactical Command & Control Hardware & Software ..	164,409	162,909	- 1,500
	Improving funds management: TNOM funding ahead of need .....			- 4,500
	Restoring acquisition accountability: CPI2 funding ahead of need .....			- 10,000
	Improving funds management: UTR prior year carry-over .....			- 12,000
	Transfer funding for network modernization strategy: EJ6 Protected SATCOM, Army-requested from OPA line 102 .....			+ 25,000
114	Suite of Survivability Enhancement Systems—EMD .....	98,600	92,900	- 5,700
	Program increase: Additional APS funding .....			+ 25,000
	Improving funds management: VPS/MAPS funding ahead of need .....			- 3,700
	Restoring acquisition accountability: Bradley test funding ahead of need .....			- 20,000

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
	Restoring acquisition accountability: Stryker test funding ahead of need .....			- 7,000
115	Artillery Systems—EMD .....	1,972	3,972	+ 2,000
	Program increase: Integrated tube #3 demonstrator, blast over pressure testing .....			+ 2,000
116	Information Technology Development .....	81,776	74,576	- 7,200
	Restoring acquisition accountability: AcqBiz program management growth .....			- 2,000
	Improving funds management: Prior year carryover .....			- 5,200
117	Integrated Personnel and Pay System-Army (IPPS-A) .....	172,361	189,744	+ 17,383
	Army-requested transfer from line 215 .....			+ 17,383
118	Armored Multi-Purpose Vehicle (AMPV) .....	199,778	191,778	- 8,000
	Improving funds management: Excess EMD funding .....			- 8,000
122	TRACTOR TIRE .....	34,670	113,570	+ 78,900
	Program increase: Classified cyber capabilities .....			+ 78,900
125	Common Infrared Countermeasures (CIRCM) .....	105,778	79,378	- 26,400
	Improving funds management: Program of record prior year carryover .....			- 26,400
129	Defensive CYBER Tool Development .....	55,165	38,165	- 17,000
	Improving funds management: Prior year carryover .....			- 17,000
130	Tactical Network Radio Systems (Low-Tier) .....	20,076	11,337	- 8,739
	Restoring acquisition accountability: Manpack test delay .....			- 8,739
132	Missile Warning System Modernization (MWSM) .....	55,810	13,000	- 42,810
	Restoring acquisition accountability: Funding early to need .....			- 42,810
134	Indirect Fire Protection Capability Inc 2—Block 1 .....	175,069	143,169	- 31,900
	Restoring acquisition accountability: EMD schedule delay .....			- 31,900
135	Ground Robotics .....	70,760	59,730	- 11,030
	Improving funds management: CRS-I EMD contract delay .....			- 11,030
137	AMF Joint Tactical Radio System (JTRS) .....	8,965	18,965	+ 10,000
	Transfer funding for network modernization strategy: Army-requested from OPA line 102 .....			+ 10,000
138	Joint Air-to-Ground Missile (JAGM) .....	34,626	19,726	- 14,900
	Restoring acquisition accountability: Limited user test delay .....			- 14,900
140	Army Integrated Air and Missile Defense (AIAMD) .....	336,420	330,420	- 6,000
	Program increase: Cybersecurity research .....			+ 15,000
	Program increase: Rapid integration for emerging threats .....			+ 25,000
	Restoring acquisition accountability: Excess funding due to program restructure .....			- 46,000
143	National Capabilities Integration (MIP) .....	6,882	9,382	+ 2,500
	Program increase .....			+ 2,500
152	Threat Simulator Development .....	22,862	31,862	+ 9,000
	Program increase: Integrated threat force .....			+ 9,000
154	Major T&E Investment .....	102,901	114,901	+ 12,000
	Program increase: Cyber virtualization research .....			+ 12,000
159	Army Test Ranges and Facilities .....	307,588	317,588	+ 10,000
	Program increase: Distributed environment for system-of-system cybersecurity testing .....			+ 10,000
170	Technical Information Activities .....	33,934	37,934	+ 4,000
	Program increase .....			+ 4,000
171	Munitions Standardization, Effectiveness and Safety .....	43,444	57,444	+ 14,000
	Program increase .....			+ 14,000
183	Long Range Precision Fires (LRPF) .....	102,014	88,014	- 14,000
	Restoring acquisition accountability: TMRR contract delay .....			- 14,000
184	Apache Product Improvement Program .....	59,977	57,877	- 2,100
	Restoring acquisition accountability: FOT&E II delay .....			- 2,100
186	Chinook Product Improvement Program .....	194,567	170,317	- 24,250

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
	Restoring acquisition accountability: Blk 2 EMD contract delay .....			-19,250
	Improving funds management: Program management excess growth .....			-5,000
188	Improved Turbine Engine Program .....	204,304	147,504	-56,800
	Restoring acquisition accountability: PDR funds excess to need .....			-40,400
	Restoring acquisition accountability: Blackhawk and Apache integration funding ahead of need .....			-16,400
190	Logistics Automation .....	1,504		-1,504
	Improving funds management: Prior year carryover .....			-1,504
193	Family of Biometrics .....	6,159		-6,159
	Improving funds management: Prior year carryover .....			-6,159
194	Patriot Product Improvement .....	90,217	78,867	-11,350
	Improving funds management: Prior year carryover .....			-8,750
	Restoring acquisition accountability: Program management growth .....			-2,600
195	Aerostat Joint Project—COCOM Exercise .....	6,749		-6,749
	Program termination .....			-6,749
197	Combat Vehicle Improvement Programs .....	343,175	321,175	-22,000
	Program increase .....			+3,000
	Program increase: Development of ECP for the M88A2E1 .....			+8,000
	Restoring acquisition accountability: Abrams ECP1B delay .....			-10,000
	Restoring acquisition accountability: Abrams program support excess growth .....			-2,000
	Restoring acquisition accountability: Bradley ECP2 delay .....			-5,000
	Restoring acquisition accountability: Bradley UBIS contract delay .....			-1,000
	Restoring acquisition accountability: Stryker ECP2 delay .....			-15,000
203	Missile/Air Defense Product Improvement Program .....	2,723	28,723	+26,000
	Program increase: Stinger product improvement program research .....			+26,000
209	Lower Tier Air and Missile Defense [AMD] System .....	78,926	72,426	-6,500
	Improving funds management: Prior year carryover .....			-6,500
210	Guided Multiple-Launch Rocket System [GMLRS] .....	102,807	97,807	-5,000
	Improving funds management: Prior year carryover .....			-5,000
213	Security and Intelligence Activities .....	13,807	35,652	+21,845
	Program increase: Cyber capabilities development .....			+21,845
214	Information Systems Security Program .....	132,438	106,438	-26,000
	Program increase: Cyber security operations center .....			+18,000
	Restoring acquisition accountability: Excess embedded crypto modernization funding due to program delay .....			-44,000
215	Global Combat Support System .....	64,370	46,987	-17,383
	Army-requested transfer to line 117 .....			-17,383
225	MQ-1C Gray Eagle UAS .....	9,574		-9,574
	Restoring acquisition accountability: Testing previously funded .....			-9,574
229	Win-T Increment 2—Initial Networking .....	4,723		-4,723
	Program termination: Network modernization strategy .....			-4,723
230	End Item Industrial Preparedness Activities .....	60,877	85,677	+24,800
	Program increase: Army inventory management and demand planning software .....			+9,800
	Program increase: Nanoscale materials .....			+15,000

*Improved Turbine Engine Program.*—The fiscal year 2018 budget request includes \$204,304,000 for the Improved Turbine Engine Program [ITEP]. The Army’s acquisition strategy for ITEP includes contracting with no less than two engine developers through Mile-

stone B to ensure competition in the program. The Committee is fully supportive of this approach and the overall program and has provided the necessary resources to fully fund this strategy. The Committee notes, however, that funding for the Preliminary Design Review has expended more slowly than planned. Additionally, the Engineering and Manufacturing Development contract, which includes Black Hawk and Apache integration, has been delayed at least three months and is now scheduled to be awarded in the first quarter of fiscal year 2019. Therefore, the Committee recommends a reduction of \$56,800,000 to the fiscal year 2018 budget request but remains supportive of this important Army modernization priority.

*Armored Multi-Purpose Vehicle.*—While the Committee understands the Army's requirement to field the Armored Multi-Purpose Vehicle [AMPV], particularly in the European theater, to increase survivability; size, weight, power, and cooling improvements; and the ability to incorporate future technologies, it is concerned with the concurrency built into the continued development, testing, and procurement of the program. The fiscal year 2018 budget request includes \$199,778,000 for research, development, test and evaluation, to include procurement of live fire test assets for planned second quarter fiscal year 2020 testing, as well as \$447,618,000 for procurement of 107 vehicles that will begin delivering in the fourth quarter of fiscal year 2019.

To ensure that vehicles are operationally effective before deploying to theater, the Committee encourages the Army to accelerate testing and directs the Secretary of the Army to provide a report to the congressional defense committees within 180 days of enactment of this act on the results of vehicle testing to date and an explanation of why vehicles are being procured in significant quantities prior to Initial Operational Test and Evaluation, currently scheduled for second quarter of fiscal year 2021.

*Soldier Fitness Program and Suicide Prevention Program.*—The fiscal year 2018 budget request includes \$3,120,000 for the Soldier Fitness Program and Suicide Prevention Program. While the Committee is fully supportive of these programs, it is dismayed that the budget justification materials for them lacked sufficient detail and substance and expects these omissions to be corrected in the fiscal year 2019 budget request.

*Life Cycle Pilot Process.*—The Committee commends the Army for its continuing work in Transformative Manufacturing Technology and strongly encourages the Secretary of the Army to dedicate resources to further the development and equipping of the national technical industrial base with these new and emerging Transformative Manufacturing and ammunition technologies.

*Materials Under Extreme Dynamic Environments.*—The Committee recognizes the critical role of the Army's Materials in Extreme Dynamic Environments program in strengthening the domestic capability to develop and manufacture essential protection materials and encourages the Secretary of the Army to continue research in this area.

*Power Management Systems for Ground Combat Vehicles.*—The Committee recognizes that power demand for ground combat vehicles like Stryker and High Mobility Multipurpose Wheeled Vehicle

(HMMWV) is increasing due to the addition of sophisticated electronic communication systems, sensor systems, electrical drive chain equipment, and active protection systems. Advanced battery and power management systems provide the possibility of replacing existing battery standards for more efficient energy usage and longer durations of low heat-signature observation. The Committee encourages the Department of the Army to conduct further research in modular lithium battery systems for ground combat vehicles and other power management system solutions.

*Strategic Materials Research.*—The Committee continues to recognize the importance of the Army Research Laboratory [ARL] in expanding research, education, and technology development efforts in materials and metals processing science and engineering, aiming to transform the affordability, performance and environmental sustainability of strategic materials. The Committee further notes that ARL's Open Campus concept benefits the Army, the academic community, and industry through collaboration involving ARL's research staff and facilities, leading to continued technological superiority for the U.S. warfighter. The Committee encourages the Army to consider accelerating expansion of its Open Campus approach to its Materials and Manufacturing Science laboratories in order to benefit strategic materials research.

*Adaptive Red Team Support.*—The Committee supports the work of the Army's Adaptive Red Team Technical Support and Operational Analysis program and understands it provides vital feedback on information technology system vulnerabilities and limitations. Highlighting these vulnerabilities has translated into more secure and resilient systems as well as increased production cost savings in the acquisition process. Therefore, the Committee encourages the Secretary of the Army to continue to invest in these efforts.

*Material Development, Characterization, and Computational Modeling.*—The Committee recognizes the importance of evaluating materials and technologies as well as designing and developing methodologies and models to enable enhanced lethality and survivability. Methods such as computational research allow for the development of models that predict the mechanical properties of materials that are used in research and development at the U.S. Army Research Laboratory [ARL]. These models and simulations, which are based on quantum mechanics, statistical mechanics principles and thermodynamic simulations, and are tested via cold spray synthesis and mechanical testing, provide a cost savings to the Department of Defense by simulating materials prior to testing them to ensure mechanical properties will work together. Additionally, these methodologies allow for the enhanced development of technologies such as lightweight armors, protective structures, kinetic energy active protection, ballistic shock and mine blast protection, helmet technologies to prevent traumatic brain injury, and numerous other uses. The Committee encourages ARL to continue the utilization of computational modeling and simulations research to achieve greater cost savings.

*Human Factors Engineering Technology.*—The Committee is encouraged by the overall progress of the Human Factors Engineering Technology program and particularly the Army's collaboration

with institutes of higher education and centers of excellence. Within this program, the work being done regarding Continuous Multifaceted Soldier Characterization for Adaptive Technologies has shown much promise, and the Committee encourages continuing research in this area.

*Underwater Cut and Capture.*—The Committee is concerned that insufficient attention has been placed on successfully migrating obsolete, discarded, and unstable munitions disposal technology to the undersea arena. Therefore, the Committee encourages the Secretary of the Army to conduct additional targeted research to demonstrate technology which removes underwater munitions without displacing the munition body in order to avoid damaging critical habitat and coral by detonating the munition.

*Surface Haptics.*—The Committee is aware of recent advances in human-computer interface making use of tactile communication channels. Potential applications of surface haptics for situational awareness and team communication, human-human and human-computer interaction when vision is impaired, when light emission is unacceptable, when visual attention must be maintained elsewhere, or when motion and vibration compromise reliable interaction with controls. The Committee encourages the Secretary of the Army to increase research into surface haptics both for visual touchscreens and also for non-visual interaction (dark haptics).

*Bioresorbable Electronic Systems.*—The Committee is aware of recent advances in bioresorbable electronic systems and biocompatible devices to facilitate a new class of technology for emergency medicine, combat casualty care, and rehabilitation care. The Committee encourages the Secretary of the Army to increase research into bioresorbable electronic systems and biocompatible devices, including relevant work across the spectrum from fundamental research through clinical research and engineering development.

RESEARCH, DEVELOPMENT, TEST AND EVALUATION, NAVY

Appropriations, 2017 .....	\$17,214,530,000
Budget estimate, 2018 .....	17,650,035,000
Committee recommendation .....	17,628,000,000

The Committee recommends an appropriation of \$17,628,000,000. This is \$22,035,000 below the budget estimate.

COMMITTEE RECOMMENDED PROGRAM

The following table summarizes the budget estimate for this appropriation, the Committee recommendation, and the Committee recommended adjustments to the budget estimate:

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
	RESEARCH, DEVELOPMENT, TEST & EVAL, NAVY			
	BASIC RESEARCH			
1	UNIVERSITY RESEARCH INITIATIVES .....	118,130	118,130	.....
2	IN-HOUSE LABORATORY INDEPENDENT RESEARCH .....	19,438	19,438	.....
3	DEFENSE RESEARCH SCIENCES .....	458,333	458,333	.....
	TOTAL, BASIC RESEARCH .....	595,901	595,901	.....

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
	APPLIED RESEARCH			
4	POWER PROJECTION APPLIED RESEARCH .....	13,553	18,553	+ 5,000
5	FORCE PROTECTION APPLIED RESEARCH .....	125,557	174,057	+ 48,500
6	MARINE CORPS LANDING FORCE TECHNOLOGY .....	53,936	55,936	+ 2,000
7	COMMON PICTURE APPLIED RESEARCH .....	36,450	36,450	.....
8	WARFIGHTER SUSTAINMENT APPLIED RESEARCH .....	48,649	48,649	.....
9	ELECTROMAGNETIC SYSTEMS APPLIED RESEARCH .....	79,598	85,598	+ 6,000
10	OCEAN WARFIGHTING ENVIRONMENT APPLIED RESEARCH .....	42,411	49,911	+ 7,500
11	JOINT NON-LETHAL WEAPONS APPLIED RESEARCH .....	6,425	6,425	.....
12	UNDERSEA WARFARE APPLIED RESEARCH .....	56,094	61,094	+ 5,000
13	FUTURE NAVAL CAPABILITIES APPLIED RESEARCH .....	156,805	156,805	.....
14	MINE AND EXPEDITIONARY WARFARE APPLIED RESEARCH .....	32,733	35,233	+ 2,500
15	INNOVATIVE NAVAL PROTOTYPES (INP) APPLIED RESEARCH .....	171,146	171,146	.....
16	SCIENCE AND TECHNOLOGY MANAGEMENT—ONR HEAD- QUARTERS .....	62,722	62,722	.....
	TOTAL, APPLIED RESEARCH .....	886,079	962,579	+ 76,500
	ADVANCED TECHNOLOGY DEVELOPMENT			
19	FORCE PROTECTION ADVANCED TECHNOLOGY .....	26,342	54,342	+ 28,000
20	ELECTROMAGNETIC SYSTEMS ADVANCED TECHNOLOGY .....	9,360	9,360	.....
21	MARINE CORPS ADVANCED TECHNOLOGY DEMONSTRATION [ATD] .....	154,407	166,907	+ 12,500
22	JOINT NON-LETHAL WEAPONS TECHNOLOGY DEVELOPMENT .....	13,448	13,448	.....
23	FUTURE NAVAL CAPABILITIES ADVANCED TECHNOLOGY DEV .....	231,772	231,772	.....
24	MANUFACTURING TECHNOLOGY PROGRAM .....	57,797	57,797	.....
25	WARFIGHTER PROTECTION ADVANCED TECHNOLOGY .....	4,878	12,878	+ 8,000
26	UNDERSEA WARFARE ADVANCED TECHNOLOGY .....	.....	10,000	+ 10,000
27	NAVY WARFIGHTING EXPERIMENTS AND DEMONSTRATIONS .....	64,889	64,889	.....
28	MINE AND EXPEDITIONARY WARFARE ADVANCED TECHNOLOGY ..	15,164	15,164	.....
29	INNOVATIVE NAVAL PROTOTYPES (INP) ADVANCED TECHNOLOGY .....	108,285	128,485	+ 20,200
	TOTAL, ADVANCED TECHNOLOGY DEVELOPMENT .....	686,342	765,042	+ 78,700
	DEMONSTRATION & VALIDATION			
30	AIR/OCEAN TACTICAL APPLICATIONS .....	48,365	48,365	.....
31	AVIATION SURVIVABILITY .....	5,566	5,566	.....
33	AIRCRAFT SYSTEMS .....	695	695	.....
34	ASW SYSTEMS DEVELOPMENT .....	7,661	7,661	.....
35	TACTICAL AIRBORNE RECONNAISSANCE .....	3,707	3,707	.....
36	ADVANCED COMBAT SYSTEMS TECHNOLOGY .....	61,381	7,745	- 53,636
36A	RAPID PROTOTYPING, EXPERIMENTATION AND DEMONSTRATION .....	.....	24,050	+ 24,050
37	SURFACE AND SHALLOW WATER MINE COUNTERMEASURES .....	154,117	77,407	- 76,710
37A	SURFACE MINE COUNTERMEASURES .....	.....	12,900	+ 12,900
37B	AIRBORNE LITTORAL MCM .....	.....	11,623	+ 11,623
38	SURFACE SHIP TORPEDO DEFENSE .....	14,974	14,974	.....
39	CARRIER SYSTEMS DEVELOPMENT .....	9,296	9,296	.....
40	PILOT FISH .....	132,083	111,383	- 20,700
41	RETRACT LARCH .....	15,407	15,407	.....
42	RETRACT JUNIPER .....	122,413	122,413	.....
43	RADIOLOGICAL CONTROL .....	745	745	.....
44	SURFACE ASW .....	1,136	1,136	.....
45	ADVANCED SUBMARINE SYSTEM DEVELOPMENT .....	100,955	89,955	- 11,000
46	SUBMARINE TACTICAL WARFARE SYSTEMS .....	13,834	13,834	.....
47	SHIP CONCEPT ADVANCED DESIGN .....	36,891	21,316	- 15,575
48	SHIP PRELIMINARY DESIGN & FEASIBILITY STUDIES .....	12,012	23,741	+ 11,729
49	ADVANCED NUCLEAR POWER SYSTEMS .....	329,500	329,500	.....
50	ADVANCED SURFACE MACHINERY SYSTEMS .....	29,953	29,953	.....
51	CHALK EAGLE .....	191,610	191,610	.....
52	LITTORAL COMBAT SHIP [LCS] .....	40,991	40,991	.....
53	COMBAT SYSTEM INTEGRATION .....	24,674	20,274	- 4,400
54	OHIO REPLACEMENT PROGRAM .....	776,158	801,158	+ 25,000
55	LITTORAL COMBAT SHIP [LCS] MISSION MODULES .....	116,871	96,871	- 20,000
56	AUTOMATED TEST AND RE-TEST .....	8,052	8,052	.....
57	FRIGATE DEVELOPMENT .....	143,450	113,450	- 30,000
58	CONVENTIONAL MUNITIONS .....	8,909	8,909	.....

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
60	MARINE CORPS GROUND COMBAT/SUPPORT SYSTEM .....	1,428	1,428	.....
61	JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOPMENT .....	53,367	49,867	- 3,500
63	OCEAN ENGINEERING TECHNOLOGY DEVELOPMENT .....	8,212	8,212	.....
64	ENVIRONMENTAL PROTECTION .....	20,214	20,214	.....
65	NAVY ENERGY PROGRAM .....	25,623	39,623	+ 14,000
66	FACILITIES IMPROVEMENT .....	2,837	6,837	+ 4,000
67	CHALK CORAL .....	245,143	245,143	.....
68	NAVY LOGISTIC PRODUCTIVITY .....	2,995	2,995	.....
69	RETRACT MAPLE .....	306,101	306,101	.....
70	LINK PLUMERIA .....	253,675	402,575	+ 148,900
71	RETRACT ELM .....	55,691	55,691	.....
72	LINK EVERGREEN .....	48,982	48,982	.....
74	NATO RESEARCH AND DEVELOPMENT .....	9,099	9,099	.....
75	LAND ATTACK TECHNOLOGY .....	33,568	18,568	- 15,000
76	JOINT NONLETHAL WEAPONS TESTING .....	29,873	29,873	.....
77	JOINT PRECISION APPROACH AND LANDING SYSTEMS .....	106,391	106,391	.....
78	DIRECTED ENERGY AND ELECTRIC WEAPON SYSTEMS .....	107,310	99,310	- 8,000
79	GERALD R. FORD CLASS NUCLEAR AIRCRAFT CARRIER .....	83,935	83,935	.....
81	TACTICAL AIR DIRECTIONAL INFRARED COUNTERMEASURES .....	46,844	46,844	.....
83	MARINE CORPS ADDITIVE MANUFACTURING TECHNOLOGY DE- VELOPMENT .....	6,200	6,200	.....
85	RAPID TECHNOLOGY CAPABILITY PROTOTYPE .....	7,055	17,055	+ 10,000
86	LX (R) .....	9,578	9,578	.....
87	ADVANCED UNDERSEA PROTOTYPING .....	66,543	66,543	.....
87A	UNMANNED UNDERSEA VEHICLE .....	.....	22,687	+ 22,687
89	PRECISION STRIKE WEAPONS DEVELOPMENT PROGRAM .....	31,315	22,715	- 8,600
90	SPACE & ELECTRONIC WARFARE [SEW] ARCHITECTURE/ENGINE .....	42,851	42,851	.....
91	OFFENSIVE ANTI-SURFACE WARFARE WEAPON DEVELOPMENT .....	160,694	160,694	.....
93	ASW SYSTEMS DEVELOPMENT—MIP .....	8,278	8,278	.....
94	ADVANCED TACTICAL UNMANNED AIRCRAFT SYSTEM .....	7,979	7,979	.....
95	ELECTRONIC WARFARE DEVELOPMENT—MIP .....	527	527	.....
	TOTAL, DEMONSTRATION & VALIDATION .....	4,193,714	4,211,482	+ 17,768
	ENGINEERING & MANUFACTURING DEVELOPMENT			
96	TRAINING SYSTEM AIRCRAFT .....	16,945	18,545	+ 1,600
97	OTHER HELO DEVELOPMENT .....	26,786	26,786	.....
98	AV-8B AIRCRAFT—ENG DEV .....	48,780	45,680	- 3,100
99	STANDARDS DEVELOPMENT .....	2,722	2,722	.....
100	MULTI-MISSION HELICOPTER UPGRADE DEVELOPMENT .....	5,371	5,371	.....
101	AIR/OCEAN EQUIPMENT ENGINEERING .....	782	5,782	+ 5,000
102	P-3 MODERNIZATION PROGRAM .....	1,361	1,361	.....
103	WARFARE SUPPORT SYSTEM .....	14,167	14,167	.....
104	TACTICAL COMMAND SYSTEM .....	55,695	49,745	- 5,950
105	ADVANCED HAWKEYE .....	292,535	302,535	+ 10,000
106	H-1 UPGRADES .....	61,288	61,288	.....
107	ACOUSTIC SEARCH SENSORS .....	37,167	37,167	.....
108	V-22A .....	171,386	186,386	+ 15,000
109	AIR CREW SYSTEMS DEVELOPMENT .....	13,235	14,195	+ 960
110	EA-18 .....	173,488	141,488	- 32,000
111	ELECTRONIC WARFARE DEVELOPMENT .....	54,055	57,055	+ 3,000
112	EXECUTIVE HELO DEVELOPMENT .....	451,938	451,938	.....
113	NEXT GENERATION JAMMER [NGJ] .....	632,936	617,936	- 15,000
114	JOINT TACTICAL RADIO SYSTEM—NAVY (JTRS—NAVY) .....	4,310	4,310	.....
115	NEXT GENERATION JAMMER [NGJ] INCREMENT II .....	66,686	66,686	.....
116	SURFACE COMBATANT COMBAT SYSTEM ENGINEERING .....	390,238	333,738	- 56,500
117	LPD-17 CLASS SYSTEMS INTEGRATION .....	689	689	.....
118	SMALL DIAMETER BOMB [SDB] .....	112,846	112,846	.....
119	STANDARD MISSILE IMPROVEMENTS .....	158,578	133,578	- 25,000
120	AIRBORNE MCM .....	15,734	15,734	.....
122	NAVAL INTEGRATED FIRE CONTROL-COUNTER AIR SYSTEMS ENG .....	25,445	25,445	.....
124	ADVANCED ABOVE WATER SENSORS .....	87,233	87,233	.....
125	SSN-688 AND TRIDENT MODERNIZATION .....	130,981	130,981	.....
126	AIR CONTROL .....	75,186	75,186	.....



[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
127	SHIPBOARD AVIATION SYSTEMS .....	177,926	177,926	.....
128	COMBAT INFORMATION CENTER CONVERSION .....	8,062	8,062	.....
129	AIR AND MISSILE DEFENSE RADAR (AMDR) SYSTEM .....	32,090	32,090	.....
130	NEW DESIGN SSN .....	120,087	120,087	.....
131	SUBMARINE TACTICAL WARFARE SYSTEM .....	50,850	50,850	.....
132	SHIP CONTRACT DESIGN/LIVE FIRE T&E .....	67,166	67,634	+ 468
133	NAVY TACTICAL COMPUTER RESOURCES .....	4,817	4,817	.....
134	VIRGINIA PAYLOAD MODULE (VPM) .....	72,861	72,861	.....
135	MINE DEVELOPMENT .....	25,635	25,635	.....
136	LIGHTWEIGHT TORPEDO DEVELOPMENT .....	28,076	28,076	.....
137	JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOPMENT .....	7,561	7,561	.....
138	PERSONNEL, TRAINING, SIMULATION, AND HUMAN FACTORS .....	40,828	24,728	- 16,100
139	JOINT STANDOFF WEAPON SYSTEMS .....	435	435	.....
140	SHIP SELF DEFENSE (DETECT & CONTROL) .....	161,713	164,713	+ 3,000
141	SHIP SELF DEFENSE (ENGAGE: HARD KILL) .....	212,412	212,412	.....
142	SHIP SELF DEFENSE (ENGAGE: SOFT KILL/EW) .....	103,391	103,391	.....
143	INTELLIGENCE ENGINEERING .....	34,855	44,855	+ 10,000
144	MEDICAL DEVELOPMENT .....	9,353	9,353	.....
145	NAVIGATION/ID SYSTEM .....	92,546	92,546	.....
146	JOINT STRIKE FIGHTER (JSF)—EMD .....	152,934	267,934	+ 115,000
147	JOINT STRIKE FIGHTER (JSF) .....	108,931	108,931	.....
148	JSF FOLLOW ON DEVELOPMENT—MARINE CORPS .....	144,958	107,312	- 37,646
149	JSF FOLLOW ON DEVELOPMENT—NAVY .....	143,855	106,469	- 37,386
150	INFORMATION TECHNOLOGY DEVELOPMENT .....	14,865	14,865	.....
151	INFORMATION TECHNOLOGY DEVELOPMENT .....	152,977	123,177	- 29,800
152	ANTI-TAMPER TECHNOLOGY SUPPORT .....	3,410	3,410	.....
153	CH-53K .....	340,758	340,758	.....
154	MISSION PLANNING .....	33,430	33,430	.....
155	COMMON AVIONICS .....	58,163	53,512	- 4,651
156	SHIP TO SHORE CONNECTOR (SSC) .....	22,410	32,410	+ 10,000
157	T-AO (X) .....	1,961	1,961	.....
158	UNMANNED CARRIER AVIATION .....	222,208	209,008	- 13,200
159	JOINT AIR-TO-GROUND MISSILE (JAGM) .....	15,473	14,873	- 600
160	MULTI-MISSION MARITIME AIRCRAFT (MMA) .....	11,795	11,795	.....
161	MULTI-MISSION MARITIME AIRCRAFT (MMA) INCREMENT 3 .....	181,731	121,731	- 60,000
162	MARINE CORPS ASSAULT VEHICLES SYSTEM DEVELOPMENT AND DEMO .....	178,993	157,993	- 21,000
163	JOINT LIGHT TACTICAL VEHICLE (JLTV) SYSTEM DEVELOPMENT AND DEMO .....	20,710	20,710	.....
164	DDG-1000 .....	140,500	140,500	.....
168	TACTICAL CRYPTOLOGIC SYSTEMS .....	28,311	28,311	.....
170	CYBER OPERATIONS TECHNOLOGY DEVELOPMENT .....	4,502	4,502	.....
	TOTAL, ENGINEERING & MANUFACTURING DEVELOPMENT .....	6,362,102	6,178,197	- 183,905
	RDT&E MANAGEMENT SUPPORT			
171	THREAT SIMULATOR DEVELOPMENT .....	91,819	91,819	.....
172	TARGET SYSTEMS DEVELOPMENT .....	23,053	23,053	.....
173	MAJOR T&E INVESTMENT .....	52,634	69,634	+ 17,000
174	JOINT THEATER AIR AND MISSILE DEFENSE ORGANIZATION .....	141	141	.....
175	STUDIES AND ANALYSIS SUPPORT—NAVY .....	3,917	3,917	.....
176	CENTER FOR NAVAL ANALYSES .....	50,432	50,432	.....
179	TECHNICAL INFORMATION SERVICES .....	782	782	.....
180	MANAGEMENT, TECHNICAL & INTERNATIONAL SUPPORT .....	94,562	132,062	+ 37,500
181	STRATEGIC TECHNICAL SUPPORT .....	4,313	4,313	.....
182	RDT&E SCIENCE AND TECHNOLOGY MANAGEMENT .....	1,104	1,104	.....
183	RDT&E SHIP AND AIRCRAFT SUPPORT .....	105,666	105,666	.....
184	TEST AND EVALUATION SUPPORT .....	373,667	373,667	.....
185	OPERATIONAL TEST AND EVALUATION CAPABILITY .....	20,298	20,298	.....
186	NAVY SPACE AND ELECTRONIC WARFARE (SEW) SUPPORT .....	17,341	17,341	.....
188	MARINE CORPS PROGRAM WIDE SUPPORT .....	21,751	21,751	.....
189	MANAGEMENT HEADQUARTERS—R&D .....	44,279	44,279	.....

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
190	WARFARE INNOVATION MANAGEMENT .....	28,841	28,841	.....
191	MANAGEMENT HEADQUARTERS (DEPARTMENTAL SUPPORT ACTIVITIES) .....	1,749	1,749	.....
194	SEW SURVEILLANCE/RECONNAISSANCE SUPPORT .....	9,408	9,408	.....
	TOTAL, RDT&E MANAGEMENT SUPPORT .....	945,757	1,000,257	+ 54,500
	OPERATIONAL SYSTEMS DEVELOPMENT			
196	COOPERATIVE ENGAGEMENT CAPABILITY (CEC) .....	92,571	103,571	+ 11,000
197	DEPLOYABLE JOINT COMMAND AND CONTROL .....	3,137	3,137	.....
198	STRATEGIC SUB & WEAPONS SYSTEM SUPPORT .....	135,219	142,219	+ 7,000
199	SSBN SECURITY TECHNOLOGY PROGRAM .....	36,242	36,242	.....
200	SUBMARINE ACOUSTIC WARFARE DEVELOPMENT .....	12,053	12,053	.....
201	NAVY STRATEGIC COMMUNICATIONS .....	18,221	18,221	.....
203	F/A-18 SQUADRONS .....	224,470	137,570	- 86,900
203A	IRST BLOCK II .....	.....	47,900	+ 47,900
204	FLEET TACTICAL DEVELOPMENT .....	33,525	8,525	- 25,000
205	SURFACE SUPPORT .....	24,829	24,829	.....
206	TOMAHAWK AND TOMAHAWK MISSION PLANNING CENTER (TMPC) .....	133,617	106,817	- 26,800
207	INTEGRATED SURVEILLANCE SYSTEM .....	38,972	38,972	.....
208	AMPHIBIOUS TACTICAL SUPPORT UNITS .....	3,940	3,940	.....
209	GROUND/AIR TASK ORIENTED RADAR .....	54,645	54,645	.....
210	CONSOLIDATED TRAINING SYSTEMS DEVELOPMENT .....	66,518	66,518	.....
211	CRYPTOLOGIC DIRECT SUPPORT .....	1,155	1,155	.....
212	ELECTRONIC WARFARE (EW) READINESS SUPPORT .....	51,040	51,040	.....
213	HARM IMPROVEMENT .....	87,989	87,989	.....
214	TACTICAL DATA LINKS .....	89,852	89,852	.....
215	SURFACE ASW COMBAT SYSTEM INTEGRATION .....	29,351	29,351	.....
216	MK-48 ADCAP .....	68,553	49,053	- 19,500
217	AVIATION IMPROVEMENTS .....	119,099	124,099	+ 5,000
218	OPERATIONAL NUCLEAR POWER SYSTEMS .....	127,445	127,445	.....
219	MARINE CORPS COMMUNICATIONS SYSTEMS .....	123,825	136,825	+ 13,000
220	COMMON AVIATION COMMAND AND CONTROL SYSTEM .....	7,343	7,343	.....
221	MARINE CORPS GROUND COMBAT/SUPPORTING ARMS SYSTEMS .....	66,009	66,009	.....
222	MARINE CORPS COMBAT SERVICES SUPPORT .....	25,258	25,258	.....
223	USMC INTELLIGENCE/ELECTRONIC WARFARE SYSTEMS (MIP) .....	30,886	30,886	.....
224	AMPHIBIOUS ASSAULT VEHICLE .....	58,728	58,728	.....
225	TACTICAL AIM MISSILES .....	42,884	36,584	- 6,300
226	ADVANCED MEDIUM RANGE AIR-TO-AIR MISSILE (AMRAAM) .....	25,364	25,364	.....
232	CONSOLIDATED AFLOAT NETWORK ENTERPRISE SERVICES .....	24,271	24,271	.....
233	INFORMATION SYSTEMS SECURITY PROGRAM .....	50,269	50,269	.....
236	JOINT MILITARY INTELLIGENCE PROGRAMS .....	6,352	6,352	.....
237	TACTICAL UNMANNED AERIAL VEHICLES .....	7,770	7,770	.....
238	UAS INTEGRATION AND INTEROPERABILITY .....	39,736	21,936	- 17,800
239	DISTRIBUTED COMMON GROUND SYSTEMS/SURFACE SYSTEMS .....	12,867	12,867	.....
240	DISTRIBUTED COMMON GROUND SYSTEMS/SURFACE SYSTEMS .....	46,150	46,150	.....
241	MQ-4C TRITON .....	84,115	84,115	.....
242	MQ-8 UAV .....	62,656	62,656	.....
243	RQ-11 UAV .....	2,022	2,022	.....
245	SMALL (LEVEL 0) TACTICAL UAS (STUASLO) .....	4,835	4,835	.....
246	RQ-21A .....	8,899	10,649	+ 1,750
247	MULTI-INTELLIGENCE SENSOR DEVELOPMENT .....	99,020	99,020	.....
248	UNMANNED AERIAL SYSTEMS (UAS) PAYLOADS [MIP] .....	18,578	18,578	.....
249	RQ-4 MODERNIZATION .....	229,404	174,404	- 55,000
250	MODELING AND SIMULATION SUPPORT .....	5,238	5,238	.....
251	DEPOT MAINTENANCE (NON-IF) .....	38,227	26,879	- 11,348
252	MARITIME TECHNOLOGY (MARITECH) .....	4,808	4,808	.....
253	SATELLITE COMMUNICATIONS (SPACE) .....	37,836	37,836	.....
	TOTAL, OPERATIONAL SYSTEMS DEVELOPMENT .....	2,615,793	2,452,795	- 162,998
9999	CLASSIFIED PROGRAMS .....	1,364,347	1,461,747	+ 97,400
	TOTAL, RESEARCH, DEVELOPMENT, TEST & EVAL, NAVY	17,650,035	17,628,000	- 22,035

## COMMITTEE RECOMMENDED ADJUSTMENTS

The following table details the adjustments recommended by the Committee:

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
4	Power Projection Applied Research .....	13,553	18,553	+ 5,000
	Program increase: High performance microwave for counter-IED research .....			+ 5,000
5	Force Protection Applied Research .....	125,557	174,057	+ 48,500
	Program increase .....			+ 26,500
	Program increase: Alternative energy research .....			+ 15,000
	Program increase: Hybrid composite structures research for enhanced mobility .....			+ 5,000
	Program increase: Standoff detection of buried hazards .....			+ 2,000
6	Marine Corps Landing Force Technology .....	53,936	55,936	+ 2,000
	Program increase .....			+ 2,000
9	Electromagnetic Systems Applied Research .....	79,598	85,598	+ 6,000
	Program increase .....			+ 6,000
10	Ocean Warfighting Environment Applied Research .....	42,411	49,911	+ 7,500
	Program increase .....			+ 7,500
12	Undersea Warfare Applied Research .....	56,094	61,094	+ 5,000
	Program increase .....			+ 5,000
14	Mine and Expeditionary Warfare Applied Research .....	32,733	35,233	+ 2,500
	Program increase .....			+ 2,500
19	Force Protection Advanced Technology .....	26,342	54,342	+ 28,000
	Program increase: Navy autonomous swarmboats .....			+ 28,000
21	USMC Advanced Technology Demonstration [ATD] .....	154,407	166,907	+ 12,500
	Program increase .....			+ 12,500
25	Warfighter Protection Advanced Technology .....	4,878	12,878	+ 8,000
	Program increase: Novel therapeutic interventions research .....			+ 8,000
26	Undersea Warfare Advanced Technology .....		10,000	+ 10,000
	Program increase: Unmanned underwater vehicle research .....			+ 10,000
29	Innovative Naval Prototypes [INP] Advanced Technology Development .....	108,285	128,485	+ 20,200
	Program increase: Solid state laser technology maturation .....			+ 8,200
	Program increase: Ruggedized high energy laser .....			+ 12,000
36	Advanced Combat Systems Technology .....	61,381	7,745	- 53,636
	Transfer to line 36a for execution: Project 0385 Expeditionary SURTASS .....			- 20,000
	Insufficient budget justification: Project 0399 .....			- 15,361
	Insufficient budget justification: Projects 3422, 3423, 3424 .....			- 18,275
36a	Rapid Prototyping, Experimentation and Demonstration .....		24,050	+ 24,050
	Transfer from line 36 for execution—Expeditionary SURTASS .....			+ 20,000
	Program increase: Expeditionary SURTASS .....			+ 4,050
37	Surface and Shallow Water Mine Countermeasures .....	154,117	77,407	- 76,710
	Program increase: Unmanned influence sweep system .....			+ 13,000
	Transfer to line 37A: Projects 0530, 1235, 1233 .....			- 12,900
	Transfer to line 37B: Project 2131 .....			- 11,623
	Transfer to line 87A: Project 2094 .....			- 60,187
	Restoring acquisition accountability: Barracuda schedule delays .....			- 5,000
37A	Surface Mine Countermeasures .....		12,900	+ 12,900
	Transfer from line 37: Projects 0530, 1235, 1233 .....			+ 12,900
37B	Airborne Littoral MCM .....		11,623	+ 11,623
	Transfer from line 37: Project 2131 .....			+ 11,623
40	PILOT FISH .....	132,083	111,383	- 20,700
	Program adjustment .....			- 20,700
45	Advanced Submarine System Development .....	100,955	89,955	- 11,000

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
	Restoring acquisition accountability: Project 2096 program adjustment .....			- 11,000
47	Ship Concept Advanced Design .....	36,891	21,316	- 15,575
	Restoring acquisition accountability: Future surface combatant studies early to need .....			- 22,000
	Transfer from National Defense Sealift Fund: Strategic Sealift Research & Development .....			+ 6,425
48	Ship Preliminary Design & Feasibility Studies .....	12,012	23,741	+ 11,729
	Transfer from National Defense Sealift Fund: Naval Operational Logistics Integration .....			+ 11,729
53	Combat System Integration .....	24,674	20,274	- 4,400
	Program termination: Existing processes replaced by Digital Warfare Office .....			- 4,400
54	Ohio Replacement .....	776,158	801,158	+ 25,000
	Program increase: Advanced materials propeller program .....			+ 25,000
55	LCS Mission Modules .....	116,871	96,871	- 20,000
	Restoring acquisition accountability: Anti-submarine warfare mission package program delays .....			- 20,000
57	Frigate Development .....	143,450	113,450	- 30,000
	Restoring acquisition accountability: Accelerate FFG (X) program .....			- 50,000
	Program increase: Government and industry source selection preparation .....			+ 20,000
61	Joint Service Explosive Ordnance Development .....	53,367	49,867	- 3,500
	Restoring acquisition accountability: Mk18 Mod2 contract award delay .....			- 3,500
65	Navy Energy Program .....	25,623	39,623	+ 14,000
	Program increase: Natural gas technologies .....			+ 4,000
	Program increase: Renewable energy technologies .....			+ 10,000
66	Facilities Improvement .....	2,837	6,837	+ 4,000
	Program increase .....			+ 4,000
70	LINK PLUMERIA .....	253,675	402,575	+ 148,900
	Program adjustments .....			+ 148,900
75	Land Attack Technology .....	33,568	18,568	- 15,000
	Insufficient budget justification: AGS projectile unjustified request .....			- 15,000
78	Directed Energy and Electric Weapon Systems .....	107,310	99,310	- 8,000
	Restoring acquisition accountability: SNLWS limit material/long lead items to single system only .....			- 14,000
	Program increase: High energy storage modules .....			+ 6,000
85	Rapid Technology Capability Prototype .....	7,055	17,055	+ 10,000
	Program increase: Increase rapid acquisition capability for Marine Corps Warfighting Lab .....			+ 10,000
87A	Unmanned Undersea Vehicle .....		22,687	+ 22,687
	Transfer from line 37: LDUUV .....			+ 60,187
	Restoring acquisition accountability: LDUUV UUV program concurrency .....			- 37,500
89	Precision Strike Weapons Development Program .....	31,315	22,715	- 8,600
	Restoring acquisition accountability: Project 3378 analysis of alternatives completed .....			- 8,600
96	Training System Aircraft .....	16,945	18,545	+ 1,600
	Program increase: T-45 and F/A-18 physiological episodes funding .....			+ 1,600
98	AV-8B Aircraft—Eng Dev .....	48,780	45,680	- 3,100
	Restoring acquisition accountability: AIM 120C Final Fit lack of full funding .....			- 3,100
101	Air/Ocean Equipment Engineering .....	782	5,782	+ 5,000
	Program increase: Unmanned systems in maritime environment .....			+ 5,000
104	Tactical Command System .....	55,695	49,745	- 5,950
	Program termination: Existing processes replaced by Digital Warfare Office .....			- 5,950
105	Advanced Hawkeye .....	292,535	302,535	+ 10,000
	Program increase: Radar enhancements .....			+ 10,000

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
108	V-22A .....	171,386	186,386	+ 15,000
	Program increase: MV-22 CC-RAM nacelle improvements .....			+ 15,000
109	Air Crew Systems Development .....	13,235	14,195	+ 960
	Program increase: T-45 and F/A-18 physiological episodes funding .....			+ 960
110	EA-18 .....	173,488	141,488	- 32,000
	Insufficient budget justification: ICP 3 unjustified growth .....			- 32,000
111	Electronic Warfare Development .....	54,055	57,055	+ 3,000
	Program increase: Intrepid Tiger [IT] II (V) 3 UH-1Y jet-tison capability .....			+ 3,000
113	Next Generation Jammer [NGJ] .....	632,936	617,936	- 15,000
	Insufficient budget justification: integration delays .....			- 15,000
116	Surface Combatant Combat System Engineering .....	390,238	333,738	- 56,500
	Restoring acquisition accountability: FTIIP unjustified growth .....			- 11,000
	Restoring acquisition accountability: ACB 12 BL 9.A1 lack of justification .....			- 21,000
	Restoring acquisition accountability: ACB 20 unjustified growth .....			- 10,000
	Restoring acquisition accountability: 5.3x upgrade unjustified growth .....			- 14,500
119	Standard Missile Improvements .....	158,578	133,578	- 25,000
	Restoring acquisition accountability: SM-2 improvements ECP program adjustment due to cost .....			- 25,000
132	Ship Contract Design/ Live Fire T&E .....	67,166	67,634	+ 468
	Transfer from National Defense Sealift Fund: Maritime Prepositioning Force (Future) .....			+ 468
138	Personnel, Training, Simulation, and Human Factors .....	40,828	24,728	- 16,100
	Restore acquisition accountability: MPT&E— Fund ADE strategy, architecture, design efforts and MPTE Core Field Test only .....			- 16,100
140	Ship Self Defense (Detect & Control) .....	161,713	164,713	+ 3,000
	Program increase: C2 systems for amphibs—integrating CAC2S with SSDS .....			+ 3,000
143	Intelligence Engineering .....	34,855	44,855	+ 10,000
	Program increase: Maritime port security technology integration .....			+ 10,000
146	Joint Strike Fighter [JSF]—EMD .....	152,934	267,934	+ 115,000
	Program increase: STOVL third life-cycle test aircraft .....			+ 115,000
148	Joint Strike Fighter Follow On Modernization [FoM]—Marine Corps .....	144,958	107,312	- 37,646
	Improving funds management: Follow on modernization early to need .....			- 37,646
149	Joint Strike Fighter Follow On Modernization [FoM]—Navy .....	143,855	106,469	- 37,386
	Improving funds management: Follow on modernization early to need .....			- 37,386
151	Information Technology Development .....	152,977	123,177	- 29,800
	MPT&E: ADE prototype concurrency .....			- 9,800
	MPT&E Core: Integration concurrency .....			- 17,000
	NMMES-TR acceleration concurrency with NMMES upgrades to support clean financial audit .....			- 13,000
	Enterprise product lifecycle management analytics for affordability .....			+ 10,000
155	Common Avionics .....	58,163	53,512	- 4,651
	Program termination: Existing processes replaced by Digital Warfare Office .....			- 4,651
156	Ship to Shore Connector [SSC] .....	22,410	32,410	+ 10,000
	Program increase: Composites research .....			+ 10,000
158	Unmanned Carrier Aviation [UCA] .....	222,208	209,008	- 13,200
	Control segment and connectivity unjustified growth .....			- 13,200
159	Joint Air-to-Ground Missile [JAGM] .....	15,473	14,873	- 600
	Restoring acquisition accountability: Unjustified studies .....			- 600

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
161	Multi-Mission Maritime [MMA] Increment III .....	181,731	121,731	- 60,000
	Restoring acquisition accountability: Increment III content and funding adjustment lack of justification .....			- 60,000
162	Marine Corps Assault Vehicles System Development & Demonstration .....	178,993	157,993	- 21,000
	Restoring acquisition accountability: Corrective action modifications .....			- 21,000
173	Major T&E Investment .....	52,634	69,634	+ 17,000
	Program increase .....			+ 4,000
	Program increase: Critical infrastructure investments for major range and test facilities—Navy unfunded requirements .....			+ 7,000
	Program increase: Critical infrastructure investments for major range and test facilities—Navy unfunded requirements .....			+ 6,000
180	Management, Technical & International Support .....	94,562	132,062	+ 37,500
	Program increase: Printed circuit board .....			+ 7,500
	Program increase: Navy Research Lab infrastructure upgrades .....			+ 30,000
196	Cooperative Engagement Capability [CEC] .....	92,571	103,571	+ 11,000
	Program increase: CEC identification friend or foe [IFF] Mode 5 acceleration .....			+ 11,000
198	Strategic Sub & Weapons System Support .....	135,219	142,219	+ 7,000
	Program increase .....			+ 7,000
203	F/A-18 Squadrons .....	224,470	137,570	- 86,900
	Transfer to line 203A: IRST Block II development .....			- 86,900
203A	IRST Block II .....		47,900	+ 47,900
	Transfer from line 203: IRST Block II development .....			+ 86,900
	Restoring acquisition accountability: Infrared search and track contract award delay .....			- 39,000
204	Fleet Telecommunications (Tactical) .....	33,525	8,525	- 25,000
	Restoring acquisition accountability: HFORCE .....			- 25,000
206	Tomahawk and Tomahawk Mission Planning Center [TMPC] .....	133,617	106,817	- 26,800
	Restoring acquisition accountability: JMEWS ECP product development lack of cost data .....			- 7,000
	Restoring acquisition accountability: M-Code ECP product development lack of cost data .....			- 19,800
216	MK-48 ADCAP .....	68,553	49,053	- 19,500
	Restoring acquisition accountability: TI-1 contract award delay .....			- 19,500
217	Aviation Improvements .....	119,099	124,099	+ 5,000
	Program increase .....			+ 5,000
219	Marine Corps Communications Systems .....	123,825	136,825	+ 13,000
	Program increase: Radar system sustainment .....			+ 13,000
225	Tactical AIM Missiles .....	42,884	36,584	- 6,300
	Restoring acquisition accountability: System improvement program [SIP] program delays .....			- 6,300
238	UAS Integration and Interoperability .....	39,736	21,936	- 17,800
	Restoring acquisition accountability: Lack of transition plans from unmanned aerial vehicle control system software development programs .....			- 17,800
246	RQ-21A .....	8,899	10,649	+ 1,750
	Program increase: Spectral and reconnaissance imagery for tactical exploitation .....			+ 1,750
249	RQ-4 Modernization .....	229,404	174,404	- 55,000
	Restoring acquisition accountability: Program risk and concurrency .....			- 55,000
251	Depot Maintenance (Non-IF) .....	38,227	26,879	- 11,348
	MH-60 SLAP program adjustment .....			- 11,348
999	Classified programs .....	1,364,347	1,461,747	+ 97,400
	Classified adjustment .....			+ 97,400

*Rapid Prototyping, Experimentation and Demonstration.*—The fiscal year 2018 President’s budget request contains \$162,000,000 in Research, Development, Test and Evaluation, Navy lines 29, 36, and 78 for several Rapid Prototyping, Experimentation and Demonstration [RPED] projects designated as “Accelerated Acquisitions for the Rapid Development, Demonstration and Fielding of Capability” by the Chief of Naval Operations and the Assistant Secretary of the Navy (Research, Development and Acquisition). The Committee notes that subsequent to the budget submission, the Navy identified to the Committee additional requirements of \$121,000,000 for these projects that are being addressed through funding flexibilities granted by Congress via below threshold reprogramming authority, above threshold reprogramming authority, and additional funds recommended by the Committee in this bill. The Committee continues to expect timely and complete communication from the Secretary of the Navy and the Chief of Naval Operations regarding RPED projects, to include cost, schedule, as well as progress against previously identified objectives and transition plans, and will continue to review each project on its requirement, merit, technology and manufacturing readiness, cost, schedule, and performance. Finally, the Committee notes that several projects selected for accelerated acquisitions were previously either rejected by the Navy or initiated without a full understanding of system design maturity, full development costs, or schedule requirements, which resulted in unbudgeted funding requirements. The Committee expects the Secretary of the Navy and the Chief of Naval Operations, through their respective designees, to exercise the appropriate acquisition rigor and fiscal oversight for all proposed accelerated acquisition programs.

*Surface and Shallow Water Mine Countermeasures.*—The fiscal year 2018 President’s budget request includes \$154,117,000 for numerous programs and projects in the program element for Surface and Shallow Water Mine Countermeasures, an increase of more than 66 percent from 2 years ago. The Committee finds the current budget structure and associated nomenclature unnecessarily obfuscating and, after consultation with the Assistant Secretary of the Navy (Financial Management and Comptroller), recommends realigning funds for the projects as displayed in the table of Committee Recommended Adjustments. The Assistant Secretary of the Navy (Financial Management and Comptroller) is directed to follow this format in future budget submissions.

*FFG (X) Acquisition.*—The fiscal year 2018 President’s budget request includes \$143,450,000 in Research, Development, Test and Evaluation, Navy for the conceptual design and development of the Navy’s FFG (X) Frigate, a multi-mission platform designed for operation in littoral and blue water environments. The Committee understands that Frigate capabilities will include an increased air warfare capability in both self-defense and escort roles, enhanced survivability specifically focused on reduced vulnerability, and increased electromagnetic maneuver warfare capability. The Committee further understands that these capabilities were added to the Frigate program due to a changing threat environment that impacts naval concepts of operations. Therefore, the Committee is concerned that with submission of the fiscal year 2018 President’s

budget, the Navy changed the Littoral Combat Ship (LCS)/Frigate acquisition strategy by extending the period for Frigate conceptual design and studies and delaying the acquisition of FFG (X) Frigates by one year. Given the contested threat environment, the Committee recommends accelerating the Frigate acquisition program and recommends an increase of \$20,000,000 to advance Government and industry source selection efforts in support of a competitive FFG (X) acquisition.

*Marine Corps Rapid Capabilities Office.*—The fiscal year 2018 President’s budget request includes \$7,055,000 for the Marine Corps Rapid Capabilities Office [MCRCO]. The Committee recommends \$17,055,000, an increase of \$10,000,000, and directs that none of these funds may be obligated or expended until the Marine Corps provides an update to the Committee on the status of plans and decisions for pending projects and projects under review. The Committee notes the positive congressional engagements by the Marine Corps Rapid Capabilities Office with the Committee regarding program plans and expects these communications to continue and accelerate as projects are reviewed and initiated.

*EA-18G Modernization.*—The fiscal year 2018 President’s budget request includes \$173,488,000 for modernization of the EA-18G, an increase of \$69,044,000 over amounts appropriated in fiscal year 2017 and \$126,567,000 over amounts appropriated in fiscal year 2016. The Committee has previously supported continued modernization of the EA-18G through flight plan spiral capability development. However, the Committee is concerned by the poor justification of these budget requests, to include insufficient details regarding content, requirements changes, as well as adjustments to previous plans, schedules and budgets. In fiscal year 2018, a significant amount of the budget request is explained as being for “Wholeness”. The Committee finds this unsatisfactory and recommends \$141,488,000 for EA-18G modernization in fiscal year 2018, a reduction of \$32,000,000 from the request, and consistent with amounts planned for flight plan upgrades in the previous budget submission.

*Surface Combatant Combat Systems Engineering.*—The fiscal year 2018 President’s budget request includes \$390,238,000, an increase of \$114,474,000 over amounts enacted in fiscal year 2017, for further development and integration of modifications to the AEGIS Weapon System. The Committee notes the significant capabilities the AEGIS combat system provides to the warfighter, to include countering current and expected future air, ballistic missile, surface and sub-surface threats. However, the Committee is concerned by the repeated annual programmatic, fiscal, and schedule perturbations in the Navy’s program. Further, the Committee is concerned by the apparent disconnect between the Navy and the Missile Defense Agency regarding Aegis baselines with Integrated Air and Missile Defense Capability, to include nomenclature, schedules, as well as joint and unique funding requirements. The Committee encourages the Navy and Missile Defense Agency to improve joint program efforts regarding the Aegis Integrated Air and Missile Defense Capability.

*P-8A Poseidon.*—The fiscal year 2018 President’s budget request includes \$181,731,000 for continued development of P-8A Poseidon



Increment III, an increase of \$69,411,000 over amounts appropriated in fiscal year 2017. The Committee remains concerned by the lack of budget clarity for the multiple engineering change proposals being developed under Increment III, which remains the budgetary equivalent of a major defense acquisition program, and sees no justification for an increase to the budget. Therefore, the Committee recommends a reduction of \$60,000,000.

*Costs of Engineering Change Proposals for Missile Programs.*—The fiscal year 2018 President's budget request includes no less than \$101,000,000 for five development efforts of the Tomahawk weapons system that the Navy plans to incorporate into current Tomahawk missiles through a series of engineering change proposals during the missiles' recertification process. The development of these modernization initiatives is budgeted at close to \$900,000,000 over the next 5 years, and cutting these efforts into production will significantly increase the Tomahawk missile's unit cost. The Committee recognizes and strongly supports the need to modernize the Tomahawk and other weapons systems through incremental upgrades, but is concerned that the Navy historically has failed to recognize the true cost of developing and procuring missile upgrades through engineering change proposals upfront. The Committee notes that as a result, when previously funded engineering change proposals transitioned from development to production, the Navy has had to reduce planned procurement quantities due to higher than budgeted costs. This has resulted in a loss of fielded capacity of at least two other families of missiles. The Committee directs the Assistant Secretary of the Navy (Research, Development and Acquisition) to review the Navy's acquisition practices for engineering change proposals in all its missile programs, to include cost estimating as well as measures to inject competition into modernization efforts, and to report back to the congressional defense committees with submission of the Fiscal Year 2019 budget request with his findings. Further, the Committee recommends no funds, a reduction of \$26,800,000, to initiate two new engineering change proposals for the Tomahawk weapon system in fiscal year 2018.

*Advanced Energetics Research.*—The Committee notes advances made by our adversaries in advanced energetics and believes the United States would benefit from a renewed, long-term investment in research and development for advanced energetics to increase the lethality, range and speed of weapons, develop new leap-ahead capabilities, and grow the national energetics workforce. Therefore, the Committee recommends additional funds for multi-domain research, development, prototyping and experimentation to lead to energetic weapons improvement. The Committee encourages the Office of Naval Research to execute the funding for the necessary efforts best suited to advance the overall knowledge, expertise and capability of energetics, to conduct a pilot program in rapid prototyping, technology transfer, technology business incubation and continuing education for the Navy energetics workforce, and to incorporate these developments into advanced weapon systems, when technologically feasible, as appropriate.

*Navy Alternative Energy Research.*—The Committee recommends \$15,000,000 in additional funds for Navy alternative energy re-

search, and \$10,000,000 for renewable energy technologies. The Committee notes the fiscal and operational value of investing in alternative energy research and encourages the Navy to continue research, development, test and deployment of advanced energy systems that have the potential to reduce the cost of energy and increase energy security, reliability and resiliency at Department of Defense facilities. The Committee understands that the integration of emerging land- and ocean-based energy generation and energy efficiency technologies could potentially improve the operational security and resiliency of critical physical and cyber-physical infrastructure and encourages the Navy to invest in energy demonstration activities relating to Department of Defense facilities and activities in coordination with other Federal agencies and entities.

*Power Generation and Energy Storage Research.*—The Committee continues to support Navy investments in power generation and energy storage research. The Committee notes that the development and deployment of lithium-ion batteries are critical to Department of Defense missions, but that safety incidents restrict their operational use. Therefore, the Committee believes that the development and qualification of technologies that improve the safety in lithium-ion batteries should be a research priority.

*Marine Corps Asset Life-Cycle Management.*—The Committee supports Marine Corps' efforts to reduce costs associated with routine equipment maintenance through further research and development in the areas of remanufacturing and vehicle monitoring. The Committee encourages the Office of Naval Research to continue its efforts in this area.

*Improved Optical Space Surveillance.*—The Committee understands the importance of improving ground-based space situational awareness, and encourages the Naval Research Laboratory to continue investments that significantly extend U.S. National space situational awareness capabilities.

*Ocean Warfighting Environment.*—The Committee notes the importance of basic research of the natural environment for technological developments that provide new or enhanced warfare capabilities for the battlespace environment, to include measuring, analyzing, modeling and simulating environmental factors affecting naval material and operations in the battlespace environment. The Chief of Naval Research is directed to provide a report to the congressional defense committees within 180 days after enactment of this act detailing the research being conducted in these areas, to include an assessment of ways to streamline the transition of technology through the science and technology "valley of death."

*Research and Workforce Partnerships for Submarine and Undersea Vehicle Programs.*—In order to support a potential increase in Navy submarine force structure, the Committee encourages the Chief of Naval Research and the Assistant Secretary of the Navy (Research, Development and Acquisition) to build stronger partnerships between the Office of Naval Research laboratories, Navy program offices, academia and U.S. nuclear shipyards for the purposes of leveraging additional research facilities, manufacturing tools and engineering expertise that will strengthen industrial capacity.

*Coastal Environmental Research.*—The Committee notes the importance of the littorals to the Navy and encourages the Chief of

Naval Research to focus additional research on the characteristics of the magnetic, electric, and acoustic ambient fields in the coastal ocean regions, and the development of predictive techniques to distinguish ships and submarines from naturally occurring background features.

*Silicon Carbide Power Modules.*—The Committee notes the recommendations in the 2015 Naval Power and Energy System Technology Development Roadmap for the development of advanced power electronics, to include silicon carbide power modules, which the Committee understands can reduce the size and weight of electronic systems needed to power advanced sensors and weapon systems. Noting space limitations in a shipboard environment, the Committee encourages the Chief of Naval Research to invest in cost reduction initiatives and the qualification of silicon carbide power modules in order to enable planned deployment of high-power, mission-critical systems on Navy platforms in the near future.

*Unmanned Systems in a Maritime Environment.*—The Committee recognizes the importance of unmanned maritime systems and the numerous challenges to incorporating these novel technologies onto the battlefield. The Committee understands that the development of a test range for unmanned maritime systems is underway and that ongoing oceanographic measurements in the region of the range are a critical gap. The Navy is encouraged to develop partnerships with research universities and to leverage the national oceanographic expertise to enhance Naval capabilities and fill this critical gap.

*Maritime Port Security Technology.*—The Committee notes the maritime security threats facing U.S. military and commercial ports, and the danger these pose to the Department of Defense, U.S. industry and critical maritime infrastructure. Therefore, the Committee recommends additional funds for the development of a maritime security technology integration framework to develop capabilities to support maritime surveillance, detection and warning.

*Aircraft Engine Noise Reduction.*—The Committee understands the difficulties near-field and far-field aircraft engine noise poses for communities surrounding military installations and service members working in close proximity to military aircraft. The Committee notes that the Navy has pursued noise reduction solutions, and understands that variable exhaust nozzle seal chevron technologies have the potential to contribute to noise reduction. The Committee encourages the Navy to continue to pursue researching these technologies.

*Spectral and Reconnaissance Imagery for Tactical Exploitation.*—The Committee is aware of the versatility and broad application the spectral and reconnaissance imagery for tactical exploitation sensor system brings to the warfighter in support of intelligence, surveillance and reconnaissance missions. The Committee understands that certain capabilities are available for integration and testing on current unmanned aircraft prior to the complete system being available and encourages the Navy to accelerate integration and test of these modular sensor systems.

*Synthetic Biology.*—The Committee recognizes the potential for synthetic biology to enable the manufacture of pharmaceuticals,

fuels, and industrial chemicals using environmentally low impact and cost effective processes. The Committee urges the Department of Defense (DoD), through the Office for Naval Research, to support basic research and engineering on the rapid development of cell-free biosynthesis of commercially important molecules, by combining high throughput screening methods, rapid protein production, and computational analysis.

*Materials Research.*—The Committee urges the Office of Naval Research to support research and development that addresses materials homogeneity and integration related to electronic and photonic technologies. The results of fundamental electronic and photonic materials research can be more rapidly translated into military and commercial applications in portable electronics and displays, such as sensors, communications systems, power systems, and enemy monitoring technology.

*Improving Performance of Military Platforms.*—The Committee notes that turbulent boundary layers form along the surfaces of aircraft and marine platforms, and produce a force that opposes the motion of the subject vehicle. The Committee further notes that mitigating such drag can reduce fuel consumption and optimize performance of military platforms, such as ships, submarines, and transport and fighter aircraft. However, there is only limited domestic capability to study and quantify the impact of turbulent boundary layers on Naval platforms. Therefore, the Committee encourages the Office of Naval Research to review its existing infrastructure and technical capabilities to experimentally quantify aircraft and marine platforms turbulence, and to address any identified gaps.

#### RESEARCH, DEVELOPMENT, TEST AND EVALUATION, AIR FORCE

Appropriations, 2017 .....	\$27,788,548,000
Budget estimate, 2018 .....	34,914,359,000
Committee recommendation .....	36,587,419,000

The Committee recommends an appropriation of \$36,587,419,000. This is \$1,673,060,000 above the budget estimate.

#### COMMITTEE RECOMMENDED PROGRAM

The following table summarizes the budget estimate for this appropriation, the Committee recommendation, and the Committee recommended adjustments to the budget estimate:

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
	RESEARCH, DEVELOPMENT, TEST & EVAL, AIR FORCE			
	BASIC RESEARCH			
1	DEFENSE RESEARCH SCIENCES .....	342,919	342,919	.....
2	UNIVERSITY RESEARCH INITIATIVES .....	147,923	147,923	.....
3	HIGH ENERGY LASER RESEARCH INITIATIVES .....	14,417	14,417	.....
	TOTAL, BASIC RESEARCH .....	505,259	505,259	.....
	APPLIED RESEARCH			
4	MATERIALS .....	124,264	144,264	+ 20,000
5	AEROSPACE VEHICLE TECHNOLOGIES .....	124,678	139,678	+ 15,000
6	HUMAN EFFECTIVENESS APPLIED RESEARCH .....	108,784	108,784	.....

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
7	AEROSPACE PROPULSION .....	192,695	197,695	+ 5,000
8	AEROSPACE SENSORS .....	152,782	159,282	+ 6,500
9	SCIENCE AND TECHNOLOGY MANAGEMENT—MAJOR HEAD- QUARTERS .....	8,353	8,353	.....
10	SPACE TECHNOLOGY .....	116,503	156,103	+ 39,600
11	CONVENTIONAL MUNITIONS .....	112,195	112,195	.....
12	DIRECTED ENERGY TECHNOLOGY .....	132,993	132,993	.....
13	DOMINANT INFORMATION SCIENCES AND METHODS .....	167,818	189,318	+ 21,500
14	HIGH ENERGY LASER RESEARCH .....	43,049	43,049	.....
	TOTAL, APPLIED RESEARCH .....	1,284,114	1,391,714	+ 107,600
	ADVANCED TECHNOLOGY DEVELOPMENT			
15	ADVANCED MATERIALS FOR WEAPON SYSTEMS .....	37,856	37,856	.....
16	SUSTAINMENT SCIENCE AND TECHNOLOGY (S&T) .....	22,811	22,811	.....
17	ADVANCED AEROSPACE SENSORS .....	40,978	47,978	+ 7,000
18	AEROSPACE TECHNOLOGY DEV/DEMO .....	115,966	115,966	.....
19	AEROSPACE PROPULSION AND POWER TECHNOLOGY .....	104,499	122,999	+ 18,500
20	ELECTRONIC COMBAT TECHNOLOGY .....	60,551	60,551	.....
21	ADVANCED SPACECRAFT TECHNOLOGY .....	58,910	83,910	+ 25,000
22	MAUI SPACE SURVEILLANCE SYSTEM [MSSS] .....	10,433	10,433	.....
23	HUMAN EFFECTIVENESS ADVANCED TECHNOLOGY DEVELOPMENT	33,635	33,635	.....
24	CONVENTIONAL WEAPONS TECHNOLOGY .....	167,415	167,415	.....
25	ADVANCED WEAPONS TECHNOLOGY .....	45,502	45,502	.....
26	MANUFACTURING TECHNOLOGY PROGRAM .....	46,450	55,050	+ 8,600
27	BATTLESPACE KNOWLEDGE DEVELOPMENT & DEMONSTRATION ..	49,011	55,011	+ 6,000
	TOTAL, ADVANCED TECHNOLOGY DEVELOPMENT .....	794,017	859,117	+ 65,100
	ADVANCED COMPONENT DEVELOPMENT			
28	INTELLIGENCE ADVANCED DEVELOPMENT .....	5,652	7,652	+ 2,000
30	COMBAT IDENTIFICATION TECHNOLOGY .....	24,397	24,397	.....
31	NATO RESEARCH AND DEVELOPMENT .....	3,851	3,851	.....
33	INTERCONTINENTAL BALLISTIC MISSILE .....	10,736	30,736	+ 20,000
34	POLLUTION PREVENTION (DEM/VAL) .....	2	2	.....
35	LONG RANGE STRIKE .....	2,003,580	2,003,580	.....
36	INTEGRATED AVIONICS PLANNING AND DEVELOPMENT .....	65,458	65,458	.....
37	ADVANCED TECHNOLOGY AND SENSORS .....	68,719	88,349	+ 19,630
38	NATIONAL AIRBORNE OPS CENTER [NAOC] RECAP .....	7,850	4,850	- 3,000
39	TECHNOLOGY TRANSFER .....	3,295	18,295	+ 15,000
40	HARD AND DEEPLY BURIED TARGET DEFEAT SYSTEM .....	17,365	14,065	- 3,300
41	CYBER RESILIENCY OF WEAPON SYSTEMS—ACS .....	32,253	42,453	+ 10,200
44	DEPLOYMENT AND DISTRIBUTION ENTERPRISE R&D .....	26,222	26,222	.....
46	TECH TRANSITION PROGRAM .....	840,650	1,026,650	+ 186,000
47	GROUND BASED STRATEGIC DETERRENT .....	215,721	200,621	- 15,100
49	NEXT GENERATION AIR DOMINANCE .....	294,746	294,746	.....
50	THREE DIMENSIONAL LONG-RANGE RADAR .....	10,645	10,645	.....
52	COMMON DATA LINK EXECUTIVE AGENT (CDL EA) .....	41,509	41,509	.....
53	CYBER OPERATIONS TECHNOLOGY DEVELOPMENT .....	226,287	194,487	- 31,800
54	ENABLED CYBER ACTIVITIES .....	16,687	16,687	.....
55	SPECIAL TACTICS/COMBAT CONTROL .....	4,500	4,500	.....
56	CONTRACTING INFORMATION TECHNOLOGY SYSTEM .....	15,867	15,867	.....
57	NAVSTAR GLOBAL POSITIONING SYSTEM (USER EQUIPMENT) (SPACE) .....	253,939	332,439	+ 78,500
58	EO/IR WEATHER SYSTEMS .....	10,000	10,000	.....
59	WEATHER SYSTEM FOLLOW-ON .....	112,088	102,088	- 10,000
60	SPACE SITUATION AWARENESS SYSTEMS .....	34,764	44,764	+ 10,000
61	MIDTERM POLAR MILSATCOM SYSTEM .....	63,092	63,092	.....
62	SPACE CONTROL TECHNOLOGY .....	7,842	128,642	+ 120,800
63	SPACE SECURITY AND DEFENSE PROGRAM .....	41,385	38,385	- 3,000
64	PROTECTED TACTICAL ENTERPRISE SERVICE (PTES) .....	18,150	18,150	.....
65	PROTECTED TACTICAL SERVICE (PTS) .....	24,201	24,201	.....
66	PROTECTED SATCOM SERVICES (PSCS)—AGGREGATED .....	16,000	16,000	.....
67	OPERATIONALLY RESPONSIVE SPACE .....	87,577	87,577	.....

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
	TOTAL, ADVANCED COMPONENT DEVELOPMENT .....	4,605,030	5,000,960	+ 395,930
	ENGINEERING & MANUFACTURING DEVELOPMENT			
68	FUTURE ADVANCED WEAPON ANALYSIS & PROGRAMS .....	5,100	5,100	.....
69	INTEGRATED AVIONICS PLANNING AND DEVELOPMENT .....	101,203	101,203	.....
70	NUCLEAR WEAPONS SUPPORT .....	3,009	3,009	.....
71	ELECTRONIC WARFARE DEVELOPMENT .....	2,241	2,241	.....
72	TACTICAL DATA NETWORKS ENTERPRISE .....	38,250	38,250	.....
73	PHYSICAL SECURITY EQUIPMENT .....	19,739	19,739	.....
74	SMALL DIAMETER BOMB [SDB] .....	38,979	38,979	.....
78	AIRBORNE ELECTRONIC ATTACK .....	7,091	2,091	- 5,000
80	ARMAMENT/ORDNANCE DEVELOPMENT .....	46,540	46,540	.....
81	SUBMUNITIONS .....	2,705	2,705	.....
82	AGILE COMBAT SUPPORT .....	31,240	37,740	+ 6,500
84	LIFE SUPPORT SYSTEMS .....	9,060	9,060	.....
85	COMBAT TRAINING RANGES .....	87,350	83,850	- 3,500
86	F-35—EMD .....	292,947	292,947	.....
88	LONG RANGE STANDOFF WEAPON .....	451,290	451,290	.....
89	ICBM FUZE MODERNIZATION .....	178,991	178,991	.....
90	JOINT TACTICAL NETWORK CENTER (JTNC) .....	12,736	12,736	.....
91	JOINT TACTICAL NETWORK (JTN) .....	9,319	9,319	.....
92	F-22 MODERNIZATION INCREMENT 3.2B .....	13,600	13,600	.....
94	NEXT GENERATION AERIAL REFUELING AIRCRAFT KC-46 .....	93,845	83,845	- 10,000
95	ADVANCED PILOT TRAINING .....	105,999	86,199	- 19,800
96	COMBAT RESCUE HELICOPTER .....	354,485	354,485	.....
100	AIR AND SPACE OPS CENTER 10.2 .....	119,745	5,000	- 114,745
101	B-2 DEFENSIVE MANAGEMENT SYSTEM .....	194,570	143,370	- 51,200
102	NUCLEAR WEAPONS MODERNIZATION .....	91,237	91,237	.....
103	F-15 EPAWSS .....	209,847	209,847	.....
104	STAND IN ATTACK WEAPON .....	3,400	3,400	.....
105	FULL COMBAT MISSION TRAINING .....	16,727	8,727	- 8,000
109	NEXTGEN JSTARS .....	417,201	405,451	- 11,750
110	C-32 EXECUTIVE TRANSPORT RECAPITALIZATION .....	6,017	6,017	.....
111	PRESIDENTIAL AIRCRAFT REPLACEMENT .....	434,069	434,069	.....
112	AUTOMATED TEST SYSTEMS .....	18,528	18,528	.....
113	COMBAT SURVIVOR EVADER LOCATOR .....	24,967	24,967	.....
114	SPACE SITUATION AWARENESS OPERATIONS .....	10,029	10,029	.....
115	COUNTERSPACE SYSTEMS .....	66,370	66,370	.....
116	SPACE SITUATION AWARENESS SYSTEMS .....	48,448	48,448	.....
117	SPACE FENCE .....	35,937	62,837	+ 26,900
118	ADVANCED EHF MILSATCOM (SPACE) .....	145,610	145,610	.....
119	POLAR MILSATCOM (SPACE) .....	33,644	33,644	.....
120	WIDEBAND GLOBAL SATCOM (SPACE) .....	14,263	7,263	- 7,000
121	SPACE BASED INFRARED SYSTEM [SBIRS] HIGH EMD .....	311,844	324,644	+ 12,800
122	EVOLVED SBIRS .....	71,018	71,018	.....
123	EVOLVED EXPENDABLE LAUNCH VEHICLE PROGRAM (SPACE)— EMD .....	297,572	397,572	+ 100,000
	TOTAL, ENGINEERING & MANUFACTURING DEVELOP- MENT .....	4,476,762	4,391,967	- 84,795
	RDT&E MANAGEMENT SUPPORT			
124	THREAT SIMULATOR DEVELOPMENT .....	35,405	35,405	.....
125	MAJOR T&E INVESTMENT .....	82,874	117,874	+ 35,000
126	RAND PROJECT AIR FORCE .....	34,346	34,346	.....
128	INITIAL OPERATIONAL TEST & EVALUATION .....	15,523	15,523	.....
129	TEST AND EVALUATION SUPPORT .....	678,289	705,689	+ 27,400
130	ACQ WORKFORCE— GLOBAL POWER .....	219,809	219,809	.....
131	ACQ WORKFORCE— GLOBAL VIG & COMBAT SYS .....	223,179	228,179	+ 5,000
132	ACQ WORKFORCE— GLOBAL REACH .....	138,556	138,556	.....
133	ACQ WORKFORCE— CYBER, NETWORK, & BUS SYS .....	221,393	206,393	- 15,000
134	ACQ WORKFORCE— GLOBAL BATTLE MGMT .....	152,577	147,577	- 5,000
135	ACQ WORKFORCE— CAPABILITY INTEGRATION .....	196,561	217,061	+ 20,500
136	ACQ WORKFORCE— ADVANCED PRGM TECHNOLOGY .....	28,322	28,322	.....
137	ACQ WORKFORCE— NUCLEAR SYSTEMS .....	126,611	121,111	- 5,500

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
140	MANAGEMENT HQ—R&D .....	9,154	9,154	.....
141	FACILITIES RESTORATION & MODERNIZATION—TEST & EVAL .....	135,507	135,507	.....
142	FACILITIES SUSTAINMENT—TEST AND EVALUATION SUPPORT .....	28,720	28,720	.....
143	REQUIREMENTS ANALYSIS AND MATURATION .....	35,453	142,453	+ 107,000
146	ENTERPRISE INFORMATION SERVICES (EIS) .....	29,049	29,049	.....
147	ACQUISITION AND MANAGEMENT SUPPORT .....	14,980	14,980	.....
148	GENERAL SKILL TRAINING .....	1,434	1,434	.....
150	INTERNATIONAL ACTIVITIES .....	4,569	4,569	.....
151	SPACE TEST AND TRAINING RANGE DEVELOPMENT .....	25,773	25,773	.....
152	SPACE AND MISSILE CENTER (SMC) CIVILIAN WORKFORCE .....	169,887	159,887	– 10,000
153	SPACE & MISSILE SYSTEMS CENTER—MHA .....	9,531	9,531	.....
154	ROCKET SYSTEMS LAUNCH PROGRAM (SPACE) .....	20,975	33,975	+ 13,000
155	SPACE TEST PROGRAM (STP) .....	25,398	25,398	.....
	TOTAL, RDT&E MANAGEMENT SUPPORT .....	2,663,875	2,836,275	+ 172,400
	OPERATIONAL SYSTEMS DEVELOPMENT			
157	NUCLEAR WEAPONS SUPPORT .....	27,579	27,579	.....
158	SPECIALIZED UNDERGRADUATE FLIGHT TRAINING .....	5,776	5,776	.....
159	WIDE AREA SURVEILLANCE .....	16,247	16,247	.....
161	AIR FORCE INTEGRATED MILITARY HUMAN RESOURCES SYSTEM .....	21,915	17,915	– 4,000
162	ANTI-TAMPER TECHNOLOGY EXECUTIVE AGENCY .....	33,150	33,150	.....
163	FOREIGN MATERIEL ACQUISITION AND EXPLOITATION .....	66,653	66,653	.....
164	HC/MC–130 RECAP RDT&E .....	38,579	32,979	– 5,600
165	NG3 INTEGRATION .....	12,636	12,636	.....
166	B–52 SQUADRONS .....	111,910	107,310	– 4,600
167	AIR-LAUNCHED CRUISE MISSILE [ALCM] .....	463	463	.....
168	B–1B SQUADRONS .....	62,471	62,471	.....
169	B–2 SQUADRONS .....	193,108	171,108	– 22,000
170	MINUTEMAN SQUADRONS .....	210,845	210,845	.....
171	STRAT WAR PLANNING SYSTEM—USSTRATCOM .....	25,736	25,736	.....
173	WORLDWIDE JOINT STRATEGIC COMMUNICATIONS .....	6,272	13,272	+ 7,000
174	INTEGRATED STRATEGIC PLANNING & ANALYSIS NETWORK .....	11,032	11,032	.....
176	UH–1N REPLACEMENT PROGRAM .....	108,617	108,617	.....
177	REGION/SECTOR OPERATION CONTROL CENTER MODERNIZATION .....	3,347	3,347	.....
179	MQ–9 UAV .....	201,394	190,994	– 10,400
182	A–10 SQUADRONS .....	17,459	17,459	.....
183	F–16 SQUADRONS .....	246,578	256,578	+ 10,000
184	F–15E SQUADRONS .....	320,271	320,271	.....
185	MANNED DESTRUCTIVE SUPPRESSION .....	15,106	15,106	.....
186	F–22 SQUADRONS .....	610,942	610,942	.....
187	F–35 SQUADRONS .....	334,530	256,717	– 77,813
188	TACTICAL AIM MISSILES .....	34,952	34,952	.....
189	ADVANCED MEDIUM RANGE AIR-TO-AIR MISSILE (AMRAAM) .....	61,322	61,322	.....
191	COMBAT RESCUE—PARARESCUE .....	693	693	.....
193	PRECISION ATTACK SYSTEMS PROCUREMENT .....	1,714	1,714	.....
194	COMPASS CALL .....	14,040	34,240	+ 20,200
195	AIRCRAFT ENGINE COMPONENT IMPROVEMENT PROGRAM .....	109,243	109,243	.....
197	JOINT AIR-TO-SURFACE STANDOFF MISSILE [JASSM] .....	29,932	24,932	– 5,000
198	AIR AND SPACE OPERATIONS CENTER [AOC] .....	26,956	88,756	+ 61,800
199	CONTROL AND REPORTING CENTER [CRC] .....	2,450	2,450	.....
200	AIRBORNE WARNING AND CONTROL SYSTEM [AWACS] .....	151,726	151,726	.....
201	TACTICAL AIRBORNE CONTROL SYSTEMS .....	3,656	3,656	.....
203	COMBAT AIR INTELLIGENCE SYSTEM ACTIVITIES .....	13,420	15,920	+ 2,500
204	TACTICAL AIR CONTROL PARTY—MOD .....	10,623	10,623	.....
205	C2ISR TACTICAL DATA LINK .....	1,754	1,754	.....
206	DCAPES .....	17,382	17,382	.....
207	NATIONAL TECHNICAL NUCLEAR FORENSICS .....	2,307	2,307	.....
208	SEEK EAGLE .....	25,397	25,397	.....
209	USAF MODELING AND SIMULATION .....	10,175	10,175	.....
210	WARGAMING AND SIMULATION CENTERS .....	12,839	12,839	.....
211	DISTRIBUTED TRAINING AND EXERCISES .....	4,190	4,190	.....
212	MISSION PLANNING SYSTEMS .....	85,531	85,531	.....
213	TACTICAL DECEPTION .....	3,761	3,761	.....

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
214	AF OFFENSIVE CYBERSPACE OPERATIONS .....	35,693	35,693	.....
215	AF DEFENSIVE CYBERSPACE OPERATIONS .....	20,964	20,964	.....
218	GLOBAL SENSOR INTEGRATED ON NETWORK (GSIN) .....	3,549	3,549	.....
219	NUCLEAR PLANNING AND EXECUTION SYSTEM (NPES) .....	4,371	4,371	.....
227	AIR FORCE SPACE AND CYBER NON-TRADITIONAL ISR FOR BATTLESPACE AWARENESS .....	3,721	3,721	.....
228	E-4B NATIONAL AIRBORNE OPERATIONS CENTER [NAOC] .....	35,467	35,467	.....
230	MINIMUM ESSENTIAL EMERGENCY COMMUNICATIONS NETWORK .....	48,841	27,841	- 21,000
231	INFORMATION SYSTEMS SECURITY PROGRAM .....	42,973	42,973	.....
232	GLOBAL COMBAT SUPPORT SYSTEM .....	105	105	.....
233	GLOBAL FORCE MANAGEMENT—DATA INITIATIVE .....	2,147	2,147	.....
236	AIRBORNE SIGINT ENTERPRISE .....	121,948	121,948	.....
237	COMMERCIAL ECONOMIC ANALYSIS .....	3,544	3,544	.....
240	CCMD INTELLIGENCE INFORMATION TECHNOLOGY .....	1,542	1,542	.....
241	GLOBAL AIR TRAFFIC MANAGEMENT (GATM) .....	4,453	4,453	.....
243	WEATHER SERVICE .....	26,654	26,654	.....
244	AIR TRAFFIC CONTROL, APPROACH, & LANDING SYSTEM (ATC) ..	6,306	6,306	.....
245	AERIAL TARGETS .....	21,295	21,295	.....
248	SECURITY AND INVESTIGATIVE ACTIVITIES .....	415	415	.....
250	DEFENSE JOINT COUNTERINTELLIGENCE ACTIVITIES .....	3,867	3,867	.....
257	DRAGON U-2 .....	34,486	29,486	- 5,000
258	ENDURANCE UNMANNED AERIAL VEHICLES .....	.....	40,000	+ 40,000
259	AIRBORNE RECONNAISSANCE SYSTEMS .....	4,450	26,950	+ 22,500
260	MANNED RECONNAISSANCE SYSTEMS .....	14,269	14,269	.....
261	DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS .....	27,501	36,501	+ 9,000
262	RQ-4 UAV .....	214,849	222,849	+ 8,000
263	NETWORK-CENTRIC COLLABORATIVE TARGET [TIARA] .....	18,842	18,842	.....
265	NATO AGS .....	44,729	44,729	.....
266	SUPPORT TO DCGS ENTERPRISE .....	26,349	26,349	.....
269	INTERNATIONAL INTELLIGENCE TECHNOLOGY AND ARCHITEC- TURES .....	3,491	9,491	+ 6,000
271	RAPID CYBER ACQUISITION .....	4,899	4,899	.....
275	PERSONNEL RECOVERY COMMAND & CTRL (PRC2) .....	2,445	2,445	.....
276	INTELLIGENCE MISSION DATA (IMD) .....	8,684	8,684	.....
278	C-130 AIRLIFT SQUADRON .....	10,219	10,219	.....
279	C-5 AIRLIFT SQUADRONS .....	22,758	11,758	- 11,000
280	C-17 AIRCRAFT .....	34,287	34,287	.....
281	C-130J PROGRAM .....	26,821	26,821	.....
282	LARGE AIRCRAFT IR COUNTERMEASURES [LAIRCM] .....	5,283	5,283	.....
283	KC-135S .....	9,942	9,942	.....
284	KC-10S .....	7,933	7,933	.....
285	OPERATIONAL SUPPORT AIRLIFT .....	6,681	6,681	.....
286	CV-22 .....	22,519	22,519	.....
287	AMC COMMAND AND CONTROL SYSTEM .....	3,510	3,510	.....
288	SPECIAL TACTICS / COMBAT CONTROL .....	8,090	8,090	.....
289	DEPOT MAINTENANCE (NON-IF) .....	1,528	1,528	.....
290	MAINTENANCE, REPAIR & OVERHAUL SYSTEM .....	31,677	31,677	.....
291	LOGISTICS INFORMATION TECHNOLOGY [LOGIT] .....	33,344	33,344	.....
292	SUPPORT SYSTEMS DEVELOPMENT .....	9,362	11,362	+ 2,000
293	OTHER FLIGHT TRAINING .....	2,074	2,074	.....
294	OTHER PERSONNEL ACTIVITIES .....	107	107	.....
295	JOINT PERSONNEL RECOVERY AGENCY .....	2,006	2,006	.....
296	CIVILIAN COMPENSATION PROGRAM .....	3,780	3,780	.....
297	PERSONNEL ADMINISTRATION .....	7,472	7,472	.....
298	AIR FORCE STUDIES AND ANALYSIS AGENCY .....	1,563	1,563	.....
299	FINANCIAL MANAGEMENT INFORMATION SYSTEMS DEVELOPMENT ..	91,211	91,211	.....
300	SERVICE SUPPORT TO STRATCOM—SPACE ACTIVITIES .....	14,255	14,255	.....
301	AF TENCAP .....	31,914	31,914	.....
302	FAMILY OF ADVANCED BLOS TERMINALS (FAB-T) .....	32,426	56,526	+ 24,100
303	SATELLITE CONTROL NETWORK (SPACE) .....	18,808	18,808	.....
305	NAVSTAR GLOBAL POSITIONING SYSTEM (SPACE AND CONTROL SEGMENTS) .....	10,029	10,029	.....
306	SPACE AND MISSILE TEST AND EVALUATION CENTER .....	25,051	65,051	+ 40,000



[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
307	SPACE INNOVATION, INTEGRATION AND RAPID TECHNOLOGY DEVELOPMENT .....	11,390	11,390	.....
308	INTEGRATED BROADCAST SERVICE (IBS) .....	8,747	8,747	.....
309	SPACELIFT RANGE SYSTEM (SPACE) .....	10,549	20,549	+ 10,000
310	GPS III SPACE SEGMENT .....	243,435	215,435	- 28,000
311	SPACE SUPERIORITY INTELLIGENCE .....	12,691	10,691	- 2,000
312	JSPOC MISSION SYSTEM .....	99,455	147,955	+ 48,500
313	NATIONAL SPACE DEFENSE CENTER .....	18,052	86,052	+ 68,000
314	SHARED EARLY WARNING [SEW] .....	1,373	1,373	.....
315	NCMC—TW/AA SYSTEM .....	5,000	5,000	.....
316	NUDET DETECTION SYSTEM (SPACE) .....	31,508	31,508	.....
317	SPACE SITUATION AWARENESS OPERATIONS .....	99,984	131,984	+ 32,000
318	GLOBAL POSITIONING SYSTEM III—OPERATIONAL CONTROL SEGMENT .....	510,938	510,938	.....
	TOTAL, OPERATIONAL SYSTEMS DEVELOPMENT .....	5,647,300	5,862,487	+ 215,187
9999	CLASSIFIED PROGRAMS .....	14,938,002	15,739,640	+ 801,638
	TOTAL, RESEARCH, DEVELOPMENT, TEST & EVAL, AIR FORCE .....	34,914,359	36,587,419	+ 1,673,060

## COMMITTEE RECOMMENDED ADJUSTMENTS

The following table details the adjustments recommended by the Committee:

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
4	Materials .....	124,264	144,264	+ 20,000
	Program increase: Certification of advanced composites .....	.....	.....	+ 15,000
	Program increase: Coatings .....	.....	.....	+ 5,000
5	Aerospace Vehicle Technologies .....	124,678	139,678	+ 15,000
	Program increase: Hypersonic vehicle structures .....	.....	.....	+ 10,000
	Program increase: Hypersonic research capability development .....	.....	.....	+ 5,000
7	Aerospace Propulsion .....	192,695	197,695	+ 5,000
	Program increase .....	.....	.....	+ 5,000
8	Aerospace Sensors .....	152,782	159,282	+ 6,500
	Program increase: Research by minority leaders program .....	.....	.....	+ 2,500
	Program increase .....	.....	.....	+ 4,000
10	Space Technology .....	116,503	156,103	+ 39,600
	Program increase: Small satellites for resiliency and augmentation of space architecture .....	.....	.....	+ 19,600
	Program increase .....	.....	.....	+ 20,000
13	Dominant Information Sciences and Methods .....	167,818	189,318	+ 21,500
	Program increase: Radar-based C-UAS systems .....	.....	.....	+ 6,000
	Program increase .....	.....	.....	+ 15,500
17	Advanced Aerospace Sensors .....	40,978	47,978	+ 7,000
	Program increase .....	.....	.....	+ 7,000
19	Aerospace Propulsion and Power Technology .....	104,499	122,999	+ 18,500
	Program increase: Silicon carbide research .....	.....	.....	+ 11,000
	Program increase .....	.....	.....	+ 7,500
21	Advanced Spacecraft Technology .....	58,910	83,910	+ 25,000
	Program increase: Commercial SSA consortia/testbed .....	.....	.....	+ 15,000
	Program increase .....	.....	.....	+ 10,000
26	Manufacturing Technology Program .....	46,450	55,050	+ 8,600
	Program increase: F-35 battery technology .....	.....	.....	+ 8,600
27	Battlespace Knowledge Development and Demonstration .....	49,011	55,011	+ 6,000

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
	Program increase: Radar-based C-UAS systems .....			+ 6,000
28	Intelligence Advanced Development .....	5,652	7,652	+ 2,000
	Program increase: Distributed common ground systems .....			+ 2,000
33	Intercontinental Ballistic Missile—Dem/Val .....	10,736	30,736	+ 20,000
	Program increase .....			+ 20,000
37	Advanced Technology and Sensors .....	68,719	88,349	+ 19,630
	Program increase: Advanced Synthetic Aperture Radar Systems [ASARS—2B] .....			+ 11,500
	Program increase: Hyperspectral chip development .....			+ 8,130
38	National Airborne Ops Center [NAOC] Recap .....	7,850	4,850	- 3,000
	Maintain program affordability: Recap excess to need .....			- 3,000
39	Technology Transfer .....	3,295	18,295	+ 15,000
	Program increase: Technology partnerships .....			+ 15,000
40	Hard and Deeply Buried Target Defeat System [HDBTDS] Program .....	17,365	14,065	- 3,300
	Maintain program affordability: Excess to need for Advanced 5000 Pound Penetrator .....			- 3,300
41	Cyber Resiliency of Weapon Systems-ACS .....	32,253	42,453	+ 10,200
	Program increase: Cybersecurity and resiliency for weapon systems .....			+ 10,200
46	Tech Transition Program .....	840,650	1,026,650	+ 186,000
	Program increase: Light attack combat demonstration .....			+ 100,000
	Program increase: Directed energy prototyping .....			+ 70,000
	Program increase: Logistics technologies .....			+ 10,000
	Program increase: Alternative energy research .....			+ 6,000
47	Ground Based Strategic Deterrent .....	215,721	200,621	- 15,100
	Improving funds management: Forward financed .....			- 15,100
53	Cyber Operations Technology Development .....	226,287	194,487	- 31,800
	Maintain program affordability: Unjustified program growth .....			- 31,800
57	NAVSTAR Global Positioning System (User Equipment) (SPACE) .....	253,939	332,439	+ 78,500
	Program increase: Military GPS user equipment—INC2—handhelds .....			+ 98,500
	Improving funds management: Prior year carryover .....			- 20,000
59	Weather System Follow-on .....	112,088	102,088	- 10,000
	Program increase: Commercial Weather Data pilot program .....			+ 10,000
	Improving funds management: Prior year carryover .....			- 20,000
60	Space Situation Awareness Systems .....	34,764	44,764	+ 10,000
	Program increase .....			+ 10,000
62	Space Control Technology .....	7,842	128,642	+ 120,800
	Program increase: Space Enterprise Defense Implementation .....			+ 7,000
	Program increase: Space Defense Force Packaging .....			+ 113,800
63	Space Security and Defense Program .....	41,385	38,385	- 3,000
	Maintain program affordability: Unjustified growth .....			- 3,000
78	Airborne Electronic Attack .....	7,091	2,091	- 5,000
	Improving funds management: Forward financed .....			- 5,000
82	Agile Combat Support .....	31,240	37,740	+ 6,500
	Program increase: Civil engineering readiness .....			+ 3,500
	Program increase: PACOM joint expeditionary air-field damage repair initiative .....			+ 3,000
85	Combat Training Ranges .....	87,350	83,850	- 3,500
	Program increase: Test range threat systems .....			+ 6,000
	Improving funds management: Forward financed .....			- 9,500
94	KC-46 .....	93,845	83,845	- 10,000
	Restoring acquisition accountability: Delayed test program .....			- 10,000
95	Advanced Pilot Training .....	105,999	86,199	- 19,800

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
	Restoring acquisition accountability: Contract award delay .....			- 19,800
100	Air & Space Ops Center 10.2 RDT&E .....	119,745	5,000	- 114,745
	Transfer: Air Force-requested to RDAF line 198 and OMAF SAG 11C .....			- 84,800
	Program termination: AOC 10.2 .....			- 29,945
101	B-2 Defensive Management System .....	194,570	143,370	- 51,200
	Restoring acquisition accountability: Technical and programmatic changes to acquisition strategy .....			- 51,200
105	Full Combat Mission Training .....	16,727	8,727	- 8,000
	Improving funds management: Forward financed .....			- 8,000
109	JSTARS Recap .....	417,201	405,451	- 11,750
	Maintain program affordability: Excess management services .....			- 11,750
117	Space Fence .....	35,937	62,837	+ 26,900
	Program increase: Space fence site 1 and ground based operational surveillance system .....			+ 26,900
120	Wideband Global SATCOM (SPACE) .....	14,263	7,263	- 7,000
	Reduce duplication: AoA effort .....			- 7,000
121	Space Based Infrared System (SBIRS) High EMD .....	311,844	324,644	+ 12,800
	Program increase: Fix upgrades SBIRS SST Phase 3 .....			+ 12,800
123	Evolved Expendable Launch Vehicle Program (SPACE)—EMD .....	297,572	397,572	+ 100,000
	Program increase .....			+ 100,000
125	Major T&E Investment .....	82,874	117,874	+ 35,000
	Program increase .....			+ 15,000
	Program increase: T&E range investments .....			+ 15,000
	Program increase: Weapon system cyber resiliency—test and evaluation .....			+ 5,000
129	Test and Evaluation Support .....	678,289	705,689	+ 27,400
	Program increase: 4th Gen Mods: Adds 1 F-15C, 1 F-15E, 6 F-16s and 1 B-1 test aircraft .....			+ 23,000
	Program increase: Weapon system cyber resiliency—test and evaluation .....			+ 4,400
131	Acq Workforce- Global Vig & Combat Sys .....	223,179	228,179	+ 5,000
	Transfer: Air Force requested from RDTE line 134 .....			+ 5,000
133	Acq Workforce- Cyber, Network, & Bus Sys .....	221,393	206,393	- 15,000
	Transfer: Air Force requested to RDTE line 135 .....			- 15,000
134	Acq Workforce- Global Battle Mgmt .....	152,577	147,577	- 5,000
	Transfer: Air Force requested to RDTE line 131 .....			- 5,000
135	Acq Workforce- Capability Integration .....	196,561	217,061	+ 20,500
	Transfer: Air Force requested from RDTE lines 133 and 137 .....			+ 20,500
137	Acq Workforce- Nuclear Systems .....	126,611	121,111	- 5,500
	Transfer: Air Force requested to RDTE line 135 .....			- 5,500
143	Requirements Analysis and Maturation .....	35,453	142,453	+ 107,000
	Program increase: Modeling and simulation—joint simulation environment .....			+ 70,000
	Program increase: Global Strike Command analytics .....			+ 7,000
	Program increase: Air superiority 2030 planning for development .....			+ 30,000
152	Space and Missile Center (SMC) Civilian Workforce .....	169,887	159,887	- 10,000
	Maintain program affordability: Maintain level of effort following transfer of positions. ....			- 10,000
154	Rocket Systems Launch Program (SPACE) .....	20,975	33,975	+ 13,000
	Program increase .....			+ 13,000
161	AF Integrated Personnel and Pay System [AF-IPPS] .....	21,915	17,915	- 4,000
	Maintain program affordability: Unjustified program growth .....			- 4,000
164	HC/MC-130 Recap RDT&E .....	38,579	32,979	- 5,600
	Restoring acquisition accountability: Block 8 development early to need .....			- 5,600
166	B-52 Squadrons .....	111,910	107,310	- 4,600

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
	Restoring acquisition accountability: GPS-IU contract award delay .....			-4,600
169	B-2 Squadrons .....	193,108	171,108	-22,000
	Improving funds management: Forward financed .....			-13,000
	Restoring acquisition accountability: JASSM-ER integration early to need .....			-8,000
	Maintain program affordability: Airspace compliance excess to need .....			-1,000
173	Worldwide Joint Strategic Communications .....	6,272	13,272	+7,000
	Program increase: NC3 architecture development .....			+7,000
179	MQ-9 UAV .....	201,394	190,994	-10,400
	Maintain program affordability: Release 3 excess to need .....			-10,400
183	F-16 Squadrons .....	246,578	256,578	+10,000
	Program increase: F-16 Multifunctional Information Distribution System-JTRS .....			+10,000
187	F-35 Squadrons .....	334,530	256,717	-77,813
	Improving funds management: Follow on modernization early to need .....			-77,813
194	Compass Call .....	14,040	34,240	+20,200
	Program increase: EC-X/Compass Call Cross Deck .....			+20,200
197	Joint Air-to-Surface Standoff Missile [JASSM] .....	29,932	24,932	-5,000
	Insufficient budget justification: Capability enhancements .....			-5,000
198	Air & Space Operations Center [AOC] .....	26,956	88,756	+61,800
	Transfer: Air Force-requested from RDAF line 100 .....			+61,800
203	Combat Air Intelligence System Activities .....	13,420	15,920	+2,500
	Program increase .....			+2,500
230	Minimum Essential Emergency Communications Network [MEECN] .....	48,841	27,841	-21,000
	Improving funds management: Forward financed .....			-21,000
257	Dragon U-2 .....	34,486	29,486	-5,000
	Improving funds management: Forward financed .....			-5,000
258	Endurance Unmanned Aerial Vehicles .....		40,000	+40,000
	Program increase: Ultra-long endurance aircraft .....			+40,000
259	Airborne Reconnaissance Systems .....	4,450	26,950	+22,500
	Program increase: Multi-mission payload program .....			+17,500
	Program increase .....			+5,000
261	Distributed Common Ground/Surface Systems .....	27,501	36,501	+9,000
	Program increase: Open architecture and SIGINT integration .....			+9,000
262	RQ-4 UAV .....	214,849	222,849	+8,000
	Program increase: UPA for Block 40s .....			+8,000
269	International Intelligence Technology and Architectures .....	3,491	9,491	+6,000
	Transfer: Air Force-requested from OPAF line 13 .....			+6,000
279	C-5 Airlift Squadrons (IF) .....	22,758	11,758	-11,000
	Improving funds management: Forward financed .....			-11,000
292	Support Systems Development .....	9,362	11,362	+2,000
	Program increase .....			+2,000
302	Family of Advanced BLoS Terminals [FAB-T] .....	32,426	56,526	+24,100
	Program increase: Fix POTUS national voice conference integration .....			+21,700
	Program increase: NC3 FAB-T CPT .....			+7,400
	Improving funds management: Prior year carryover .....			-5,000
306	Space and Missile Test and Evaluation Center .....	25,051	65,051	+40,000
	Program increase: Space Enterprise Defense Implementation .....			+40,000
309	Spacelift Range System (SPACE) .....	10,549	20,549	+10,000
	Program increase: Space launch range services .....			+10,000
310	GPS III Space Segment .....	243,435	215,435	-28,000
	Improving funds management: Prior year carryover .....			-7,500
	Reduce duplication: M-code .....			-20,500
311	Space Superiority Intelligence .....	12,691	10,691	-2,000
	Improving funds management: Prior year carryover .....			-2,000

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
312	JSpOC Mission System .....	99,455	147,955	+ 48,500
	Program increase: Space Enterprise Defense Implementation .....			+ 48,500
313	National Space Defense Center .....	18,052	86,052	+ 68,000
	Program increase: Fix enterprise space battle management command and control .....			+ 68,000
317	Space Situation Awareness Operations .....	99,984	131,984	+ 32,000
	Program increase: Space fence site 1 and ground based operational surveillance system .....			+ 32,000
999	Classified Programs .....	14,938,002	15,739,640	+ 801,638
	Classified adjustment .....			+ 801,638

*Long Range Strike Bomber.*—The Committee recommendation includes \$2,003,580,000, the same as the budget request, for the development of the B-21 Long Range Strike Bomber. To more easily oversee the development progress of the next generation bomber, the Committee directs the Rapid Capabilities Office to provide quarterly briefings on the B-21 program to the congressional defense committees. The quarterly briefings should include updated data by month of planned and actual: (1) personnel levels, (2) obligations and expenditures, (3) software builds, and (4) design packages.

*Small Diameter Bomb Modifications.*—The Committee understands ongoing counter-terrorism operations drive the current need for Global Positioning System [GPS] guided air-to-ground missiles like the Small Diameter Bomb. However, the increasing risk of GPS jamming threatens the warfighter's ability to strike targets precisely with low collateral damage in many areas of the globe. The Committee appreciates the work of the Strategic Capabilities Office in developing methods for legacy weapons to navigate using alternative sources to GPS and encourages the Air Force to apply these modifications to an increasing percentage of their munitions inventories in the future.

*Joint Surveillance and Target Attack Radar System.*—The fiscal year 2018 budget request includes \$417,201,000 for the Joint Surveillance and Target Attack Radar System [JSTARS] recapitalization program, of which more than \$370,000,000 is budgeted to support the start of the Engineering and Manufacturing Development [EMD] phase. Similar to schedule delays in the last three budget requests, the fiscal year 2018 request delays the EMD contract award from early fiscal year 2018 to the late fiscal year 2018. As a result, the Committee extends the period of obligation or expenditure of funds for pre-milestone activities to June 30, 2018.

Following the release of the budget, Air Force leadership informed several members of Congress that the Air Force plans to reconsider alternatives to the JSTARS recapitalization program. The Committee encourages the Air Force to award the JSTARS EMD contract as soon as possible and continue efforts to accelerate initial operational capability in 2024 and full operational capability in 2028. An analysis of alternatives was completed prior to initiating the recapitalization program in 2011 and reviewed again prior to the Milestone A decision in 2015. The Committee is concerned that another review will result in further delays, contradicting the in-

tent of the program to rapidly integrate mature technologies onto an existing platform. Therefore, the Committee encourages the Air Force to only consider follow-on modernization efforts to a fielded JSTARS recapitalization platform. This approach aligns with the Air Force's acquisition strategy for the JSTARS recapitalization program to competitively develop mission capability with a modular, open services-based architecture.

If the Secretary of the Air Force cancels or modifies the current JSTARS recapitalization acquisition strategy, the Committee directs the Secretary of Defense to submit a report to the congressional defense committees to include: (1) a justification for the new strategy and the impact on each service and combatant command, (2) a certification that the new strategy does not result in capability gaps to the combatant commanders, and (3) an assessment on whether the Air Force or Army is best positioned to execute the new acquisition strategy.

Further, the Committee notes that the current JSTARS fleet provides significant joint air command and control capabilities in both land and maritime areas and strongly encourages the Department to fund all necessary modifications to the current JSTARS fleet in order to continue worldwide missions, avoid degradation of mission performance, and meet Combatant Commander requirements.

*Civilian Personnel.*—The fiscal year 2018 President's budget request transfers 10,458 civilian full time equivalents [FTE] and \$1,202,613,000 from Operation and Maintenance, Air Force to Research, Development, Test and Evaluation, Air Force [RDTE, AF] to support the civilian personnel costs of the acquisition workforce. The intent of the transfer is to improve budget flexibility and address changing requirements as acquisition programs begin and evolve. The Committee supports this proposal, but wants to ensure that there is increased visibility and appropriate execution. Therefore, the Committee directs the Secretary of the Air Force to provide semi-annual updates to the congressional defense committees on civilian personnel funding in RDTE, AF by program element, and not limited to the acquisition workforce, to include: (1) the number of civilian FTEs and funding programmed in the current fiscal year and annually over the next five fiscal years, (2) the number of civilian FTEs and funding executed in the current and previous fiscal years, (3) explanation of all below the threshold and above the threshold reprogrammings involving civilian personnel, and (4) the impact on the staffing and effectiveness of the acquisition programs. Reports shall be submitted not later than 30 days following the end of the second quarter and 30 days following the end of the fiscal year.

*Distributed Common Ground Systems.*—The Committee recognizes the importance the Air Force's globally networked intelligence, surveillance, and reconnaissance [ISR] enterprise, referred to as Distributed Common Ground Systems [DCGS]. The Committee commends the warfighters that collect, process, exploit, and deliver tailored, real-time intelligence and recommends an additional \$92,300,000 in Other Procurement, Air Force and Research, Development, Test and Evaluation, Air Force funding to support DCGS modernization.

However, the Committee understands that several deficiencies exist with DCGS, including that the enterprise is: (1) too stove-piped, making it difficult for the warfighter to provide integrated products that incorporate different types of intelligence from different weapon systems across different levels of classification, (2) not survivable against cyber threats, and (3) comprised of eight separate acquisition programs, all of which are in the sustainment phase despite new capabilities being regularly tested and fielded. Further, the Committee understands that the Air Force plans to transition DCGS to an open architecture, but will rely on existing legacy systems until 2024. Therefore, the Committee directs the Secretary of the Air Force to submit a report to the congressional defense committees not later than 150 days after enactment of this act on a DCGS Modernization Roadmap, to include: (1) a plan to accelerate the transition of the eight acquisition programs and all planned capabilities to an open architecture, (2) a plan to achieve cyber security for the DCGS enterprise, (3) a summary by appropriation of funding to sustain, develop, test, and field capabilities, and (4) opportunities to use agile software development practices.

*Global Hawk.*—The Committee recognizes the importance of the Block 40 variant of the Global Hawk fleet that supports ground forces with intelligence, surveillance and reconnaissance on moving targets. The Committee understands that the Air Force plans to modify the fleet with a universal payload adapter [UPA] to increase flexibility and capability. The Committee recommends an additional \$8,000,000 for the Air Force to accelerate the integration of the UPA to the Block 40 while continuing currently planned, critical modernization efforts to the Global Hawk fleet.

#### SPACE PROGRAMS

*Weather.*—The Committee has long advocated that the Air Force ensure that the next generation of weather satellites meet the full spectrum of warfighter and intelligence requirements, that other weather coverage gaps are met using appropriate civil or international weather assets, and that urgent needs for electro-optical/infrared coverage for cloud characterization and weather forecasting, particularly in the CENTCOM theater of operations are met with rapid capability solutions. The Committee is encouraged that the fiscal year 2018 President's budget submission shows the Air Force's commitment to all of these efforts.

While the Committee supports the comprehensive plan, it recommends that the Secretary of the Air Force examine the possibility of achieving cost savings by combining the short-term Operationally Responsive Space-8 (ORS-8) electro-optical/infrared solution with the long-term Weather System Follow-On electro-optical/infrared [WSF-E] solution. The Committee recommends that the Secretary examine whether vendor solutions for the ORS-8 mission could meet WSF-E requirements and consider proposal submission that are over budget for ORS-8, but if used to satisfy long-term WSF-E requirements, could achieve overall cost savings to the Air Force. Finally, the Committee directs the Secretary of the Air Force to continue efforts to examine the use of commercial weather data to supplement existing assets and fill future coverage gaps and rec-

ommends \$10,000,000 for the commercial weather data pilot program.

*Space Acquisition Strategy.*—In early 2017, the Office of Cost Assessment and Program Evaluation [CAPE] provided an analysis of national security space acquisition that found a troubling pattern of near-simultaneous recapitalization of almost every Department of Defense satellite system. The analysis showed a dramatic decrease in spending on space research and development following recapitalization that resulted in reductions in the numbers of scientists and engineers at major satellite contractors in the following decade. This industrial base decline, in turn, resulted in even higher costs during the next recapitalization phase as contractors and the government had to rebuild a skilled workforce for several satellite architectures concurrently.

The Committee is concerned that the Air Force is about to embark on another near-simultaneous recapitalization as the Air Force plans for new development or completely new architectures in Space Situation Awareness, Positioning, Navigation and Timing, Weather, Early Warning, Wideband Communications, and Protected Communications. In light of the CAPE findings and expected continued budget constraints, the Committee recommends that the Secretary of the Air Force reexamine current recapitalization plans to focus on those highest priority programs that must enter a near-term redevelopment phase and determine whether other programs can replace ageing satellites with continued production of current designs in the near-term in order to stagger architecture recapitalization, better protect the industrial base, and potentially achieve cost savings.

RESEARCH, DEVELOPMENT, TEST AND EVALUATION, DEFENSE-WIDE

Appropriations, 2017 .....	\$18,778,550,000
Budget estimate, 2018 .....	20,490,902,000
Committee recommendation .....	21,680,660,000

The Committee recommends an appropriation of \$21,680,660,000. This is \$1,189,758,000 above the budget estimate.

COMMITTEE RECOMMENDED PROGRAM

The following table summarizes the budget estimate for this appropriation, the Committee recommendation, and the Committee recommended adjustments to the budget estimate:

(In thousands of dollars)

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
	RESEARCH, DEVELOPMENT, TEST & EVAL, DEFENSE-WIDE			
	BASIC RESEARCH			
1	DTRA UNIVERSITY STRATEGIC PARTNERSHIP BASIC RESEARCH ..	37,201	37,201	.....
2	DEFENSE RESEARCH SCIENCES .....	432,347	408,837	- 23,510
3	BASIC RESEARCH INITIATIVES .....	40,612	40,612	.....
4	BASIC OPERATIONAL MEDICAL RESEARCH SCIENCE .....	43,126	43,126	.....
5	NATIONAL DEFENSE EDUCATION PROGRAM .....	74,298	103,298	+ 29,000
6	HISTORICALLY BLACK COLLEGES & UNIV (HBCU) .....	25,865	25,865	.....
7	CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM .....	43,898	43,898	.....
	TOTAL, BASIC RESEARCH .....	697,347	702,837	+ 5,490



[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
	APPLIED RESEARCH			
8	JOINT MUNITIONS TECHNOLOGY .....	19,111	19,111	.....
9	BIOMEDICAL TECHNOLOGY .....	109,360	109,360	.....
11	LINCOLN LABORATORY RESEARCH PROGRAM .....	49,748	49,748	.....
12	APPLIED RESEARCH FOR ADVANCEMENT S&T PRIORITIES .....	49,226	49,226	.....
13	INFORMATION AND COMMUNICATIONS TECHNOLOGY .....	392,784	392,784	.....
14	BIOLOGICAL WARFARE DEFENSE .....	13,014	13,014	.....
15	CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM .....	201,053	203,053	+ 2,000
16	CYBER SECURITY RESEARCH .....	14,775	14,775	.....
17	TACTICAL TECHNOLOGY .....	343,776	312,776	- 31,000
18	MATERIALS AND BIOLOGICAL TECHNOLOGY .....	224,440	201,896	- 22,544
19	ELECTRONICS TECHNOLOGY .....	295,447	295,447	.....
20	WEAPONS OF MASS DESTRUCTION DEFEAT TECHNOLOGIES .....	157,908	157,908	.....
21	SOFTWARE ENGINEERING INSTITUTE .....	8,955	8,955	.....
22	SPECIAL OPERATIONS TECHNOLOGY DEVELOPMENT .....	34,493	34,493	.....
	TOTAL, APPLIED RESEARCH .....	1,914,090	1,862,546	- 51,544
	ADVANCED TECHNOLOGY DEVELOPMENT			
23	JOINT MUNITIONS ADVANCED TECH INSENSITIVE MUNITIONS AD	25,627	25,627	.....
24	COMBATING TERRORISM TECHNOLOGY SUPPORT .....	76,230	123,730	+ 47,500
25	FOREIGN COMPARATIVE TESTING .....	24,199	22,199	- 2,000
26	COUNTERPROLIFERATION INITIATIVES-PROLIF PREV & DEFEAT ..	268,607	268,607	.....
27	ADVANCED CONCEPTS AND PERFORMANCE ASSESSMENT .....	12,996	12,996	.....
29	WEAPONS TECHNOLOGY .....	5,495	5,495	.....
31	ADVANCED RESEARCH .....	20,184	20,184	.....
32	JOINT DOD-DOE MUNITIONS TECHNOLOGY DEVELOPMENT .....	18,662	18,662	.....
35	ADVANCED AEROSPACE SYSTEMS .....	155,406	120,406	- 35,000
36	SPACE PROGRAMS AND TECHNOLOGY .....	247,435	247,435	.....
37	ANALYTIC ASSESSMENTS .....	13,154	13,154	.....
38	ADVANCED INNOVATIVE ANALYSIS AND CONCEPTS .....	37,674	37,674	.....
39	ADVANCED INNOVATIVE ANALYSIS AND CONCEPTS-MHA .....	15,000	15,000	.....
40	COMMON KILL VEHICLE TECHNOLOGY .....	252,879	56,879	- 196,000
41	DEFENSE INNOVATION UNIT EXPERIMENTAL (DIUX) .....	29,594	34,594	+ 5,000
42	TECHNOLOGY INNOVATION .....	59,863	39,863	- 20,000
43	CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM-ADVANCED			
	DEV .....	145,359	145,359	.....
44	RETRACT LARCH .....	171,120	171,120	.....
45	JOINT ELECTRONIC ADVANCED TECHNOLOGY .....	14,389	14,389	.....
46	JOINT CAPABILITY TECHNOLOGY DEMONSTRATIONS .....	105,871	105,871	.....
47	NETWORKED COMMUNICATIONS CAPABILITIES .....	12,661	12,661	.....
48	DEFENSE-WIDE MANUFACTURING SCIENCE AND TECHNOLOGY			
	PROG .....	136,159	176,159	+ 40,000
49	MANUFACTURING TECHNOLOGY PROGRAM .....	40,511	40,511	.....
50	EMERGING CAPABILITIES TECHNOLOGY DEVELOPMENT .....	57,876	80,376	+ 22,500
51	GENERIC LOGISTICS R&D TECHNOLOGY DEMONSTRATIONS .....	10,611	16,611	+ 6,000
53	STRATEGIC ENVIRONMENTAL RESEARCH PROGRAM .....	71,832	74,832	+ 3,000
54	MICROELECTRONIC TECHNOLOGY DEVELOPMENT AND SUPPORT			
	.....	219,803	249,803	+ 30,000
55	JOINT WARFIGHTING PROGRAM .....	6,349	6,349	.....
56	ADVANCED ELECTRONICS TECHNOLOGIES .....	79,173	79,173	.....
57	COMMAND, CONTROL AND COMMUNICATIONS SYSTEMS .....	106,787	93,295	- 13,492
58	NETWORK-CENTRIC WARFARE TECHNOLOGY .....	439,386	439,386	.....
59	SENSOR TECHNOLOGY .....	210,123	195,740	- 14,383
60	DISTRIBUTED LEARNING ADVANCED TECHNOLOGY DEVELOPMENT			
	.....	11,211	11,211	.....
62	SOFTWARE ENGINEERING INSTITUTE .....	15,047	15,047	.....
63	QUICK REACTION SPECIAL PROJECTS .....	69,203	67,203	- 2,000
64	ENGINEERING SCIENCE AND TECHNOLOGY .....	25,395	25,395	.....
65	TEST & EVALUATION SCIENCE & TECHNOLOGY .....	89,586	105,586	+ 16,000
66	OPERATIONAL ENERGY CAPABILITY IMPROVEMENT .....	38,403	40,903	+ 2,500
67	CWMD SYSTEMS .....	33,382	33,382	.....
68	SPECIAL OPERATIONS ADVANCED TECHNOLOGY DEVELOPMENT ..			
	.....	72,605	95,605	+ 23,000
	TOTAL, ADVANCED TECHNOLOGY DEVELOPMENT .....	3,445,847	3,358,472	- 87,375

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
	DEMONSTRATION & VALIDATION			
69	NUCLEAR AND CONVENTIONAL PHYSICAL SECURITY EQUIPMENT	32,937	32,937	.....
70	WALKOFF .....	101,714	101,714	.....
72	ACQUISITION ENTERPRISE DATA AND INFORMATION SERVICES ...	2,198	2,198	.....
73	ENVIRONMENTAL SECURITY TECHNICAL CERTIFICATION PROGRAM .....	54,583	54,583	.....
74	BALLISTIC MISSILE DEFENSE TERMINAL DEFENSE SEGMENT .....	230,162	508,662	+ 278,500
75	BALLISTIC MISSILE DEFENSE MIDCOURSE DEFENSE SEGMENT ...	828,097	980,093	+ 151,996
76	CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM .....	148,518	138,593	- 9,925
77	BALLISTIC MISSILE DEFENSE SENSORS .....	247,345	291,307	+ 43,962
77A	HOMELAND DEFENSE RADAR—HAWAII .....	.....	109,000	+ 109,000
78	BALLISTIC MISSILE DEFENSE ENABLING PROGRAMS .....	449,442	508,384	+ 58,942
79	SPECIAL PROGRAMS—MDA .....	320,190	320,190	.....
80	AEGIS BMD .....	852,052	749,005	- 103,047
83	BALLISTIC MISSILE DEFENSE COMMAND AND CONTROL, BATTLE MANAGEMENT .....	430,115	463,115	+ 33,000
84	BALLISTIC MISSILE DEFENSE JOINT WARFIGHTER SUPPORT .....	48,954	48,954	.....
	BALLISTIC MISSILE DEFENSE INTERGRATION AND OPERATIONS CENTER (MDIOC) .....	53,265	53,265	.....
86	REGARDING TRENCH .....	9,113	9,113	.....
87	SEA BASED X-BAND RADAR (SBX) .....	130,695	143,695	+ 13,000
88	ISRAELI COOPERATIVE PROGRAMS .....	105,354	373,800	+ 268,446
89	BALLISTIC MISSILE DEFENSE TEST .....	305,791	331,191	+ 25,400
90	BALLISTIC MISSILE DEFENSE TARGETS .....	410,425	467,546	+ 57,121
91	HUMANITARIAN DEMINING .....	10,837	10,837	.....
92	COALITION WARFARE .....	10,740	10,740	.....
93	DEPARTMENT OF DEFENSE CORROSION PROGRAM .....	3,837	3,837	.....
94	TECHNOLOGY MATURATION INITIATIVES .....	128,406	164,406	+ 36,000
95	MISSILE DEFEAT PROJECT .....	98,369	98,369	.....
96	HYPERSONIC DEFENSE .....	75,300	55,100	- 20,200
97	ADVANCED INNOVATIVE TECHNOLOGIES .....	1,175,832	1,200,832	+ 25,000
98	TRUSTED AND ASSURED MICROELECTRONICS .....	83,626	83,626	.....
99	RAPID PROTOTYPING PROGRAM .....	100,000	100,000	.....
101	DOD UNMANNED AIRCRAFT SYSTEM (UAS) COMMON DEVELOPMENT .....	3,967	7,967	+ 4,000
102	WARGAMING AND SUPPORT FOR STRATEGIC ANALYSIS (SSA) ....	3,833	3,833	.....
104	JOINT C5 CAPABILITY DEVELOPMENT, INTEGRATION AND INTEROPERABILITY .....	23,638	23,638	.....
105	LONG RANGE DISCRIMINATION RADAR .....	357,659	370,159	+ 12,500
106	IMPROVED HOMELAND DEFENSE INTERCEPTORS .....	465,530	693,730	+ 228,200
107	BMD TERMINAL DEFENSE SEGMENT TEST .....	36,239	36,239	.....
108	AEGIS BMD TEST .....	134,468	134,468	.....
109	BALLISTIC MISSILE DEFENSE SENSOR TEST .....	84,239	84,239	.....
110	LAND-BASED SM-3 [LBSM3] .....	30,486	30,486	.....
111	AEGIS SM-3 BLOCK IIA CO-DEVELOPMENT .....	9,739	9,739	.....
112	BALLISTIC MISSILE DEFENSE MIDCOURSE DEFENSE SEGMENT TEST .....	76,757	86,057	+ 9,300
113	MULTI-OBJECT KILL VEHICLE .....	6,500	6,500	.....
114	JOINT ELECTROMAGNETIC TECHNOLOGY [JET] PROGRAM .....	2,902	2,902	.....
115	CYBER SECURITY INITIATIVE .....	986	986	.....
116	SPACE TRACKING AND SURVEILLANCE SYSTEM .....	34,907	34,907	.....
117	BALLISTIC MISSILE DEFENSE SYSEM SPACE PROGRAMS .....	16,994	16,994	.....
	NATIONAL SECURITY TECHNOLOGY ACCELERATOR/MDS .....	.....	25,500	+ 25,500
	TOTAL, DEMONSTRATION & VALIDATION .....	7,736,741	8,983,436	+ 1,246,695
	ENGINEERING & MANUFACTURING DEVELOPMENT			
118	NUCLEAR AND CONVENTIONAL PHYSICAL SECURITY EQUIPMENT	12,536	12,536	.....
119	PROMPT GLOBAL STRIKE CAPABILITY DEVELOPMENT .....	201,749	201,749	.....
120	CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM .....	406,789	368,887	- 37,902
122	JOINT TACTICAL INFORMATION DISTRIBUTION SYSTEM [JTIDS] ...	15,358	17,858	+ 2,500
123	WEAPONS OF MASS DESTRUCTION DEFEAT CAPABILITIES .....	6,241	6,241	.....
124	INFORMATION TECHNOLOGY DEVELOPMENT .....	12,322	11,322	- 1,000
125	HOMELAND PERSONNEL SECURITY INITIATIVE .....	4,893	4,893	.....

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
126	DEFENSE EXPORTABILITY PROGRAM .....	3,162	2,162	- 1,000
127	OUS(D) IT DEVELOPMENT INITIATIVES .....	21,353	21,353	.....
128	DOD ENTERPRISE SYSTEMS DEVELOPMENT AND DEMONSTRATION .....	6,266	6,266	.....
129	DCMO POLICY AND INTEGRATION .....	2,810	2,810	.....
130	DEFENSE AGENCY INITIATIVES FINANCIAL SYSTEM .....	24,436	24,436	.....
131	DEFENSE RETIRED AND ANNUITANT PAY SYSTEM (DRAS) .....	13,475	13,475	.....
133	DEFENSE-WIDE ELECTRONIC PROCUREMENT CAPABILITY .....	11,870	11,870	.....
134	TRUSTED & ASSURED MICROELECTRONICS .....	61,084	61,084	.....
135	GLOBAL COMBAT SUPPORT SYSTEM .....	2,576	2,576	.....
136	DOD ENTERPRISE ENERGY INFORMATION MANAGEMENT (EEIM) .....	3,669	3,669	.....
137	CWMD SYSTEMS: SYSTEM DEVELOPMENT AND DEMONSTRATION .....	8,230	8,230	.....
	TOTAL, ENGINEERING & MANUFACTURING DEVELOPMENT .....	818,819	781,417	- 37,402
	RDT&E MANAGEMENT SUPPORT			
138	DEFENSE READINESS REPORTING SYSTEM (DRRS) .....	6,941	6,941	.....
139	JOINT SYSTEMS ARCHITECTURE DEVELOPMENT .....	4,851	4,851	.....
140	CENTRAL TEST AND EVALUATION INVESTMENT DEVELOPMENT .....	211,325	211,325	.....
141	ASSESSMENTS AND EVALUATIONS .....	30,144	30,144	.....
142	MISSION SUPPORT .....	63,769	63,769	.....
143	JOINT MISSION ENVIRONMENT TEST CAPABILITY (JMETS) .....	91,057	91,057	.....
144	TECHNICAL STUDIES, SUPPORT AND ANALYSIS .....	22,386	22,386	.....
145	JOINT INTEGRATED AIR AND MISSILE DEFENSE ORGANIZATION .....	36,581	36,581	.....
146	CLASSIFIED PROGRAM USD(P) .....	.....	138,494	+ 138,494
147	SYSTEMS ENGINEERING .....	37,622	37,622	.....
148	STUDIES AND ANALYSIS SUPPORT .....	5,200	5,200	.....
149	NUCLEAR MATTERS—PHYSICAL SECURITY .....	5,232	5,232	.....
150	SUPPORT TO NETWORKS AND INFORMATION INTEGRATION .....	12,583	12,583	.....
151	GENERAL SUPPORT TO USD (INTELLIGENCE) .....	31,451	31,451	.....
152	CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM .....	104,348	104,348	.....
161	SMALL BUSINESS INNOVATION RESEARCH/TECHNOLOGY TRANSFER .....	2,372	2,372	.....
162	DEFENSE TECHNOLOGY ANALYSIS .....	24,365	27,365	+ 3,000
163	DEFENSE TECHNICAL INFORMATION CENTER (DTIC) .....	54,145	54,145	.....
164	R&D IN SUPPORT OF DOD ENLISTMENT, TESTING & EVALUATION .....	30,356	22,856	- 7,500
165	DEVELOPMENT TEST AND EVALUATION .....	20,571	20,571	.....
166	MANAGEMENT HEADQUARTERS (RESEARCH & DEVELOPMENT) .....	14,017	14,017	.....
167	MANAGEMENT HEADQUARTERS DEFENSE TECHNICAL INFORMATION CENTER (DTIC) .....	4,187	4,187	.....
168	BUDGET AND PROGRAM ASSESSMENTS .....	3,992	3,992	.....
169	ODNA TECHNOLOGY AND RESOURCE ANALYSIS .....	1,000	1,000	.....
170	OPERATIONS SECURITY (OPSEC) .....	2,551	5,551	+ 3,000
171	JOINT STAFF ANALYTICAL SUPPORT .....	7,712	7,712	.....
174	SUPPORT TO INFORMATION OPERATIONS (IO) CAPABILITIES .....	673	673	.....
175	DEFENSE MILITARY DECEPTION PROGRAM OFFICE .....	1,006	1,006	.....
177	COMBINED ADVANCED APPLICATIONS .....	16,998	15,498	- 1,500
180	INTELLIGENCE CAPABILITIES AND INNOVATION INVESTMENTS .....	18,992	18,992	.....
181	CWMD SYSTEMS: RDT&E MANAGEMENT SUPPORT .....	1,231	1,231	.....
183	COCOM EXERCISE ENGAGEMENT AND TRAINING TRANSFORMATION .....	44,500	44,500	.....
184	MANAGEMENT HEADQUARTERS—MDA .....	29,947	29,947	.....
187	JOINT SERVICE PROVIDER (JSP) .....	5,113	5,113	.....
9999	CLASSIFIED PROGRAMS .....	63,312	63,312	.....
	TOTAL, RDT&E MANAGEMENT SUPPORT .....	1,010,530	1,146,024	+ 135,494
	OPERATIONAL SYSTEMS DEVELOPMENT			
188	ENTERPRISE SECURITY SYSTEM (ESS) .....	4,565	4,565	.....
189	REGIONAL INTERNATIONAL OUTREACH & PARTNERSHIP FOR PEAC .....	1,871	1,871	.....
190	OVERSEAS HUMANITARIAN ASSISTANCE SHARED INFORMATION SY .....	298	298	.....
191	INDUSTRIAL BASE ANALYSIS AND SUSTAINMENT SUPPORT .....	10,882	16,882	+ 6,000

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
192	OPERATIONAL SYSTEMS DEVELOPMENT .....	7,222	7,222	.....
193	GLOBAL THEATER SECURITY COOPERATION MANAGEMENT .....	14,450	14,450	.....
194	CHEMICAL AND BIOLOGICAL DEFENSE (OPERATIONAL SYSTEMS DEVELOPMENT) .....	45,677	45,677	.....
195	PLANNING AND DECISION AID SYSTEM .....	3,037	3,037	.....
196	C4I INTEROPERABILITY .....	59,490	59,490	.....
198	JOINT/ALLIED COALITION INFORMATION SHARING .....	6,104	6,104	.....
202	NATIONAL MILITARY COMMAND SYSTEM-WIDE SUPPORT .....	1,863	1,863	.....
203	DEFENSE INFO INFRASTRUCTURE ENGINEERING & INTEGRATION .....	21,564	21,564	.....
204	LONG HAUL COMMUNICATIONS (DCS) .....	15,428	15,428	.....
205	MINIMUM ESSENTIAL EMERGENCY COMMUNICATIONS NETWORK .....	15,855	15,855	.....
206	PUBLIC KEY INFRASTRUCTURE (PKI) .....	4,811	4,811	.....
207	KEY MANAGEMENT INFRASTRUCTURE (KMI) .....	33,746	33,746	.....
208	INFORMATION SYSTEMS SECURITY PROGRAM .....	9,415	9,415	.....
209	INFORMATION SYSTEMS SECURITY PROGRAM .....	227,652	232,652	+ 5,000
210	GLOBAL COMMAND AND CONTROL SYSTEM .....	42,687	42,687	.....
211	JOINT SPECTRUM CENTER (DEFENSE SPECTRUM ORGANIZATION) .....	8,750	8,750	.....
214	JOINT INFORMATION ENVIRONMENT (JIE) .....	4,689	4,689	.....
216	FEDERAL INVESTIGATIVE SERVICES INFORMATION TECHNOLOGY .....	50,000	36,000	- 14,000
222	CYBER SECURITY INITIATIVE .....	1,686	1,686	.....
227	POLICY R&D PROGRAMS .....	6,526	6,526	.....
228	NET CENTRICITY .....	18,455	18,455	.....
230	DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS .....	5,496	5,496	.....
233	DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS .....	3,049	3,049	.....
236	INSIDER THREAT .....	5,365	5,365	.....
237	HOMELAND DEFENSE TECHNOLOGY TRANSFER PROGRAM .....	2,071	2,071	.....
243	INTELLIGENCE MISSION DATA (IMD) .....	13,111	13,111	.....
245	PACIFIC DISASTER CENTERS .....	1,770	1,770	.....
246	DEFENSE PROPERTY ACCOUNTABILITY SYSTEM .....	2,924	2,924	.....
248	MQ-9 UAV .....	37,863	30,863	- 7,000
251	SPECIAL OPERATIONS AVIATION SYSTEMS ADVANCED DEV .....	259,886	260,386	+ 500
252	SPECIAL OPERATIONS INTELLIGENCE SYSTEMS DEVELOPMENT ...	8,245	8,245	.....
253	SOF OPERATIONAL ENHANCEMENTS .....	79,455	99,455	+ 20,000
254	WARRIOR SYSTEMS .....	45,935	57,935	+ 12,000
255	SPECIAL PROGRAMS .....	1,978	1,978	.....
256	UNMANNED ISR .....	31,766	36,766	+ 5,000
257	SOF TACTICAL VEHICLES .....	2,578	2,578	.....
258	SOF MARITIME SYSTEMS .....	42,315	55,115	+ 12,800
259	SOF GLOBAL VIDEO SURVEILLANCE ACTIVITIES .....	4,661	4,661	.....
260	SOF OPERATIONAL ENHANCEMENTS INTELLIGENCE .....	12,049	12,049	.....
261	SOF TELEPORT PROGRAM .....	642	642	.....
	TOTAL, OPERATIONAL SYSTEMS DEVELOPMENT .....	1,177,882	1,218,182	+ 40,300
999	CLASSIFIED PROGRAMS .....	3,689,646	3,627,746	- 61,900
	TOTAL, RESEARCH, DEVELOPMENT, TEST & EVAL, DEF-WIDE .....	20,490,902	21,680,660	+ 1,189,758

## COMMITTEE RECOMMENDED ADJUSTMENTS

The following table details the adjustments recommended by the Committee:

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
2	Defense Research Sciences .....	432,347	408,837	- 23,510
	Restoring acquisition accountability: Insufficient budget justification (New Functionalities for Biological Systems) .....	.....	.....	- 9,510
	Improving funds management: Program delays .....	.....	.....	- 14,000
5	National Defense Education Program .....	74,298	103,298	+ 29,000

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
	Program increase: Manufacturing initiatives .....			+ 29,000
15	Chemical and Biological Defense Program .....	201,053	203,053	+ 2,000
	Program increase .....			+ 2,000
17	Tactical Technology .....	343,776	312,776	- 31,000
	Improving funds management: Program delays .....			- 31,000
18	Materials and Biological Technology .....	224,440	201,896	- 22,544
	Improving funds management: Program delays .....			- 22,544
24	Combating Terrorism Technology Support .....	76,230	123,730	+ 47,500
	Program increase: Anti-tunneling research .....			+ 47,500
25	Foreign Comparative Testing .....	24,199	22,199	- 2,000
	Improving funds management: Prior year carryover .....			- 2,000
35	Advanced Aerospace Systems .....	155,406	120,406	- 35,000
	Improving funds management: Program delays .....			- 35,000
40	Common Kill Vehicle Technology .....	252,879	56,879	- 196,000
	Transfer to line 106 for RKV schedule and technology risk reduction .....			- 100,000
	Transfer to line 94 for low power laser demonstrator prototypes post-PDR risk reduction .....			- 36,000
	MOKV program adjustment .....			- 60,000
41	Defense Innovation Unit Experimental (DIUx) .....	29,594	34,594	+ 5,000
	Program increase .....			+ 5,000
42	Technology Innovation .....	59,863	39,863	- 20,000
	Maintain Program Affordability: Maintain level of effort .....			- 20,000
48	Defense-Wide Manufacturing Science and Technology Program .....	136,159	176,159	+ 40,000
	Program increase: Gallium nitride semiconductor technology .....			+ 15,000
	Program increase: Manufacturing engineering programs .....			+ 25,000
50	Emerging Capabilities Technology Development .....	57,876	80,376	+ 22,500
	Program increase: Disruptive air and missile defense .....			+ 7,500
	Program increase: High-altitude optical reconnaissance unit and sensors .....			+ 10,000
	Program increase: Technical support and operational analysis effort .....			+ 5,000
51	Generic Logistics R&D Technology Demonstrations .....	10,611	16,611	+ 6,000
	Program increase: Liquid hydrocarbon fuels and nanocellulose composites .....			+ 4,000
	Program increase: Sustainable technology demonstration and validation .....			+ 2,000
53	Strategic Environmental Research Program .....	71,832	74,832	+ 3,000
	Program increase .....			+ 3,000
54	Microelectronics Technology Development and Support .....	219,803	249,803	+ 30,000
	Program increase: Trusted Foundry .....			+ 30,000
57	Command, Control and Communications Systems .....	106,787	93,295	- 13,492
	Improving funds management: Program delays .....			- 13,492
59	Sensor Technology .....	210,123	195,740	- 14,383
	Improving funds management: Program delays .....			- 14,383
63	Quick Reaction Special Projects .....	69,203	67,203	- 2,000
	Improving funds management: Prior year carryover .....			- 5,000
	Program increase: Solar energy research .....			+ 3,000
65	Test & Evaluation Science & Technology .....	89,586	105,586	+ 16,000
	Program increase .....			+ 16,000
66	Operational Energy Capability Improvement .....	38,403	40,903	+ 2,500
	Program increase .....			+ 2,500
68	SOF Advanced Technology Development .....	72,605	95,605	+ 23,000
	Program increase: Identity threat mitigation research .....			+ 18,000
	Program increase: Tactical assault light operator suit .....			+ 5,000
74	Ballistic Missile Defense Terminal Defense Segment .....	230,162	508,662	+ 278,500
	Program increase: THAAD/Patriot JEON Phase 4 (THAAD) ..			+ 108,800
	Program increase: THAAD/Patriot JEON Phase 4 (Patriot) ..			+ 145,500
	Program increase: THAAD/Patriot JEON Phase I-III .....			+ 20,200
	Program increase: Improved discrimination capabilities ..			+ 4,000
75	Ballistic Missile Defense Midcourse Defense Segment .....	828,097	980,093	+ 151,996
	Program increase: Improved discrimination capabilities ..			+ 21,996

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
	Program increase: Accelerate deployment of 20 additional GBIs with RKV .....			+ 52,000
	Program increase: Begin missile field #4 at Fort Greely with 20 new silos .....			+ 78,000
76	Chemical and Biological Defense Program—Dem/Val .....	148,518	138,593	- 9,925
	Restoring acquisition accountability: Schedule slips .....			- 9,925
77	Ballistic Missile Defense Sensors .....	247,345	291,307	+ 43,962
	Homeland Defense Radar—Hawaii—Transfer to line 77A .....			- 21,000
	Atlantic radar study—early to need .....			- 5,000
	Program increase: Improved discrimination capabilities .....			+ 57,862
	Program increase: THAAD/Patriot JEON Phase 4 .....			+ 6,900
	Program increase: THAAD/Patriot JEON Phase I-III .....			+ 5,200
77A	Homeland Defense Radar—Hawaii .....		109,000	+ 109,000
	Homeland Defense Radar—Hawaii—Transfer from line 77 .....			+ 21,000
	Program increase: Homeland Defense Radar—Hawaii .....			+ 88,000
78	BMD Enabling Programs .....	449,442	508,384	+ 58,942
	Aegis Ashore unjustified program growth .....			- 10,000
	Program increase: Cyber training and enhancements .....			+ 25,000
	Program increase: High fidelity modeling and simulation .....			+ 6,100
	Program increase: Improved discrimination capabilities .....			+ 23,342
	Program increase: THAAD/Patriot JEON Phase I-III .....			+ 14,500
80	AEGIS BMD .....	852,052	749,005	- 103,047
	SM-3 Block IIA All Up Rounds—transfer to Procurement, Defense-wide for All Up Round interceptor procurement .....			- 41,247
	Aegis ballistic missile defense 6.x development unjustified growth .....			- 64,500
	Program increase: THAAD/Patriot JEON Phase I-III .....			+ 2,700
83	Ballistic Missile Defense Command and Control, Battle Management and Communicati .....	430,115	463,115	+ 33,000
	Program increase: Improved discrimination capabilities .....			+ 3,000
	Program increase: Accelerate mobile sensor integration .....			+ 30,000
87	Sea Based X-Band Radar [SBX] .....	130,695	143,695	+ 13,000
	Program increase: Accelerate SBX software upgrades .....			+ 13,000
88	Israeli Cooperative Programs .....	105,354	373,800	+ 268,446
	Program increase: Arrow program .....			+ 71,459
	Program increase: Arrow upper tier .....			+ 28,139
	Program increase: Arrow upper tier flight test .....			+ 105,000
	Program increase: David's Sling short range ballistic missile defense .....			+ 63,848
89	Ballistic Missile Defense Test .....	305,791	331,191	+ 25,400
	Program increase: HALO replacement aircraft and sensors .....			+ 17,500
	Program increase: THAAD/Patriot JEON Phase 4 .....			+ 7,400
	Program increase: THAAD/Patriot JEON Phase I-III .....			+ 500
90	Ballistic Missile Defense Targets .....	410,425	467,546	+ 57,121
	Flight test delay .....			- 21,379
	Program increase: THAAD/Patriot JEON Phase 4 .....			+ 42,500
	Program increase: Accelerate deployment of 20 additional GBIs with RKV .....			+ 36,000
94	Technology Maturation Initiatives .....	128,406	164,406	+ 36,000
	Transfer from line 40 for low power laser demonstrator prototypes post-PDR risk reduction .....			+ 36,000
96	Hypersonic Defense .....	75,300	55,100	- 20,200
	Early to need pending completion of Analysis of Alternatives .....			- 20,200
97	Advanced Innovative Technologies .....	1,175,832	1,200,832	+ 25,000
	Program increase: Smarter machine learning .....			+ 25,000
101	Department of Defense [DoD] Unmanned System Common Development .....	3,967	7,967	+ 4,000
	Program increase: Unmanned traffic management system development .....			+ 4,000
105	Long Range Discrimination Radar [LRDR] .....	357,659	370,159	+ 12,500
	Program increase: LRDR BMEWS removal .....			+ 12,500
106	Improved Homeland Defense Interceptors .....	465,530	693,730	+ 228,200

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
	Transfer from line 40 for RKV risk reduction and acceleration .....			+ 100,000
	C3 booster early to need .....			- 11,200
	Program increase: Accelerate deployment of 20 additional GBIs with RKV .....			+ 139,400
112	Ballistic Missile Defense Midcourse Segment Test .....	76,757	86,057	+ 9,300
	Program increase: Accelerate deployment of 20 additional GBIs with RKV .....			+ 9,300
xx	National Security Technology Accelerator/MD5 .....		25,500	+ 25,500
120	Chemical and Biological Defense Program—EMD .....	406,789	368,887	- 37,902
	Improving funds management: Prior year carryover .....			- 37,902
122	Joint Tactical Information Distribution System [JTIDS] .....	15,358	17,858	+ 2,500
	Program increase .....			+ 2,500
124	Information Technology Development .....	12,322	11,322	- 1,000
	Improving funds management: Prior year carryover .....			- 1,000
126	Defense Exportability Program .....	3,162	2,162	- 1,000
	Improving funds management: Prior year carryover .....			- 1,000
146	Classified Program USD(P) .....		138,494	+ 138,494
	Classified Adjustment .....			+ 138,494
162	Defense Technology Analysis .....	24,365	27,365	+ 3,000
	Program increase .....			+ 3,000
164	R&D in Support of DoD Enlistment, Testing and Evaluation .....	30,356	22,856	- 7,500
	Improving funds management: Prior year carryover .....			- 7,500
170	Defense Operations Security Initiative [DOSI] .....	2,551	5,551	+ 3,000
	Program increase .....			+ 3,000
177	Combined Advanced Applications .....	16,998	15,498	- 1,500
	Improving funds management: Prior year carryover .....			- 1,500
191	Industrial Base Analysis and Sustainment Support .....	10,882	16,882	+ 6,000
	Program increase .....			+ 6,000
209	Information Systems Security Program .....	227,652	232,652	+ 5,000
	Program increase: Security tools .....			+ 5,000
216	Federal Investigative Services Information Technology .....	50,000	36,000	- 14,000
	Improving funds management: Forward financing .....			- 14,000
248	MQ-9 UAV .....	37,863	30,863	- 7,000
	Restoring acquisition accountability: Excess product development (MALET MQ-9) .....			- 7,000
251	Aviation Systems .....	259,886	260,386	+ 500
	Transfer: SOCOM requested transfer from PDW line 49 .....			+ 7,500
	Transfer: SOCOM requested transfer from PDW line 49 .....			+ 6,000
	Restoring acquisition accountability: Excess product development (RFCM) .....			- 10,000
	Insufficient budget justification: poor justification materials (CV-22) .....			- 3,000
253	Operational Enhancements .....	79,455	99,455	+ 20,000
	Program increase: Autonomous anti-denial defeat UAS .....			+ 2,000
	Program increase: Enhanced precision strike munitions .....			+ 16,000
	Program increase: Software enhancement for ingestion of PAI data .....			+ 2,000
254	Warrior Systems .....	45,935	57,935	+ 12,000
	Program increase: Small glide munition UAS integration .....			+ 12,000
256	Unmanned ISR .....	31,766	36,766	+ 5,000
	Program increase: UAS anti-icing .....			+ 5,000
258	Maritime Systems .....	42,315	55,115	+ 12,800
	Transfer: SOCOM requested transfer from PDW line 62 .....			+ 12,800
	Classified Programs .....	3,689,646	3,627,746	- 61,900
	Classified Adjustment .....			- 61,900

*Manufacturing Technology Program.*—The Committee understands that metal castings play a significant role in ensuring warfighter preparedness and that investment is needed in castings technology to maintain technological superiority in the advanced manufacturing industry. Therefore, the Committee supports the fis-

cal year 2018 President's budget request of \$41,5110,000 for the Manufacturing Technology Program and encourages the Secretary of Defense to invest in metal castings technology.

*Joint Chemical-Biological Defense Logistics and Distribution Center.*—Consistent with the report accompanying the Senate version of the National Defense Authorization Act for Fiscal Year 2018 (Senate Report 115–125), the Committee directs the Secretary of Defense to evaluate the feasibility of designating a Joint Chemical-Biological Defense Logistics Distribution Center to consolidate the Joint Chemical, Biological, Radiological, and Nuclear sustainment functions and provide enhanced military readiness to the warfighter.

*Strategic Capabilities Office.*—The Committee supports the Department of Defense's fiscal year 2018 President's budget request of \$1,175,832,000 for the Strategic Capabilities Office [SCO] and commends SCO for responding to critical needs from Combatant Commanders that address near term national security requirements. Further, the Committee notes that SCO's direct reporting to the Secretary of Defense has led to the rapid development of breakthrough technologies that have successfully transitioned to the military services. Therefore, the Committee directs the Department to maintain the current chain of command for conducting SCO activities.

*Trusted Microelectronics.*—The Committee remains concerned with the Department of Defense's lack of a long-term plan to establish a trusted microelectronics roadmap that maintains supply chain assurance against counterfeit parts and ensures access to trusted microelectronics. In the report accompanying the Senate version of the Department of Defense Appropriations Act, 2017 (Senate Report 114–263), the Committee directed quarterly updates on efforts to maintain a trusted microelectronics capability. In the fiscal year 2018 President's budget request, the Department requested \$364,513,000 for trusted foundry, trusted microelectronics, and microelectronics technology development without a comprehensive plan. While the Committee recognizes the challenge of ensuring secure microelectronics requires a whole of government approach, the Department of Defense is encouraged to apply greater urgency, oversight and resources to address the issue. Therefore, the Committee directs the Under Secretary of Defense (Research and Engineering) and the Under Secretary of Defense (Acquisition and Sustainment) to provide a joint report no later than 180 days after enactment of this act which includes a definition of the scope of the microelectronics problem; confirmation that the United States has the infrastructure to provide legacy and future chips for our weapons systems or what resources might be necessary to provide for that infrastructure; and testing protocols that the Department is utilizing to ensure current microelectronics have achieved security assurance. The report shall also identify policy concerns to ensure the Department of Defense complies sufficiently in conducting the National Security mission.

*Cyber Vulnerabilities Organization/Section 1647.*—Consistent with section 1647 of the National Defense Authorization Act for Fiscal Year 2016, Congress provided funding to evaluate the cyber vulnerabilities of major Department of Defense weapons systems in



fiscal year 2016. The organization tasked with conducting these assessments, referred to as section 1647, has provided critical insights into the challenges and solutions being utilized to address vulnerabilities in the Nation's critical systems. The Committee believes their success was evident in the Department's June 2017 submission of a reprogramming action to continue cyber vulnerability assessments in fiscal year 2017. The Committee encourages the Department to continue to adequately resource the organization in future budget submissions to ensure its continued progress in protecting the Department's systems from cyber threats.

With the reorganization of the Under Secretary of Defense (Acquisition, Technology and Logistics), the Committee is concerned that the essential mission being served by section 1647 may be squandered if it is moved into an organization whose mission is more information technology focused. The Committee believes that the section 1647 group must be aligned with an organization within the Department that is focused on operational needs and addresses the requirements of the Combatant Commands. Therefore, not later than 90 days of the enactment of this act, the Committee directs the Secretary of Defense, in coordination with the Chairman of the Joint Chiefs of Staff, to report to the congressional defense committees on a plan to realign section 1647 within the Department of Defense that maintains its focus on mission and operational assurance and provides an avenue for adequate resourcing.

*National Security Accelerator/MD5.*—The Committee continues to support the work of The National Security Technology Accelerator Initiative/MD5 to facilitate collaboration between civilian and military personnel, their counterparts in academia, and high-tech industry. Therefore, the Committee recommends \$25,500,000 for the program in fiscal year 2018 and encourages the Department of Defense to include funding for this program in its fiscal year 2019 budget request.

*Directed Energy Fielded Capabilities Bridge.*—The Committee notes that robust directed energy technology investments have not produced acquisition programs or fielded capabilities sufficient to warfighter requirements. The Department of Defense has consistently described the potential warfighting advantages of directed energy programs, as well as their concern about the growing operational capabilities and developments of foreign adversaries in this technology area. Therefore, the Committee directs the Undersecretary of Defense (Research and Engineering) to conduct a review across the services to identify directed energy technologies that can be transitioned out of the laboratories and provide a report to the congressional defense committees no later than 120 days after the enactment of this act which describes the technology readiness levels of existing programs, an assessment of both the time frame for potential transition of each program to a program of record/fielded technology, as well as funds required to complete the technology transition.

*Manufacturing Engineering Education Grant Program.*—The Committee recognizes that the United States must maintain a technically trained workforce to meet the defense industrial base requirements of the Department of Defense. Therefore, the Committee recommends an additional \$25,000,000 above the fiscal year

2018 budget request for manufacturing engineering grants and encourages the Secretary of Defense to prioritize funding under this program to support community colleges and technical schools.

*Prompt Global Strike.*—The Committee continues to support the Department’s efforts to develop and demonstrate a conventional prompt global strike capability and recommends full funding of the President’s fiscal year 2018 budget request, an increase of more than \$40,000,000 over the fiscal year 2017 enacted level. Further, the Committee understands that validated requirements from Pacific Command and European Command are in risk of not being supported in the 2020–2022 timeframe. Therefore, the Committee encourages the Secretary of Defense to provide an updated plan to the congressional defense committees for deployment of an early operational capability.

#### MISSILE DEFENSE AGENCY

*Redesigned Kill Vehicle.*—The fiscal year 2018 President’s request includes \$384,900,000 in Research, Development, Test and Evaluation, Defense-Wide for continued development of the Redesigned Kill Vehicle [RKV], which will provide a more robust homeland defense capability and be more reliable, producible, effective, easier to maintain, and cheaper to build than the current kill vehicle. Subsequent to the fiscal year 2018 budget submission, the President submitted a request to Congress to accelerate the RKV program and field 20 additional Ground-Based Interceptors [GBIs] with RKVs in a new missile field that will be constructed at Fort Greely, Alaska. Following successful completion of a flight test, employment of 20 GBIs with RKVs is scheduled to begin in late 2021 and complete by the end of fiscal year 2023. The Committee recommends full funding for this request.

The Committee has been informed by MDA that the accelerated RKV program is fully funded in MDA’s budget, that all technical risks are understood, and that MDA will maintain its current acquisition strategy, to include compliance with the Department of Defense’s full funding policy for usable end items. Further, the Committee has been informed that MDA plans to maintain its ‘fly before you buy’ acquisition approach. Nevertheless, to reduce the risk introduced to the RKV program by the accelerated fielding and integration schedule, the Committee recommends an additional \$100,000,000 for RKV development risk reduction in fiscal year 2018, and an additional \$236,700,000 to further mitigate schedule risk for the employment of the 20 GBIs with RKVs by 2023.

The Committee directs the Director, Cost Assessment and Program Evaluation to provide to the congressional defense committees with the fiscal year 2019 President’s request an updated Independent Cost Estimate for the RKV program that reflects the accelerated development, testing, integration, and fielding schedule. In addition, the Director, MDA, in conjunction with the Under Secretary of Defense (Acquisition, Technology and Logistics), is directed to provide to the congressional defense committees with the fiscal year 2019 President’s request an updated acquisition strategy for the RKV program, to include the revised acquisition objective, an acquisition program baseline, the test plan, contracting strategy, as well as an identification of any programmatic, technical and

manufacturing risks to the program schedule. Finally, the Director, MDA is directed to certify to the congressional defense committees with the fiscal year 2019 President’s request full funding of the accelerated RKV program.

*Sea-Based X-Band (SBX) Radar Report.*—The Committee understands that pursuant to section 1684 of the National Defense Authorization Act for Fiscal Year 2016, the Director, Missile Defense Agency [MDA], is reviewing possible basing locations for an SBX radar in the Atlantic. The Committee encourages the Director, MDA to consult with the Secretary of the Navy to avoid homeport sites that negatively impact national defense infrastructure and priorities, including U.S. naval operations such as ship and submarine maintenance activities at public shipyards. The Director, MDA and the Secretary of the Navy are directed to include in the forthcoming report an evaluation for each Atlantic SBX radar location under consideration of potential impacts to public shipyards, as well as mitigation strategies and associated joint costs.

OPERATIONAL TEST AND EVALUATION, DEFENSE

Appropriations, 2017 .....	\$186,994,000
Budget estimate, 2018 .....	210,900,000
Committee recommendation .....	210,900,000

The Committee recommends an appropriation of \$210,900,000. This is equal to the budget estimate.

[In thousands of dollars]

Line	Item	2018 budget estimate	Committee recommendation	Change from budget estimate
1	Operational Test and Evaluation .....	83,503	83,503	.....
2	Live Fire Test and Evaluation .....	59,500	59,500	.....
3	Operational Test Activities and Analyses .....	67,897	67,897	.....
	Total, Operational Test and Evaluation, Defense .....	210,900	210,900	.....