AIR NATIONAL GUARD

2011

WEAPONS SYSTEMS
MODERNIZATION REQUIREMENTS

GUARDING AMERICA * DEFENDING FREEDOM

FOREWORD

From the first days of the Air National Guard, Guard Airmen have stood ready to provide a dedicated and highly capable force to prosecute any mission, anywhere, anytime. Today's national security environment requires that our military, including the Air National Guard, be capable of engaging across the full spectrum of conflict. We must be agile, adaptable, and, in today's environment, cost effective.

During our history, the Air Guard has proven itself an invaluable element of the Total Force. Today we function as a ready and reliable operational reserve, while continuing to robust our strategic surge capability. We are an integral component of on-going operations in Iraq, Afghanistan, and countless other locations around the globe. There is no doubt that our Airmen are ready for today's contingencies and commitments. The questions we have to answer are: Are we ready for 2025? Have we made the decisions that will lay the foundation for the Air National Guard our next generation of Americans will need? Will they have the equipment they need?

The Air Force has embarked on a significant recapitalization and modernization initiative for its aging aircraft fleet. The Air Guard must be included in these endeavors with concurrency and balance. We must also deal with our dual mission - consistent support to the combatant commanders and domestic response capability for our governors, we must have the right tools for the job if we are to do the job right.

The theme of the 2010 Air Reserve Component Weapons and Tactics Conference (WEPTAC), "Legacy Platforms, Future Fight," accurately captured how the Air National Guard leverages its core strengths to modernize existing weapons systems, keeping them relevant and effective across the spectrum of the military operations today and for the future. Furthermore, our weapons systems must be evaluated for maximum effectiveness and integrated into established platforms seamlessly to enable immediate mission impact and unparalleled agility.

Embedded in our Airman culture is the commitment to provide a lean and agile force dominating air, space and cyberspace. The Air National Guard's modernization efforts are unparalleled successes and allow us to maintain our combat edge. The first-hand knowledge that our tactical leaders provide during WEPTAC drives our modernization processes. I am incredibly proud to present the Air National Guard's 2011 Modernization Book.

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INTRODUCTION

The 2011 Weapon Systems Modernization Requirements Book documents capability requirements highlighted during the 2010 Air Reserve Component Weapons and Tactics (WEPTAC) Conference. The WEPTAC Conference hosted over 1,200 military and civilian attendees including commercial industry partners and representatives from all Air National Guard (ANG) and Air Force Reserve weapon systems. These experts from the field identified capability requirements and briefed the results to the Director, Air National Guard at the conference outbrief.

The 2011 Weapon Systems Modernization Requirements Book is organized by weapon system and includes seventeen individual Weapon System Tabs. Each tab includes a summary of critical, essential, and desired capability requirements. Critical requirements are those needed within three years; essential requirements are needed within three to five years; and desired capabilities are defined as those needed beyond five years. Each tab also includes an executive summary containing the required appropriation type, program element codes, and five-year cost projections for each program. The last items in each tab are the information papers that define programs to fulfill all or part of a capability requirement.

The information papers contained in this book are grouped into six functional categories. The six functional categories include five Service Core Function categories and a Simulation and Distributed Mission Operations category. A header identifies each information paper as belonging to one of the six functional categories listed below:

- *Air Superiority / Global Precision Attack*
- *Space Superiority / Cyberspace Superiority / Command and Control / Global Integrated ISR*
- *Rapid Global Mobility*
- *Special Operations / Personnel Recovery*
- *Agile Combat Support*
- *Simulation and Distributed Mission Operations*

The Weapon Systems Modernization Requirements table summarizes and prioritizes each program identified in the information papers. Programs are listed in priority order and include type of funds required and program costs. Each modernization program is prioritized only within its functional category.

It should be noted that this book follows a new naming convention. Unlike last year's book, the 2011 Weapon Systems Modernization Requirements Book is based on the results of the 2010 WEPTAC Conference. The conference results captured in this book cover all aspects of ANG modernization with the exception of domestic operations addressed in the companion 2011 Domestic Operations Equipment Requirements book.

2011 Weapons Systems Modernization Requirements

AIR SUPERIORITY/GLOBAL PRECISION ATTACK	Type Funds	Units Required	Unit Cost	Program Cost
F-15 Active Electronically Scanned Array (AESA) Radar				
*Next generation precision capability to detect, track, and eliminate asymmetric threats	3010	19	$6,600,000	$125,400,000
F-16 Integrated Sensor Enhancements - Active Electronically Scanned Array (AESA) Radar				
*Program NRE	3600	1	$330,400,000	$330,400,000
*APG-68+ NRE	3600	1	$20,000,000	$20,000,000
*AESA Radars	3010	114	$4,300,000	$490,200,000
*APG-68+ kits	3010	114	$700,000	$79,800,000
*Next generation precision capability for detection and targeting of ground and air targets.				
F-16C Blk 30/32/40/42 Advanced Identification Friend/Foe (AIFF)				
*Program NRE	3600	1	$10,700,000	$10,700,000
Block 42 APX-113-60 AIFF Kits	3010	47	$379,000	$17,813,000
Block 30 APX-113-60 AIFF retrofit Kits	3010	79	$107,595	$8,500,005
*Required IFF upgrades				
F-15 Infrared Search-and-Track (IRST)				
*Program NRE	3600	1	$20,000,000	$20,000,000
*IRST Kits	3010	50	$3,900,000	$195,000,000
*Enables passive detection and tracking of asymmetric and radar jamming threats				
F-16 Integrated Sensor Enhancements - Infrared Search-and-Track (IRST) Pod				
*Program NRE	3600	1	$25,000,000	$25,000,000
*IRST Kits	3010	78	$3,900,000	$304,200,000
*Enables passive detection and tracking of asymmetric and radar jamming threats				
F-16/A-10 Day/Night Helmet Mounted Integrated Targeting (HMIT) System				
*F-16 HMIT kits	3010	166	$120,000	$19,920,000
*HMIT helmets	3010	83	$60,000	$4,980,000
*A-10 HMIT kits	3010	159	$150,000	$23,850,000
*F-16 JHMCS Night kits	3010	129	$240,000	$30,960,000
*Provides increased situational awareness and lethality while preventing fratricide.				
F-16 Center Display Unit (CDU)				
*Color Display units	3010	333	$110,000	$36,630,000
*IBS Receiver kits	3010	333	$160,000	$53,280,000
*Replaces center pedestal with a smart color display.				
F-15 Combat Identification				
*Program NRE	3600	1	$20,000,000	$20,000,000
*Combat identification units	3010	60	$450,000	$27,000,000
*Identification of threat aircraft while reducing risk of engagement with friendly aircraft.				
A-10 Anti-Jam Embedded GPS / INS (EGI)				
*Program NRE	3600	1	$32,000,000	$32,000,000
*Anti-jam EGI	3010	116	$200,000	$23,200,000
*provides ability to operate in a degraded, denied, or deceived environment.				
F-15 Display Upgrades and Advanced Targeting Pod (ATP) Integration				
*Radar Displays	3010	156	$75,000	$11,700,000
*RWR Displays	3010	124	$140,000	$17,360,000
*ATP Group B kits	3010	103	$20,000	$2,060,000
*Upgraded displays and improved acquisition and combat ID of asymmetric targets				
F-16 Integrated Electronic Warfare (EW) Suite				
*NRE (ALR-69)	3600	1	$31,590,000	$31,590,000
*F-16 Blk 30/42 ALR-69 Upgrade	3010	338	$110,000	$37,180,000
*NRE (ALR-56M)	3600	1	$50,000,000	$50,000,000
*F-16 BLK 40/50/52 ALR-56M upgrade	3010	78	$340,000	$26,520,000
*Upgraded Electronic Attack (EA) Pod Development	3600	1	$20,000,000	$20,000,000
*Upgraded Electronic Attack (EA) Pods	3010	60	$1,320,000	$79,200,000
*F-16 Blk 40/50/52 ALQ-213 Development	3600	1	$28,000,000	$28,000,000
*ALQ-213 kits	3010	150	$130,000	$19,500,000
*Provides all F-16 blocks with an upgraded EW suite				
F-16 Advanced Targeting Pod Upgrades				
*4th Gen pod upgrades	3010	101	$1,130,000	$114,130,000
*ATP-SE Pods	3010	40	$1,700,000	$68,000,000
*Provides 4th generation targeting/identification/recognition capability				
A-10 Advanced Digital Radar Warning Receiver (RWR) and Geolocation				
*Program NRE	3600	1	$31,590,000	$31,590,000
*ALR-69 Upgrade kits	3010	106	$130,000	$13,780,000
*Enhanced threat detection and azimuth accuracy				
F-15 Modernized Protection Suite				
*RF countermeasures NRE	3600	1	$50,000,000	$50,000,000
*RWR NRE	3600	1	$10,000,000	$10,000,000
*RWR Upgrade kits	3010	103	$710,000	$73,130,000
*RFCM Systems	3010	103	$1,410,000	$145,230,000
*BOL kits	3010	103	$120,000	$12,360,000
*Upgraded defensive suite				
A-10 Advanced Electronic Attack (EA) Pod				
*Program NRE	3600	1	$20,000,000	$20,000,000
*Upgrades pods with Digital Radio Frequency Memory (DRFM) technology	3010	30	$1,320,000	$39,600,000

AIR SUPERIORITY/GLOBAL PRECISION ATTACK	Type Funds	Units Required	Unit Cost	Program Cost
A-10 Fully Integrated Communication Suite				
*Directional Audio NRE	3600	1	$6,000,000	$6,000,000
*SA waveform NRE	3600	1	$2,000,000	$2,000,000
*Directional kits	3010	117	$80,000	$9,360,000
*Integrates advanced communications suite with directional audio				
A-10 Lightweight Airborne Radio System (LARS) Upgrade				
*Program NRE	3600	1	$750,000	$750,000
*LARS units	3010	116	$70,000	$8,120,000
*Provides compatibility with ground based CSAR survival radios				
F-16 Secure Line-of-Sight (SLOS) and Beyond LOS (BLOS) with 3-D Audio Communications				
*Directional audio NRE	3600	1	$8,300,000	$8,300,000
*F-16 2nd ARC-210 radio kit	3010	333	$150,000	$49,950,000
*Directional kits	3010	333	$80,000	$26,640,000
*Enhances time sensitive targeting and coordination with ground forces				
A-10 Engine Replacement				
*Program NRE	3600	1	$268,000,000	$268,000,000
*A-10 engine replacement required to sustain the A-10 for the next 25 years.	3010	231	$1,500,000	$346,500,000
TOTAL				**$3,525,383,005**

SPACE SUPERIORITY/CYBERSPACE SUPERIORITY/ COMMAND AND CONTROL/GLOBAL INTEGRATED ISR	Type Funds	Units Required	Unit Cost	Program Cost
RC-26 Block 30 Fleet Modernization				
*Program NRE	3010	1	$2,000,000	$2,000,000
*Common fleet baseline block configuration with avionics, comm and mission upgrades	3010	10	$3,950,000	$39,500,000
Dismounted Interoperable Acquisition of Sensor Computer	3840	336	$10,000	$3,360,000
*Lightweight digital interactive mapping device for air and ground forces SA				
JSTARS Engine Replacement				
*Program NRE	3600	1	$66,990,000	$66,990,000
*TF-33 Engine kits	3010	80	$14,350,125	$1,148,010,000
*Engine retrofit modification improving performance and reliability.				
Cyber and Critical Infrastructure Range (CCIR) Weapons System				
*CCIR Weapons Systems	3080	8	$510,000	$4,080,000
*CCIR Refresh/Sustainment	3840	8	$840,000	$6,720,000
JSTARS Organic Combat Identification Capability For Targeting				
*Aided target Recognition (ATR) Software Development	3600	1	$41,198,000	$41,198,000
*Net-Centric Collaborative Targeting (NCCT) NRE	3600	1	$31,914,000	$31,914,000
*NCCT Kits	3010	18	$384,000	$6,912,000
*MS-177 EO/IR Sensor NRE	3600	1	$250,015,000	$250,015,000
*EO/IR Sensors	3010	6	$74,739,000	$448,434,000
*Organic combat identification capability for targeting				
C-130J Senior Scout Certification & Kits				
*Program NRE	3010	1	$4,200,000	$4,200,000
*C-130J Aircraft TCTSs	3010	10	$200,000	$2,000,000
MQ-1/MQ-9 Integrated Communications Suite				
*NRE 2nd Radio	3600	1	$3,600,000	$3,600,000
*NRE Ground Relay	3600	1	$1,200,000	$1,200,000
*Radio/Antenna Kits	3010	120	$800,000	$96,000,000
*Ground Relay	3080	12	$1,700,000	$20,400,000
Domain Infrastructure Capability Enhancement (DICE)				
*Switch	3080	169	$12,000	$2,028,000
DCGS Unclassified Processing Exploitation and Dissemination (PED) Capability				
*DCGS unclassified Enclaves	3080	6	$2,320,000	$13,920,000
*DCGS unclassified Gateways	3080	6	$1,520,000	$9,120,000
*NRE security gateway	3080	1	$2,750,000	$2,750,000
*Technical Refresh costs	3080	1	$3,500,000	$3,500,000
Senior Scout Super High Frequency (SHF) Tuners				
*Program NRE	3010	1	$2,950,000	$2,950,000
*Ship sets	3010	4	$575,000	$2,300,000
JSTARS Cross-Domain Security				
*CENTRIXS	3010	15	$30,000	$450,000
*MS Office Software License (NRE)	3600	1	$500,000	$500,000
*Swiftbroadband Integration (NRE)	3600	1	$15,000,000	$15,000,000
*Swiftbroadband kits	3010	18	$555,556	$10,000,000
*Gives JSTARS chat, email, browse and Microsoft (MS) Office products to support OEF				
Senior Scout Radio Frequency Distribution (RFD) Enhancements				
*Program NRE	3600	1	$2,200,000	$2,200,000
*Ship sets	3010	4	$680,000	$2,720,000
EC-130J Radio Signal Propagation Modeling Program				
*RF Propagation software program	3080	1	$360,000	$360,000
*Range support	3840	1	$250,000	$250,000
Senior Scout Receiver Modernization				
*Program NRE	3600	1	$2,610,000	$2,610,000
*Ship sets	3010	4	$430,000	$1,720,000

SPACE SUPERIORITY/CYBERSPACE SUPERIORITY/ COMMAND AND CONTROL/GLOBAL INTEGRATED ISR	Type Funds	Units Required	Unit Cost	Program Cost
Senior Scout Blue Force Tracking				
*Program NRE	3010	1	$1,260,000	$1,260,000
*Ship sets	3010	4	$540,000	$2,160,000
RC-26 Increased Onboard Electrical Generator Capacity				
*Program NRE	3010	1	$120,000	$120,000
*Ship sets	3010	13	$164,000	$2,132,000
RC-26B Modernized Self-Protection System				
*Program NRE	3010	1	$520,000	$520,000
*Ship sets	3010	11	$220,000	$2,420,000
MQ-1/MQ-9 Independent and Redundant Data Architectures				
*NRE RPA Gateway	3080	1	$2,200,000	$2,200,000
*RPA Gateway kits	3080	10	$700,000	$7,000,000
*Service Delivery Points	3080	6	$400,000	$2,400,000
JSTARS Tactical Data Link Interoperability				
*Program NRE	3600	1	$44,900,000	$44,900,000
*Data links/gateways	3010	18	$1,230,000	$22,140,000
*Allows Joint STARS to operate on both Link-16 and SADL networks				
Deployable Cyber Quick Reaction Capability (DCQRC)				
*Suites	3080	9	$142,000	$1,278,000
Theater Deployable Communications (TDC)	3080	12	$800,000	$9,600,000
*Provides network reachback capability				
Binocular Night Vision Device (BNVD)				
*BNVD for JTACs	3080	408	$9,461	$3,860,088
Power Distribution Panel System (PDPS)				
*Systems	3840	24	$125,000	$3,000,000
ADS Tactical Satellite (TACSAT) Communication				
*TACSAT Communication Systems	3840	24	$50,000	$1,200,000
Tactical Quiet Generators (TQG)				
*Systems	3080	60	$67,000	$4,020,000
JTAC LPI/LPD Body-worn hands free Receiver				
*LIP/LPD VDL Kits	3080	168	$21,000	$3,528,000
JSTARS Integrated Broadcast Service				
*Program NRE	3600	1	$45,150,000	$45,150,000
*Primary threat warning system to Joint STARS and also provides intelligence reports (NRE)	3010	1	$22,350,000	$22,350,000
Cyber Operations Execution Platform (COEP)				
*COEP Systems	3080	5	$220,000	$1,100,000
Immersive Telepresence for Distributed Operations (ITDO)				
*ITDO Systems	3080	8	$320,000	$2,560,000
Improved MQ-1/MQ-9 Targeting Pod				
*Program NRE	3600	1	$21,000,000	$21,000,000
*Advanced Targeting Pods (ATP)	3010	48	$2,000,000	$96,000,000
*Video Data Link kits	3010	48	$95,000	$4,560,000
Improved MQ-1/MQ-9 Electronic Protection				
*Program NRE	3600	1	$8,700,000	$8,700,000
*Provides GPS in jamming environment	3010	120	$1,700,000	$204,000,000
Improved MQ-1/MQ-9 Human Machine Interface				
*Block 50 Mod kits	3080	30	$1,383,333	$41,500,000
TOTAL				**$2,809,569,088**

SPECIAL OPERATIONS/PERSONNEL RECOVERY	Type Funds	Units Required	Unit Cost	Program Cost
HC/MC-130 BLOS/LOS Tactical Data Link (TDL)				
*Program NRE	3600	1	$3,250,000	$3,250,000
*Kits for H/MC-130	3010	13	$1,100,000	$14,300,000
*FMV/VDL Kit	3010	13	$300,000	$3,900,000
*Low cost data link designed to give real time threat and friendly information.				
HH-60 Improved Communications Suite with Three-Dimensional Audio				
*Technical Orders, Installs (NRE)	3010	1	$1,500,000	$1,500,000
*Directional Audio (NRE)	3600	1	$3,000,000	$3,000,000
*Radio Kits	3010	18	$130,000	$2,340,000
*Directional Kits	3010	72	$40,000	$2,880,000
*Provides secure com for HD and fills a radio shortfall for combat missions.				
HH-60 Hostile Fire Indicator (HFI) w/Enhanced Defensive System Suite				
*Program NRE	3600	1	$2,000,000	$2,000,000
*HFI	3010	17	$1,400,000	$23,800,000
*HFI detects small arms and RPGs.				
Enhanced Combat Survivability Suite				
*M4 modernization	3080	90	$600	$54,000
*M9 modernization	3080	90	$700	$63,000
*Seven Layer Combat System Modernization	3080	90	$1,400	$126,000
*Portable Situational Awareness Data Link	3080	60	$20,000	$1,200,000
*Handheld Day/night Laser Marker	3080	60	$80,000	$4,800,000
*Command and Control Trailer	3080	3	$120,000	$360,000
*Non-Lethal Weapons	3080	60	$600	$36,000
*Provides critical uniform, communication and weapons improvements and upgrades.				

SPECIAL OPERATIONS/PERSONNEL RECOVERY	Type Funds	Units Required	Unit Cost	Program Cost
ST Universal Data Link				
*Universal Data Link	3080	20	$40,000	$800,000
*Provides improved situational awareness and communication capabilities during combat operations.				
HC/MC-130 EO/IR Sensor Upgrade				
*Program NRE	3010	1	$2,000,000	$2,000,000
*EO/IR Sensor Kits	3010	13	$300,000	$3,900,000
*Integrate onboard sensors with aircraft systems and provide data link capability				
GA Improve Recovery Vehicles				
*Advance Water Rescue Craft	3080	20	$60,000	$1,200,000
*Search and Rescue Tactical Vehicle	3080	6	$100,000	$600,000
*Light Air Deliverable Rescue Vehicle	3080	6	$100,000	$600,000
*Provides special equipment for recover operations.				
HH-60 Helmet Mounted Cueing System (HMCS)				
*Program NRE	3600	1	$5,000,000	$5,000,000
*Group A	3010	20	$300,000	$6,000,000
*Group C	3010	132	$80,000	$10,560,000
*NV Units	3010	132	$60,000	$7,920,000
*Provides enhanced crew awareness.				
HH-60 Improved/Advanced Weapon Systems				
*M134D	3010	36	$60,000	$2,160,000
*GAU-21	3010	36	$140,000	$5,040,000
*Provides .50 caliber machine gun capability.				
HC-130 Improved Self Protection and Hostile Fire Indicator (HFI)				
*HFI	3010	15	$770,000	$11,550,000
*HFI detects small arms and RPGs.				
Special Tactics Enhanced Lightweight Dismounted Operators Suite				
*Personal Protection Equipment	3080	107	$3,700	$395,900
*Enhanced LOS Antennae	3080	200	$200	$40,000
*Advanced Combat Rifle	3080	107	$5,000	$535,000
*Improved Rifle Targeting System	3080	120	$3,000	$360,000
*Multi Spectrum NVD	3080	20	$33,000	$660,000
*Hot Weather Headset	3080	100	$300	$30,000
*Multi-spectrum Combat ID	3080	200	$1,500	$300,000
*Next Generation MFD	3080	100	$1,200	$120,000
*Enhanced Grenade Launcher	3080	37	$3,100	$114,700
*Provides lightweight gear for rapid return of fire and precision airstrikes.				
Special Tactics Next Generation Assault Zone Operations Suite				
*GPS Enabled Survey System	3080	5	$68,000	$340,000
*Assault Zone Penetrometer	3080	4	$60,000	$240,000
*Airfield Situational Awareness Platform	3080	8	$15,000	$120,000
*Improved Light Gun	3080	5	$5,700	$28,500
*Provides modern gear conducive to dismounted operations that also reduces exposure time.				
LC/HC/MC-130 Electronic Propeller Control System (EPCS)				
*EPCS FOR H/MC-130	3010	13	$615,000	$7,995,000
*Replaces synchrophasers and propeller control systems with reliable digital controls.				
L/M/HC-130 Eight Bladed Propeller Upgrade				
*Integration Costs	3010	1	$2,500,000	$2,500,000
*NP2000 System for HC/MC-130	3010	13	$2,000,000	$26,000,000
*Replaces existing propulsion (propellers, engine sys) with high efficiency, low MX items				
HC-130 Oil Cooler Augmentation				
Synchrophaser	3010	3	$50,000	$150,000
60/90kVA and Oil Cooler Augmentation	3010	3	$950,000	$2,850,000
*Significantly lowers engine oil temperature.				
HH-60 Point Designation and Coordinate Generation				
*Program NRE	3600	1	$3,000,000	$3,000,000
*Coordinate Generating Laser	3010	18	$500,000	$9,000,000
*Provides the capability to mark a target of interest and gain the geo coordinate information of the target.				
GA Scenario Training Suite				
*Scenario Training Suite	3080	3	$900,000	$2,700,000
*Provides GA confined space, high angle alternate extraction/insertion and terminal fire training simulator.				
ST Rapidly Deployable Domestic Emergency Response Center				
Radio Command and Control Suite	3080	2	$160,000	$320,000
*Provides ST a mobile radio command and control suite to direct domestic rescue operations.				
TOTAL				**$178,738,100**

RAPID GLOBAL MOBILITY	Type Funds	Units Required	Unit Cost	Program Cost
C/HC/MC-130 Integrated BLOS/LOS/Data Link/VDL				
*Kits for C-130	3010	167	$400,000	$66,800,000
*Low cost data link designed give real time threat and friendly information.				
KC-135 Advanced Infrared Countermeasures (IRCM) Defensive Systems				
*NRE	3600	1	$6,000,000	$6,000,000
*Group A	3010	190	$850,000	$161,500,000
*Group B	3010	95	$2,000,000	$190,000,000
*Allows KC-135 aircraft to fly in an environment of increasing threat complexity and lethality.				

RAPID GLOBAL MOBILITY	Type Funds	Units Required	Unit Cost	Program Cost
C-5 Structural Issues				
*Replaces the aft crown skin	3010	33	$9,400,000	$310,200,000
C-17 Next Generation Threat Detection System				
*NRE	3600	1	$6,000,000	$6,000,000
*Next Generation Sensors	3010	9	$780,000	$7,020,000
*LAIRCM Group A kits	3010	9	$2,100,000	$18,900,000
*LAIRCM Group B kits	3010	9	$3,000,000	$27,000,000
*Allows for wide-angle view from the 3 o'clock to 9 o'clock continuum behind the aircraft				
C-38 Replacement Aircraft				
*Supports Congressional, DOD, Air Force and National Guard Travel missions worldwide.	3010	4	$63,590,000	$254,360,000
C-130 - Advanced Infrared Countermeasures (IRCM) Suite				
*NexGen Group A Kits for C-130H/J and EC-130	3010	104	$970,000	$100,880,000
*NexGen Group B Kits for C-130H/J and EC-130	3010	74	$4,400,000	$325,600,000
*Allows C-130 aircraft to fly in an increasing threat environment				
KC-135 Tactical Data Link (TDL) and Situational Awareness Cockpit Display Units				
*NRE	3600	1	$4,000,000	$4,000,000
*Group A	3010	190	$130,000	$24,700,000
*TDL Radios	3010	190	$330,000	$62,700,000
*TDL Processors	3010	190	$80,000	$15,200,000
*Low cost data link designed give real time threat and friendly information.				
C-17 Real Time in the Cockpit and Data Link				
*NRE	3600	1	$4,000,000	$4,000,000
*Group A	3010	9	$100,000	$900,000
*TDL Radios	3010	9	$330,000	$2,970,000
*TDL Processors	3010	9	$100,000	$900,000
*Provides LOS/BLOS data link				
C-130 Missile Approach Warning System Upgrade and Hostile Fire Upgrade				
*Missile Warning System (MWS) upgrades	3010	171	$770,000	$131,670,000
*Provides crews with an upgraded MWS				
C-130 H/J Single Pass Precision Guided Airdrop				
*NRE	3600	1	$6,000,000	$6,000,000
*APN-241 Radar Upgrade	3010	1	$3,000,000	$3,000,000
*Pod/SMFCD Kit C-130H	3010	59	$1,155,000	$68,145,000
*Pod/SMFCD Kit C-130J	3010	12	$1,155,000	$13,860,000
*Increases air drop accuracy approaching 50m				
C-130H Surface to Air Threat Detection Observer Rear Lookout Capability				
*NRE	3600	1	$14,000,000	$14,000,000
*Initial Installation	3010	1	$9,300,000	$9,300,000
*Lookout Windows	3010	165	$650,000	$107,250,000
*Allows for wide-angle view from the 3 o'clock to 9 o'clock continuum behind the aircraft				
C-5 Large Aircraft Infrared Countermeasures (IRCM) and Next Generation Threat Detection System				
*LAIRCM NRE	3600	1	$10,000,000	$10,000,000
*LAIRCM Group A	3010	33	$4,500,000	$148,500,000
*LAIRCM Group B	3010	33	$3,000,000	$99,000,000
*Next Generation NRE	3600	1	$6,000,000	$6,000,000
*Next Generation Sensors	3010	33	$780,000	$25,740,000
*Allows C-5 aircraft to fly in an increasing threat environment				
C-130 Advanced Radar Warning Receiver (RWR)				
*NRE(ALR-69A)	3600	1	$10,000,000	$10,000,000
*ALR-69A for C-130s without RWRs	3010	72	$1,220,000	$87,840,000
*NRE (ALR-69)	3600	1	$31,590,000	$31,590,000
*ALR-69 upgrade for C-130s with existing RWRs	3010	69	$140,000	$9,660,000
*NRE(ALR-56M)	3600	1	$50,000,000	$50,000,000
*ALR-56M upgrade for C-130J with existing RWRs	3010	31	$380,000	$11,780,000
*Installs/upgrades C-130 RWRs with digital receivers				
C-40C Procurement				
*Supports Congressional, DOD, Air Force and National Guard Travel missions worldwide.	3010	1	$98,000,000	$98,000,000
C-40C High Speed Data (HSD) Onboard Internet Capability				
*Supplemental Type Certificate	3010	1	$4,000,000	$4,000,000
*High Speed Data System	3010	3	$2,000,000	$6,000,000
*Provides DV critical communication infrastructure				
KC-135 External Overt/Covert Lighting				
*NRE	3600	1	$1,000,000	$1,000,000
*Kits	3010	190	$70,000	$13,300,000
*Will increase safety by meeting FAA and MILSPEC standards and allowing covert options in theater.				
C-130J Loadmaster Crashworthy Seat				
*Loadmaster Seat Kits	3010	219	$150,000	$32,850,000
*Provides the C-130 Loadmaster with a seat able to withstand excessive impact.				
C-17 Radar Warning Receiver (RWR)				
*NRE	3600	1	$10,000,000	$10,000,000
*ALR-69A	3010	9	$1,220,000	$10,980,000
*Provides improved threat location.				

RAPID GLOBAL MOBILITY	Type Funds	Units Required	Unit Cost	Program Cost
LC/HC/MC-130 Electronic Propeller Control System (EPCS)				
*LC/C-130	3010	9	$615,000	$5,535,000
*Replaces synchrophasers and propeller control systems with reliable digital controls.				
LC-130 Eight Bladed Propeller Upgrade				
*Integration Costs	3010	1	$2,500,000	$2,500,000
*NP2000 System for LC-130	3010	9	$2,000,000	$18,000,000
*Replaces existing propulsion (propellers, engine sys) with high efficiency, low MX items				
C-5 Brake Temperature Monitoring System (BTMS)				
*Upgraded Brake System	3010	33	$2,000,000	$66,000,000
*Brake Temperature Monitoring System	3010	33	$2,000,000	$66,000,000
*Provides critical real-time brake temperature data.				
C-40C Avionics Upgrades				
*Avionics Standardization	3010	3	$367,000	$1,101,000
*VHF Data Link Mode 2	3010	3	$400,000	$1,200,000
*Brings C-40Cs to standard configuration and complies with FAA/ICAO mandates				
C-130J High Pressure Portable Oxygen Bottle				
*High Pressure Oxygen Kits	3010	20	$6,000	$120,000
*Provides portable high pressure oxygen				
LC-130 Crevasse Detection Radar				
*Operational Implementation Cost	3010	2	$1,000,000	$2,000,000
*Provides crevasse detection for take-off/landings on snow and ice				
C-130J Cargo Compartment Camera				
*NRE	3600	1	$2,000,000	$2,000,000
*Kits	3010	18	$350,000	$6,300,000
*Provides aircrew monitoring capability for the cargo compartment				
C-40C Electronic Flight Bag (EFB)				
*Supplemental Type Certificate	3010	1	$280,000	$280,000
*Electronic Flight Bags	3010	3	$100,000	$300,000
*Provides EFB for C-40B				
C-5 Class III Electronic Flight Bag (EFB)				
*NRE	3600	1	$500,000	$500,000
*Electronic Flight Bag	3010	33	$150,000	$4,950,000
*Provides aircrew with digital flight publications and performance data.				
C-17 Enhanced Flight Crew Communication				
*Wireless Intercom system	3010	9	$20,000	$180,000
*Active Noise Reduction Headsets	3010	90	$800	$72,000
*Provides wireless intercom and active noise reduction to aircrew.				
C-17 Class III Electronic Flight Bag (EFB)				
*NRE	3600	1	$500,000	$500,000
*Electronic Flight Bag	3010	9	$150,000	$1,350,000
*Provides aircrew with digital flight publications and performance data.				
EC-130J Removable Airborne Military Information Support Operations System (RAMS)				
*NRE(ALR-56M)	3600	1	$3,300,000	$3,300,000
*SABIR systems	3010	2	$1,750,000	$3,500,000
*Fly Away Broadcast System	3010	2	$4,100,000	$8,200,000
**Installs roll on/roll off transmitter capability				
EC-130J Power Distribution Panel				
*NRE	3600	1	$1,000,000	$1,000,000
*Power Distribution Panel Kits	3010	5	$1,500,000	$7,500,000
*Increased power distribution capability for improved mission support				
LC-130 Jet Assisted Take-Off Program				
*Replacement JATO Motors	3010	1750	$20,000	$35,000,000
*Procures replacement JATO rocket motors				
TOTAL				**$2,846,483,000**

SIMULATION/DMO/TRAINING	Type Funds	Units Required	Unit Cost	Program Cost
KC-135 Boom Operator Simulation System (BOSS)				
*Program NRE	3010	1	$1,800,000	$1,800,000
*Provides high fidelity training ensuring increased readiness	3010	15	$1,600,000	$24,000,000
RC-26B Simulators				
*RC-26B Multi Mission Crew Trainer	3010	1	$1,800,000	$1,800,000
Advanced Squadron Level Simulator (ASLS)				
*Program NRE	3600	1	$4,500,000	$4,500,000
*KC-135 ASLS	3010	10	$4,200,000	$42,000,000
*C-130J	3010	7	$5,200,000	$36,400,000
*C-27J	3010	5	$4,800,000	$24,000,000
*RC-26B	3010	1	$4,500,000	$4,500,000
*Provides high fidelity KC-135 training				
F-15 DMO Fidelity Simulators				
*DMO Cockpits	3010	4	$1,042,500	$4,170,000
Simulation and DMO Training and Rehearsal System				
*Provides high fidelity DMO JTAC simulation	3840	18	$17,000	$306,000

SIMULATION/DMO/TRAINING	Type Funds	Units Required	Unit Cost	Program Cost
F-16 Full Combat Mission Trainer (FCMT)				
*Simulators	3010	8	$4,500,000	$36,000,000
A-10 Full Mission Trainer (FMT)				
*Provides high fidelity DMO flight simulators	3010	5	$4,500,000	$22,500,000
Space Based Infrared Systems Survivable Endurable Evolution Training Suite				
*Program NRE	3080	1	$800,000	$800,000
*Training Suite				
EC-130J Weapon System Training Device	3010	1	$850,000	$850,000
*Multi Function Training Aide				
TOTAL				**$203,626,000**

AGILE COMBAT SUPPORT	Type Funds	Units Required	Unit Cost	Program Cost
Security Forces Mobility Bag Upgrades				
*Mini Thermal Monocular	3080	550	$13,000	$7,150,000
*Mobility Bag Replacement	3080	1600	$7,700	$12,320,000
*Protective Combat Uniform Level 1-3 (undergarment)	3080	32000	$120	$3,840,000
*Protective Combat Uniform Level 7 (outer garment)	3080	8000	$400	$3,200,000
*Protective Eyewear	3080	8000	$80	$640,000
*Protective Goggles	3080	8000	$60	$480,000
*DAGR (GPS)	3080	550	$2,000	$1,100,000
*Provides SF equipment required for deployment and combat operations.				
SF Surveillance, Target Acquisition, & Night Observation (STANO)				
*AN/PAS-13 (V2)	3080	1845	$12,000	$22,140,000
*AN/PAS-13 (V3)	3080	35	$12,000	$420,000
*AN/PSQ-18A	3080	1250	$2,000	$2,500,000
*AN/PEQ-15	3080	2500	$1,200	$3,000,000
*QFELB	3080	92	$50,000	$4,600,000
*Provides the capability to operate in low visibility conditions.				
C-130 Isochronal Inspection Stands				
*Inspection stands	3010	16	$500,000	$8,000,000
*Increases C-130 maintenance personal safety				
E-8C Airlift Ground Air Conditioner				
*Cooling carts	3080	3	$550,000	$1,650,000
*Field service support	3840	3	$500,000	$1,500,000
*Provides ground cooling in hot environments				
Security Forces Small Arms Training Simulator/Simulated Munitions				
*Combat Training Simulators	3080	4	$750,000	$3,000,000
*M-4 Simulated Munitions Kit	3080	8000	$200	$1,600,000
*M-9 Simulated Munitions Kit	3080	8000	$200	$1,600,000
*M-249 Simulated Munitions Kit	3080	1230	$300	$369,000
*M-240B Simulated Munitions Kit	3080	615	$300	$184,500
*Simulated Munitions	3080	3	$250,000	$750,000
*Simulated Munitions PPE	3080	8000	$100	$800,000
*Provides SF the ability to train without limited small arms ranges.				
Security Forces Less-than-lethal Equipment				
*Crowd Control/Civil Disturbance Kits	3080	550	$20,000	$11,000,000
*Tasers	3080	3000	$600	$1,800,000
*Provides SF crowd control and civil disturbance equipment.				
Security Forces Explosive Detection Handheld Electronic Kit				
*Handheld Explosive Detection Kit	3080	300	$40,000	$12,000,000
Multiple Mission Design Series Leak Detection Capability	3010	83	$7,832	$650,056
*Ultrasonic leak detectors				
*Decreases the time to detect leaks in all MDS				
Satellite Communication Radio Support Capability				
*Testers	3010	176	$17,955	$3,160,080
*Improves trouble shooting efficiency				
Multiple Mission Design Series Armament Tester for Fighter and Attack Aircraft				
*Common armament testers	3010	28	$200,000	$5,600,000
*Improves trouble shooting efficiency for fighter MDS				
TOTAL				**$115,053,636**

TOTAL ANG 2011 MODERNIZATION REQUIREMENTS	**$9,678,852,829**

State Matrix

Weapons System Reference Table by State (2011)

Refer to Weapon System Tabs for Specific Information

	A-10	B-2	C-5	C-17	C-27J	C-130	E-8	F-15	F-16	F-22	HH-60	KC-135	RPA	OSA	C^2	Space / Cyber / IO	Manned ISR	GA / ST / SF	DCGS
AK				●		●					●	●			●	Space		GA	
AL									●			●					●		●
AR	●					●													●
AZ									●			●	MQ-1		●		●		
CA						●			●		●		MQ-1			Space	●	GA	●
CO									●					●		Space			
CT														●	●				
DC									●					●		Cyber			
DE						●										Cyber			
FL								●								Space	●		
GA						●	●								●				●
GU																			
HI				●						●		●			●				●
IA									●			●			●				
ID	●														●	Space			
IL						●						●			●				
IN	●														●				●
KS												●			●	CY/SP			●
KY						●												ST	
LA								●							●				
MA								●							●				●
MD	●				●											Cyber			
ME												●							
MI	●											●		●	●				
MN						●			●										
MO		●				●									●				
MS				●								●			●		●		
MT								●											
NC						●									●				
ND													MQ-1	●					
NE												●							
NH												●							
NJ									●			●			●				
NM																	●		
NV						●							MQ-1						●
NY			●			●					●		MQ-9		●	Space	●	GA	
OH					●				●			●	MQ-1		●	Cyber			
OK									●			●			●				
OR								●							●			ST	
PA						●						●			●	IO			
PR						●									●				
RI						●										Cyber			
SC									●										
SD									●										
TN			●			●						●				Space			
TX						●			●				MQ-1		●	Cyber	●		
UT												●			●	Cyber	●		●
VA										●									●
VI																			
VT									●							Cyber			
WA												●			●	Cyber	●		
WI									●			●			●		●		
WV			●			●											●		
WY						●										Space			

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A-10

- **Close Air Support**
- **Forward Air Controller – Airborne**
- **Combat Search and Rescue**

The Air National Guard operates over one hundred and eight A-10 aircraft across five wings, representing one third of the total U.S. combat-coded A-10 force.

The venerable A-10 is well-suited to execute current and future Overseas Contingency Operations (OCO). With eleven weapons stations, GAU-8 and a targeting pod, the A-10 is able to engage any target with a wide variety of general purpose and precision munitions. The aircraft remains the close air support platform of choice and has maintained a near continuous presence during Operations ENDURING FREEDOM (OEF), NEW DAWN (OND) and IRAQI FREEDOM (OIF) since 2003.

All ANG A-10s have completed their conversion to the A-10C Precision Engagement (PE). PE provides a data link, JDAM capability, improved targeting pod functionality, a moving map, and many other integrated cockpit and airframe improvements.

Current A-10 modernization programs include fielding of a second secure line-of-sight ARC-210 SATCOM radio, the AN/AAR-47 which provides the pilot with 360 degrees of missile launch warning and the Gentex Scorpion Helmet Mounted Integrated Targeting (HMIT) System which reduces the time to acquire targets with aircraft sensors from minutes to seconds. Future combat capability will include an updated Combat Search and Rescue (CSAR) radio and an integrated noise cancelling, 3-dimensional cockpit audio system.

A-10 2010 Weapons and Tactics Conference

Critical Combat Capabilities List

- Low Cost, Night Compatible Helmet Mounted Integrated Targeting (HMIT) System
- Embedded Global Positioning System (GPS)/Inertial Navigation System (INS) with Ability to Operated in a GPS Degraded, Denied, or Deceived Environment
- Integrated ALR-69 Legacy System Improvement Program (LSIP) and Digital Radio Frequency Memory (DRFM) Based Electronic Attack Pod in Order to Detect, Identify, and Target via Electronic Attack
- Fully Integrated Communications Suite to Include 3-D Audio, Personnel Locator System (PLS), Enhanced Data Link, and Harris Situational Awareness Waveform
- Engine Modernization and Enhancement

Essential Capabilities List

- Laser Protection for Eyes and Sensors
- Laser Guided Rockets
- Guided Bomb Unit (GBU) with Increased Stand-Off Capability
- Cockpit Modernization (High Resolution Displays)
- AIM-9X for Maritime and Ground Targets
- Continued Targeting Pod (TGP) Spiral Development (High Resolution Output, Full Color)
- Continued HUD Improvements Including Instrument Flight Rules (IFR) Certification
- Dual Covert/Overt Landing/Taxi Light
- Improved Digital Audio/Video Recording Capability
- Five Additional Full Mission Trainers (FMT)
- 1760 Compatible, Digital, Pneumatic, Multiple-Carriage Suspension Equipment
- 1553 and Electronic Warfare (EW) Recording Capability in the A-10C
- Specialized Combat Search and Rescue (CSAR)/Urban Close Air Support (CAS) Weapons
- New Wide Field-of-View Head-Up Display (HUD)
- Improved Wide Field-Of-View (WFOV) Night Vision Goggles (NVGs)
- Combat Fuel Tank
- On-Board Oxygen Generation System (OBOGS)
- High Capacity Removable Memory Module Devices (RMMDs) for Digital Video/Data

Desired Capabilities List

- NVG Camera
- Wide Band Situational Awareness Data Link (SADL)
- New Radar Altimeter
- In Cockpit DC Power Supply for Weather and Safety Information

A-10 EXECUTIVE SUMMARY

Modernization Funding Profiles ($ Million)

Program	P.E. Number	2012	2013	2014	2015	2016	Total
Low Cost Day/Night Helmet Mounted Integrated Targeting	027131F	$13.85 [2] -	$10.00 [2] -	- -	- -	- -	$23.85
Anti-Jam Embedded GPS/INS	027131F	- $10.00 [3]	- $22.00 [3]	$23.20 [2] -	- -	- -	$55.20
Advanced Digital RWR and Threat Geo-Location	027131F	- 21.59 [3]	- $10.00 [3]	$5.00 [2] -	$8.78 [2] -	- -	$45.37
Advanced Electronic Attack Pod	027131F	$8.00 [2] $20.00 [3]	$20.00 [2] -	$11.60 [2] -	- -	- -	$59.60
Fully Integrated Communications Suite	027131F	$6.00 [2] $8.00 [3]	$3.36 [2] -	- -	- -	- -	$17.36
Lightweight Airborne Radio System Upgrade	027131F	$8.12 [2] $0.75 [3]	- -	- -	- -	- -	$8.87
Engine Modernization and Enhancement	027131F	- $75.25 [3]	- $107.25 [3]	$76.50 [2] $85.50 [3]	$135.00 [2] -	$135.00 [2] -	$614.50

Notes: [1] 3840 Appropriation [2] 3010 Appropriation [3] 3600 Appropriation [4] 3080 Appropriation

- A-10 Low Cost Day/Night Helmet Mounted Integrated Targeting (HMIT) System - Provides off-boresight rapid day/night target acquisition capability and builds pilot situational awareness.
- A-10 Anti-Jam Embedded Global Positioning System (GPS) /Inertial Navigation System (EGI) - Provides ability to operate in a degraded, denied, or deceived GPS environment.
- A-10 Advanced Digital Radar Warning Receiver (RWR) & Threat Geo-Location - Provides significant improvement of all RWR functions such as decreased response time and radar threat identification/location.
- A-10 Advanced Electronic Attack (EA) Pod - Upgrades pods with Digital Radio Frequency Memory (DRFM) technology for enhanced self-protection against current and emerging radar-guided threats.
- A-10 Fully Integrated Communication Suite - Directional Audio will significantly enhance cockpit situational awareness with respect to communication and threat warning. Harris Situational Awareness Waveform will allow GPS data to be displayed on the A-10 Tactical Awareness Display (TAD).
- A-10 Lightweight Airborne Radio System (LARS) Upgrade - Allows A-10s to quickly and precisely find isolated personnel carrying the latest survival radios.
- A-10 Engine Modernization and Enhancement - Required to increase agility at medium / high altitude, provide increased combat munitions loads, and sustain the A-10 for the next 20 years.

INFORMATION PAPER

ON

A-10 LOW COST, DAY/NIGHT HELMET MOUNTED INTEGRATED TARGETING (HMIT) SYSTEM

1. Background. The Scorpion HMIT built by Gentex and offered for the A-10 by Raytheon, reduces the time required to acquire targets with aircraft sensors from minutes to seconds, which can make the difference between acquiring a high-value, fleeting target or the target slipping away. Currently, pilots typically acquire targets by pointing the aircraft at the target to put it within the Heads Up Display (HUD) Field of View (FOV), which is time consuming and maneuvers the aircraft closer to the threat. The Scorpion HMIT is a full day/night color cueing and display system compatible with current Night Vision Goggles (NVG) fielded with A-10 pilots. The HMIT system has magnetic sensors which determine where the pilot is looking and provides rapid acquisition of ground and air targets for hand-off to other aircraft sensors and weapons. The HMIT system allows a pilot to fly parallel to a target to maintain standoff and thus improve survivability, and acquire the target by simply looking at it. The high resolution color display in front of the pilots eye shows aircraft and data-link network integrated symbology, reducing the heads-down time in the cockpit, further improving survivability and allowing the pilot to quickly build a three dimensional picture of the battlespace. Pilots will no longer need to interpret two-dimensional cockpit displays in terms of the three-dimensional space around them. The Scorpion HMIT also overlays existing Forward Looking Infrared (FLIR) and Charged Couple Device (CCD) television video images from targeting pods to enhance pilot situational awareness at night and during high task mission segments.

2. Requirement. Combatant Commander's Urgent Operational Need (UON), dated 26 Sep 08.

3. Impact If Not Funded. Many critical targets have slipped away in Iraq and Afghanistan because pilots could not acquire them quickly enough. Target mis-identification, collateral damage, and fratricide potential are much higher without the display benefits of a HMIT.

4. Units Impacted.

122 FW Ft Wayne, IN	127 WG Selfridge ANGB, MI	188 FW Ft Smith, AR
124 WG Boise, ID	175 WG Baltimore, MD	

5. Contractor. Gentex, Aurora, IL.

6. Cost.

Units Required*	Unit Cost **	Program Cost
159 HMIT (3010)	**$150,000**	**$23,850,000**

* Assumes 1.5 systems per aircraft.

** Installation and test equipment included.

INFORMATION PAPER

ON

A-10 ANTI-JAM EMBEDDED GLOBAL POSITIONING SYSTEM/ INERTIAL NAVIGATION SYSTEM (EGI)

1. Background. The A-10 uses an Embedded Global Positioning System (GPS)/Inertial Navigation System (INS) for precision navigation and weapons employment. The EGI is the heart of the A-10 avionics system and virtually every system on the aircraft depends on the highly accurate position, orientation, and velocity data it provides. Jamming equipment has evolved to counter this capability with technology that degrades and denies the effectiveness of the EGI in the aircraft, affecting navigation, positional awareness and the accurate employment of ordnance. Selective Availability Anti-Spoofing Modules (SAASM) combat these hostile or hazardous outside jamming influences to protect Precise Positioning System (PPS) and Standard Positioning System (SPS) for defense and aerospace uses. A current FAA ruling mandates a SAASM-based Automatic Dependent Surveillance-Broadcast (ADS-B) EGI by 2020 for all aircraft to support its transition of the air traffic control system from a radar-based system to a satellite-based system capable of providing better surveillance precision and reliability.

2. Requirement. FAA Rule - 14 CFR Part 91 [Docket No. FAA-2007-29305; Amdt. No.91-314], RIN 2120-AI92 - Automatic Dependent Surveillance-Broadcast (ADS-B) Out Performance Requirements to Support Air Traffic Control (ATC) Services, 28 May 2010.

3. Impact If Not Funded. Not funding will severely impact the ability of the A-10 to operate in the Close Air Support (CAS) precision dependent combat environment of current and future theaters of operation. The ability to employ munitions with surgical precision will be hindered and it will increase the risk of collateral damage to both ground forces and civilians.

4. Units Impacted.

122 FW Ft Wayne, IN	127 WG Selfridge ANGB, MI	188 FW Ft Smith, AR
124 WG Boise, ID	175 WG Baltimore, MD	

5. Contractor. TBD.

6. Cost.

Units Required *	Unit Cost	Program Cost
Anti-Jam EGI NRE (3600)	**N/A**	**$32,000,000**
116 Anti-Jam EGI (3010)	**$200,000**	**$23,200,000**
Total		**$55,200,000**

* Includes 10% spares.

INFORMATION PAPER

ON

A-10 ADVANCED DIGITAL RADAR WARNING RECEIVER (RWR) AND THREAT GEO-LOCATION

1. Background. The current ALR-69 RWR provides threat radar warning indications to A-10 pilots as well as providing threat information to the ALQ-213 to initiate auto countermeasures. The legacy ALR-69 has subassemblies that are no longer supportable, is unable to provide acceptable defensive situational awareness, and is incapable of supporting the onboard/off board warfighter requirements. Specific performance shortfalls include inadequate response time, processing overload conditions, unacceptable identification performance, inadequate threat detection capability, unacceptable threat geo-location and lack of digital information. Upgrading the legacy RWR with a modification that incorporates an advanced digital receiver, or replacing it with either a new internal system or embedded with an advanced electronic attack pod, will address the aforementioned issues while providing accurate passive targeting information. The ability to pass target quality emitter coordinates to any net-centric aircraft is a key component of Air Combat Command's "Sensors Forward" concept of operations. This capability will enhance the Air Force's ability to safely prosecute assigned missions in a more lethal threat environment.

2. Requirement. A-10 Electronic Warfare Capability Development Document (CDD) 16 Apr 07.

3. Impact if Not Funded. The A-10 will remain at risk to current radar threats and have little capability against most advanced threat systems resulting in areas of "denied access" that will significantly reduce the ability of the A-10 to accomplish missions.

4. Units Impacted.

122 FW Ft Wayne, IN	127 WG Selfridge ANGB, MI	188 FW Ft Smith, AR
124 WG Boise, ID	175 WG Baltimore, MD	

5. Contractors. BAE, Yonkers, NY, Nashua, NH; EDO, North Amityville, NY; Georgia Tech Research Institute, Atlanta, GA; ITT Avionics, Clifton, NJ; Lockheed Martin, Owego, NY & Fort Worth, TX; Northrop Grumman, Rolling Meadows, IL; Raytheon, Goleta, CA.

6. Cost.

Units Required *	Unit Cost	Program Cost
NRE (3600)	**N/A**	**$31,590,000**
106 RWRs (3010)	**$130,000**	**$13,780,000**
Total		**$45,370,000**

* Includes 10% spares.

INFORMATION PAPER

ON

A-10 ADVANCED ELECTRONIC ATTACK (EA) POD

1. Background. The A-10 is equipped with either an ALQ-131 or ALQ-184 EA pod. These pods were designed in the 1980s and permitted Air Force fighter aircraft like the A-10 to operate against 1980s threats. Today, these pods experience significant sustainment issues and are incapable of protecting the A-10 against many modern radar-guided threat systems, resulting in large areas of denied access. The key feature that all modern EA pods feature is Digital Radio Frequency Memory (DRFM). EA pods with DRFM based technology allow effectiveness against current and future radar threats, while reducing escalating sustainment costs.

2. Requirement. A-10 Electronic Warfare Capability Development Document (CDD), 16 April 2007.

3. Impact If Not Funded. The A-10 will remain at risk from many current threats, and most future threat systems, resulting in areas of "denied access," significantly reducing the pilot's ability to accomplish assigned missions and meet Combatant Commander (COCOM) requirements.

4. Units Impacted.

122 FW Ft Wayne, IN	127 WG Selfridge ANGB, MI	188 FW Ft Smith, AR
124 WG Boise, ID	175 WG Baltimore, MD	

5. Contractor. TBD.

6. Cost.

Units Required *	Unit Cost	Program Cost
NRE (3600)	**N/A**	**$20,000,000**
30 EA Pod Upgrades (3010)	**$1,320,000**	**$39,600,000**
Total		**$59,600,000**

* Includes required spares, support equipment, and technical orders.

INFORMATION PAPER

ON

A-10 FULLY INTEGRATED COMMUNICATIONS SUITE

1. Background. The A-10 communications suite improvements consist of the ARC-210 radio, three-dimensional (3-D) Audio, LARS V-12 Personnel Locator System (PLS) (see page 9), Enhanced Data Link and Harris Situation Awareness (SA) Waveform. Two ARC-210 multi-band and multi-mode digital radios that include Satellite Communications (SATCOM) to meet the urgent operational need for Simultaneous Beyond Line-of-Sight (BLOS) and Secure Line-of-Sight (SLOS) communications have been fully funded and are currently fielding. The Enhanced Data Link requirement has not been fully defined. Integration of Harris SA Waveform in the ARC-210 radio would allow Global Positioning System (GPS) data, transmitted by existing radios proliferated by the thousands to ground troops, to be displayed on the A-10 Tactical Awareness Display (TAD), reducing the workload on the pilot in a Combat Search and Rescue (CSAR) or close air support scenario. The integration of noise cancelling and 3-D audio in the cockpit will increase SA by spatially separating aural warning and radio signals and providing angular cueing to ground and air threats when used in conjunction with the Helmet Mounted Integrated Targeting System. This spatial separation and reduction in ambient noise significantly increases the pilot's ability to process information coming simultaneously from multiple radios and warning systems. The continued upgrades to data links and targeting systems and the requirement to operate the A-10 through 2030 require a fully integrated communications suite.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC.

3. Impact If Not Funded. Not funding 3-D audio will severely impact the pilot's ability to integrate the multitude of radio and aural warning cues in the aircraft spatial environment, limiting situational awareness, reducing reaction time and survivability. Not funding Harris SA Waveform increases the task loading on the pilot in time-critical CSAR missions, hindering mission coordination and timely recovery of a downed aircrew.

4. Units Impacted.

122 FW Ft Wayne, IN	127 WG Selfridge ANGB, MI	188 FW Ft Smith, AR
124 WG Boise, ID	175 WG Baltimore, MD	

5. Contractor. Directional (3-D) Audio - Terma North America, Crystal City, VA; Raytheon, Waltham, MA; Situational Awareness Waveform - Harris Corp, Melbourne, FL.

6. Cost.

Units Required *	Unit Cost	Program Cost
Directional Audio NRE (3600)	**N/A**	**$6,000,000**
117 Directional Kits (3010)	**$80,000**	**$9,360,000**
Harris SA Waveform NRE (3600)	**N/A**	**$2,000,000**
Total		**$17,360,000**

* Includes 10% spares.

INFORMATION PAPER

ON

A-10 LIGHTWEIGHT AIRBORNE RADIO SYSTEM (LARS) UPGRADE

1. Background. There are numerous fielded Combat Search and Rescue (CSAR) survival radios that provide a wide spectrum of capability. Survival radios range from the basic PRC-90 to the PRQ-7 Combat Survivor-Evader Locator (CSEL) radio. The AN/ARS-6 (V-6) LARS cockpit radio currently installed in the A-10 is not compatible with the newer survivor radios and can only display range and bearing to the survivor. The newer survivor radios offer more accurate information (Geo-Location, Text Messaging, and Situation Reports) to CSAR forces attempting to rescue downed survivors. The AN/ARS-6 (V-12) LARS is compatible with all CSAR survival radios. It is capable of presenting on aircraft cockpit displays, geographic coordinates and text messaging transmitted from the newer survival radios such as PRQ-7 CSEL and the Hook-112G. Additionally, the AN/ARS-6 (V-12) LARS provides the ability to quickly and securely pass vital survivor data (coordinates and messaging) between all CSAR aircraft cockpits, providing a better coordinated and more covert rescue while protecting both the survivor as well as the rescuers. The AN/ARS-6 (V-12) LARS also has improved antennas for better coverage and reliability.

2. Requirement. Combat Air Force (CAF) Operational Requirements Document CAF 401-91-I/II/III-D for A/OA-10 Aircraft Multi-Staged Improvement Program (MSIP) Oct 1999. LARS AN/ARS-6 (V-12) 1067 Modification Proposal, 24 Jul 2008.

3. Impact If Not Funded. Without upgrading to the AN/ARS-6 (V-12) LARS, rescue forces lack secure communications and exact GPS location to both the PRC-112G and the PRQ-7 CSEL survivor radios currently in use. These modern CSEL radios significantly shorten the time required to locate and recover downed airmen, improving the chance of recovery and reducing rescue force exposure to enemy fire. The lack of these capabilities hinders mission coordination, timely and accurate survivor information and represents a significant operational disadvantage during the inherently dangerous and time-critical CSAR events.

4. Units Impacted.

122 FW Ft Wayne, IN	127 WG Selfridge ANGB, MI	188 FW Ft Smith, AR
124 WG Boise, ID	175 WG Baltimore, MD	

5. Contractor. Cubic Corp, San Diego, CA.

6. Cost.

Units Required*	Unit Cost	Program Cost
NRE (3600)	**N/A**	**$750,000**
116 LARS (3010)	**$70,000**	**$8,120,000**
Total		**$8,870,000**

***** Includes 1 system per aircraft and 10% spares.

INFORMATION PAPER

ON

A-10 ENGINE MODERNIZATION AND ENHANCEMENT

1. Background. The A-10 has documented thrust deficiencies in its operational environment. In order to meet Combatant Commander tasking at high-density altitude locations such as the current Operation ENDURING FREEDOM theater, A-10 pilots must reduce fuel loads, restrict take-off times to early morning hours, or refuse tasking that increases gross weights to unsupportable and unsafe limits. In addition, the aircraft does not perform well at medium and high altitudes, putting pilots at increased risk to rapidly proliferating ground-based threats and forcing commanders to provide separate low-altitude A-10 air refueling tracks. Potential solutions range from an upgrade kit for the existing engine to a completely new engine. For over ten years the Air Reserve Component Weapons and Tactics Conference has listed engine upgrades or new engines as a high priority for the A-10.

2. Requirement. Concept Development Document (CDD) approved 17 Mar 05 by the Air Force Requirements for Operational Capability Council (AFROCC). CDD Version 1.1 approved 21 Apr 06.

3. Impact If Not Funded. A-10 mission success is based on the ability of the airframe to adequately perform the assigned mission. Tasking has migrated from low altitude (the design criteria of the aircraft) to medium/high altitude. Future viability as a persistent, lethal platform is dependent on adequate thrust and agility in a maximum gross weight configuration both at take-off and medium/high altitude.

4. Units Impacted.

122 FW Ft Wayne, IN	127 WG Selfridge ANGB, MI	188 FW Ft Smith, AR
124 WG Boise, ID	175 WG Baltimore, MD	

5. Contractor. GE Aircraft Engines, Lynn, MA; Pratt &Whitney, East Hartford, CT.

6. Cost.

Units Required *	Unit Cost	Program Cost
NRE (3600)	**N/A**	**$268,000,000**
231 Engines (3010)	**$1,500,000**	**$346,500,000**
Total		**$614,500,000**

* Includes 10% spares.

C2

• Command & Control

- **Joint Terminal Attack Control**
- **Air Battle Management**
- **Air Traffic Control**
- **Air and Space Operational Support**
- **Military Range Control**
- **Air Defense and Surveillance for North America**
- **Centralized Control**
- **Decentralized Execution**
- **Ground Controlled Intercept**
- **Flight Safety Monitoring**

The ANG C2 weapon systems are integral to the joint fight in overseas contingencies operations, and transforming the rapidly escalating Homeland Defense mission area.

AIR SUPPORT OPERATIONS CENTER AND TACTICAL AIR CONTROL PARTY (ASOC/TACP) An ASOC is subordinate to the Air Operations Center (AOC), responsible for the direction and control of air operations directly supporting the ground combat forces. With TACP providing advice, assistance, planning for the employment of air and space power, and control of close air support firepower onto enemy ground targets.

AIR CONTROL SQUADRON (ACS) An ACS is the only Air Force 24/7 deployable and sustainable ground air Battle Management Command and Control (BMC2) platform at the operational and tactical level of war, providing surveillance, weapon control, tactical communications, data links, and combat-related air battle management of joint air operations with real-time shared situational awareness.

AIR AND SPACE OPERATIONS CENTER (AOC) An AOC is the senior weapon system of the Theater Air Control System (TACS) employed by the Commander, Air Force Forces (COMAFFOR) providing centralized control and decentralized execution of aerospace forces to the Joint Force Air Component Commander (JFACC).

AIR DEFENSE SECTOR (ADS) An ADS provides tactical communication and data-link capabilities with other military and civil capabilities responsible for planning, directing, coordinating, and controlling forces for air surveillance, air defense, and control of sovereign U.S. airspace (including the National Capital Region), ensuring air defense for the entire North American continent.

Command and Control
2010 Weapons and Tactics Conference

Critical Combat Capabilities List

Air Operations Center (AOC)
- Trusted Thin Client/Gateway Architecture
- Distributed Simulation Training
- Communications Training Lab
- Airborne ISR Simulation

Air Defense Sector (ADS)
- Baseline Sector DMO Capability
- Communications Modernization Suite
- ADS Beyond-Line-of-Sight (BLOS) Communications and Data
- Forensic Recording/Playback Capability
- Funding for Advanced Sensor Arrays

Control and Reporting Center (CRC)
- Theater Deployable Communications
- Power Distribution System (PDP)
- Tactical Quite Generators (TQG)

Air Support Operations Center and Tactical Air Control Party (ASOC/TACP)
- Dismount Interoperable Acquisition of Sensor Computer
- Gen III Auto-Gated Omni-VII+Night Vision Device (NVD)
- LPI/LPD Body-Worn Hands-Free Receiver
- JTAC DMO

Essential Capabilities List

AOC
- Adequate Bandwidth Available at Each Unit (Hi and Low) to Support DMO
- Resources to accomplish Mission Qualification Training (MQT) and Continuation Training (CT)

CRC
- Establish an Air Control Group for the CRC/ACS
- Secure Chat Capability within Modular Control Equipment (MCE)
- Single Modern Multi-Platform Battle Management Suite and Sensor

ASOC/TACP
- Next Generation Hand-Held, High Power (>20 Watts) JTAC Radio
- Aircraft System Displays Ground-Based S/A
- CAS Training Capability to meet AFI13-112V1 Requirements

Desired Capabilities List

AOC
- Integrated, Reliable, Stable Operating Environment Supporting Full Spectrum of Operations
- Data Link Equipment, Radios, and Support

CRC
- Agile, Persistent, Deployable, All-Altitude Sensor, Comm Relay and Data Link
- Full ADS/CRC DMO Integration

ASOC/TACP
- Light-Weight Handheld Data Link Connectivity with Dynamic Network Position Reporting,
- JTAC Ability to Verify by Direct LOS Aircraft Sensor Point of Interest and Daylight Laser Spot

C2 EXECUTIVE SUMMARY

Modernization Funding Profiles ($ Million)

Program	P.E. Number	2012	2013	2014	2015	2016	Total
ADS							
Air Defense Sector Tactical Satellite Communications	501305F	$1.20 [1]	-	-	-	-	$1.20
CRC							
Theater Deployable Communications	502672F	$4.80 [4]	$4.80 [4]	-	-	-	$9.60
Power Distribution Panel System	502672F	$1.70 [1]	$1.30 [1]	-	-	-	$3.00
Tactical Quiet Generators	502672F	$2.01 [4]	$2.01 [4]	-	-	-	$4.02
ASOC/TACP							
Dismounted Interoperable Acquisition of Sensor Computer	502671F	$1.12 [4]	$1.12 [4]	$1.12 [4]	-	-	$3.36
JTAC Binocular Night Vision Device	502671F	$1.93 [4]	$1.93 [4]	-	-	-	$3.86
Low Probability of Intercept /Low Probability of Detection Video Downlink Receiver	502671F	$1.18 [4]	$1.18 [4]	$1.17 [4]	-	-	$3.53

Notes: [1] 3840 Appropriation [2] 3010 Appropriation [3] 3600 Appropriation [4] 3080 Appropriation

Air Defense Sector (ADS)

- Air Defense Sector (ADS) Tactical Satellite (TACSAT) Communications - Provides multi-frequency, high band (400-512 MHz) capable, anti-jam, secure, data capable TACSAT for 100% beyond line-of-sight coverage in the CONUS.

Control and Reporting Center (CRC)

- Theater Deployable Communications (TDC) - Network / reach back capable assets to round out shortfalls within the fielded systems of record.
- Power Distribution Panel System (PDPS) - Provides all weather, load balancing, and capacity to provide equipment and personnel protection.
- Tactical Quiet Generators (TQG) - Replaces existing legacy generators enabling overall reduction of assets with paralleling capabilities.

Air Support Operations Center and Tactical Air Control Party (ASOC/TACP)

- Dismounted Interoperable Acquisition of Sensor Computer (DIASC) - Lightweight, digital, interactive mapping device capable of providing situational awareness of air and ground forces.
- Joint Terminal Attack Controller (JTAC) Binocular Night Vision Device (BNVD) - Enhanced night vision goggles that match capabilities of attack aircraft and can operate in areas with significant ambient, cultural lighting.
- Low Probability of Intercept/Low Probability of Detection Video Downlink Receiver - Provides a hands-free body-worn receiver for dismounted operations.

INFORMATION PAPER

ON

AIR DEFENSE SECTOR (ADS)
TACTICAL SATELLITE (TACSAT) COMMUNICATIONS

1. Background. Continental United States (CONUS) air defense sectors require a Beyond Line-of-Sight (BLOS) TACSAT capability to achieve 100 percent radio and data coverage as well as provide a backup to line-of-sight communications. TACSAT must be voice/data, multi-frequency, (SATCOM, UHF, VHF) 30MHz-2GHz, anti-jam, and frequency secure to enable Department of Defense support to civil authorities. Radios must be located at the ADS. Satellite Communication (SATCOM) antenna will be local while the UHF/VHF signal will be sent to remote antenna at various locations throughout the CONUS. The primary method of communication will be via satellite, enabling 100 percent communication connectivity for Homeland Defense (HLD) and civil support. If satellite access is denied, ADS will rely on legacy UHF/VHF communications with air defense aircraft. Employment of TACSAT at the ADS will positively affect voice and data connectivity in all North American Aerospace Defense Command and Northern Command (NORAD-NORTHCOM) mission sets to include Defense Support of Civil Authorities (DSCA), HLD and Air Sovereignty Alert (ASA).

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC; revised Logistics Detail (LOGDET) for emerging requirements.

3. Impact If Not Funded. Command and Control (C2) entities will be unable to communicate with aircraft during "no-fail" missions due to Line-of-Sight (LOS) limitations. Furthermore, the lack of data link situational awareness due to LOS limitations will degrade C2 and pilots ability to successfully execute the mission with all available data. Relying on legacy LOS communications is an unnecessary risk in the execution of NORAD-NORTHCOM missions.

4. Units Impacted.
WADS McChord AFB, WA EADS Rome, NY

5. Contractor. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
24 TACSAT Systems (3840)	**$50,000**	**$1,200,000**

INFORMATION PAPER

ON

THEATER DEPLOYABLE COMMUNICATIONS (TDC)

1. Background. Air Combat Command (ACC) as Air Force lead command for Command and Control (C2) has tasked the Air National Guard (ANG) to provide ten (10) Air Control Squadrons (ACS) to execute mission functions and capabilities of a deployable Control and Reporting Center (CRC) in support of air operations. The CRC is a mobile Battle Management C2 capability with the deployable radar elements of the Theater Air Control System (TACS). The CRC integrates a comprehensive air picture via multiple data links from air, sea, and land-based sensors, as well as from its imbedded surveillance and control radars. It performs decentralized C2 of joint operations by conducting threat warning, battle management, theater missile defense, weapons control, combat identification, and strategic communications. All ANG ACS units are critically short various end items and quantities of each.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC.

3. Impact If Not Funded. ANG ACS units will be unable to meet combatant commander tasking due to the lack of specialized equipment required to support combat operations in the theater of operations. Specifically, the lack of proper TDC equipment across the CRC will break the Joint Force Air Component Command's (JFACC) ability to execute the air war as the CRC will be unable to generate the air picture, and provide battlespace management of the airspace.

4. Units Impacted.

103 ACS Orange, CT	117 ACS Savannah, GA	133 TS Fort Dodge, IA
107 ACS Luke AFB, AZ	121 ACS St Louis, MO	134 ACS McConnell AFB, KS
109 ACS Salt Lake City, UT	123 ACS Blue Ash, OH	141 ACS Punta Borinquen, PR
116 ACS Warrenton, OR	128 ACS Volk Field, WI	255 ACS Gulfport, MS

5. Contractor. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
12 Unit Requirements (3080)	**$800,000**	**$9,600,000**

INFORMATION PAPER

ON

POWER DISTRIBUTION PANEL SYSTEM (PDPS)

1. Background. Air Combat Command (ACC), as the Air Force lead command for Command and Control (C2), has tasked the ANG to provide ten (10) Air Control Squadrons (ACS) to execute mission functions and capabilities of a deployable Control and Reporting Center (CRC) in support of air operations. The CRC is a mobile Battle Management C2 capability with the deployable radar elements of the Theater Air Control System (TACS). The CRC integrates a comprehensive air picture via multiple data links from air, sea, and land-based sensors, as well as from its imbedded surveillance and control radars. It performs decentralized C2 of joint operations by conducting threat warning, battle management, theater missile defense, weapons control, combat identification, and strategic communications. Air Control Squadrons require properly sized and configured PDPSs to enable consolidation and reduction of numerous legacy electrical power production units. The primary PDPS must be capable of load balancing, 200 Amps, 3 phase, 120/208 Volts Alternating Current (VAC), (5) wire, with Cam type receptacles, and meet National Electrical Manufacturers Association (NEMA) 3R Weatherproof requirements. Each secondary power distribution box must be 100 Amp, 3 phase, 120/208 VAC, Cam Input, with 120/208 VAC, 3 phase Cam output, all meeting NEMA 3R Weatherproof requirements. Each tertiary PDPS must be a minimum of 30 AMP, 3 and single phase, 120/208 VAC, Cam Input, with 120/208 VAC single and 3 phase Cam output, all meeting NEMA 3R Weatherproof requirements. All PDPS must have user defied inputs, outputs and amperage ratings meeting equipment configuration specifications.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC. PDPS are called for by Unit Type Codes (UTC) 7FVBC and 7FVDC and Logistics Detail (LOGDET) validation.

3. Impact If Not Funded. Lack of proper PDPSs at each element of the CRC will continue to drive additional manpower and logistical resources necessary to operate legacy power units with an increased risk of loss of life and catastrophic equipment failure. Elements of the CRC will continue to be limited in response, operating, ability to incorporate evolving systems and to changing mission requirements required to meet urgent warfighter needs.

4. Units Impacted.

103 ACS Orange, CT	117 ACS Savannah, GA	133 TS Fort Dodge, IA
107 ACS Luke AFB, AZ	121 ACS St Louis, MO	134 ACS McConnell AFB, KS
109 ACS Salt Lake City, UT	123 ACS Blue Ash, OH	141 ACS Punta Borinquen, PR
116 ACS Warrenton, OR	128 ACS Volk Field, WI	255 ACS Gulfport, MS

5. Contractor. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
24 Systems (3840)	**$125,000**	**$3,000,000**

INFORMATION PAPER

ON

TACTICAL QUIET GENERATORS (TQG)

1. Background. Air Combat Command (ACC) as the AF lead command for Command and Control (C2) has tasked the Air National Guard (ANG) to provide 10 Air Control Squadrons (ACS) to execute mission functions and capabilities of a deployable Control and Reporting Center (CRC) in support of battle management operations. The CRC is a mobile Battle Management C2 capability with the deployable radar elements of the Theater Air Control System (TACS). The CRC integrates a comprehensive air picture via multiple data links from air, sea, and land-based sensors, as well as from its imbedded surveillance and control radars. It performs decentralized C2 of joint operations by conducting threat warning, battle management, theater missile defense, weapons control, combat identification, and strategic communications. 200KW TQGs with aural signature of 70dBA or less at seven (7) meters are required to support mission electrical power requirements. The Generator Set must be capable of 120/208/240/416 volt, 50/60 Hz, self-contained skid mounted, portable unit that meets all electrical load requirements. It should be equipped with controls, instruments, and accessories for operation as a single unit or in parallel with another unit of the same class and mode. The system must be configured as follows: diesel engine powered, brushless generator, excitation system, speed governing system, fuel system, 24 volt starting system, electronic control and fault system, and a Electronic Modular Control Panels (EMCP) for Human Machine Interface (HMI). System must be operational in climate conditions range of -25º F to + 120º F.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC. TQGs are the prime mission asset identified by Unit Type Codes (UTC) and Logistics Detail (LOGDET) validation process.

3. Impact If Not Funded. Lack of properly sized TQGs will continue increased airlift requirements in order to properly operate and sustain mission operations across each element of the CRC. CRC elements will be logistically challenged, limited in response, operations, and integration of evolving systems.

4. Units Impacted.

103 ACS Orange, CT	117 ACS Savannah, GA	133 TS Fort Dodge, IA
107 ACS Luke AFB, AZ	121 ACS St Louis, MO	134 ACS McConnell AFB, KS
109 ACS Salt Lake City, UT	123 ACS Blue Ash, OH	141 ACS Punta Borinquen, PR
116 ACS Warrenton, OR	128 ACS Volk Field, WI	255 ACS Gulfport, MS

5. Contractor. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
60 Systems (3080)	**$67,000**	**$4,020,000**

INFORMATION PAPER

ON

DISMOUNTED INTEROPERABLE ACQUISITION OF SENSOR COMPUTER (DIASC)

1. Background. Dismounted Joint Terminal Attack Controllers (JTAC) currently use non-graphic Global Positioning Systems (GPS), maps, and compasses to build situational awareness, navigate, and generate target coordinates because the currently fielded digital equipment is too heavy to carry on foot patrols. JTACs require extremely lightweight equipment to keep their weight burden manageable during dismounted foot patrols. Lightweight, digital, interactive mapping devices capable of providing situational awareness of air and ground forces, navigation, and target coordinate generation will shorten the kill chain timeline and mitigate collateral damage and fratricide. JTACs require the capability to simultaneously operate geospatial mapping, navigation and precision targeting software with the option to provide direct, near real-time connectivity with supporting aircraft and ground forces. This device should be capable of operating for a minimum of eight (8) hours without loss of voice communications. This requirement must also include the ability to provide Sensor Point of Interest (SPI) and other J series messages on a common data linked system.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC. Operational Requirements Document (ORD), Increment 1.0 for this ACAT III capability clearly validates the requirements for this capability as part of TACP Modernization.

3. Impact If Not Funded. ANG JTACs will be unable to effectively navigate, maintain situational awareness and communicate digitally with supporting aircraft and will be reliant upon legacy technology to complete mission objectives. SPI and situational awareness capabilities can dramatically decrease required voice communications, decrease the propensity for target mis-identification and expedite kinetic strikes on known targets.

4. Units Impacted.

113 ASOS Terre Haute, IN	146 ASOS Will Rodgers, OK	227 ASOS Atlantic City, NJ
116 ASOS Camp Murray, WA	147 ASOS Ellington Field, TX	238 ASOS Meridian, MS
118 ASOS New London, NC	148 ASOS Fort Indiantown Gap, PA	274 ASOS Syracuse, NY
122 ASOS Camp Beauregard, LA	165 ASOS Brunswick, GA	284 ASOS Smoky Hill, KS
124 ASOS Ellington Field, TX	169 ASOS Peoria, IL	

5. Contractor. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
336 DIASC (3840)	**$10,000**	**$3,360,000**

INFORMATION PAPER

ON

JOINT TERMINAL ATTACK CONTROLLER BINOCULAR NIGHT VISION DEVICE (BNVD)

1. Background. Joint Terminal Attack Controllers (JTACs) and additional members of Tactical Air Control Parties (TACPs) are currently being deployed to conduct full spectrum Close Air Support (CAS) and Intelligence, Surveillance, and Reconnaissance (ISR) missions with antiquated Night Vision Devices (NVD). During the planning and execution of these missions, it is absolutely critical that the JTAC be equipped with NVDs capable of specifically and precisely identifying not only the target, but the attacking aircraft, to minimize the potential for fratricide and/or non-combatant casualties and collateral damage. The NVDs currently being fielded to USAF TACPs are single tube, Generation-3 NVDs designed specifically for close range ground combat operations in areas with minimal cultural lighting. The abundance of high intensity cultural lighting in the urban areas of Operation NEW DAWN (OND) and Operation ENDURING FREEDOM (OEF) often washes out or blinds current Generation-3 NVDs, which makes them unsuitable for precise air-to-ground operations in the current theaters. Generation-4, gated NVD systems are the current standard among attack aircraft crews because they are specifically designed to mitigate the negative effects of cultural lighting. JTACs continually deploy with antiquated NVDs which are not on par with air-to-ground strike asset, creating the inability to ensure a common battlefield picture. This continues to pose a risk to friendly forces, civilian non-combatants and other collateral concerns.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC; lessons learned Operations ENDURING FREEDOM (OEF) and IRAQI FREEDOM (OIF).

3. Impact If Not Funded. Without this capability, the dismounted JTAC will be unable to accurately mark a target covertly during night operations. Risk of fratricide and civilian collateral damage remains significantly high until such a capability is fielded.

4. Units Impacted.

111 ASOS Camp Murray, WA	146 ASOS Will Rodgers, OK	182 ASOG Peoria, IL
113 ASOS Terre Haute, IN	147 ASOS Ellington Field, TX	194 ASOG Camp Murray, WA
116 ASOS Tacoma, WA	148 ASOS Ft Indiantown Gap, PA	227 ASOS Atlantic City, NJ
118 ASOS Badin, NC	165 ASOS Brunswick, GA	238 ASOS Meridian, MS
122 ASOS Pineville, LA	168 ASOS Peoria, IL	274 ASOS Syracuse, NY
124 ASOS Boise, ID	169 ASOS Peoria, IL	284 ASOS Smoky Hill, KS

5. Contractor. Night Vision Depot, Allentown, PA.

6. Cost.

Units Required	Unit Cost	Program Cost
408 BNVD (3080)	**$9,461**	**$3,860,088**

INFORMATION PAPER

ON

LOW PROBABILITY OF INTERCEPT / LOW PROBABILITY OF DETECTION (LPI/LPD) VIDEO DOWNLINK RECEIVER

1. Background. Joint Terminal Attack Controllers (JTACs) are currently being deployed to conduct full spectrum Close Air Support (CAS) and Intelligence, Surveillance, and Reconnaissance (ISR) missions in Operations NEW DAWN and ENDURING FREEDOM. The ability to receive Video Downlink (VDL) and Full Motion Video (FMV) feeds is limited to semi-permanent fixed and vehicle mounted operations due to the size and probability of detection of backlighting caused by large screens used for viewing the transmissions. Observation by ISR assets is proving to be a critical combat capability link in the kinetic kill chain as well as one of the primary means of providing constant tracking and or surveillance of potential high value assets. Dismounted JTACs need the same capability of VDL/FMV as fixed locations, but with the increased risk of exposure to direct enemy combatants this device must have LPI/LPD capability. The receiver characteristics must allow for a body-worn hands-free with limited human-machine interface (HMI) VDL receiver for dismounted CAS operations, which is an internet protocol (IP) based, multi-band, secure, digital and analog receiver designed for ease of integration. Devices should have external interfaces the user can connect to virtually any existing display device, computer or currently used power sources available to the JTAC equipment set.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC. Operational Requirements Document (ORD), Increment 1.0 for this ACAT III capability clearly validates the requirements for this capability as part of TACP Modernization.

3. Impact If Not Funded. Dismounted JTACs will continue to rely on radio relayed information from a fixed site, exposed themselves to enemy detection by continuing to use current handheld devices capable of VDL/FMV or operate without the added capability of direct VDL/FMV information.

4. Units Impacted.

113 ASOS Terre Haute, IN	146 ASOS Will Rodgers, OK	227 ASOS Atlantic City, NJ
116 ASOS Camp Murray, WA	147 ASOS Ellington Field, TX	238 ASOS Meridian, MS
118 ASOS New London, NC	148 ASOS Fort Indiantown Gap, PA	274 ASOS Syracuse, NY
122 ASOS Camp Beauregard, LA	165 ASOS Brunswick, GA	284 ASOS Smoky Hill, KS
124 ASOS Ellington Field, TX	169 ASOS Peoria, IL	

5. Contractor. L3 Communications, San Diego CA.

6. Cost.

Units Required	Unit Cost	Program Cost
168 LPI/LPD VDL Kits (3080)	**$21,000**	**$3,528,000**

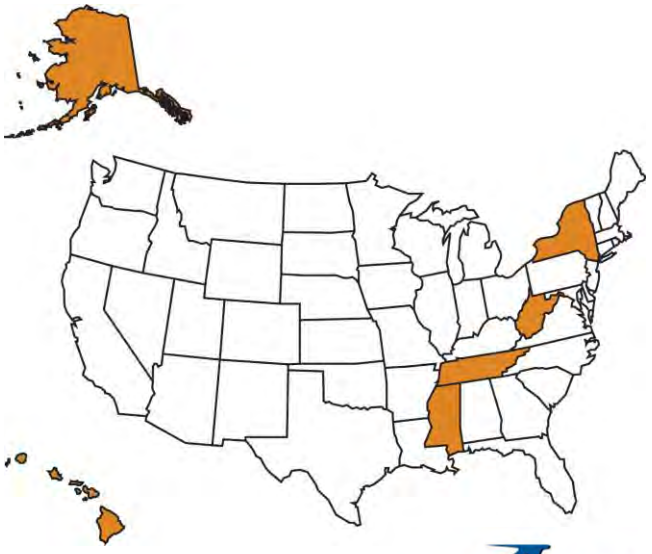
C-5 and C-17

- **Strategic Airlift**
- **Outsized or Oversized Cargo Airlift**
- **Aeromedical Evacuation Missions**

The C-5 Galaxy, with its unmatched payload capability and delivery speed, provides AMC intertheater airlift in support of US national defense strategy. The C-5 provides all-weather passenger and outsized/oversized cargo airlift, air land, and special operations-type missions. With the C-5's unique visor door and kneeling capability, the aircraft can both load and unload (roll on/roll off) simultaneously. The aircraft can carry fully equipped, combat-ready military units to any point in the world on short notice, and provide critical field support to sustain the fighting force**.**

The ANG operates a fleet of thirty-three C-5A aircraft located at 105th Airlift Wing (AW), Stewart ANGB, NY; 164th AW at Memphis, TN and 167th AW at Martinsburg, WV.

The C-17 Globemaster III is the nation's core military airlifter and continues to excel in a wide range of operational mission scenarios. It provides the flexibility to support both intertheater and intratheater missions and allows AMC to significantly improve throughput during contingency operations. Using C-17s as an intratheater airlift platform has provided relief to the C-130 fleet and also reduced ground forces' dependence on vehicle convoys.



The ANG operates eight C-17 aircraft assigned to the 172nd Airlift Wing (AW) in Jackson, MS. The 154th AW in Hickam AFB, HI and the 176th Wing at Elmendorf AFB, AK are ANG associate units.

C-5 and C-17
2010 Weapons and Tactics Conference

Critical Combat Capabilities List

C-5
- Structural Issues
- Large Aircraft Infrared Countermeasures (LAIRCM)
- Next Generation Threat Detection System
- Brake Temperature Monitoring System (BTMS)
- Electronic Flight Bag (EFB)

C-17
- Next Generation Threat Detection System
- Real Time in the Cockpit (RTIC) and Data Link (DL)
- Radar Warning Receiver (RWR)
- Enhanced Flight Crew Communication
- Electronic Flight Bag (EFB)

Essential Capabilities List

C-5
- Flight Deck NVG Observer Program
- Install Yoke Mounted Expendables Delivery Switch (YMEDS)

Desired Capabilities List

C-5
- Advanced Situational Awareness Countermeasures (ASACMS) Compatible Radar Warning Receiver (RWR)

C-17
- SIPR/NIPR Access
- Seat Replacement

C-5 & C-17 EXECUTIVE SUMMARY

Modernization Funding Profiles ($ Million)

Program	P.E. Number	2012	2013	2014	2015	2016	Total
C-5							
Structural Issues	0401119F	$62.04 [2]	$62.04 [2]	$62.04 [2]	$62.04 [2]	$62.04 [2]	$310.20
Large Aircraft Infrared Countermeasures and Next Generation Threat Detection System	0401134F 0401119F	$49.50 [2] $10.00 [3] $5.15 [2] $6.00 [3]	$49.50 [2] - $5.15 [2] -	$49.50 [2] - $5.15 [2] -	$49.50 [2] - $5.15 [2] -	$49.50 [2] - $5.14 [2] -	$289.24
Brake Temperature Monitoring System	0401119F	$26.40 [2]	$26.40 [2]	$26.40 [2]	$26.40 [2]	$26.40 [2]	$132.00
Class III Electronic Flight Bag	0401119F	$4.95 [2] $0.50 [3]	- -	- -	- -	- -	$5.45
C-17							
Next Generation Threat Detection System *	0401134F 0401130F	$15.30 [2] $2.34 [2] $6.00 [3]	$15.30 [2] $2.34 [2] -	$15.30 [2] $2.34 [2] -	- - -	- - -	$58.92
Real-Time in the Cockpit and Data Link	0401130F	$2.65 [2] $4.00 [3]	$2.12 [2]	-	-	-	$8.77
Radar Warning Receiver	0401130F	$3.66 [2] $10.00 [3]	$3.66 [2]	$3.66 [2]	-	-	$20.98
Enhanced Flight Crew Communication	0401130F	$0.26 [2]	-	-	-	-	$0.26
Electronic Flight Bag *	0401130F	$1.35 [2] $0.50 [3]	-	-	-	-	$1.85

Notes: [1] 3840 Appropriation [2] 3010 Appropriation [3] 3600 Appropriation [4] 3080 Appropriation

* This critical capability is covered in an information paper listed in the C-5 section.

C-5

- C-5 Structural Issues - Replaces aging cracked structures which minimizes or eliminates current 20 percent or more cargo weight reduction.
- C-5 and C-17 Large Aircraft Infrared Countermeasures (LAIRCM) and Next Generation Threat Detection System - Allows aircraft to survive in lethal threat environments where MANPADS are widely used by providing the optimum countermeasure solution that does not rely on pyrotechnic expendables. Provides a 360 degree (azimuth and elevation) picture displayed at the navigator, loadmaster, and cockpit flight stations.
- C-5 Brake Temperature Monitoring System (BTMS) - Provides critical information if heavy braking is encountered or after the discovery of a brake malfunction.
- C-5 and C-17 Class III Electronic Flight Bag (EFB) - Adds an electronic information management device that helps to improve situational awareness, cockpit efficiency, productivity, and allows aircrews to safely adapt to in-flight mission changes.

C-17

- Next Generation Threat Detection System - Provides a 360 degree (azimuth and elevation) picture displayed at the navigator, loadmaster, and cockpit flight stations. NOTE: This critical capability for the C-17 is contained in the C-5 and C-17 LAIRCM and Next Generation Threat Detection System information paper in the C-5 section.
- C-17 Real-Time in the Cockpit (RTIC) and Data Link (DL) - Provides a robust, secure, and scalable line-of-sight (LOS) and beyond-line-of-sight (BLOS) connectivity with the network centric battlefield.
- C-17 Radar Warning Receiver (RWR) - Modern RWRs feature digital receiver architectures, increased sensitivity and improved threat location accuracy.
- C-17 Enhanced Flight Crew Communication - Wireless communications system allows for safer and faster communications during all phases of ground and flight operations.
- Electronic Flight Bag (EFB) - Adds an electronic information management device that improves situational awareness, cockpit efficiency, productivity, and allows aircrews to safely adapt to in-flight mission changes. NOTE: This critical capability for the C-17 is contained in the C-5 and C-17 Class III Electronic Flight Bag information paper in the C-5 section.

INFORMATION PAPER

ON

C-5 STRUCTURAL ISSUES

1. Background. The C-5A fleet provides 25 percent of the U.S. outsize cargo airlift capability. Confirmed cracking of the C-5A aft crown skins due to stress and corrosion requires a replacement fleet wide to avoid extensive groundings and flight restrictions.

2. Requirement. Air Mobility Command (AMC) Validated AF Form 1067; AMC C-5 Requirements & Planning Council (R&PC), Jun 2010.

3. Impact if not funded. The initial restriction will reduce the cargo load factor by 20 percent and will adjust further downward depending on the severity of the cracking. Because of the unpredictable nature of the cracking, accumulation may lead to unsafe structural integrity and a potential catastrophic failure.

4. Units Impacted.

105 AW Stewart, NY 164 AW Memphis, TN 167 AW Martinsburg, WV

5. Contractor. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
33 Crown Skin Replacements (3010)	**$9,400,000**	**$310,200,000**

INFORMATION PAPER

ON

C-5 AND C-17 LARGE AIRCRAFT INFRARED COUNTERMEASURES (LAIRCM) AND NEXT GENERATION THREAT DETECTION SYSTEM

1. Background. Air National Guard (ANG) C-5s and C-17s operate worldwide in environments where Infrared (IR) Man-Portable Air Defense System (MANPADS) seeking missiles are widely available and represent a significant threat during take-off and landing. Some of these missiles are advanced and designed to defeat flare-based defensive systems. Flares are also extremely volatile, require special handling, and supply is limited on the aircraft. The AN/AAQ-24 (V) LAIRCM system provides the most effective countermeasures against MANPADS that are increasingly sophisticated. C-5A aircraft are equipped with a flare-based Aircraft Defensive System (ADS). C-17s transferring to the ANG may not arrive with LAIRCM. LAIRCM and its sensors are a prerequisite to having the Next Generation Threat Detection System installed. An upgrade to the current AAR-54 missile launch detectors is available which would provide better IR threat detection, significantly increasing flare or LAIRCM effectiveness. The upgraded launch detect system must be capable of providing a 360 degree (azimuth and elevation) picture displayed at the navigator, loadmaster, and cockpit flight stations allowing crewmembers to see previously blind sectors and react accordingly.

2. Requirement. LAIRCM Operational Requirements Document (ORD) 314-92, Aug 98.

3. Impact If Not Funded. C-5s and C-17s operate in environments of increasing levels of threat complexity and lethality while employing less than state-of-the-art aircraft defensive systems, risking damage to or loss of aircraft and potential loss of life.

4. Units Impacted.

105 AW Stewart, NY
164 AW Memphis, TN
167 AW Martinsburg, WV
172 AW Jackson, MS

5. Contractors. Boeing, San Antonio, TX; Northrop Grumman, Rolling Meadows, IL.

6. Cost.

Units Required	Unit Cost	Program Cost
C-5 LAIRCM NRE (3600)	**N/A**	**$10,000,000**
C-5 and C-17 Next Gen NRE (3600)	**N/A**	**$12,000,000**
33 C-5 LAIRCM Group A Kits (3010)	**$4,500,000**	**$148,500,000**
33 C-5 LAIRCM Group B Kits (3010) *	**$3,000,000**	**$99,000,000**
9 C-17 LAIRCM Group A Kits (3010)	**$2,100,000**	**$18,900,000**
9 C-17 LAIRCM Group B Kits (3010) *	**$3,000,000**	**$27,000,000**
42 Next Gen Sensors	**$780,000**	**$32,760,000**
Total		**$348,160,000**

* Includes spares, support equipment, technical orders, and training.

INFORMATION PAPER

ON

C-5 BRAKE TEMPERATURE MONITORING SYSTEM (BTMS)

1. Background. Several recent incidents of brake fires have led to millions of dollars in damage to aircraft and disruption of flight operations. Aircrews have no real time data to alert them to an impending brake fire, and must rely on situational awareness to determine when a brake temperature estimate should be accomplished. This temperature estimate on twenty-four different sets of brakes is manually accomplished by the Flight Engineer and can take as much as thirty minutes. It is during this time that crew actions taken such as crew egress and coordinating for ground fire support can significantly limit the potential for loss of life and/or assets. The installation of BTMS first requires the installation of an upgraded brake system. These brakes are planned to be utilized on the C-5M as they can accommodate heavier cargo loads. Currently, the C-5A fleet is not programmed to receive the new brakes, but will only receive them on an attrition basis.

2. Requirement. AF 1067 with Air Mobility Command (AMC) tracking numbers 09-103 and 09-104 refer to upgrades to the brake system. BTMS is listed on AMC's R&PC Matrix.

3. Impact if not funded. The system would provide critical information that would impact an aircrew's course of action if heavy braking is encountered or after the discovery of a brake malfunction. This information would greatly enhance the crew's situational awareness and decrease reaction times, increasing the chances of preventing loss of life and/or assets.

4. Units Impacted.

105 AW Stewart, NY 164 AW Memphis, TN 167 AW Martinsburg, WV

5. Contractor. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
33 Upgraded Brake Systems (3010)	**$2,000,000**	**$66,000,000**
33 Brake Temperature Monitoring Systems (3010)	**$2,000,000**	**$66,000,000**
Total		**$132,000,000**

INFORMATION PAPER

ON

C-5 AND C-17 CLASS III ELECTRONIC FLIGHT BAG (EFB)

1. Background. The definition of an EFB, according to the Federal Aviation Administration's (FAA) Advisory Circular (AC No. 120-76A), is "an electronic display system intended primarily for cockpit/flight deck or cabin use. EFB devices can display a variety of aviation data or perform basic calculations." In short, an EFB is an electronic information management device that helps to improve situational awareness, cockpit efficiency, productivity, and safety. They typically consist of a screen and a control unit that may be installed, mounted or contained in one sole portable unit. EFBs can electronically store and retrieve documents required for flight operations, such as Technical Orders (TOs), Air Force Instructions (AFIs), Flight Operations Manual (FOM), Minimum Equipment Lists (MEL), as well as providing the most current Flight Information Publications (FLIP). Additional motivators for using an EFB are significant cost savings on annual paper FLIP purchases and the considerable reduction of paper waste associated with each FLIP changeover. The potential to receive significant mission changes during worldwide cargo and personnel transport missions is extremely high. The aircrew needs the ability to have all possible mission information and performance calculation capability at their fingertips. Although specified to be a Class III EFB at the Air Reserve Component Weapons and Tactics Conference, the AMC standard will most likely be a Class II solution which is much more cost effective and is less intrusive on the aircraft and its systems.

2. Requirement. C-5 AF Form 1067 with Air Mobility Command (AMC) tracking number 09-165. C-17 AF Form 1067 with Air Mobility Command (AMC) tracking number 09-164.

3. Impact If Not Funded. Not funding the EFB might place the crew in a position where a single mission change could jeopardize mission success. Without the EFB, crews will continue to make critical decisions without accurate real-time information in the cockpit.

4. Units Impacted.

105 AW Stewart, NY
164 AW Memphis, TN
167 AW Martinsburg, WV
172 AW Jackson, MS

5. Contractor. Esterline CMC Electronics, Montreal, Canada; NavAero, Chicago, IL; IMS Flight Deck, Brea, CA; Boeing Commercial Airplane Company, Seattle, WA.

6. Cost.

Item	Unit Cost	Program Cost
Non-Recurring Engineering (NRE) (3600)	**N/A**	**$1,000,000**
33 C-5 Electronic Flight Bag (3010)	**$150,000**	**$4,950,000**
9 C-17 Electronic Flight Bag (3010)	**$150,000**	**$1,350,000**
Total		**$7,300,000**

INFORMATION PAPER

ON

C-17 REAL-TIME IN THE COCKPIT (RTIC) AND DATA LINK (DL)

1. Background. Current information-based dynamic battlespace environments require secure airborne data communications in a net-centric environment with other aircraft, Command and Control (C2) agencies, and ground-based forces. Data link and data transfer will provide aircrews the ability to report and receive battlespace information from monitoring C2 agencies such as position of other aircraft, weather, threat, mission events, mission status, task completion, resource status, etc. This increased situational awareness allows agencies the ability to track mission progress, facilitating rapid decisions and adjustments during mission execution. Additionally, near real-time aircrew reporting will enable information exchanges with global and theater Air Operations Centers (AOC) and Mobility Air Force (MAF) assets (to include those that are airborne), which will improve synchronization of supporting and supported forces.

2. Requirement. Air Mobility command (AMC) C-17 Requirements & Planning Council (R&PC), Jun 2010.

3. Impact If Not funded. Without data link and data transfer capability, aircrew flexibility and situational awareness will be inadequate to be fully effective in current and evolving mission environments. Critical battlespace information would not be available to aircrew members or to monitoring C2 agencies tasked with execution of the assigned missions. Additionally, the inability to rapidly transfer critical information will further hamper battlespace driven adjustment to mission requirement and has the potential for damage to the aircraft and/or loss of life.

4. Units Impacted.
172 AW Jackson, MS

5. Contractor. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE (3600)	**N/A**	**$4,000,000**
9 Group A (3010)	**$100,000**	**$900,000**
9 TDL Radios (3010)	**$330,000**	**$2,970,000**
9 TDL Processors (3010)	**$100,000**	**$900,000**
Total		**$8,770,000**

INFORMATION PAPER

ON

C-17 RADAR WARNING RECEIVER (RWR)

1. Background. The Air National Guard (ANG) C-17 fleet has does not have a RWR. Modern RWRs feature digital receiver architectures, increased sensitivity and improved threat location accuracy. The only candidate RWR is the ALR-69A. Procuring a RWR is critical to support C-17 operations requirements.

2. Requirement. AN/ALR-69A Capabilities Production Document (CPD) approved by AFROCC, 17 Nov 05.

3. Impact If Not Funded. Without an advanced capability radar warning system, C-17s are unable to operate in any region defended by radar guided threats creating "denied access" regions. Combatant commanders are unable to deliver any personnel and cargo via aircraft to "denied access" regions.

4. Units Impacted.
172 AW Jackson, MS

5. Contractor. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE ALR-69A (3600)	**N/A**	**$10,000,000**
9 ALR-69A (3010) *	**$1,220,000**	**$10,980,000**
Total		**$20,980,000**

* Includes spares, support equipment, and technical orders.

INFORMATION PAPER

ON

C-17 ENHANCED FLIGHT CREW COMMUNICATION

1. Background. Current intercom systems for short-range communication in and around C-17 Aircraft utilize 50-100 ft cords that physically connect loadmasters/scanners to the aircraft. These cords restrict user movement and become tangled with other cords, equipment and passengers. In addition, the current intercom systems can be hazardous to the crewmembers during ground and Engine Running On or Offload (ERO) operations. Wireless communications system allow for safer and faster communications during all phases of ground and flight operations. A wireless system would also be more economical than using the current corded wires and multiple loadmasters/scanners would have the capability to communicate information with each other to prevent damage to aircraft during the on/off loading of cargo. Environmental stressors such as hazardous noise levels are proven by the Federal Aviation Administration (FAA) to increase fatigue levels in aircrew. Studies conducted by the 315 AW Flight Surgeon discovered that many C-17 pilots suffered measurable hearing loss from exposure to long term decibel levels in the C-17. Utilizing passive hearing protection such as earplugs along with the standard headsets are not as effective as using Active Noise Reduction (ANR) headsets. The FAA suggests that using ANR headset will minimize initial hearing loss and reduce further hearing damage to those who have experienced some degree of hearing loss.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC.

3. Impact If Not funded. Continued use of antiquated, troublesome and dangerous corded system could cause injury to crewmembers and aircraft. Existing interphone cords get hung up on equipment. This restricts movement and in some cases prevents crewmembers from performing critical duties in a timely manner, thus reducing mission effectiveness. Continued permanent damage to aircrew hearing.

4. Units Impacted.
172 AW Jackson, MS

5. Contractor. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
9 Wireless Intercom Systems (3010)	**$20,000**	**$180,000**
90 Active Noise Reduction Headsets (3010)	**$800**	**$72,000**
Total		**$252,000**

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C-130

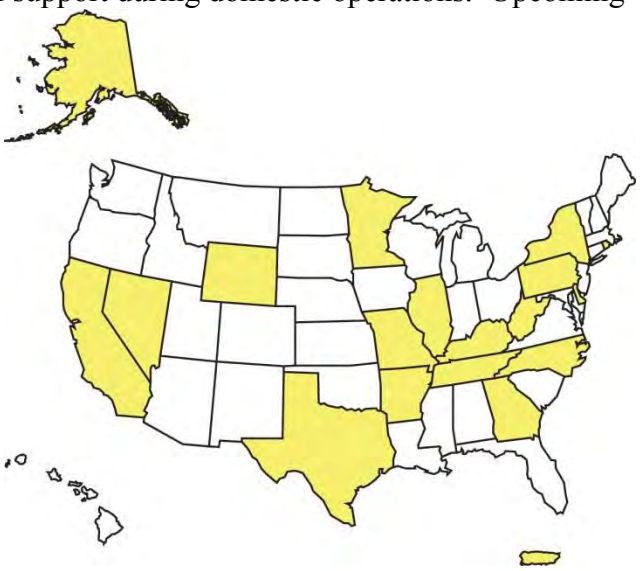
- **Tactical Airlift**
- **Special Operations Forces (SOF)/Combat Search and Rescue**
- **Special Mission (Airborne Firefighting, Antarctic Resupply)**

Forty percent of the Air Force C-130 fleet resides in the Air National Guard (ANG).

C-130H/J: The C-130 Hercules is the U.S. military's primary combat delivery aircraft. In addition to its primary role in tactical airlift, ANG C-130s support humanitarian, peacekeeping, and disaster relief operations worldwide. The ANG will be the first to field equipment from the C-130 Avionics Modernization Program (AMP) and is the lead for operational test and evaluation.

Procurement efforts continue for Large Aircraft Infrared Countermeasure (LAIRCM) system, tactical data link (SLOS/BLOS) capability, surface-to-air fire (SAFIRE) lookout window, loadmaster crashworthy seat, and precision guided airdrop capability. All these efforts will provide promise for enhanced capability.

HC/MC/LC-130/EC-130J: The ANG provides 35 percent of the Air Force's HC/MC-130 combat search and rescue capability. ANG HC/MC-130 units continue to deploy in support of overseas contingency operations and provide emergency rescue and relief support during domestic operations. Upcoming modernization efforts for the ANG HC/M-130 fleet include AN/ARS-6v12 LARS, multi-function color displays with data link and EO/IR sensor modifications. The EC-130J Commando Solo conducts information operations, psychological operations, and civil affairs broadcasts. Finally, the LC-130 operates on snowfields in remote areas of the Polar Regions in support of the National Science Foundation. Current modification efforts include crevasse detection radar, eight bladed propellers, and a new jet assisted takeoff motor.



C-130 2010 Weapons and Tactics Conference

Critical Combat Capabilities List

C-130H
- Data Link Capability with Secure-Line-Of-Sight (SLOS)/Beyond-Line-Of-Sight (BLOS)
- Improved Self Protection
- Single Pass Precision Guided Airdrop
- Surface-to-Air Threat Detection
- Radar Warning Receiver

C-130J
- Improved Self-Protection
- Increased Loadmaster Safety
- Single Pass Precision Airdrop
- Cargo Compartment Camera

HC/MC-130
- Integrated BLOS/Line-Of-Sight (LOS) Data Link and Video Downlink (VDL)
- Electro-Optical (EO)/Infrared (IR) Upgrade for Find-Fix-Track
- Self-Protection - Hostile Fire Indicator
- Increased Engine and Propeller Performance
- Oil Cooler Augmentation

EC-130J
- Removable Airborne Military Information Support Operations System (RAMS) with Articulating Arm/Fly-Away Broadcast System Version 2 (FABSv2)
- Advanced Infrared Countermeasures (IRCM)
- Weapon System Training Device
- Power Distribution Panel

LC-130
- Crevasse Detection Radar
- Electronic Propeller Control System
- Eight Bladed Propeller Upgrade
- Jet-Assisted Takeoff (JATO) Replacement

Essential Capabilities List

C-130H
- Crashworthy Seat
- NVIS Compatible Cockpit and Windscreen
- Loadmaster Wireless Communication System
- Global Positioning System (GPS) – Receiver Autonomous Integrity Monitor (RAIM) / Avionics Modernization Program (AMP) Flight Modernization System (FMS)
- Electronic Takeoff/Landing Data (E-TOLD)
- Propeller Modernization
- Virtual Electronic Combat Training Simulator
- Dual Mode Federal Aviation Regulation (FAR) Compliant Exterior Lights
- Electronic Flight Bag
- Cargo Compartment Modernization

C-130J
- Improved Combat Delivery System (CDS) Gate Release Mechanism
- Loadmaster Wireless ICS
- On Board Electronic Warfare (EW) Training
- Advanced Squadron Level Simulator

HC/MC-130
- Retractable External Store Arm
- Integrated Electronic Warfare System
- Integrated Body Armor/Survival Vest System
- Single Pass Precision Airdrop System
- Base Operational Support (BOS) Sys/Equip
- Gas Turbine Compressor (GTC) to Auxiliary Power Unit (APU) Upgrade
- Upgraded Pressurization/Integrated Body Armor/Survival Vest
- Digital Map Interface System (DMIS)
- Universal Aerial Refueling Receptacle Slipway (UARRSI)
- Precision Employment of Non-Lethal / Low Collateral Damage Munitions
- Digital Takeoff and Landing Data
- Multi-Band Havequick Radio

EC-130J
- External Fuel Tanks
- 60 HZ Frequency Converters for Special Mission Equipment (SME)
- SME Console Interphone Relocation

Desired Capabilities List

C-130H

- Defensive Systems Integration
- Visual Threat Recognition Awareness Trainer (VTRAT)
- Distributed Mission Operations Simulator (DMO) (H-2, H-3 and J)
- Noise Cancellation Cockpit
- Vertical Situational Awareness

C-130J

- Mission Recording Capability

HC/MC-130

- Virtual Electronic Combat Training Simulator (VECTS) and VTRAT
- Variable Speed Drogue
- Radio Frequency (RF) Jammer
- DMO Weapon System Trainer (WST) Simulators
- Global Positioning System (GPS) Internal Repeater

EC-130J

- Focused Beam Antennae

C-130 EXECUTIVE SUMMARY

Modernization Funding Profiles ($ Million)

Program	P.E. Number	2012	2013	2014	2015	2016	Total
C-130H							
Tactical Data Link with SLOS / BLOS	401115F	$20.60 [2]	$15.40 [2]	$15.40 [2]	$15.40 [2]	-	$66.80
Advanced IRCM	401115F	$73.08 [2]	$67.00 [2]	$77.80 [2]	$66.32 [2]	$70.08 [2]	$354.28
Missile Approach Warning System Upgrade and Hostile Fire Indicator	401115F	$23.50 [2]	$30.00 [2]	$22.25 [2]	$21.06 [2]	$21.00 [2]	$117.81
Single Pass Precision Guided Airdrop	401115F	$11.00 [2] $3.00 [3]	$15.61 [2]	$15.61 [2]	$14.47 [2]	$14.46 [2]	$74.15
C-130H Surface-To-Air Threat Detection Observer Rear Lookout Capability	401115F	$12.15 [2] $14.00 [3]	$26.10 [2]	$26.10 [2]	$26.10 [2]	$26.10 [2]	$130.55
C-130 Advanced Radar Warning Receiver (RWR)	401115F	$28.49 [2] $25.00 [3]	$17.08 [2] $25.00 [3]	$17.08 [2] $25.00 [3]	$28.86 [2] -	$34.36 [2] -	$200.87
C-130J							
Improved Self-Protection * Advanced IRCM	401115F	$10.15 [2]	$10.15 [2]	$10.14 [2]	$10.14 [2]	$10.14 [2]	$50.72
Improved Self-Protection * Hostile Fire Indicator	401115F	$5.00 [2]	$4.50 [2]	$4.36 [2]	-	-	$13.86
C-130 Loadmaster Crashworthy Seat	401115F	$7.77 [2]	$7.77 [2]	$7.77 [2]	$7.74 [2]	$1.80 [2]	$32.85
Single Pass Precision Airdrop *	401115F	$1.16 [2] $3.00 [3]	$3.47 [2]	$3.47 [2]	$3.46 [2]	$2.30 [2]	$16.86
C-130J High Pressure Portable Oxygen Bottle	401132F	$0.12 [2]	-	-	-	-	$0.12
C-130J Cargo Compartment Camera	401132F	$3.15 [2] $2.00 [3]	$3.15 [2] -	- -	- -	- -	$8.30
HC/MC-130							
Integrated BLOS/LOS Data Link and VDL *	27224F 27230F	$21.45 [2]	-	-	-	-	$21.45
HC/MC-130 EO/IR Sensor Upgrade For Find-Fix-Track	27224F 27230F	$5.90 [2]	-	-	-	-	$5.90
Self-Protection - Hostile Fire Indicator *	27224F 27230F	$11.55 [2]	-	-	-	-	$11.55
Electronic Propeller Control System (EPCS)	27224F 27230F	$8.00 [2]	-	-	-	-	$8.00
Increased Performance * Eight Bladed Propeller	27224F 27230F	$28.50 [2]	-	-	-	-	$28.50
HC-130 Oil Cooler Augmentation	27224F	$3.00 [2]	-	-	-	-	$3.00

EC-130							
Removable Airborne Military Information Support Operations System	401132F	$5.85 [2] $3.30 [3]	$5.85 [2] -	- -	- -	- -	$15.00
Advanced IRCM *	401134F	$10.74 [3]	$10.74 [3]	-	-	-	$21.48
EC-130J Power Distribution Panel	401132F	$4.50 [2] $1.00 [3]	$3.00 [2] -	- -	- -	- -	$8.50
LC-130							
Crevasse Detection Radar	401115F	$2.00 [2]	-	-	-	-	$2.00
Electronic Propeller Control System *	401115F	$5.54 [2]	-	-	-	-	$5.54
C-130 Eight Bladed Propeller Upgrade	401115F	$20.50 [2]	-	-	-	-	$20.50
Jet Assisted Takeoff Program	401115F	$7.20 [2]	$7.20 [2]	$7.20 [2]	$7.20 [2]	$7.20 [2]	$35.00

Notes: [1] 3840 Appropriation [2] 3010 Appropriation [3] 3600 Appropriation [4] 3080 Appropriation

* This critical capability is covered in an information paper in a different C-130 variant section. See bullet below for information paper location.

C-130H

- C/HC/MC-130 Tactical Data Link (TDL) With Secure Line-Of-Sight (SLOS) / Beyond Line-Of-Sight (BLOS) - Provides real-time information to aircrews and increases survivability in combat operations. The Cockpit Display Unit (CDU) allows display of real-time data.
- C/EC-130 Advanced Infrared Countermeasures (IRCM) Suite - Allows aircraft to survive in an environment of increasingly complex threats and lethality.
- C/HC/MC-130 Missile Approach Warning System Upgrade and Hostile Fire Indicator - Enhances existing missile warning system to provide operationally acceptable probabilities of detection and false alarms to include a Hostile Fire Indication capability.
- C-130H/J Single Pass Precision Guided Airdrop - Eliminates multiple passes for wind sonde data during airdrops decreasing risk to while meeting U.S. Army requirements.
- C-130H Surface-to-Air Threat Detection Observer Rear Lookout Capability - Allows for wide-angle view from the 3 o'clock to 9 o'clock continuum behind the aircraft.
- C-130 Advanced Radar Warning Receiver (RWR) - Provides advanced, digital RWR capable of ensuring adequate defensive situational awareness against present and future threats.

C-130J

- Improved Self-Protection -
  - Advanced IRCM allows survival in a complex and lethal threat environment. NOTE: This critical capability for the C-130J is contained in the Advanced Infrared Countermeasures paper in the C-130H section.
  - Missile Approach Warning System Upgrade and Hostile Fire Indicator - Provides operationally acceptable probabilities of detection and false alarms to include a Hostile Fire Indication capability. NOTE: This critical capability for the C-130J is contained in the Missile Approach Warning System Upgrade and Hostile Fire Indicator paper in the C-130H section.
- C/EC/LC/HC/MC-130 Loadmaster Crashworthy Seat - Provides the Loadmaster with a crashworthy seat able to withstand excessive impact or wheels up landing forces.

- Single Pass Precision Airdrop - Eliminates multiple passes for wind sonde data during airdrops decreasing risk while meeting US Army requirements. NOTE: This critical capability for the C-130J is contained in the Single Pass Precision Guided Airdrop information paper found in the C-130H section.
- C-130J High Pressure Portable Oxygen Bottle - Allows loadmasters greater mobility within cargo compartment during airdrops and decreases use of re-connection to aircraft oxygen.
- C-130J Cargo Compartment Camera - Provides monitoring from cargo compartment and flight deck during parachute deployments, condition of extraction parachutes, cargo pallet extraction, as well as personnel movement within the cargo compartment.

HC/MC-130

- Integrated BLOS/LOS Data Link/VDL - Networks the HC/MC-130 with other assets in theater enhancing situational awareness during Combat Search and Rescue Task Force (CSARTF) missions and reducing potential fratricide. NOTE: This critical capability is contained in the Tactical Data Link information paper in the C-130H section.
- HC/MC-130 Electro-Optical (EO)/Infrared (IR) Sensor Upgrade for Find-Fix-Track - Includes the ability to transmit and receive Full Motion Video (FMV) from EO/IR sensors.
- Self-Protection - Hostile Fire Indicator - Alerts the crew to small arms and rocket propelled grenade fire. NOTE: This critical capability for the HC/MC-130 is contained in the Missile Approach Warning System Upgrade/Hostile Fire Indicator paper in the C-130H section.
- LC/HC/MC-130 Electronic Propeller Control System (EPCS) - Updates existing mechanical synchronizer and propeller control system with digital electronics for improved reliability.
- Increased Engine and Propeller Performance - The 8 bladed propellers replace the existing 4 bladed propellers improving takeoff performance. NOTE: This critical capability for the HC/MC-130 is contained in the Eight Bladed Propeller Upgrade paper in the LC-130 section.
- HC-130P Oil Cooler Augmentation - The Oil Cooler Augmentation allows HC-130Ps to operate for extended periods on the ground without having to shut down engines due to excessive oil temperature.

EC-130J

- EC-130J Removable Airborne Military Information Support Operations System (RAMS) - Articulating arm and fly away broadcast system
- Advanced Infrared Countermeasures - Allows survival in a complex and lethal threat environment. NOTE: This critical capability for the EC-130J is contained in the Advanced Infrared Countermeasures paper in the C-130H section.
- EC-130J Power Distribution Panel - More adaptive platform for multi-mission capability.

LC-130

- LC-130 Crevasse Detection Radar - Completes integration of radar capable of identifying crevasses/hazards on snowfields the LC-130 uses for deep field landing sites.
- Electronic Propeller Control System - Incorporates a digital electronic propeller control system to replace existing mechanical system. NOTE: This critical capability for LC-130s is contained in the Electronic Propeller Control System paper in the HC/MC-130 section.
- LC/HC/MC-130 Eight Bladed Propeller Upgrade - Replaces the existing 4 bladed props with 8 bladed propellers that improve the takeoff performance of the aircraft.
- LC-130 Jet Assisted Takeoff Program - Funds production of new JATO motors.

INFORMATION PAPER

ON

C/HC/MC-130 TACTICAL DATA LINK (TDL) WITH SECURE LINE-OF-SIGHT (SLOS) / BEYOND LINE-OF-SIGHT (BLOS)

1. Background. Installation of a TDL provides comprehensive Command and Control (C2) and maximizes C-130 aircrew situational awareness with SLOS and BLOS capabilities. It provides critical real-time data to aircrews to participate in the present day network-centric battle space. TDL capability must be compatible with any situational awareness C-130 Cockpit Display Units (CDU). Additionally, equipping HC/MC-130 aircraft with the AN/AAQ-36 and the AN/AAQ-38 electro-optical infrared sensors with Full Motion Video (FMV) link capability relieves reliance on high-demand ISR assets during time-critical Combat Search and Rescue Missions. TDL capabilities must be compatible with existing fielded TDL technology on other aircraft.

2. Requirement. Mobility Air Forces (MAF) Network Enabling Concept, 26 Apr 06; AMC MAF Data Link Integration Technical Requirements Document (TRD), 25 Oct 06; Tactical Data Link Transformation CDD, Increment 1, JROCM, 23 Jun 04; AMC R&PC Mission Essential 07/08. CAF MNS 316-92, Real-Time Information in the Cockpit (RTIC). Global Information Grid CRD, JROCM 134-01, 30 Aug 01. Air Force Tactical Data Link Master Plan.

3. Impact If Not Funded. Without a tactical data link capability crews will be denied a complete picture of the battle space and will not be part of the net-centric C2 structure.

4. Units Impacted.

106 RQW	Gabreski Field, NY	143 AW	Quonset APT, RI	166 AW	Wilmington APT, DE
109 AW	Schenectady, NY	145 AW	Charlotte IAP, NC	176 WG	Kulis ANGB, AK
123 AW	Louisville, KY	146 AW	Channel Island, CA	182 AW	Peoria APT, IL
129 RQW	Moffett, CA	152 AW	Reno IAP, NV	189 AW	Little Rock AFB, AR
130 AW	Charleston, WV	153 AW	Cheyenne MAP, WY	193 SOW	Harrisburg, PA
133 AW	Minneapolis, MN	156 AW	San Juan IAP, PR		
139 AW	St Joseph APT, MO	165 AW	Savannah, GA		

5. Contractors. AIRINC, Oklahoma City, OK; Boeing, Chantilly, VA; Northrop Grumman, Melbourne, FL; Rockwell Collins, Cedar Rapids, IA; Raytheon, Fullerton, CA.

6. Cost

Units Required	Unit Cost	Program Cost
NRE for HC/MC-130 (3010)	**N/A**	**$3,250,000**
13 Kits for HC/MC-130 (3010)	**$1,100,000**	**$14,300,000**
13 FMV/VDL Mods for HC/MC-130 (3010)	**$300,000**	**$3,900,000**
167 Kits for C-130 (3010) *	**$400,000**	**$66,800,000**
Total		**$88,250,000**

* Includes 10% spares.

INFORMATION PAPER

ON

C/EC-130 ADVANCED INFRARED COUNTERMEASURES (IRCM) SUITE

1. Background. Air National Guard (ANG) C/HC/MC/EC-130s operate worldwide in a low to medium threat environment where Infrared (IR) guided Man-Portable Air Defense Systems (MANPADS) are widely available, hence a significant threat during takeoffs and landings. Additionally, tactical airlift mission profiles increases the exposure to this threat. The ANG requires an advanced IRCM system, like the AN/AAQ-24 Large Aircraft Infrared Counter Measures (LAIRCM) system, that provides the best countermeasures against MANPADS and does not rely on pyrotechnic expendables. The infrared seekers on more advanced missiles are resistant to pyrotechnic expendables. Additionally, pyrotechnics are volatile, require special handling and there are limited amounts onboard the aircraft. The next generation LAIRCM configuration is two Guardian Laser Transmitter Assemblies (GLTAs), five (5) next generation Ultra-Violet (UV) sensors, one processor and one Control Indicator Unit (CIU) that would provide greater warning, reduce false alarm rates, and provide better reliability.

2. Requirement. LAIRCM Operational Requirements Document (ORD) 314-92, Aug 98.

3. Impact If Not Funded. The C/HC/MC/EC-130 is routinely tasked to operate in high threat areas where there is a higher potential loss of aircraft and crew. The aircraft operate in this environment with defensive systems that are less than state-of-the-art and as a result less effective. Also, without advanced defensive systems the aircraft expend much more of the pyrotechnic expendables.

4. Units Impacted.

109 AW	Schenectady, NY	145 AW	Charlotte, NC	176 AW	Kulis, AK
123 AW	Louisville, KY	146 AW	Channel Islands, CA	182 AW	Peoria APT, IL
130 AW	Charleston, WV	152 AW	Reno, NV	189 AW	Little Rock AFB, AR
136 AW	Fort Worth, TX	153 AW	Cheyenne, WY	193 SOW	Harrisburg, PA
139 AW	St Joseph, MO	165 AW	Savannah IAP, GA		
143 AW	Quonset APT, RI	166 AW	Wilmington, DE		

5. Contractors. Northrop Grumman Electronics Systems, Rolling Meadows, IL; BAE Systems, Nashua, NH; Lockheed Martin, Crestview, FL.

6. Cost.

Units Required *	Unit Cost	Program Cost
104 NexGen Group A Kits (3010) (84 C-130H, 16 C-130J, 4 EC-130)	**$970,000**	**$100,880,000**
74 NexGen Group B Kits (3010) (62 C-130H, 8 C-130J, 4 EC-130)	**$4,400,000**	**$325,600,000**
Total		**$426,480,000**

* Includes required spares, support equipment, and technical orders.

INFORMATION PAPER

ON

C/HC/MC-130 MISSILE APPROACH WARNING SYSTEM UPGRADE AND HOSTILE FIRE INDICATOR

1. Background. Air National Guard (ANG) C/HC/MC-130s operate worldwide in a low to medium threat environment where shoulder-fired, Man-Portable Air Defense System (MANPADS) infrared-seeking missiles are widely available and small arms threats are prolific. These threats are significant during take-offs, landings and airdrops. To counter MANPADS and small arms threats, the ANG requires a missile warning system that has very high probability of detecting missile launches and hostile small arms fire with a very low false alarm rate. The missile approach warning system/Hostile Fire Indicator (HFI) works in conjunction with pyrotechnic expendables and/or laser based countermeasures to decoy or destroy an infra-red guided surface-to-air missile and alert the crew to hostile fire. Combat crews require precise real time threat information that is fully integrated with existing defensive systems with the addition of a hostile fire indicator.

2. Requirement. Air Mobility Command (AMC) Annex 314-92 to LAIRCM ORD; Navy AAR-47 ORD. ANG Validated Critical Requirement; lessons learned Operations ENDURING FREEDOM and IRAQI FREEDOM (OEF/OIF).

3. Impact If Not Funded. The C/HC/MC-130 operates in environments of increasing levels of threat and lethality and therefore must have a robust MANPAD self-defense capability. C-130 defensive systems that do not meet acceptable rates of detection and false alarms will result in either denied areas or loss of personnel and equipment.

4. Units Impacted.

106 RQW Gabreski Field, NY	143 AW Quonset APT, RI	166 AW Wilmington APT, DE
109 AW Schenectady, NY	145 AW Charlotte IAP, NC	176 WG Kulis ANGB, AK
123 AW Louisville, KY	146 AW Channel Island, CA	182 AW Peoria APT, IL
129 RQW Moffett, CA	152 AW Reno IAP, NV	189 AW Little Rock AFB, AR
130 AW Charleston, WV	153 AW Cheyenne MAP, WY	193 SOW Harrisburg, PA
133 AW Minneapolis, MN	156 AW San Juan IAP, PR	
139 AW St Joseph APT, MO	165 AW Savannah, GA	

5. Contractors. ATK, Clearwater, FL; BAE Systems, Nashua, NH; Northrop Grumman, Rolling Meadows, IL; Symetrics, Melbourne, FL.

6. Cost.

Units Required	Unit Cost *	Program Cost
153 C-130H Upgrades (3010)	**$770,000**	**$117,810,000**
18 C-130J Upgrades (3010)	**$770,000**	**$13,860,000**
15 HC/MC-130 Upgrades (3010)	**$770,000**	**$11,550,000**
TOTAL		**$143,220,000**

* Cost includes aircraft installation, test equipment and 10% spares.

INFORMATION PAPER

ON

C-130H/J SINGLE PASS PRECISION GUIDED AIRDROP

1. Background. The Air National Guard (ANG) C-130 fleet has several shortfalls in its ability to precisely deliver airdrop loads. In current high threat operations, there is a requirement for airdrop accuracy to within 50 meters; however, traditional methods only provide accuracy to a 300 meter range at altitudes higher than 3000 feet AGL. Joint Precision Airdrop System Mission Planning Software (JPADS-MP) and Improved Container Delivery System (ICDS) requires multiple passes over the drop zone for wind sonde deployment and atmospheric calculations. GPS guided "Firefly" chutes do not need multiple passes, but are only accurate to 150 meters. The APN-241 radar can be equipped with ballistic wind sensing and Synthetic Aperture Radar (SAR) capabilities through upgrades, which provides more accurate data for ICDS drops. Adding targeting pods and Smart Multifunction Color Displays (SMFCD) aids in precisely locating drop zones, calculating appropriate Computed Air Release Points (CARP), and assessing airdrop effectiveness in real- time. Without the upgrade, C-130s must continue to conduct airdrops from altitudes as low as 300 feet AGL to achieve the required accuracy.

2. Requirement. Mission Need Statement AMC/CAF/AETC/AFSOC/AFMC 301-97. C-130 Avionics Modernization Program (AMP) System Requirement Document, 31 Mar 00.

3. Impact If Not Funded. Without improved precision guidance capabilities, C-130s will not be able to airdrop within 50 meters from safe drop altitudes in accordance with Army requirements.

4. Units Impacted.

109 AW Schenectady, NY	143 AW Quonset APT, RI	156 AW San Juan IAP, PR
123 AW Louisville, KY	144 AS Anchorage, AK	165 AW Savannah, GA
130 AW Charleston, WV	145 AW Charlotte IAP, NC	166 AW Wilmington APT, DE
133 AW Minneapolis, MN	146 AW Channel Island, CA	182 AW Peoria APT, IL
136 AW Ft Worth, TX	152 AW Reno IAP, NV	189 AW Little Rock AFB, AR
139 AW St Joseph APT, MO	153 AW Cheyenne MAP, WY	193 SOW Harrisburg, PA

5. Contractor. Northrop Grumman, Rolling Meadows, IL (APN-241, TGP). Lockheed Martin Missile and Fire Control, Orlando, FL (TGP).

6. Cost.

Units Required *	Unit Cost	Program Cost
NRE C-130H (3600)	**N/A**	**$3,000,000**
NRE C-130J (3600)	**N/A**	**$3,000,000**
APN-241 Radar Upgrade (3010)	**N/A**	**$3,000,000**
59 Pod/SMFCD Kit C-130H (3010)	**$1,155,000**	**$68,145,000**
12 Pod/SMFCD Kit C-130J (3010)	**$1,155,000**	**$13,860,000**
Total		**$91,005,000**

* Includes 10% spares, support equipment, and technical orders.

INFORMATION PAPER

ON

C-130H SURFACE-TO-AIR THREAT DETECTION OBSERVER REAR LOOKOUT CAPABILITY

1. Background. During Operation IRAQI FREEDOM (OIF) and Operation ENDURING FREEDOM (OEF), loadmasters stand watch at portal windows in the troop doors to scan the ground and horizon for hostile Surface-to-Air Fire (SAFIRE). Upon detection of SAFIRE, loadmasters immediately advise the pilots to take evasive action and initiate countermeasures. Windows used for observation in C-130s are relatively small with a restricted field of view. Loadmasters experience neck and back strain while striving to maintain their position at the window to obtain an aft view out the portal. Having a larger sized window would increase field of view and reduce physical strain on loadmasters.

2. Requirement. Air Mobility Command (AMC) validated AF Form 1067-04-064; AMC C-130 Requirements and Planning Council (R&PC) Critical Item.

3. Impact If Not Funded. Vision is extremely restricted when loadmasters don helmets, flack vests, survival vests, Night Vision Goggles (NVGs) and attempt to look out the troop door portal during a tactical departure. Without a clear, wide-angle view from the 3 o'clock to 9 o'clock positions outside the aircraft, SAFIRE launches could go undetected during vulnerable phases of flight. Undetected SAFIRE launches could result in damage to equipment and potentially loss of aircraft and crew.

4. Units Impacted.

109 AW Schenectady, NY	139 AW St Joseph APT, MO	156 AW San Juan IAP, PR
123 AW Louisville, KY	144 AS Kulis, AK	165 AW Savannah, GA
130 AW Charleston, WV	145 AW Charlotte IAP, NC	166 AW Wilmington APT, DE
133 AW Minneapolis, MN	152 AW Reno IAP, NV	182 AW Peoria APT, IL
136 AW Fort Worth, TX	153 AW Cheyenne MAP, WY	189 AW Little Rock AFB, AR

5. Contractor. Argon ST (formally Coherent Systems International), Fairfax, VA.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE (3600)	**N/A**	**$14,000,000**
Initial installation (3010)	**N/A**	**$9,300,000**
165 Lookout Windows (3010) *	**$650,000**	**$107,250,000**
Total		**$130,550,000**

* Units required include 2 doors per aircraft.

INFORMATION PAPER

ON

C-130 ADVANCED RADAR WARNING RECEIVER (RWR)

1. Background. The Air National Guard (ANG) C-130 fleet has several shortfalls with RWRs. First, not all C-130s have RWRs. C-130s that have RWRs are equipped with legacy ALR-69 RWR, except for the J-model which is equipped with the ALR-56M. The legacy ALR-69 provides threat radar warning indications to the aircrews; however, it has significant performance shortfalls, reliability and maintainability issues, and is not capable of ensuring adequate defensive situational awareness (SA) against some present and most future radar systems. The ALR-56M, while newer and more sensitive, lacks a digital receiver capability and therefore is not well positioned to address future threats. Modern RWRs feature digital receiver architectures, increased sensitivity and improved threat location accuracy. Replacing or upgrading the existing RWRs and procuring new RWRs for aircraft not currently equipped are critical to both reduce sustainment costs (commonality of all aircraft now having the same RWR system) and support C-130 operations requirements.

2. Requirement. AN/ALR-69A CPD approved by AFROCC, 17 Nov 05.

3. Impact If Not Funded. Without an advanced capability radar warning system, C-130s are unable to operate in any region defended by radars creating "denied access" regions. Combatant commanders are unable to deliver any personnel and cargo via aircraft to "denied access" regions.

4. Units Impacted.

109 AW Schenectady, NY	139 AW St Joseph APT, MO	156 AW San Juan IAP, PR
123 AW Louisville, KY	144 AS Kulis, AK	165 AW Savannah, GA
130 AW Charleston, WV	145 AW Charlotte IAP, NC	166 AW Wilmington APT, DE
133 AW Minneapolis, MN	152 AW Reno IAP, NV	182 AW Peoria APT, IL
136 AW Fort Worth, TX	153 AW Cheyenne MAP, WY	189 AW Little Rock AFB, AR

5. Contractor. TBD.

6. Cost.

Units Required *	Unit Cost	Program Cost
72 ALR-69A (3010)	**$1,220,000**	**$87,840,000**
NRE ALR-69A (3600)	**N/A**	**$10,000,000**
69 ALR-69 Upgraded RWRs (3010)	**$140,000**	**$9,660,000**
NRE ALR-69 Upgrade (3600)	**N/A**	**$31,590,000**
31 ALR-56M Upgraded RWRs (3010)	**$380,000**	**$11,780,000**
NRE ALR-56M (3600)	**N/A**	**$50,000,000**
Total		**$200,870,000**

* Includes required spares, support equipment, and technical orders.

INFORMATION PAPER

ON

C/EC/HC/LC/MC-130 LOADMASTER CRASHWORTHY SEAT

1. Background. Air National Guard (ANG) C-130 aircraft do not have a designated loadmaster seat in the cargo compartment designed to withstand excessive impact or wheels-up landing forces. While carrying troops or passengers in the cargo compartment, the loadmaster is responsible for ensuring the safe and expeditious evacuation of the aircraft during emergency egress situations. During combat operations loadmasters are directed to stand at the troop doors while performing scanning duties. Loadmasters don a strap restraint harness and take positions at the troop doors to scan the ground for Surface-to-Air Fire (SAFIRE). Due to the design, the restraint harness is only authorized during approaches and after departure, and not for use during takeoff and landing. Study of past Class A mishaps revealed that crewmembers seated in flight deck-designed seats were able to escape death compared to loadmasters who sat in nylon web seats with only a lap belt. Crashworthy seats currently fixed to a litter stanchion and installed in the sidewall aft of the crew entrance door or forward of the right troop door and aft of the crew are potential solutions for loadmaster safety.

2. Requirement. Air Mobility Command (AMC) Validated AF Form 1067-04-065; Class A Mishap MC-130P 20020213FTEV016A Safety Investigation Board (SIB) 2 Recommendation; Class A Mishap MC-130H 20020612FTEV033A Report, Other Recommendation of Significance (ORS) 6; Fall 04/05/06/07 AMC Requirements and Planning Council (R&PC) Mission Critical Item.

3. Impact If Not Funded. If the loadmaster becomes incapacitated during the wheels-up landing or impact due to inadequate restraint, not only does the Air Force lose a valuable resource, but expeditious evacuation of troops or passengers is jeopardized.

4. Units Impacted.

106 RQW Suffolk, NY	139 AW St Joseph APT, MO	156 AW San Juan IAP, PR
109 AW Schenectady, NY	143 AW Quonset APT, RI	166 AW Wilmington APT, DE
123 AW Louisville, KY	144 AS Kulis, AK	165 AW Savannah, GA
129 RQW Moffett, CA	145 AW Charlotte IAP, NC	176 WG Kulis, AK
130 AW Charleston, WV	146 AW Channel Is AGS, CA	182 AW Peoria APT, IL
133 AW Minneapolis, MN	152 AW Reno IAP, NV	189 AW Little Rock AFB, AR
136 AW Ft Worth, TX	153 AW Cheyenne MAP, WY	193 SOW Harrisburg IAP, PA

5. Contractors. Airdyne Aerospace, Spring Hill, FL.

6. Cost.

Units Required *	Unit Cost	Program Cost
219 Loadmaster Kits (3010) (162 C-130H, 20 C-130J, 16 HC/MC-130, 9 EC-130, 12 LC-130)	**$150,000**	**$32,850,000**

* Two seats per kit. Includes spares.

INFORMATION PAPER

ON

C-130J HIGH PRESSURE PORTABLE OXYGEN BOTTLE

1. Background. C-130J loadmasters need a supplemental source of oxygen to support Joint Precision Airdrop System (JPADS) airdrops. Supplemental oxygen will provide improved mobility, longer duration over existing low-pressure walk-around bottles, and keep the oxygen regulator controls within arm's reach. The design must be compatible with users wearing a helmet and oxygen mask, body armor, and survival vest. The bottle will be used when the loadmaster is required to be mobile in the cargo compartment and use of a direct connection between the oxygen mask and regulator is not feasible. The existing walk-around bottles are designed to provide a maximum of 30 minutes of oxygen during periods of low exertion. In actual use, these bottles provide approximately five (5) minutes of useable oxygen during high altitude airdrop operations or periods of high exertion. As a result, loadmasters must stop performing in-flight mission duties to refill their walk-around bottle or use a 40 foot oxygen hose tethered to the aircraft. Due to the limited length of the hose, loadmasters must switch between using the aircraft and walk-around bottles to completely cover the C-130J cargo compartment.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC; Air Mobility Command (AMC) Requirements and Planning Council (R&PC) Essential Item.

3. Impact If Not Funded. Increased likelihood of physiological incident resulting from oxygen loss due to switching oxygen sources or from pinching the oxygen supply hose.

4. Units Impacted.
143 AW Quonset APT, RI 146 AW Channel Islands, CA

5. Contractors. AVOX, Lancaster, NY.

6. Cost.

Units Required *	Unit Cost	Program Cost
20 kits (3010)	**$6,000**	**$120,000**

* Includes aircraft installation, test equipment and 10% spares.

INFORMATION PAPER

ON

C-130J CARGO COMPARTMENT CAMERA

1. Background. C-130J aircrews require the capability to monitor activity within the cargo compartment during heavy equipment airdrops and engine running on-load and off-load operations. This capability must permit operations within the cargo compartment to be monitored simultaneously both in the cargo compartment and on the flight deck. The capability must monitor parachute deployments, condition of extraction parachutes, cargo pallet extraction, as well as personnel movement within the cargo compartment. This solution, to include all sensors, controls, and displays, must be Night Vision Goggle (NVG) compatible. The existing C-130J crew complement does not permit using a primary crewmember to serve as a safety observer for operations within the cargo compartment during Engine Running On or Offload (ERO) operations. Safety observation is accomplished by the navigator in the C-130E/H aircraft and through the use of a pilot observation bubble on the C-17.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC; Air Mobility Command (AMC) Requirements and Planning Council (R&PC) Essential Item.

3. Impact If Not Funded. During ERO operations, the possibility exists for the loadmaster to be injured and the situation not detected by the remaining crewmembers. This delay could prevent necessary and immediate medical attention and result in serious injury or even death. During airdrops of heavy equipment, monitoring the condition of the extraction parachutes and extraction sequence is critical to preventing damage to the aircraft, and maintaining safety within the cargo compartment and on the drop zone.

4. Units Impacted.

143 AW Quonset APT, RI 146 AW Channel Islands, CA

5. Contractors. TBD.

6. Cost.

Units Required *	Unit Cost	Program Cost
NRE (3600)	**N/A**	**$2,000,000**
18 Kits (3010)	**$350,000**	**$6,300,000**
Total		**$8,300,000**

* Includes aircraft installation, test equipment and 10% spares.

INFORMATION PAPER

ON

HC/MC-130 ELECTRO-OPTICAL (EO) / INFRA RED (IR) SENSOR UPGRADE FOR FIND-FIX-TRACK

1. Background. Rescues performed in combat and the aftermath of Hurricane Katrina highlighted the need to modernize the HC/MC-130 situational awareness capability. Real-time information exchange is paramount during personnel recovery operations requiring great precision and speed in asymmetric battle space environments. Recent technical advancements provide the means to integrate existing HC/MC-130 sensors with modern processors and data links facilitating superior Command and Control (C2) and tactical coordination from either an overhead or offset orbit. Integrating eye-safe laser range finder, illuminator and designator capabilities in current EO/IR sensors to Find, Fix, and Track (F2T) targets of interest, or to precisely mensurate survivor location provides the Combined Force Air Component Commander (CFACC) with a powerful collaboration tool in uncertain tactical environments.

2. Requirement. Air Combat Command (ACC) validated AF Form 1067, HC/MC-130 EO/IR Sensor VDL Upgrade Capability, 27 Jan 08.

3. Impact If Not Funded. The CSAR task force will have no precision marking for fixed or dynamic targets; and no F2T capability for cross cueing. CSAR is reliant on low-density, high demand weapons systems to provide these critical capabilities during recovery operations despite on-going tactical requirements of equal priority.

4. Units Impacted.
106 RQW Gabreski Field, NY 129 RQW Moffett Federal Airfield, CA 176 WG Kulis ANGB, AK

5. Contractor. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE (3010)	**N/A**	**$2,000,000**
13 EO/IR Sensor Upgrades (3010)	**$300,000**	**$3,900,000**
Total		**$5,900,000**

INFORMATION PAPER

ON

LC/HC/MC-130 ELECTRONIC PROPELLER CONTROL SYSTEM (EPCS)

1. Background. The EPCS replaces current 1950s-era mechanical valve housings and 1970s-vintage synchrophaser with modern electronic valve housings and electronic propeller controls. The EPCS enhances performance because of improved synchrophasing during ground operations and improved control responsiveness (very little delay after making throttle adjustments). Pilots report instant response to throttle adjustments versus delays experienced by the current systems. Noise and vibration generated from the current system due to inefficient synchrophasing is reduced by 400 percent. This EPCS has an estimated Mean Time Between Failure (MTBF) rate increase to approximately 12,000 hours, or 8 times the MTBF of the current system. Parts count is reduced by almost half and the digital electronics don't wear out or need adjustment. The system has built in diagnostics and all adjustments are automatically completed. The EPCS also improves crew comfort and reduces maintenance actions due to vibration reductions. The Navy has already incorporated this system in the E-2 and C-2 aircraft and they have documented a 4 percent increase in mission completion due directly to the use of the EPCS.

2. Requirement. Air Mobility Command (AMC) validated AF Form 1067, 9 Feb 10.

3. Impact if not funded. If not funded the HC/MC-130 aircraft will not benefit from the improved performance, increased mission availability, or reduced maintenance and operational costs of the EPCS. Also, the EPCS is a pre-requisite component for the eight-bladed propeller.

4. Units Impacted.

106 RQW Gabreski, NY 109 AW Schenectady, NY 129 RQW Moffett, CA
176 WG Kulis, AK

5. Contractor. Hamilton-Sundstrand, Windsor Locks, CT.

6. Cost.

Units Required	Unit Cost	Program Cost
9 LC-130 Aircraft (3010)	**$615,000**	**$5,535,000**
13 HC/MC aircraft (3010)	**$615,000**	**$7,995,000**
Total		**$13,530,000**

INFORMATION PAPER

ON

HC-130P OIL COOLER AUGMENTATION

1. Background. In order to increase aircraft mission availability by reducing maintenance down time, the HC-130P needs to have commonality of aircraft spare parts while deployed. Installing a common synchrophaser and 60/90 kVA generators on the HC-130P will allow maintenance personnel to access a larger pool of spare parts, thereby increasing availability of these high-demand mission aircraft. Additionally, operations in high ambient temperature locations during Operation IRAQI FREEDOM (OIF) and Operation ENDURING FREEDOM (OEF) have demonstrated an urgent need to have additional engine oil cooling capability on the ground. The oil cooler augmentation modification will allow the HC-130Ps to operate for extended periods on the ground without having to shut down an engine due to an excessive oil temperature.

2. Requirement. Air Combat Command (ACC) validated AF Form 1067, HC-130 Oil Cooler Augmentation (CSAR Aircraft), 5 Dec 03.

3. Impact If Not Funded. The HC-130P will continue to experience spare parts access problems resulting in extended down time, and will continue to be forced to shut engines down on the ground when encountering high engine oil temperatures.

4. Units Impacted.
106 RQW Gabreski Airport, NY

5. Contractor. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
3 x Synchrophaser (3010)	**$50,000**	**$150,000**
3 x 60/90kVA and Oil Cooler Augmentation (3010)	**$950,000**	**$2,850,000**
Total		**$3,000,000**

INFORMATION PAPER

ON

EC-130J REMOVABLE AIRBORNE MILITARY INFORMATION SUPPORT OPERATIONS SYSTEM (RAMS)

1. Background. In 2008, the 193d Special Operations Wing (SOW) EC-130J Commando Solo conversion program was reduced from six to three aircraft. Due to the program change, the 193 SOW has four EC-130J slick aircraft without an airborne dissemination capability for Psychological Operations (PSYOP). The concept behind the RAMS is to develop a low cost, removable system capable of providing additional dissemination capacity and advanced capability, primarily in a digital format. There are two areas requiring effort: a group A system consisting of permanent modifications to the aircraft i.e. power supply and a group B system consisting of the Army's fly away broadcast system version 2 (FABSv2), Special Airborne Mission Installation and Response (SABIR) system (articulation arms), and associated antennas. The FABSv2 provides the user with an FM, TV, digital TV, and short message service (SMS) capability. Initial capability consists of two SABIR systems and two FABSv2; full capability includes three SABIR systems and four FABSv2 systems.

2. Requirement. Initial Capabilities Document for Psychological Operations, 1 Sep 04; Joint Operations Requirements Document Air Force Special Operations Command 001-99 for Airborne Mission Equipment, 28 Mar 05.

3. Impact If Not Funded. Without additional capacity, the 193 SOW is unable to support multiple OPLANs which would result in mission failure and/or degradation. In addition, as target audience's transition to digital media, the EC-130J will be unable to support airborne broadcasts in the digital format resulting in mission failure. Only 3 of the 7 EC-130J aircraft are capable of performing the primary mission of military information system operations (formerly PSYOP) broadcasting. These systems are an integral part of making the EC-130J slick aircraft capable of broadcasting commercial FM, TV, digital TV, and SMS to target audiences.

4. Unit Impacted.
193 SOW Harrisburg IAP, PA

5. Contractor. Airdyne Aerospace Inc, Spring Hill, FL; Johns Hopkins University/Applied Physics Lab, Laurel, MD.

6. Cost.

Units Required *	Unit Cost	Program Cost
RDTE (3600)	**N/A**	**$3,300,000**
2 SABIR systems (3010)	**$1,750,000**	**$3,500,000**
2 FABSv2 (3010)	**$4,100,000**	**$8,200,000**
Total		**$15,000,000**

* Includes required spares, support equipment, and technical orders.

INFORMATION PAPER

ON

EC-130J POWER DISTRIBUTION PANEL

1. Background. All EC-130J aircraft have 60/90 kVA generators as standard equipment; however, only the three hardwired Commando Solo aircraft utilize this improved capability. The EC-130J slick does not have a means to access the generator power due to lack of a power distribution panel. The aircraft manufacturer has developed as standard equipment a power distribution panel for the HC/MC-130J recapitalization program. This panel, if added to the four EC-130J slick aircraft, would allow multi-mission capability that the Commando Solo platforms are capable of accomplishing. Current initiatives include the Removable Airborne Military Information Support Operation Systems (RAMS) consisting of an articulating arm and Fly Away Broadcast System version 2 (FABSv2).

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC; lessons learned Operations ENDURING FREEDOM and IRAQI FREEDOM (OEF/OIF).

3. Impact If Not Funded. Only 3 of the 7 EC-130J aircraft are capable of accessing the increased power provided by the 60/90 kVA generators. Without a power distribution panel, EC-130J slick aircraft are unable to perform or adapt to additional special missions.

4. Unit Impacted.
193 SOW Harrisburg IAP, PA

5. Contractor. Lockheed Martin, Marietta, GA.

6. Cost.

Units Required *	Unit Cost	Program Cost
NRE (3600)	**N/A**	**$1,000,000**
5 Kits (3010)	**$1,500,000**	**$7,500,000**
Total		**$8,500,000**

***** Includes aircraft installation, test equipment and 10% spares.

INFORMATION PAPER

ON

LC-130 CREVASSE DETECTION RADAR

1. Background. The New York Air National Guard's (ANG) 109th Airlift Wing has the responsibility for supporting the Air Force's capability to operate in extremely cold arctic environments. The 109 AW supports both Air Force polar operations and National Science Foundation (NSF) polar research missions using specialized, ski-equipped LC-130 aircraft. Over the last four decades, LC-130 aircraft have sustained serious damage while landing on unsurveyed ice and snow covered areas. Current methods to identify hazards with national imaging assets entail long lead times and increasing unreliability. The 109 AW has an immediate need for Crevasse Detection Radar (CDR) to operate safely and effectively in the polar regions. The ANG completed a successful evaluation of a Sandia Labs built radar mounted on an Air Force Special Operations Command (AFSOC) developed articulating arm fitted in place of an aft troop door.

2. Requirement. AF Form 1067, 19 Nov 04.

3. Impact if not funded. Risk of aircraft damage and crew injury from landing in areas with ground hazards not visible to the human eye.

4. Units Impacted.
109 AW Schenectady, NY

5. Contractor. Hamilton-Sundstrand, NY.

6. Cost.

Units Required	Unit Cost	Program Cost
2 Crevasse Detection Radars (3010)	**$1,000,000**	**$2,000,000**

INFORMATION PAPER

ON

LC/HC/MC-130 EIGHT BLADED PROPELLER UPGRADE

1. Background. Air National Guard (ANG) LC-130Hs from Schenectady, NY have ski-equipped landing gear to enable landings and takeoffs on snow and ice. The current fleet consists of six (6) Air Force owned and four (4) National Science Foundation (NSF) owned aircraft. A significant portion of their mission requires landing on deep field runways and unimproved snow and ice. In order to ensure successful takeoff from deep field bases, the use of Jet Assisted Take-Off (JATO) rocket motors is required. Dwindling supplies of circa 1950 JATO motors will require funding replacements requiring a minimum of $7.0 million per year additional funding. The NP2000 is an 8-bladed, composite propeller system that significantly improves the thrust output of the current LC-130 engines during take-off. This will not completely replace JATO, but the additional thrust would significantly reduce future JATO requirements by enabling the aircraft to takeoff without the use of the supplemental thrust provided by JATO. An added benefit of the 8-bladed propeller is the availability of this additional power at any time during a mission. The HC/MC-130s provide Combat Search and Recovery (CSAR) air refueling capability. The added power at low altitude, improved supportability, reduced mobility footprint, and smaller noise signature make the eight bladed propellers a natural complement for this CSAR mission.

2. Requirement. Air Mobility Command (AMC) validated AF Form 1067, 21 Jul 05.

3. Impact if not funded. The fleet would not benefit from the opportunity to reduce the cost of maintenance and mobility footprint, or experience the improved performance and reduced noise signature of the 8 bladed propellers. If a propulsion system upgrade for the LC-130 is not funded, the AF JATO supply will quickly disappear. The resulting loss of capability would seriously reduce future polar operations.

4. Units Impacted.

106 RQW Gabreski, NY 109 AW Schenectady, NY 129 RQW Moffett, CA
176 WG Kulis, AK

5. Contractor. Hamilton-Sundstrand, Windsor Locks, CT.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE (3010)	**N/A**	**$5,000,000**
9 NP2000 Systems for 9 LC-130 (3010) *	**$2,000,000**	**$18,000,000**
13 NP2000 Systems for 13 HC/MC-130 (3010) *	**$2,000,000**	**$26,000,000**
Total		**$49,000,000**

* Electronic Propeller Control System (EPCS) is pre-requisite component - replaces mechanical valve housing and its cost is not included in this estimate.

INFORMATION PAPER

ON

LC-130 JET ASSISTED TAKEOFF PROGRAM

1. Background. The New York Air National Guard (ANG) 109th Airlift Wing provides 100 percent of the Air Force capability to operate in extremely cold weather environments and support the National Science Foundation's (NSF) polar research missions using specialized, ski-equipped LC-130 aircraft. The Jet Assisted Take-Off (JATO) rocket motor enables ski equipped LC-130 operations in deep field locations. The LC-130 is currently using JATO bottles produced in the 1950s and the existing stock will soon be depleted. It is critical that ANG plan to procure replacement JATO motors as soon as practical. The LC-130 will eventually have to limit their deep field missions in the polar-regions if the motors are not replaced, Indian Head Naval Surface Warfare Center (NSWC) will complete the development of a new design but there is no funding to complete production efforts.

2. Requirement. National Guard Bureau (NGB) ORD 002-03, 20 Feb 03.

3. Impact If Not Funded. If new JATO motors are not available, cancellation of deep field operations for the LC-130 will result. Both the science and rescue missions will be required to use alternate methods for transportation which will result in the loss of their operational capability.

4. Unit Impacted.
109 AW Schenectady, NY

5. Contractor. Indian Head NSWC, Indian Head, MD.

6. Cost.

JATO Replacement	Unit Cost	Program Cost
1750 Replacement JATO Motors (3010)	**$20,000**	**$35,000,000**

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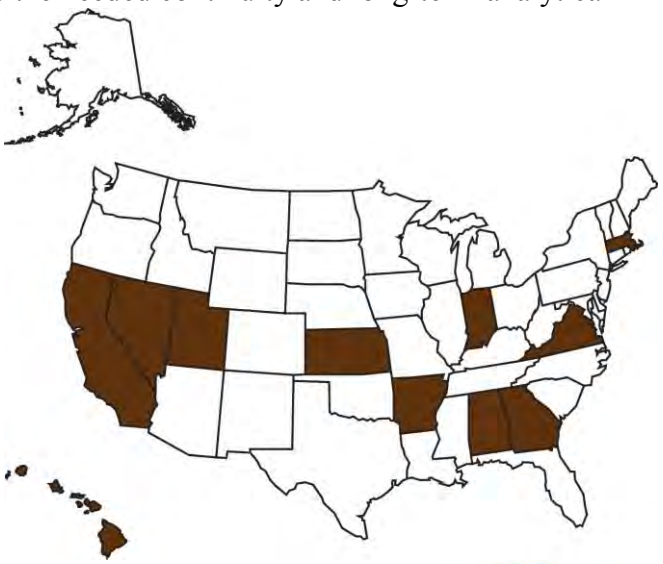
Distributed Common Ground System

- **Critical Worldwide Intelligence, Surveillance and Reconnaissance (ISR) Weapon System**
- **Provides Actionable Intelligence to Combatant Commanders**
- **Supports data from U-2, RQ-4, MQ-1, & MQ-9**

The Air Force Distributed Common Ground System (AF DCGS), officially designated the AN/GSQ-272 Sentinel, is a global, network-centric, intelligence, surveillance, and reconnaissance (ISR) weapon system responsible for the Processing, Exploitation, and Dissemination (PED) of intelligence data from airborne, national, and commercial reconnaissance platforms and sensors. Primary ISR sources include the U-2 Dragonlady, RQ-4 Global Hawk, MQ-1 Predator and MQ-9 Reaper. Future Sentinel operational data sources will include other current (e.g. E-8C) and future collection platforms.

AF DCGS is a single weapon system conducting worldwide, round-the-clock ISR operations from "reach-back" locations. The Sentinel includes six multi-intelligence ANG Distributed Ground Stations (DGS) in Alabama, Arkansas, Indiana, Kansas, Massachusetts, and Nevada. It also includes two ANG classic associate units conducting operations at Air Force DGS locations in California, and Virginia. Further, ANG units in Georgia, Hawaii, Ohio, and Utah provide daily support to Sentinel operations. Lastly, the 217th Training Squadron (TX ANG) has a secondary mission of providing formal weapon system formal training for the Sentinel operators in close cooperation with its active duty Air Force associate unit.

During Overseas Contingency Operations (OCO), accurate information and derived precision intelligence from Sentinel enables commanders to own the battlespace. ANG Sentinel units, as full partners in Total Force Sentinel operations, provide the needed continuity and long-term analytical persistence enabling these commanders to make critical and informed combat decisions to fight and win**.**



Distributed Common Ground System (DCGS)
2010 Weapons and Tactics Conference

Critical Combat Capabilities List

- Unclassified Processing, Exploitation, and Dissemination (PED) Capability
- Higher resolution, Multi-Spectral Sensors with Increased Coordinate Accuracy for the MQ-1 and MQ-9

Essential Capabilities List

- Enhance DCGS Joint Communications Architecture Via Radio-Over-IP
- Acquire the Ability to Provide CAT I / CAT II Coordinates (i.e. Precision Strike Suite – SOF), Obtain Training, and Develop Tactics, Techniques, and Procedures (TTPs) to Use CAT I / CAT II Coordinates
- Develop and Implement "SOF-like" mIRC TTPs Across the ANG Distributed Ground Station (DGS) Enterprise in Order to Conduct Conventional MQ-1/9 Missions Similarly To Unconventional Missions

Desired Capabilities List

- Increase Opportunities for ANG DGS Units to Develop Mutual TTPs with Other Platforms, Supported Units, and Joint Terminal Attack Controller (JTACs) in Flag Type Exercises and/or Mission Employment Phase of the USAF Weapons School.

DISTRIBUTED COMMON GROUND SYSTEM (DCGS) EXECUTIVE SUMMARY

Modernization Funding Profiles ($ Million)

Program	P.E. Number	2012	2013	2014	2015	2016	Total
Air Force Distributed Common Ground System Unclassified Processing, Exploitation, and Dissemination Capability	503117F	$7.88 [4]	$7.88 [4]	$7.88 [4]	$5.65 [4]	-	$29.29

Notes: [1] 3840 Appropriation [2] 3010 Appropriation [3] 3600 Appropriation [4] 3080 Appropriation

- Air Force Distributed Common Ground System (DCGS) Unclassified Processing, Exploitation, and Dissemination Capability - Provides a releasable network for Air National Guard (ANG) DCGS units to process data from platforms with imagery sensors and to transmit real-time raw and analyzed imagery to on-scene and national, state, and local authorities for homeland security, disaster response, and rescue operations.

INFORMATION PAPER

ON

AIR FORCE DISTRIBUTED COMMON GROUND SYSTEM (DCGS) UNCLASSIFIED PROCESSING, EXPLOITATION, AND DISSEMINATION CAPABILITY

1. Background. Air National Guard (ANG) Intelligence, Surveillance, and Reconnaissance (ISR) units have highly trained and experienced imagery analysts at units located in each of the ten (10) U.S. Federal Emergency Management Agency (FEMA) regions, including the Distributed Ground Station (DGS) squadrons (components of the AF DCGS AN/GSQ-272 Sentinel weapon system). These units Process, Exploit, and Disseminate (PED) imagery and associated data derived from U-2, RQ-4, MQ-1 Predator, MQ-9 Reaper, and national sensors - all at the Top Secret level. ANG DGS units are currently not capable of processing imagery at the releasable level (Unclassified or For Official Use Only) to conduct Defense Support of Civil Authorities (DSCA), Incident Awareness and Assessment (IAA), and Humanitarian Relief Operations missions. A releasable PED capability will allow ANG DGS units to process data from platforms with imagery sensors (e.g., ANG RC-26, ANG C-130 Shadow Harvest, MC-12, USAF MQ-1 Predator, ARNG OH-58, USN P-3, CBP MQ-9, Civil Air Patrol, etc.), and to transmit real-time raw and analyzed imagery to on-scene and national, state, and local authorities for homeland security, disaster response, and rescue operations. This PED capability will also incorporate NGB Guardnet to link ANG DGS sites with state Joint Operations Centers (JOCs) during homeland security and DSCA/IAA operations.

2. Requirement. USAF Katrina/Rita Lessons Learned, 2006; USAF Homeland Defense Conference Briefs, 27 Feb - 1 Mar 2007; ANG Support to Operation UNIFIED RESPONSE, 13 Jan – 31 Mar 2010.

3. Impact If Not Funded. ANG DCGS will not be able to fully support operations, particularly for homeland security, disaster response, and rescue operations.

4. Units Impacted.

101 IS	Otis ANGB, MA	117 IS	Birmingham, AL	123 IS	Little Rock, AR
137 IS	Terre Haute, IN	152 IS	Reno, NV	161 IS	Wichita, KS

5. Contractors. WR-ALC/GRC, Robins AFB, GA.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE for Security Gateway (3080)	**N/A**	**$2,750,000**
6 DCGS Unclass Enclaves (3080)	**$2,320,000**	**$13,920,000**
6 Unclass Gateways (3080)	**$1,520,000**	**$9,120,000**
Technical Refresh Costs (3080)	**N/A**	**$3,500,000**
Total		**$29,290,000**

E-8C JSTARS

- **Advanced wide-area airborne battle management**
- **Robust C2ISR node for the warfighter**
- **Real-time ground, littoral and maritime surveillance/tracking**

The Joint Surveillance Target Attack Radar System (JSTARS) has provided over 57,000 Operation ENDURING FREEDOM and Operation IRAQI FREEDOM combat hours and is the premier command and control system of choice for Combatant Commanders.

The E-8C is the world's most advanced wide-area airborne battle management aircraft that brings a unique combination of robust communication and real-time ground surveillance to both the air and ground battle spaces in true network centric warfare. Through continued investment in modernization, the E-8C will remain vital to joint force combat operations well into the 21st Century.

The 116 ACW at Robins AFB, GA is home to 17 E-8Cs and the only E-8(T)C and stands as a pioneer as the first Total Force wing, combining active-duty and Air National Guard Airmen into a single unit. An unblemished combat record and continuous deployment in the combat theater, without relief since 2001 with over 62,000 combat hours flown in support of irregular warfare in Iraq and Afghanistan, stand testament to the success of the Total Force concept. The 116 ACW is manned by 1,625 active duty Air Force personnel, 90 active duty Army personnel, 599 full-time ANG personnel and 542 traditional ANG personnel.

Modernization efforts are underway to enhance the war fighting capabilities of the E-8C through programs that include re-engining, fielding the Communication/Network Upgrade, enhanced target identification utilizing Enhanced Land/Maritime Mode (ELMM), cross-domain security solution to include multi-theater chat, e-mail, and web access, and Electro-Optical/Infrared (EO/IR) Sensors.

E-8C
2010 Weapons and Tactics Conference

Critical Combat Capabilities List

- Engine Replacement
- Organic High Fidelity Combat ID Capability for Targeting
- Cross Domain Security Solution / Multi-Theater Chat / Email / Web Access
- Tactical Data Link Interoperability / Multi-Tactical Data Link Gateway
- Intelligence Broadcast System (IBS) Replacement to Include Automated Identification System Upgrade (AIS) (Maritime Cooperative ID)

Essential Capabilities List

- INU Update / Reset Capability for Surveillance Quality (Cat 4 or better) Updates Without GPS
- LOS / BLOS Wideband Communications (40Mb +)
- Surveillance and Control Data Link (Crypto Mod/Increased Bandwidth)
- Enhanced Radar EP Capabilities to Defend Current/ Future Threats
- IR / ECM Self-Defense Suite

Desired Capabilities List

- Radar Receive Chain Modernization for Target Quality TLE and Discrimination
- Mission Crew Voice / Video Recorder
- BFT/FBCB2 v2 Upgrade
- Increased Mission Crew Simulator Configuration Flexibility with Single Software Baseline
- Electronic Flight Bag
- 3D Spatial Audio
- CSAR Support / Compatibility with CSEL Radios
- Replace or Refurbish Aircrew Seating

E-8C EXECUTIVE SUMMARY

Modernization Funding Profiles ($ Million)

Program	P.E. Number	2012	2013	2014	2015	2016	Total
Engine Replacement	27581F	$27.47 [2] $39.52 [3]	$336.69 [2] -	$368.32 [2] -	$381.73 [2] -	$32.63 [2] -	$1186.36
Organic Combat Identification Capability for Targeting Aided Target Recognition Net Centric Collaborative Targeting MS-177 EO/IR Sensor	27581F	 $3.36 [3] - $5.30 [3] - $8.55 [3]	 $8.62 [3] - $14.92 [3] - $35.98 [3]	 $11.79 [3] $1.30 [2] $11.70 [3] - $107.06 [3]	 $8.61 [3] $4.95 [2] - - $98.43 [3]	 $8.82 [3] $0.67 [2] - $15.28 [2] -	$345.34
Cross-Domain Security Solution CENTRIXS Swiftbroadband	27581F	$0.95 [2] $5.00 [2] $15.00 [3]	- $5.00 [2] -	- - -	- - -	- - -	$25.95
Tactical Data Link Interoperability / Multi-Tactical Data Link Gateway	27581F	- $20.50 [3]	- $14.72 [3]	$10.24 [2] $9.68 [3]	$11.90 [2] -	- -	$67.04
Integrated Broadcast Service	27581F	- $22.16 [3]	- $14.01 [3]	- $8.98 [3]	$4.77 [2] -	$11.42 [2] -	$61.34

Notes: [1] 3840 Appropriation [2] 3010 Appropriation [3] 3600 Appropriation [4] 3080 Appropriation

- E-8C Engine Replacement - Replacing the engines significantly reduces sustainment costs, boosts performance, and provides power for expanded mission system requirements.
- E-8C Organic Combat Identification Capability for Targeting - Organic combat identification capability allowing multiple sensors on the aircraft to provide targeting quality identification to other forces.
- E-8C Cross-Domain Security Solution - Provides a Combined Enterprise Regional Information Exchange System (CENTRIXS) capability with chat, email, browse and Microsoft Office products to support the Afghanistan Mission Network.
- E-8C Tactical Data Link Interoperability/Multi-Tactical Data Link Gateway - Allows Joint Surveillance Target Attack Radar System (JSTARS) to operate on both Link-16 and Situation Awareness Data Link (SADL) as well as potentially operate as a gateway for current or future data links.
- Integrated Broadcast Service - The primary threat warning system to JSTARS and also provides intelligence reports of Electronic Intelligence (ELINT), Signals Intelligence (SIGINT) and Human Intelligence (HUMINT) for fusion with local sensor information in support of target nomination and identification.

INFORMATION PAPER

ON

E-8C ENGINE REPLACEMENT

1. Background. The current TF-33 engines are the biggest reliability problem and capability shortfall for the Joint Surveillance Target Attack Radar System (JSTARS). The Air Force's report to Congress in 2004 and the update requested in 2005 clearly outline these issues as well as the sustainment cost savings to be gained by replacing the JSTARS E-8C engines. Upgrading JSTARS with new JT8D-219 engines will provide improved fuel economy, quicker climb to mission altitude, the ability to use shorter runways, compliance with international noise and emission standards, and most importantly, enhanced reliability and maintainability.

2. Requirement Source. JSTARS Operational Requirements Document (ORD), Version 5, reference paragraph 5.14.4.

3. Impact if Not Funded. Decreasing mission capable rates and exponentially increasing sustainment costs are occurring with the TF-33 engines. Overall mission degradation will continue to increase due to long in-transit and retrograde times, slow time-to-climb, restricted altitudes, more frequent aerial refueling, continued need for longer runways, increased mission maintenance rates, and non-compliance with domestic and international pollution and noise standards.

4. Units Impacted.
116 ACW Robins AFB, GA

5. Contractors. Northrop Grumman Corp, Melbourne, FL (prime); Pratt & Whitney, Hartford, CT.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE (3600)	**N/A**	**$66,990,000**
80 TF-33 Engine Mods (3010)	**$14,350,125**	**$1,148,010,000**
Total		**$1,215,000,000**

INFORMATION PAPER

ON

E-8C ORGANIC COMBAT IDENTIFICATION CAPABILITY FOR TARGETING

1. Background. An on-board Combat Identification (CID) capability on the E-8C Joint Surveillance Target Attack Radar System (JSTARS) aircraft increases lethality of the weapons system by reducing the length of the sensor to shooter kill chain. This capability would enable an accurate characterization of detected objects in the joint battlespace and would provide decision quality data to the operator for the timely application of military options and weapons. Depending on the situation and the operational decisions that must be made, this characterization may be limited to friend, foe or neutral. There may not be a single solution to field this requirement. A Family-of-Systems (FOS) approach may be used to find a balanced combination of sensors with the capability to collectively provide the identification information required to perform all mission area tasks. These systems may include Blue Force Tracker and any number of multi-spectral, electro-optical or infrared sensors that are cued by the radar and incorporate an aided target recognition upgrade to the current radar system.

2. Requirement. JSTARS ORD (USAF 001-84) I/II/II A (Rev 5), Dec 04, contains a requirement for CID.

3. Impact If Not Funded. JSTARS will be unable to internally identify a target thereby requiring additional ground or air assets to provide the identification. This delay can add minutes or even hours to the kill chain. Because JSTARS lacks an onboard CID capability its standoff capability is not utilized and additional personnel and equipment are placed in harm's way.

4. Units Impacted.
116 ACW Robins AFB, GA

5. Contractor. Northrop Grumman Corporation, Melbourne FL.

6. Cost.

Units Required	Unit Cost	Program Cost
Aided Target Recognition (ATR) Software Development (3600)	**N/A**	**$41,198,000**
Net Centric Collaborative Targeting (NCCT) NRE (3600)	**N/A**	**$31,914,000**
18 NCCT Kits (3010)	**$384,000**	**$6,920,000**
MS-177 EO/IR Sensor NRE (3600)	**N/A**	**$250,015,000**
6 EO/IR Sensors (3010)	**$74,739,000**	**$448,433,000**
Total		**$778,480,000**

INFORMATION PAPER

ON

E-8C CROSS-DOMAIN SECURITY SOLUTION

1. Background. The Joint Surveillance Target Attack Radar System (JSTARS) has limited capability to communicate directly with all Joint C4ISR systems and Allied/Coalition forces during combined operations. This communication shortfall inhibits the timely exchange of ground track/position data of emerging targets and battlespace awareness of friendly forces. Current capabilities require man-machine interface, which is time consuming and subject to error, lengthening the kill chain and increasing the potential for attacking the wrong target. JSTARS requires a Combined Enterprise Regional Information Exchange System (CENTRIXS) capability with chat, email, browse and Microsoft (MS) Office products to support the Afghanistan Mission Network. A software solution is required to provide MS Office capabilities as an integrated capability. Additionally, the ability to print and share files between the operator workstations and MS Office will further enhance this capability. The installation of stand-alone laptops offers an interim solution to meet urgent warfighter needs until a fully integrated software solution is available. Furthermore, the total bandwidth available using current JSTARS telecommunications service over International Maritime Satellites (INMARSAT) is limited to 256K which is insufficient to support additional Secret Internet Protocol Router Network (SIPRNET) INMARSAT requirements. Upgrading to SwiftBroadband© will increase current INMARSAT capability with 864K available bandwidth, roughly four times more throughput and essential to support growing bandwidth demands. An additional benefit of Swiftbroadband is lower cost. The service is 39 percent cheaper than the current system, providing an estimated annual cost savings of more than $4,000,000.

2. Requirement. AFCENT Urgent Operational Need (UON) 18 Jun 10.

3. Impact If Not Funded. Joint, Allied, and Coalition operations experience communication shortfalls that can inhibit the timely exchange of ground track/position data of emerging targets or battlespace awareness of friendly forces. Degraded communications between these agencies can result in impeded combat operations or even fratricide.

4. Units Impacted.
116 ACW Robins AFB, GA

5. Contractor. Northrop Grumman Corporation, Melbourne FL.

6. Cost.

Units Required	Unit Cost	Program Cost
15 CENTRIXS Kits (3010)	**$30,000**	**$450,000**
MS Office Software License	**N/A**	**$500,000**
Swiftbroadband Integration NRE (3600)	**N/A**	**$15,000,000**
18 Swiftbroadband Kits (3010)	**$555,555**	**$10,000,000**
Total		**$25,950,000**

INFORMATION PAPER

ON

E-8C TACTICAL DATA LINK INTEROPERABILITY / MULTI-TACTICAL DATA LINK GATEWAY

1. Background. Situational Awareness Data Link (SADL) capability is needed on the Joint Surveillance Target Attack Radar System (JSTARS) platform to support improved interoperability between JSTARS and Situation Awareness Data Link (SADL) equipped attack aircraft such as Air Reserve Component (ARC) Block 30 F-16s and all A-10s. Because these assets have a SADL data link instead of a Link 16 (TADIL J) capability, JSTARS must pass target information through a ground based gateway system or by voice. Communication via a ground-based gateway is dependent upon using existing infrastructure and does not provide capability for operating in austere locations or during initial strike packages into hostile countries. Furthermore, passing information by voice is time consuming and subject to error, lengthening the kill chain and increasing the potential for attacking the wrong target. An airborne gateway allows JSTARS to exchange ground track and position data of detected targets with SADL enabled aircraft in a net-centric manner allowing rapid dissemination of data and further shortens the kill chain. It also resolves line-of-sight issues aircraft experience with ground-based gateways such as degradation from mountainous terrain, thus improving data link connectivity and reliability between all LINK16 and SADL aircraft. The recommended solution is an integrated SADL radio capability with government provided Link 16/SADL gateway translation software to interface with the existing JSTARS Link16 system.

2. Requirement. JSTARS Operational Requirements Document (ORD) - Rev 5, Dec 04, paragraphs 4, 4.b., 4.b.1.

3. Impact If Not Funded. Communications between JSTARS and SADL equipped aircraft are vulnerable to interruption or faulty information due to reliance on ground-based gateways and voice communications which lengthens the kill chain and increases the possibility of attacking the wrong targets. Furthermore, there is reduced battlespace awareness for platforms operating in austere locations or executing strike packages, resulting in missed targets or even fratricide with friendly ground forces.

4. Units Impacted.
116 ACW Robins AFB, GA

5. Contractor. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
Data Link/Gateway NRE (3600)	**N/A**	**$44,900,000**
18 Data Links/Gateways (3010)	**$1,230,000**	**$22,140,000**
Total		**$67,040,000**

INFORMATION PAPER

ON

E-8C INTEGRATED BROADCAST SERVICE

1. Background. Integrated Broadcast Service (IBS) is the primary threat warning system to the Joint Surveillance Target Attack Radar System (JSTARS) and those interacting with JSTARS. Additionally, IBS also provides intelligence reports of Electronic Intelligence (ELINT), Signals Intelligence (SIGINT) and Human Intelligence (HUMINT) for fusion with local sensor information in support of target nomination and identification. Production of Commander's Tactical Terminal/ Hybrid, Receive Only (CTT/H-R) terminals that supply IBS information to users has ended with repair support ending in 2013. The system's internal components are no longer supplied through the commercial market with repairs taking 90-180 days. Furthermore, the CTT/H-R terminals cannot be modified to support new Common Message Format (CMF) nor Common Interactive Broadcast (CIB) waveform migration and its crypto requires replacement with a Crypto Modernization Program compliant device/algorithm. Air Force Tactical Receiver System-Ruggedized (AFTRS-R) terminals are fully capable of supporting IBS requirements and replacement of CTT/H-R terminals. AFTRS-R NSA certified Block II terminals are already readily available for JSTARS; however, these assets require integration and test with the aircraft.

2. Requirement. JSTARS ORD - Rev 5, Dec 04, paragraphs 4, 4.b., 4.b.1.

3. Impact If Not Funded. Without IBS Joint STARS will have no future threat warning capability which severely reduces the aircraft's survivability in hostile threat environments.

4. Units Impacted.
116 ACW Robins AFB, GA

5. Contractor. Northrop Grumman Corporation, Melbourne FL.

6. Cost.

Units Required	Unit Cost	Program
AFTRS-R NRE (3600)	**N/A**	**$45,150,000**
AFTRS-R NRE (3010)	**N/A**	**$22,350,000**
Total		**$67,500,000**

F-15

- **Combat-proven Air Superiority: 104 kills to zero losses**
- **24/7 Air Sovereignty Alert and Homeland Defense**
- **Key player to ensure Air Dominance in any theatre**

The Air National Guard operates seven squadrons of F-15C/Ds, and in FY11 will represent 55 percent of the Combat Air Force's (CAF) air superiority capability.

ANG F-15s led the CAF by fielding the APG-63(v)3 Active Electronically Scanned Array (AESA) Radar in March 2010, providing Combatant Commanders the world's newest airborne fighter radar for Air Dominance.

Representing 40% of the nation's Air Sovereignty Alert (ASA) assets, ANG F-15s provide 24-hour Homeland Defense and have performed over 600 alert scrambles since Sept 11, 2001. Due to CAF restructuring, the ANG retired some of its older F-15s and replaced them with long-term F-15s. The ANG will continue to operate six combat-coded squadrons, compared to three active duty squadrons, and will provide the majority of air superiority assets for Air Expeditionary Forces (AEF) commitments. Additionally, the ANG will operate the USAF's only F-15 flying training unit at the 173 FW, Klamath Falls IAP, OR and will train all F-15 pilots for both the ANG and the active duty Air Force.

Current F-15 modernization programs are necessary to improve this combat-proven fighter's capabilities for both Homeland Defense and overseas combat. These include the APG-63(v)3 AESA radar, an Advanced Self-Protection Electronic Warfare suite, integration of the Advanced Targeting Pod, an Infrared Search and Track (IRST) system, an improved Combat Identification capability, and improved cockpit displays to efficiently present these new capabilities.

F-15
2010 Weapons and Tactics Conference

Critical Combat Capabilities List

- Airborne Electronically Scanned Array (AESA) Radar / Infrared Search-and-Track
- Combat Identification
- Cockpit Display Upgrades
- Modernize Self Protection Suite (Digital Radio Frequency Memory Jammer, Fiber-Optic Towed Decoy, BOL AN/ALE-58 Countermeasures Dispenser, Digital Radar Warning Receiver)
- Advanced Targeting Pod Integration

Essential Capabilities List

- External Missile Launcher
- Conformal Fuel Tanks
- High Fidelity Simulators at Air National Guard Bases
- 5^{th} / 4^{th} Generation Data Link
- Operational Flight Program (OFP) Upgrades
- Advanced Data Computer

Desired Capabilities List

- Common AESA Configuration
- Offensive Electronic Warfare Capability
- Air Launch Hit-to-Kill Capability
- U.S. Government Owned OFP

F-15 EXECUTIVE SUMMARY

Modernization Funding Profiles ($ Million)

Program	P.E. Number	2012	2013	2014	2015	2016	Total
Active Electronically Scanned Array Radar	0207130F	$52.80 [2]	$52.80 [2]	$19.80 [2]	-	-	$125.40
Infrared Search-and-Track System	0207130F 0207134F	- $9.00 [3]	$24.00 [2] $9.00 [3]	$63.23 [2] $2.00 [3]	$63.23 [2] -	$44.54 [2] -	$215.00
Combat Identification	0207130F 0207134F	- $15.00 [3]	$4.50 [2] $5.00 [3]	$22.50 [2] -	- -	- -	$47.00
Display Upgrades and Advanced Targeting Pod Integration	0207130F 0207130F	$7.10 [2] $2.06 [2]	$10.98 [2] -	$10.98 [2] -	- -	- -	$31.12
Modernized Protection Suite							
Advanced Digital RWR	0207130F 0207134F	$12.78 [2] $10.00 [3]	$25.56 [2] -	$34.79 [2] -	- -	- -	$290.72
Advanced Digital RFCM	0207130F 0207134F	- $25.00 [3]	$14.10 [2] $25.00 [3]	$28.19 [2] -	$51.47 [2] -	$51.47 [2] -	
BOL IRCM	0207130F	$4.00 [2]	$2.09 [2]	$2.09 [2]	$2.09 [2]	$2.09 [2]	

Notes: [1] 3840 Appropriation [2] 3010 Appropriation [3] 3600 Appropriation [4] 3080 Appropriation

- F-15 Active Electronically Scanned Array (AESA) Radar - State-of-the-art capability to detect, track and target traditional and asymmetric threats for homeland and in-theater air defense.
- F-15 Infrared Search-and-Track (IRST) System - Passive sensor that couples with AESA radar to enable effective targeting in radar jamming environments and against asymmetric threats.
- Combat Identification - Improved combat identification capability enables pilots to rapidly employ against threat aircraft while reducing the risk of engagement with friendly aircraft.
- F-15 Display Upgrades and Advanced Targeting Pod (ATP) Integration -
  - Cockpit Displays - Upgraded displays to allow the human factors interface between the pilot and the information used for situational awareness and weapons employment. Smart displays will enable the use of Advanced Targeting Pods.
  - Advanced Targeting Pod (ATP) Integration - Enables F-15 pilots to identify and visually track. Addition of the ATP will vastly improve day and night acquisition and combat identification of asymmetric targets while performing homeland defense missions.
- F-15 Modernized Protection Suite -
  - Advanced Digital Radar Warning Receiver (RWR) - Detects enemy radars for improved situational awareness and survivability in threat environments.
  - Advanced Digital Radio Frequency Countermeasures (RFCM) - Degrades enemy's airborne and ground-based radars to provide survivability in previously denied access airspace.
  - BOL Infrared Countermeasures (IRCM) - Provides advanced, long-duration infrared countermeasures against air-to-air and surface-to-air missile systems.

INFORMATION PAPER

ON

F-15 ACTIVE ELECTRONICALLY SCANNED ARRAY (AESA) RADAR

1. Background. The APG-63(v)3 Active Electronically Scanned Array (AESA) radar exponentially increases detection and track ranges of airborne targets and greatly improves identification capability. AESA radar gives the F-15C true multi-target track and attack capability, as well as a vastly increased capability against advanced Electronic Attack (EA) from enemy systems. Additionally, AESA eliminates the hydraulic and electrical systems associated with mechanically operated radars resulting in dramatically improved reliability and maintainability. The current radar system in ANG F-15s is the APG-63(v)0 and (v)1. The APG-63(v)0 is 1970s technology and is unable to keep pace with current and postulated threats. The Mean Time Between Failure (MTBF) for the legacy (v)0 is 10 - 12 hrs of flight time, while the MTBF for the (v)3 AESA radar is over 30 times greater. The addition of the APG-63(v)1 to ANG has increased the MTBF for the radar for equipped aircraft, but it does not possess the asymmetric threat capability enjoyed by the AESA. The F-15's air-to-air advantage remains Beyond-Visual-Range (BVR). BVR requires an ability to detect airborne threats to retain the first shot, first kill ability, which is essential to effective employment. AESA radar is also critical for homeland defense missions. The inherent capability of the AESA radar allows pilots to locate a Target of Interest (TOI) in the saturated air traffic environments prevalent around major population centers. The AESA radar also provides the capability to detect and track asymmetric threats. The requirement for ANG F-15Cs is 48 AESA radars. This allows each operational ANG unit to provide AESA-equipped F-15Cs for worldwide deployment while simultaneously providing 24/7 homeland defense at ASA alert sites. To date, Congressional appropriations have purchased 29 AESA systems for the Air National Guard (ANG) outside the DoD budget request.

2. Requirement. F-15C/D Radar Improvement Program, APG-63(v)3 CDD, 21 Apr 05.

3. Impact If Not Funded. ANG F-15s are tasked for threat areas throughout the world as part of the Air and Space Expeditionary Force (AEF) and defending the homeland on Air Sovereignty Alert (ASA). Without AESA radar, the F-15 may be unable to counter both asymmetric threats and enemy fighters.

4. Units Impacted.

104 FW Westfield, MA	142 FW Portland, OR	173 FW Klamath Falls, OR
120 FW Great Falls, MT	159 FW New Orleans, LA	125 FW Jacksonville, FL

5. Contractors. Raytheon, El Segundo, CA; Boeing Company, St Louis, MO.

6. Cost.

Units Required	Unit Cost *	Program Cost
19 AESA Systems (3010)	**$6,600,000**	**$125,400,000**

* Includes installation and program costs.

INFORMATION PAPER

ON

F-15 INFRARED SEARCH-AND-TRACK (IRST) SYSTEM

1. Background. The IRST system is an external pod carried by the F-15 and is a completely passive sensor that detects and tracks the heat generated by an airborne target. The current fighter threat employs Digital Radio Frequency Memory (DRFM) Electronic Attack (EA) methods that degrade radar performance, but IRST is completely passive and is not susceptible to EA. Asymmetric threats, such as cruise missiles and slow moving, light aircraft, are difficult to detect with conventional airborne radars but can be detected and tracked with IRST. IRST provides a complementary capability to a fighter's radar for detection and weapons cueing; it is not a capability that should be used in lieu of AESA radars, but as part of the integrated fire-control system in a radar-jamming environment. IRST is a game-changing capability essential to current and future air dominance and a critical enabler for currently unfilled mission sets, such as airborne ballistic missile defense.

2. Requirement. F/A-18 Infrared Search and Track System CDD, 20 Nov 08; USAF Annex, Nov 2009.

3. Impact If Not Funded. Air National Guard **(**ANG) F-15s are tasked for threat areas throughout the world as part of the Air and Space Expeditionary Force (AEF) while defending the homeland. Based on current and emerging threats, both traditional and asymmetric, the F-15 will be unable to provide tasked homeland defense and is vulnerable when countering enemy airborne fighters in a deployed environment.

4. Units Impacted.

104 FW Westfield, MA	142 FW Portland, OR	125 FW Jacksonville, FL
120 FW Great Falls, MT	159 FW New Orleans, LA	

5. Contractors. Lockheed-Martin, Orlando, FL.

6. Cost.

Units Required	Unit Cost	Program
NRE (3600) *	**$20,000,000**	**$20,000,000**
50 IRST Systems (3010)	**$3,900,000** **	**$195,000,000**
Total		**$215,000,000**

* Additional 3600 may be provided by USN and/or USAF.

** Includes installation and program costs.

INFORMATION PAPER

ON

COMBAT IDENTIFICATION

1. Background. The completion of a valid identification matrix is the most critical portion of any air-to-air combat mission. This matrix is required before shooting at hostile aircraft and to prevent the accidental engagement of friendly forces. The pilot's ability to quickly identify a hostile target may determine mission success or failure. While there are platforms that have improved onboard identification capabilities that can be shared amongst other aircraft, it is not always possible to effectively get this information to the pilot when needed. Communications jamming, heavy radio traffic, task saturation, and the pure speed of the intercept may prevent the pilot from successfully receiving and interpreting this identification, preventing target engagement. The addition of a new, onboard capability will not only allow for rapid, positive identification and engagement, but will help prevent engagement of friendly forces and will ensure mission success.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC.

3. Impact If Not Funded. Failure to add an updated combat identification capability will prevent F-15 pilots from engaging hostile targets and will increase the risk of friendly engagement. The inability to positively identify enemy aircraft will lead to mission failure.

4. Units Impacted.

104 FW Westfield, MA	142 FW Portland, OR	125 FW Jacksonville, FL
120 FW Great Falls, MT	159 FW New Orleans, LA	

5. Contractors. Boeing Company, St. Louis, MO; TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE (3600)	**$20,000,000**	**$20,000,000**
60 Units (3010)	**$450,000**	**$27,000,000**
Total		**$47,000,000**

INFORMATION PAPER

ON

F-15 DISPLAY UPGRADES AND ADVANCED TARGETING POD (ATP) INTEGRATION

1. Background. Current F-15 cockpit displays were designed based on the amount of information that needed to be displayed to the pilot in the 1970s. The F-15 has experienced an exponential growth in capability and lethality in its 30+ years of combat-proven service due to the modernization of radars, weapons, sensors, and data links. However, these enhancements dictate a complex human-factors interface with the pilot and the legacy displays, which due to their small size and outdated monochromatic technology, are incapable of properly displaying this information. Replacement of legacy displays with larger color and/or smart color display systems will increase the lethality of F-15s by more intuitively displaying and processing data. The addition of a color display will allow the pilot to interpret the data more quickly, increasing the effectiveness of the Pilot-to-Vehicle Interface (PVI). Addition of a smart display will not only improve pilot awareness, but will also facilitate rapid integration of the ATP into the F-15 fleet. ATPs will bring vastly improved day and night target acquisition and combat ID at extended ranges in both the air-to-surface and air-to-air roles. ATPs are required for domestic ASA aircraft in order to track and target asymmetric threats, aid in target identification, and conduct maritime interdiction taskings.

2. Requirement. F-15C/D Operational Requirement Document (ORD); critical capability shortfall identified at the 2010 ARC WEPTAC.

3. Impact If Not Funded. Without the addition of new displays, ANG F-15 pilots will not be able to process the information provided by on and off board sensors, thereby reducing operational effectiveness. Not funding ATP integration will limit the ANG's ability to effectively fulfill its Air Expeditionary Force (AEF) and homeland defense missions. It will restrict the pilot's capability to acquire, identify, and successfully engage hostile forces or asymmetric targets at range degrading the pilot's ability to covertly and safely identify targets.

4. Units Impacted.

104 FW Westfield, MA	142 FW Portland, OR	173 FW Klamath Falls, OR
120 FW Great Falls, MT	159 FW New Orleans, LA	125 FW Jacksonville, FL

5. Contractors. Boeing Company, St. Louis, MO; TBD.

6. Cost.

Units Required	Unit Cost *	Program Cost
156 Radar Displays (3010)	**$75,000**	**$11,700,000**
124 RWR Displays (3010)	**$140,000**	**$17,360,000**
103 ATP Group B (3010) **	**$20,000**	**$2,006,000**
Total		**$31,066,000**

* Assumes installation and program costs.

** Assumes full purchase and integration of the RWR Cockpit Display.

INFORMATION PAPER

ON

F-15 MODERNIZED PROTECTION SUITE

1. Background. The current F-15C/D Electronic Warfare (EW) internal self-protection suite (ALQ-135 Internal Countermeasures System (ICS) and ALR-56C Radar Warning Receiver (RWR)) was designed to permit operations in environments defended by 1980s-era radar based ground and air threats. Today, both systems suffer from sustainment issues and have significant capability gaps against modern threat systems. A robust electronic attack suite enables the F-15 to counter current and future radars, especially the fighters F-15s are tasked to employ against. This requires a Radio Frequency Countermeasures (RFCM) system with Digital Radio Frequency Memory (DRFM) capability and a Digital RWR. Additionally, current and future infrared missiles significantly reduce the F-15's survivability. Increased threat missile lethal range and improved flare rejection logic require extended use of counter measures for survival. BOL (LAU-128C with ALE-58 flares) is a proven and previously fielded countermeasures system that has proven superior to legacy IR counter measure systems fielded on USAF fighters. The AF documented these requirements in a Capabilities Design Document (CDD) entitled Eagle Passive Active Warning Survivability System (EPAWSS). Replacing or upgrading the existing system to include these requirements and have the potential for growth (to include Fiber-Optic Towed Decoy (FOTD) technology) is critical to pilot survivability and to ensure air dominance in combat operations.

2. Requirement. TAF 304-80-I/II/III-C System ORD for the F-15A-D Tactical Electronic Warfare Suite dated 7 Apr 92. JROC EPAWSS CDD Jun 07.

3. Impact If Not Funded. The F-15C/D is at risk from the current and future threat systems that are proliferating throughout potential deployment areas. The lack of robust self-protection directly affects combat capability and survivability. F-15s will be restricted from entering any "access denied" areas preventing mission execution and ultimately resulting in mission failure.

4. Units Impacted.

104 FW Westfield, MA	142 FW Portland, OR	159 FW New Orleans, LA
120 FW Great Falls, MT	125 FW Jacksonville, FL	

5. Contractor. BAE Systems, Austin, TX; Boeing Company, St Louis, MO; TBD.

6. Cost.

Units Required *	Unit Cost	Program Cost
RFCM NRE (3600)	**N/A**	**$50,000,000**
RWR NRE (3600)	**N/A**	**$10,000,000**
103 RWR Receivers (3010)	**$710,000**	**$73,130,000**
103 RFCM Systems (3010)	**$1,410,000**	**$145,230,000**
103 BOL Kits (3010)	**$120,000**	**$12,360,000**
Total		**$290,720,000**

* Includes required spares, support equipment, and technical orders.

F-16C

- **Close Air Support / Interdiction / Precision Strike**
- **Suppression/Destruction of Enemy Air Defenses (SEAD/DEAD)**
- **Air Superiority for Homeland Defense**

Since September 11, 2001, Air National Guard (ANG) F-16s have flown over 156,988 hours in direct support of contingencies around the globe including Operations NOBLE EAGLE, IRAQI FREEDOM, ENDURING FREEDOM, NEW DAWN, and homeland defense. Since 2003, ANG F-16Cs have fulfilled over 30 Percent of CENTAF precision guided munitions (PGM) and close air support (CAS) taskings in Operation IRAQI FREEDOM. In support of combat operations in Iraq, ANG F-16s provide convoy escort, dedicated infrastructure defense, border patrol, and raid support. ANG F-16s led LITENING AT Video Downlink (VDL) and ARC-210 secure line-of-sight development, testing, and production to meet CENTAF urgent need requests in minimal time.

The ANG operates 387 Block 25, 30, 32, 40, 42, 50 and 52 F-16C/Ds. Block 25/30/32 aircraft are equipped with color displays and situational awareness data link (SADL) and provide a near-constant presence in operational theaters conducting close air support and armed reconnaissance. The F-16 Block 30's unique data link capabilities make it the platform of choice for operations requiring advanced integration with ground units in Iraq. Block 40/42 and Block 50/52 aircraft have completed the Common Configuration Implementation Program (CCIP) upgrade with color displays, Link-16 data link, and helmet mounted cueing. Block 52s provide unparalleled SEAD/DEAD capability with a unique blend of pilot experience and advanced technology such as the HARM Targeting System R7 Sting pod.

Modernization efforts are underway to improve the war fighting capabilities of ANG F-16s by fielding beyond line-of-sight communications suites, center display units with higher data processing capacity, helmet mounted integrated targeting system, enhanced self protection, and improved radar performance/reliability.

F-16
2010 Weapons and Tactics Conference

Critical Combat Capabilities List

- Fully Integrated Sensor Enhancements with Robust Air-To-Ground, Air-to-Air, and Identification Capabilities (Active Electronically Scanned Array (AESA), Infrared Search and Track (IRST), APG-68+, Advanced Identification, Friend or Foe (AIFF))
- Night Vision Goggle (NVG) Compatible Helmet-Mounted Cueing System
- Additional High Resolution Display with Data Transfer and Stand Alone Processing that Can Transmit and Receive Real-Time Data
- Integrated Electronic Warfare (EW) Suite Incorporating Advanced Electronic Protection (EP), Electronic Attack (EA), Missile Warning System (MWS), and Infrared Countermeasures (IRCM) Technology
- Additional Enhancements and Procurement of Advanced Targeting Pods
- Secure Line-of-Sight (SLOS)/Beyond Line-of-Sight (BLOS) with Directional Audio

Essential Capabilities List

- All-Weather Air-to-Ground Strike Capability
- Improved Memory and Processing for Aircraft Displays
- Distributed Mission Operations (DMO)/Unit Training Device (UTD) Upgrades Consisting of Live Virtual Constructive Training Capabilities to Include: Virtual Electronic Combat Training System (VECTS) Improvements and Aircraft Integration, JRE and Situation Awareness Data Link (SADL) Upgrades, Joint Distributed Operations Training, EW Training Systems, and Other Potential Live-Fly and DMO Integration Software and Hardware Upgrades
- Blue Force Tracker (BFT), Gateway, and Data Link Integration Upgrades
- Pilot-Friendly Dual-Mode Weapons for Employment Against Static and Moving Targets Including AIM-9X Surface Attack Capabilities and Additional AIM-9X Captive Missiles
- Laser Eye Protection and Sensor Hardening
- Crypto-Compliant ARC-210 Radios
- Mobile and Adjustable Threat Emitters for Situational Awareness Threat Training
- Improved Data Link Jam Resistance
- Selective Availability Anti-Spoofing Module (SASSM) Embedded Global Positioning System Inertial Navigation System (EGI)
- Multi-Carriage Smart Rack
- Improved Antennas for Data Link and Communications
- Updated Local EW and Data Link Training Systems

Desired Capabilities List

- None

F-16 EXECUTIVE SUMMARY

Modernization Funding Profiles ($ Million)

Program	P.E. Number	2012	2013	2014	2015	2016	Total
Integrated Sensor Enhancements AESA Radar AESA APG-68+	0207133F	- $92.90 [3] $8.00 [3]	- $105.60 [3] $8.00 [3]	- $97.10 [3] $4.00 [3]	$24.80 [2] $28.90 [3] $42.00 [2]	$141.90 [2] $5.90 [3] $42.00 [2]	$601.10
Sensor Enhancements - Block 30/32/40/42AIFF	0207133F	$16.02 [2]	$3.57 [2]	$8.71 [2]	$8.71 [2]	-	$37.01
Integrated Sensor Enhancements - IRST Pod	0207133F	$32.80 [3]	$60.30 [2]	$112.80 [2]	$123.30 [2]	-	$329.2
Helmet Mounted Integrated Targeting (HMIT) HMIT Joint Helmet Mounted Cueing System (JHMCS)	0207133F	$8.30 [2] $10.32 [2]	$8.30 [2] $10.32 [2]	$8.30 [2] $10.32 [2]	- -	- -	$55.86
High Resolution Display: Center Color Display Integrated Broadcast Service	0207133F	$12.21 [2] $17.76 [2]	$12.21 [2] $17.76 [2]	$12.21 [2] $17.76 [2]	- -	- -	$89.91
Integrated Electronic Warfare Suite: ALR-69 Upgrades ALR-56 Upgrades EA Pod Upgrades ALQ-213 Upgrades	0207133F	 $31.59 [3] $50.00 [3] $20.00 [3] $28.00 [3]	 $12.54 [2] $13.26 [2] $26.40 [2] $9.75 [2]	 $12.54 [2] $13.26 [2] $26.40 [2] $9.75 [2]	 $12.10 [2] - $26.40 [2] -	 - - - -	$291.99
Advanced Targeting Pod 4th Gen Upgrades ATP Procurement	0207249F	 $33.00 [2] $34.00 [2]	 $33.00 [2] $34.00 [2]	 $33.00 [2] -	 $15.13 [2] -	 -	$182.13
Secure LOS and Beyond LOS w/ 3-D Audio Comm 2nd ARC-210 Directional Audio	0207133F	 $12.59 [2] $8.88 [2] $8.30 [3]	 $23.73 [2] $8.88 [2] -	 $13.63 [2] $8.88 [2] -	 - - -	 - - -	$84.89

Notes: [1] 3840 Appropriation [2] 3010 Appropriation [3] 3600 Appropriation [4] 3080 Appropriation

- F-16 Integrated Sensor Enhancements - Active Electronically Scanned Array (AESA) Radar - Replaces mechanically scanned radar in Block 42/52, with AESA for improved detection and targeting of ground and air targets.
- F-16 Sensor Enhancements - Block 30/32/40/42 Advanced Identification Friend/Foe (AIFF) - Provides Block 30/32/40/42 aircraft with Mode 5/S and the capability to interrogate air targets utilizing the APX-113-60.
- F-16 Integrated Sensor Enhancements - Infrared Search-and-Track (IRST) Pod - Enables passive detection and tracking of asymmetric and radar jamming threats for both homeland defense and in-theater operations.

- F-16 Day/Night Compatible Helmet Mounted Integrated Targeting (HMIT) - Provides day/night, self-cueing for air and ground weapons employment, standoff capability and full sensor-to-pilot fusion.
- F-16 Additional High Resolution Display - Center Display Unit (CDU) -
  - Center Display Unit (CDU) - Replaces flight instruments with color display to provide high-resolution image from 4th generation targeting pods to the pilot; allows image transfer, improved data processing, and robust input of mission planning information.
  - Integrated Broadcast Service (IBS) - Allows aircrew to transmit and receive real-time data from national sources through the display while providing en-route threat warning.
- F-16 Integrated Electronic Warfare (EW) Suite -
  - ALR-69/ALR-56M Radar Warning Receiver (RWR) Upgrades - Improves detection, identification, and geo-location of current and emerging radar guided threat systems.
  - ALQ-213 Upgrade - Increases processor speed (10x) and memory size (100x) while enabling capacity to facilitate future software updates that provide capabilities such as the multi-ship Virtual Electronic Combat Training System (VECTS), additional threat processing, and Ethernet capability.
  - Electronic Attack (EA) Pods - Upgrades pods with digital radio frequency memory (DRFM).
- F-16 Advanced Targeting Pod (ATP) Upgrades and Procurement - Allows warfighter to employ precision-guided munitions, coordinate with ground elements, and target airborne threats.
  - 4th Generation Upgrades
  - Advanced Targeting Pod Procurement
- Secure Line-Of-Sight (SLOS) and Beyond Line-Of-Sight (BLOS) with 3-D Audio Communications -
  - 2nd ARC-210 - Provides advanced secure and beyond line-of-site communications for integration with ground forces and homeland defense agencies
  - Directional Audio - Provides directional audio/noise cancelling to improve pilot situational awareness.

INFORMATION PAPER

ON

F-16 INTEGRATED SENSOR ENHANCEMENTS - ACTIVE ELECTRONICALLY SCANNED ARRAY (AESA) RADAR

1. Background. Air National Guard (ANG) F-16 Block 40/42/50/52 aircraft require new AESA radars to replace the current APG-68 mechanically-scanned radar in order to effectively employ in defense of the homeland and in the Suppression of Enemy Air Defenses (SEAD) and Destruction of Enemy Air Defenses (DEAD) roles. The new AESA radar, an array of hundreds of transmitter receiver modules, provides increased power and can perform detection, tracking, communication, and jamming functions in multiple directions simultaneously. AESA radars provide significant increases in range and precision to detect, track, and eliminate multiple threats which allows pilots to locate a Target of Interest (TOI) in the saturated air traffic environments prevalent around major population centers, a critical capability for Homeland Defense. The system's ability to generate the large Synthetic Aperture Radar (SAR) maps are necessary to engage surface targets and perform the full-spectrum of combat capabilities in the weather amplifying the strike capability of SEAD/DEAD missions. Additionally, AESA radars eliminate the hydraulic and electrical systems associated with mechanically operated radars resulting in dramatically improved reliability and maintainability. Current technology allows installation of AESA radars that fit within existing cooling and electrical capacity on the aircraft, thereby reducing installation complexity and cost. APG-68 radar system upgrades may provide some capability and supportability enhancements until a full AESA capability can be fielded.

2. Requirement. TAF 303-76-I/II/III-A SORD for the F-16C/D, CAF ORD 303-76-I/II/III-D F-16C/D MSIP ORD (14 Aug 00).

3. Impact If Not Funded. As the technology of hostile nations continues to mature, the existing capabilities on U.S. fighters are becoming less effective against asymmetric threats and enemy fighters. Without the inherent capabilities and reliability of an AESA radar, the survivability and lethality of the F-16, half the Air Force's fighter inventory, will diminish.

4. Units Impacted.

114 FW Sioux Falls, SD	148 FW Duluth, MN	180 FW Toledo, OH
138 FW Tulsa, OK	169 FW McEntire, SC	

5. Contractor. Northrop Grumman, Baltimore, MD; Raytheon, El Segundo, CA.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE (3600)	**N/A**	**$330,400,000**
114 AESA Radars (3010)	**$4,300,000**	**$490,200,000**
APG-68+ NRE (3600)	**N/A**	**$20,000,000**
114 APG-68+ Kits (3010)	**$700,000**	**$79,800,000**
Total		**$920,400,000**

INFORMATION PAPER

ON

F-16 SENSOR ENHANCEMENTS - BLOCK 30/32/40/42 ADVANCED IDENTIFICATION FRIEND/FOE (AIFF)

1. Background. Air National Guard (ANG) F-16s fulfill defensive counter-air tasking in the Air and Space Expeditionary Force (AEF) as well as Air Sovereignty Alert (ASA) missions over the United States. The AIFF provides an interrogator capability that enables the F-16 to meet established Rules-of-Engagement (ROE) for identifying aircraft. Furthermore, interrogator capability is vital in the ASA role ensuring proper Target of Interest (TOI) identification, avoidance of civilian air traffic in dense airspace, and timely intercept completion. The Block 50/52 F-16 fleet is replacing older model interrogators with the updated APX-113-60, which addresses the new Mode S requirement for the Global Air Traffic Management (GATM) system and the Congressionally mandated Mode 5 requirement. ANG Block 42s are tasked with ASA and require the same system as the Block 50 aircraft. ANG Block 25/30/32 aircraft currently employ the APX-113-56, which does not have Mode 5/S. Retrofitting the Block 30/32 aircraft with APX-113-60 components resolves the aircraft Mode 5/S capability gap.

2. Requirement. TAF 303-76-I/II/III-A SORD (Jul 91) for the F-16 Blk-40. NORTHCOM Integrated Priority List.

3. Impact If Not Funded. The system increases the intercept success of ASA mission in high density traffic areas, radar-cluttered environments, and limited air surveillance coverage areas. Lack of an interrogation capability risks intercepting wrong target and improper TOI identification, delays intercepts and presents a safety of flight concern in congested environments.

4. Units Impacted.

113 WG Andrews AFB, MD	140 WG Buckley, CO	177 FW Atlantic City, NJ
115 FW Truax, WI	144 FW Fresno, CA	180 FW Toledo. OH
132 FW Des Moines, IA	158 FW Burlington, VT	
138 FW Tulsa, Ok	162 FW Tucson, AZ	

5. Contractor. BAE Systems, Greenlawn, NY.

6. Cost.

Units Required	Unit Cost	Program Cost
Block 42 Integration NRE (3010)	**N/A**	**$10,700,000**
47 Block 42 APX-113-60 Kits (3010) *	**$379,000**	**$17,813,000**
79 Block 30 APX-113-60 Retrofit Kits (3010)	**$107,595**	**$8,500,000**
Total		**$37,013,000**

* Includes aircraft install and spares.

INFORMATION PAPER

ON

F-16 INTEGRATED SENSOR ENHANCEMENTS - INFRARED SEARCH-AND-TRACK (IRST) POD

1. Background. The Infrared Search-and-Track (IRST) pod is a completely passive sensor that detects and tracks the heat generated by an airborne target. Asymmetric threats such as cruise missiles and small unmanned vehicles are difficult to detect with the existing conventional mechanically scanned F-16 radar. IRST systems offer robust tracking capabilities against nearly all airborne targets. This capability is key to Air Sovereignty Alert (ASA) operations in defense of the homeland. Current fighter threats employ Digital Radio Frequency Memory (DRFM) Electronic Attack (EA) methods that degrade radar performance. However, the passive nature of IRST is not susceptible to such jamming. IRST provides a complementary capability to an active electronically scanned fighter radar for detection and targeting in both radar jamming and high priority ASA environments. The Air National Guard (ANG) requires a minimum of forty (40) IRST pods to support operations at ten (10) ASA sites, twenty (20) pods to support training, and eighteen (18) pods to support overseas contingency operations. IRST pods can be shared between the F-16 and F-15 fleets.

2. Requirement. TAF 303-76-I/II/III-A SORD for the F-16C/D, CAF ORD 303-76-I/II/III-D F-16C/D MSIP ORD (14 Aug 00).

3. Impact If Not Funded. ANG F-16s will face continued limitations in tracking and targeting asymmetric threats and operating in dense EA environments. IRST capability is a high interest homeland defense item for both NORAD and NORTHCOM.

4. Units Impacted.

113 WG Andrews AFB, MD	140 WG Buckley, CO	162 FW Tucson, AZ
114 FW Sioux Falls, SD	144 FW Fresno, CA	169 FW McEntire, SC
115 FW Truax, WI	148 FW Duluth, MN	177 FW Atlantic City, NJ
132 FW Des Moines, IA	149 FW Kelly AFB, TX	187 FW Dannelly Fld, AL
138 FW Tulsa, OK	158 FW Burlington, VT	

5. Contractors. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE (3600)	**N/A**	**$25,000,000**
78 IRST Pods (3010) *	**$3,900,000**	**$304,200,000**
Total		**$329,200,000**

*Includes install cost.

INFORMATION PAPER

ON

F-16 DAY/NIGHT COMPATIBLE HELMET MOUNTED INTEGRATED TARGETING (HMIT) SYSTEM

1. Background. The Scorpion HMIT built by Gentex, and offered for the F-16 by Raytheon, reduces the time required to acquire targets with aircraft sensors from minutes to seconds, which can make the difference between acquiring a high-value, fleeting target or not. Currently, pilots typically acquire targets by pointing the aircraft at the target to place it within the Heads-Up Display (HUD) Field of View (FOV). This is time consuming and maneuvers the aircraft closer to the threat. Scorpion can perform precise, head-steered weapons and sensor cueing enabling pilots to fly parallel to targets and maintain standoff distance, thus improving survivability. The cueing system allows rapid target acquisition giving aircrew the ability to acquire targets simply by looking at them. Furthermore, Scorpion's high resolution color, SVGA display places information in front of the pilot's eye reducing heads-down time in the cockpit and improving survivability. The display technology allows pilots to quickly build a three-dimensional picture of the battlespace by placing data linked symbols over actual target, threat, and friendly positions. Scorpion is compatible with existing AN/AVS-9 Night Vision Goggles and fully supports night operations. Air National Guard (ANG) F-16 Block 40/42/50/52 aircraft are equipped with the day-only Joint Helmet Mounted Cueing System (JHMCS) but require a night cueing and display module compatible with the existing Joint Helmet Mounted Cueing System.

2. Requirement. JHMCS ORD CAF-USN 308-93-II-A Dec 1996, CAF 301-01-B, F-16C/D Block 25/30/32 MSIP ORD (15 Dec 04), CENTCOM Urgent Operational Need (UON).

3. Impact If Not Funded. Target mis-identification, collateral damage, and fratricide potential are much higher without the display benefits of a HMIT.

4. Units Impacted

113 WG Andrews AFB, MD	140 WG Buckley, CO	162 FW Tucson, AZ
114 FW Sioux Falls, SD	144 FW Fresno, CA	169 FW McEntire, SC
115 FW Truax, WI	148 FW Duluth, MN	177 FW Atlantic City, NJ
132 FW Des Moines, IA	149 FW Kelly AFB, TX	180 FW Toledo, OH
138 FW Tulsa, OK	158 FW Burlington, VT	187 FW Dannelly Fld, AL

5. Contractor. Gentex, Aurora, IL; Raytheon Technical Services Indianapolis, IN; Vision Systems International LLC, San Jose, CA.

6. Cost.

Units Required	Unit Cost	Program Cost
166 HMIT Kits (3010)	**$120,000**	**$19,920,000**
83 HMIT Helmets (3010)	**$60,000**	**$4,980,000**
129 JHMCS Night Kits (3010)	**$240,000**	**$30,960,000**
Total		**$55,860,000**

INFORMATION PAPER

ON

F-16 ADDITIONAL HIGH RESOLUTION DISPLAY - CENTER DISPLAY UNIT (CDU)

1. Background. ANG F-16 Block 30/32/40/42/50/52 aircraft require a new CDU to transfer imagery with ground controllers, fully utilize fourth generation advanced targeting pod image quality, improve available processing power, and replace aging flight instruments. The new CDU will directly connect to the ARC-210 radio and provide pilots with the ability to securely transfer data, such as a targeting pod scenes, joint tactical air controller taskings, and updated target area imagery. The ability to transfer data is critical for rapid coordination with ground units during close air support missions and with command and control assets during time sensitive and emerging target operations. Expanding CDU with an Integrated Broadcasting Service (IBS) capability allows aircrew to transmit and receive real-time data from national sources through the display while providing en-route threat warning. Furthermore, the CDU contains additional processing capacity that allows for the manipulation of data external to the aircraft Operational Flight Program (OFP). This additional processing capacity provides pilots with the ability to insert mission planning data pre-mission via USB like interfaces, while opening low cost pathways for the integration of future weapons and updates without the costly and time consuming process of changing the OFP. Pilot selectable display options will provide electronic instrument flight displays (attitude, performance, and navigation) when required.

2. Requirement. CAF 301-01-B, F-16C/D Block 25/30/32 MSIP ORD (15 Dec 04).

3. Impact If Not Funded. Pilots will remain unable to transfer imagery with ground controllers, exploit the improved image quality of next generation targeting pods in order to increase standoff while determining the intent of enemy combatants, and rapidly integrate emerging technologies, degrading their ability to effectively execute close air support, interdiction and time sensitive target taskings.

4. Units Impacted.

113 WG Andrews AFB, MD	140 WG Buckley, CO	162 FW Tucson, AZ
114 FW Sioux Falls, SD	144 FW Fresno, CA	169 FW McEntire, SC
115 FW Truax, WI	148 FW Duluth, MN	177 FW Atlantic City, NJ
132 FW Des Moines, IA	149 FW Kelly AFB, TX	187 FW Dannelly Fld, AL
138 FW Tulsa, OK	158 FW Burlington, VT	

5. Contractor. BAE, Greenlawn, NY; DRS, Dayton, OH; Elbit Systems of America, Fort Worth, TX; Raytheon, Indianapolis, IN; Rockwell Collins, San Jose, CA.

6. Cost.

Units Required *	Unit Cost	Program Cost
333 Color Displays (3010)	**$110,000**	**$36,630,000**
333 IBS Receiver Kits (3010)	**$160,000**	**$53,280,000**
Total		**$89,910,000**

* Includes integration, installation, and spares.

INFORMATION PAPER

ON

F-16 INTEGRATED ELECTRONIC WARFARE (EW) SUITE

1. Background. Current F-16 Block 30/32/40/42/50/52 EW suite is comprised of a series of EW equipment designed in the 1980s which are incapable of providing adequate defensive situational awareness and countermeasures against some present and most future radar systems. Today, both systems suffer from sustainment issues and have significant capability issues against modern threat systems. A robust integrated electronic attack suite will enable all F-16 blocks to counter current and future radars. The attributes of this integrated suite shall incorporate an upgraded digital Radar Warning Receiver (RWR), an Electronic Attack (EA) pod and the ALQ-213 legacy Electronic Combat (EC) integration system. The F-16 fleet has two legacy analog RWRs (ALR-69 and ALR-56M) and two legacy analog EA pods (ALQ-131 and ALQ-184). All require sustainment as well as digital based performance upgrades. The ALQ-213 EC integration system is installed on all F-16 pre-blocks but must be installed on all F-16 Block 40/42/50/52.

2. Requirement. AN/ALR-69A CPD approved by AFROCC, 17 Nov 05, CAF 301-01-B, F-16 C/D Block 25/30/32 MSIP ORD (15 Dec 04), CAF ORD 303-76-I/II/III-D F-16C/D MSIP ORD (14 Aug 00).

3. Impact If Not Funded. F-16s remain at risk to several current and all advanced threat systems resulting in areas of denied access. These deficiencies severely impact the pilot's lethality/survivability in performing counter-air, suppression/destruction of enemy air defenses, and close air support missions against existing threats in hostile nations.

4. Units Impacted.

113 WG Andrews AFB, MD	140 WG Buckley, CO	162 FW Tucson, AZ
114 FW Sioux Falls, SD	144 FW Fresno, CA	169 FW McEntire, SC
115 FW Truax, WI	148 FW Duluth, MN	177 FW Atlantic City, NJ
132 FW Des Moines, IA	149 FW Kelly AFB, TX	187 FW Dannelly Fld, AL
138 FW Tulsa, OK	158 FW Burlington, VT	

5. Contractor. TBD.

6. Cost.

Units Required *	Unit Cost	Program Cost
ALR-69 NRE (3600)	**N/A**	**$31,590,000**
338 ALR-69 Upgrades (3010)	**$110,000**	**$37,180,000**
ALR-56M NRE (3600)	**N/A**	**$50,000,000**
78 ALR-56M Upgrades (3010)	**$340,000**	**$26,520,000**
EA Pod NRE (3600)	**N/A**	**$20,000,000**
60 EA Pod Upgrades (3010)	**$1,320,000**	**$79,200,000**
ALQ-213 NRE (3600)	**N/A**	**$28,000,000**
150 ALQ-213 (3010)	**$130,000**	**$19,500,000**
Total		**$291,990,000**

* Includes required spares, support equipment, and technical orders.

INFORMATION PAPER

ON

F-16 ADVANCED TARGETING POD (ATP) UPGRADES AND PROCUREMENT

1. Background. Procurement of Advanced Targeting Pods (ATP) has been an Air National Guard (ANG) top priority for several years. A total of 150 Northrop Grumman Litening pods (65 AT, 22 G4 New and 63 G4 Upgrade) and 42 Lockheed Martin Sniper XR targeting pods were funded between FY98 and FY09. Litening and Sniper are multi-sensor systems that enhance contingency and Air Sovereignty Alert (ASA) operations. Fielded Litening AT and Sniper pods employ 3rd generation Forward Looking Infrared (FLIR) and Electro-Optical (EO) television / Charge-Coupled Device (CCD) imaging sensors to provide standoff capability, precise targeting of GPS-guided weapons, and air-to-air identification. ATP Video Downlink (VDL) provides streaming video to Tactical Air Control Parties (TACPs) and Joint Terminal Attack Controllers (JTACs) equipped with Remotely Operated Video Enhanced Receiver (ROVER) terminals. Modernization with 4th generation capability, including 1K FLIR, 1K CCD, Laser Target Image Processing (LTIP), and digital video downlinks vastly improves day and night target acquisition at extended ranges in both air-to-ground and air-to-air roles. The ANG requires 4th generation capability on all ATPs. Forty (40) additional ATPs are required for domestic ASA aircraft in order to track and target asymmetric threats, aid in target identification and conduct maritime interdiction taskings. All future pod procurements will utilize the USAF's new ATP-SE contract providing baseline 4th generation capabilities and improved functionality.

2. Requirement. Combatant Commander Urgent Need Request (UNR), Nov 04.

3. Impact If Not Funded. Not funding will limit the ANG's ability to effectively fulfill its Air Expeditionary Force (AEF) and Homeland Defense taskings. It will severely restrict the capability of pilots to acquire, identify, and successfully engage hostile forces. It will limit the standoff capability of our current GPS and laser-guided weapons and degrade the pilot's ability to detect, track, and target threats in defense of the homeland during air sovereignty missions.

4. Units Impacted.

113 WG Andrews AFB, MD	140 WG Buckley, CO	162 FW Tucson, AZ
114 FW Sioux Falls, SD	144 FW Fresno, CA	169 FW McEntire, SC
115 FW Truax, WI	148 FW Duluth, MN	177 FW Atlantic City, NJ
132 FW Des Moines, IA	149 FW Kelly AFB, TX	180 FW Toledo, OH
138 FW Tulsa, OK	158 FW Burlington, VT	187 FW Dannelly Fld, AL

5. Contractor. Lockheed Martin, Orlando, FL; Northrop Grumman, Rolling Meadows, IL.

6. Cost.

Units Required	Unit Cost	Program Cost
101 4th Gen Upgrades (3010)	**$1,130,000**	**$114,130,000**
40 ATP-SE Pods (3010)	**$1,700,000**	**$68,000,000**
Total		**$182,130,000**

INFORMATION PAPER

ON

F-16 SECURE LINE-OF-SIGHT (SLOS) AND BEYOND LINE-OF-SIGHT (BLOS) WITH 3-D AUDIO COMMUNICATIONS

1. Background. Current upgrades to F-16s provide SLOS and improved BLOS communications through the installation of one ARC-210 radio. The ARC-210 modification provides an improved ability to securely communicate with ground forces and Command and Control (C2) nodes, but does not allow simultaneous operations on SLOS/BLOS frequencies. Homeland Defense (HD) and in-theater operations require simultaneous SLOS/BLOS communications to concurrently maintain contact with both C2 and friendly forces. A second ARC-210 permits growth to extended data and image transfer when linked to an advanced display. The combination of two ARC-210s plus a legacy radio (three radios total) allows in-theater communications on a C2 frequency, a secure tactical frequency with ground forces, and an intra-flight frequency. In the homeland defense mission, this radio configuration enables monitoring C2, air traffic control, and intra-flight frequencies. The integration of noise cancelling and directional (3-D) audio simplifies interpretation of simultaneous radio calls by spatially separating aural warning and radio signals and providing angular cueing to ground and air threats when used in conjunction with a helmet mounted cueing system. These capabilities are critical to operations in remote areas, dense threat environments, and dynamic HD missions.

2. Requirement. TAF 303-76-I/II/III-A SORD for the F-16C/D, CAF ORD 303-76-I/II/III-D F-16C/D MSIP ORD (14 Aug 00), CENTCOM UON. NORTHCOM Integrated Priority List.

3. Impact If Not Funded. Combat and Air Sovereignty Alert (ASA) missions are vulnerable to encumbered intercept and engagement authentications that are caused by interrupted communications between fighters, ground forces, and C2 authorities. Furthermore, switching between radio channels to communicate with multiple parties slows mission execution and increases the likelihood aircrew members will miss vital information.

4. Units Impacted.

113 WG Andrews AFB, MD	140 WG Buckley, CO	162 FW Tucson, AZ
115 FW Truax, WI	144 FW Fresno, CA	169 FW McEntire, SC
132 FW Des Moines, IA	148 FW Duluth, MN	177 FW Atlantic City, NJ
138 FW Tulsa, OK	158 FW Burlington, VT	

5. Contractor. ARC-210: Rockwell Collins, Cedar Rapids, IA. Directional Audio: TBD.

6. Cost.

Units Required *	Unit Cost	Program Cost
333 2nd ARC-210 Radio Kits (3010)	**$150,000**	**$49,950,000**
Directional Audio NRE (3600)	**N/A**	**$8,300,000**
333 Directional Kits (3010)	**$80,000**	**$26,640,000**
Total		**$84,890,000**

* Includes 10% spares and installs.

HH-60G

- **Combat Search and Rescue**

Air National Guard Combat Search and Rescue helicopters and crews play a critical and highly involved role in support of overseas Contingency Operations while also responding to increasingly high demand for domestic operations. These ANG CSAR helicopters are based in: 101 RQS, Francis S. Gabreski Airport, NY; the 129 RQS, Moffett Federal Airfield, CA; 210 RQS, Kulis ANGB, AK.

During FY10, Air National Guard helicopters and crews deployed in support of Operation ENDURING FREEDOM in Afghanistan providing the Combatant Commander 24-hour, theater-wide rescue capability. These combat operations, several under hostile enemy fire, resulted in hundreds of lives saved.

In FY10, the 129 RQS flew life saving rescue missions 650 miles off the coast of Baja California. The 210 RQS continues to hold a 24-hour, state-wide, rescue alert in Alaska resulting in numerous lives saved. The 101 RQS from New York continued its long involvement in providing critical rescue capability during Space Shuttle launches.

In FY10, the Air Force continued modernization programs for the HH-60G including programs started by the Air National Guard such as the Multi-function Color Display, Situational Awareness Data Link and AN/ARS-6 v12 Personnel Locator System. While ACC has funded and is managing these programs for the total force, the Air National Guard has a list of requirements including modernized aircraft defensive equipment and a helmet mounted display/cueing system. ANG funded programs expected to continue in the upcoming year are the GAU-21 Gun System and a Communications and Avionics Upgrade.

HH-60G
2010 Weapons and Tactics Conference

Critical Combat Capabilities List

- Improved Communications Suite/Three Dimensional Audio
- Hostile Fire Indicator
- Helmet Mounting Cueing and Display System
- Improved/Advanced Weapons Systems
- Point Designation/Coordinate Generation

Essential Capabilities List

- SMFCD / SADL / LARS V12
- Full-Motion Video/Video Downlink
- Lightweight Body Armor/Combat Egress Gear
- GPS Certified A/C
- IFF Mode 5/S
- Crew Thermal Management
- Standard Cockpit Reconfiguration

Desired Capabilities List

- DMO (Simulator)
- Improved Rotor Blades
- Improved Engines
- Improved Generators
- Flight Data Recorder
- Lightweight Personal O2 System
- High-Visibility Cockpit Doors

HH-60G
EXECUTIVE SUMMARY

Modernization Funding Profiles ($ Million)

Program	P.E. Number	2012	2013	2014	2015	2016	Total
Improved Communication Suite With 3-D Audio	53114F	$6.72 [2] $3.00 [3]	- -	- -	- -	- -	$9.72
Hostile Fire Indicator With Enhanced Defensive Systems Suite	53114F	$23.80 [2] $2.00 [3]	- -	- -	- -	- -	$25.80
Day/Night Helmet Mounted Display/Cueing	53114F	$24.48 [2] $5.00 [3]	- -	- -	- -	- -	$29.48
Improved/Advanced Weapon Systems	53114F	$7.20 [2]	-	-	-	-	$7.20
Point Designation/ Coordinate Generation	53114F	$9.00 [2] $3.00 [3]	- -	- -	- -	- -	$12.00

Notes: [1] 3840 Appropriation [2] 3010 Appropriation [3] 3600 Appropriation [4] 3080 Appropriation

- HH-60G Improved Communication Suite with Three-Dimensional Audio - Secure multi-spectrum radio ensures military and civil command authorities that Air National Guard rescue helicopters will be ready for all relief operations. In addition, the radio increases HH-60G combat search and rescue capability by filling an existing secure radio shortfall. Three-dimensional audio is critical to provide tasked saturated aircrews the ability to prioritize and organize numerous simultaneous radio transmissions during all phases of flight.
- HH-60G Hostile Fire Indicator With Enhanced Defensive Systems Suite - Defensive system that alerts the crew to small arms and rocket propelled grenade fire. Current methods employed to detect enemy threats is via ground force radio notification or visual detection by the crew which is not time sensitive enough to provide the aircrew with effective information. The Hostile Fire Indicator will significantly improve aircrew safety and reduce aircraft damage.
- H-60G Day/Night Helmet Mounted Display/Cueing System - Helmet mounted cueing and display capability significantly increases pilot and crew situational awareness, weapons employment capability, enhances terminal area search and rescue operations and reduces overall internal communication during critical mission phases.
- HH-60G Improved/Advanced Weapon Systems - The Fabrique Nationale Herstal M3M .50 caliber machine gun has a high rate of fire and can suppress enemy threats at up to 1500 meters, thus filling a gap in defensive coverage. The Dillon Aero M134D minigun is an ultra-reliable, GAU-2B minigun replacement which provides aircraft gross weight savings. Finally, titanium minigun parts allow improved reliability and functionality of the existing GAU-2B miniguns.
- HH-60G Point Designation/Coordinate Generation - The ability to designate a location on the ground and generate coordinates will allow the crew to not only direct their navigation system directly to the point, but put that location over a data link as well, raising the situational awareness of all assets with very little confusion and communication.

INFORMATION PAPER

ON

HH-60 GIMPROVED COMMUNICATION SUITE WITH THREE-DIMENSIONAL AUDIO

1. Background. The Homeland Defense mission of responding to civil tasking (natural and manmade disasters as well law enforcement operations) requires immediate and decisive operations to minimize the loss of life and property. The HH-60G has severely limited capability to communicate with civil responders hindering rescue relief operations. A secure multi-spectrum radio will ensure military and civil command authorities can communicate directly with Air National Guard (ANG) rescue helicopters will be ready for any relief operations. In addition, the radio increases the HH-60G combat search and rescue capability by filling an existing secure radio shortfall. Three-dimensional audio is critical to provide tasked saturated aircrews the ability to prioritize and organize numerous simultaneous radio transmissions during all phases of flight.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC; lessons learned from Operations ENDURING FREEDOM (OEF) and IRAQI FREEDOM (OIF).

3. Impact If Not Funded. Lack of direct communication to on scene first responders will result in increased response time to civil disasters and risk loss of life and property.

4. Units Impacted.
106 RQW Gabreski Field, NY 129 RQW Moffett Federal Airfield, CA 176 WG Kulis ANGB, AK

5. Contractor. Raytheon, Fort Wayne, IN; Raytheon, Indianapolis, IN.

6. Cost.

Units Required	Unit Cost	Program Cost
Radio NRE (3010)	**N/A**	**$1,500,000**
18 Radios (3010)	**$130,000**	**$2,340,000**
Directional Audio (NRE) (3600)	**N/A**	**$3,000,000**
72 Directional Kits (3010)	**$40,000**	**$2,880,000**
Total		**$9,720,000**

INFORMATION PAPER

ON

HH-60G HOSTILE FIRE INDICATOR WITH ENHANCED DEFENSIVE SYSTEMS SUITE

1. Background. Rescues performed in combat highlighted the need to modernize the HH-60G defensive systems. Combat crews require precise, real-time threat information that is fully integrated with existing defensive systems with the addition of a hostile fire indicator. The currently installed systems do not alert the aircrew of Rocket Propelled Grenade (RPG) or small arms fire which are the most common threats encountered in theater. The current method employed to detect these threats is visual detection by the aircrew or via radio notification from a friendly ground party. When crews have the ability to detect ballistic to include RPG and small arms fire the aircrew will be able to react saving lives and aircraft. The crews will be able to return precise and immediate defensive fire effectively suppressing or destroying the enemy threat, or maneuver to avoid the threat as needed.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC; lessons learned Operations ENDURING FREEDOM (OEF) and IRAQI FREEDOM (OIF).

3. Impact If Not Funded. There is an increased chance that Combat Search and Rescue (CSAR) HH-60G crews and aircraft will be lost to enemy hostile fire without the hostile fire indicator and enhanced defensive systems.

4. Units Impacted.
106 RQW Gabreski Field, NY 129 RQW Moffett Federal Airfield, CA 176 WG Kulis ANGB, AK

5. Contractor. Northrop Grumman, Rolling Meadows IL.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE (3600)	**N/A**	**$2,000,000**
17 Hostile Fire Indicator (3010)	**$1,400,000**	**$23,800,000**
Total		**$25,800,000**

INFORMATION PAPER

ON

HH-60G DAY/NIGHT HELMET MOUNTED DISPLAY/CUEING SYSTEM

1. Background. The addition of day and night, helmet mounted cueing and display capability in the HH-60G significantly increases aircrew situational awareness and weapons employment capability; enhances terminal area search and rescue operations; and reduces overall internal communication during critical mission phases. A helmet mounted cueing system allows all crewmembers to quickly build Situational Awareness (SA) based on other crewmembers SA without the need for voice communication. Sensor and data link symbols will be visible on the helmet mounted display superimposed over the geographic location of friendly, hostile, and survivor positions. Additionally, the ability to display sensor pictures and data link information while maintaining a heads-up posture will greatly enhance safety while flying in the low-level (<500ft) environment. Since the majority of the HH-60G mission employment occurs at night, this capability needs to be compatible with Night Vision Goggles (NVGs).

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC; lessons learned Operations ENDURING FREEDOM (OEF) and IRAQI FREEDOM (OEF).

3. Impact If Not Funded. Heads-down time in the cockpit during low-level flight increases the chances of a mishap. For rescue operations and weapons employment, continued operation without the Helmet Mounted Cueing System (HMCS) will hamper execution and put mission success at-risk. Aircrew will continue to rely on voice communication in an already congested environment during mission critical phases of flight.

4. Units Impacted.
106 RQW Gabreski Field, NY 129 RQW Moffett Federal Airfield, CA 176 WG Kulis ANGB, AK

5. Contractor. BAE Systems, Kent, UK; Gentex, Aurora, IL; Rafael, Haifa, Israel; Vision Systems International LLC, San Jose, CA; Insight Technology Inc, Manchester, NH; ITT Night Vision, Roanoke, VA.

6. Cost.

Units Required *	Unit Cost	Program Cost
NRE (3600)	**N/A**	**$5,000,000**
20 HMCS Aircraft Kits (3010)	**$300,000**	**$6,000,000**
132 HMCS Helmet Kits (3010)	**$80,000**	**$10,560,000**
132 Night Vision Units (3010)	**$60,000**	**$7,920,000**
Total		**$29,480,000**

***** Includes 10% spares.

INFORMATION PAPER

ON

HH-60G IMPROVED/ADVANCED WEAPON SYSTEMS

1. Background. The HH-60G has a requirement to provide reliable defensive firepower in the gap in coverage between the 800 meter maximum range of the currently fielded GAU-2B and the supporting fighter's Weapons Employment Zone (WEZ) minimum range of 1000 meters. The Fabrique Nationale Herstal (FNH) GAU-21 .50 caliber machine gun is an accurate, reliable, lightweight, high rate of fire, open bolt weapon that can effectively suppresses threats out to 1500 meters. Since the HH-60G routinely operates at maximum allowable gross weight, it is necessary to find weight savings whenever possible to allow addition of new capabilities such as data link and over-the-horizon communications. The Dillon Aero M134D mini-gun is an ultra-reliable, GAU-2B mini-gun replacement which provides overall weight savings.

2. Requirement. Air Combat Command (ACC) Project 96-012A HH-60G Cabin Configuration FOT&E Final Report (U) dated April 1997 and CAF ORD 306-00-I/II/III HH-60G Block 152 (U) both state the requirement for a .50-caliber machine gun on the Rescue HH-60Gs; ACC / CENTCOM C-MNS 02-501, approved ACC GAU-21 1067.

3. Impact If Not Funded. The HH-60G fleet will continue to have an unreliable defensive capability between the maximum range of the current system and the minimum range of supporting fighters. Ability to add new capabilities to the aircraft will be hampered by excess weight of current systems.

4. Units Impacted.
106 RQW Gabreski Field, NY 129 RQW Moffett Federal Airfield, CA 176 WG Kulis ANGB, AK

5. Contractor. FN Herstal USA Inc, McLean, VA; FN Manufacturing Inc. (FNMI), Columbia, SC; Dillon Aero, Scottsdale, AZ.

6. Cost.

Units Required	Unit Cost	Program Cost
36 Dillon M134D Miniguns (3010)	**$60,000**	**$2,160,000**
36 FNH GAU-21 .50 cal Machine Guns (3010) *	**$140,000**	**$5,040,000**
Total		**$7,200,000**

* Includes NRE, Integration and T.O.s.

INFORMATION PAPER

ON

HH-60G POINT DESIGNATION/COORDINATE GENERATION

1. Background. The HH-60G currently has no method to develop and transmit coordinates for a location that is not directly below the aircraft. This limitation requires the crew to use voice transmissions to talk crewmembers and supporting assets onto potential landing zones, threat locations or any point of interest. This limitation causes time to be lost and errors to develop as the crewmember with the highest situational awareness attempts to communicate the location to the rest of the crew. The ability to designate a location on the ground and generate coordinates will allow the crew to direct their navigation system directly to the point. If coordinate data is put out over a data link it will raise the situational awareness of all assets with minimal confusion and communication. A designation/coordinate generation system will increase the survivability of the aircraft in a hostile environment, decrease the time required to accomplish the mission, and reduce crew communication.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC; lessons learned Operations ENDURING FREEDOM (OEF) and IRAQI FREEDOM (OEF).

3. Impact If Not Funded. HH-60G crews will continue to be forced to use voice communication in hostile environments and in difficult situations to develop crew and supporting asset situational awareness. This will cause delays in mission execution and could result in mission failure.

4. Units Impacted.
106 RQW Gabreski Field, NY 129 RQW Moffett Federal Airfield, CA 176 WG Kulis ANGB, AK

5. Contractor. Northrop Grumman, Rolling Meadows, IL; Raytheon, Indianapolis, IN.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE, T.O.s, Installs (3600)	**N/A**	**$3,000,000**
18 Coordinate Generating Laser (3010)	**$500,000**	**$9,000,000**
Total		**$12,000,000**

KC-135

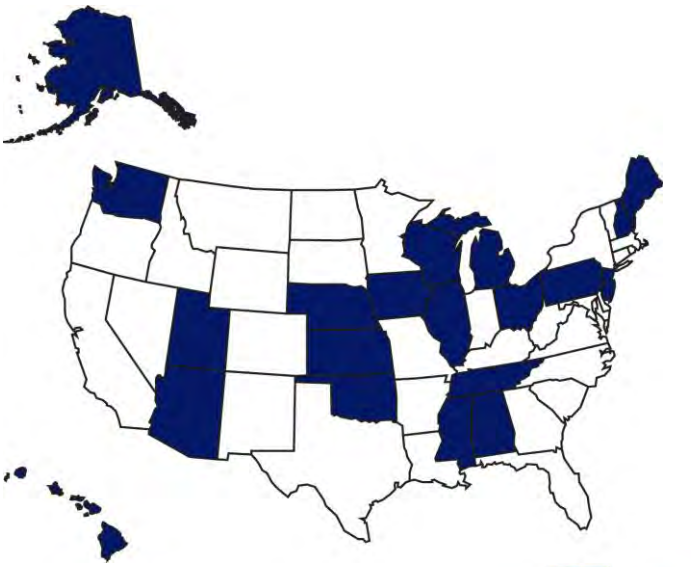
- **Air Refueling**
- **Airlift**
- **Aeromedical Evacuation**

The Air National Guard's 21 Air Refueling Wings represent 43 percent of the entire Air Force KC-135 fleet.

Air refueling is vital to air mobility and serves to enable and multiply the effects of airpower at all levels of warfare. The KC-135 Stratotanker is AMC's primary air refueling platform providing approximately 90 Percent of the Command's air refueling capability in support of US, allied, and coalition military aircraft. The KC-135 enhances air refueling capabilities and supports deployment, employment, sustainment, and redeployment of joint forces across the full range of military operations from nuclear warfare to normal and routine military activities to irregular warfare.

More and more, the KC-135s are being tasked to operate in more challenging, high threat environments. Defensive systems are needed to prevent shoulder-fired surface-to-air-missile systems from destroying aircraft during takeoff, landing, and low altitude flight regimes.

Tactical data link technologies and situational awareness displays that bring real-time threat information to KC-135 crewmembers are required modifications that will greatly enhance worldwide refueling, airlift, and aeromedical evacuation missions.



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KC-135
2010 Weapons and Tactics Conference

Critical Combat Capabilities List

- Advanced Infrared Counter Measures (IRCM) Defensive Systems
- Tactical Data Link (TDL) and Situational Awareness Cockpit Display Units (CDU)
- External Overt/Covert Lighting

Essential Capabilities List

- Boom Operator Simulation Systems (BOSS)
- Advanced Squadron Level Simulator (ASLS) Systems
- New Air Cycle Machine with Ground Cooling Capability
- Fuel Tank Fire Explosion Protection

Desired Capabilities List

- Electronic Flight Bag
- Improved Crew Bunks

KC-135 EXECUTIVE SUMMARY

Modernization Funding Profiles ($ Million)

Program	P.E. Number	2012	2013	2014	2015	2016	Total
KC-135 Advanced Infrared Counter Measures Defensive Systems	0401134F	$70.30 [2] $6.00 [3]	$70.30 [2] -	$70.30 [2] -	$70.30 [2] -	$70.30 [2] -	$357.50
KC-135 Tactical Data Link and Situational Awareness Cockpit Display Units	0401218F	$20.52 [2] $4.00 [3]	$20.52 [2] -	$20.52 [2] -	$20.52 [2] -	$20.52 [2] -	$106.60
External Overt/Covert Lighting	0401218F	$6.65 [2] $1.00 [3]	$6.65 [2] -	- -	- -	- -	$14.30

Notes: [1] 3840 Appropriation [2] 3010 Appropriation [3] 3600 Appropriation [4] 3080 Appropriation

- KC-135 Advanced Infrared Counter Measures (IRCM) Defensive Systems - Provides an integral self-protection system to combat IR threats to large aircraft. Man-Portable Air Defense Systems (MANPADS) are a significant threat during takeoffs, landings, and low altitude refueling missions. An advanced IRCM system is needed to counter MANPAD threats. Existing pyrotechnic systems (flares) are incompatible with the air refueling mission because of the highly combustible fuel load and lack of tank inerting.
- KC-135 Tactical Data Link (TDL) and Situational Awareness Cockpit Display Units (CDU) - Provides a robust, secure, and scalable Line-of-Sight (LOS) and Beyond-Line-of-Sight (BLOS) connectivity with the network centric battlefield allowing tankers more flexibility to carry out effective operations deeper into enemy airspace. Supplies increased situational awareness to aircrew by providing critical Real-Time Information in the Cockpit (RTIC).
- KC-135 External Overt/Covert Lighting - Provides FAA and MILSPEC compliant external lighting. Also provides covert mode to reduce mid-air collision potential during night-time blacked-out operations, and improved reliability with significantly increased Mean Time Between Failures (MTBF).

INFORMATION PAPER

ON

KC-135 ADVANCED INFRARED COUNTERMEASURES (IRCM) DEFENSIVE SYSTEMS

1. Background. Changes in employment concepts are placing KC-135 aircraft in high threat areas. Low altitude refueling, forward positioning, and mission sets establishing the tanker as a command and control relay are subjecting the KC-135 to increasingly hostile operational environments. This threat environment is widely populated with shoulder fired, Man-Portable Air Defense Systems (MANPADS) infrared seeking missiles. MANPADS are a significant threat during takeoffs, landings, and low altitude refueling missions. An advanced IRCM system is needed to counter MANPADS; one that does not rely on pyrotechnic expendables that are incompatible with a fuel-laden aircraft, and leverages previous government investments in laser based countermeasures.

2. Requirement. Large Aircraft Infrared Countermeasures **(**LAIRCM) ORD 314-92, dated Aug 98, LAIRCM Equipage Study; AMC Requirements and Planning Council ranked Defensive Systems as #1 out of 38 at the 2010 Executive Session.

3. Impact If Not Funded. KC-135 aircraft are uniquely vulnerable to MANPADS due to size, lack of maneuverability, and large combustible fuel load. Without defensive systems, a MANPAD attack against a KC-135 has a high probability of a kill. Additionally, lack of defensive systems limits the KC-135 from operating out of forward operating bases causing increased flying time and fuel consumption thus decreasing mission effectiveness by limiting fuel available for offload.

4. Units Impacted.

101 ARW	Bangor IAP, ME	128 ARW	Milwaukee IAP, WI	161 ARW	Phoenix IAP, AZ
108 ARW	McGuire AFB, NJ	134 ARW	Knoxville APT, TN	168 ARW	Eielson AFB, AK
117 ARW	Birmingham APT, AL	151 ARW	Salt lake IAP, UT	171 ARW	Pittsburgh IAP, PA
121 ARW	Rickenbacker ANGB, OH	154 WG	Hickam AFB, HI	185 ARW	Sioux City IAP, IA
126 ARW	Scott AFB, IL	155 ARW	Lincoln MAP, NE	190 ARW	Forbes FLD, KS
127 WG	Selfridge, MI	157 ARW	Pease ANGB, NH		

5. Contractors. BAE Systems, Nashua NH, Lockheed Martin, Orlando FL; Elbit Systems of America, Fort Worth, TX; Northrop Grumman Electronics Systems, Rolling Meadows, IL.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE (3600)	**N/A**	**$6,000,000**
190 Group A Kits (3010)	**$850,000**	**$161,500,000**
95 Group B Kits (3010) *	**$2,000,000**	**$190,000,000**
Total		**$357,500,000**

* Includes required spares, support equipment, and technical orders.

INFORMATION PAPER

ON

KC-135 TACTICAL DATA LINK (TDL) AND SITUATIONAL AWARENESS COCKPIT DISPLAY UNITS (CDU)

1. Background. Recent combat operations have highlighted the need for comprehensive, networked Command and Control (C2) throughout all theaters of operation. Installation of a robust, secure, and scalable TDL provides this C2 link and maximizes KC-135 aircrew situational awareness with Beyond-Line-of-Sight (BLOS) and Line-of-Sight (LOS) capabilities. TDL provides critical real-time information to KC-135 aircrews such as positions of other aircraft, especially those about to receive fuel; weather: and threat locations, thus greatly increasing the tankers ability to effectively participate in the present day network-centric battlespace. The resulting connectivity enables C2 elements near real-time monitoring of mission events, mission status, task completion, and resource status while enhancing the situational awareness of both tanker formations and the joint and coalition aircraft involved in aerial refueling operations. A TDL capability should be compatible with any situational awareness CDU utilized by the community.

2. Requirement. Draft annex to Tanker ORD (AF/A5R). Mobility Air Forces (MAF) Network Enabling Concept, 26 Apr 06. AMC MAF Data Link Integration Technical Requirements Document (TRD), 25 Oct 06. TDL Transformation CDD, Increment 1, JROCM, 23 Jun 04.

3. Impact If Not Funded. Without a tactical data link, ANG tanker assets will remain outside the C2 networks in the various theaters of operation and are thus unable to receive time critical tasking information and remain blind to broadcasted threats.

4. Units Impacted.

101 ARW	Bangor IAP, ME	128 ARW	Milwaukee IAP, WI	157 ARW	Pease ANGB, NH
108 ARW	McGuire AFB, NJ	134 ARW	Knoxville APT, TN	161 ARW	Phoenix IAP, AZ
117 ARW	Birmingham APT, AL	141 ARW	Fairchild AFB, WA	168 ARW	Eielson AFB, AK
121 ARW	Rickenbacker ANGB, OH	151 ARW	Salt Lake IAP, UT	171 ARW	Pittsburgh IAP, PA
126 ARW	Scott AFB, IL	154 WG	Hickam AFB, HI	185 ARW	Sioux City IAP, IA
127 WG	Selfridge, MI	155 ARW	Lincoln MAP, NE	190 ARW	Forbes FLD, KS

5. Contractors. AIRINC, Oklahoma City, OK; BAE, Boeing, Chantilly, VA; Northrop Grumman, Melbourne, FL; Rockwell Collins, Cedar Rapids, IA.

6. Cost.

Units Required *	Unit Cost	Program Cost
NRE (3600)	**N/A**	**$4,000,000**
190 Group A (3010)	**$130,000**	**$24,700,000**
190 TDL Radios (3010)	**$330,000**	**$62,700,000**
190 TDL Processors (3010)	**$80,000**	**$15,200,000**
Total		**$106,600,000**

***** Includes initial spares.

INFORMATION PAPER

ON

KC-135 EXTERNAL OVERT/COVERT LIGHTING

1. Background. Current KC-135 exterior lighting does not meet Military Specification (MILSPEC) illumination standards. This deficiency has been highlighted during ground testing conducted by Air Force Research Lab (AFRL). By replacing the existing incandescent lighting with updated Light Emitting Diode (LED) lighting, the KC-135 combat and peacetime operations benefit in three areas: safety, survivability, and sustainability. LED lighting increases safety margins by providing significantly better aircraft visual acquisition during ground and airborne operations. The covert mode will allow KC-135 crews the ability to comply with theater requirements while allowing friendly forces using night vision devices to see the aircraft. Covert lighting drastically reduces the potential of a mid-air collision which has been highlighted as a safety concern during night operations in theater. The upgraded lighting will increase Mean Time Between Failures (MTBF) from 40 to 60 hours for incandescent bulbs to over 10,000 hours with LEDs. This significant increase in MTBF will reduce supply costs and decrease maintenance requirements.

2. Requirement. Air Mobility Command **(**AMC) Requirements and Planning Council ranked external overt/covert lighting as #23 out of 34 at the 2010 Executive Session. AF Form 1067 with AMC tracking number 10-044.

3. Impact If Not Funded. Aircraft are vulnerable to mid-air collisions in blacked-out conditions where covert lighting would make them visible to friendly forces utilizing night vision devices. The deficient lighting also creates safety hazards in day and night operations.

4. Units Impacted.

101 ARW	Bangor IAP, ME	128 ARW	Milwaukee IAP, WI	157 ARW	Pease ANGB, NH
108 ARW	McGuire AFB, NJ	134 ARW	Knoxville APT, TN	161 ARW	Phoenix IAP, AZ
117 ARW	Birmingham APT, AL	141 ARW	Fairchild AFB, WA	168 ARW	Eielson AFB, AK
121 ARW	Rickenbacker ANGB, OH	151 ARW	Salt Lake IAP, UT	171 ARW	Pittsburgh IAP, PA
126 ARW	Scott AFB, IL	154 WG	Hickam AFB, HI	185 ARW	Sioux City IAP, IA
127 WG	Selfridge, MI	155 ARW	Lincoln MAP, NE	190 ARW	Forbes FLD, KS

5. Contractors. Support Systems Associates, Inc., Melbourne, FL; Air Force Research Lab, Mesa, AZ.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE (3600)	**N/A**	**$1,000,000**
190 Kits (3010)	**$70,000 ***	**$13,300,000**
Total		**$14,300,000**

* Cost for initial test kit.

Logistics

- **Homeland Defense**
- **Provide agile and responsive forces**
- **Viability through modernization**

The Air National Guard (ANG) has a rich history in defending and protecting America's interests at home and abroad. From humble beginnings the Air National Guard has evolved into a force that delivers one third of the Air Force's combat power and nearly one-third of the nation's airlift capability. The contributions of our citizen Airmen are without equal and provide both the State Governors and combatant commanders with a highly skilled, professional, and flexible force. Air National Guard maintenance personnel from the 54 states, territories and the District Colombia, representing 83 flying organizations, generated 320,956 flying hours in support of state missions and Operations IRAQI FREEDOM and ENDURING FREEDOM. The ANG is committed to modernization and recapitalization required to keep our forces "Guarding America" and "Defending Freedom." With limited resources, the capabilities based process focuses on modernizing and recapitalizing our aircraft and equipment to protect our Homeland, fight the Global War on Terrorism, and transform capabilities to meet future needs.

Logistics
2010 Weapons and Tactics Conference

Critical Combat Capabilities List

- C-130 Isochronal Inspection Stands
- E-8/Airlift Ground Air Conditioners
- Multiple Mission Design Series (MDS) Leak Detection Capability
- SATCOM Radio Support Capability
- Multiple Fighter MDS Armament Tester

Essential Capabilities List

- Thermal Imaging Detection Capability
- Flight Line Shelters
- F-15 Towed Decoy Replacement
- Certified Digital X-Ray Capability
- Ruggedized/Replacement E-Tools Laptops
- A-10 Fuel Quantity Calibration Tester
- Fall Restraint Equipment
- TTU-205 Tester Replacement
- F-22 COLT Tester Replacement (Armament)
- KC-135 Covert Lighting for Ground Operations
- Diesel Cabin Pressure Tester with Digital Readout
- On-Board Oxygen Generating System
- MQ-1/MQ-9 Ground Control Station (GCS) Uninterruptable Power Supply
- Rapid Deployment GCS for MQ-1/MQ-9
- Airlift-Loadable MQ-1 Container
- Occupational Safety/Health Standards Cold Weather Gear Compliant for Aviation Gas Use

Desired Capabilities List

- Replacement Advanced Identification Friend or Foe Antennae Covers
- Replacement HH-60 Fuel Control Unit
- Replacement HH-60 Vertical Instrument Display Tester
- Replacement F-16 Digital Fuel Quantity Control Unit
- C-130H Replacement Battery
- Inflatable Aircraft Shelters
- Automated/Space-Saver Tool Storage
- Built-in-Hanger Aircraft Hydraulics
- F-15 Multiplex Bus Tester
- A-10 Improved Avionics Intermediate Shop Interface
- Aircraft Leading Edge Protective Coatings/Covers
- Hydraulic Fluid Purification System
- Wire Illuminator Add-On for Electronic Technical Orders
- Ground Operation Wireless Intercom
- Airborne Wireless Intercom for Rescue Missions
- Electric/Alternative Fuel Jammers
- MQ-1 Tie-Downs

LOGISTICS EXECUTIVE SUMMARY

Modernization Funding Profiles ($ Million)

Program	P.E. Number	2012	2013	2014	2014	2016	Total
C-130 Isochronal Inspection Stands	401115F	$2.50 [2]	$2.25 [2]	$2.25 [2]	$1.00 [2]	-	$8.00
E-8C Airlift Ground Air Conditioners	027581F	$0.50 [1] $1.60 [4]	$0.50 [1] -	$0.50 [1] -	- -	- -	$3.15
Multiple Mission Design Series Leak Detection Capability	207133F	$0.65 [4]	-	-	-	-	$0.65
Satellite Communication Radio Support Capability	207133F	$1.60 [4]	$1.56 [4]	-	-	-	$3.16
Multiple Mission Design Series Armament Tester for Fighter and Attack Aircraft	207133F	$2.00 [2]	$2.00 [2]	$1.60 [2]	-	-	$5.60

Notes: [1] 3840 Appropriation [2] 3010 Appropriation [3] 3600 Appropriation [4] 3080 Appropriation

- C-130 Isochronal Inspection Stands - Used to perform scheduled maintenance in hard to reach places of the aircraft.
- E-8C Airlift Ground Air Conditioner - Provides ground cooling air to the interior of the aircraft prior to launch and before the aircraft environmental system is activated.
- Multiple Mission Design Series (MDS) Leak Detection Capability - Leak detectors will be used to improve troubleshooting capabilities of any pressurized aircraft system.
- Satellite Communication Radio Support Capability - Equipment will provide troubleshooting capability for advanced aircraft radio frequency systems.
- Multiple Mission Design Series (MDS) Armament Tester for Fighter and Attack Aircraft - Used to complete follow on armament system maintenance and to verify system operation prior to munitions loading.

INFORMATION PAPER

ON

C-130 ISOCHRONAL INSPECTION STANDS

1. Background. C-130 Isochronal (ISO) inspection maintenance stands no longer meet new AF OSH or Occupational Safety and Health Administration (OSHA) fall protection standards of eight (8) feet. Additionally, many stands currently in use require frequent maintenance to keep them usable. Many of these stands are 40+ years old and are still critical to accomplishing periodic inspection requirements.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC; elevated work stands must meet OSHA standards found in 29 CFR 1910 Subpart D.

3. Impact If Not Funded. Current stands do not comply with federal or Air Force safety requirements, which is the number one concern with aging stands. They require frequent and time-consuming maintenance efforts that are re-directed from aircraft-specific tasks. Units continue to accept and manage risks required to keep aircraft flowing through the inspection process. Established work-arounds delay production, effectively double inspection times, and negatively impact aircraft availability. New stands will alleviate this unneeded risk mitigation issue and allow maintainers to re-focus energy on aircraft-specific tasks.

4. Units Impacted.

106 RQG	Suffolk, NY	133 AW	Minneapolis, MN	165 AW	Savannah, GA
109 AW	Schenectady, NY	139 AW	Saint Joseph, MO	166 AW	Wilmington APT, DE
118 AW	Nashville, TN	145 AW	Charlotte IAP, NC	182 AW	Peoria APT, IL
123 AW	Louisville, KY	152 AW	Reno IAP, NV	189 AW	Little Rock AFB, AR
129 RQG	Moffet, CA	153 AW	Cheyenne MAP, WY		
130 AW	Charleston, WV	156 AW	San Juan, PR		

5. Contractors. KWD Manufacturing, San Antonio, TX.

6. Cost.

Units Required	Unit Cost	Program Cost
16 ISO Inspection Stands (3010)	**$500,000**	**$8,000,000**

INFORMATION PAPER

ON

E-8C AIRLIFT GROUND AIR CONDITIONER

1. Background. Current Aerospace Ground Equipment (AGE) used to cool the E-8C Prime Mission Equipment (PME) during ground operations, to include maintenance actions and flight preparation, is inadequate in the high temperature environment encountered in its deployed location. The deficiency is most acute in the summer months when temperatures reach their extremes, nearing 140° F. These deficiencies are documented in Northrop Grumman Corporation Field Service Engineering Reports (06-179 and 08-269) and in a report from the 751 Electronics System Group dated Aug 09. While the AGE System Program Office (SPO) is in the process of sourcing a replacement to the air conditioning equipment currently in use, the Program Manager does not expect it to be fielded until 2014 at best. Procurement of an immediately available alternative is necessary to sustain E-8C deployed operations until such time as the SPO's permanent solution is fielded. This alternative system must provide the ability to operate PME in 140° F conditions for indefinite periods of time, allowing for ground maintenance, a full operations preflight, and uninterrupted transition from operational checks to flight operations.

2. Requirement. Joint Surveillance and Target Attack Radar System (JSTARS) Operational Requirements Document (ORD) - Rev 5, 28 Dec 04, Paragraph 4.c.3.d.2; 379 Air Expeditionary Wing (AEW)/CC memorandum dated 13 Nov 09.

3. Impact If Not Funded. If a more capable system is not fielded that provides the ability to complete ground maintenance, a full operations preflight, and uninterrupted transition from operational checks to flight operations, deployed JSTARS mission effectiveness will continue to be significantly degraded during the warmer months. Continued restrictions to the relatively cooler night hours for maintenance personnel working discrepancies will drive longer fix rates, reducing aircraft availability. Sustained inability to fully functional check the PME on the ground prior to takeoff will continue to lead to a high number of ground and air aborts, resulting in lost station time during warmer months.

4. Units Impacted.
116 ACW Robins AFB, GA

5. Contractors. HDT (formerly Nordic Air), Geneva, OH.

6. Cost.

Units Required	Unit Cost	Program Cost
3 Cooling Cart (3080)	**$550,000**	**$1,650,000**
3 FSR Support (3840) *	**$500,000**	**$1,500,000**
Total		**$3,150,000**

* Cost is for 6 months of deployed Field Service Representative (FSR) support per year to cover the warmer months. Requirement for 3 years of support is anticipated.

INFORMATION PAPER

ON

MULTIPLE MISSION DESIGN SERIES (MDS) LEAK DETECTION CAPABILITY

1. Background. Current cabin/cockpit pressurization troubleshooting procedures often employ ineffective and time-consuming methods to find leaks, such as using soap and water to detect bubbles, human senses such as touch or hearing, and running plastic bags over suspect areas. These procedures often become more of an art than qualified maintenance procedures and lead to long down times. Due to the inefficient leak detection methods currently employed, maintainers often fall into a cycle of fix a leak, perform operational checks in accordance with technical guidance, find another leak in the same area, repair it, and repeat the steps. Operational checks often fail and the same process is repeated several times. The decision to stop troubleshooting is determined by whether or not the aircraft passes its pressurization checks in accordance with technical data, not necessarily if all leaks are found and repaired. Evolving ultrasonic technology used in the CTRL UL101 ultrasonic leak detector allows more effective and efficient detection than the current find-fix-find technology. The United States Army (USA), United States Navy (USN), and National Aeronautics and Space Administration (NASA) have approved CTRL UL101 ultrasonic leak detectors for numerous troubleshooting procedures, including cabin/cockpit and bleed air leaks on the T-38C, AV-8, various C-130s (both USAF and USN), F-35, P-3, F-16 (USN owned), F-15, and UH-60 aircraft. In addition, both the USA and USN use the UL101 to detect if a valve, solenoid, or relay is functioning properly, and also to determine the condition of bearings, pumps, and gears (lubed, dry, or normal) by the sounds generated while troubleshooting with the UL101. Air National Guard and Air Force Reserve Command Test Center (AATC) capability demonstrations conducted on several platforms over the past year have resulted in System Program Office recommendations for use of the CTRL UL101 on A-10, F-15, C-130, C-5, C-17, and F-35 aircraft.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC.

3. Impact If Not Funded. Continued lengthy troubleshooting times for cabin/cockpit leak detection resulting in reduced aircraft availability.

4. Units Impacted. All ANG flying units.

5. Contractors. CTRL Systems, Westminster, MD.

6. Cost.

Units Required *	Unit Cost	Program Cost
83 Ultrasonic Leak Detectors (3010)	**$7,832**	**$650,000**

* Includes spares and training.

INFORMATION PAPER

ON

SATELLITE COMMUNICATION RADIO SUPPORT CAPABILITY

1. Background. In 2009 the A-10 and F-16 System Program Offices (SPO) fielded a satellite communication (SATCOM) capable ARC-210 radio system for Air National Guard (ANG) and Air Force Reserve Command aircraft. This fielding was in response to a United States Central Command Urgent Need Request for an A-10/F-16 robust, frequency-selectable line-of-sight and beyond line-of-sight secure communications capability. Subsequently, similar combatant commander requirements to add SATCOM radio capabilities have been levied against other Air Reserve Component Mission Design and Series (MDS) aircraft. SATCOM radio systems, including the ARC-210, were tested and fielded without immediate consideration for maintainability and sustainability. There is currently no fielded test equipment available for ground testing or troubleshooting specific SATCOM functionality on recently-acquired radio systems on aircraft other than the A-10, however, that tester could be adapted for use on any SATCOM equipped MDS.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC.

3. Impact If Not Funded. Without SATCOM radio test capability, maintainers are unable to test, troubleshoot, or repair the new SATCOM radio systems currently installed on ARC aircraft. Maintainers also have very limited on-station ability to perform operational checks at home station prior to deploying or for training to meet specific unit tasking for future deployments.

4. Units Impacted. All current and future ANG SATCOM equipped units.

5. Contractors. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
176 Testers (2 per unit) (3010)	**$17,955**	**$3,160,000**

INFORMATION PAPER

ON

MULTIPLE MISSION DESIGN SERIES (MDS) ARMAMENT TESTER FOR FIGHTER AND ATTACK AIRCRAFT

1. Background. The Air National Guard (ANG) armament community is faced with maintaining aging aircraft systems with equally antiquated support equipment. The existing equipment is rapidly approaching the point of being unsustainable and uneconomical to repair. These points are compounded by a diminishing source of supply as original manufacturers disappear. Even if the sustainability issue was resolved, legacy testers are marginally capable of testing advanced armament systems and munitions associated with aircraft modernization efforts designed to increase combat capability. The tester needs to be a non-MDS specific Common Armament Tester with the capability for expansion to future munitions and 5th generation fighters.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC.

3. Impact If Not Funded. Current testers used on the A-10C, F-15 C/D and F-16 are 20 to 30 years old. The ability to combine numerous legacy testers into a more reliable and deployable tester is paramount to the sustainment of existing combat aircraft. Failure to field a common armament tester will negatively impact fighter aircraft availability and the ANG's ability to respond to Combatant Commander tasking in various Areas of Responsibility.

4. Units Impacted. All ANG Combat Air Force units.

5. Contractor. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
28 Common Armament Testers (3010)	**$200,000**	**$5,600,000**

Manned ISR

- **Intelligence Surveillance and Reconnaissance (ISR)**
- **Multi-Discipline Intelligence Collection**

The U.S. intelligence community calls upon Air National Guard (ANG) airborne manned reconnaissance assets to fill critical ISR requirements. These ANG resources for ISR operations are called upon to support Combatant Commanders (COCOM) in their Areas of Responsibility (AORs) for Overseas Contingency Operations (OCO).

C-130 SENIOR SCOUT

Senior Scout provides the USAF's premiere, medium altitude, signals intelligence capability supporting Army, Marines, and Special Forces. The program requires critical system upgrades to ensure continued direct tactical support to troops-in-contact. Senior Scout is operated by the 169th Intelligence Squadron (UT ANG) and can be carried on any C-130E/H/H1/H2/H3 model aircraft.

RC-26B CONDOR

The RC-26B is the preferred manned ISR platform providing day and night full motion video for ISR requirements with two aircraft versions (Block 20, 25). The RC-26B is a Limited Supply, High Demand (LS/HD) platform that operates both CONUS and OCONUS. For Overseas Contingency Operations (OCO), it supports a variety of COCOMs to include U.S. Central Command and U.S. Special Operations Command. All modernization capabilities will move toward a common aircraft configuration (Block 30), and better equip the platform with net-centric capabilities mandated by the battle space environment. Eleven aircraft are attached to eleven units from three commands (ACC, AMC, AETC) throughout the United States (AL, AZ, CA, FL, MS, NM, NY, TX, WA, WI, and WV), and one provisional training unit currently operated for OCO training.

Manned Intelligence, Surveillance, and Reconnaissance (ISR)
2010 Weapons and Tactics Conference

Critical Combat Capabilities List

RC-26B
- Block 30 Fleet Modernization
- Increased On-Board Electrical Generator Capacity
- Modernized Self-Protection System
- High Fidelity Flight Deck and Mission Crew Trainers (Simulators)

Senior Scout
- J-Model Certification and Kits
- Super High Frequency (SH) Tuners
- Radio Frequency Detection (RFD) Enhancements
- Receiver Modernization
- Blue Force Tracker Upgrade

Essential Capabilities List

RC-26B
- Next Generation LOS FMV/Data Downlink
- Additional Sensor Capability (Synthetic Aperture Radar (SAR), Ground Moving Target Indicator (GMTI), Hyper Spectral, Signals Intelligence)

Senior Scout
- Wide Bandwidth Data Link Management
- Streaming Playback
- Automated Ground Analysis

Desired Capabilities List

RC-26B
- Weapons Capability
- High Efficiency Winglets
- Composite High Performance Propellers

Senior Scout
- Near Real-Time (NRT) Collection Metadata Analysis
- Ku Band BLOS Graphic User Interface (GUI) Upgrade
- Background Spectral Search

MANNED INTELLIGENCE, SURVEILLANCE AND RECONNAISSANCE (ISR) EXECUTIVE SUMMARY

Modernization Funding Profiles ($ Million)

Program	P.E. Number	2012	20113	2014	2015	2016	Total
RC-26B							
RC-26B Block 30 Modernization	502889F	$19.50 [2]	$11.30 [2]	$10.40 [2]	$0.30 [2]	-	$41.50
RC-26B Increased Onboard Electrical Generator Capacity	502889F	$2.25 [2]	-	-	-	-	$2.25
RC-26 Modernized Self-Protection System	502889F	$2.94 [2]	-	-	-	-	$2.94
Senior Scout							
C-130 J-Model Certification and Kits	053115F	$6.20 [2]	- -	- -	- -	- -	$6.20
Senior Scout Super High Frequency Tuners	053115F	$5.25 [2]	- -	- -	- -	- -	$5.25
Senior Scout Radio Frequency Distribution Enhancements	053115F	$2.72 [2] $2.20 [3]	-	-	-	-	$4.92
Senior Scout Receiver Modernization	053115F	$1.72 [2] $2.61 [3]	-	-	-	-	$4.33
Senior Scout Blue Force Tracking	053115F	$3.42 [2]	- -	- -	- -	- -	$3.42

Notes: [1] 3840 Appropriation [2] 3010 Appropriation [3] 3600 Appropriation [4] 3080 Appropriation

- RC-26B Block 30 Modernization - Replacement of obsolete and unsustainable Mission Management Systems, Avionics and Mission Communications. Provides sustainability for the Weapon System to meet all mission requirements, and provides a common aircraft configuration.
- RC-26B Increased Onboard Electrical Generator Capacity - Generators currently operate at maximum capacity for aircraft and mission systems. More electrical power will allow a safety margin and allow accommodation of additional mission equipment and sensor capability.
- RC-26B Modernized Self-Protection System (SPS) - The current system is not supportable. A new system will provide sustainability and enhance missile detection in all threat environments.
- C-130 J-Model Certification and Kits - Provides C-130J model certification and kits, increasing MAF aircraft availability for Senior Scout support.

- Senior Scout Super High Frequency (SHF) Tuners - Provides Senior Scout with optimized collection in the SHF band. Provides high performance capability for computer controlled search and exploitation modes.
- Senior Scout Radio Frequency Distribution (RFD) Enhancements - Expands RFD to support multiple simultaneous receivers in order for operators to collect and prosecute against non-traditional signals in the current operational threat environment.
- Senior Scout Receiver Modernization - Provides Senior Scout with improved COMINT capability to search for, detect and characterize new low power conventional and spread spectrum radio signals at extended stand-off ranges in the presence of interference.
- Senior Scout Blue Force Tracking - Allows Senior Scout operators to discern blue forces and hostile forces during ongoing combat operations.

INFORMATION PAPER

ON

RC-26B BLOCK 30 MODERNIZATION

1. Background. The RC-26B is a Limited Supply High Demand (LS/HD) manned Intelligence, Surveillance, and Reconnaissance (ISR) aircraft that collects critical intelligence for the warfighter. The aircraft suffers from two disparate aircraft configurations, the Block 20 (domestic) and Block 25(overseas). Both contain obsolete and unsustainable Mission Management Systems (MMS), avionics and mission communications (MC). Two configurations make aircrew training and currency problematic limiting mission effectiveness and crew utilization. Moreover, these legacy systems are unable to integrate with the current battle space environment and are continually at risk of being non-mission capable due to age, technical insufficiencies, and lack of spares. The MMS must be able to integrate with currently fielded digital combat sensors, communications equipment and future technologies. The avionics and MCs are not Communication Navigation Surveillance/Air Traffic Management (CNS/ATM) compliant which could lead to safety issues. Neither configuration transmits or receives Positive Position Locating Information (PPLI) for Situational Awareness Data Link (SADL) or Sensor Point of Interest (SPI) to the battle space network. This reduces mission effectiveness and does not allow platform-to-platform data exchange for responsive target acquisition. Block 30 modernization will ensure compliance with Federal Aviation Administration (FAA) and International Civil Aviation Organization (ICAO) regulations.

2. Impact If Not Funded. Loss of a single MMS, avionics and mission communications component will render the aircraft non-mission capable. A non-mission capable aircraft will not be able to fly and support critical intelligence requirements of current contingency operations. A system failure during operations could lead to safety issues such as Controlled Flight Into Terrain (CFIT), information incompatibility, and target misidentification and fratricide.

3. Requirement. AF Form 1067 (09 Apr 10); critical capability shortfall identified at the 2010 ARC WEPTAC.

4. Units Impacted.

115 FW	Truax, WI	144 FW	Fresno, CA	186 ARW	Meridian, MS
125 FW	Jacksonville, FL	147 FW	Ellington, TX	187 FW	Dannelly Field, AL
130 AW	Charleston, WV	150 FW	Kirtland AFB, NM	174 FW	Syracuse, NY
141 ARW	Fairchild AFB, WA	162 FW	Tucson, AZ	745 SOS (P)	Hurlburt Field, FL

5. Contractor. Prime CLS, Oklahoma City, OK.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE (3010)	**N/A**	**$2,000,000**
10 Shipset Kits (3010)	**$3,950,000**	**$39,500,000**
Total		**$41,500,000**

INFORMATION PAPER

ON

RC-26B INCREASED ONBOARD ELECTRICAL GENERATOR CAPACITY

1. Background. The RC-26B is a Limited Supply High Demand (LS/HD) manned Intelligence, Surveillance, and Reconnaissance (ISR) aircraft that collects critical intelligence for the warfighter. The existing 300 ampere generators on the RC-26B currently operate at maximum capacity within FAA requirements. This capacity is not enough to allow a safety margin and accommodate proposed modifications to mission systems, avionics and communications equipment. Additionally, the suite of sensors the RC-26B will be required to carry to support operations is continuously growing, yet there is no extra margin of electrical power to support them. Increasing the generator capacity to a minimum of 400 amperes will provide the requisite power to integrate Block 30 upgrade systems and equipment as well as additional sensors, and will significantly increase the combat capability of the fleet.

2. Impact If Not Funded. RC-26B will not be able to complete the pending Block 30 upgrade or integrate the full suite of sensors that current operations requires, thus limiting its ability to effectively support commanders, intelligence analysts, and ground forces.

3. Requirement. AF Form 1067, 09 Apr 10; critical capability shortfall identified at the 2010 ARC WEPTAC.

4. Units Impacted.

115 FW	Truax, WI	144 FW	Fresno, CA	186 ARW	Meridian, MS
125 FW	Jacksonville, FL	147 FW	Ellington, TX	187 FW	Dannelly Field, AL
130 AW	Charleston, WV	150 FW	Kirtland AFB, NM	174 FW	Syracuse, NY
141 ARW	Fairchild AFB, WA	162 FW	Tucson, AZ	745 SOS (P)	Hurlburt Field, FL

5. Contractor. Prime CLS, Oklahoma City, OK.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE (3010)	**N/A**	**$120,000**
13 Shipset Kits (3010)	**$164,000**	**$2,132,000**
Total		**$2,252,000**

INFORMATION PAPER

ON

RC-26B MODERNIZED SELF-PROTECTION SYSTEM (SPS)

1. Background. The RC-26B is a Limited Supply High Demand (LS/HD) manned Intelligence, Surveillance, and Reconnaissance (ISR) aircraft that collects critical intelligence for the warfighter. It can be tasked to operate worldwide in threat environments where Man-Portable Air Defense Systems (MANPADS) are widely available. This threat is significant during takeoff and landing. To counter MANPADS, the RC-26B requires a SPS capable of detecting and defeating missile launches. The current AAR/ALE-47 SPS is obsolete and continuously displays high false alarm rates and indications burdening aircrews with non-existent threat warnings. Additionally, components of the ALE-47 are no longer manufactured and there are no spares available. The entire fleet must be upgraded to provide acceptable probabilities of missile launch detection, reduce false alarm rates, and increase sustainability. Upgrades to the existing system include using the (v)2 configuration/processor or a more advanced missile warning system such as the AAR/ALE-57.

2. Requirement. AF Form 1067; critical capability shortfall identified at the 2010 ARC WEPTAC.

3. Impact If Not Funded. RC-26B aircrews are at risk of being shot down by MANPADS and other potential IR guided threats with no ability to detect and counter them. Aircrews may become overburdened in the cockpit by technical deficiencies and aircraft may become non-mission capable due to inoperative self-protection systems.

4. Units Impacted.

115 FW	Truax, WI	144 FW	Fresno, CA	186 ARW	Meridian, MS
125 FW	Jacksonville, FL	147 FW	Ellington, TX	187 FW	Dannelly Field, AL
130 AW	Charleston, WV	150 FW	Kirtland AFB, NM	174 FW	Syracuse, NY
141 ARW	Fairchild AFB, WA	162 FW	Tucson, AZ	745 SOS (P)	Hurlburt Field, FL

5. Contractor. Prime CLS, Oklahoma City, OK.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE (3010)	**N/A**	**$520,000**
11 Shipset Kits (3010)	**$220,000**	**$2,420,000**
Total		**$2,940,000**

INFORMATION PAPER

ON

C-130 J-MODEL SENIOR SCOUT CERTIFICATION AND KITS

1. Background. Senior Scout is an airborne tactical, low profile, Signal Intelligence (SIGINT) system consisting of a roll-on roll-off shelter that fits into a slightly modified C-130E/H providing direct tactical support to friendly ground forces. Senior Scout provides theater and national level consumers with Near Real-Time (NRT) on-scene SIGINT collection, analysis, geo-location and dissemination capabilities. Currently, available C-130 carriers for Senior Scout are limited and continue to dwindle as the Mobility Air Forces (MAF) recapitalize C-130H aircraft with C-130J models. Senior Scout must have J-model certification by Lockheed-Martin and must procure kits to install on C-130Js, thus, increasing MAF aircraft availability for Senior Scout support.

2. Requirement. Tactical Air Force (TAF) / Electronic Security Command (ESC) Statement of Need (SON) 1-83; Network Centric Collaborative Targeting (NCCT) requirements as pertains to wideband reach-back capability; Operational Requirements Document (ORD), Air Force Command and Control Intelligence, Surveillance, and Reconnaissance Center (AFC2ISRC) 002-88-I/II/III-a, 9 May 99; Capabilities Review and Risk Assessment (CRAA) issue #22, ISR Sensor Capabilities; CRAA issue #30, ISR - Characterization of Electromagnetic Environment; Integrated Priority List (IPL) #1 for CENTCOM and SOUTHCOM.

3. Impact If Not Funded. Senior Scout operations will be restricted to only C-130E/H carriers and will not have access to increasing numbers of C-130J aircraft.

4. Units Impacted.
169 IS Salt Lake City, UT

5. Contractors. Lockheed-Martin Integrated Systems and Solutions, Littleton, CO.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE (3010)	**N/A**	**$4,200,000**
10 C-130J Aircraft TCTOs (3010)	**$200,000**	**$2,000,000**
Total		**$6,200,000**

INFORMATION PAPER

ON

SENIOR SCOUT SUPER HIGH FREQUENCY (SHF) TUNERS

1. Background. Senior Scout is an airborne tactical, low profile, Signals Intelligence (SIGINT) system consisting of a roll-on roll-off shelter that fits into a slightly modified C-130E/H providing direct tactical support to the Army, Marines, and Special Operations (SOF). Senior Scout provides theater and national level consumers with Near Real-Time (NRT) on-scene SIGINT collection, analysis, geo-location and dissemination capabilities. Target Communications Intelligence (COMINT) signals of interest have expanded to frequency ranges above the traditional collection limit of 3.0 GHz. As new advance commercial communication and data systems are fielded, high priority targets are moving to utilize these new capabilities. In order to provide optimized collection in this SHF band, the Senior Scout platform requires new SHF tuners with high performance capabilities for computer controlled search and exploitation modes. This will allow Senior Scout to locate high-priority emitters in a key family of telecommunications systems for overseas operations. Computer controlled interfaces will allow these collection assets to be integrated with existing platform tool suites providing platform operators with seamless capabilities throughout the entire target radio frequency band. This effort will procure, integrate and implement these new SHF tuners into the Senior Scout systems providing operators with seamless capabilities throughout the entire target radio frequency band.

2. Requirement. Tactical Air Force (TAC) / Electronic Security Command (ESC) Statement of Need (SON) 1-83; NCCT requirements as pertains to wideband reach-back capability; Operational Requirements Document (ORD), Air Force Command and Control Intelligence, Surveillance, and Reconnaissance Center (AFC2ISRC) 002-88-I/II/III-a, 9 May 99; Capabilities Review and Risk Assessment (CRAA) issue #22, ISR Sensor Capabilities; CRAA issue #35, ISR - Processing and Exploitation to support Dynamic Targeting.

3. Impact If Not Funded. Senior Scout's ability to detect and collect against advance modern communication systems in support of high-priority intelligence requirements for overseas operations.

4. Units Impacted.
169 IS Salt Lake City, UT

5. Contractors. Lockheed-Martin Integrated Systems and Solutions, Littleton, CO.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE (3010)	**N/A**	**$2,950,000**
4 Ship Sets (B-kits, Install and Flight Test) (3010)	**$575,000**	**$2,300,000**
Total		**$5,250,000**

INFORMATION PAPER

ON

SENIOR SCOUT RADIO FREQUENCY DISTRIBUTION (RFD) ENHANCEMENTS

1. Background. Senior Scout is an airborne tactical, low profile, Signals Intelligence (SIGINT) system consisting of a roll-on roll-off shelter that fits into a slightly modified C-130E/H providing direct tactical support to friendly ground forces. Senior Scout provides theater and national level consumers with Near Real-Time (NRT) on-scene SIGINT collection, analysis, geo-location and dissemination capabilities. In order to facilitate routing the various wideband radio frequency (RF) data from the various antennas to the appropriate processing equipment, a multi-channel switch is required to perform this distribution. The current RF Distribution (RFD) switch has reached capacity and is therefore unable to accommodate any future growth. This effort will develop and integrate a new switch that has more input and output channels to accommodate planned channel expansion and future growth. The planned implementation will utilize the existing RFD switch technology but increase the number of channels by approximately 50 percent over the current switch.

2. Requirement. Tactical Air Force (TAC) / Electronic Security Command (ESC) Statement of Need (SON) 1-83; NCCT requirements as pertains to wideband reach-back capability; Operational Requirements Document (ORD), Air Force Command and Control Intelligence, Surveillance, and Reconnaissance Center (AFC2ISRC) 002-88-I/II/III-a, 9 May 99; Capabilities Review and Risk Assessment (CRAA) issue #6, Force Application Platform Survivability; CRAA issue #35, ISR - Processing and Exploitation to Support Dynamic Targeting; Integrated Priority List (IPL) #1 for CENTCOM and SOUTHCOM.

3. Impact If Not Funded. Senior Scouts ability to collect against High Value Targets (HVTs) in theaters of operation as they move to new communications capabilities will be limited.

4. Units Impacted.
169 IS Salt Lake City, UT

5. Contractors. Lockheed-Martin Integrated Systems and Solutions, Littleton, CO.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE (3600)	**N/A**	**$2,200,000**
4 Ship Sets (B-Kits, Install, and Flight Test) (3010)	**$680,000**	**$2,720,000**
Total		**$4,920,000**

INFORMATION PAPER

ON

SENIOR SCOUT RECEIVER MODERNIZATION

1. Background. Senior Scout is an airborne tactical, low profile, Signals Intelligence (SIGINT) system consisting of a roll-on roll-off shelter that fits into a slightly modified C-130E/H providing direct tactical support to friendly ground forces. Senior Scout provides theater and national level consumers with Near Real-Time (NRT) on-scene SIGINT collection, analysis, geo-location and dissemination capabilities. There is an immediate need to add improved Communication Intelligence (COMINT) capability to search for, detect and characterize new and modern low power conventional and spread spectrum radio signals at extended stand-off ranges in the presence of interference. The current systems are not able to detect these specific signal sets, which limits intelligence collection capabilities. The effort will provide a single, small form factor, airborne unit which can detect and characterize the UHF / VHF, low power modern signals resulting in a system that can be directly extended to perform carrier demodulation and exploitation of these modern signals.

2. Requirement. Tactical Air Force (TAF) / Electronic Security Command (ESC) Statement of Need (SON) 1-83; Network Centric Collaborative Targeting (NCCT) requirements as pertains to wideband reach-back capability; Operational Requirements Document (ORD), Air Force Command and Control Intelligence, Surveillance, and Reconnaissance Center (AFC2ISRC) 002-88-I/II/III-a, 9 May 99; Capabilities Review and Risk Assessment (CRAA) issue #22, ISR Sensor Capabilities, CRAA issue #30, ISR - Characterization of Electromagnetic Environment; Integrated Priority List (IPL) #1 for CENTCOM and SOUTHCOM.

3. Impact If Not Funded. To maximize its operational effectiveness, Senior Scout requires enhanced COMINT capability to detect multiple, low power emitters at extended stand-off ranges. Without this capability, the AF's ability to detect and collect advance modern communication system will be limited.

4. Units Impacted.
169 IS Salt Lake City, UT

5. Contractors. Lockheed-Martin Integrated Systems and Solutions, Littleton, CO.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE (3600)	**N/A**	**$2,610,000**
4 Ship Sets (B-Kits, Install, and Flight Test) (3010)	**$430,000**	**$1,720,000**
Total		**$4,330,000**

INFORMATION PAPER

ON

SENIOR SCOUT BLUE FORCE TRACKING

1. Background. Senior Scout is an Airborne tactical, low profile, Signal Intelligence (SIGINT) system consisting of a roll-on roll-off "shelter" that fits into a slightly modified C-130H providing direct tactical support to the Army, Marines, and SOF. Senior Scout provides theater and national level consumers with Near Real-Time (NRT) on-scene SIGINT collection, analysis, geo-location and dissemination capabilities. The Blue Force Tracking capability will allow Senior Scout operators to discern blue forces and hostile forces during ongoing combat operations. As new advance friendly force tracking systems are fielded, Senior Scout operators are constrained in their ability to provide adequate force protection information to troops on the battlefield. In order to provide optimized support to the supported military forces, the Senior Scout platform requires new Blue Force Tracker collection subsystems with high performance capabilities for computer controlled search in order to determine location of sources. Computer controlled interfaces will allow these collection assets to be integrated with existing platform tool suites providing platform operators with seamless capabilities. This effort will procure, integrate and implement the new Blue Force Tracker subsystem into the Senior Scout shelters.

2. Requirement. Tactical Air Force (TAC)/Electronic Security Command (ESC) Statement of Need (SON) 1-83; NCCT requirements as pertains to wideband reach-back capability; Operational Requirements Document (ORD), Air Force Command and Control Intelligence, Surveillance, and Reconnaissance Center (AFC2ISRC) 002-88-I/II/III-a, 9 May 99; Capabilities Review and Risk Assessment (CRAA) issue #22, ISR Sensor Capabilities; CRAA issue #35, ISR - Processing and Exploitation to Support Dynamic Targeting.

3. Impact If Not Funded. Senior Scouts ability to detect and track friendly forces in relationship to the threat environment will be limited.

4. Units Impacted.
169 IS Salt Lake City, UT

5. Contractors. Lockheed-Martin Integrated Systems and Solutions, Littleton, CO.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE (3010)	**N/A**	**$1,260,000**
4 B-Kits, Install and Flight Test (3010)	**$540,000**	**$2,160,000**
Total		**$3,420,000**

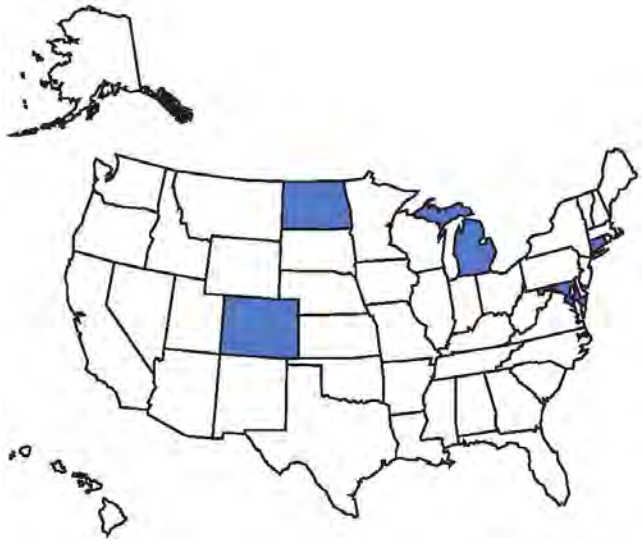
Operational Support Aircraft (OSA)

- **Provides Special Mission Transportation of Distinguished Visitors**

The ANG supports special missions including Distinguished Visitor (DV) transportation. The ANG's Operational Support Aircraft (OSA) include the C-40C and C-38A flown by the D.C. Air Guard's 201st Airlift Squadron (AS), Andrews AFB, MD and the C-21A flown by the 200 AS, Colorado Springs, CO; the 119th Wing, Fargo, ND; the 103d Airlift Wing, Bradley, CT; and the 110th Airlift Wing, Battle Creek, MI. The 201 AS provides worldwide DV transportation for Congressional, DoD, Air Force and National Guard travel missions. The primary mission of all OSA aircraft is to ensure passenger safety and comfort while providing the utmost in reliability. The ANG modernization effort will continue to focus on keeping these aircraft modern and safe.

Since the ANG began the C-40C mission, demand has increased significantly. In order to improve service and increase mission availability an additional C-40C aircraft is required.

The C-38A was originally acquired to support CONUS operations; however, the evolution of National Guard OCONUS commitments has driven a fundamental mission change. The two C-38As lack the range and reliability to meet new mission requirements and need to be replaced. A capabilities based assessment determined that the best course of action was to replace the C-38As with C-37Bs.



Operational Support Aircraft
2010 Weapons and Tactics Conference

Critical Combat Capabilities List

- C-38A Replacement Aircraft
- C-40C Procurement
- C-40C High Speed Data, Onboard Internet Capability
- C-40C Avionics Upgrades
- C-40C Electronic Flight Bag

Essential Combat Capability

- None

Desired Combat Capability

- None

OPERATIONAL SUPPORT AIRCRAFT EXECUTIVE SUMMARY

Modernization Funding Profiles ($ Million)

Program	PE Number	2012	2013	2014	2015	2016	Total
C-38A Replacement Aircraft Program	0401314F	$59.00 [2]	$62.00 [2]	$65.10 [2]	$68.26 [2]	-	$254.36
C-40C Procurement	0401314F	$98.00 [2]	-	-	-	-	$98.00
C-40C High Speed Data	0401314F	$6.00 [2]	$4.00 [2]	-	-	-	$10.00
C-40C Avionics Upgrades	0401314F	$2.30 [2]	-	-	-	-	$2.30
C-40C Electronic Flight Bag	0401314F	$0.58 [2]	-	-	-	-	$0.58

Notes: [1] 3840 Appropriation [2] 3010 Appropriation [3] 3600 Appropriation [4] 3080 Appropriation

- C-38A Replacement Aircraft Program - Replaces existing C-38 aircraft with longer range aircraft to support evolving worldwide Congressional and DoD missions.
- C-40C Procurement - Completes the requirement for the C-40C aircraft in the ANG. This aircraft supports worldwide Congressional, DoD, Air Force, and National Guard Distinguished Visitor (DV) support missions.
- C-40C High Speed Data (HSD) - Allows the DVs and their staffs traveling on the C-40C the ability to conduct time-critical business via internet, e-mail, and phone while airborne.
- C-40C Avionics Upgrades - Adds numerous avionics enhancements which will ensure compliance with future FAA / ICAO equipment requirements necessary to fly in US and European airspace, and also allow for greater flexibility and mission success.
- C-40C Electronic Flight Bag (EFB) - Adds an electronic information management device that helps to improve situational awareness, cockpit efficiency, productivity, and most important, allows aircrews to safely adapt to in-flight mission changes.

INFORMATION PAPER

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C-38A REPLACEMENT AIRCRAFT PROGRAM

1. Background. A C-38A replacement aircraft is required to support the existing Distinguished Visitor (DV) transportation fleet at the 201st Airlift Squadron (AS), Andrews AFB. The unit supports Congressional members and Delegation (CODEL), Executive Branch, Department of Defense, Air Force, and National Guard travel missions worldwide. Current requirements call for four small DV support aircraft. The 201 AS currently operates only two C-38A aircraft. Replacing the C-38As addresses several operational shortfalls and significantly improves the mission capability. The replacement aircraft will extend the non-stop range of the aircraft well into European airspace and complement the existing larger C-40Cs for smaller contingents. This capability eliminates time-consuming enroute refueling stops and decreases extended duty days for passengers and aircrews. In addition to the lack of range, the C-38A has a poor reliability rate. It has most recently exhibited a 63% mission capable rate which is unacceptable for aircraft in the DV transportation arena.

2. Requirement. Air Mobility Command Operational Requirements Document (ORD) 000-90 dated 12 June 1995 modified 3 May 1996. NGB Mission Need Statement (MNS) 002-94 and NGB Operational Requirements Document (ORD) 002-94 dated 24 July 1994.

3. Impact If Not Funded. The unit is currently operating with only two short range aircraft to fulfill taskings. Requests for support are unfilled because the current aircraft are tasked or don't have the range to complete the mission. A replacement aircraft close mission capability gaps by extending range and increasing mission readiness. Without additional aircraft, the ANG assets will remain over tasked and unable to effectively accomplish the unit's primary mission.

4. Unit Impacted.
201 AS Andrews AFB, MD

5. Contractor. Bombardier, Montreal, Quebec, Canada; Gulfstream, Savannah, GA.

6. Cost.

Units Required	Unit Cost	Program Cost
4 Replacement Aircraft (3010)	**$63,590,000 ***	**$254,360,000**

* Based on the average of FY12-FY15 costs beginning with $59M and increasing 5% per year.

INFORMATION PAPER

ON

C-40C PROCUREMENT

1. Background. The 201st Airlift Squadron (AS), District of Columbia Air National Guard (ANG) provides worldwide air transportation for Congressional Members and Delegations (CODEL), the Executive Branch, Department of Defense (DoD) officials, high-ranking U.S. and foreign dignitaries and HQ USAF inspection team travel. The 201st AS currently operates three C-40Cs (military modified Boeing 737 Boeing Business Jets (BBJ)). The ANG is one aircraft short of meeting operational requirements. A fourth aircraft will significantly improve fleet readiness and reliability. Scheduled maintenance reduces unit capability and if unscheduled maintenance actions ground additional aircraft there is a good chance that flights will be cancelled. An additional aircraft allows the unit to overlap schedules and significantly improves aircraft availability. Another aircraft is required in order to increase airlift capability, reliability and support additional airlift requests.

2. Requirement. Mission Need Statement (MNS) NGB 001-97 dated 10 Jun 97 and ANG Operational Requirements Document (ORD) 002-02 dated 19 Feb 04.

3. Impact If Not Funded. Not funding a fourth aircraft will significantly impact aircraft availability, mission readiness, and will impact the unit's ability to meet all Congressional taskings.

4. Unit Impacted:
201 AS Andrews AFB, MD

5. Contractor. Boeing Commercial Airplane Company, Seattle, WA.

6. Cost.

Units Required	Unit Cost	Program Cost
C-40C Aircraft (3010)	**$98,000,000**	**$98,000,000**

INFORMATION PAPER

ON

C-40C HIGH SPEED DATA (HSD)

1. Background. The 201s^{t} Airlift Squadron utilizes the C-40C to provide worldwide air transportation to Congressional Members and Delegations (CODEL), the Executive Branch, Department of Defense (DoD) officials and high-ranking U.S. and foreign dignitaries. The changing technological landscape has re-defined the equipment and the tools necessary to effectively conduct business in today's corporate/government environment. The distinguished visitors and their staffs traveling on the C-40C require the ability to conduct time critical unclassified business via internet, e-mail, and phone while airborne.

2. Requirement. Air National Guard (ANG) Operational Requirements Document (ORD) 002-02 dated 19 Feb 04. AMC Requirements and Planning Council (R&PC) requirements matrix, July 2010. ANG sponsored AF Form 1067 submitted to AMC.

3. Impact If Not Funded. Although the unit currently provides excellent service to the DV traveler and his/her staff, it does not meet their technological needs for effectively conducting business while airborne. Not funding this capability will significantly impact the unit's ability to provide an adequate airborne work environment, thus negatively impacting the DV and his/her staff.

4. Units Impacted.
201 AS Andrews AFB, MD

5. Contractor. Rockwell Collins, Cedar Rapids, IA; PentaStar Aviation, Waterford, MI; EMS Satcom, Kanata, Ontario, Canada; ViaSat, Carlsbad, CA.

6. Cost.

Units Required	Unit Cost	Program Cost
Supplemental Type Certificate (STC) (3010)	**N/A**	**$4,000,000**
3 High Speed Data Systems (3010)	**$2,000,000**	**$6,000,000**
Total		**$10,000,000**

INFORMATION PAPER

ON

C-40C AVIONICS UPGRADES

1. Background. The Air National Guard (ANG) Operational Requirements Document (ORD) 002-02 specifies that the avionics and flight deck configurations of the C-40B/C fleet be of a common configuration. The ANG C-40C aircraft are lacking numerous hardware and software items to establish a common configuration with the newer AFRC C-40C aircraft. Some of the items requiring upgrades are the Flight Management Computers (FMC), the TCAS II processors, and the VHF Data Link/Mode 2 system. This list is not all encompassing, but lists the major items needing upgrades. Not only are these changes necessary to ensure fleet commonality, they will ensure compliance with future FAA / ICAO equipment requirements necessary to fly in US and European airspace, and also allow for greater flexibility and mission success.

2. Requirement. ANG Operational Requirements Document (ORD) 002-02 dated 19 Feb 04. AMC Requirements and Planning Council (R&PC) requirements matrix, July 2010. AF Forms 1067 with AMC tracking numbers 10-138 and 10-139.

3. Impact If Not Funded. Not upgrading the avionics will ensure non-compliance with future FAA/ICAO equipment requirements and may adversely affect successful mission accomplishment.

4. Units Impacted.
201 AS Andrews AFB, MD

5. Contractor. Boeing Commercial Airplane Company, Seattle, WA.

6. Cost.

Units Required	Unit Cost	Program Cost
3 Avionics Standardization (3010)	**$367,000**	**$1,101,000**
3 VHF Data Link/Mode 2 (3010)	**$400,000**	**$1,200,000**
Total		**$2,300,000**

INFORMATION PAPER

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C-40C ELECTRONIC FLIGHT BAG (EFB)

1. Background. The definition of an EFB, according to the Federal Aviation Administration's (FAA) Advisory Circular (AC No. 120-76A), is "an electronic display system intended primarily for cockpit / flight deck or cabin use. EFB devices can display a variety of aviation data or perform basic calculations." In short, an EFB is an electronic information management device that helps to improve situational awareness, cockpit efficiency, productivity, and safety. They typically consist of a screen and a control unit that may be installed, mounted or contained in one sole portable unit. EFBs can electronically store and retrieve documents required for flight operations, such as Technical Orders (TOs), Air Force Instructions (AFIs), Flight Operations Manual (FOM), Minimum Equipment Lists (MEL), as well as providing the most current Flight Information Publications (FLIP). Additional motivators for using an EFB are significant cost savings on annual paper FLIP purchases and the considerable reduction of paper waste associated with each FLIP changeover.

2. Requirement. AF Form 1067 with Air Mobility Command (AMC) tracking number 03-119. AMC Operational Support Airlift / Executive Airlift (OSA/EA) Requirements Matrix.

3. Impact If Not Funded. The potential to receive significant mission changes during distinguished visitor transport missions is extremely high. The aircrew needs the ability to have all possible mission information and performance calculation capability at their fingertips. Not funding the EFB might place the crew in a position where a single mission change could jeopardize mission success. Without the EFB, crews will continue to make critical decisions without accurate real-time information in the cockpit.

4. Units Impacted.
201 AS Andrews AFB, MD

5. Contractor. Esterline CMC Electronics, Montreal, Canada; NavAero, Chicago, IL; IMS Flight Deck, Brea, CA; Boeing Commercial Airplane Company, Seattle, WA.

6. Cost.

Units Required	Unit Cost	Program Cost
Supplemental Type Certificate (STC) (3010)	**N/A**	**$280,000**
3 Electronic Flight Bag (3010)	**$100,000**	**$300,000**
Total		**$580,000**

GUARDIAN ANGEL/SPECIAL TACTICS/SECURITY FORCES

- **Combat Search and Rescue**
- **Special Operations**
- **Security Forces**

ANG Guardian Angels comprise 30 percent of the Air Force's critical high demand Combat Pararescue personnel while ANG Special Tactics Squadrons account for 25 percent of the Air Force Special Tactics capability. ANG Security Forces personnel from the 54 states and territories and the District of Columbia comprise over 7,000 assigned Security Forces members.

The ANG has three Guardian Angel squadrons: the 103d Rescue Squadron (RQS), Francis S. Gabreski Airport, NY; 131 RQS, Moffett Federal Airfield, CA; 212 RQS, Kulis ANGB, AK. Pararescue consists of Combat Rescue Officers (CROs) and Pararescue Jumpers (PJs). Their mission is to recover downed and injured aircrew members in austere and non-permissive environments. Pararescue provides emergency medical treatment necessary to stabilize and evacuate injured personnel while acting in an enemy evading recovery role.

The ANG has two Special Tactics (STS) squadrons: 123 STS, Standiford Field, KY and 125 STS, Portland IAP, OR. STSs are quick-reaction, deployable Air Force units, which are uniquely organized, trained, and equipped to facilitate the air/ground interface during joint special operations and sensitive recovery missions. Special tactics personnel provide quick-reaction command and control, positive air traffic management, and casualty recovery, treatment and evacuation staging during joint air and ground/maritime operations including short notice, sensitive contingencies.

As the battlefield dictates, Security Forces train to encounter hostile threats while conducting Military Operations in Urban Terrain, Area Security Operations, Close Precision Engagement, Raven missions, Fly-Away Security, Detainee Movement Operations, Agricultural Development missions, Personal Security Details, mounted/dismounted individual and team patrols, convoy operations, high-risk vehicle inspections, suspect apprehension/detention, installation access control, and heavy weapons support.

Guardian Angel / Special Tactics Squadrons / Security Forces
2010 Weapons and Tactics Conference

Critical Combat Capabilities List

Guardian Angel
- Enhanced Combat Survivability Suite
- Improved Recovery Vehicles
- Scenario Training Suite

Special Tactics Squadrons
- Data Link with Ground Communication Equipment
- Enhanced Lightweight Dismounted Operator Suite
- Next Generation Assault Zone Operations Suite
- Rapidly Deployable Domestic Operations Suite

Security Forces
- Force Protection Mobility Bag Upgrades
- Surveillance, Target Acquisition, and Night Observation (STANO) Upgrades
- Small Arms Training Simulated Munitions
- Less Than Lethal Capability
- Explosive Detection Kits

Essential Capabilities List

Guardian Angel
- Scheduling Program to Integrate Host Aviation Resource Management (HARM), Ground Training, and Aircraft Requirements and Scheduling

Security Forces
- M4/M203/M240/M249/M9/M870 Weapon Accessory Shortfalls
- Dual Use Traffic Control / Security Kits
- Combat Training Simulator
- All Terrain Utility Vehicles

Desired Capabilities List

Security Forces
- Portable Weapon Qualification Range

GUARDIAN ANGEL / SPECIAL TACTICS / SECURITY FORCES EXECUTIVE SUMMARY

Modernization Funding Profiles ($ Million)

Program	P.E. Number	2012	2013	2014	2015	2016	Total
Guardian Angel							
Enhanced Combat Survivability Suite	53119F	$6.64 [4]	-	-	-	-	$6.64
Improved Recovery Vehicles	53119F	$2.40 [4]	-	-	-	-	$2.40
Scenario Training Suite	53119F	$2.70 [4]	-	-	-	-	$2.70
Special Tactics							
Universal Data Link	53130F	$0.80 [4]	-	-	-	-	$0.80
Enhanced Lightweight Dismounted Operator Suite	53130F	$2.56 [4]	-	-	-	-	$2.56
Next Generation Assault Zone Operations Suite	53130F	$0.73 [4]	-	-	-	-	$0.73
Rapidly Deployable Domestic Operations Suite	53130F	$0.32 [4]	-	-	-	-	$0.32
Security Forces							
Mobility Bag Upgrades	52625F	$28.73 [4]	-	-	-	-	$28.73
Surveillance, Target Acquisition and Night Observation	52625F	$32.66 [4]	-	-	-	-	$32.66
Small Arms Training Simulated Munitions	52625F	$8.30 [4]	-	-	-	-	$8.30
Less-Than-Lethal Equipment	52625F	$12.80 [4]	-	-	-	-	$12.80
Handheld Electronic Explosive Detection Kits	52625F	$12.00 [4]	-	-	-	-	$12.00

Notes: [1] 3840 Appropriation [2] 3010 Appropriation [3] 3600 Appropriation [4] 3080 Appropriation

Guardian Angel

- Enhanced Combat Survivability Suite - Improvements to Pararescue equipment to include link, handheld daytime laser marker, communication and control trailer and non-lethal weapons will ensure the Pararescue Jumper is ready for any environment against any enemy.
- Improved Recovery Vehicles - These watercraft and ground vehicles allow Guard Angels to respond quickly and survive any over-land rescue scenario.
- Scenario Training Suite - In an effort to continually modernize and improve safety of Alternate Insertion/Extraction (AIE), a simulator is required to practice these hazardous tasks in a controlled environment.

Special Tactics

- Universal Data Link - Special Tactics Teams (STSs) require the lightest and easiest to operate situational awareness receivers available and it must be universally compatible with the equipment on all strike aircraft.
- Enhanced Lightweight Dismounted Operator Suite - Special Tactics Teams (STSs) require the lightest, most accurate, and easiest to operate gear available to increase their lethality on the battlefield by engaging the enemy with their personal weapons, then gain situational awareness to quickly bring precise airpower to bear on the enemy while avoiding fratricide.
- Next Generation Assault Zone Operations Suite - Special Tactics Teams (STSs) deployed in Afghanistan and Iraq find themselves conducting an increased number of assault zone operations. A majority of the items in the Special Tactics Assault Zone Survey and Operations Equipment have not been modernized in over ten years and much of it is prohibitively bulky and/or heavy for dismounted operations. Current survey equipment requires 6 hours of exposure on an airfield. Recent testing has shown that the exposure time can be reduced to 2 hrs by utilizing updated survey equipment, thus increasing efficiency and reducing the risk of compromise by enemy forces.
- Rapidly Deployable Domestic Operations Suite - A small mobile communications trailer allows modern computer and communications capabilities using existing civil infrastructure (satellites, cell phone towers, etc.) to provide secure and non-secure internet and telephone connectivity resulting in a faster response and the ability to maintain a connection with operators in the field which greatly improves the chances of mission success.

Security Forces

- Security Forces Mobility Bag Upgrades - High deployment and operational tempos for SF personnel causes significant wear and tear on mobility bags and equipment must be replaced on a regular basis.
- Surveillance, Target Acquisition and Night Observation (STANO) - Modular body armor designed to give the warfighter mobility, protection, and capability.
- Small Arms Combat Training Simulator / Simulated Munitions - The simulated munitions will not require a specific range, and the USAF has certified them as safe for use inside facilities. The enhancement of combat skills that will be gained with the training and use of these items will greatly benefit our SF airmen, leading to a more secure air base in both the deployed and home station areas of operation.
- Less-Than-Lethal Equipment - Current Use of Force (UoF) options between verbal commands and lethal force are severely restricted due to equipment shortfalls. In most cases, especially during domestic operations, the use of less than lethal force is a more appropriate solution than the use of deadly force.
- Handheld Electronic Explosive Detection Kits - Active duty security forces combat the threat of explosive detection with highly trained dogs (K-9) able to detect explosives, and supplemented with handheld explosive detection equipment. The ability to procure K-9 resources is not an option for the Air National Guard (ANG); therefore, the procurement of handheld explosive detection equipment is the best way to fill this critical gap.

INFORMATION PAPER

ON

GUARDIAN ANGEL ENHANCED COMBAT SURVIVABILITY SUITE

1. Background. Pararescue (PJ) personnel are required to perform a variety of missions at a moment's notice. This requirement demands that the Guardian Angel (GA) be highly flexible and autonomous. This flexibility requires a unique blend of equipment designed to function in almost any environment and be effective against any enemy threat. In an effort to continually modernize and improve safety of rescue operations, pararescue jumpers and Combat Rescue Officers (CRO) require significant increased capabilities to include weapons, communication and personal protective equipment. Multiple missions in Operation ENDURING FREEDOM have highlighted the need for improvements to current pararescue personal protective equipment and weapons upgrades to include the M-4 upper receiver replacement. Additionally, communication enhancements and a small mobile communications trailer allow pararescue command elements to maintain a connection with operators in the field which greatly improves the chances of mission success.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC; lessons learned from Operations ENDURING FREEDOM and IRAQI FREEDOM; unit required equipment.

3. Impact If Not Funded. Mission accomplishment may be jeopardized due to antiquated weapons and personal protective equipment. Lack of constant and robust communication with GAs operating in isolated environments may delay, hinder or cause mission failure.

4. Units Impacted.
106 RQW Gabreski Field, NY 129 RQW Moffett Federal Airfield, CA 176 WG Kulis ANGB, AK

5. Contractor. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
90 M-4 Modernization (3080)	**$600**	**$54,000**
90 M-9 Modernization (3080)	**$700**	**$63,000**
90 7- Layer Combat System Mods (3080)	**$1,400**	**$126,000**
60 Portable Data Links (3080)	**$20,000**	**$1,200,000**
60 Handheld Day/Nite Laser Markers (3080)	**$80,000**	**$4,800,000**
3 Command and Control Trailers (3080)	**$120,000**	**$360,000**
60 Non-Lethal Weapons (3080)	**$600**	**$36,000**
Total		**$6,639,000**

INFORMATION PAPER

ON

GUARDIAN ANGEL IMPROVED RECOVERY VEHICLES

1. Background. Pararescue (PJ) teams are required to operate in any environment and recover isolated personnel in any terrain, in both combat and domestic response events. A water rescue craft capable of being air-dropped and operating in the open ocean conditions is needed to replace the legacy water rescue craft. Additionally, ground rescue vehicles, both armored and unarmored are needed to ensure Guardian Angels (GAs) can respond quickly and survive any over-land rescue scenario. Currently, the GA community is developing specific armored vehicles that will support their operational requirements, but fielding for the Air National Guard (ANG) is not projected until late 2012 or early 2013. ANG teams are currently operating without this critical mission equipment.

2. Requirement. Guardian Angel, Air-Deployable, Recovery Vehicle SDR; lessons learned Operations ENDURING FREEDOM and IRAQI FREEDOM; unit required equipment.

3. Impact If Not Funded. GA personnel will continue to rely on legacy vehicles and watercraft with limited range and capability, risking operator/patient safety and mission accomplishment.

4. Units Impacted.
106 RQW Gabreski Field, NY 129 RQW Moffett Federal Airfield, CA 176 WG Kulis ANGB, AK

5. Contractor. Rapid Response Technology, NY, NY; Northwind Marine, Seattle, WA; NAVATEK, Honolulu, HI; BC Customs, Salt Lake City, UT.

6. Cost.

Units Required	Unit Cost	Program Cost
20 Advanced Water Rescue Craft (3080)	**$60,000**	**$1,200,000**
6 Search and Rescue Tactical Vehicle (3080)	**$100,000**	**$600,000**
6 Air Deliverable Rescue Vehicles (3080)	**$100,000**	**$600,000**
Total		**$2,400,000**

INFORMATION PAPER

ON

GUARDIAN ANGEL SCENARIO TRAINING SUITE

1. Background. Guardian Angel (GA) personnel rely on multiple means of being inserted and extracted into the area of operation by helicopter to include fastrope, hoist, rappel and rope ladder. In an effort to continually modernize and improve safety of Alternate Insertion / Extraction (AIE), a simulator is required to practice these hazardous tasks in a controlled environment and where aircraft availability is severely limited. Utilizing a simulator would also maximize limited aircraft availability. This simulator will also be configured to train on other hazardous mission sets such as high angle, confined space and structural collapse.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC; lessons learned Operations ENDURING FREEDOM and IRAQI FREEDOM; unit required equipment.

3. Impact If Not Funded. Mission accomplishment may be jeopardized when helicopter insertion is required to get to the area of operation or during high angle, confined space and structural collapse areas.

4. Units Impacted.
106 RQW Gabreski Field, NY 129 RQW Moffett Federal Airfield, CA 176 WG Kulis ANGB, AK

5. Contractor. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
3 Scenario Training Suites (3080)	**$900,000**	**$2,700,000**

INFORMATION PAPER

ON

SPECIAL TACTICS UNIVERSAL DATA LINK

1. Background. Special Tactics Combat Control Teams (CCT) deployed in Afghanistan and Iraq are being ambushed by the enemy at ranges from one meter to three hundred meters. CCT must provide precision strike capabilities on targets at ranges from two hundred meters to three thousand meters. In the period between June 2008 and Oct 2009, 89% of Operation ENDURING FREEDOM (OEF) Joint Terminal Attack Controllers (JTAC) have been involved in troops-in-contact missions. Additionally, these same JTACs have controlled 5,325 sorties and directed the delivery of 690,899 pounds of ordnance on enemy targets. CCTs lost two personnel this year due to ambushes that may have been avoided through better situational awareness of the enemy's location. Lessons learned indicate that the key to survival and victory of friendly forces is to avoid ambush all together, but, if ambushed, they must rapidly gain fire superiority and follow this with immediate and accurate precision air strikes. CCTs require the lightest and easiest to operate situational awareness receivers available and it must be universally compatible with the equipment on all strike aircraft.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC; lessons learned Operations ENDURING FREEDOM and IRAQI FREEDOM.

3. Impact If Not Funded. Real time information to and from ground party personnel and aircraft is critical to conducting ground operations in hostile territory. Lack of data link communication creates high potential for mission failures, lost personnel, lost aircraft and increased likelihood of collateral damage. The situational awareness suites must be interoperable with all air packages.

4. Units Impacted.
123 STS Louisville IAP, KY 125 STS Portland IAP, OR

5. Contractor. Raytheon, Fullerton CA.

6. Cost.

Units Required	Unit Cost	Program Cost
20 Universal Data Link (3080)	**$40,000**	**$800,000**

INFORMATION PAPER

ON

SPECIAL TACTICS ENHANCED LIGHTWEIGHT DISMOUNTED OPERATOR SUITE

1. Background. Special Tactics Teams (STT) deployed in Afghanistan and Iraq find themselves engaging the enemy with their personal weapons at close range while providing precision strike capabilities on targets at ranges from two hundred meters to three thousand meters. Lessons learned indicate that the key to the survival and victory of friendly forces is rapid and accurate return fire on the enemy followed by immediate and accurate precision air strikes. As aircraft technology has advanced, the need to carry additional devices in order to employ those capabilities has increased the dismounted STT load. STTs require the lightest, most accurate, and easiest to operate gear available to increase their lethality on the battlefield by engaging the enemy with their personal weapons, then gain situational awareness to quickly bring precise airpower to bear on the enemy while avoiding fratricide.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC; lessons learned from Operations IRAQI FREEDOM and ENDURING FREEDOM.

3. Impact If Not Funded. Failure to provide STSs with lighter, more precise, and easily operated equipment will result in decreased mission capability, possible fratricide events, and increased casualties among Special Tactics Team members.

4. Units Impacted.
123 STS Louisville IAP, KY 125 STS Portland IAP, OR

5. Contractor. KDH Defense Systems, Eden, NC; COBHAM, Lewisville, TX; FN USA, McLean, VA; L3-Insight Technology, Londonderry, NH; General Dynamics - Itronix, Sunrise, FL; SILYNX, Invisio, Virginia Beach, VA; MI; Peltor-3M, Indianapolis, IN; Diffraction Limited, Dayton, OH and Waitsfield, VT; Harris, Rochester, NY.

6. Cost.

Units Required	Unit Cost	Program Cost
107 Personal Protection Equip (3080)	**$3,700**	**$395,900**
200 Enhanced LOS Antennae (3080)	**$200**	**$40,000**
107 Advanced Combat Rifle (3080)	**$5,000**	**$535,000**
120 Improved Rifle Targeting System (3080)	**$3,000**	**$360,000**
20 Multi-Spectrum NVD (3080)	**$33,000**	**$660,000**
100 Hot Weather Headset (3080)	**$300**	**$30,000**
200 Multi-Spectrum Combat ID (3080)	**$1,500**	**$300,000**
100 Next Generation MFD (3080)	**$1,200**	**$120,000**
37 Enhanced Grenade Launcher (3080)	**$3,100**	**$114,700**
Total		**$2,555,600**

INFORMATION PAPER

ON

SPECIAL TACTICS NEXT GENERATION ASSAULT ZONE OPERATIONS SUITE

1. Background. Special Tactics Combat Control Teams (CCT) deployed in Afghanistan and Iraq find themselves conducting an increased number of assault zone operations. The current and future fight in Afghanistan is characterized by lightning quick strikes on remote enemy forces that often require helicopter and fixed wing landing zone assessment and control. Additionally, the shift in tactical directive toward Village Stability Operations has created an increased demand for remote airfields to supply troops and villagers alike. Disaster Relief Operations such as those associated with Hurricane Katrina (3,000 sorties per day) or the earthquake in Haiti (hundreds per day) require large scale landing zone assessment, marking and control operations. The number of deployed CCT Assault Zone Team personnel has doubled in 2010 with additional requirements expected in the near term. A majority of the items in the Special Tactics Assault Zone Survey and Operations Equipment have not been modernized in over ten years, and much of it is prohibitively bulky and/or heavy for dismounted operations. Current survey equipment requires 6 hours of exposure on an airfield. Recent testing has shown that the exposure time can be reduced to 2 hours by utilizing updated survey equipment, thus increasing efficiency and reducing the risk of compromise by enemy forces.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC; lessons learned Operations ENDURING FREEDOM and IRAQI FREEDOM.

3. Impact If Not Funded. Failure to provide CCT with lighter, more precise, and easily operated equipment will result in decreased mission capability, increased risk of air traffic control incidents, and increased casualties among CCT.

4. Units Impacted.
123 STS Louisville IAP, KY 125 STS Portland IAP, OR

5. Contractor. Trimble, Sunnyvale, CA; SOF Coast, Corbin, KY; ATI Avionics, Lavel, Canada.

6. Cost.

Units Required	Unit Cost	Program Cost
5 GPS Enabled Survey System (3080)	**$68,000**	**$340,000**
4 Assault Zone Penetrometer (3080)	**$60,000**	**$240,000**
8 Airfield Situational Awareness Platform (3080)	**$15,000**	**$120,000**
5 Improved Light Gun (3080)	**$5,700**	**$28,500**
Total		**$728,500**

INFORMATION PAPER

ON

SPECIAL TACTICS RAPIDLY DEPLOYABLE DOMESTIC OPERATIONS SUITE

1. Background. Special Tactics (ST) personnel are required to perform a variety of missions at a moment's notice. This requirement demands that their operations center be highly flexible and autonomous. This flexibility requires a unique blend of equipment designed to function in almost any environment and be effective in a variety of situations. ST personnel acted as the Command and Control node for the combined Personnel Recovery/Special Missions Branch rescue effort during Hurricane Katrina. This task force evacuated nearly 12,000 displaced persons and rescued over 1,300 people. Similar efforts for later hurricanes all point out that Command and Control of ST significantly increases the overall rescue capabilities of any task force. The current Command and Control suite is intended for wartime environments and requires intensive infrastructure to maximize its capabilities that may take days to become available. Newer computer and communications capabilities can use existing civil infrastructure (satellites, cell phone towers, etc.) to provide secure and non-secure internet and telephone connectivity. Additionally, a small mobile communications trailer would allow the most rapid and flexible deployment of the Command and Control Element. This would result in faster response and maintain a connection with operators in the field which greatly improves the chances of mission success.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC.

3. Impact If Not Funded. Failure to procure equipment will result in under-equipped and under-prepared emergency responders and will degrade mission effectiveness.

4. Units Impacted.
123 STS Louisville IAP, KY 125 STS Portland IAP, OR

5. Contractor. Automated Business Power, Gaithersburg, MD.

6. Cost.

Units Required	Unit Cost	Program Cost
2 Radio Comm Suite (3080)	**$160,000**	**$320,000**

INFORMATION PAPER

ON

SECURITY FORCES MOBILITY BAG UPGRADES

1. Background. Security Forces (SF) deploy for long and frequent periods of time. This high Operations Tempo (OPSTEMPO) has caused equipment to degrade more rapidly than planned. The SF mobility bag contains specialized equipment that requires periodic replacement based on time and use. Evolving Area of Responsibility (AOR) requirements have identified a need for fire retardant clothing. However, the current inventory of SF clothing does not meet this requirement and places SF members at a greater risk of severe burn injuries when exposed to indirect fire or Improvised Explosive Devices (IED). Additionally, eye protection is an important equipment item used by SF members to combat environmental hazards inherent to force protection missions. Most SF units do not have this equipment thereby exposing personnel to greater risk of eye injuries. The complexity of emerging missions has forced SF personnel to negate aggressively threats in a multitude of environments to include low light and low visibility operations. A thermal capability is critical to force protection and the SF warfighter. Procurement of the upgraded GPS is necessary to replace current inventory that is 15 years old. Requested equipment brings improved capabilities to a field evaluated requirement.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC; lessons learned from domestic operations as well as Operations ENDURING FREEDOM and IRAQI FREEDOM/NEW DAWN.

3. Impact If Not Funded. Failure to replace deteriorating equipment will result in under-equipped/under-prepared warfighters less capable of defeating the enemy.

4. Units Impacted. All 92 ANG SF Squadrons in the fifty-four (54) states, territories, and DC.

5. Contractors. PCU: Drifire, Albany, NY; XGO Longworth Industries Incorporated, West End, NC; Protective goggles/eyewear: ESS Eyewear, Sun Valley, ID; Defense Advanced GPS Receiver: Rockwell-Collins, Cedar Rapids, IA.

6. Cost.

Units Required	Unit Cost	Program Cost
550 Mini Thermal Monocular (3080)	**$13,000**	**$7,150,000**
1,600 Mobility Bag Replacement (3080)	**$7,700**	**$12,320,000**
32,000 Protective Combat Uniform Level 1-3 (Undergarment) (3080)	**$120**	**$3,840,000**
8,000 Protective Combat Uniform Level 7 (Outer Garment) (3080)	**$400**	**$3,200,000**
8,000 Protective Eyewear (3080)	**$80**	**$640,000**
8,000 Protective Goggles (3080)	**$60**	**$480,000**
550 DAGR (GPS) (3080)	**$2,000**	**$1,100,000**
Total		**$28,730,000**

INFORMATION PAPER

ON

SECURITY FORCES SURVEILLANCE, TARGET ACQUISITION AND NIGHT OBSERVATION (STANO)

1. Background. The AN/PAS-13 (V1) Night Vision Scope enhances combat capability of Security Forces (SF) who are required to operate with the M-240B/M-249 machine guns in a low visibility environment. This new equipment is the only authorized night vision scope for M240B/M249. The AN/PAS-13 (V2) Night Vision Scope enhances combat capability of SF who is required to operate with the MK-19 grenade launcher & M-2 .50 caliber machine gun in a low visibility environment. This new equipment is the only authorized night vision scope for MK-19/M-2. The M-4, M-203, M-240B, and M-249 use the AN/PEQ-15, Advanced Target Pointer Illuminator Aiming Light. This equipment provides critical infrared and individual tactical illumination capabilities. An additional optic needed for the M-203 is the AN/PSQ-18, Infrared Quadrant Sight. This is a sight specifically designed for the M-203 IOT enabling the grenadier to effectively engage targets for use during both day and night operations. The QFELB UTC is designed to provide SF Combat Arms airmen the ability to repair any small arm in the AF inventory in any austere environment. This kit provides the required tools and weapons parts in mobile and easily transported package.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC; lessons learned from Operations ENDURING FREEDOM and IRAQI FREEDOM/NEW DAWN.

3. Impact If Not Funded. Failure to procure required STANO items will significantly degrade mission effectiveness and increase the vulnerability of SF personnel and all protected resources. SF personnel will be unable to engage targets effectively in any operation during hours of limited light and visibility. In addition, procurement is necessary for the standardization between the Air National Guard and active duty forces. Personnel cannot deploy without this required equipment. Limited stocks on-hand translates to limited number of deployable personnel.

4. Units Impacted. All 92 ANG SF Squadrons in the fifty-four (54) states, territories, and the District of Columbia.

5. Contractor. TBD; QFELB: Garrett Container Systems, Accident, MD.

6. Cost.

Units Required	Unit Cost	Program Cost
1845 AN/PAS-13 (V2) (3080)	**$12,000**	**$22,140,000**
35 AN/PAS-13 (V3) (3080)	**$12,000**	**$420,000**
1250 AN/PSQ-18A (3080)	**$2,000**	**$2,500,000**
2500 AN/PEQ-15 (3080)	**$1,200**	**$3,000,000**
92 QFELB (3080)	**$50,000**	**$4,600,000**
Total		**$32,660,000**

INFORMATION PAPER

ON

SECURITY FORCES SMALL ARMS COMBAT TRAINING SIMULATOR / SIMULATED MUNITIONS

1. Background. Pre-deployment training includes up to 60 days of Temporary Active Duty (TDY). The use of combat simulators will enhance the combat training of our Security Forces (SF) with fewer resources and at a reduced cost. In addition, it will allow more training at home station, which will relieve stress on families, employers and wing commanders. The Air National Guard (ANG) spent over $6,600,000 last year in small arms training munitions, and the number has grown exponentially each year due to increasing deployments and operations tempo. The ANG owns and operates twelve (12) small arms ranges, and the cost of maintenance and sustainment of these ranges is in excess of $1,000,000 per year. The use of other small arms ranges comes at both a financial cost to the ANG unit and significant time to travel to an available range. The use of small arms ranges increases safety and environmental hazards. The simulated munitions will not require a specific range, and the USAF has certified them as safe for use inside facilities. The enhancement of combat skills that will be gained with the training and use of these items will greatly benefit our SF airmen, leading to a more secure air base in both the deployed and home station areas of operation.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC; lessons learned from domestic operations as well as Operations ENDURING FREEDOM and IRAQI FREEDOM/NEW DAWN.

3. Impact If Not Funded. Failure to procure the individual equipment items will significantly degrade mission effectiveness, increase SF personnel vulnerability and reduce Total Force standardization.

4. Units Impacted. All 92 ANG SF Squadrons in the fifty-four (54) states, territories, and the District of Columbia.

5. Contractor. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
4 Combat Training Simulators (3080)	**$750,000**	**$3,000,000**
8000 M-4 Simulated Munitions Kit (3080)	**$200**	**$1,600,000**
8000 M-9 Simulated Munitions Kit (3080)	**$200**	**$1,600,000**
1230 M-249 Simulated Munitions Kit (3080)	**$300**	**$369,000**
615 M-240B Simulated Munitions Kit (3080)	**$300**	**$184,500**
3 Simulated Munitions (3080)	**$250,000**	**$750,000**
8000 Simulated Munitions PPE (3080)	**$100**	**$800,000**
Total		**$8,303,500**

INFORMATION PAPER

ON

SECURITY FORCES LESS-THAN-LETHAL EQUIPMENT

1. Background. Security Forces (SF) are the first responders of choice at home and abroad. The QFENL UTC is a non-lethal capability that resides within the SF basic 13-person deployable UTC (QFEB2). Current Use of Force (UoF) options between verbal commands and lethal force are severely restricted due to equipment shortfalls. In most cases, especially during domestic operations and Phase 4 and Phase 5 overseas operations (riot control, prisoner administration, etc.), the use of less-than-lethal force is a more appropriate solution than the use of deadly force. Security incidents often involve an increased risk to the public until first responders can secure the scene. Crowd control/civil disturbance kits are essential to address the National Response Framework eight key threat scenarios. Additionally, this kit aligns SF with active duty requirements. A single kit equips a squad of 13 with tasers and less-than-lethal munitions such as bean bag rounds and tear gas. In addition, each kit contains helmets, pads, shields, batons, and Oleoresin Capsicum (pepper) spray for each member.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC; lessons learned from domestic operations as well as Operation ENDURING FREEDOM and Operation IRAQI FREEDOM/NEW DAWN.

3. Impact If Not Funded. Failure to procure these individual equipment items significantly degrades mission effectiveness. These kits allow for SF response using the minimum amount of force necessary for mission accomplishment. Failure to procure increases both vulnerability of SF personnel and the risk of harm to the public. The lack of less-than-lethal options for SF will negatively impact the ability to establish and maintain control during domestic incident response.

4. Units Impacted. All 92 ANG SF Squadrons in the fifty-four (54) states, territories, and the District of Columbia.

5. Contractors.
Crowd control/civil disturbance kits: TBD; Taser International, Scottsdale, AZ.

6. Cost.

Units Required	Unit Cost	Program Cost
550 Crowd Control / Civil Disturbance Kits (3080)	**$20,000**	**$11,000,000**
3000 Tasers (3080)	**$600**	**$1,800,000**
Total		**$12,800,000**

INFORMATION PAPER

ON

SECURITY FORCES HANDHELD ELECTRONIC EXPLOSIVE DETECTION KIT

1. Background. The very high Operations Tempo (OPSTEMPO) including homeland security responsibilities and Air Expeditionary Force (AEF) deployments requires outfitting Security Forces (SF) with the most modern equipment available. In addition, there are increasing aerial port and entry-control-point responsibilities even while explosive threats are increasing in numbers and complexity. A primary vulnerability in the Air National Guard (ANG) SF community is the lack of explosive detection. Active Duty (AD) SF combat the threat of explosive detection with highly trained dogs (K-9) able to detect explosives and handheld explosive detection equipment. There is no K-9 support in the ANG SF community and they currently lack any handheld explosive detection equipment. The ability to procure K-9 resources is not an option. Therefore, the procurement of handheld explosive detection equipment is the best way to fill this critical gap. The ability to detect explosives at base entry control points will ensure installation security as well as the safety and security of our SF airmen.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC; lessons learned from domestic operations as well as Operations ENDURING FREEDOM and IRAQI FREEDOM/NEW DAWN.

3. Impact If Not Funded. Failure to procure explosive detection equipment significantly degrades mission effectiveness and increases the vulnerability of SF personnel and all protected resources. The lack of ability to detect explosives at entry points to installations is an enormous threat to all ANG operations. In addition, procurement is necessary for the standardization between the ANG and the AD forces. Personnel cannot deploy without this required equipment. Limited available stock translates to a limited number of deployable personnel per SF Squadron.

4. Units Impacted. All 92 ANG SF Squadrons within the fifty-four (54) states, territories, and the District of Columbia.

5. Contractor. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
300 Handheld Explosive Detection Device (3080)	**$40,000**	**$12,000,000**

Remotely Piloted Aircraft

- **Intelligence, Surveillance, and Reconnaissance (ISR)**
- **Air Interdiction/Armed Reconnaissance**
- **Close Air Support to Ground Forces**

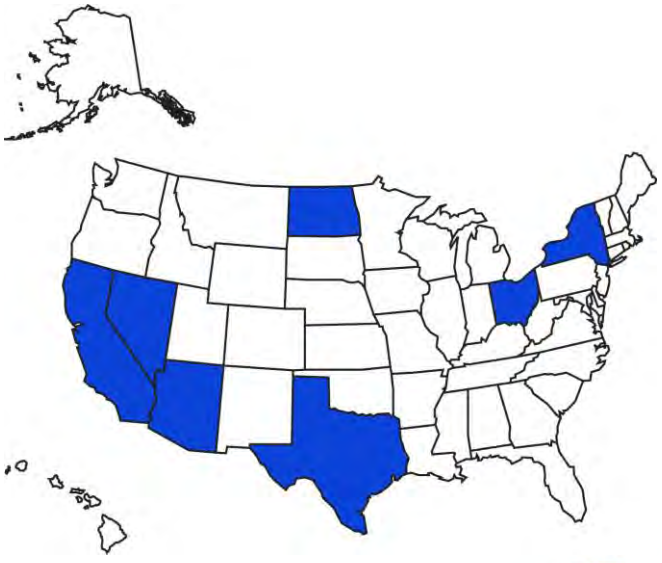
MQ-1 PREDATOR REMOTELY PILOTED AIRCRAFT (RPA)

The MQ-1 Predator is a medium-altitude, long endurance, remotely piloted aircraft system. The MQ-1s primary mission is to act as an ISR asset, employing sensors to provide real-time data to commanders and intelligence specialists at all levels. The MQ-1 conducts interdiction and armed reconnaissance with a system integrating electro-optical, infrared laser designator and laser illuminator into a single sensor package. The aircraft can employ two laser-guided AGM-114 Hellfire missiles. Additionally, the MQ-1 is a theater asset for reconnaissance, surveillance and target acquisition organic to the Joint Forces Air Component Commander's forces. The MQ-1 Predator is flown by North Dakota, Arizona, Texas, and California Air National Guard units. The Nevada ANG supports active duty MQ-1 operational and training sorties. The Ohio ANG will operate the MQ-1 in FY11.

MQ-9 REAPER REMOTELY PILOTED AIRCRAFT

The MQ-9 Reaper is a medium-to-high altitude, long-endurance, remotely piloted aircraft system. Because of its robust weapons payload capacity, long endurance and on-station times the MQ-9s primary mission is hunter-killer operations against emerging targets. The MQ-9s secondary mission is to act as an ISR asset, employing sensors to provide real-time data to commanders and intelligence specialists at all levels. It is larger and more powerful than the MQ-1 Predator, and is designed to go after time-sensitive targets using its capabilities for precision targeting, array of precision-guided bombs and missiles, and long endurance to find, fix, and destroy or disable those targets.

The New York Air National Guard operates the MQ-9 Reaper. The Nevada ANG supports active duty MQ-9 operational and training sorties.



Remotely Piloted Aircraft (RPA)
2010 Weapons and Tactics Conference

Critical Combat Capabilities List

- Integrated Communication Suite
- Independent and Redundant Data Architectures
- Improved Targeting Pod (TGP)
- Improved Electronic Protection
- Improved Human Machine Interface (HMI)

Essential Capabilities List

- Weapon Simulation Mode
- Improved Full-System Integrated Debrief Capability
- Self-Protection

Desired Capabilities List

- None

REMOTELY PILOTED AIRCRAFT (RPA) EXECUTIVE SUMMARY

Modernization Funding Profiles ($ Million)

Program	P.E. Number	2012	2013	2014	2015	2016	Total
MQ-1/MQ-9 Integrated Communications Suite	53219F	$8.00 [2] $2.40 [3]	$16.00 [2] -	$16.00 [2] -	$16.00 [2] -	$16.00 [2] -	$121.20
	53218F	$1.70 [4] $1.60 [2] $2.40 [3] $1.70 [4]	$3.40 [4] $5.60 [2] - $3.40 [4]	$3.40 [4] $5.60 [2] - -	$3.40 [4] $5.60 [2] - -	$3.40 [4] $5.60 [2] - -	
MQ-1/MQ-9 Independent and Redundant Data Architectures	53219F 53218F	$2.60 [4] $2.80 [4]	$2.00 [4] $4.20 [4]	- -	- -	- -	$11.60
Improved MQ-1/MQ-9 Targeting Pod	53219F	-	$25.14 [2]	$25.14 [2]	$25.14 [2]	-	$121.56
	53218F	$7.88 [3] - $2.63 [3]	$7.87 [3] $8.38 [2] $2.62 [3]	- $8.38 [2] -	- $8.38 [2] -	- - -	
Improved MQ-1/MQ-9 Electronic Protection	53219F 53218F	$4.35 [3] $4.35 [3]	$61.20 [2] $6.80 [2]	$61.20 [2] $6.80 [2]	$27.20 [2] $6.80 [2]	$34.00 [2] -	$212.70
Improved MQ-1/MQ-9 Human Machine Interface	53219F 53218F	$5.50 [4] -	$16.80 [4] $1.20 [4]	$10.80 [4] $1.20 [4]	$4.80 [4] $1.20 [4]	-	$41.50

Notes: [1] 3840 Appropriation [2] 3010 Appropriation [3] 3600 Appropriation [4] 3080 Appropriation

- MQ-1/MQ-9 Integrated Communications Suite - Provides an integrated communication suite for the MQ-1 and MQ-9 that includes both air-based and ground-based systems and improvements. Fixes current communication limitations on the aircraft with the addition of a second radio. Provides improved antenna design and mounting location.
- MQ-1/MQ-9 Independent and Redundant Data Architectures - Fields a protected data network architecture with dedicated control of all data updates/patches/upgrades/settings to test/evaluate functionality and minimize interruptions to operations and dissemination of mission critical data. Current systems include Secret Internet Protocol Network (SIPRNET), Joint Worldwide Intelligence Communications System (JWICS), Combined Enterprise Regional Information Exchange System (CENTRIXS), and Tactical Data Link (TDL).
- Improved MQ-1/MQ-9 Targeting Pod - Improves survivability through increased stand-off distances while providing reliable Moving Target Tracking (MTT) capability and Positive Identification (PID) criteria to ground commanders.
- Improved MQ-1/MQ-9 Electronic Protection - Improves MQ-1/MQ-9 ability to operate in a non-permissive EW environment. Improves GPS antenna on the aircraft in addition to provide ability to update the navigation system with a manual fix.
- Improved MQ-1/MQ-9 Human Machine Interface - Fields new cockpits for MQ-1 and MQ-9. Provides fused information display capability and intuitive flight and weapon system controls to optimize mission effectiveness.

INFORMATION PAPER

ON

MQ-1/MQ-9 INTEGRATED COMMUNICATIONS SUITE

1. Background. Effective employment of air power requires sufficient means of communication to allow aircrew to send and receive vital, time-sensitive information to Command and Control (C2) agencies, intelligence analysts, and other battlefield entities including aircrew performing the same mission and ground-based personnel requiring airborne support. Both the MQ-1 and the MQ-9 currently lack effective and reliable means of communication. Both aircraft have a single on-board radio that has significant limitations in terms of antenna placement and function. There are existing ground-based solutions that enhance communication capabilities but they are neither deployed to the Air National Guard (ANG) MQ-1/MQ-9 fleet nor integrated with existing systems to allow effective tactical use. Failing to leverage the ground-based connectivity of the MQ-1 and MQ-9 systems significantly hinders the ability to provide optimized support to customers in current operations.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC.

3. Impact If Not Funded. MQ-1/MQ-9 units will continue to have a limited ability to provide effective real-time support to ground forces in theater. Continuously emerging missions will be significantly hampered by the lack of flexibility of a severely limited communications suite.

4. Units Impacted.

119 WG Fargo, ND	163 RW March ARB, CA	214 RG Davis-Monthan AFB, AZ
147 RW Ellington Fld, TX	174 WG Syracuse, NY	178 OG Springfield, OH

5. Contractor. Aeronautical Systems Center/WI, Wright Patterson AFB, OH; General Atomics-Aeronautical Systems, Inc., San Diego, CA; Warner Robins Air Logistics Center/GRC, Robins AFB, GA.

6. Cost.

Required Units	Unit Cost	Program Cost
NRE 2nd Radio (3600)	**N/A**	**$3,600,000**
NRE Ground Relay (3600)	**N/A**	**$1,200,000**
120 Radio/Antenna kits (3010)	**$800,000**	**$96,000,000**
12 Ground Relays (3080)	**$1,700,000**	**$20,400,000**
Total		**$121,200,000**

INFORMATION PAPER

ON

MQ-1/MQ-9 INDEPENDENT AND REDUNDANT DATA ARCHITECTURES

1. Background. The MQ-1 and MQ-9 system is a unique tactical airpower asset because it requires ground-based systems to effectively operate. Aircrew situational awareness is gained and maintained in today's battlefield through digital network-based connectivity. Persistent and uninterrupted connectivity is often the difference between mission success or mission failure. The MQ-1 and MQ-9 community currently lacks independent and redundant data architecture to ensure uninterrupted connectivity. Reliance on outside agencies for sustainment and control of these required network connections poses a significant capability gap. Ensuring squadron-level direct connection and control over current systems such as Secret Internet Protocol Network (SIPRNET), Joint Worldwide Intelligence Communications System (JWIC) and Combined Enterprise Regional Information Exchange System (CENTRIXS), in addition to future systems, will aid mission success.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC.

3. Impact If Not Funded. MQ-1 and MQ-9 will continue to rely on non-MQ-1/MQ-9, non-combat related agencies to sustain, maintain, and control mission-critical systems leading to lengthy periods of non-connectivity and mission failure.

4. Units Impacted.

113 WG	Fargo, ND	63 RW	March ARB, CA	214 RG	Davis-Monthan AFB, AZ
147 RW	Ellington Fld, TX	74 WG	Syracuse, NY	178 OG	Springfield, OH

5. Contractor. Warner Robins Air Logistics Center/GRC, Robins AFB, GA.

6. Cost.

Required Units	Unit Cost	Program Cost
NRE RPA Gateway (3080)	**N/A**	**$2,200,000**
10 RPA Gateway Kits (3080)	**$700,000**	**$7,000,000**
6 Service Delivery Points (3080)	**$400,000**	**$2,400,000**
Total		**$11,600,000**

INFORMATION PAPER

ON

IMPROVED MQ-1/MQ-9 TARGETING POD

1. Background. The current Targeting Pod (TGP) used on the MQ-1 and MQ-9 is severely lacking in capability in comparison to other fielded TGPs. In today's non-linear battlefield, precision target identification and kinetic employment is critical to achieving military and national objectives while limiting collateral damage. The MQ-1 and MQ-9 lack features that would greatly increase target identification and tracking capability and increase weapons payload options. These features include Laser Spot Search and Track (LSST) and reliable Moving Target Tracking (MTT) capability. Additionally, the MQ-1 and MQ-9 need the ability to provide Positive Identification (PID) criteria to ground commanders from minimized-detection operating stand-off distances. Features such as improved geographic pointing stability and continuous zoom are needed to prevent the loss of High Value Targets (HVT) and to minimize the possibility of unintended collateral damage due to uncontrolled weapon impact. The ability to exploit multiple cameras at multiple zoom levels simultaneously will leverage the persistent presence of the MQ-1 and MQ-9 to maximize the benefit to the ground forces.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC.

3. Impact If Not Funded. The MQ-1 and MQ-9 will be limited in target tracking and identification effectiveness and will have limited weapons payload options. Ground forces in theater will continue to receive less than optimal support during mission-critical phases.

4. Units Impacted.

119 WG Fargo, ND	163 RW March ARB, CA	214 RG Davis-Monthan AFB, AZ
147 RW Ellington Fld, TX	174 WG Syracuse, NY	178 OG Springfield, OH

5. Contractor. Aeronautical Systems Center/WI, Wright Patterson AFB, OH; General Atomics-Aeronautical Systems, Inc., San Diego, CA.

6. Cost.

Required Units	Unit Cost	Program Cost
NRE (3600)	**N/A**	**$21,000,000**
48 Advanced Targeting Pods (ATP) (3010)	**$2,000,000**	**$96,000,000**
48 Video Data Link (VDL) Kits (3010)	**$95,000**	**$4,560,000**
Total		**$121,560,000**

INFORMATION PAPER

ON

IMPROVED MQ-1/MQ-9 ELECTRONIC PROTECTION

1. Background. The proliferation of Electronic Warfare (EW) capabilities worldwide requires ANG weapon systems to be survivable in a non-permissive EW environment or risk mission failure. Global Positioning System (GPS) is how the aircraft is flown and tracked by aircrews. The MQ-1 and MQ-9 currently cannot operate with impunity in a GPS-denied environment due to design and functional problems. The antenna design for both aircraft prevents effective mitigation of GPS jamming. Additionally, the ability for the aircraft navigation systems to operate without a valid GPS solution is limited by the inability to manually update the system to correct for known navigation system errors. The ability to manually update a navigation system has been around for decades on legacy aircraft. The lack of this capability on the MQ-1 and MQ-9 severely limits the effectiveness of the aircraft and poses a danger to other airborne assets due to being lost or out-of-position.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC.

3. Impact If Not Funded. Without a GPS electronic protection system and an ability to manually update navigation systems in a degraded GPS environment, mission failure will occur.

4. Units Impacted.

119 WG Fargo, ND	163 RW March ARB, CA	214 RG Davis-Monthan AFB, AZ
147 RW Ellington Fld, TX	174 WG Syracuse, NY	178 OG Springfield, OH

5. Contractor. Aeronautical Systems Center/WI, Wright Patterson AF, OH; General Atomics-Aeronautical Systems, Inc., San Diego, CA.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE (3600)	**N/A**	**$8,700,000**
120 Mod Kits (3010)	**$1,700,000**	**$204,000,000**
Total		**$212,700,000**

INFORMATION PAPER

ON

IMPROVED MQ-1/MQ-9 HUMAN MACHINE INTERFACE

1. Background. The current Human Machine Interface (HMI) used to employ the MQ-1 and MQ-9 is poorly designed and hinders aircrew ability to quickly access key mission features and critical information. The HMI consists of up to ten (10) different screens, 2 track-balls, 2 keyboards, along with the normal flight controls used to pilot the aircraft. Aircrew must navigate through detailed engineering-style menus and displays to access time and mission-critical information about their aircraft. Accessing the various computer systems must be accomplished using a cumbersome Keyboard/Video/Mouse (KVM) manual switch. Additionally, the HMI limits aircrew access to ground-based network information. As a result, the MQ-1 and MQ-9 cannot be employed in a manner that optimizes its capability to provide kinetic and non-kinetic support to ground forces in the current theater of operations. The inability to access and present robust tactically-relevant information while simultaneously flying the aircraft in a dynamic tactical situation limits or prevents mission success. This problem is most evident during the most dynamic battlefield situations when human lives and mission objectives hang in the balance.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC.

3. Impact If Not Funded. MQ-1 and MQ-9 aircrews will continue to be limited by their ability to quickly access and present mission critical information; thus, additional assets must be employed on the same mission to achieve the desired effects. When assets are limited, this will reduce critical support to command and control agencies, intelligence analysts, and ground forces that require the kinetic and non-kinetic capabilities of these aircraft.

4. Units Impacted.

119 WG Fargo, ND	163 RW March ARB, CA	214 RG Davis-Monthan AFB, AZ
147 RW Ellington Fld, TX	174 WG Syracuse, NY	178 OG Springfield, OH

5. Contractor. Aeronautical Systems Center/WI, Wright Patterson AFB, OH; General Atomics-Aeronautical Systems, Inc., San Diego, CA.

6. Cost.

Required Units	Unit Cost	Program Cost
30 Block 50 Mod Kits (3080)	**$1,383,333**	**$41,500,000**

Simulation

- **Distributed Mission Operations (DMO)**
- **Advanced Simulation**

The Air National Guard (ANG) is a leader in the procurement of squadron level simulators and trainers to meet the specific requirements of the warfighter. The devices span the entire spectrum from the very high fidelity immersive to a family of micro simulators. Given the realities of the current resource limited environment, the emphasis has been to deploy a trainer, even one of modest fidelity, to each and every ANG unit. As part of the Guard's design before you buy policy, both flight and mission crew simulator prototypes are constructed in partnership with USAF trainer technology development centers and industry. The benefits of this approach insure that production decisions are made only after evaluation by ANG aircrew; resulting in reduced risk, cost and schedule from concept to deployment; agile technology insertion with maximum government ownership and continuous hardware "refresh" during the life of the program.

The largest ANG programs include the KC-135 Boom Operator Simulation System (BOSS) production effort in cooperation with Air Force Materiel Command and the Army's Program Executive Office, Simulation, Training and Instrumentation organization and the recently fielded next generation F-16C Full Combat Mission Trainer (FCMT). Fielded micro simulators include the MQ-9 Reaper Mission Training Device (MTD) and the KC-135 Micro BOSS (μBOSS).

Programs under development include the C-130 / KC-135 / C-27 Multi Mission Crew Trainer (MMCT), the HH-60 Pave Hawk Aircrew Rehearsal and Operations Simulator (PHAROS) technology demonstrator and the RC-26 Combined Mission Crew Trainer (CMCT).

A key training force multiplier is Distributed Mission Operations (DMO) training for ANG aircrew supported by the Distributed Training Operations Center (DTOC) located at the 132 FW in Des Moines, IA. The DTOC provides the operational environment for DMO by linking a wide array of flight and mission crew simulators at Guard, AFRC and active USAF units as well as supporting other services.

Simulation Systems and Distributed Mission Operations (DMO)
2010 Weapons and Tactics Conference *

Critical Combat Capabilities List

- Air Operations Center (AOC) Distributed Simulation Training
- Air Defense Sector (ADS) Baseline Sector DMO Capability
- EC-130J Weapon System Training Device
- RC-26B High Fidelity Flight Deck and Mission Crew Trainers (Simulators)
- Air Support Operations Center and Tactical Air Control Party (ASOC/TACP), Joint Terminal Attack Controller (JTAC) DMO

Essential Capabilities List

- A-10 Additional Full Mission Trainers
- C-130 Virtual Electronic Combat Training System (VECTS)
- C-130J Advanced Squadron Level Simulator
- F-15 High Fidelity Simulators at Air National Guard Bases
- F-16 Full Combat Mission Trainer Regional Mission Training Centers
- KC-135 Boom Operator Simulation Systems (BOSS)
- Space & CW/IO, A Collaborative Advanced Simulation Capability Linking Multiple Space Missions and Providing Realistic Effects to Warfighters

Desired Capabilities List

- C2 Control and Reporting Center (CRC), Full ADS/CRC DMO Integration
- C-130 Visual Threat Recognition and Avoidance Trainer (VTRAT)
- C-130 DMO Simulator (H-2, H-3 and J)
- HC/MC-130 VECTS and VTRAT
- HC/MC-130 DMO Weapons System Trainer (WST) Simulators
- HH-60G DMO (Simulator)

* Note: Simulation Systems and Distributed Mission Operations did not have a separate breakout session at WEPTAC. Capabilities are extracted from the referenced tab and weapon system and repeated in this tab for clarity.

SIMULATION SYSTEMS AND DISTRIBUTED MISSION OPERATIONS EXECUTIVE SUMMARY

Modernization Funding Profiles ($ Million)

Program	P.E. Number	2012	2013	2014	2015	2016	Total
KC-135 Boom Operator Simulation System	0405134F	$17.80 [2]	$8.00 [2]	-	-	-	$25.80
RC-26B Simulators	0504115F	$1.80 [2]	-	-	-	-	$1.80
Advanced Squadron Level Simulator System	0403115F 0403134F 0503115F	- $4.50 [3]	$14.20 [2] -	$32.90 [2] -	$32.00 [2] -	$27.80 [2]	$111.40
F-15 Distributed Mission Operations Fidelity Simulators	0207130F	$4.17 [2]	-	-	-	-	$4.17
Simulation and Distributed Mission Operations Training and Rehearsal System	0505671F	$0.31 [1]	-	-	-	-	$0.31
F-16 Full Combat Mission Trainer	0207133F	$18.00 [2]	$18.00 [2]	-	-	-	$36.00
A-10 Full Mission Trainer	0207131F	$9.00 [2]	$9.00 [2]	$4.50 [2]	-	-	$22.50
Space Based Infrared Systems Survivable Endurable Evolution Training Suite	0503116F	$0.80 [4]	-	-	-	-	$0.80
EC-130J Weapon System Training Device	0405132F	$0.85 [3]	-	-	-	-	$0.85

Notes: [1] 3840 Appropriation [2] 3010 Appropriation [3] 3600 Appropriation [4] 3080 Appropriation

- KC-135 Boom Operator Simulation System (BOSS) - Provides fifteen (15) very high fidelity, immersive, squadron level simulators for the KC-135 boom operator.
- RC-26B Simulators - Provides both a high fidelity non-motion flight deck and a Mission Crew Trainer (MCT) for full crew initial, recurrent and mission rehearsal training for the RC-26B Block 30 aircraft configuration.
- Advanced Squadron Level Simulator (ASLS) System - Provides up to 23 KC-135, C-130, RC-26B and C-27J reduced footprint, high fidelity flight deck simulators.
- F-15 Distributed Mission Operations (DMO) Fidelity Simulators - Provides the F-15C/D Field Training Unit with modernized high fidelity Full Mission Trainers with DMO Capability.

- Simulation and Distributed Mission Operations Training and Rehearsal System - Provides Joint Terminal Attack Controllers (JTACs) and Theater Air Control Party (TACPs) the ability to simulate guiding precision air and artillery strikes at home station in support of qualification training.
- F-16 Full Combat Mission Trainer (FCMT) - Provides two (2) Regional Mission Training centers (RMTC) to support very high fidelity mission rehearsal training.
- A-10 Full Mission Trainer (FMT) - Provides additional FMTs to meet the requirement for a two-ship at each ANG unit.
- Space Based Infrared Systems (SBIRS) Survivable Endurable Evolution (S2E2) Training Suite - Provides a training suite for SBIRS S2E2 to provide a realistic environment to develop Tactics, Techniques and Procedures (TTPs) for training and operational use.
- EC-130J Weapon System Training Device - Dedicated ground training asset.

INFORMATION PAPER

ON

KC-135 BOOM OPERATOR SIMULATION SYSTEM (BOSS)

1. Background. In order to meet a continuation training shortfall, the Air National Guard (ANG) sponsored design and procurement of a low cost, fully Distributed Mission Operations (DMO) capable, immersive boom operator simulator prototype with a high fidelity replication of the pod, controls, aircraft and boom flight models and display. This prototype originally leveraged existing development of Air Education and Training Command's (AETC) Boom Operator Weapon System Trainer (BOWST) program software to minimize costs and repackaged into a smaller footprint saving additional military construction costs. The device is designed in five modular components to fit in a standard operations building and not require a purpose built simulator facility. The major baseline hardware technology difference between the two devices is the display system technology. In both systems, the boom operator is provided with realistic depth perception and functional periscope and mirrors. In addition, to meet the needs of fully qualified and experienced boom operators, the BOSS will have additional hardware and software capabilities including Advanced Voice Recognition, Head Position Tracking, variable Ruddavator Control Profiles, and Enhanced Instructor Operator Station. The BOSS will enter production late spring 2011 under the overall program management direction of ASC/WNS (Simulator Division) and the Army's Program Executive Office Simulation, Training and Instrumentation (PEO STRI). This requirement addresses the remaining fifteen (15) production BOSS systems that are not funded.

2. Requirement. The KC-135 Training System Requirements Analysis (TSRA) and BOSS System Requirements Document (SRD).

3. Impact If Not Funded. In the absence of squadron level, high fidelity devices with DMO capability, ANG boom operators will not have any on-station ability to perform continuation training. As aircraft training sortie availability declines, boom operators will not be able to maintain required levels of readiness.

4. Units Impacted. All seventeen (17) ANG KC-135 units will benefit from this training capability. In addition, AF Reserve Command may participate in the program at a later date.

5. Contractors. Prototype: QuantaDyn Corp, Sterling, VA; 902 MSG/TD (AETC), Randolph AFB, TX. Production: TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE (3010)	**N/A**	**$1,800,000**
15 BOSS (3010)	**$1,600,000**	**$24,000,000**
Total		**$25,800,000**

INFORMATION PAPER

ON

RC-26B SIMULATORS

1. Background. The Air National Guard (ANG) RC-26B aircraft is a Limited Supply High Demand (LS/HD) manned Intelligence, Surveillance, Reconnaissance (ISR), Incidence Awareness and Assessment (IAA) aircraft that distributes critical tactical and intelligence information to the war fighter. The aircrew consists of two pilots and one Mission System Operator (MSO) with an additional crew position available for special mission personnel. It is tasked heavily for operations involving Department of Defense, law enforcement and multiple agency operations. Pilot Initial and annual pilot simulator training are contracted to a civilian contractor. Currently, there are no training systems for MSOs or additional crew personnel as required by AF Instruction 36-2251. All MSO and most pilot training must be accomplished during a live sortie, which presents prohibitive cost and scheduling issues given the limited number of aircraft. Additionally, mission equipment upgrades, such as onboard data link and sensor controls, will create additional training and currency requirements. The development of the RC-26 System Training Plan (STP) has validated the need for a high fidelity flight deck trainer for pilots and Mission Crew Trainer (MCT) for the MSO. The MCT will link to the flight deck trainer enabling full initial, recurrent and mission rehearsal capability. The Multi Mission Crew Trainer (MMCT) is a two phase approach detailed in the STP. Phase 1 will include a Cockpit Procedural Trainer (CPT) and an MCT with a planned delivery date in FY11. The high fidelity MCT will ensure standardized training for all MSOs for initial qualification and continuation training. Phase II upgrades the CPT to a high fidelity flight deck trainer that will allow pilot qualification training and integrate when desired with the MCT for full mission rehearsal. The high fidelity flight deck will be cost effective as it will eliminate the need for a commercial contract and enhance training.

2. Requirement. The system is based upon Operational Requirements Document (ORD) USAF (CAF) 304-93-I/II/III-A dated 4 August 1994 and Program Management Directive (PMD) 2368 (2)/PE# 54314 dated 17 Dec 1997.

3. Impact If Not Funded. Continued degradation of formal syllabus training in the absence of required aircrew training devices. As mission employment areas expand, a lack of mission rehearsal capability will degrade mission effectiveness and increase risk.

4. Units Impacted. TBD.

5. Contractor. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
1 MMCT (3010)	**$1,800,000**	**$1,800,000**

INFORMATION PAPER

ON

ADVANCED SQUADRON LEVEL SIMULATOR (ASLS) SYSTEM

1. Background. Most Air National Guard (ANG) large aircraft equipped units have limited access to high fidelity flight deck simulators with Distributed Mission Operations (DMO) capability. While Air Mobility Command (AMC) has deployed C-17 and C-5 simulators to all equipped ANG units, KC-135, C-130, and C-27J units and the RC-26B training unit have few simulator resources available on station. To meet this shortfall, and in keeping with the Director, ANG's mandate that all units have at least some home station simulation capability, NGB/A5 developed the ASLS program. The ASLS is a reduced footprint, high fidelity replication of the aircraft flight deck, including: associated operating systems; six degree of freedom motion base; Instructor Operator Station (IOS); physics based air model; threat environment generation station and Air Reserve Component Network (ARCNet) Gateway. The ASLS will be equivalent to a Federal Aviation Administration (FAA) Level C+ training system. The ASLS is unique in two ways. First, it is part of a family of modular ASLS encompassing four (4) weapon systems. By incorporating state of the art commercial technologies, the modular design of the ASLS will allow over 80% commonality among devices resulting in significant cost and schedule savings. Second, the design adopts a reduced footprint design with off board IOS to reduce acquisition and facility costs. Fully qualified aircrew at up to twenty-three (23) ANG units will use the device for continuation, recurrency and upgrade training. In addition, commanders can tailor specific training scenarios to meet immediate aircrew requirements for mission rehearsal. Where appropriate, KC-135 units will collocate and network the ASLS with the KC-135 Boom Operator Simulation System (BOSS) also developed by the ANG.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC; AFI 36-2251.

3. Impact If Not Funded. In the absence of a squadron level, high fidelity device with DMO capability, ANG aircrews will have very limited on-station ability to perform continuation training to meet specific unit tasking.

4. Units Impacted. Ten (10) KC-135, seven (7) C-130, five (5) C-27J and one (1) RC-26B units.

5. Contractors. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE (3600)	**N/A**	**$4,500,000**
10 KC-135 ASLS (3010)	**$4,200,000**	**$42,000,000**
7 C-130 (3010)	**$5,200,000**	**$36,400,000**
5 C-27J (3010)	**$4,800,000**	**$24,000,000**
1 RC-26B (3010)	**$4,500,000**	**$4,500,000**
Total		**$111,400,000**

INFORMATION PAPER

ON

F-15 DISTRIBUTED MISSION OPERATIONS (DMO) FIDELITY SIMULATORS

1. Background. The 173 FW, Kingsley Field, OR, Formal Training Unit (FTU) mission supports F-15C/D active duty Air Force and Air National Guard (ANG) FTU students. Kingsley Filed currently has a single four-ship simulator training center with limited capability. These simulators do not have Joint Helmet Mounted Cueing System (JHMCS) capability and only two of the four simulators have Night Vision Goggle (NVG) capability. Additionally, two of the four simulators do not have all required switches and cockpit fidelity to accomplish Emergency Procedures (EP) training. To meet FTU syllabus requirements, there exists a need for DMO level cockpit fidelity with cockpit representative switches and integration of JHMCS and NVGs to a Full Mission Trainer (FMT) software baseline. By leveraging Boeing owned surplus hardware from the deactivated Mission Training Center (MTC) at Elmendorf AFB, AK, the Guard can accomplish a complete technology refresh of the Kingsley Field MTC at significantly reduced cost and schedule.

2. Requirement. F-15 Distributed Mission Operations (DMO) Fidelity Cockpits Operational Requirements Document dated 23 September 2010.

3. Impact If Not Funded. The F-15C/D FTU will be unable to provide students with realistic training to prepare them for their flights resulting in the requirement for additional flying training in an already stressed syllabus. Additional training will be required for student at home station during aircraft sorties.

4. Units Impacted.
173 FW Klamath Falls, OR

5. Contractor. Boeing Company, St. Louis, MO.

6. Cost.

Units Required	Unit Cost	Program Cost
4 DMO Cockpits (3010)	**N/A**	**$4,170,000**

INFORMATION PAPER

ON

SIMULATION AND DISTRIBUTED MISSION OPERATIONS TRAINING AND REHEARSAL SYSTEM

1. Background. The Simulation and Distributed Mission Operations Training and Rehearsal System provides interim Distributed Mission Operations (DMO) capability to supplement existing simulation systems until mature programs are fielded. Joint Terminal Attack Controllers (JTACs) lack the ability to simulate guiding precision air and artillery strikes at home station in support of qualification training and preparation for theater deployments. Commercially available simulation systems designed to train ground controllers in tactics, techniques and procedures for successful joint close air support now meet rigid Air Force certification, accreditation and training standards. Connectivity through the Air Reserve Component Network (ARCNet) via the Distributed Training Operations Center (DTOC) will connect JTACs to pilots for live, virtual and constructive mission and qualification training. This allows the JTACs and pilots to practice and perform theater mission's rehearsals prior to deployments. In addition an immediate after action review of tactics and lesson learned from prior experiences can be interjected to reinforce training scenario. The system consists of laptops, associated software and licenses.

2. Requirement. Fulfill JTAC control and certification requirements directed under AFI 13-112, Volume 1, and AFI 13-113 via DMO.

3. Impact If Not Funded. JTACs will lack the ability to perform live, virtual and constructive mission training with kinetic aircraft simulation platforms.

4. Units Impacted.

111 ASOC	Camp Murray, WA	138 ASOS	Will Rodgers, OK	227 ASOS	Atlantic City, NJ
113 ASOS	Terre Haute, IN	147 ASOS	Ellington, TX	238 ASOS	Meridian, MS
116 ASOS	Tacoma, WA	148 ASOS	Ft Indiantown Gap, PA	274 ASOS	Syracuse, NY
118 ASOS	Badin, NC	165 ASOS	Brunswick, GA	284 ASOS	Smokey Hill, KS
122 ASOS	Pineville, LA	168 ASOS	Peoria, IL		
124 ASOS	Boise, ID	169 ASOC	Peoria, IL		

5. Contractor. MetaVR, Brookline, MA.

6. Cost.

Units Required	Unit Cost	Program Cost
18 Simulation Systems (3840)	**$17,000**	**$306,000**

INFORMATION PAPER

ON

F-16 FULL COMBAT MISSION TRAINER (FCMT)

1. Background. The Air National Guard (ANG) does not have high fidelity simulators that are fully capable of Distributed Mission Operations (DMO) at all F-16C units. To meet this shortfall, the ANG developed a regionalized training approach as an interim solution. Initially, three (3) four-ship Regional Mission Training Centers (RMTC) will be deployed at geographically dispersed locations to provide enhanced mission rehearsal training. The RMTC will consist of four (4) FCMTs; brief/debrief suites and long-haul DMO connectivity and provide a unique "Virtual Weapons School" for F-16 pilots. The FCMT is an ANG designed and funded next generation high fidelity simulator capable of supporting all levels of aircrew training. The first RMTC, equipped with four (4) Block 30 FCMTs was delivered to the 158 FW in FY10. The ANG is considering a future program to field two (2) FCMTs at each of the remaining Block 30/40/50 units. These mini-MTCs will provide units with superior continuation training and full DMO capability. Until a decision is made for continued FCMT deployment, the ANG will be forced to rely on low/medium fidelity Unit Training Devices (UTD) to meet local simulation training requirements.

2. Requirement. CSAF F-16 Block 30/40/50 Roadmap. ACC F-16 Block 30 CDD (Draft) and ACC F-16 Block 30/40 ORDs.

3. Impact If Not Funded. Failure to fund this requirement precludes completion of the CSAF/ANG F-16 DMO Roadmap. Mission rehearsal and tactics development for ANG F-16 pilots will not meet current or future training requirements or be on par with active duty aircrew. Additionally, lack of high fidelity simulator training will decrease effectiveness of aircraft flight training in the current resource (flying hour program) constrained environment.

4. Units Impacted.

113 WG Andrews AFB, MD	140 WG Buckley, CO	177 FW Atlantic City, NJ
114 FW Sioux Falls, SD	144 FW Fresno, CA	180 FW Toledo, OH
115 FW Truax, WI	148 FW Duluth, MN	187 FW Dannelly Fld, AL
132 FW Des Moines, IA	149 FW Kelly AFB, TX	
138 FW Tulsa, OK	169 FW McEntire, SC	

5. Contractor. Lockheed Martin Government Systems, Mesa, AZ. Follow-on contract TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
8 FCMTs (3010)	**$4,500,000**	**$36,000,000**

INFORMATION PAPER

ON

A-10 FULL MISSION TRAINER (FMT)

1. Background. The Air National Guard (ANG), Air Force Reserve Command (AFRC), and Air Combat Command (ACC) have jointly fielded a fully immersive, high fidelity flight simulator with 360° full field of view, high definition digital displays, threat environment, brief/ debriefing suite and Distributed Mission Operations (DMO) capability. Funding by ACC, as the lead command, for additional procurement beyond the devices currently fielded has been inadequate to meet ANG requirements. Following recent force structure and basing changes, the ANG has a total requirement for ten (10) FMTs to complete the deployment of two devices per unit. Four ANG units, 124 WG, 127 WG, 175 WG and 188 FW, currently have one ACC funded FMT each. The FMT at the 175 WG was ANG funded in FY04 in order to kick start the A-10C model conversion. This FMT was the first A-10C model simulator in the USAF with the Precision Engagement upgrade. The A-10 FMT is a critical component for unit qualification in the A-10C and for aircrew continuation training and mission rehearsal and is more important than ever with flying hour reductions reaching critical levels. The requirement for five (5) FMTs completes fielding for the ANG.

2. Requirement. A-10 ORD 19 Oct 1999 and Combat Air Forces DMO Roadmap; AFI 36-2251.

3. Impact If Not Funded. Failure to fund this requirement precludes completion of the CSAF A-10 DMO Roadmap. Mission rehearsal and tactics development for all ANG A-10 aircrews will not be available.

4. Units Impacted.

122 FW Ft Wayne, IN	127 WG Selfridge ANGB, MI	188 FW Ft Smith, AR
124 WG Boise, ID	175 WG Baltimore, MD	

5. Contractor. Lockheed-Martin Systems Management, Mesa, AZ. New contract award pending.

6. Cost.

Units Required	Unit Cost	Program Cost
5 A-10C FMTs (3010)	**$4,500,000**	**$22,500,000**

INFORMATION PAPER

ON

SPACE BASED INFRARED SYSTEMS (SBIRS) SURVIVABLE ENDURABLE EVOLUTION (S2E2) TRAINING SUITE

1. Background. The 137th Space Warning Squadron (SWS) operates the Mobile Ground System (MGS) to provide missile warning and nuclear detection capabilities to the Joint Chiefs of Staff. The MGS will undergo a major modification known as the Space Based Infrared System (SBIRS) Survivable Endurable Evolution (S2E2) to increase capabilities and longevity of the system. A training suite is required in advance of these modifications to provide a realistic environment to develop Tactics, Techniques and Procedures (TTPs) for training and operational use. This training suite will utilize an Operations Migration Capability (OMC) directly connected to established data lines that provide the operator with the ability to receive data from several missile warning satellites including DSP, SBIRS GEO and HEO. This system allows operators to receive and process real data without affecting real-world missions. The training suite will be implemented eighteen months before the S2E2 modification is deployed. The training suite is critical in the development of training plans and validation of TTPs in support of the critical missile warning mission. Additionally, the use of the training suite will allow S2E2 to be used operationally immediately upon fielding and acceptance by the unit.

2. Requirement. SBIRS Survivable Endurable Evolution OPSCON (S).

3. Impact If Not Funded. The MGS has an obligation to maintain an operational capability throughout the transition to the S2E2 modification. Without the training suite, the 137 SWS will be unable to develop training, checklists and procedures until S2E2 is delivered and fully operational, delaying implementation and risking operational integration.

4. Units Impacted.
137 SWS Greeley, CO

5. Contractor. Lockheed Martin, Colorado Springs, CO; Northrop Grumman, Colorado Springs, CO.

6. Cost.

Units Required	Unit Cost	Program Cost
NRE (3080)	**N/A**	**$800,000**

INFORMATION PAPER

ON

EC-130J WEAPON SYSTEM TRAINING DEVICE

1. Background. There is no training device at the 193d Special Operations Wing (SOW) to support ground and/or flying training requirements associated with initial/mission qualifications and/or continuation or differences training for pilots, Combat System Operators (CSOs) and loadmasters. All ground and flying training is conducted in the EC-130J aircraft. There are only seven EC-130J aircraft that are assigned to the 193d Special Operations Wing (SOW). Due to the high operational demand, the aircraft have limited availability for ground training use. The training must be conducted on an aircraft when it is not being flown or having maintenance performed. It is extremely difficult to schedule and complete the training for aircrews in a timely manner. The 193 SOW possesses the only EC-130J aircraft in the Department of Defense (DoD) inventory. Mission qualification and differences training can only be conducted at the 193 SOW in the EC-130J aircraft. The Air Education and Training Command (AETC) can only provide training on the basic C-130J airframe. The 193 SOW has Aircrew Training and Rehearsal System II (ATARS II) faculty and a formal flying training unit within the 193d Special Operations Squadron that conduct ground and flying training. The current training requirement in the EC-130J syllabi is 420 hours of static ground training and under surge operations 620 hours. A Multi-Function Training Aid (MFTA) would provide a dedicated ground training device to alleviate the aircraft scheduling burden and enhance the continuity of the training.

2. Requirement. Critical capability shortfall identified at the 2010 ARC WEPTAC.

3. Impact If Not Funded. Initial and mission qualification, along with differences and continuation training, will continue to be impacted due to lack of available training assets (aircraft). These impacts include delays in qualifying crews (increased costs) and reduced opportunities for continuation training resulting in less proficient crews (safety).

4. Units Impacted.
193 SOW Harrisburg IAP, PA

5. Contractor. Lockheed Martin.

6. Cost.

Units Required	Unit Cost	Program Cost
1 MFTA (3010)	**$850,000**	**$850,000**

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Space and Cyber Warfare/ Information

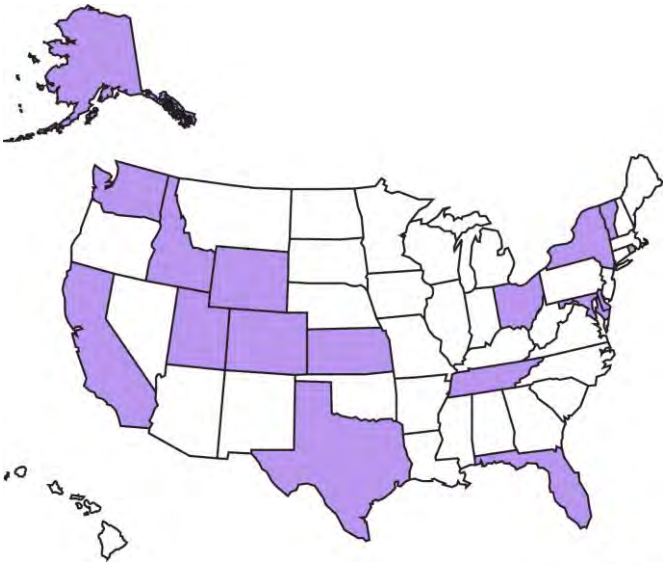
- **Space Warning to Launch Range Operations**
- **Network Warfare Operations**
- **Influence Operations**

SPACE OPERATIONS

The ANG's contribution to Air Force Space Command (AFSPC) space missions includes over 1,300 personnel within ten squadrons operating nine distinct weapon systems. These units support three of the four AFSPC functional mission areas. From the 137th Space Warning Squadron, which is the nation's sole provider of mobile survivable and endurable missile warning for the defense of North America to the 148th Space Operations Squadron, which is responsible for command and control of 40% of the MILSTAR satellite constellation, the ANG is an indispensable enabler of the AFSPC space mission. The ANG will continue to offer its experience and expertise to ensure AFSPC can provide its critical capabilities to the entire range of Combatant Commanders.

CYBER WARFARE AND INFORMATION OPERATIONS (CW/IO)

The ANG CW/IO force is made up of nine squadrons from Delaware, Kansas, Maryland, Pennsylvania, Rhode Island, Texas, Utah, Vermont, and Washington. Together, they provide cyber and IO capabilities supporting the AF, Combatant Commanders, and National/State-level agencies by conducting Network Warfare Operations, Network Warfare Support and Influence Operations/Operational level planning. Additionally, the community is very successfully providing capabilities based upon citizen airmen's civilian expertise combined with their military training. Areas in which units excel include: Network Warfare Operations, digital media/network analysis, Red/Blue Assessment teams, Critical Infrastructure analysis, and Influence Operations in both exercises and real world operations which include support to troops in contact with the enemy, targeting, strategic strike, and remote operations.



As the community matures and grows, efforts continue to robust the IO Range infrastructure in order to improve integration of ANG assets during

distributed mission training, tactics techniques and procedures development, exercise execution, and mission rehearsal/planning.

Space and Cyber Warfare/ Information Operations (CW/IO) 2010 Weapons and Tactics Conference

Critical Combat Capabilities List

Space
- Domain Infrastructure Capability Enhancement (DICE)

CW/IO
- Cyber and Critical Infrastructure Range (CCIR) Weapons System
- EC-130J Radio Signal Propagation Modeling Program (RSPM)
- Deployable Cyber Quick Reaction Capability (DCQRC)
- Cyberspace Operations Execution Platform (COEP)
- Immersive Telepresence for Distributed Operations (ITDO)

Essential Capabilities List

Space
- A Collaborative Advanced Simulation Capability Linking Multiple Space Missions and Providing Realistic Effects to Warfighters
- Transit Case Telemetry Station (TCeTS) for Operationally Responsive Space Launch Support in Austere Environments

CW/IO
- Cross Domain Solution
- Back-Up Generator
- Geosynchronous Road Mapping Technology Equipment

Desired Capabilities List

CW/IO
- Virtualization Farm Suite
- Wireless and Radio Frequency Testing Equipment
- Uninterruptible Power Supply (UPS) Back-Up Battery
- Portable Video Display
- Air National Guard Site License
- Kansas STO/Sensitive Compartmented Information Facility (SCIF Cyber Facility)
- Tennessee Maintenance Facility
- Maryland SCIF Facility
- Idaho Cyber Ops Building
- Delaware Cyber Facility
- Power Generation Station

SPACE AND CYBER WARFARE/ INFORMATION OPERATIONS (CW/IO) EXECUTIVE SUMMARY

Modernization Funding Profiles ($ Million)

Program	P.E. Number	2012	2013	2014	2015	2016	Total
Space							
Domain Infrastructure Capability Enhancement	53116F	$2.03 [4]	-	-	-	-	$2.03
CW/IO							
Cyber and Critical Infrastructure Range Weapon System	53056F 53116F	$2.88 [1] $2.92 [4] $0.96 [1] $1.16 [4]	$0.54 [1] - $0.18 [1] -	$0.54 [1] - $0.18 [1] -	$0.54 [1] - $0.18 [1] -	$0.54 [1] - $0.18 [1] -	$10.80
EC-130J Radio Signal Propagation Modeling Program	53056F	$0.25 [1] $0.36 [4]	- -	- -	- -	- -	$0.61
Deployable Cyber Quick Reaction Capability	53056F 53116F	$1.14 [4] $0.14 [4]	- -	- -	- -	- -	$1.28
Cyberspace Operations Execution Platform	53056F	$1.10 [4]	-	-	-	-	$1.10
Immersive Telepresence for Distributed Operations	53056F	$2.56 [4]	-	-	-	-	$2.56

Notes: [1] 3840 Appropriation [2] 3010 Appropriation [3] 3600 Appropriation [4] 3080 Appropriation

Space

- Domain Infrastructure Capability Enhancement (DICE) - Provides capability for Command and Control Squadrons (CACS) to equip facilities, provide users independent network access, global situational awareness, and information collaboration capabilities for state and federal agencies and military forces.

CW/IO

- Cyber and Critical Infrastructure Range (CCIR) Weapon System - Provides the ability to continually prepare personnel in specialized "cyber-centric" activities supporting the development of new tactics, techniques, and procedures in a net-centric environment.
- EC-130J Radio Signal Propagation Modeling Program - A software program tool to model radio frequency propagation pattern mapping.
- Deployable Cyber Quick Reaction Capability - A scalable suite of specialized tools for responding to compromised U.S. networks and Industrial Control Systems (ICS).
- Cyberspace Operations Execution Platform (COEP) - Provides target planning, network mapping, situational awareness, and frameworks for IP networks, Industrial Control Systems, wireless exploitation, active/passive network defense, forensics and reconstruction of events.
- Immersive Telepresence for Distributed Operations (ITDO) - Systems capable of immediate interaction and collaboration by sharing and presenting documents real-time.

INFORMATION PAPER

ON

DOMAIN INFRASTRUCTURE CAPABILITY ENHANCEMENT (DICE)

1. Background. Command and Control Squadrons (CACS) provide facilities, user independent network access, global situational awareness, and information collaboration capabilities for state, federal agencies, and military forces. In their state and federal roles, the units facilitate connectivity between first responders and national, state, and local authorities during times of natural and manmade disasters. To complete their military missions, CACS personnel access and assimilate information for multiple world-wide users, across various classification levels, in support of national command directives. Users must be able to quickly and seamlessly transition between various networks from any crew position driving requirements for concurrent access to multiple networks and domains. Current cyber capacity does not meet user needs. The requested funding will support procurement of cyber infrastructure and associated National Security Agency (NSA) approved switches for simultaneous access to all required systems at 119 crew positions for one unit and 50 crew positions for a second unit. The solution will complement the existing Clear Cube solution to maintain equipment commonality and minimize system maintenance, administration, and functionality costs.

2. Requirement. Classified CONOPS; USSPACECOM requirements; critical capability shortfall identified at the 2010 ARC WEPTAC.

3. Impact If Not Funded. Unit capabilities will not be able to fully meet combatant commander wartime requirements, federal emergency response agency accessibility, and state continuity objectives. Additionally, these National Guard operations centers will be underequipped as compared to equivalent active duty operations centers.

4. Units Impacted.

212 CACS Gowen Field, ID 127 CACS McConnell AFB, KS

5. Contractor. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
169 Switches (3080)	**$12,000**	**$2,028,000**

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ON

CYBER AND CRITICAL INFRASTRUCTURE RANGE (CCIR) WEAPON SYSTEM

1. Background. Air, Space, and Cyberspace are domains. In the evolving Cyberspace domain, Computer Network Operations (CNO) missions and tactics must constantly evolve to keep pace with rapidly advancing cyber threats, technology and tactics. Air National Guard (ANG) CNO squadrons require a system capable of continually preparing personnel in specialized "cyber-centric" activities. The system supports the development of new tactics, techniques and procedures in a net-centric environment, and simultaneously facilitates a common cyber operating picture and sharing of capabilities among units. The system will emulate friendly and adversarial networks and cyberspace environments. The CCIR weapon system is a combination of Commercial-Off-the-Shelf (COTS) and Government-Off-the-Shelf (GOTS) Information Technology (IT) and infrastructure. This system will bring capabilities in line with active duty cyber components, and will increase the ANG's ability to protect and defend critical network-controlled domestic infrastructures. The CCIR weapon system operates as a stand-alone simulator for network exploitation and network attack. The system will also provide secure reach-back in the conduct of operational DOD Network Integrity Assessments and directly support real-time network defense.

2. Requirement. AFSPC AFCYBER PAD, dated 9 Feb 2009; National Strategy to Secure Cyberspace, dated Feb 2003; NSPD-54/HSPD-23, dated Jan 2008; Air Force Program Action Directive 07-08, para 1.2.1, dated 9 Feb 2009; NSPD-38, dated 2004; critical capability shortfall identified at the 2010 ARC WEPTAC.

3. Impact If Not Funded. Without the CCIR, the ANG will be unable to adequately support the National Strategy to Secure Cyberspace from zero-day exploits, and cannot keep pace with adversaries' technological capability in both attacking and defending cyberspace. Critical cyber infrastructure will be lost, and the ability to perform net-centric activities will cease.

4. Units Impacted.

102 NWS	Coventry ANGS, RI	175 NWS	Martin State, MD	262 NWS	McChord AFB, WA
166 NWS	New Castle, DE	177 IAS	McConnell AFB, KS	273 IOS	Lackland AFB, TX
119 CACS	McGhee Tyson, TN	212 CACS	Gowen Field, ID		

5. Contractor. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
8 CCIR Weapons Systems (3080)	**$510,000**	**$4,080,000**
8 CCIR Refresh/Sustainment (3840)	**$840,000**	**$6,720,000**
Total		**$10,800,000**

INFORMATION PAPER

ON

EC-130J RADIO SIGNAL PROPAGATION MODELING PROGRAM

1. Background. The 193d Special Operations Wing operates the EC-130J Commando Solo aircraft as an airborne Military Information System Operations (MISO) platform and provides airborne electronic attack (EA). To effectively keep pace with changes in technology and communication equipment both missions require a software tool to model the propagation of Radio Frequency (RF) signals from the aircraft and depict effects on targets of interest. This tool will also illustrate conflicts between EC-130J signals and other assets that exploit the RF spectrum, reducing both fratricide and unintended effects. The tool will be employed on-board the aircraft and display to the crew real-time information about the effects of RF signals being emitted by the aircraft. Crews will use the software to support real-time re-tasking, allowing the aircraft to support higher priority missions as they develop. The tool will also be used when it is necessary to deviate from the planned mission due to weather conditions or developing threats. The new program requires data concerning the electrical performance of EC-130J systems. ANG/AFRC Test Center (AATC) will collect data, which will require two days use of the air-to-ground range at the Naval Air Station at Patuxent River, MD.

2. Requirement. Joint Operational Requirements Document (JORD) AFSOC 001-99 (U) (signed: 28 Mar 05); critical capability shortfall identified at the 2010 ARC WEPTAC.

3. Impact If Not Funded. The Commando Solo mission effectiveness and subsequent support to troops on the ground during Troops in Contact (TIC) is compromised by using obsolete and inaccurate tools. RF effects and broadcast messages may miss their intended targets and possibly strike unintended targets with potentially negative effects on US and coalition forces.

4. Units Impacted.
193 SOW Harrisburg, PA

5. Contractor. Naval Air Systems Command (NAVAIR) for range support; TBD for software.

6. Cost.

Units Required	Unit Cost	Program Cost
1 RF Propagation Software Program (3080)	**$360,000**	**$360,000**
1 Range Support (3840)	**$250,000**	**$250,000**
Total		**$610,000**

INFORMATION PAPER

ON

DEPLOYABLE CYBER QUICK REACTION CAPABILITY (DCQRC)

1. Background. Air National Guard (ANG) units engaged in cyber operations require DCQRC to execute network warfare operations in support of their Title 10, 32, and 50 missions. These scalable kits comprise a suite of highly specialized network equipment and software for identifying and mitigating compromised Air Force networks and attached Industrial Control Systems (ICS). DCQRC primarily provides network defenders the ability to move to the infected system and subsequently find, identify, track, target, engage, and assess cyber attacks, while supporting warfighter mission assurance requirements.

2. Requirement. U.S. Cyber Command, USAF (all commands), and ANG "mission assurance"; Homeland Security Presidential Directive 7: Critical Infrastructure Identification, Prioritization, and Protection requires network capability to identify, assess and protect critical infrastructure; critical capability shortfall identified at the 2010 ARC WEPTAC.

3. Impact If Not Funded. Air Force and warfighter networks (e.g. Nuclear Enterprise, Aerial Layer network) as well as attached ICS will continue to remain exposed and vulnerable to cyber attacks. In addition, warfighting operations may be denied, degraded, disrupted, deceived, or destroyed by cyber attacks. This impairs the availability of mission critical information to decision makers, degrades command and control, and severely limits the U.S. ability to protect strategic centers of gravity.

4. Units Impacted.

101 IOF	Salt Lake City, UT	175 NWS	Martin State, MD	262 NWS	McChord AFB, WA
102 NWS	Coventry ANGS, RI	177 IAS	McConnell AFB, KS	273 IOS	Lackland AFB, TX
166 NWS	New Castle, DE	229 IOS	Northfield, VT	212 CACS	Gowen Field, ID

5. Contractor. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
9 Suites (3080)	**$142,000**	**$1,278,000**

INFORMATION PAPER

ON

CYBERSPACE OPERATIONS EXECUTION PLATFORM (COEP)

1. Background. Air National Guard (ANG) units require an inherent capability that provides a multitude of cyberspace tactics and techniques that, when directed, facilitates cyberspace operations in support of combatant commanders and Title 32 missions. This Cyberspace Operations Execution Platforms (COEP) provides a common total force framework to enable cross-state collaboration for execution of cradle-to-grave Cyberspace Tasking Orders in a synergistic approach. Inherent toolsets will enable guard units to exercise and validate the platforms on their Cyber and Critical Infrastructure Range (CCIR) while providing the option for operational convention, thus enabling guard units with the ability to train as we fight. In house toolsets facilitate deployed-in-place options while using cyberspace as a platform to launch non-kinetic capabilities that transcend the internet. Nonproprietary toolsets provide operators extensible utilization and updates on the fly. Capabilities should include, but not be limited to, target planning, network mapping, situational awareness, frameworks for Internet Protocol (IP) networks, Internet Connection Sharing (ICS), wireless exploitation, active/passive network defense, forensics and reconstruction of events.

2. Requirement. AF Space Command (AFSPC) requirement for cyber and space integration; critical capability shortfall identified at the 2010 ARC WEPTAC.

3. Impact If Not Funded. Commanders will not have the ability to properly align their cyber forces. Currently cyberspace operations support land and air operations. Lack of this capability will impact the combatant commander's ability to influence cyberspace from numerous locations, which will substantially decrease cyber operations synergistic effects. Lack of integrated cyber operations either overseas or in support of homeland missions will substantially decrease the effectiveness of the commander in meeting mission objectives.

4. Units Impacted.

102 NWS Coventry ANGS, RI	175 NWS Martin State, MD	262 NWS McChord AFB, WA
166 NWS New Castle, DE	177 IAS McConnell AFB, KS	

5. Contractor. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
5 COEP (3080)	**$220,000**	**$1,100,000**

INFORMATION PAPER

ON

IMMERSIVE TELEPRESENCE FOR DISTRIBUTED OPERATIONS (ITDO)

1. Background. Air National Guard (ANG) Information Operations (IO) and Network Warfare (NW) squadrons have various educational levels and cyber skill sets that are not being utilized in a synergistic manner. The ability to operate synergistically will dramatically affect the ANG's effectiveness in supporting national and state missions and objectives. ANG IO/NW units require a system that will support the ability to collaborate and share information real-time in a common operating picture environment that is immersive, life-size and completely flexible. The ITDO is a commercial-off-the-shelf system with the capability to support the development of innovative ideas that foster the advancement of tactics, techniques, and procedures for the Air Reserve Component as well as the entire Department of Defense. These systems are capable of immediate interaction and collaboration by sharing and presenting documents in real-time. Further, these systems will allow disparate units from multiple states to synchronize and prioritize efforts toward national and state cyber missions. For state missions, ITDO enables a coordinated effort via a common operating picture for multi-state support to emergency events. Additionally, ITDO provides deployed individuals a reach-back capability to subject matter experts to ensure that the information being used marries with the rapidly changing information technology environment. The ITDO systems will increase unity of effort in response to an emergency event between all ANG IO/NW units or surrounding states. This synergy between units can also be leveraged by the Department of Homeland Security, other government organizations, and respective state governments (Joint Force Headquarters, Adjutant General, and the Governor). Finally, it gives all ANG IO/NW units the ability to boost IO/NW operations mission effectiveness.

2. Requirement. AFSPC AFNetOps UON memo requesting increased situational awareness on the network; critical capability shortfall identified at the 2010 ARC WEPTAC.

3. Impact If Not Funded. ANG units will not be able to provide a coordinated rapid response to national security/cyber events. Mission effectiveness and collaborative efforts will be substantially degraded hampering the mitigation of cascading effects to other networks.

4. Units Impacted.

101 IOF	Salt Lake City, UT	175 NWS	Martin State, MD	262 NWS	McChord AFB, WA
102 NWS	Coventry ANGS, RI	177 IAS	McConnell AFB, KS	273 IOS	Lackland AFB, TX
166 NWS	New Castle, DE	229 IOS	Northfield, VT		

5. Contractor. TBD.

6. Cost.

Units Required	Unit Cost	Program Cost
8 ITDO (3080)	**$320,000**	**$2,560,000**

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