

UNCLASSIFIED

Exhibit P-40, Budget Line Item Justification: PB 2020 Air Force **Date:** February 2019

Appropriation / Budget Activity / Budget Sub Activity:
3021F: Space Procurement, Air Force / BA 01: Space Procurement, Air Force / BSA
1: Space Programs

P-1 Line Item Number / Title:
MSSBIR / SBIR High (Space)

ID Code (A=Service Ready, B=Not Service Ready): A **Program Elements for Code B Items:** 0604441F **Other Related Program Elements:** 1206441F

Line Item MDAP/MAIS Code: 210

Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
Procurement Quantity (<i>Units in Each</i>)	-	-	-	-	-	-	-	-	-	-	-	-
Gross/Weapon System Cost (<i>\$ in Millions</i>)	916.611	929.058	108.397	233.952	-	233.952	176.065	55.188	8.340	8.490	0.000	2,436.101
Less PY Advance Procurement (<i>\$ in Millions</i>)	-	-	-	-	-	-	-	-	-	-	-	-
Net Procurement (P-1) (<i>\$ in Millions</i>)	916.611	929.058	108.397	233.952	-	233.952	176.065	55.188	8.340	8.490	0.000	2,436.101
Plus CY Advance Procurement (<i>\$ in Millions</i>)	-	-	-	-	-	-	-	-	-	-	-	-
Total Obligation Authority (<i>\$ in Millions</i>)	916.611	929.058	108.397	233.952	-	233.952	176.065	55.188	8.340	8.490	0.000	2,436.101

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (<i>\$ in Millions</i>)	-	-	-	-	-	-	-	-	-	-	-	-
Flyaway Unit Cost (<i>\$ in Millions</i>)	-	-	-	-	-	-	-	-	-	-	-	-
Gross/Weapon System Unit Cost (<i>\$ in Millions</i>)	-	-	-	-	-	-	-	-	-	-	-	-

Description:

Note: This program had \$132.420M Advance Procurement for SBIRS SV 7-8. That effort has been canceled and Congress zeroed out the AP in the FY 2018 budget.

Note: The flyaway unit cost is not included on the P-40 exhibit because there are multiple P-5 Cost Analysis exhibits.

Funding for this exhibit contained in PE 1203915F.

The Space Based Infrared System's (SBIRS) primary mission is to provide initial warning of a ballistic missile attack on the US, its deployed forces and its allies. SBIRS enhances detection and improves reporting of intercontinental ballistic missiles, submarine launched ballistic missiles, and tactical ballistic missiles. SBIRS provides increased detection and tracking performance in order to meet requirements in the Operational Requirements Document (ORD). SBIRS will consist of satellites in Geosynchronous Earth Orbit (GEO) and in Highly Elliptical Orbit (HEO) with an integrated, centralized ground station serving all SBIRS space elements, Defense Support Program (DSP) satellites and other program related support activities. The HEO payloads operate on a classified host.

SBIRS 3-6 SATELLITES:

SBIRS GEO-3 and 4 satellites are derivatives of the first two GEO satellites which were delivered on the SBIRS Engineering and Manufacturing Development (EMD) contract (RDT&E funded). The GEO-3 and 4 satellite production efforts are necessary to meet constellation requirements. In Dec 2008, the Department approved the procurement of GEO-3 and 4 satellites and the HEO-3 and 4 payloads using a Cost-Plus contract. In order to minimize the number of storage actions and costs associated with aligning the SBIRS launches to the earliest assigned Initial Launch Capability (ILC) date of Apr 2016, the GEO-3 satellite completed production and was placed into storage in Jul 2015. The GEO-4 satellite launched as the third flight (GEO-4 Flight-3) in Jan 2017. The GEO-3 (Flight-4) satellite launched in Jan 2018.

SBIRS GEO-5 and 6 satellites are derivatives of the GEO-3 and 4 satellites and will be replacements for GEO-1 and 2. A four phased contract approach awarded non-recurring engineering and parts obsolescence using advanced procurement funds in Sep 2012, followed by award of long lead items in Feb 2013, full production in Jun 2014, and technical refresh in Jun 2015. The GEO-5 and 6 technical refresh contract modification modernizes the existing spacecraft bus design to improve commonality across Air Force and Government satellite programs, and enable compatibility with multiple launch vehicles. The full production effort includes 2 satellites with persistent infrared missile and threat warning payloads, launch vehicle integration, launch and early orbit test, dual communication band modification (unified SBand), and contractor operations support through operational acceptance.

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Exhibit P-40, Budget Line Item Justification: PB 2020 Air Force		Date: February 2019
Appropriation / Budget Activity / Budget Sub Activity: 3021F: Space Procurement, Air Force / BA 01: Space Procurement, Air Force / BSA 1: Space Programs		P-1 Line Item Number / Title: MSSBIR / SBIR High (Space)
ID Code (A=Service Ready, B=Not Service Ready): A	Program Elements for Code B Items: 0604441F	Other Related Program Elements: 1206441F
Line Item MDAP/MAIS Code: 210		
<p>For the GEO 5-6 block buy, the FY 2013 NDAA authorizes six years of incremental production funding and limits the incrementally funded contract obligation to \$3,900M. The years of incremental funding are FY 2013-2018. Advance procurement was appropriated in FY 2011 and FY 2012. GEO 5-6 advance procurement and incremental funding are attributed to FY 2013 for the purposes of identifying full funding for procurement end items. Each year of appropriation FY 2013-2018 is in two parts, the incrementally funded contract amount and annual program support costs. The incrementally funded amount complies with the NDAA cap.</p> <p>SBIRS HEO-3 and 4 payloads are replenishments for HEO-1 and 2 payloads, which were delivered on the SBIRS Engineering and Manufacturing Development (EMD) contract (RDT&E funded). The HEO-1 and 2 payloads are on-orbit and certified for Integrated Tactical Warning/Attack Assessment (ITW/AA) missile warning operations and certified for technical intelligence operations. The HEO-3 payload is on-orbit and has completed its initial checkout. The HEO-4 payload was delivered to the classified host in May 2015.</p> <p>Total GEO 3-4 3020/3021 funds are \$2,818.760M. Total GEO 5-6 3020/3021 funds are \$3,336.571M. Total HEO 3-4 3020/3021 funds are \$1,146.672M. Total S2E2 3080/3020/3021 funds are \$394.010M.</p> <p>SBIRS MOBILE AND FIXED SITE COMMUNICATIONS/ELECTRONIC REPLACEMENT: This effort procures DSP and SBIRS assets to maintain the Data Processing Sub-System. Fixed site examples include, but are not limited to, legacy receiver, antenna drive system, Spacecraft Simulator RF, MCS display, Rapid Delog (instantaneous translation of computer data to a human-readable format), Sybase database obsolescence, communications and network routers, and switches and time server replacements. Mobile system examples include, but are not limited to, aging radio frequency communications equipment, aging antenna equipment, aging electrical equipment and cabling, and unsupported data processing subsystem components. This effort includes the recurring hardware/software antenna obsolescence updates to peacetime survivable ground effort called Rapid Adaption GEO Relay Station (RANGERS).</p> <p>SBIRS SURVIVABLE ENDURABLE EVOLUTION (S2E2): The S2E2 effort recapitalizes the DSP Mobile Ground System (MGS) DSP Mobile Ground Terminals with SBIRS Mobile Ground Terminals (SMGT) and prime mover tractor trailers. The MGS is the only US Survivable and Endurable (S/E) Tactical Warning and Attack Assessment (TW/AA) system (S/E TW/AA). It is the critical Situation Monitoring element in three national-level architectures: Integrated TW/AA System, Chairman, Joint Chiefs of Staff (CJCS) Critical Nodes, and Nuclear Command and Control System (NCCS). USSTRATCOM needs AFSPCs global S/E TW/AA operational capabilities to meet President of the United States, Joint Staff, Combatant Commander and Forward User (FU) requirements for continuous, persistent, and enduring TW/AA non-imaging infrared (NIR) for Missile Warning and static events, and Nuclear Detonation (NUDET) detection and reporting across all phases of military operations. The current MGS can only process DSP data for strategic Missile Warning and NUDET detection. This effort will address long-standing obsolescence/supportability and cyber security concerns of the MGS, enable the MGS to process SBIRS and DSP satellite data. Training software, spares and integration of Universal Ground NDS Terminals (UGNTs) are included. The shelters will also be upgraded for increased protection from high altitude electromagnetic pulse (HEMP) per MIL-STD-188-125-2.</p> <p>Space acquisition must respond with speed and agility to emerging adversary threats. Space & Missile Systems Center (SMC) is transforming the organization and implementation of space acquisition to an enterprise approach, maximizing innovation and resiliency, leveraging international, commercial, and mission partnerships, and managing program/project priorities according to an integrated unclassified/classified enterprise space architecture. Expanding the appropriate acquisition authorities and contract mechanisms to deliver capability sooner, SMC will strategically execute experimentation, prototyping, risk reduction, and other efforts to develop new or repurpose capabilities.</p> <p>As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is \$14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.</p>		

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Appropriation / Budget Activity / Budget Sub Activity: 3021F: Space Procurement, Air Force / BA 01: Space Procurement, Air Force / BSA 1: Space Programs
P-1 Line Item Number / Title: MSSBIR / SBIR High (Space)

ID Code (A=Service Ready, B=Not Service Ready): A **Program Elements for Code B Items:** 0604441F **Other Related Program Elements:** 1206441F

Line Item MDAP/MAIS Code: 210

Exhibits Schedule					Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Exhibit Type	Title*	Subexhibits	ID CD	MDAP/MAIS Code	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)
P-5	GEO 3-4		A		- / 141.944	- / 17.787	- / -	- / -	- / -	- / -
P-5	GEO 5-6		A		- / 609.849	- / 858.843	- / 99.970	- / 128.002	- / -	- / 128.002
P-5	HEO 3-4		A		- / 28.518	- / 7.499	- / -	- / -	- / -	- / -
P-5	SBIRS Survivable Endurable Evolution (S2E2)		A		- / 128.995	- / 27.889	- / 0.685	- / 90.067	- / -	- / 90.067
P-3a	1 / SBIRS Mobile System & Fixed Comm Electronics Upgrades (Reliability & Maintainability)		B		- / 7.305	- / 17.040	- / 7.742	- / 15.883	- / 0.000	- / 15.883
P-40	Total Gross/Weapon System Cost				- / 916.611	- / 929.058	- / 108.397	- / 233.952	- / -	- / 233.952

Exhibits Schedule					FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
Exhibit Type	Title*	Subexhibits	ID CD	MDAP/MAIS Code	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)	Quantity / Total Cost (Each) / (\$ M)
P-5	GEO 3-4		A		- / -	- / -	- / -	- / -	- / -	- / -
P-5	GEO 5-6		A		- / -	- / -	- / -	- / -	- / -	- / -
P-5	HEO 3-4		A		- / -	- / -	- / -	- / -	- / -	- / -
P-5	SBIRS Survivable Endurable Evolution (S2E2)		A		- / -	- / -	- / -	- / -	- / -	- / -
P-3a	1 / SBIRS Mobile System & Fixed Comm Electronics Upgrades (Reliability & Maintainability)		B		- / 71.026	- / 55.188	- / 8.340	- / 8.490	- / -	- / 191.014
P-40	Total Gross/Weapon System Cost				- / 176.065	- / 55.188	- / 8.340	- / 8.490	- / 0.000	- / 2,436.101

*Title represents 1) the Number / Title for Items; 2) the Number / Title [DODIC] for Ammunition; and/or 3) the Number / Title (Modification Type) for Modifications.

Note: Totals in this Exhibit P-40 set may not be exact or sum exactly due to rounding.

Justification:
 FY 2020 funding provides for launch integration and early on orbit test for GEO-5 and 6 satellites, resilience efforts and continued program/product support.

FY 2020 funding procures SBIRS mobiles/ground hardware and/or software. SBIRS Mobile System & Fixed Site Communications/Electronics Upgrades. The RANGERS upgrade to the Survivable Mission Control Station (SMCS) and Survivable Remote Ground Station (SRGS) antennas to common GEO capable antennas required to provide Survivable GEO downlink capability and reduce SRGS sustainment posture risk.

FY 2020 S2E2 Funds are required to deliver initial SBIRS ORD survivable and endurable performance requirements. The updated program baseline will deliver S2E2 through Initial Operating Capability (IOC) and bring SBIRS GEO and GPS NUDET into the USSTRATCOM NC3 endurable mission. Funding also provides Interim Contractor Support (ICS).

Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. These activities may include, but are not limited to program office support, studies, technical analysis, prototyping, etc.

Efforts with funding starting in FY 2021 through FY 2024 are summarized on the P-40. Not all details of this funding are included in this P-40 exhibit set. A summary of the excepted details is as follows:

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Appropriation / Budget Activity / Budget Sub Activity: 3021F: Space Procurement, Air Force / BA 01: Space Procurement, Air Force / BSA 1: Space Programs		P-1 Line Item Number / Title: MSSBIR / SBIR High (Space)
ID Code (A=Service Ready, B=Not Service Ready): A	Program Elements for Code B Items: 0604441F	Other Related Program Elements: 1206441F
Line Item MDAP/MAIS Code: 210		

(a) FY 2021 Cost Delta: 105.039 million
(b) FY Total Cost Delta: 2,245.087 million

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Exhibit P-5, Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation / Budget Activity / Budget Sub Activity: 3021F / 01 / 1	P-1 Line Item Number / Title: MSSBIR / SBIR High (Space)	Item Number / Title [DODIC]: GEO 3-4

ID Code (A=Service Ready, B=Not Service Ready) : A	MDAP/MAIS Code:
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Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Procurement Quantity (Units in Each)	-	-	-	-	-	-
Gross/Weapon System Cost (\$ in Millions)	141.944	17.787	-	-	-	-
Less PY Advance Procurement (\$ in Millions)	-	-	-	-	-	-
Net Procurement (P-1) (\$ in Millions)	141.944	17.787	-	-	-	-
Plus CY Advance Procurement (\$ in Millions)	-	-	-	-	-	-
Total Obligation Authority (\$ in Millions)	141.944	17.787	-	-	-	-

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (\$ in Millions)	-	-	-	-	-	-
Gross/Weapon System Unit Cost (\$ in Millions)	-	-	-	-	-	-

Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2018			FY 2019			FY 2020 Base			FY 2020 OCO			FY 2020 Total		
	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)
Space Vehicle - GEO 3-4 Cost																		
Recurring Cost																		
GEO 3-4 Hardware	-	-	0.342	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GEO 3-4 Integration and Assembly	-	-	1.282	-	-	13.535	-	-	-	-	-	-	-	-	-	-	-	-
GEO 3-4 Enterprise Systems Engineering & Integration (SE&I)	-	-	14.853	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Subtotal: Recurring Cost</i>	-	-	<i>16.477</i>	-	-	<i>13.535</i>	-	-	-	-	-	-	-	-	-	-	-	-
Non Recurring Cost																		
GEO 3-4 Launch Vehicle and Range Integration	-	-	5.772	-	-	0.500	-	-	-	-	-	-	-	-	-	-	-	-
<i>Subtotal: Non Recurring Cost</i>	-	-	<i>5.772</i>	-	-	<i>0.500</i>	-	-	-	-	-	-	-	-	-	-	-	-
<i>Subtotal: Space Vehicle - GEO 3-4 Cost</i>	-	-	<i>22.249</i>	-	-	<i>14.035</i>	-	-	-	-	-	-	-	-	-	-	-	-
Checkout and Launch - GEO 3-4 Cost																		
GEO 3-4 Launch Ops & Checkout	-	-	72.112	-	-	3.752	-	-	-	-	-	-	-	-	-	-	-	-
Interim Contractor Support (ICS)	-	-	47.583	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Subtotal: Checkout and Launch - GEO 3-4 Cost</i>	-	-	<i>119.695</i>	-	-	<i>3.752</i>	-	-	-	-	-	-	-	-	-	-	-	-
Gross/Weapon System Cost	-	-	141.944	-	-	17.787	-	-	-	-	-	-	-	-	-	-	-	-

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Exhibit P-5, Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation / Budget Activity / Budget Sub Activity: 3021F / 01 / 1	P-1 Line Item Number / Title: MSSBIR / SBIR High (Space)	Item Number / Title [DODIC]: GEO 3-4
ID Code (A=Service Ready, B=Not Service Ready) : A	MDAP/MAIS Code:	
Remarks: Total GEO 3-4 3020/3021 funds are \$2,818.760M.		

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Exhibit P-5, Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation / Budget Activity / Budget Sub Activity: 3021F / 01 / 1	P-1 Line Item Number / Title: MSSBIR / SBIR High (Space)	Item Number / Title [DODIC]: GEO 5-6

ID Code (A=Service Ready, B=Not Service Ready) : A	MDAP/MAIS Code:
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Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Procurement Quantity (Units in Each)	-	-	-	-	-	-
Gross/Weapon System Cost (\$ in Millions)	609.849	858.843	99.970	128.002	-	128.002
Less PY Advance Procurement (\$ in Millions)	-	-	-	-	-	-
Net Procurement (P-1) (\$ in Millions)	609.849	858.843	99.970	128.002	-	128.002
Plus CY Advance Procurement (\$ in Millions)	-	-	-	-	-	-
Total Obligation Authority (\$ in Millions)	609.849	858.843	99.970	128.002	-	128.002

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (\$ in Millions)	-	-	-	0.000	-	0.000
Gross/Weapon System Unit Cost (\$ in Millions)	-	-	-	-	-	-

Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2018			FY 2019			FY 2020 Base			FY 2020 OCO			FY 2020 Total		
	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)
Space Vehicle - GEO 5-6 Cost																		
Recurring Cost																		
GEO 5-6 Hardware	-	-	307.148	-	-	194.783	-	-	3.402	-	-	3.461	-	-	-	-	-	3.461
GEO 5-6 Integration and Assembly	-	-	107.889	-	-	312.515	-	-	19.279	-	-	24.611	-	-	-	-	-	24.611
GEO 5-6 Enterprise Systems Engineering & Integration (SE&I)	-	-	17.114	-	-	19.975	-	-	5.869	-	-	6.743	-	-	-	-	-	6.743
Technical Mission Analysis	-	-	49.203	-	-	14.095	-	-	6.082	-	-	6.075	-	-	-	-	-	6.075
Subtotal: Recurring Cost	-	-	481.354	-	-	541.368	-	-	34.632	-	-	40.890	-	-	-	-	-	40.890
Non Recurring Cost																		
GEO 5-6 Obsolescence Non-Recurring	-	-	41.385	-	-	5.012	-	-	-	-	-	-	-	-	-	-	-	-
GEO 5-6 Launch Vehicle and Range Integration	-	-	4.029	-	-	23.844	-	-	8.428	-	-	25.464	-	-	-	-	-	25.464
Subtotal: Non Recurring Cost	-	-	45.414	-	-	28.856	-	-	8.428	-	-	25.464	-	-	-	-	-	25.464
Subtotal: Space Vehicle - GEO 5-6 Cost	-	-	526.768	-	-	570.224	-	-	43.060	-	-	66.354	-	-	-	-	-	66.354
Checkout and Launch - GEO 5-6 Cost																		
GEO 5-6 Launch Ops & Checkout	-	-	0.500	-	-	212.116	-	-	6.045	-	-	13.459	-	-	-	-	-	13.459

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Appropriation / Budget Activity / Budget Sub Activity: 3021F / 01 / 1						P-1 Line Item Number / Title: MSSBIR / SBIR High (Space)						Item Number / Title [DODIC]: GEO 5-6					
ID Code (A=Service Ready, B=Not Service Ready) : A									MDAP/MAIS Code:								

Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2018			FY 2019			FY 2020 Base			FY 2020 OCO			FY 2020 Total		
	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)
Interim Contractor Support (ICS)	-	-	-	-	-	26.884	-	-	25.000	-	-	25.000	-	-	-	-	-	25.000
<i>Subtotal: Checkout and Launch - GEO 5-6 Cost</i>	-	-	0.500	-	-	239.000	-	-	31.045	-	-	38.459	-	-	-	-	-	38.459
Support - GEO 5-6 Cost																		
Other Support	-	-	30.854	-	-	23.171	-	-	6.867	-	-	6.883	-	-	-	-	-	6.883
FFRDC	-	-	21.818	-	-	8.844	-	-	9.923	-	-	9.913	-	-	-	-	-	9.913
A&AS	-	-	29.909	-	-	17.604	-	-	9.075	-	-	6.393	-	-	-	-	-	6.393
<i>Subtotal: Support - GEO 5-6 Cost</i>	-	-	82.581	-	-	49.619	-	-	25.865	-	-	23.189	-	-	-	-	-	23.189
Gross/Weapon System Cost	-	-	609.849	-	-	858.843	-	-	99.970	-	-	128.002	-	-	-	-	-	128.002

Remarks:

The incrementally funded amount includes the above Total Space Vehicle Cost (less: SE&I, Launch Vehicle & Range Integration, and Interim Contractor Support) and Launch Ops & Checkout Cost. Total incrementally funded amount of \$2,883.5M complies with FY13 NDAA limiting procurement cost to \$3,900M.

The FY 2013 gross weapon system cost includes advance procurement amount of \$243.314M appropriated in FY 2011 and \$243.500M appropriated in FY12.

Total GEO 5-6 3020/3021 funds are \$3,336.571M.

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Exhibit P-5, Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation / Budget Activity / Budget Sub Activity: 3021F / 01 / 1	P-1 Line Item Number / Title: MSSBIR / SBIR High (Space)	Item Number / Title [DODIC]: HEO 3-4

ID Code (A=Service Ready, B=Not Service Ready) : A	MDAP/MAIS Code:
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Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Procurement Quantity (Units in Each)	-	-	-	-	-	-
Gross/Weapon System Cost (\$ in Millions)	28.518	7.499	-	-	-	-
Less PY Advance Procurement (\$ in Millions)	-	-	-	-	-	-
Net Procurement (P-1) (\$ in Millions)	28.518	7.499	-	-	-	-
Plus CY Advance Procurement (\$ in Millions)	-	-	-	-	-	-
Total Obligation Authority (\$ in Millions)	28.518	7.499	-	-	-	-

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (\$ in Millions)	-	-	-	-	-	-
Gross/Weapon System Unit Cost (\$ in Millions)	-	-	-	-	-	-

Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2018			FY 2019			FY 2020 Base			FY 2020 OCO			FY 2020 Total		
	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)
Space Vehicle - HEO 3-4 Cost																		
Recurring Cost																		
HEO 3-4 Integration and Assembly	-	-	0.244	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Subtotal: Recurring Cost</i>	-	-	<i>0.244</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Non Recurring Cost																		
HEO 3-4 Launch Vehicle and Range Integration	-	-	0.244	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Subtotal: Non Recurring Cost</i>	-	-	<i>0.244</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Subtotal: Space Vehicle - HEO 3-4 Cost</i>	-	-	<i>0.488</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Checkout and Launch - HEO 3-4 Cost																		
HEO Host Accommodation	-	-	2.468	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HEO 3-4 Launch Ops & Checkout	-	-	25.162	-	-	7.499	-	-	-	-	-	-	-	-	-	-	-	-
<i>Subtotal: Checkout and Launch - HEO 3-4 Cost</i>	-	-	<i>27.630</i>	-	-	<i>7.499</i>	-	-	-	-	-	-	-	-	-	-	-	-
Support - HEO 3-4 Cost																		
Other Support	-	-	0.400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Subtotal: Support - HEO 3-4 Cost</i>	-	-	<i>0.400</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Exhibit P-5, Cost Analysis: PB 2020 Air Force												Date: February 2019					
Appropriation / Budget Activity / Budget Sub Activity: 3021F / 01 / 1						P-1 Line Item Number / Title: MSSBIR / SBIR High (Space)						Item Number / Title [DODIC]: HEO 3-4					
ID Code (A=Service Ready, B=Not Service Ready) : A												MDAP/MAIS Code:					

Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2018			FY 2019			FY 2020 Base			FY 2020 OCO			FY 2020 Total		
	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)
Gross/Weapon System Cost	-	-	28.518	-	-	7.499	-	-	-	-	-	-	-	-	-	-	-	-

Remarks:
Total HEO 3-4 3020/3021 funds are \$1,146.672M.

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Exhibit P-5, Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation / Budget Activity / Budget Sub Activity: 3021F / 01 / 1	P-1 Line Item Number / Title: MSSBIR / SBIR High (Space)	Item Number / Title [DODIC]: SBIRS Survivable Endurable Evolution (S2E2)

ID Code (A=Service Ready, B=Not Service Ready) : A	MDAP/MAIS Code:
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Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Procurement Quantity (Units in Each)	-	-	-	-	-	-
Gross/Weapon System Cost (\$ in Millions)	128.995	27.889	0.685	90.067	-	90.067
Less PY Advance Procurement (\$ in Millions)	-	-	-	-	-	-
Net Procurement (P-1) (\$ in Millions)	128.995	27.889	0.685	90.067	-	90.067
Plus CY Advance Procurement (\$ in Millions)	-	-	-	-	-	-
Total Obligation Authority (\$ in Millions)	128.995	27.889	0.685	90.067	-	90.067

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (\$ in Millions)	-	-	-	-	-	-
Gross/Weapon System Unit Cost (\$ in Millions)	-	-	-	-	-	-

Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2018			FY 2019			FY 2020 Base			FY 2020 OCO			FY 2020 Total		
	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)
Hardware - SBIRS Survivable Endurable Evolution (S2E2) Cost																		
Recurring Cost																		
2.5 S2E2 SMGT	30.452	2	60.903	-	-	5.776	-	-	0.343	-	-	0.334	-	-	-	-	-	0.334
<i>Subtotal: Recurring Cost</i>	-	-	60.903	-	-	5.776	-	-	0.343	-	-	0.334	-	-	-	-	-	0.334
Non Recurring Cost																		
2.2 S2E2 Software Integration Facility (SIF)	-	-	0.000	-	-	0.000	-	-	-	-	-	-	-	-	-	-	-	-
2.4 S2E2 SMGT 1-3 DSP/GEO Stereo Capability Modification	10.729	3	32.187	-	-	15.492	-	-	0.342	-	-	74.544	-	-	-	-	-	74.544
2.6 S2E2 Integration	-	-	17.532	-	-	4.943	-	-	-	-	-	-	-	-	-	-	-	-
<i>Subtotal: Non Recurring Cost</i>	-	-	49.719	-	-	20.435	-	-	0.342	-	-	74.544	-	-	-	-	-	74.544
<i>Subtotal: Hardware - SBIRS Survivable Endurable Evolution (S2E2) Cost</i>	-	-	110.622	-	-	26.211	-	-	0.685	-	-	74.878	-	-	-	-	-	74.878
Software - SBIRS Survivable Endurable Evolution (S2E2) Cost																		
Non Recurring Cost																		
2.1 S2E2 Software	18.373	1	18.373	-	-	1.678	-	-	-	-	-	15.189	-	-	-	-	-	15.189
<i>Subtotal: Non Recurring Cost</i>	-	-	18.373	-	-	1.678	-	-	-	-	-	15.189	-	-	-	-	-	15.189

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Exhibit P-5, Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation / Budget Activity / Budget Sub Activity: 3021F / 01 / 1	P-1 Line Item Number / Title: MSSBIR / SBIR High (Space)	Item Number / Title [DODIC]: SBIRS Survivable Endurable Evolution (S2E2)
ID Code (A=Service Ready, B=Not Service Ready) : A		MDAP/MAIS Code:

Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2018			FY 2019			FY 2020 Base			FY 2020 OCO			FY 2020 Total		
	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)
<i>Subtotal: Software - SBIRS Survivable Endurable Evolution (S2E2) Cost</i>	-	-	18.373	-	-	1.678	-	-	-	-	-	15.189	-	-	-	-	-	15.189
Gross/Weapon System Cost	-	-	128.995	-	-	27.889	-	-	0.685	-	-	90.067	-	-	-	-	-	90.067

Remarks:

SBIRS Survivable Endurable Evolution (S2E2): SBIRS capable MGS require the interim deliverables over this period as described below.

S2E2 Software Non-Recurring:

-FY 2016 (Prior Year) - Provided training software for Standardized Space Trainer. (SPAF funded)

S2E2 Hardware Non-Recurring:

-FY 2016 (Prior Year) - Modified SMGTs 1-3 to add PDSS antennas and other hardware for full Stereo DSP/GEO capability; completes UGNT integration (SPAF funded)

S2E2 Hardware Recurring:

-FY 2015 (Prior Year) - Procured 1 fully tested and sustainable GEO SMGT with two PDSSs. Procures the System Test Environment (STE) for high fidelity Development, Testing & Evaluation (DT&E) and future sustainment.

-FY 2016 (Prior Year) - Procured 2 fully capable Stereo DSP/GEO SMGTs with two PDSSs each, as well as 9 additional PDSSs needed to field full, simultaneous DSP and SBIRS downlink capability for FOC. (SPAF funded)

Total S2E2 Funding for FY 2011-2021 = \$394.010M

Quantity = 5

Gross Unit Cost = \$78.802M

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Exhibit P-3a, Individual Modification: PB 2020 Air Force		Date: February 2019
Appropriation / Budget Activity / Budget Sub Activity: 3021F / 01 / 1	P-1 Line Item Number / Title: MSSBIR / SBIR High (Space)	Modification Number / Title: 1 / SBIRS Mobile System & Fixed Comm Electronics Upgrades

ID Code (A=Service Ready, B=Not Service Ready) : B	MDAP/MAIS Code:
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Resource Summary	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
Procurement Quantity (<i>Units in Each</i>)	-	-	-	-	-	-	-	-	-	-	-	-
Gross/Weapon System Cost (<i>\$ in Millions</i>)	7.305	17.040	7.742	15.883	0.000	15.883	71.026	55.188	8.340	8.490	-	191.014
Less PY Advance Procurement (<i>\$ in Millions</i>)	-	-	-	-	-	-	-	-	-	-	-	-
Net Procurement (P-1) (<i>\$ in Millions</i>)	7.305	17.040	7.742	15.883	0.000	15.883	71.026	55.188	8.340	8.490	-	191.014
Plus CY Advance Procurement (<i>\$ in Millions</i>)	-	-	-	-	-	-	-	-	-	-	-	-
Total Obligation Authority (<i>\$ in Millions</i>)	7.305	17.040	7.742	15.883	0.000	15.883	71.026	55.188	8.340	8.490	-	191.014

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (<i>\$ in Millions</i>)	-	-	-	-	-	-	-	-	-	-	-	-
Gross/Weapon System Unit Cost (<i>\$ in Millions</i>)	-	-	-	-	-	-	-	-	-	-	-	-

Description:

SBIRS MOBILE AND FIXED SITE COMMUNICATIONS/ELECTRONIC REPLACEMENT: This effort procures DSP and SBIRS assets to maintain the ground system equipment. Fixed site examples include, but are not limited to, legacy receiver, antenna drive system, Spacecraft Simulator RF, MCS display, Rapid Delog (instantaneous translation of computer data to a human-readable format), Sybase database obsolescence, communications and network routers, and switches and time server replacements. Mobile system examples include, but are not limited to, aging radio frequency communications equipment, aging antenna equipment, aging electrical equipment and cabling, and unsupportable data processing subsystem components. Funding also provides for Program Office and related support activities to include but not limited to, Systems Engineering and Technical Assistance (SETA) enterprise activities which provides intra-and inter-program office support. Funding for this effort is in program element 1203915F.

This effort includes the recurring hardware/software antenna obsolescence updates to peacetime survivable ground effort called Rapid Adaption GEO Relay Station (RANGERS).

Milestone/Development Status

Program office has recurring DSP and SBIRS requirements that is planned and programmed on an annual basis to maintain the ground system equipment.

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Exhibit P-3a, Individual Modification: PB 2020 Air Force		Date: February 2019
Appropriation / Budget Activity / Budget Sub Activity: 3021F / 01 / 1	P-1 Line Item Number / Title: MSSBIR / SBIR High (Space)	Modification Number / Title: 1 / SBIRS Mobile System & Fixed Comm Electronics Upgrades

ID Code (A=Service Ready, B=Not Service Ready) : B	MDAP/MAIS Code:
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Models of Systems Affected: SBIRS	Modification Type: Reliability & Maintainability	Related RDT&E PEs:
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Financial Plan	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	To Complete	Total
	Qty (Each) / Total Cost (\$ M)	Qty (Each) / Total Cost (\$ M)	Qty (Each) / Total Cost (\$ M)	Qty (Each) / Total Cost (\$ M)	Qty (Each) / Total Cost (\$ M)	Qty (Each) / Total Cost (\$ M)	Qty (Each) / Total Cost (\$ M)	Qty (Each) / Total Cost (\$ M)	Qty (Each) / Total Cost (\$ M)	Qty (Each) / Total Cost (\$ M)	Qty (Each) / Total Cost (\$ M)	Qty (Each) / Total Cost (\$ M)

Procurement												
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<i>Modification Item 1 of 1: SBIRS Mobiles Sys & Fixed Comm Elect Upgrades</i>												
B Kits												
Recurring												
SBIRS Mobiles Sys & Fixed Comm Elect Upgrades:EQUIPMENT Group B (Active)	1 / 3.735	1 / 15.612	1 / 6.292	1 / 13.229	- / -	1 / 13.229	1 / 69.425	1 / 53.531	1 / 6.540	- / 6.671	- / -	7 / 175.035
<i>Subtotal: Recurring</i>	- / 3.735	- / 15.612	- / 6.292	- / 13.229	- / -	- / 13.229	- / 69.425	- / 53.531	- / 6.540	- / 6.671	- / -	- / 175.035
<i>Subtotal: SBIRS Mobiles Sys & Fixed Comm Elect Upgrades</i>	- / 3.735	- / 15.612	- / 6.292	- / 13.229	- / -	- / 13.229	- / 69.425	- / 53.531	- / 6.540	- / 6.671	- / -	- / 175.035
<i>Subtotal: Procurement, All Modification Items</i>	- / 3.735	- / 15.612	- / 6.292	- / 13.229	- / -	- / 13.229	- / 69.425	- / 53.531	- / 6.540	- / 6.671	- / -	- / 175.035

Support (All Modification Items)												
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OTHER GOVT	- / 0.000	- / 0.000	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / 0.000
A&AS	- / 3.570	- / 1.428	- / 1.450	- / 2.654	- / -	- / 2.654	- / 1.601	- / 1.657	- / 1.800	- / 1.819	- / -	- / 15.979
<i>Subtotal: Support</i>	- / 3.570	- / 1.428	- / 1.450	- / 2.654	- / -	- / 2.654	- / 1.601	- / 1.657	- / 1.800	- / 1.819	- / -	- / 15.979

Installation												
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<i>Subtotal: Installation</i>	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -	- / -
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Total												
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Total Cost (Procurement + Support + Installation)	7.305	17.040	7.742	15.883	0.000	15.883	71.026	55.188	8.340	8.490	-	191.014
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Exhibit P-3a, Individual Modification: PB 2020 Air Force						Date: February 2019	
Appropriation / Budget Activity / Budget Sub Activity: 3021F / 01 / 1			P-1 Line Item Number / Title: MSSBIR / SBIR High (Space)			Modification Number / Title: 1 / SBIRS Mobile System & Fixed Comm Electronics Upgrades	
ID Code (A=Service Ready, B=Not Service Ready) : B					MDAP/MAIS Code:		
Modification Item 1 of 1: SBIRS Mobiles Sys & Fixed Comm Elect Upgrades							
Manufacturer Information							
Manufacturer Name: Lockheed Martin Space Systems				Manufacturer Location: Colorado Springs, CO			
Administrative Leadtime (<i>in Months</i>): 8				Production Leadtime (<i>in Months</i>): 12			
Dates	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Contract Dates	Feb 2019	Jun 2019	Jun 2020	Jun 2021	Jun 2022	Jun 2023	Jun 2024
Delivery Dates	Mar 2021	Jun 2020	Jun 2021	Jun 2022	Jun 2023	Jun 2024	Jun 2025
Installation Information							
Method of Implementation (Organic): Org/Intermediate					Installation Quantity: 7		