Exhibit R-2, RDT&E Budget Item Justification: PB 2020 United States Special Operations Command	Date: March 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 1160402BB / *SOF Advanced Technology Development*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	1,284.836	92.311	79.380	89.154	-	89.154	100.729	107.219	109.410	111.962	Continuing	Continuing
S200: *Advanced Technology Development*	1,241.979	73.772	57.648	66.960	-	66.960	78.150	84.159	85.874	87.877	Continuing	Continuing
SF101: *Engineering Analysis*	23.099	14.285	17.140	17.595	-	17.595	17.870	18.236	18.612	19.046	Continuing	Continuing
S225: *Information and Broadcast Systems Adv Tech*	19.758	4.254	4.592	4.599	-	4.599	4.709	4.824	4.924	5.039	Continuing	Continuing

A. Mission Description and Budget Item Justification

Advanced Technology Development (project S200) conducts rapid prototyping and Advanced Technology Demonstrations (ATDs). ATDs provide a means for demonstrating and evaluating the utility of emerging/advanced technologies in as realistic an operational environment as possible by Special Operations Forces (SOF) users. Evaluation results are included in a transition package, which assists in the initiation of or insertion into an acquisition program. ATDs also address projects that are a result of unique joint special mission or area-specific needs for which a few-of-a-kind prototypes must be developed on a rapid response basis, or are of sufficient time sensitivity to accelerate the prototyping effort of a normal acquisition program in any phase.

Engineering Analysis (project SF101) provides rapid response capability for the investigation, evaluation, and demonstration of technologies for SOF platform (ground, air, and maritime) and soldier system-unique requirements. Timely application of SOF-unique technology is critical and necessary to meet requirements in such areas as: sensor integration; enhanced situational awareness; near-real-time intelligence to include data fusion, threat detection and avoidance; electronic support measures for threat geo-location and specific emitter identification; navigation; target detection; weapon performance integration; and future SOF platform and soldier system requirements. Provides additional engineering analysis and testing required to transition items from national forces to theater forces.

Information and Broadcast Systems Advanced Technology (project S225) conducts rapid prototyping, advanced technology demonstrations, and advanced concept technology demonstrations of information and broadcast systems technology. Includes planning, analyzing, evaluating, and production information systems capabilities and distribution/dissemination broadcast systems capabilities. It provides a means for demonstrating and evaluating the utility of emerging/advanced technologies in as realistic an operational environment as possible by SOF users. This project also integrates efforts with each other and conducts technology demonstrations in conjunction with joint experiments and other assessment events. Evaluation results are included in a transition package, which assists in the initiation of or insertion into an acquisition program. The project also addresses unique, joint special mission or area-specific needs for which prototypes must be developed on a rapid response basis, or are of sufficient time sensitivity to accelerate the prototyping effort of a normal acquisition program in any phase.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 United States Special Operations Command	Date: March 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 1160402BB / *SOF Advanced Technology Development*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	72.605	79.380	89.565	-	89.565
Current President's Budget	92.311	79.380	89.154	-	89.154
Total Adjustments	19.706	0.000	-0.411	-	-0.411
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	23.000	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.009	-			
• SBIR/STTR Transfer	-3.285	-			
• Other Adjustments	-	-	-0.411	-	-0.411

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2018	FY 2019
Project: S200: *Advanced Technology Development*		
Congressional Add: *S200: SOST Identity Threat Mitigation Research*	17.339	-
Congressional Add: *S200: SOST Tactical Assault Lightweight Operator Suit (TALOS)*	4.817	-
Congressional Add Subtotals for Project: S200	22.156	-
Congressional Add Totals for all Projects	22.156	-

Change Summary Explanation

Funding:

FY 2018: Net increase of $19.706 million is due to a decrease for transfer of funds to Small Business Innovative Research/Small Business Technology Transfer programs (-$3.285 million), Congressional adds of $18.000 million for Identity Threat Mitigation Research, $5.000 million for TALOS and a minor reprogramming (-$0.009 million).

FY 2019: None.

FY 2020: Decrease of $0.411 million due to minor adjustments.

Schedule: None.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 United States Special Operations Command	Date: March 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 1160402BB *I SOF Advanced Technology Development*

Technical: None.

Exhibit R-2A, RDT&E Project Justification: PB 2020 United States Special Operations Command			Date: March 2019
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 1160402BB / *SOF Advanced Technology Development*	Project (Number/Name) S200 / *Advanced Technology Development*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
S200: *Advanced Technology Development*	1,241.979	73.772	57.648	66.960	-	66.960	78.150	84.159	85.874	87.877	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project provides for rapid prototyping, Advanced Technology Demonstrations (ATDs) and Joint Capability Technology Demonstrations. It is a means for demonstrating and evaluating the utility of emerging/advanced technologies in operationally relevant environments with Special Operations Forces (SOF) users. This project integrates emerging technologies and presents them in technology demonstrations, in conjunction with joint experiments and other assessment events. Evaluation results often facilitate the initiation of new programs and the insertion of appropriate technologies to acquisition programs. The element also addresses unique, joint special mission or area-specific needs for which a few rapid prototypes must be developed on a responsive basis, or are of sufficient time sensitivity to accelerate prototyping efforts of a normal acquisition program in any phase.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: SOF Special Technology Sub-Project	28.899	33.046	41.118
Description: This sub-project integrates emerging technologies and presents them in technology demonstrations, in conjunction with joint experiments and other assessment events. This project received two congressional adds in FY 2018.			
FY 2019 Plans: Continue the development and insertion of technology into existing programs. Technologies include, but are not limited to: reduced signature profiles, improved weapons, communications, command, and control systems, machine learning/artificial intelligence, sensors, and situational awareness tools; lightweight armor and materials, alternative power systems, eco-friendly sustainable energy devices, long duration, reduced size, high output power supplies, and technologies that reduce the load of the operator. Continue development of technologies supporting undersea, air and ground mobility. Evaluate and develop sensors across the electromagnetic spectrum to meet operational requirements. Continue the integration of critical technologies focused on providing the dismounted special operator leap-ahead capabilities via innovative collaborative processes. Continue developing unique robotic systems to reduce the load of the operator and augment human performance. Continue to develop Command, Control, Communications, Computers, and Intelligence (C4I) Technology to implement a robust, ultra-wideband communication capability. Continue effort for field prototype system incorporating technologies likely to transition to fielded systems. Based upon agreed technology maturity metrics, transfers successful projects into programs of record, and conduct field experimentations at various venues to facilitate technology insertion.			
FY 2020 Plans: Continues the development and insertion of technology into existing programs. Technologies include, but are not limited to: reduced signature profiles, improved tailorable lethality weapons, assured communications, command and control systems,			

Exhibit R-2A, RDT&E Project Justification: PB 2020 United States Special Operations Command		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 1160402BB / *SOF Advanced Technology Development*	**Project (Number/Name)** S200 / *Advanced Technology Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
machine learning/artificial intelligence, optics, sensors, and situational awareness tools; lightweight armor and materials, power and energy enablers, and technologies that reduce the load of the operator. Continues development of technologies supporting undersea, ground and air mobility. Evaluates and develops sensors across the electromagnetic spectrum to meet operational requirements. Continues the integration of critical technologies focused on providing the dismounted special operator leap-ahead capabilities via innovative collaborative processes. Continues to develop C4I technology to provide tactically relevant situational awareness and point of need. Continues effort for field prototype system incorporating technologies likely to transition to fielded systems. Based upon agreed technology maturity metrics, transfers successful projects into programs of record, and conducts field experimentations at various venues to facilitate technology insertion. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase of $8.072 million due to a focus on tactically relevant situational awareness, communication and navigation in all environments, tailored lethality and biotechnologies to support SOF needs.			
Title: Tagging, Tracking, and Locating Technologies (TTL) Sub-Project ***Description:*** TTL funds SOF unique ATDs identified in the USSOCOM Quick Look Capabilities Based Assessments (QL-CBA). TTL rapidly prototypes and expeditiously transitions projects from laboratory to acquisition Programs of Record/operational use to address SOF capability deficiencies. ***FY 2019 Plans:*** Continue to exploit and integrate recently-proven and emerging technologies for TTL and TTL-enabling systems. Continue to mature technologies that are linked to the USSOCOM/DOD TTL Roadmap, which is updated via the JCS/J8-approved annual TTL QL-CBA. Continue to increase focus on tactical sensors and enabling technologies in support of the special reconnaissance mission set. ***FY 2020 Plans:*** Continues to exploit and integrate recently-proven and emerging technologies for TTL and TTL-enabling systems. Continues to mature technologies that are linked to the USSOCOM/DOD TTL Roadmap, which is updated via the JCS/J8-approved annual TTL QL-CBA. Continues to increase focus on tactical sensors and enabling technologies in support of the special reconnaissance mission set. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase of $1.165 million to address TTL shortfalls in the maritime and Global Positioning System denied environment.	16.930	18.750	19.915
Title: Classified Sub-Project ***Description:*** Classified Sub-Project (provided under separate cover).	5.787	5.852	5.927

Exhibit R-2A, RDT&E Project Justification: PB 2020 United States Special Operations Command		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 1160402BB / *SOF Advanced Technology Development*	**Project (Number/Name)** S200 / *Advanced Technology Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 Plans: Details provided under separate cover. ***FY 2020 Plans:*** Details provided under separate cover. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Details provided under separate cover.			
Accomplishments/Planned Programs Subtotals	51.616	57.648	66.960

	FY 2018	FY 2019
Congressional Add: S200: SOST Identity Threat Mitigation Research ***FY 2018 Accomplishments:*** Continue to exploit and integrate recently-proven and emerging technologies for signature identification and enabling systems. Continue projects towards maturity that are linked to the USSOCOM Directive 530-2. Continue to increase focus on proactive measures to understand, assess, and, when necessary, actively manage signatures to minimize risks to the safety and security of special operations missions and contribute to the operations security of special operations missions.	17.339	-
Congressional Add: S200: SOST Tactical Assault Lightweight Operator Suit (TALOS) ***FY 2018 Accomplishments:*** TALOS is evaluating commercially available exoskeleton technology to assess advancements in exoskeleton design, development and performance to inform requirements for Special Operation Forces (SOF).	4.817	-
Congressional Adds Subtotals	22.156	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 United States Special Operations Command			Date: March 2019
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 1160402BB / *SOF Advanced Technology Development*	Project (Number/Name) SF101 / *Engineering Analysis*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
SF101: *Engineering Analysis*	23.099	14.285	17.140	17.595	-	17.595	17.870	18.236	18.612	19.046	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project provides a rapid response capability to support Special Operations Forces (SOF) platforms (ground, air and maritime), Unmanned Aerial Vehicle (UAV) payload sensors and soldier systems. The purpose is to correct system deficiencies, improve asset life, and enhance mission capability through the means of feasibility studies, analysis of alternatives, pre-developmental risk reduction studies, and engineering analyses. This project provides the engineering required to improve the design and performance integrity of the SOF platforms, UAV payload sensors and soldier support systems, sub-systems, equipment, and embedded computer software as they relate to the maintenance, overhaul, repair, quality assurance, modifications, materiel improvements, and service life extensions. This project also conducts risk reduction studies, analyses, and demonstrations to support emerging, time-critical weapons and sensor enhancements.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Platform Engineering Analysis	10.260	10.483	10.912
Description: Funding supports the development of rapid response capabilities to support SOF platform and soldier systems. Rapidly addresses technology needs for insertion into Programs of Record. Supports technology development to correct system deficiencies, improve platform asset life, and enhance mission capabilities. ***FY 2019 Plans:*** Continue to assess concepts and prototypes that provide increased ballistic protection of air, ground and undersea mobility platforms to include manned and unmanned UAVs, and mobility platform improvements to meet emerging threats. Assess and evaluate advanced precision guided munitions and scalable effects weapons. Identify, assess and evaluate improved Command, Control, Communication, Computer (C4) systems that incorporate significant improvements to operate in contested environments, systems that improve situational awareness on the battlefield, and next generation manned and unmanned Intelligence, Surveillance, and Reconnaissance (ISR) systems and common sensors and sensor suites. ***FY 2020 Plans:*** Continues to assess concepts and prototypes that provide increased capability of air, ground and undersea mobility platforms to include improvements to meet emerging threats. Assesses and evaluates advanced methods to deliver tailorable lethality. Identifies, assesses and evaluates improved C4 systems that incorporate significant improvements to operate in contested environments, systems that improve situational awareness on the battlefield, and disruptive technologies to enable ISR in future environments. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase of $0.429 million due to minor adjustments in funding required for individual taskings.			
Title: Soldier System Engineering Analysis	0.478	0.489	0.500

Exhibit R-2A, RDT&E Project Justification: PB 2020 United States Special Operations Command		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 1160402BB / *SOF Advanced Technology Development*	**Project (Number/Name)** SF101 / *Engineering Analysis*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: Funding supports engineering assessments and evaluation of technology feasibility, producibility, and integration readiness in the following areas: 1) next generation lightweight low-cost body armor and ballistic helmets 2) ballistic and laser variable light transmission protective eyewear 3) soldier worn sensors to assess ballistic and blast events as well as soldier health 4) next generation soldier worn load carriage systems 5) soldier worn head borne communications that provide greater situational awareness and hearing protection. ***FY 2019 Plans:*** Continue to assess advanced body armor and ballistic helmet materials, concepts and prototypes to reduce soldier load and provide increased ballistic protection against the latest emerging threats. Reduce the number of eyewear lenses needed and to have one lens that provides ballistic and laser protection as well as automatically darkens/lightens based on combat conditions. Evaluate soldier worn sensors and heads up displays for operability within soldier worn components and subsystems. Assess technologies feasibility and integration readiness of next generation load carriage systems such as exoskeletons and load-assist devices. Assess proof of concepts and technologies for next generation head borne communications systems that provide reliable and secure wireless transmission in all combat conditions, as well as provide 360 degree situational awareness and noise attenuation while increasing hearing protection. ***FY 2020 Plans:*** Continues to assess materials, concepts and prototypes to reduce soldier load and provide increased protection against the latest emerging threats. Evaluates soldier worn sensors and heads up displays for operability within soldier worn components and subsystems. Assesses technologies feasibility and integration readiness of next generation load carriage systems such as exoskeletons and load-assist devices. Assesses proof of concepts and technologies for next generation communications systems that integrated situational awareness in all environments. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase of $0.011 million is due to minor adjustments.			
Title: National to Theater Engineering Analysis ***Description:*** Provides additional engineering analysis and testing required to transition items from national forces to theater forces. ***FY 2019 Plans:*** Conduct additional testing and evaluation required on various equipment items such as communications, intelligence, weapons, and operator protection planned for transition to SOF Theater Forces. ***FY 2020 Plans:***	2.102	2.202	2.236

Exhibit R-2A, RDT&E Project Justification: PB 2020 United States Special Operations Command		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 1160402BB / *SOF Advanced Technology Development*	**Project (Number/Name)** SF101 / *Engineering Analysis*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Conducts additional testing and evaluation required on various equipment items such as communications, intelligence, weapons, and operator protection planned for transition to SOF Theater Forces. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase of $0.034 million is due to minor adjustments required for testing.			
Title: Aviation Mission Improved Survivability ***Description:*** Funding supports engineering analysis activities to address aviation survivability such as signature management, situational awareness, and versatile mission equipment (payloads, communications and weapons) to achieve SOF mission objectives. ***FY 2019 Plans:*** Continue engineering analysis activities to improve SOF aviation mission survivability. Activities include, but are not limited to, signature management (acoustic, infrared, radio frequency), situational awareness with full spectrum threat warning and countermeasures, and versatile mission equipment (payloads, communications and weapons) to improve SOF survivability in less than permissive operating environments. Proof of concepts with potential from prior year will be further matured. ***FY 2020 Plans:*** Continues engineering analysis activities to improve SOF aviation mission survivability. Activities include, but are not limited to, signature management (acoustic, infrared, radio frequency), situational awareness with full spectrum threat warning and countermeasures, and versatile mission equipment (payloads, communications and weapons) to improve SOF survivability in less than permissive operating environments. Proof of concepts with potential from prior year will be further matured. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease of $0.019 million is due to minor adjustments.	1.445	3.966	3.947
Accomplishments/Planned Programs Subtotals	14.285	17.140	17.595

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 United States Special Operations Command			Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 1160402BB / *SOF Advanced Technology Development*	**Project (Number/Name)** S225 / *Information and Broadcast Systems Adv Tech*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
S225: *Information and Broadcast Systems Adv Tech*	19.758	4.254	4.592	4.599	-	4.599	4.709	4.824	4.924	5.039	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project conducts development, rapid prototyping, demonstration/testing of information and broadcast system technology. Includes cyber capabilities that predict the best media channels to reach potential target audiences, data mining and information collections tools, propaganda and social behavior analytical tools, cultural analysis tool sets and emerging technologies that support the planning and analytical needs for the Military Information Support Operations (MISO) forces. It provides a means for demonstrating and evaluating the utility of emerging/advanced technologies in as realistic an operational environment as possible by SOF users. This project integrates efforts and conducts technology demonstrations in conjunction with joint experiments and other assessment events and performs market research on emerging technologies that support all phases of MISO. Evaluation results are included in a transition package, which assists in the initiation of or insertion into an acquisition program. The project also addresses unique, joint special mission or area-specific needs. Seeks technologies that will transform current MISO capabilities through two major objectives: 1) Exploit technologies capable of disseminating products to reach target audiences across a variety of media to include audiences in denied areas. 2) Automate and improve MISO planning and analytical capability through technologies that are integrated into SOF planning systems (Cultural Analysis, Targeting, Theme Development, Media & Product Selection, Distribution & Dissemination, and Measures of Effectiveness). Develops software applications that increases the efficiency and shortens the timeline to get MISO dissemination packages approved. Develops hardware/software tools that facilitate the collaboration and sharing of information and other critical data.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Broadcast and Dissemination Modernization	4.254	4.592	4.599
Description: Develops emerging technologies available in the marketplace to transform and modernize planning, analysis, development, broadcast, distribution, dissemination, and feedback capabilities for MISO forces. This initiative will also continue development of appropriate emerging technologies initially identified by Advance Technology Demonstrations and Joint Capability Technology Demonstrations to transition to acquisition programs. Technologies include: multi-frequency broadcast systems; digital broadcast capabilities; remote controlled electronic paper; near-real-time command and control of unattended systems, especially in denied areas; focused/beam speaker sound technologies; visual projection technologies; advanced commercial broadcast technologies including amplitude modulation and frequency modulation radio transmitters and antenna; television transmitter and antenna systems; internet and telephony dissemination and broadcast systems; technologies capable of long-loiter broadcast and delivery in denied and permissive environment; and technologies that automate and improve planning and analytical capability through integrated capabilities.			
FY 2019 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 United States Special Operations Command		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 1160402BB / *SOF Advanced Technology Development*	**Project (Number/Name)** S225 / *Information and Broadcast Systems Adv Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Continue performance of engineering studies, development, and demonstrations of planning, analysis, distribution, and broadcast capabilities in the digital domain. ***FY 2020 Plans:*** Continues performance of engineering studies, development, and demonstrations of planning, analysis, distribution, and broadcast capabilities in the digital domain. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase of $0.007 million is due to minor adjustments.			
Accomplishments/Planned Programs Subtotals	4.254	4.592	4.599

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A