

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army **Date:** May 2021

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>
--------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------

COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	-	27.236	20.511	28.849	-	28.849	-	-	-	-	-	-
FA1: <i>Manpack Radio</i>	-	22.411	9.754	17.762	-	17.762	-	-	-	-	-	-
FA2: <i>Rifleman Radio (RR)</i>	-	4.825	10.757	11.087	-	11.087	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Army Network Modernization Strategy Lines of Effort (LOE) 1, Unified Network. Efforts are aligned to support the Network-Cross Functional Team (N-CFT) capability set approach to achieve the network modernization strategy.

Tactical Network Radio Systems (Low-Tier) provide both Classified and Unclassified communications. The radios provide the Single Channel Ground and Airborne Radio System (SINCGARS) legacy waveform for Classified and Unclassified communications. They also provide advanced waveforms (e.g. TrellisWare TSM) that provide Secure but Unclassified (SBU) communications. The MP radio provides the Mobile User Objective System (MUOS) waveform for Tactical Satellite communications. The HMS program is currently in the process of conducting testing, including Laboratory and Field Based Risk Reduction events, in support of an Operational Test event.

The Handheld, Manpack, and Small Form Fit (HMS) radio program is a single Acquisition Category IC program encompassing: handheld radios (one-channel Rifleman Radio (RR), two-channel Leader Radio (LR), and Single-Channel Data Radio (SCDR)) and Manpack (MP) radio (Generation 1 and Generation 2 radios). HMS provides voice and data communication to the expeditionary Warfighter with an on-the-move, at-the-halt, and stationary Line of Sight (LOS)/Beyond Line of Sight (BLOS) capability for both dismounted personnel and platforms. HMS radio systems are software reprogrammable, networkable, multi-mode systems capable of simultaneous voice and data communication. HMS radios will support a variety of other platforms, including tactical End User Devices (EUD) voice and data needs. HMS provides tailorable and scalable, software-defined radio systems meeting U.S. Army, Air Force, Navy, Marine Corps and Special Operations Command communications needs.

The ITN is a warfighter-enabling System of Systems comprised of key networking components including HMS Program of Record (POR) radio systems, advanced high capacity commercial radios, commercial phone technologies, and advanced radio-application gateway integration and interoperability technologies. These ITN technologies increase transport options and support a converged Mission Command network. The ITN introduces a new Secure But Unclassified (SBU) security domain enhancing Mission Partner interoperability and significantly reducing key distribution and other security-related burdens for the Soldier at lower echelons. This RDTE 6.5 funding line supports ITN testing and evaluation (T&E). The ITN T&E involves mature system development, integration, and demonstration in support of ITN evaluation to include: concept refinement, characterization, data collection, demos, integrated testing, and operational assessments.

Fiscal Year (FY) 2022 Research Development Test & Evaluation (RDT&E) resources are required for continued Integrated Tactical Network (ITN) Developmental Operations (DevOps), required HMS delta testing, and to examine modular and open system architectures to decrease future integration and waveform porting costs. DevOps includes: Soldier feedback during operational demonstrations, evaluations, and test events, as well as to purchase mature production representative prototype components. The ITN DevOps process relies heavily upon Soldier Touch Points (STPs) and User Juries requiring significant resourcing in order to achieve the goals

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Army	Date: May 2021
-----------------------------------------------------------------------	-----------------------

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>
--------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------

and objectives of the N-CFT and Program offices. Additionally, the RDT&E resources are essential to support the ITN Stryker Brigade Combat Team (SBCT) and Armored Brigade Combat Team (ABCT) characterizations. These characterizations are designed and intended to directly support Capability Set 23 fielding decisions in accordance with the Army approved ITN Abbreviated-Capability Development Document (A-CDD).

B. Program Change Summary (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	28.404	28.178	47.525	-	47.525
Current President's Budget	27.236	20.511	28.849	-	28.849
Total Adjustments	-1.168	-7.667	-18.676	-	-18.676
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-6.639			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.168	-1.028			
• Adjustments to Budget Years	-	-	-18.676	-	-18.676

Change Summary Explanation

In FY21, a \$6.639M congressional mark was assessed against FA1 and an additional \$1.028M was removed for SBIR/STTR taxes.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army **Date:** May 2021

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA1 / <i>Manpack Radio</i>
--------------------------------------------------	------------------------------------------------------------------------------------------------------------	------------------------------------------------------------

COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
FA1: <i>Manpack Radio</i>	-	22.411	9.754	17.762	-	17.762	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Army Network Modernization Strategy Lines of Effort (LOE) 1, Unified Network. Efforts are aligned to support the Network-Cross Functional Team capability set approach to achieve the network modernization strategy.

The Handheld, Manpack, and Small Form Fit (HMS) radio systems serve as the backbone of the Integrated Tactical Network (ITN) architecture, supporting a converged Mission Command network. Fiscal year (FY) 2022 Research Development Test & Evaluation (RDT&E) funding supports HMS delta testing, examination of modular and open system architectures to decrease future integration and waveform porting costs, and ITN testing and evaluation, of which HMS is a key component. It will support mature system development, integration, and demonstration in support of ITN evaluation to include: concept refinement, characterization, data collection, demos, integrated testing, and operational assessments.

The ITN is a warfighter-enabling System of Systems comprised of key networking components including HMS Program of Record (POR) radio systems, advanced high capacity commercial radios, commercial phone technologies, and advanced radio-application gateway integration and interoperability technologies. These ITN technologies increase transport options and support a converged Mission Command network. The ITN introduces a new Secure But Unclassified (SBU) security domain enhancing Mission Partner interoperability and significantly reducing key distribution and other security-related burdens for the Soldier at lower echelons. This RDTE 6.5 funding line supports ITN testing and evaluation (T&E). The ITN T&E involves mature system development, integration, and demonstration in support of ITN evaluation to include: concept refinement, characterization, data collection, demos, integrated testing, and operational assessments.

The Manpack (MP) radios, both Generation 1 legacy and Generation 2 advanced, provide voice and data communication to the expeditionary Warfighter with an on-the-move, at-the-halt, and stationary Line of Sight (LOS)/Beyond Line of Sight (BLOS) capability for both dismounted personnel and platforms. MP radios will support a variety of other platforms, including tactical End User Devices (EUD) voice and data needs. HMS provides tailorable and scalable, software-defined radio systems meeting U.S. Army, Air Force, Navy, Marine Corps and Special Operations Command communications needs.

MP radios provide both Classified and Unclassified communications. MP radios provide the Single Channel Ground and Airborne Radio System (SINCGARS) legacy waveform for Classified and Unclassified communications. MP radios also provide advanced waveforms (e.g. TrellisWare TSM) that provide Secure but Unclassified (SBU) communications. The MP radio provides the Mobile User Objective System (MUOS) waveform for Tactical Satellite communications. The HMS program is currently in the process of conducting testing, including Laboratory and Field Based Risk Reduction events, in support of an Operational Test event.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022
Title: Program Management	0.829	2.262	1.230

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA1 / <i>Manpack Radio</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2020	FY 2021	FY 2022
<p>Description: Program management includes overall management of program execution, major events, reporting, funds execution, contract management, and logistical support. Includes participation in program planning and Integrated Product Team meetings.</p> <p>FY 2021 Plans: During this timeframe, funds will provide overall management and oversight to implement HMS acquisition strategy and ITN evaluation - to include Matrix and Contractor support.</p> <p>FY 2022 Plans: FY22 funds will provide overall management and oversight to implement HMS acquisition strategy and ITN evaluation - to include Matrix and Contractor support.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: The decrease in funds for Program Management is a direct result of ramping down after the completion of the HMS OT.</p>				
<p>Title: HMS Engineering/Technical Support</p> <p>Description: Overall technical analysis support to PdM HMS' Manpack and ITN products.</p> <p>FY 2021 Plans: FY 2021 funds will provide technical systems engineering support to evaluate technical alternatives and perform communication architecture analysis to identify alternatives to reduce cost, improve performance, and achieve tactical radio objectives. Funds will facilitate technical test support for candidate products utilized within ITN's iterative evaluation and capability implementation strategy to include MP.</p> <p>FY 2022 Plans: FY 2022 funds will provide technical systems engineering support to evaluate technical alternatives and perform communication architecture analysis to identify alternatives to reduce cost, improve performance, and achieve tactical radio objectives. Funds will facilitate technical test support for candidate products utilized within ITN's iterative evaluation and capability implementation strategy to include MP.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: The decrease in funds for HMS Engineering/Technical Support is a direct result of ramping down after the completion of the HMS OT.</p>		12.632	3.866	3.123
<p>Title: Test and Evaluation</p>		8.950	3.626	13.409

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA1 / <i>Manpack Radio</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022
<p>Description: Manpack's Test and Evaluation focuses on the key technical and operational characteristics of the system: Radio Frequency performance, security, Reliability, Availability & Maintainability, suitability and survivability requirements, in addition to operational environmental performance requirements as per the Capability Production Document. The OT will include support from Army and DoD operational testers and will use communication scenarios based on the Operational Mode Summary / Mission Profile of the system(s) under test. The OT is designed to validate that HMS products meet warfighter needs in terms of effectiveness, suitability and survivability in an operationally realistic environment. Results from OT will facilitate the delivery orders for Full Rate Production and inform any required delta testing.</p> <p>HMS also supports ITN's iterative evaluation and capability implementation strategy. HMS System of Systems product qualification testing (SoS PQT) includes interoperability with the ITN evaluating and demonstrating the efficacy of the ITN Variable Height Antenna (VHA) and Tactical Radio Integration Kit (TRIK) components in expansion of HMS radio range and function. The HMS Operational Test (OT) includes likelihood of an ITN excursion. In FY22 ITN capabilities will be demonstrated in an operational environment up to the Soldier Touch Point (STP) culminating event (brigade scale), as necessary, every two years. In addition, the Armored Brigade Combat Team (ABCT) Characterization event will take place, resulting in an updated ITN NBOI for Armored formations which will require further refinement once experimented with and applied to more traditional ABCT units. Additionally, funding will support any required delta testing for HMS systems.</p> <p>FY 2021 Plans: The FY 2021 funding will facilitate testing for candidate products utilized within ITN's iterative evaluation and capability implementation strategy to include MP.</p> <p>FY 2022 Plans: The FY 2022 funding will facilitate testing for HMS delta testing and candidate products utilized within ITN's iterative evaluation and capability implementation strategy to include MP.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: The increase in funds for Test and Evaluation is a direct result of HMS delta testing and supporting ITN's iterative evaluation and capability implementation strategy, which includes preparations for the upcoming Capability Set 23 Design Decision and Soldier Touch Point.</p>			
Accomplishments/Planned Programs Subtotals	22.411	9.754	17.762

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army	Date: May 2021
--------------------------------------------------------------------	-----------------------

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA1 / <i>Manpack Radio</i>
--------------------------------------------------	------------------------------------------------------------------------------------------------------------	------------------------------------------------------------

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
• FA2: <i>Rifleman Radio (RR)</i>	4.825	10.757	11.087	-	11.087	-	-	-	-	-	-
• B95004: <i>Handheld Manpack Small Form Fit (HMS)</i>	468.026	547.148	775.069	-	775.069	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

MP Radio is currently executing a May 2014 approved acquisition strategy to procure Non-Developmental Items (NDI). Utilizing a full and open competition strategy, the MP base contract was awarded to all potential industry partners. The MP contract was awarded on 26 February 2016, and procures NDI MP radios for use in a classified environment. As laid out in the Acquisition Strategy, these candidate NDI radios will need to demonstrate through testing, compliance with program requirements; assess effectiveness, suitability, and survivability; to obtain material release for Full Rate Production (FRP). The MP is currently capable of running the following waveforms: Single Channel Ground and Airborne Radio System (SINCGARS), Satellite Communications (SATCOM) - Army managed waveforms, Mobile User Objective System (MUOS) - Navy managed waveform, and other advanced networking waveforms.

The Army will procure radios through a multiple step selection process:

- a. Awarded FFP Contracts to all qualified vendors based on technical acceptability and demonstrations (26 February 2016)
- b. Awarded initial delivery orders based on Qualification Test results (19 December 2016)
- c. Awarded second delivery orders based on Customer Test results (31 July 2017)
- d. Awarded LRIP delivery orders (30 April 2018, 06 June 2019, and 22 April 2020)
- e. Achieve Full Rate Production (3QFY21)

On 14 May 2019, the ITN gained approval from the Army Acquisition Executive to execute via the Middle Tier of Acquisition (MTA) Rapid Prototyping pathway. The ITN Rapid Prototyping MTA approach provides for the use of innovative technologies to rapidly develop fieldable prototypes to demonstrate new capabilities and meet emerging military needs. The ITN acquisition approach is based on integration of Commercial-Off-The-Shelf (COTS), Non-Developmental Item (NDI), and Government-Off-The-Shelf (GOTS) components. The accelerated schedule for the procurement of experimentation equipment was directed by the Army and driven by the ITN Directed Requirement (DR). Contract execution for ITN Non-POR equipment is being leveraged from existing indefinite delivery indefinite quantity (IDIQ) contracts. All contracts are competitive awards using FAR approved contracting vehicles, such as DLA, CHS, NASA SEWP, GSA (IDIQ) or direct contracts that have been established after a market survey has been completed.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army **Date:** May 2021

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Sys tems (Low-Tier)</i>	Project (Number/Name) FA1 / <i>Manpack Radio</i>
--------------------------------------------------	-----------------------------------------------------------------------------------------------------------------	------------------------------------------------------------

Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Project Management Office Support	Various	PEO C3T & CECOM : Various; APG, MD	0.935	0.829		1.456		1.230		-		1.230	0.000	4.450	-
Subtotal			0.935	0.829		1.456		1.230		-		1.230	0.000	4.450	N/A

Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering/Technical Support	Various	PEO C3T, ARL, C5ISR, & ATC : Various	3.294	12.632		4.672		3.123		-		3.123	0.000	23.721	-
Subtotal			3.294	12.632		4.672		3.123		-		3.123	0.000	23.721	N/A

Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Follow on Delta Development & Testing	Various	EPG : Ft. Huachuca	2.447	-		1.651		1.556		-		1.556	0.000	5.654	-
Follow on Delta Development & Testing (2)	Various	OTC : Various	6.813	7.241		-		-		-		-	0.000	14.054	-
ITN Testing	Various	Various : TBD	-	1.709		1.975		11.853		-		11.853	0.000	15.537	-
Subtotal			9.260	8.950		3.626		13.409		-		13.409	0.000	35.245	N/A

			Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			13.489	22.411	9.754	17.762	-	17.762	0.000	63.416	N/A

Remarks

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA1 / <i>Manpack Radio</i>

Event Name	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
MP LBRR	[Redacted]																											
ITN CS21 Design Decision	1																											
Operational Test (OT)					HMS OT																							
MP Full Rate Production (FRP)					2																							
Stryker Brigade Combat Team (SBCT) Characterization					3																							
ITN CS23 Prototyping & Testing					[Redacted]																							
ITN CS23 Soldier Touch Point									4																			
ITN CS23 Design Decision									5																			
Armored Brigade Combat Team (ABCT) Characterization									6																			
HMS Follow-on Test Events FY22									HMS Follow-on Test Events FY22																			
HMS Follow-on Test Events FY23													HMS Follow-on Test Events FY23															
ITN CS25 Soldier Touch Point																	7											
ITN CS25 Design Decision																	8											

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA1 / <i>Manpack Radio</i>

Event Name	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
HMS Follow-on Test Events FY24																	■											
ITN CS25 Prototyping & Testing																	■											
HMS Follow-on Test Events FY25																					■							
HMS Follow-on Test Events FY26																									■			

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA1 / <i>Manpack Radio</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Manpack (MP) Customer Test (CT)	2	2017	4	2017
MP Sandbox and Soldier Feedback Study	1	2018	2	2018
MP Field/Lab Base Risk Reduction Test (FBRR/LBRR)	3	2018	4	2018
NIE 18.2	1	2019	1	2019
MP Log Demo	2	2019	3	2019
MP MUOS MOT&E 2B	3	2019	3	2019
Integrated Tactical Network (ITN) CS21 LBRR	3	2019	4	2019
MP LBRR	2	2020	3	2020
ITN CS21 Design Decision	3	2020	3	2020
Operational Test (OT)	2	2021	2	2021
MP Full Rate Production (FRP)	3	2021	3	2021
Stryker Brigade Combat Team (SBCT) Characterization	4	2021	4	2021
ITN CS23 Prototyping & Testing	2	2021	2	2022
ITN CS23 Soldier Touch Point	2	2022	2	2022
ITN CS23 Design Decision	3	2022	3	2022
Armored Brigade Combat Team (ABCT) Characterization	3	2022	3	2022
HMS Follow-on Test Events FY22	3	2022	3	2022
HMS Follow-on Test Events FY23	3	2023	3	2023
ITN CS25 Soldier Touch Point	2	2024	2	2024
ITN CS25 Design Decision	3	2024	3	2024
HMS Follow-on Test Events FY24	3	2024	3	2024
ITN CS25 Prototyping & Testing	3	2024	2	2026

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army **Date:** May 2021

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA1 / <i>Manpack Radio</i>
--------------------------------------------------	------------------------------------------------------------------------------------------------------------	------------------------------------------------------------

Events	Start		End	
	Quarter	Year	Quarter	Year
HMS Follow-on Test Events FY25	3	2025	3	2025
HMS Follow-on Test Events FY26	3	2026	3	2026
HMS Follow-on Test Events FY27	3	2027	3	2027

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army **Date:** May 2021

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA2 / <i>Rifleman Radio (RR)</i>
--------------------------------------------------	------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------

COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
<i>FA2: Rifleman Radio (RR)</i>	-	4.825	10.757	11.087	-	11.087	-	-	-	-	-	-
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

This funding line is directly aligned to the Army Network Modernization Strategy LOE 1, Unified Network. Efforts are aligned to support the Network-Cross Functional Team capability set approach to achieve the network modernization strategy.

The Handheld, Manpack, and Small Form Fit (HMS) radio systems serve as the backbone of the Integrated Tactical Network (ITN) architecture, supporting a converged Mission Command network. Fiscal year (FY) 2022 Research Development Test & Evaluation (RDT&E) funding supports HMS delta testing, examination of modular and open system architectures to decrease future integration and waveform porting costs, and ITN testing and evaluation, of which HMS is a key component. It will support mature system development, integration, and demonstration in support of ITN evaluation to include: concept refinement, characterization, data collection, demos, integrated testing, and operational assessments.

The ITN is a warfighter-enabling System of Systems comprised of key networking components including HMS Program of Record (POR) radio systems, advanced high capacity commercial radios, commercial phone technologies, and advanced radio-application gateway integration and interoperability technologies. These ITN technologies increase transport options and support a converged Mission Command network. The ITN introduces a new Secure But Unclassified (SBU) security domain enhancing Mission Partner interoperability and significantly reducing key distribution and other security-related burdens for the Soldier at lower echelons. This RDTE 6.5 funding line supports ITN testing and evaluation (T&E). The ITN T&E involves mature system development, integration, and demonstration in support of ITN evaluation to include: concept refinement, characterization, data collection, demos, integrated testing, and operational assessments.

The HMS handheld radios include the one-channel Rifleman Radio (RR), two-channel Leader Radio (LR), and Single-Channel Data Radio (SCDR). Handheld radios provide voice/data communication to the expeditionary Warfighter with an on-the-move, at-the-halt, and stationary Line of Sight (LOS)/Beyond Line of Sight (BLOS) capability for both dismounted personnel and platforms. Handheld radio systems are software reprogrammable, networkable, multi-mode systems capable of simultaneous voice and data communication (RR/LR). Handheld radios will support a variety of other platforms, including tactical End User Devices (EUD) voice and data needs. HMS provides tailorable and scalable, software-defined radio systems meeting U.S. Army, Air Force, Navy, Marine Corps and Special Operations Command communications needs.

Handheld radios provide both Classified and Unclassified communications. Handheld radios provide the Single Channel Ground and Airborne Radio System (SINGARS) legacy waveform for Classified and Unclassified communications. Handheld radios also provide advanced waveforms (e.g. TrellisWare TSM) that provide Secure but Unclassified (SBU) communications. The HMS program is currently in the process of conducting testing, including Laboratory and Field Based Risk Reduction events, in support of an Operational Test event.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA2 / <i>Rifleman Radio (RR)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2020	FY 2021	FY 2022
<p>Title: Program Management</p> <p>Description: Program management includes overall management of program execution, major events, reporting, funds execution, contract management, and logistical support. Includes participation in program planning and Integrated Product Team meetings.</p> <p>FY 2021 Plans: During this timeframe, funds will provide overall management and oversight to implement HMS acquisition strategy and ITN evaluation - to include Matrix and Contractor support.</p> <p>FY 2022 Plans: During this timeframe, funds will provide overall management and oversight to implement HMS acquisition strategy and ITN evaluation - to include Matrix and Contractor support.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: The increase in funds for Program Management is a direct result of HMS delta testing and supporting ITN's iterative evaluation and capability implementation strategy.</p>		0.003	0.144	0.899
<p>Title: HMS Engineering/Technical Support</p> <p>Description: Overall technical analysis support to PdM HMS' Handheld and ITN products.</p> <p>FY 2021 Plans: FY 2021 funds will provide technical systems engineering support to evaluate technical alternatives and perform communication architecture analysis to identify alternatives to reduce cost, improve performance, and achieve tactical radio objectives. Funds will facilitate technical test support for candidate products utilized within ITN's iterative evaluation and capability implementation strategy to include LR.</p> <p>FY 2022 Plans: FY 2021 funds will provide technical systems engineering support to evaluate technical alternatives and perform communication architecture analysis to identify alternatives to reduce cost, improve performance, and achieve tactical radio objectives. Funds will facilitate technical test support for candidate products utilized within ITN's iterative evaluation and capability implementation strategy to include LR.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: The decrease in funds for HMS Engineering/Technical Support is a direct result of ramping down after the completion of the HMS OT.</p>		0.105	5.440	1.725
<p>Title: Test and Evaluation</p>		4.717	5.173	8.463

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA2 / <i>Rifleman Radio (RR)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2020	FY 2021	FY 2022
<p>Description: Handheld's Test and Evaluation focuses on the evaluation of key technical and operational characteristics of the system: Radio Frequency performance, security, Reliability, Availability & Maintainability, and survivability requirements, in addition to operational environmental performance requirements as per the Capability Production Document. All previous testing on the Leader Radio, served as risk reduction and Operational Test (OT) preparations in support of FRP. The OT will include support from Army and DoD operational testers and will use communication scenarios based on the Operational Mode Summary / Mission Profile of the system(s) under test. The OT is designed to validate that the HMS products meet warfighter needs in terms of effectiveness, suitability and survivability in an operationally realistic environment. Results from the OT will facilitate the delivery orders for Full Rate Production and inform any required delta testing.</p> <p>HMS also supports ITN's iterative evaluation and capability implementation strategy. HMS System of Systems product qualification testing (SoS PQT) includes interoperability with the ITN evaluating and demonstrating the efficacy of the ITN Variable Height Antenna (VHA) and Tactical Radio Integration Kit (TRIK) components in expansion of HMS radio range and function. The HMS Operational Test (OT) includes likelihood of an ITN excursion. In FY22 ITN capabilities will be demonstrated in an operational environment up to the Soldier Touch Point (STP) culminating event (brigade scale), as necessary, every two years. In addition, the Armored Brigade Combat Team (ABCT) Characterization event will take place, resulting in an updated ITN NBOI for Armored formations which will require further refinement once experimented with and applied to more traditional ABCT units. Additionally, funding will support any required delta testing for HMS systems.</p> <p>FY 2021 Plans: The FY 2021 funding will facilitate testing for candidate products utilized within ITN's iterative evaluation and capability implementation strategy to include LR.</p> <p>FY 2022 Plans: The FY 2022 funding will facilitate testing for candidate products utilized within ITN's iterative evaluation and capability implementation strategy to include LR.</p> <p>FY 2021 to FY 2022 Increase/Decrease Statement: The increase in funds for Test and Evaluation is a direct result of HMS delta testing and supporting ITN's iterative evaluation and capability implementation strategy, which includes preparations for the upcoming Capability Set 23 Design Decision and Soldier Touch Point.</p>			
Accomplishments/Planned Programs Subtotals	4.825	10.757	11.087

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2022 Army **Date:** May 2021

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA2 / <i>Rifleman Radio (RR)</i>
--------------------------------------------------	------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u> <u>Base</u>	<u>FY 2022</u> <u>OCO</u>	<u>FY 2022</u> <u>Total</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• FA1: <i>Manpack Radio</i>	22.411	9.754	17.762	-	17.762	-	-	-	-	-	-
• B95004: <i>Handheld Manpack Small Form Fit (HMS)</i>	468.026	547.148	775.069	-	775.069	-	-	-	-	-	-

Remarks

D. Acquisition Strategy

On 13 September 2016 the Army Acquisition Executive approved a decrease to the Basis of Issue (BOI) for the single channel RR, increase the BOI for the two channel LR and move forward with acquisition activities for the two channel LR. An acquisition strategy addendum adding LR was approved in March 2017. The addendum continued the multi-vendor approach utilizing the existing Indefinite Delivery Indefinite Quantity (IDIQ) RR base contract (awarded 29 April 2015) to on-ramp LR capabilities (18 September 2018). The LR effort is a separate competition under the Handheld radio suite. As laid out in the acquisition strategy, these candidate non-developmental radios will need to demonstrate through testing, compliance with program requirements; assess effectiveness, suitability, and survivability; to obtain material release for Full Rate Production (FRP).

The LR will simultaneously run Single Channel Ground and Airborne Radio System (SINCGARS) and other advanced networking waveforms, in one radio with both handheld and mounted configurations, for fixed and mobile sites.

The Army will procure radios through a multiple step selection process:

- a. Awarded FFP Contracts to all qualified vendors based on technical acceptability and demonstrations (18 September 2018)
- b. Awarded LRIP delivery orders to support SFAB and ITN fieldings/evaluations (18 September 2018)
- c. Awarded LRIP delivery orders based on results of the best value trade-off construct (20 December 2019 & 12 November 2020)
- d. Achieve Full Rate Production (3QFY21)

On 14 May 2019, the ITN gained approval from the Army Acquisition Executive to execute via the Middle Tier of Acquisition (MTA) Rapid Prototyping pathway. The ITN Rapid Prototyping MTA approach provides for the use of innovative technologies to rapidly develop fieldable prototypes to demonstrate new capabilities and meet emerging military needs. The ITN acquisition approach is based on integration of Commercial-Off-The-Shelf (COTS), Non-Developmental Item (NDI), and Government-Off-The-Shelf (GOTS) components. The accelerated schedule for the procurement of experimentation equipment was directed by the Army and driven by the ITN Directed Requirement (DR). Contract execution for ITN Non-POR equipment is being leveraged from existing indefinite delivery indefinite quantity (IDIQ) contracts. All contracts are competitive awards using FAR approved contracting vehicles, such as DLA, CHS, NASA SEWP, GSA (IDIQ) or direct contracts that have been established after a market survey has been completed.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Army												Date: May 2021			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0605042A / Tactical Network Radio Sys tems (Low-Tier)				FA2 / Rifleman Radio (RR)							
Management Services (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Management Office Support	Various	PEO C3T & CECOM : Various; APG, MD	2.587	0.003		0.441		0.899		-		0.899	0.000	3.930	Continuing
Subtotal			2.587	0.003		0.441		0.899		-		0.899	0.000	3.930	N/A
Support (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
HMS Engineering/ Technical Support	Various	PEO C3T, ARL, C5ISR, & ATC : Various	2.319	0.105		5.143		1.725		-		1.725	0.000	9.292	-
Subtotal			2.319	0.105		5.143		1.725		-		1.725	0.000	9.292	N/A
Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Follow on Delta Development & Testing	Various	EPG : Fort Huachuca	4.776	-		0.962		1.064		-		1.064	0.000	6.802	-
Follow on Delta Development & Testing (2)	Various	OTC : Various	5.534	4.717		-		-		-		-	0.000	10.251	-
ITN Testing	Various	Various : TBD	13.099	-		4.211		7.399		-		7.399	0.000	24.709	-
Subtotal			23.409	4.717		5.173		8.463		-		8.463	0.000	41.762	N/A
Project Cost Totals			28.315	4.825		10.757		11.087		-		11.087	0.000	54.984	N/A
Remarks															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA2 / <i>Rifleman Radio (RR)</i>

Event Name	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Production Qualification Test (PQT)	[Redacted]																											
LR EUA	[Redacted]																											
ITN CS21 Design Decision	1																											
Operational Test (OT)					[Redacted]																							
LR Full Rate Production (FRP)						2																						
Stryker Brigade Combat Team (SBCT) Characterization							3																					
ITN CS23 Soldier Touch Point								4																				
ITN CS23 Prototyping & Testing					[Redacted]																							
ITN CS23 Design Decision								5																				
Armored Brigade Combat Team (ABCT) Characterization								6																				
HMS Follow-on Test Events FY22									[Redacted]																			
HMS Follow-on Test Events FY23													[Redacted]															
ITN CS25 Prototyping & Testing													[Redacted]															

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA2 / <i>Rifleman Radio (RR)</i>

Event Name	FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
ITN CS25 Soldier Touch Point																	7 ITN CS25 STP											
ITN CS25 Design Decision																	8 ITN CS25 Design Decision											
HMS Follow-on Test Events FY24																	HMS Follow-on Test Events FY24											
HMS Follow-on Test Events FY25																	HMS Follow-on Test Events FY25											
ITN CS27 Prototyping & Testing																	ITN CS27 Prototyping & Testing											
HMS Follow-on Test Events FY26																	HMS Follow-on Test Events FY26											

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army		Date: May 2021
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA2 / <i>Rifleman Radio (RR)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Leader Radio (LR) Release For Proposal (RFP)	4	2017	4	2017
LR Qualification Test (QT)	1	2018	2	2018
LR Lab Based Risk Reduction	4	2018	4	2018
LR Contract Award	4	2018	4	2018
LR Early User Assessment (EUA)	3	2019	4	2019
Production Qualification Test (PQT)	4	2019	2	2020
Integrated Tactical Network (ITN) CS21 LBRR	3	2019	4	2019
LR Lab Based Risk Reduction (LBRR)	2	2019	4	2019
LR EUA	4	2019	2	2020
ITN CS21 Design Decision	3	2020	3	2020
Operational Test (OT)	2	2021	2	2021
LR Full Rate Production (FRP)	3	2021	3	2021
Stryker Brigade Combat Team (SBCT) Characterization	4	2021	4	2021
ITN CS23 Soldier Touch Point	2	2022	2	2022
ITN CS23 Prototyping & Testing	2	2021	2	2022
ITN CS23 Design Decision	3	2022	3	2022
Armored Brigade Combat Team (ABCT) Characterization	3	2022	3	2022
HMS Follow-on Test Events FY22	3	2022	3	2022
HMS Follow-on Test Events FY23	3	2023	3	2023
ITN CS25 Prototyping & Testing	4	2022	2	2024
ITN CS25 Soldier Touch Point	2	2024	2	2024
ITN CS25 Design Decision	3	2024	3	2024

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2022 Army **Date:** May 2021

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA2 / <i>Rifleman Radio (RR)</i>
--------------------------------------------------	------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------

Events	Start		End	
	Quarter	Year	Quarter	Year
HMS Follow-on Test Events FY24	3	2024	3	2024
HMS Follow-on Test Events FY25	3	2025	3	2025
ITN CS27 Prototyping & Testing	4	2024	1	2027
HMS Follow-on Test Events FY26	3	2026	3	2026