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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army **Date:** February 2020

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>
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	18.761	28.404	28.178	-	28.178	47.525	27.188	26.594	26.467	0.000	203.117
FA1: <i>Manpack Radio</i>	-	1.894	23.372	17.014	-	17.014	36.301	15.930	15.283	15.120	0.000	124.914
FA2: <i>Rifleman Radio (RR)</i>	-	16.867	5.032	11.164	-	11.164	11.224	11.258	11.311	11.347	0.000	78.203

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.

FY 2021 RDT&E resources are required to purchase mature production representative prototype components for operational demonstration evaluations, testing, and Integrated Tactical Network (ITN) Stryker Brigade Combat Team (SBCT) characterization in support of Capability Set 23 in accordance with the Army approved ITN Abbreviated-Capability Development Document (A-CDD).

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) 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.

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 significant testing, including Laboratory and Field Based Risk Reduction events in support of an Operational Test event.

The HMS radio systems serve as the backbone of the ITN architecture, supporting a converged Mission Command network. This funding supports ITN testing and evaluation, of which HMS is a key component. The Army intends to test and integrate two-channel communication technologies, utilizing existing Army two-channel radio variants (MP Radios), in support of Air to Ground. A single-channel variant that runs an advanced networking waveform and Small Form Factors will be evaluated as part of the ITN as an affordable option to reduce size, weight, and power. This RDTE 6.5 funding line will involve mature system development, integration, and demonstration in support of ITN evaluation to include: concept refinement, characterization, data collection, demos, integrated testing, and operational assessments.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army	Date: February 2020
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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>
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B. Program Change Summary (\$ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	3.825	35.654	50.297	-	50.297
Current President's Budget	18.761	28.404	28.178	-	28.178
Total Adjustments	14.936	-7.250	-22.119	-	-22.119
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-7.250			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	14.936	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-22.119	-	-22.119

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army										Date: February 2020		
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
FA1: <i>Manpack Radio</i>	-	1.894	23.372	17.014	-	17.014	36.301	15.930	15.283	15.120	0.000	124.914
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.

FY 2021 RDT&E resources are required to purchase mature production representative prototype components for operational demonstration evaluation, testing, and Integrated Tactical Network (ITN) Stryker Brigade Combat Team (SBCT) characterization in support of Capability Set 23 in accordance with the Army approved ITN Abbreviated-Capability Development Document (A-CDD).

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 significant testing, including Laboratory and Field Based Risk Reduction events in support of an Operational Test event.

The HMS radio systems serve as the backbone of the Integrated Tactical Network (ITN) architecture, supporting a converged Mission Command network. This funding supports ITN testing and evaluation, of which HMS is a key component. The Army intends to test and integrate two-channel communication technologies, utilizing existing Army two-channel radio variants (MP Radios), in support of Air to Ground. A single-channel variant that runs an advanced networking waveform and Small Form Factors will be evaluated as part of the ITN as an affordable option to reduce size, weight, and power. This RDTE 6.5 funding line will involve mature system development, integration, and demonstration in support of ITN evaluation to include: concept refinement, characterization, data collection, demos, integrated testing, and operational assessments.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2019	FY 2020	FY 2021
Title: Program Management	0.075	0.550	0.700

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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 2019	FY 2020	FY 2021
<p>Description: PdM HMS Manpack's 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 2020 Plans: During this timeframe, will provide overall management and oversight to implement PdM HMS acquisition strategy. Includes Matrix and Contractor support.</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 2020 to FY 2021 Increase/Decrease Statement: The increase in funds for Program Management is a direct result of supporting ITN's iterative evaluation and capability implementation strategy.</p>				
<p>Title: HMS Engineering/Technical Support</p> <p>Description: Overall technical analysis support to PdM HMS' Manpack and ITN products.</p> <p>FY 2020 Plans: To provide technical support, including systems engineering to evaluate technical alternatives and test support. System Engineering efforts includes: communication architecture analysis, identifying alternatives to reduce costs, improving system performance, and achieving tactical radio objectives. Technical test support includes: planning and execution of laboratory and field test events, support for testing of mature production representative prototypes, EDMs, commercial radio solutions, Developmental and Operational Test events, and data collection/reduction/analysis of tactical radio performance.</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 2020 to FY 2021 Increase/Decrease Statement: The increase in funds for Engineering/Technical Support is a direct result of supporting ITN's iterative evaluation and capability implementation strategy.</p>		1.452	1.000	1.540
<p>Title: Test and Evaluation</p>		0.367	21.822	14.774

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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 2019	FY 2020	FY 2021
<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. All radios awarded a contract were required to go through the Qualification Test (QT) to qualify for a Customer Test (CT). Following CT there was a Sandbox, Soldier Feedback Study, and Field / Lab Based Risk Reduction (FBRR/LBRR) that serve as risk reduction events prior to Operational Test (OT) to ensure the radio is operational at full capability and ready to be used by soldiers. 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 will be 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.</p> <p>HMS also supports ITN's iterative evaluation and capability implementation strategy.</p> <p>FY 2020 Plans: The FY 2020 funding is needed to conduct testing for the MP candidate products to demonstrate compliance with program requirements; assess effectiveness, suitability, and survivability; to obtain material release for FRP; engineering and technical support at test events; and to fully fund the testing requirements on the MP candidate radios as laid out in the HMS Acquisition Strategy approved May 2014. HMS is planning an operational test in FY 2020 to assess required capabilities, operational efficacy, and interoperability across the communications network. In FY 2020 the Army intends to test and integrate 2-channel communications technologies in support of Air to Ground.</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 2020 to FY 2021 Increase/Decrease Statement: The decrease in funds for Test and Evaluation is due to the completion of Operational Test in FY 2020. The program office continues to support ITN's iterative evaluation and capability implementation strategy.</p>			
Accomplishments/Planned Programs Subtotals	1.894	23.372	17.014

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• FA2: <i>Rifleman Radio (RR)</i>	16.867	5.032	11.164	-	11.164	11.224	11.258	11.311	11.347	0.000	78.203

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• B95004: <i>Handheld Manpack Small Form Fit (HMS)</i>	298.475	468.026	550.848	-	550.848	687.792	838.216	989.541	852.259	Continuing	Continuing

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.

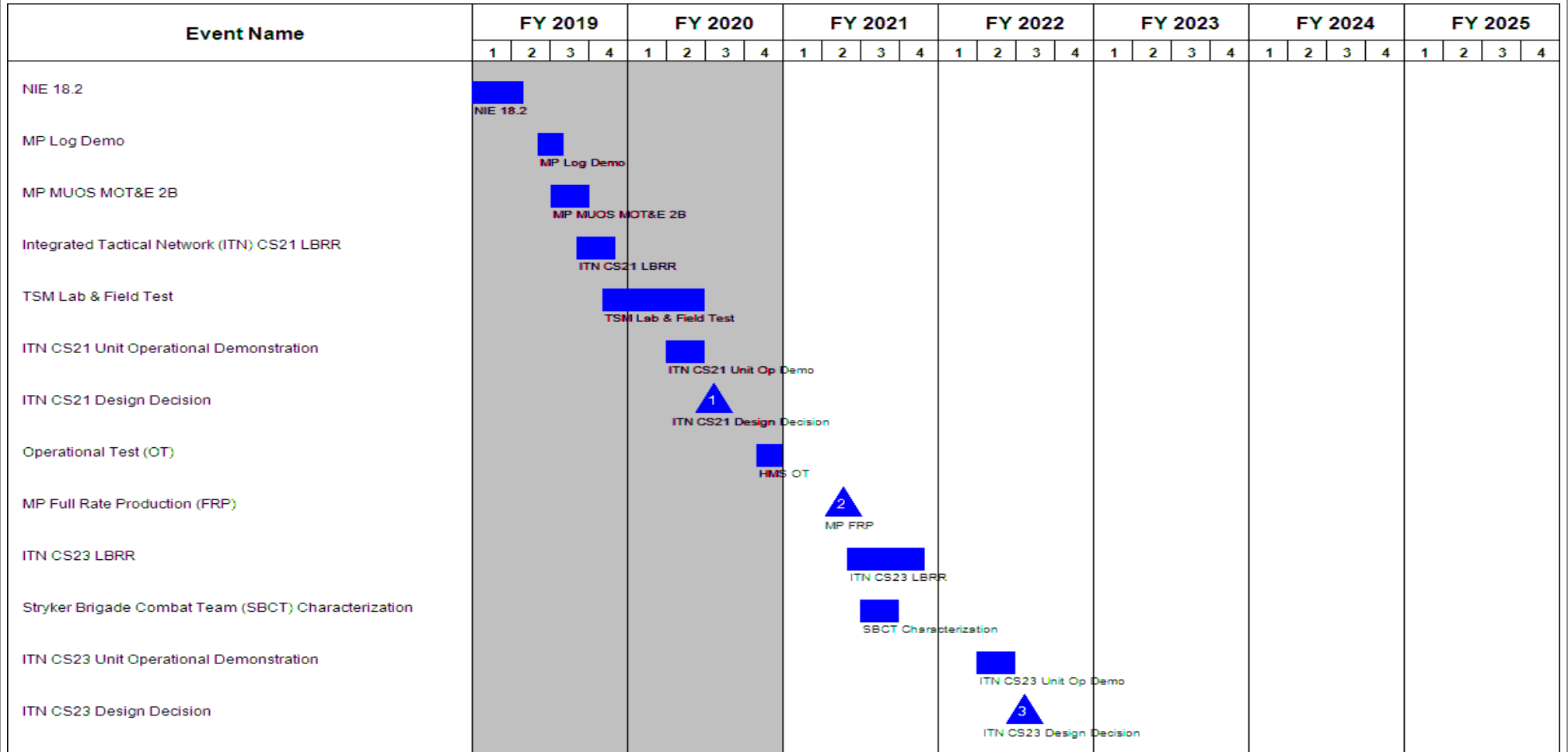
- The Army will procure radios through a multiple step selection process:
- a. Awarded FFP Contracts to all qualified vendors based on technical acceptability and demonstrations (26 February 2016)
 - b. Awarded initial delivery orders based on Qualification Test results (19 December 2016)
 - c. Awarded second delivery orders based on Customer Test results (31 July 2017)
 - d. Award(ed) LRIP delivery orders (30 April 2018, 06 June 2019, and 3QFY20)
 - e. Achieve Full Rate Production (2QFY21)

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army												Date: February 2020			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0605042A / Tactical Network Radio Systems (Low-Tier)				FA1 / Manpack Radio							
Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	0.860	0.075	Dec 2018	0.550		0.700		-		0.700	0.000	2.185	-
Subtotal			0.860	0.075		0.550		0.700		-		0.700	0.000	2.185	N/A
Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
Engineering/Technical Support	Various	PEO C3T, ARL, C5ISR, & ATC : Various	1.842	1.452	Jan 2019	1.000		1.540		-		1.540	0.000	5.834	-
Subtotal			1.842	1.452		1.000		1.540		-		1.540	0.000	5.834	N/A
Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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 : Ft. Huachuca	2.447	-		-		6.639		-		6.639	0.000	9.086	-
Follow on Delta Development & Testing (2)	Various	OTC : Various	6.446	0.367	Nov 2018	21.822		-		-		-	0.000	28.635	-
ITN Testing	Various	Various : TBD	-	-		-		8.135		-		8.135	0.000	8.135	-
Subtotal			8.893	0.367		21.822		14.774		-		14.774	0.000	45.856	N/A
Project Cost Totals			11.595	1.894		23.372		17.014		-		17.014	0.000	53.875	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
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>



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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
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 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
Armored Brigade Combat Team (ABCT) Characterization													■ ABCT Characterization															
ITN CS25 LBRR																	■ ITN CS25 LBRR											
ITN CS25 Unit Operational Demonstration																					■ ITN CS25 Unit Op Demo							
ITN CS25 Design Decision																					▲ ITN CS25 Design Decision							
HMS Network Evaluation Opportunities									Network Evaluation Opportunities																			

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
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
TSM Lab & Field Test	4	2019	2	2020
ITN CS21 Unit Operational Demonstration	2	2020	2	2020
ITN CS21 Design Decision	3	2020	3	2020
Operational Test (OT)	4	2020	4	2020
MP Full Rate Production (FRP)	2	2021	2	2021
ITN CS23 LBRR	2	2021	4	2021
Stryker Brigade Combat Team (SBCT) Characterization	3	2021	3	2021
ITN CS23 Unit Operational Demonstration	2	2022	2	2022
ITN CS23 Design Decision	3	2022	3	2022
Armored Brigade Combat Team (ABCT) Characterization	3	2022	3	2022
ITN CS25 LBRR	2	2023	4	2023
ITN CS25 Unit Operational Demonstration	2	2024	2	2024
ITN CS25 Design Decision	3	2024	3	2024
HMS Network Evaluation Opportunities	3	2019	4	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army										Date: February 2020		
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
FA2: <i>Rifleman Radio (RR)</i>	-	16.867	5.032	11.164	-	11.164	11.224	11.258	11.311	11.347	0.000	78.203
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.

FY 2021 RDT&E resources are required to purchase mature production representative prototype components for evaluation (lab and field based risk reduction events), testing, and Integrated Tactical Network (ITN) Stryker Brigade Combat Team (SBCT) characterization in support of Capability Set 23 in accordance with the Army approved ITN Abbreviated-Capability Development Document (A-CDD).

The HMS handheld radios include the one-channel Rifleman Radio (RR), two-channel Leader Radio (LR), and single-channel data radio. 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 (SINCGARS) 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 significant tests including Laboratory and Field Based Risk Reduction events in support of an Operational Test event.

The HMS radio systems serve as the backbone of the Integrated Tactical Network (ITN) architecture, supporting a converged Mission Command network. This funding supports ITN testing and evaluation, of which HMS is a key component. A single-channel variant that runs an advanced networking waveform and Small Form Factors will be evaluated as part of the ITN as an affordable option to reduce size, weight, and power. This RDTE 6.5 funding line will involve mature system development, integration, and demonstration in support of ITN evaluation to include: concept refinement, characterization, data collection, demos, integrated testing, and operational assessments.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2019	FY 2020	FY 2021
Title: Program Management	1.729	0.475	0.827

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
<p>Description: PdM HMS Handheld's 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 2020 Plans: During this timeframe, will provide overall management and oversight to implement HMS acquisition strategy. Includes Matrix and Contractor support.</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 2020 to FY 2021 Increase/Decrease Statement: The increase in funds for Program Management is a direct result of supporting ITN's iterative evaluation and capability implementation strategy.</p>				
<p>Title: HMS Engineering/Technical Support</p> <p>Description: Overall technical analysis support to PdM HMS' Handheld and ITN products.</p> <p>FY 2020 Plans: Provide technical systems engineering support to evaluate technical alternatives and perform communication architecture analysis to identify alternatives to reduce cost, improve performance, and achieving tactical radio objectives. Technical test support for the planning and execution of laboratory and field test events, including support for testing of mature production representative prototypes, EDMs, commercial radio solutions, Developmental and Operational Test events, and data collection/reduction/analysis of tactical radio performance.</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 2020 to FY 2021 Increase/Decrease Statement: The increase in funds for Engineering/Technical Support is a direct result of supporting ITN's iterative evaluation and capability implementation strategy.</p>		1.865	0.400	1.026
Title: Test and Evaluation		13.273	4.157	9.311

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B. Accomplishments/Planned Programs (\$ in Millions)

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 radios awarded a contract will be required to go through the Qualification Test (QT) to qualify for Field Based Army Evaluation Center (AEC) Evaluation/Lab Based Risk Reduction (FBAE/LBRR) that will serve as risk reduction events prior to Operational Test (OT) to ensure the radio is operational at full capability and ready to be used by soldiers. 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 will be 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.

HMS also supports ITN's iterative evaluation and capability implementation strategy.

FY 2020 Plans:

The FY 2020 funding is needed to conduct testing for the LR candidate products to demonstrate compliance with program requirements; assess effectiveness, suitability, and survivability; to obtain material release for FRP; and to fund the testing requirements on the LR candidate radios as laid out in the HMS Acquisition Strategy addendum approved in March 2017. In FY 2020 the Army intends to test and integrate 2-channel communications technologies in support of Air to Ground.

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.

FY 2020 to FY 2021 Increase/Decrease Statement:

The increase in funds for Test and Evaluation is a direct result of supporting ITN's iterative evaluation and capability implementation strategy.

FY 2019	FY 2020	FY 2021
Accomplishments/Planned Programs Subtotals		
16.867	5.032	11.164

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

Line Item	FY 2019	FY 2020	FY 2021	FY 2021	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Cost To	
			Base	OCO	Total					Complete	Total Cost
• FA1: <i>Manpack Radio</i>	1.894	23.372	17.014	-	17.014	36.301	15.930	15.283	15.120	0.000	124.914
• B95004: <i>Handheld Manpack Small Form Fit (HMS)</i>	298.475	468.026	550.848	-	550.848	687.792	838.216	989.541	852.259	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
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 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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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. Award LRIP delivery orders based on results of the best value trade-off construct (2QFY20 & 4QFY20)
- d. Achieve Full Rate Production (2QFY21)

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army												Date: February 2020				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 5				PE 0605042A / Tactical Network Radio Systems (Low-Tier)				FA2 / Rifleman Radio (RR)								
Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	0.858	1.729	Dec 2018	0.475		0.827		-		0.827	0.000	3.889	Continuing	
Subtotal			0.858	1.729		0.475		0.827		-		0.827	0.000	3.889	N/A	
Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	0.454	1.865	Jan 2019	0.400		1.026		-		1.026	0.000	3.745	-	
Subtotal			0.454	1.865		0.400		1.026		-		1.026	0.000	3.745	N/A	
Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	-		-		1.176		-		1.176	0.000	5.952	-	
Follow on Delta Development & Testing (2)	Various	OTC : Various	5.360	0.174	Nov 2018	4.157		-		-		-	0.000	9.691	-	
ITN Testing	Various	Various : TBD	-	13.099	Dec 2019	-		8.135		-		8.135	0.000	21.234	-	
Subtotal			10.136	13.273		4.157		9.311		-		9.311	0.000	36.877	N/A	
Project Cost Totals			11.448	16.867		5.032		11.164		-		11.164	0.000	44.511	N/A	
Remarks																

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
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 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
LR Early User Assessment (EUA)			■																									
LR EUA				■																								
Production Qualification Test (PQT)				■																								
LR PQT				■																								
Integrated Tactical Network (ITN) CS21 LBRR			■																									
ITN CS21 LBRR			■																									
LR Lab Based Risk Reduction (LBRR)		■																										
LR LBRR		■																										
LR LBRR/EUA						■																						
LR LBRR/EUA						■																						
ITN CS21 Unit Operational Demonstration						■																						
ITN CS21 Unit Op Demo						■																						
ITN CS21 Design Decision						▲																						
ITN CS21 Design Decision						▲																						
Operational Test (OT)								■																				
HMS OT								■																				
LR Full Rate Production (FRP)											▲																	
LR FRP											▲																	
ITN CS23 LBRR											■																	
ITN CS23 LBRR											■																	
Stryker Brigade Combat Team (SBCT) Characterization											■																	
SBCT Characterization											■																	
ITN CS23 Unit Operational Demonstration															■													
ITN CS23 Unit Op Demo															■													
ITN CS23 Design Decision																▲												
ITN CS23 Design Decision																▲												

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
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 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
Armored Brigade Combat Team (ABCT) Characterization																												
ITN CS25 LBRR																												
ITN CS25 Unit Operational Demonstration																												
ITN CS25 Design Decision																												
HMS Network Evaluation Opportunities																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
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 LBRR/EUA	2	2020	3	2020
ITN CS21 Unit Operational Demonstration	2	2020	2	2020
ITN CS21 Design Decision	3	2020	3	2020
Operational Test (OT)	4	2020	4	2020
LR Full Rate Production (FRP)	2	2021	2	2021
ITN CS23 LBRR	2	2021	4	2021
Stryker Brigade Combat Team (SBCT) Characterization	3	2021	3	2021
ITN CS23 Unit Operational Demonstration	2	2022	2	2022
ITN CS23 Design Decision	3	2022	3	2022
Armored Brigade Combat Team (ABCT) Characterization	3	2022	3	2022
ITN CS25 LBRR	2	2023	4	2023
ITN CS25 Unit Operational Demonstration	2	2024	2	2024
ITN CS25 Design Decision	3	2024	3	2024
HMS Network Evaluation Opportunities	3	2019	4	2025