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

<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy I BA 7: Operational Systems Development</i>	<b>R-1 Program Element (Number/Name)</b> PE 0204460M I (U) <i>Ground/Air Task Oriented Radar (G/ATOR)</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	430.875	43.184	28.891	22.205	-	22.205	13.659	13.536	12.533	12.785	Continuing	Continuing
9999: <i>Congressional Adds</i>	0.000	0.000	5.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.000
9C89: <i>Marine Ground-Air Radar</i>	430.875	43.184	23.891	22.205	-	22.205	13.659	13.536	12.533	12.785	Continuing	Continuing

**Program MDAP/MAIS Code:**  
**Project MDAP/MAIS Code(s):** 386

**A. Mission Description and Budget Item Justification**

The Ground/Air Task Oriented Radar (G/ATOR) is a multi-role, ground-based, expeditionary radar that replaces five legacy radar systems for the Marine Air Ground Task Force. It satisfies the Marine Air Command and Control System (G/ATOR Block 1) and the Ground Counter Fire/Counter Battery (G/ATOR Block 2) capabilities. The G/ATOR replaces the AN/TPS-63 and complements the AN/TPS-59 long range radar and will provide mobile, multi-functional, three-dimensional surveillance of air breathing targets, detection of cruise missiles and Unmanned Aerial Systems (UAS), and the cueing of air defense weapons. The G/ATOR contributes to the extension of Sea Shield/Sea Strike by surveillance and detection of enemy air threats not seen by Navy sensors in the littorals by participating in a cooperative engagement network of sensors and shooters. G/ATOR enables Integrated Fire Control (IFC) and provides an engage/fire on remote capability. G/ATOR surveillance coverage with IFC will provide unprecedented reach, volume, and precision in exploiting positional advantage and defending key maritime terrain that enables persistent sea control and denial operations forward.

**B. Program Change Summary (\$ in Millions)**

	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021 Base</u>	<u>FY 2021 OCO</u>	<u>FY 2021 Total</u>
Previous President's Budget	44.579	23.891	10.524	-	10.524
Current President's Budget	43.184	28.891	22.205	-	22.205
Total Adjustments	-1.395	5.000	11.681	-	11.681
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	5.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.395	0.000			
• Program Adjustments	0.000	0.000	11.700	-	11.700
• Rate/Misc Adjustments	0.000	0.000	-0.019	-	-0.019

**Congressional Add Details (\$ in Millions, and Includes General Reductions)**

**Project:** 9999: *Congressional Adds*

FY 2019	FY 2020

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2021 Navy	<b>Date:</b> February 2020
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<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy I BA 7: Operational Systems Development</i>	<b>R-1 Program Element (Number/Name)</b> PE 0204460M I (U) <i>Ground/Air Task Oriented Radar (G/ATOR)</i>
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**Congressional Add Details (\$ in Millions, and Includes General Reductions)**

Congressional Add: *Low, slow, small targets*

Congressional Add Subtotals for Project: 9999

Congressional Add Totals for all Projects

	FY 2019	FY 2020
	0.000	5.000
	0.000	5.000
	0.000	5.000

**Change Summary Explanation**

RDT&E funding decreases \$6.686M from FY20 to FY21 due to a \$5M congressional add in FY20 and reductions in test & evaluation and Government technical support, while ensuring continued improvement in G/ATOR software capabilities required in a Peer/Near-Peer Competitor environment.

FY 2021 President's Budget Submission increased \$11.7M from the FY 2020 President's Budget Submission to adequately resource both program Electronic Protection and software capability modification efforts necessary in a Peer/Near-Peer Competitor environment.

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Navy **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0204460M / (U)Ground/Air Task Oriented Radar (G/ATOR)	<b>Project (Number/Name)</b> 9999 / Congressional Adds
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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
9999: Congressional Adds	0.000	0.000	5.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.000
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

Initiates the software development for G/ATOR to detect Low, Slow, Small targets, in support of JUONS #CC-0558 and JEONS #ST-0008 requirements to enhance the radar's ability for the Counter-Unmanned Aerial System (C-UAS) mission. This enhancement will enable G/ATOR to discriminate air threats below the current minimum velocity requirement. It will increase situational awareness within the operational picture and improve kill chain timeline to ensure forward deployed forces possess the capabilities required to mitigate threats from enemy Unmanned Aerial Systems.

FY20 RDT&E funding increases \$5.0M to support Congressional add for Low, Slow, Small Target detection.

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

	FY 2019	FY 2020
<b>Congressional Add:</b> Low, slow, small targets	0.000	5.000
<b>FY 2019 Accomplishments:</b> N/A		
<b>FY 2020 Plans:</b> - Initiates the software development for G/ATOR to detect Low, Slow, Small targets, in support of JUONS #CC-0558 and JEONS #ST-0008 requirements to enhance the radar's ability for the Counter-Unmanned Aerial System (C-UAS) mission.		
<b>Congressional Adds Subtotals</b>	0.000	5.000

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021 Base</u>	<u>FY 2021 OCO</u>	<u>FY 2021 Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• RDTE/0604504N/0718: <i>Air Control MATCALs</i>	7.080	6.648	3.222	-	3.222	2.667	2.708	2.760	2.814	Continuing	Continuing
• PMC/4655: <i>Ground/Air Task Oriented Radar</i>	220.416	273.022	284.283	-	284.283	297.664	21.328	19.348	19.752	22.874	1,629.911
• PMC/7000: <i>Initial Spares- G/ATOR.</i>	11.611	13.235	13.506	-	13.506	13.806	14.101	14.383	14.671	Continuing	Continuing

**Remarks**

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0204460M / (U)Ground/Air Task Oriented Radar (G/ATOR)	<b>Project (Number/Name)</b> 9999 / Congressional Adds

**D. Acquisition Strategy**

Software enhancements supporting Low, Slow, Small target detection will be executed on the Sustainment Engineering and Logistics Support contract 3QFY20.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0204460M / (U)Ground/Air Task Oriented Radar (G/ATOR)	<b>Project (Number/Name)</b> 9999 / Congressional Adds
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<b>Product Development (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
G/ATOR BLOCK 1 DEVELOPMENT	C/CPIF	NORTHROP GRUMMAN MISSION SYSTEMS : LINTHICUM HEIGHTS	0.000	0.000		5.000	Jun 2020	0.000		-		0.000	0.000	5.000	-
<b>Subtotal</b>			0.000	0.000		5.000		0.000		-		0.000	0.000	5.000	N/A

**Remarks**  
FY20 RDT&E funding increases \$5.0M due to a congressional add for Low, Slow, Small Target detection to enhance the radar's ability to support the Counter-Unmanned Aerial System (C-UAS) mission.

	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>	0.000	0.000	5.000	0.000	-	0.000	0.000	5.000	N/A

**Remarks**  
FY20 RDT&E funding increases \$5.0M due to a congressional add for Low, Slow, Small Target detection.

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

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0204460M / (U)Ground/Air Task Oriented Radar (G/ATOR)	<b>Project (Number/Name)</b> 9999 / Congressional Adds
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Proj 9999	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025							
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
Low, Slow, Small Targets																																

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0204460M / (U)Ground/Air Task Oriented Radar (G/ATOR)	<b>Project (Number/Name)</b> 9999 / Congressional Adds

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 9999</b>				
Low, Slow, Small Targets: Low, Slow, Small Targets	3	2020	2	2021

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy										<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 7					<b>R-1 Program Element (Number/Name)</b> PE 0204460M / (U)Ground/Air Task Oriented Radar (G/ATOR)				<b>Project (Number/Name)</b> 9C89 / Marine Ground-Air Radar			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
9C89: Marine Ground-Air Radar	430.875	43.184	23.891	22.205	-	22.205	13.659	13.536	12.533	12.785	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
<b>Project MDAP/MAIS Code:</b> 386												

**A. Mission Description and Budget Item Justification**

The Ground/Air Task Oriented Radar (G/ATOR) is a multi-role, ground-based, expeditionary radar that replaces five legacy radar systems for the Marine Air Ground Task Force. It satisfies the Marine Air Command and Control System (G/ATOR Block 1) and the Ground Counter Fire/Counter Battery (G/ATOR Block 2) capabilities. The G/ATOR replaces the AN/TPS-63 and complements the AN/TPS-59 long range radar and will provide mobile, multi-functional, three-dimensional surveillance of air breathing targets, detection of cruise missiles and Unmanned Aerial Systems (UAS), and the cueing of air defense weapons. The G/ATOR contributes to the extension of Sea Shield/Sea Strike by surveillance and detection of enemy air threats not seen by Navy sensors in the littorals by participating in a cooperative engagement network of sensors and shooters. G/ATOR enables Integrated Fire Control (IFC) and provides an engage/fire on remote capability. G/ATOR surveillance coverage with IFC will provide unprecedented reach, volume, and precision in exploiting positional advantage and defending key maritime terrain that enables persistent sea control and denial operations forward.

FY 2021 President's Budget submit increased \$11.7M from the FY 2020 President's Budget request to adequately resource both program Electronic Protection and software capability modification efforts necessary in a Peer/Near-Peer Competitor environment.

**B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)**

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> G/ATOR Contractor Technical, Development Engineering/Block 1	18.305	12.930	12.904	0.000	12.904
<b>Articles:</b>	-	-	-	-	-
<b>FY 2020 Plans:</b> -Continue Pallet Communications Support Processor (PCSP) Tech Refresh, Electronic Protection, and Radar Survivability efforts including Decoys. -Complete initial radar emplacement/displacement time improvements. -Initiate advanced software radar emplacement/displacement time improvements and Low, Slow, Small Target detection to reduce the warfighter's exposure to hostile threats in a Peer/Near Peer Competitor Environment and enhance system mobility.					
<b>FY 2021 Base Plans:</b> -Will continue PCSP Tech Refresh, Electronic Protection and Radar Survivability efforts including Decoys.					
<b>FY 2021 OCO Plans:</b>					

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy				<b>Date:</b> February 2020	
<b>Appropriation/Budget Activity</b> 1319 / 7		<b>R-1 Program Element (Number/Name)</b> PE 0204460M / (U)Ground/Air Task Oriented Radar (G/ATOR)		<b>Project (Number/Name)</b> 9C89 / Marine Ground-Air Radar	
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>					
N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Developmental funding decreases \$0.026M in FY21 as G/ATOR is in Full Rate Production (FRP), while continuing to focus on software capability improvements including Pallet Communications Support Processor (PCSP) Tech Refresh, Program/Technology Protection, and Radar Survivability which also includes Advanced Radar Emplacement/Displacement efforts that are designed to improve Radar Survivability in a Peer, Near-Peer Competitor environment.					
<b>Title:</b> G/ATOR Contractor Technical, Development Engineering/Block 2					
<b>Articles:</b>					
	6.199	0.000	0.000	0.000	0.000
	-	-	-	-	-
<b>FY 2020 Plans:</b> N/A					
<b>FY 2021 Base Plans:</b> N/A					
<b>FY 2021 OCO Plans:</b> N/A					
<b>Title:</b> Government Technical Support					
<b>Articles:</b>					
	9.095	6.206	5.555	0.000	5.555
	-	-	-	-	-
<b>Description:</b> The Government Technical Support Team provides primarily inherent governmental support functions, including Federally Funded Research and Development Centers (FFRDCs), adding depth, breadth, and expertise not resident in the G/ATOR Program Office. Functions include technical planning as well as execution and analysis across multi-disciplinary competencies to include: Systems Architecture, Radar Software Engineering, Radar Systems Engineering, Radar Decoy Engineering, Cyber Security/Information Assurance, Human Systems Integration, Safety, Program Protection, and Configuration Management. It also includes the coordination necessary to enable a System of Systems interface with other programs in the "Cue to Slew" kill chain such as Air Command and Control and Sensor Netting (AC2SN), Composite Tracking Network (CTN) & Advanced Field Artillery Tactical Data System (AFATDS), ultimately ensuring platform/software compatibility. Technical Team support is vital during the G/ATOR System's Production phase as it is the Government's responsibility to ensure that G/ATOR meets Government Performance Specification Verification.					
<b>FY 2020 Plans:</b>					

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy			<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0204460M / (U)Ground/Air Task Oriented Radar (G/ATOR)	<b>Project (Number/Name)</b> 9C89 / Marine Ground-Air Radar			
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>					
Continue support from the following activities to enable program execution: MITRE; NAVAIR; NSWC Dahlgren; NSWC Crane; NAWC-AD China Lake; NSWC Indian Head; AIMS; NAWCWD Pt Mugu and DTIC.					
<b>FY 2021 Base Plans:</b> Will continue Government support from the following activities to enable program execution: MITRE; NAVAIR; NSWC Dahlgren; NSWC Crane; NAWC-AD China Lake; NSWC Indian Head; AIMS; NAWCWD Pt Mugu and DTIC.					
<b>FY 2021 OCO Plans:</b> N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Government Technical Support funding decreases \$0.651M from FY20 to FY21 as NAWCWD Pt Mugu technical support is reduced.					
<b>Title:</b> G/ATOR: Test and Evaluation					
<b>Articles:</b>					
	9.295	4.470	3.466	0.000	3.466
	-	-	-	-	-
<b>FY 2020 Plans:</b> Conduct two (2) engineering test events. The first is a Mode 5/S component level certification test that includes Identification Friend or Foe (IFF) and interoperability testing. The second is a Mode 5/S platform level certification that will include IFF and interoperability testing, Electronic Protection testing and signature controlled target testing. The testing has been relocated from Pt Mugu to Yuma Proving Grounds and Wallops Island. Additionally, associated test support necessary for the signature controlled target testing has been right-sized accordingly.					
<b>FY 2021 Base Plans:</b> Will conduct a survivability related engineering test event focusing on Electronic Protection, Decoys, Emplacement/Displacement, 6400 Mil Mode, and Decoys.					
<b>FY 2021 OCO Plans:</b> N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> T&E funding decreases \$1.004M from FY20 to FY21 as G/ATOR transitions to a survivability related engineering test.					
<b>Title:</b> G/ATOR: Management Services & Travel					
	0.290	0.285	0.280	0.000	0.280

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0204460M / (U)Ground/Air Task Oriented Radar (G/ATOR)	<b>Project (Number/Name)</b> 9C89 / Marine Ground-Air Radar

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<i>Articles:</i>	-	-	-	-	-
<b><i>FY 2020 Plans:</i></b> Provides program office travel in support of system development and two (2) engineering tests supporting Mode 5/S component and platform certifications that will also include radar survivability related and Signature Controlled Target testing.					
<b><i>FY 2021 Base Plans:</i></b> Provides program office travel in support of system development and a survivability related engineering test event.					
<b><i>FY 2021 OCO Plans:</i></b> N/A					
<b><i>FY 2020 to FY 2021 Increase/Decrease Statement:</i></b> Travel funding decreases \$0.005M from FY20 to FY21.					
<b>Accomplishments/Planned Programs Subtotals</b>	43.184	23.891	22.205	0.000	22.205

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• RDTE/0604504N/0718: <i>AIR CONTROL MATCALS</i>	7.080	6.648	3.222	-	3.222	2.667	2.708	2.760	2.814	Continuing	Continuing
• PMC/7000: INITIAL <i>SPARES-G/ATOR</i>	11.611	13.235	13.506	-	13.506	13.806	14.101	14.383	14.671	Continuing	Continuing
• PMC/4655: GROUND/AIR <i>TASK ORIENTED RADAR</i>	220.416	273.022	284.283	-	284.283	297.664	21.328	19.348	19.752	22.874	1,629.911

**Remarks**

**D. Acquisition Strategy**  
The Ground/Air Task Oriented Radar (G/ATOR) is a multi-role, ground-based, expeditionary radar that replaces five legacy radar systems and provides the USMC Air Defense and Air Surveillance (AD/AS) (G/ATOR Block 1), Counterfire/Targeting (G/ATOR Block 2), and Air Traffic Control (G/ATOR Block 4) capability. The AD/AS (GB1) development effort was competitively awarded in 2007 and completed Milestone C in FY14. GB1 achieved Initial Operational Capability (IOC) in March 2018. Development of the Counterfire/Targeting (GB2) capability was initiated in FY10 with a RFI to industry, followed by a Business Case Analysis (BCA) to select the most cost effective procurement strategy. The results of the BCA indicated that a sole source contract to Northrup Grumman Mission Systems (NGMS) was the most cost

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<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0204460M / (U)Ground/Air Task Oriented Radar (G/ATOR)	<b>Project (Number/Name)</b> 9C89 / Marine Ground-Air Radar
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effective solution. Thus, the GB2 development contract awarded in August FY15. GB2 achieved IOC in February 2019. The Full Rate Production (FRP) Contract with NGMS awarded in June 2019 and a Systems Engineering and Logistics Support Contract award is planned for 3QFY20. G/ATOR enhancements include a Composite Tracking Network (CTN) interface for GB2, Processor Tech Refresh, a three-phased Electronic Protection effort, Decoys and Radar Emplacement/Displacement improvements which are all necessary to increase G/ATOR's survivability in a Peer/Near-Peer competitor environment. An LRIP Tech Refresh will upgrade the Gallium Arsenide (GaAS) Transmit and Receive Modules to Gallium Nitride (GaN) Transmit and Receive Modules in the first six (6) LRIP Radar Systems as well as implement the upgrade of the electronic processors in all fifteen (15) LRIP Radar Systems.

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2021 Navy</b>											<b>Date: February 2020</b>				
<b>Appropriation/Budget Activity</b> 1319 / 7						<b>R-1 Program Element (Number/Name)</b> PE 0204460M / (U)Ground/Air Task Oriented Radar (G/ATOR)					<b>Project (Number/Name)</b> 9C89 / Marine Ground-Air Radar				

<b>Product Development (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
G/ATOR BLOCK 1 DEVELOPMENT	C/CPIF	NORTHROP GRUMMAN SYSTEMS CORPORATION : LINTHICUM HEIGHTS, MD	201.601	18.305	Dec 2018	12.930	Dec 2019	12.904	Dec 2020	-		12.904	Continuing	Continuing	Continuing
G/ATOR BLOCK 2 SOFTWARE DEVELOPMENT	C/CPFF	NORTHROP GRUMMAN SYSTEMS CORPORATION : LINTHICUM HEIGHTS, MD	60.763	6.199	Dec 2018	0.000		0.000		-		0.000	0.000	66.962	-
<b>Subtotal</b>			262.364	24.504		12.930		12.904		-		12.904	Continuing	Continuing	N/A

**Remarks**  
 Developmental funding decreases \$0.026M in FY21 as G/ATOR is in Full Rate Production (FRP), while continuing to focus on software capability improvements including Pallet Communications Support Processor (PCSP) Tech Refresh, Program/Technology Protection and Radar Survivability which also includes Advanced Radar Emplacement/ Displacement efforts that are designed to improve Radar Survivability in a Peer, Near-Peer Competitor environment. Award dates reflected are the actual obligation date for the first incremental award. The Northrop Grumman Product Development contract is incrementally funded throughout the fiscal year. FY20 & FY21 funding is specific to the entire Radar system and displayed in Block 1.

<b>Support (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
FFRDC TECHNICAL SUPPORT	FFRDC	MITRE : BOSTON, MA	6.008	0.726	Dec 2018	1.196	Dec 2019	1.175	Dec 2020	-		1.175	Continuing	Continuing	Continuing
NSWC TECHNICAL SUPPORT	WR	NSWC DAHLGREN : DAHLGREN, VA	45.140	2.016	Dec 2018	1.564	Dec 2019	1.448	Dec 2020	-		1.448	Continuing	Continuing	Continuing
NSWC TECHNICAL SUPPORT	WR	NSWC CRANE : CRANE, IN	1.325	1.427	Dec 2018	1.370	Dec 2019	1.282	Dec 2020	-		1.282	Continuing	Continuing	Continuing
NAVAIR TECHNICAL SUPPORT	WR	NAWC AD : CHINA LAKE, CA	0.075	0.020	Dec 2018	0.020	Dec 2019	0.020	Dec 2020	-		0.020	Continuing	Continuing	Continuing

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0204460M / (U)Ground/Air Task Oriented Radar (G/ATOR)	<b>Project (Number/Name)</b> 9C89 / Marine Ground-Air Radar
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<b>Support (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
NAVAIR TECHNICAL SUPPORT	WR	NAVAIR : PAX RIVER, MD	4.459	1.688	Dec 2018	0.826	Dec 2019	0.781	Dec 2020	-		0.781	Continuing	Continuing	Continuing
NSWC TECHNICAL SUPPORT	WR	NSWC-IH : INDIAN HEAD, MD	0.968	0.350	Dec 2018	0.355	Dec 2019	0.309	Dec 2020	-		0.309	Continuing	Continuing	Continuing
AIMS TECHNICAL SUPPORT	WR	AIMS : ROBINS AFB, GA	0.500	0.255	Dec 2018	0.260	Dec 2019	0.256	Dec 2020	-		0.256	Continuing	Continuing	Continuing
NAWCWD TECHNICAL SUPPORT	WR	NAWCWD : PT MUGU, CA	1.552	0.338	Dec 2018	0.335	Dec 2019	0.000		-		0.000	Continuing	Continuing	Continuing
DTIC TECHNICAL SUPPORT	WR	DTIC : FT BELVOIR, VA	0.680	0.280	Dec 2018	0.280	Dec 2019	0.284	Dec 2020	-		0.284	Continuing	Continuing	Continuing
CTN TECHNICAL SUPPORT	WR	AC2SN PMO PEO LS : QUANTICO, VA	0.000	1.995	Dec 2018	0.000		0.000		-		0.000	0.000	1.995	-
Prior Years Cumulative Funding	Various	N/A : N/A	8.993	0.000		0.000		0.000		-		0.000	0.000	8.993	-
<b>Subtotal</b>			69.700	9.095		6.206		5.555		-		5.555	Continuing	Continuing	N/A

**Remarks**  
Award dates reflected are the actual obligation date for the first incremental award. Most activities, excluding MITRE are incrementally funded throughout the fiscal year. Government Technical Support funding decreases \$0.651M from FY20 to FY21 as NAWCWD Pt Mugu technical and other support is reduced.

<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
PRIME CONTRACTOR TEST SUPPORT	C/CPIF	NORTHROP GRUMMAN SYSTEMS CORPORATION : LINTHICUM HEIGHTS, MD	12.653	1.876	Dec 2018	1.466	Dec 2019	1.244	Dec 2020	-		1.244	Continuing	Continuing	Continuing
TEST SUPPORT	WR	NSWC DAHLGREN : DAHLGREN, VA	8.754	2.404	Dec 2018	0.832	Dec 2019	0.466	Dec 2020	-		0.466	Continuing	Continuing	Continuing

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0204460M / (U)Ground/Air Task Oriented Radar (G/ATOR)	<b>Project (Number/Name)</b> 9C89 / Marine Ground-Air Radar
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<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
TEST SUPPORT	WR	AC2SN PEO LS : QUANTICO, VA	2.218	0.235	Dec 2018	0.000		0.000		-		0.000	0.000	2.453	-
TEST SUPPORT	MIPR	JTIC : FT HUACHUCA, AZ	0.427	0.120	Dec 2018	0.050	Dec 2019	0.000		-		0.000	Continuing	Continuing	Continuing
TEST PLANNING/ SUPPORT	Various	NSWC-FALLBROOK : CPEN, CA	8.953	0.478	Dec 2018	0.305	Dec 2019	0.275	Dec 2020	-		0.275	Continuing	Continuing	Continuing
TEST PLANNING/ SUPPORT	Various	NSWC CRANE : CRANE, IN	0.229	0.000		0.295	Dec 2019	0.305	Dec 2020	-		0.305	0.000	0.829	-
TEST SUPPORT	Various	NSWC CORONA : CORONA, CA	5.298	0.514	Dec 2018	0.250	Dec 2019	0.225	Dec 2020	-		0.225	Continuing	Continuing	Continuing
TEST PLANNING/ SUPPORT	Various	NSWC PHD : DAM NECK, VA	8.658	0.645	Dec 2018	0.222	Dec 2019	0.226	Dec 2020	-		0.226	Continuing	Continuing	Continuing
TEST PLANNING/ SUPPORT	WR	NAVAIR : PAX RIVER, MD	0.766	0.659	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
TEST OPERATOR SUPPORT	Various	MARFOR : Various	1.432	0.175	Dec 2018	0.150	Dec 2019	0.125	Dec 2020	-		0.125	Continuing	Continuing	Continuing
TEST RANGE SUPPORT	WR	YPG : YUMA, AZ	2.381	0.695	Dec 2018	0.525	Dec 2019	0.375	Dec 2020	-		0.375	0.000	3.976	-
TEST RANGE SUPPORT	WR	NAWCWD : PT MUGU, CA	1.765	0.784	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
TEST FACILITY SUPPORT	WR	SCSC : WALLOPS IS, MD	0.837	0.000		0.225	Dec 2019	0.000		-		0.000	0.000	1.062	-
TEST FACILITY SUPPORT	WR	MCAS YUMA : YUMA, AZ	1.635	0.420	Dec 2018	0.000		0.000		-		0.000	0.000	2.055	-
TEST FACILITY SUPPORT	WR	MCB 29 PALMS : 29 PALMS, CA	0.515	0.290	Dec 2018	0.150	Dec 2019	0.225	Dec 2020	-		0.225	0.000	1.180	-
Prior Years Cumulative Funding	Various	N/A : N/A	29.022	0.000		0.000		0.000		-		0.000	0.000	29.022	-
<b>Subtotal</b>			85.543	9.295		4.470		3.466		-		3.466	Continuing	Continuing	N/A

**Remarks**  
Award dates reflected are the actual obligation date for the first incremental award. T&E funding decreases \$1.004M from FY20 to FY21 based on T&E activities. JTIC and Wallops Island test support is not required to conduct Survivability Testing.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0204460M / (U)Ground/Air Task Oriented Radar (G/ATOR)	<b>Project (Number/Name)</b> 9C89 / Marine Ground-Air Radar
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<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
MANAGEMENT SERVICES	C/FP	MCSC : MCSC - QUANTICO, VA	11.548	0.000		0.000		0.000		-		0.000	0.000	11.548	-
TRAVEL	Various	MCSC : QUANTICO, VA	1.720	0.290	Sep 2019	0.285	Sep 2020	0.280	Sep 2021	-		0.280	Continuing	Continuing	Continuing
<b>Subtotal</b>			13.268	0.290		0.285		0.280		-		0.280	Continuing	Continuing	N/A

**Remarks**  
Travel funding decreases \$0.005M from FY20 to FY21.

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	430.875	43.184	23.891	22.205	-	22.205	Continuing	Continuing	N/A

**Remarks**  
RDT&E funding decreases \$1.686M from FY20 to FY21 ensuring continued improvement in G/ATOR software capabilities required in a Peer/Near-Peer competitor environment. The \$11.681M increase from the FY 2020 President's Budget Request occurred to adequately resource both program Electronic Protection and software capability modifications efforts necessary in a Peer/Near-Peer Competitor environment.

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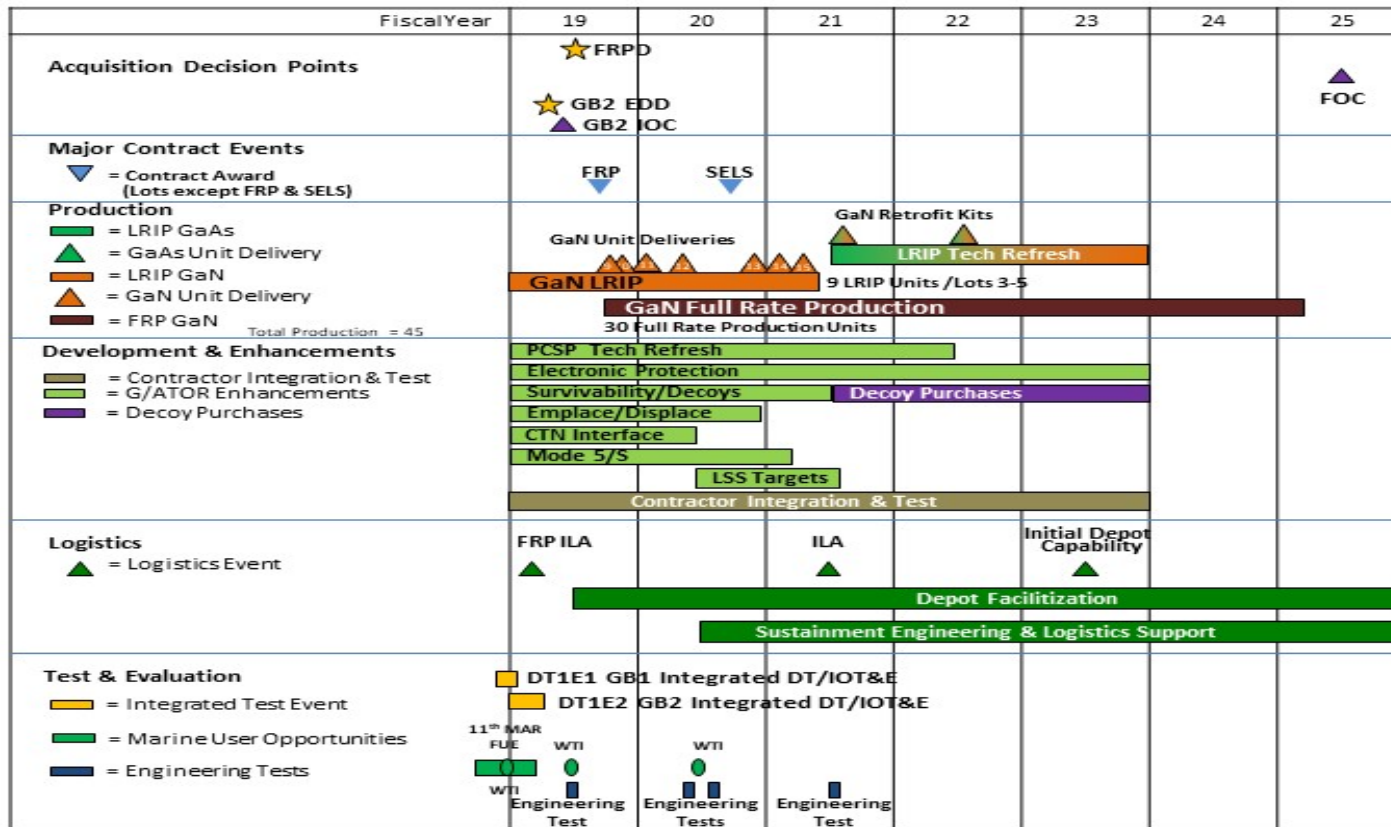
Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy

Date: February 2020

Appropriation/Budget Activity  
1319 / 7

R-1 Program Element (Number/Name)  
PE 0204460M / (U)Ground/Air Task  
Oriented Radar (G/ATOR)

Project (Number/Name)  
9C89 / Marine Ground-Air Radar



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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0204460M / (U)Ground/Air Task Oriented Radar (G/ATOR)	<b>Project (Number/Name)</b> 9C89 / Marine Ground-Air Radar

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 9C89</b>				
Gallium Arsenide (GaAs) Radar: Gallium Nitride (GaN) Retrofit Kit Procurement Lot 1	3	2021	3	2021
Gallium Arsenide (GaAs) Radar: (GaN) Retrofit Kit Procurement Lot 2	3	2022	3	2022
Gallium Arsenide (GaAs) Radar: LRIP Tech Refresh	3	2021	4	2023
Gallium Nitride (GaN) Radar: DT1E1 GB1 Integrated DT/IOT&E	1	2019	1	2019
Gallium Nitride (GaN) Radar: DT1E2 GB2 Integrated DT/IOT&E	1	2019	2	2019
Gallium Nitride (GaN) Radar: FRPD	3	2019	3	2019
Gallium Nitride (GaN) Radar: FRP	3	2019	2	2025
Gallium Nitride (GaN) Radar: 11th MAR FUE	1	2019	1	2019
Gallium Nitride (GaN) Radar: FY19 WTI	3	2019	3	2019
Gallium Nitride (GaN) Radar: Engineering Test 1: Signature	3	2019	3	2019
Gallium Nitride (GaN) Radar: Engineering Test 2	2	2020	2	2020
Gallium Nitride (GaN) Radar: FY20 WTI	3	2020	3	2020
Gallium Nitride (GaN) Radar: Engineering Test 3	3	2020	3	2020
Gallium Nitride (GaN) Radar: Engineering Test 4	3	2021	3	2021
Gallium Nitride (GaN) Radar: Full Operational Capability (FOC)	2	2025	2	2025
Ground Weapons Locating Radar (GWLR): GB2 EDD	2	2019	2	2019
Ground Weapons Locating Radar (GWLR): GB2 IOC	2	2019	2	2019
Enhancements: Electronic Protection	1	2019	4	2023
Enhancements: Radar Survivability/Decoys	1	2019	2	2021
Enhancements: Decoy Purchases	3	2021	4	2023
Enhancements: PCSP Tech Refresh	1	2019	2	2022

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**Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 7	<b>R-1 Program Element (Number/Name)</b> PE 0204460M / (U)Ground/Air Task Oriented Radar (G/ATOR)	<b>Project (Number/Name)</b> 9C89 / Marine Ground-Air Radar
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Enhancements: Emplacement/Displacement	1	2019	4	2020
Enhancements: CTN Interface	1	2019	2	2020
Enhancements: Mode 5/S	1	2019	1	2021
Enhancements: Low, Slow, Small Targets	3	2020	2	2021
Enhancements: Contractor Integration & Test	1	2019	4	2023
Logistics: FRP ILA	1	2019	1	2019
Logistics: Depot Facilitization (LRU Repair & IROAN)	3	2019	4	2025
Logistics: Sustainment Engineering and Logistics Support Contract Award	3	2020	3	2020
Logistics: Sustainment Engineering and Logistics Support	3	2020	4	2025
Logistics: ILA	3	2021	3	2021
Logistics: Initial Depot IROAN Capability	3	2023	3	2023