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

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207610F / <i>Battlefield Abn Comm Node (BACN)</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	-	42.349	26.946	6.827	0.000	6.827	34.199	0.000	0.000	0.000	Continuing	Continuing
671201: <i>E-11 Development</i>	-	0.000	26.946	6.827	0.000	6.827	34.199	0.000	0.000	0.000	Continuing	Continuing
675383: <i>BATTLEFIELD AIRBORNE COMM NODE (BACN)</i>	-	42.349	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

Battlefield Airborne Communications Node (BACN) enables tactical edge Joint and Coalition information interoperability via air, space, and surface systems, to include a Backbone Network for high capacity data transfer. As requirements emerge, BACN will integrate new hardware and software capabilities that improve system performance, interoperability, availability and open mission system technologies. Efforts include, but are not limited to, expansion of external time reference capabilities, Survivability Urgent Operational Need (UON) Military Global Positioning System (GPS) and other system enhancements, development and integration of advanced antennas and waveforms, ground support capabilities and assimilation of mandates levied on the BACN systems. Survivability UON is required for BACN Fleet to fly in increasingly contested Area of Responsibility (AOR). Safety of flight considerations, including performance, aircraft structural integrity, availability, and continuity of service requirements will be addressed. Efforts will include required non-recurring engineering and Diminishing Manufacturing Sources (DMS) issues, the development of simulators/trainers, development of training materials, and technical publications.

Execute risk reduction activities for development of future capabilities on BACN payload/aircraft efforts.

Beginning in FY21, to support the divestiture of the EQ-4B (a variant of the RQ-4 Block 20/30 aircraft) efforts will taper accordingly, to include BACN payload sustainment & other BACN specific efforts.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver BACN weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

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Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0207610F / <i>Battlefield Abn Comm Node (BACN)</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	42.349	26.946	14.781	0.000	14.781
Current President's Budget	42.349	26.946	6.827	0.000	6.827
Total Adjustments	0.000	0.000	-7.954	0.000	-7.954
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	-7.954	0.000	-7.954

Change Summary Explanation

The FY2021 funding request was reduced by \$7.954 to account for the availability of prior year execution balances.

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force										Date: February 2020		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0207610F / <i>Battlefield Abn Comm Node (BACN)</i>				Project (Number/Name) 671201 / <i>E-11 Development</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
671201: <i>E-11 Development</i>	-	0.000	26.946	6.827	0.000	6.827	34.199	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Battlefield Airborne Communications Node (BACN) enables tactical edge Joint and Coalition information interoperability via air, space, and surface systems, to include a Backbone Network for high capacity data transfer. As requirements emerge, BACN will integrate new hardware and software capabilities that improve system performance, interoperability, availability and open mission system technologies. Efforts include, but are not limited to, expansion of external time reference capabilities, Survivability Urgent Operational Need (UON) Military Global Positioning System (GPS) and other system enhancements, development and integration of advanced antennas and waveforms, ground support capabilities and assimilation of mandates levied on the BACN systems. Survivability UON is required for BACN Fleet to fly in increasingly contested Area of Responsibility (AOR). Safety of flight considerations, including performance, aircraft structural integrity, availability, and continuity of service requirements will be addressed. Efforts will include required non-recurring engineering and Diminishing Manufacturing Sources (DMS) issues, the development of simulators/trainers, development of training materials, and technical publications.

Execute risk reduction activities for development of future capabilities on BACN payload/aircraft efforts.

Beginning in FY21, to support the divestiture of the EQ-4B (a variant of the RQ-4 Block 20/30 aircraft) efforts will taper accordingly, to include BACN payload sustainment & other BACN specific efforts.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver the BACN capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F

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

	FY 2019	FY 2020	FY 2021
Title: BACN Simulators/Trainers	0.000	15.600	6.827
Description: This effort will be used to develop payload simulator trainers.			
FY 2020 Plans: Develop training systems and begin training BACN payload operators in an environment conducive for learning.			
FY 2021 Plans: Efforts will include non-recurring engineering and Diminishing Manufacturing Sources (DMS) issues, the development of simulators/trainers, development of training materials, and technical publications.			
FY 2020 to FY 2021 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207610F / <i>Battlefield Abn Comm Node (BACN)</i>	Project (Number/Name) 671201 / <i>E-11 Development</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
FY21 funding for this effort has been moved to BACN Development Efforts				
Title: BACN Development Efforts		0.000	11.346	0.000
Description: Provides common development, integration and interoperability of the BACN payload, platforms, emerging capabilities, supporting systems and support equipment. Acquisition strategies vary by effort, will utilize all contracting options available but the majority of development and integration is normally accomplished by the weapon system prime contractor. Survivability UON (Military GPS) is required for BACN Fleet to fly in increasingly contested Area of Responsibility (AOR).				
FY 2020 Plans: Continue establishment of BACN PoR				
FY 2021 Plans: FY21 funding will provide development of Training materials, technical publications, and program support costs. Performs Human Machine Interface (HMI) studies. Develop Payload Simulator/Trainers and begin training BACN payload operators in an environment conducive for learning.				
FY 2020 to FY 2021 Increase/Decrease Statement: FY21 funding increase for this effort has been moved from BACN Simulators/Trainers to Survivability UON efforts.				
Accomplishments/Planned Programs Subtotals		0.000	26.946	6.827
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
Provides common development, integration and interoperability of the BACN payload, platforms and supporting systems and equipment. Acquisition strategies vary by effort, will utilize all contracting options available but the majority of development and integration is normally accomplished by the weapon system prime contractor.				

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force												Date: February 2020				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
3600 / 7				PE 0207610F / Battlefield Abn Comm Node (BACN)				671201 / E-11 Development								
Product Development (\$ 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	
Trainers	TBD	Not specified. : TBD	-	-		4.987	Jun 2020	6.468		-		6.468	Continuing	Continuing	-	
Survivability UON	SS/TBD	Not specified. : TBD	-	-		20.000	Feb 2020	-		-		-	Continuing	Continuing	-	
Subtotal			-	-		24.987		6.468		-		6.468	Continuing	Continuing	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	
Acquisition Support	Various	Various : Various, MA	-	-		1.600	Dec 2019	-		-		-	Continuing	Continuing	-	
Subtotal			-	-		1.600		-		-		-	Continuing	Continuing	N/A	
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	
BACN A&AS	Various	A&AS : Bedford, MA	-	-		0.192	Apr 2020	0.192		-		0.192	Continuing	Continuing	-	
MITRE	Various	MITRE : Bedford, MA	-	-		0.167	Oct 2019	0.167		-		0.167	Continuing	Continuing	-	
Subtotal			-	-		0.359		0.359		-		0.359	Continuing	Continuing	N/A	
Project Cost Totals			-	-		26.946		6.827		-		6.827	Continuing	Continuing	N/A	
Remarks																

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207610F / <i>Battlefield Abn Comm Node (BACN)</i>	Project (Number/Name) 671201 / <i>E-11 Development</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Battlefield Airborne Communication Node (BACN)</i>				
BACN Development Publication and Data	2	2020	3	2022
Trainers	3	2020	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force										Date: February 2020		
Appropriation/Budget Activity 3600 / 7					R-1 Program Element (Number/Name) PE 0207610F / <i>Battlefield Abn Comm Node (BACN)</i>				Project (Number/Name) 675383 / <i>BATTLEFIELD AIRBORNE COMM NODE (BACN)</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
675383: <i>BATTLEFIELD AIRBORNE COMM NODE (BACN)</i>	-	42.349	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Battlefield Airborne Communications Node (BACN) enables tactical edge Joint and Coalition information interoperability via air, space, and surface systems, to include a Backbone Network for high capacity data transfer. As requirements emerge, BACN will integrate new hardware and software capabilities that improve system performance, interoperability, availability and open mission system technologies. Efforts include, but are not limited to, expansion of external time reference capabilities, Military GPS enhancements, integration of advanced antennas and waveforms, and assimilation of mandates levied on the BACN systems. Military GPS is required for BACN fleet to fly in increasingly contested AORs. Safety of flight considerations, including performance, aircraft structural integrity, availability, and continuity of service requirements will be addressed. Efforts will include required non-recurring engineering and Diminishing Manufacturing Sources (DMS) issues.

This effort will include the development and integration of Military GPS on the E-11A BACN platform.

Acquire Battlefield Airborne Communications Node (BACN) Payload Trainers/Simulators, to include design of all trainers, training materials, operations and maintenance technical manuals.

Beginning in FY21, to support the divestiture of the EQ-4B (a variant of the RQ-4 Block 20/30 aircraft) efforts will taper accordingly, to include BACN payload sustainment & other BACN specific efforts.

This effort will include the development of a Rapidly Deployable PCE.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver BACN weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element 0605831F.

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

	FY 2019	FY 2020	FY 2021
Title: Military GPS, E-11A & Deployable Program Control Element (PCE)	42.349	0.000	0.000
Description: Battlefield Airborne Communications Node (BACN) enables tactical edge Joint and Coalition information interoperability via air, space, and surface systems; Backbone Network for high capacity data transfer.			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Air Force		Date: February 2020		
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207610F / <i>Battlefield Abn Comm Node (BACN)</i>	Project (Number/Name) 675383 / <i>BATTLEFIELD AIRBORNE COMM NODE (BACN)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2019	FY 2020	FY 2021
<p>Military GPS is required for BACN fleet to fly in increasingly contested AORs. Safety of flight considerations, including performance, integrity, availability, and continuity of service requirements for long range reference, local area reference, and landing/terminal reference, are directly affected by how GPS sensors are used.</p> <p>This effort will include the development and integration of Military GPS on the E-11A BACN platform.</p> <p>Rapidly Deployable Program Control Elements (PCEs) are required to provide agile deployment support to establish remote and full ground control locations in a timely manner to shorten the kill-chain.</p> <p>This effort will include the development and integration of Rapidly Deployable PCE.</p> <p>FY 2020 Plans: Continue efforts started in FY19.</p> <p>FY 2021 Plans: Continue efforts started in FY19</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Funds decreased due to effort completed</p>				
Accomplishments/Planned Programs Subtotals		42.349	0.000	0.000
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
Provides for common development, integration and interoperability of the BACN payload, platforms and supporting systems and equipment. Acquisition strategies vary by effort, will utilize all contracting options available but the majority of development and integration is normally accomplished by the weapon system prime contractor.				

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Air Force												Date: February 2020			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
3600 / 7				PE 0207610F / Battlefield Abn Comm Node (BACN)				675383 / BATTLEFIELD AIRBORNE COMM NODE (BACN)							
Product Development (\$ 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
Military GPS, E-11A	SS/CPFF	AFLCMC/HNA : Hanscom AFB, MA	-	41.727	Jul 2019	-		-		-		-	Continuing	Continuing	-
Subtotal			-	41.727		-		-		-		-	Continuing	Continuing	N/A
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
MilGPS PM, Eng A&AS	Various	Not specified. : TBD	-	0.595		-		-		-		-	Continuing	Continuing	-
MilGPS Travel	Various	Not specified. : TBD	-	0.027		-		-		-		-	Continuing	Continuing	-
Subtotal			-	0.622		-		-		-		-	Continuing	Continuing	N/A
Project Cost Totals			-	42.349		0.000		-		-		-	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207610F / <i>Battlefield Abn Comm Node (BACN)</i>	Project (Number/Name) 675383 / <i>BATTLEFIELD AIRBORNE COMM NODE (BACN)</i>

	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

<i>Battlefield Airborne Comm Node (BACN)</i>																												
Military GPS, E-11A	[REDACTED]																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Air Force		Date: February 2020
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0207610F / <i>Battlefield Abn Comm Node (BACN)</i>	Project (Number/Name) 675383 / <i>BATTLEFIELD AIRBORNE COMM NODE (BACN)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Battlefield Airborne Comm Node (BACN)</i>				
Military GPS, E-11A	1	2019	4	2020