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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy **Date:** February 2016

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|---|---|
| Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i> | R-1 Program Element (Number/Name) PE 0604272N / <i>Tact Air Dir Infrared CM (TADIRCM)</i> |
|---|---|

| COST (\$ in Millions) | Prior Years | FY 2015 | FY 2016 | FY 2017 Base | FY 2017 OCO | FY 2017 Total | FY 2018 | FY 2019 | FY 2020 | FY 2021 | Cost To Complete | Total Cost |
|-----------------------|-------------|---------|---------|--------------|-------------|---------------|---------|---------|---------|---------|------------------|------------|
| Total Program Element | 7.300 | 5.677 | 18.969 | 34.920 | 37.990 | 72.910 | 38.009 | 38.789 | 24.331 | 24.826 | 249.261 | 480.072 |
| 3304: <i>CIRCM</i> | 7.300 | 5.677 | 18.969 | 34.920 | 37.990 | 72.910 | 38.009 | 38.789 | 24.331 | 24.826 | 249.261 | 480.072 |

A. Mission Description and Budget Item Justification

Decrease in TACT AIR DIR INFRARED CM (TADIRCM) by \$1.515M as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

This element includes development of electronic warfare systems for the United States Navy and United States Marine Corps assault aircraft. This includes the development and testing of advanced infrared countermeasures systems for emerging threats and emergency contingencies for Aircraft Self-Protection Equipment (ASE) suite integration.

FY 2017 OCO funding is required for developmental activities in hardware and software to reduce the size, weight, and power required to achieve a missile warning detection system compatible with mission planning information that stores sensor data for post mission threat analysis.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment.

| B. Program Change Summary (\$ in Millions) | FY 2015 | FY 2016 | FY 2017 Base | FY 2017 OCO | FY 2017 Total |
|---|----------------|----------------|---------------------|--------------------|----------------------|
| Previous President's Budget | 5.556 | 18.969 | 42.013 | - | 42.013 |
| Current President's Budget | 5.677 | 18.969 | 34.920 | 37.990 | 72.910 |
| Total Adjustments | 0.121 | 0.000 | -7.093 | 37.990 | 30.897 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | 0.300 | 0.000 | | | |
| • SBIR/STTR Transfer | -0.179 | 0.000 | | | |
| • Program Adjustments | 0.000 | 0.000 | -4.363 | - | -4.363 |
| • Rate/Misc Adjustments | 0.000 | 0.000 | -2.730 | 37.990 | 35.260 |

Change Summary Explanation

Schedule:

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| <p>PU 3304 CIRCM: Integrated Operational Test & Evaluation (IOT&E) from 4th Qtr FY18 through 4th Qtr FY19 to 4th Qtr FY19 through 4th Qtr FY20; Navy Development Test & Evaluation EMD (DT&E-EMD) from 2nd Qtr FY16 through 2nd Qtr FY18 to 2nd Qtr FY17 through 1st Qtr FY19; Navy Test Readiness Review (TRR) from 2nd Qtr FY17 to 3rd Qtr FY19; All tasks are on schedule and to be completed by the Army.</p> | | |

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy **Date:** February 2016

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| Appropriation/Budget Activity 1319 / 4 | R-1 Program Element (Number/Name) PE 0604272N / <i>Tact Air Dir Infrared CM (TADIRCM)</i> | Project (Number/Name) 3304 / <i>CIRCM</i> |
|--|---|---|

| COST (\$ in Millions) | Prior Years | FY 2015 | FY 2016 | FY 2017 Base | FY 2017 OCO | FY 2017 Total | FY 2018 | FY 2019 | FY 2020 | FY 2021 | Cost To Complete | Total Cost |
|----------------------------|-------------|---------|---------|--------------|-------------|---------------|---------|---------|---------|---------|------------------|------------|
| 3304: <i>CIRCM</i> | 7.300 | 5.677 | 18.969 | 34.920 | 37.990 | 72.910 | 38.009 | 38.789 | 24.331 | 24.826 | 249.261 | 480.072 |
| Quantity of RDT&E Articles | | - | - | - | - | - | - | - | - | - | | |

A. Mission Description and Budget Item Justification

Common Infrared Countermeasures (CIRCM) was a new start for the Navy in FY13. This project includes the development, integration, and testing of a laser-based directed infrared countermeasure system for United States Navy and United States Marine Corps assault aircraft. This infrared countermeasure, when integrated with a missile warning detection system, will be capable of countering current and emerging infrared threats. An Under Secretary of Defense for Acquisition, Technology and Logistics (USD (AT&L)) Acquisition Decision Memorandum (ADM) dated 15 April 2009 designated the Army as the lead service for developing this capability for all rotary-wing, tilt-rotor, and small fixed-wing aircraft across the Department of Defense. It also designated the program as an Acquisition Category (ACAT) ID special interest program. The Army has designated the acquisition effort for this capability as the CIRCM program. Developmental activities in hardware and software will be pursued to reduce the size, weight and power required to achieve a missile warning detection system integrated with an infrared countermeasure. This project develops integrated hardware/software solutions that link on-board integrated Aircraft Survivability Equipment (iASE) that are compatible with mission planning information and stores sensor data for post mission threat analysis. This project also adopts future multi-band, networking capabilities to facilitate real-time transfer of threat information, and off-board queuing and control of onboard sensors.

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

| | FY 2015 | FY 2016 | FY 2017 Base | FY 2017 OCO | FY 2017 Total |
|---|---------|---------|--------------|-------------|---------------|
| Title: CIRCM Technology Development (TD) | 5.677 | 18.969 | 34.920 | 37.990 | 72.910 |
| Articles: | - | - | - | - | - |
| FY 2015 Accomplishments: Achieve MS-B; Engineering Manufacturing Development (EMD) contract award. | | | | | |
| FY 2016 Plans: CIRCM will enter the Engineering Manufacturing Development (EMD) phase in FY16. The EMD Contract was awarded 4QFY15. The CIRCM Critical Design Review is scheduled for 4QFY16. | | | | | |
| FY 2017 Base Plans: Begin Development Test and Evaluation (DT&E) phase of the EMD. | | | | | |
| FY 2017 OCO Plans: N/A | | | | | |
| Accomplishments/Planned Programs Subtotals | 5.677 | 18.969 | 34.920 | 37.990 | 72.910 |

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| Appropriation/Budget Activity 1319 / 4 | R-1 Program Element (Number/Name) PE 0604272N / <i>Tact Air Dir Infrared CM (TADIRCM)</i> | Project (Number/Name) 3304 / <i>CIRCM</i> |
| C. Other Program Funding Summary (\$ in Millions) N/A | | |
| Remarks | | |
| D. Acquisition Strategy Common Infrared Countermeasures (CIRCM) was a new start for the Navy in FY13. CIRCM is an Acquisition Category (ACAT) ID Army lead acquisition program for the development, integration and production of an infrared countermeasure for US Army, US Navy, and US Marine Corps assault aircraft. The Army conducted a 21 month competitive prototyping Technology Development (TD) phase with two contractors. During the TD phase the contractors developed TD test articles for various test events with emphasis placed on reliability. Contractors concurrently developed preliminary designs for the CIRCM system; conducted systems requirements review, system functional review, and preliminary design review systems engineering technical review events at appropriate times in the schedule. Upon completion of TD, the Army conducted a competition for award of Engineering Manufacturing Development (EMD) contract(s). The EMD phase will be no more than 26 months and will include critical design reviews, test readiness reviews, 5 EMD test articles and extensive testing. Following EMD there will be Low Rate Initial Production (LRIP) phase where full qualification testing is conducted to support an Army first unit equipped date of FY20. There will be 8 Navy LRIP units delivered in FY18. The Navy's Initial Operational Capability (IOC) will be in FY21. | | |
| E. Performance Metrics FY15: Achievement of Milestone B. Successful EMD contract award by US Army. FY16: Successful critical design review. Successful exercise of Navy option on Army EMD contract for EMD test assets. | | |

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy **Date:** February 2016

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| Appropriation/Budget Activity 1319 / 4 | R-1 Program Element (Number/Name) PE 0604272N / <i>Tact Air Dir Infrared CM (TADIRCM)</i> | Project (Number/Name) 3304 / <i>CIRCM</i> |
|--|---|---|

| Product Development (\$ in Millions) | | | | FY 2015 | | FY 2016 | | FY 2017 Base | | FY 2017 OCO | | FY 2017 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 | | | |
| Primary HDW Dev CIRCM | C/CPIF | Bell-Boeing : Philadelphia, PA | 0.985 | 0.000 | | 0.000 | | 0.000 | | - | | 0.000 | 0.000 | 0.985 | 0.985 |
| Sys Eng Govt CIRCM | WR | NAWC : Patuxent River, MD | 2.847 | 0.980 | Dec 2014 | 2.198 | Oct 2015 | 1.001 | Dec 2016 | - | | 1.001 | 12.534 | 19.560 | - |
| Contractor Eng Supt CIRCM | C/CPFF | TBD : TBD | 0.000 | 0.595 | Mar 2015 | 2.007 | Oct 2015 | 2.500 | Dec 2016 | - | | 2.500 | 11.032 | 16.134 | 16.134 |
| Primary HDW DEV CIRCM | C/CPIF | TBD : TBD | 0.000 | 0.000 | | 5.389 | Dec 2015 | 15.280 | Dec 2016 | 37.990 | Dec 2016 | 53.270 | 278.202 | 336.861 | 336.861 |
| Sys Eng Govt CIRCM | WR | NRL : Washington DC | 0.000 | 1.239 | Dec 2014 | 2.296 | Oct 2015 | 1.300 | Dec 2016 | - | | 1.300 | 4.535 | 9.370 | - |
| Sys Eng Gov CIRCM | WR | NUWC : Jacksonville, FL | 0.000 | 0.313 | Dec 2015 | 0.273 | Oct 2015 | 0.299 | Dec 2016 | - | | 0.299 | 1.471 | 2.356 | - |
| Subtotal | | | 3.832 | 3.127 | | 12.163 | | 20.380 | | 37.990 | | 58.370 | 307.774 | 385.266 | - |

Remarks
FY 2017 overseas contingency operations funding is required for developmental activities in hardware and software to reduce the size, weight, and power required to achieve a missile warning detection system compatible with mission planning information that stores sensor data for post mission threat analysis.

| Support (\$ in Millions) | | | | FY 2015 | | FY 2016 | | FY 2017 Base | | FY 2017 OCO | | FY 2017 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 | | | |
| Integrated Logistics CIRCM I | WR | NAWC AD : Patuxent River, MD | 0.520 | 0.316 | Dec 2014 | 1.366 | Dec 2015 | 2.570 | Dec 2016 | - | | 2.570 | 4.184 | 8.956 | - |
| Integrated Logistics CIRCM II | C/CPFF | Wyle Labs : Huntsville, AL | 0.263 | 0.296 | Mar 2015 | 0.972 | Mar 2016 | 2.000 | Mar 2017 | - | | 2.000 | 6.470 | 10.001 | 10.001 |
| SW Dev CIRCM | WR | NAWCWD : Pt. Mugu, CA | 0.238 | 1.078 | Dec 2014 | 2.734 | Dec 2015 | 2.143 | Dec 2016 | - | | 2.143 | 5.366 | 11.559 | - |
| Subtotal | | | 1.021 | 1.690 | | 5.072 | | 6.713 | | - | | 6.713 | 16.020 | 30.516 | - |

Remarks
Software development increased to create modules that modify the JATAS EW bus interface, build a new RS-485 interface, support avionics bus monitoring of internal navigation system data, and drive the 6-wire ALE-47 discrete interface. Software, material, and electronic combat simulation and evaluation laboratory core funding required to meet DAIRCM test readiness review date.

UNCLASSIFIED

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|--|---|---|

| Test and Evaluation (\$ in Millions) | | | | FY 2015 | | FY 2016 | | FY 2017 Base | | FY 2017 OCO | | FY 2017 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 | | | |
| Eng & Eval CIRCM | C/CPFF | TBD : TBD | 0.316 | 0.000 | | 0.164 | Dec 2015 | 3.000 | Dec 2016 | - | | 3.000 | 6.286 | 9.766 | 9.766 |
| Eng & Eval Govt CIRCM | WR | NAWC : Patuxent River, MD | 0.864 | 0.085 | Dec 2014 | 0.692 | Jan 2016 | 1.678 | Jan 2017 | - | | 1.678 | 7.680 | 10.999 | - |
| Eng & Eval Govt CIRCM | WR | COTF : VA | 0.000 | 0.000 | | 0.100 | Dec 2015 | 0.455 | Jan 2017 | - | | 0.455 | 1.150 | 1.705 | - |
| Subtotal | | | 1.180 | 0.085 | | 0.956 | | 5.133 | | - | | 5.133 | 15.116 | 22.470 | - |

Remarks
Limited COTF support needed for FY16.

| Management Services (\$ in Millions) | | | | FY 2015 | | FY 2016 | | FY 2017 Base | | FY 2017 OCO | | FY 2017 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 | | | |
| Contractor Eng Supt CIRCM | C/CPFF | TBD : TBD | 0.558 | 0.353 | Mar 2015 | 0.103 | Mar 2016 | 0.194 | Mar 2017 | - | | 0.194 | 6.316 | 7.524 | 7.524 |
| Govt Eng Supt CIRCM | WR | NAWCWD : Point Mugu, CA | 0.243 | 0.000 | | 0.428 | Dec 2015 | 2.200 | Dec 2016 | - | | 2.200 | 9.610 | 12.481 | - |
| Travel CIRCM | WR | NAVAIR : Various | 0.090 | 0.200 | Dec 2014 | 0.200 | Dec 2015 | 0.200 | Dec 2016 | - | | 0.200 | 10.370 | 11.060 | - |
| Cost Analysis Supt CIRCM | WR | NAWCAD : Patuxent River, MD | 0.376 | 0.222 | Dec 2014 | 0.047 | Dec 2015 | 0.100 | Dec 2016 | - | | 0.100 | 10.010 | 10.755 | - |
| Subtotal | | | 1.267 | 0.775 | | 0.778 | | 2.694 | | - | | 2.694 | 36.306 | 41.820 | - |

| | Prior Years | FY 2015 | FY 2016 | FY 2017 Base | FY 2017 OCO | FY 2017 Total | Cost To Complete | Total Cost | Target Value of Contract | |
|----------------------------|-------------|---------|---------|--------------|-------------|---------------|------------------|------------|--------------------------|---|
| Project Cost Totals | | 7.300 | 5.677 | 18.969 | 34.920 | 37.990 | 72.910 | 375.216 | 480.072 | - |

Remarks

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|---|---|---|
| Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy | | Date: February 2016 |
| Appropriation/Budget Activity 1319 / 4 | R-1 Program Element (Number/Name) PE 0604272N / <i>Tact Air Dir Infrared CM (TADIRCM)</i> | Project (Number/Name) 3304 / <i>CIRCM</i> |

Schedule Details

| Events by Sub Project | Start | | End | |
|--|---------|------|---------|------|
| | Quarter | Year | Quarter | Year |
| <i>CIRCM</i> | | | | |
| Acquisition Milestones: Milestones: Milestone B (MS-B) | 4 | 2015 | 4 | 2015 |
| Acquisition Milestones: Milestones: Milestone C (MS-C) | 2 | 2018 | 2 | 2018 |
| Acquisition Milestones: Milestones: Common Infrared Countermeasures (CIRCM) Initial Operational Capability (IOC) | 4 | 2021 | 4 | 2021 |
| Acquisition Milestones: Milestones: Full Rate Production | 1 | 2020 | 1 | 2020 |
| Systems Development: Functional Configuration Audit (FCA) | 4 | 2017 | 4 | 2017 |
| Systems Development: Physical Configuration Audit (PCA) | 3 | 2019 | 3 | 2019 |
| Systems Development: Reviews: Integrated Baseline Review (IBR EMD) | 3 | 2016 | 3 | 2016 |
| Systems Development: Reviews: Critical Design Review (CDR) | 4 | 2016 | 4 | 2016 |
| Systems Development: Reviews: Production Readiness Review (PRR) | 1 | 2018 | 1 | 2018 |
| Test & Evaluation: Developmental Test & Evaluation - EMD (DT&E-EMD) | 3 | 2017 | 3 | 2019 |
| Test & Evaluation: Navy Test Readiness Review (TRR) | 3 | 2019 | 3 | 2019 |
| Test & Evaluation: Technical Evaluation: Integrated Operational Test & Evaluation (IOT&E) | 1 | 2020 | 4 | 2020 |
| Production Milestones: Contract Awards: Navy EMD Option Contract Award | 2 | 2016 | 2 | 2016 |
| Production Milestones: Contract Awards: Navy LRIP Option I | 2 | 2018 | 2 | 2018 |
| Production Milestones: Contract Awards: ARMY EMD Contract | 4 | 2015 | 4 | 2015 |
| Production Milestones: Contract Awards: Navy LRIP Option II | 2 | 2019 | 2 | 2019 |
| Production Milestones: Deliveries: EMD Test Article Deliveries | 3 | 2017 | 3 | 2017 |
| Production Milestones: Deliveries: Navy LRIP Units | 2 | 2019 | 2 | 2019 |