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| <b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2013 Air Force | <b>DATE:</b> February 2012 |
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| <b>APPROPRIATION/BUDGET ACTIVITY</b>                                                                                       |                |                |                         | <b>R-1 ITEM NOMENCLATURE</b>             |                          |                |                |                |                |                             |                   |
|----------------------------------------------------------------------------------------------------------------------------|----------------|----------------|-------------------------|------------------------------------------|--------------------------|----------------|----------------|----------------|----------------|-----------------------------|-------------------|
| 3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i><br>BA 5: <i>Development &amp; Demonstration (SDD)</i> |                |                |                         | PE 0604706F: <i>Life Support Systems</i> |                          |                |                |                |                |                             |                   |
| <b>COST (\$ in Millions)</b>                                                                                               | <b>FY 2011</b> | <b>FY 2012</b> | <b>FY 2013<br/>Base</b> | <b>FY 2013<br/>OCO</b>                   | <b>FY 2013<br/>Total</b> | <b>FY 2014</b> | <b>FY 2015</b> | <b>FY 2016</b> | <b>FY 2017</b> | <b>Cost To<br/>Complete</b> | <b>Total Cost</b> |
| Total Program Element                                                                                                      | 10.340         | 9.280          | 9.720                   | -                                        | 9.720                    | 10.087         | 8.450          | 8.726          | 9.520          | Continuing                  | Continuing        |
| 65412A: <i>Life Support Systems</i>                                                                                        | 10.340         | 9.280          | 9.720                   | -                                        | 9.720                    | 10.087         | 8.450          | 8.726          | 9.520          | Continuing                  | Continuing        |
| Quantity of RDT&E Articles                                                                                                 | 0              | 0              | 0                       | 0                                        | 0                        | 0              | 0              | 0              | 0              |                             |                   |

**Note**

In FY 2012, Project 65412A, Life Support Systems, the Modular Aircrew Common Helmet (MACH) program was terminated.  
 In FY 2013, Project 65412A, Life Support Systems, includes new starts for Cold Weather Aviation System (CWAS) and Integrated Aircrew Body Armor System programs.

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

This program element provides for recapitalization, continuing research and development, and integration of aircrew flight equipment/airmen combat effectiveness equipment and subsystems to satisfy operational command requirements for improved/enhanced airmen performance capabilities. Aircrew flight equipment/airmen combat effectiveness systems consist of human-centered programs that enable weapons systems to use more of their full mission envelopes, maximize combat capabilities, and protect airmen. This includes, but is not limited to, the following projects: directed energy protective equipment, flight helmets and visors, oxygen breathing equipment for aviators, radios and locator beacons to include support equipment, nuclear flash blindness protection, night vision devices, noise reduction devices, anti-g suits, flame resistant/retardant and blast protective gear, aircraft seating, impact protection, flotation devices, and personnel parachutes. Program management support includes tasks to assess deficiencies of currently fielded equipment, evaluate and demonstrate feasibility of new technologies, provide for the transition of new technologies to development programs/projects, conduct business case analyses, assess suitability of commercially available items, and support all current aircrew flight equipment/airmen combat effectiveness programs.

The Integrated Aircrew Ensemble (IAE) develops a readily-configurable integrated flight ensemble to improve safety, survival, and performance using modern materials, and addresses full spectrum of aircrew requirements for manned non-space aircraft and foster commonality across most aircraft platforms. IAE will replace the multiple layers of flight gear, to include the flight suit, g-suit, survival vest, and other equipment, used during flying operations. The system will increase acceleration protection, maximize performance and reduce thermal burden throughout full range of military operations. There are three proposed variants: ejection seat, rotary wing, and non-ejection seat aircraft.

This program is in Budget Activity 5, Engineering and Manufacturing Development (EMD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full-rate production.

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| Exhibit R-2, RDT&E Budget Item Justification: PB 2013 Air Force                                                                                                                                                                                                                                                                                                                                                                                                  |         |                                   |              | DATE: February 2012 |               |
| APPROPRIATION/BUDGET ACTIVITY                                                                                                                                                                                                                                                                                                                                                                                                                                    |         | R-1 ITEM NOMENCLATURE             |              |                     |               |
| 3600: Research, Development, Test & Evaluation, Air Force                                                                                                                                                                                                                                                                                                                                                                                                        |         | PE 0604706F: Life Support Systems |              |                     |               |
| BA 5: Development & Demonstration (SDD)                                                                                                                                                                                                                                                                                                                                                                                                                          |         |                                   |              |                     |               |
| B. Program Change Summary (\$ in Millions)                                                                                                                                                                                                                                                                                                                                                                                                                       | FY 2011 | FY 2012                           | FY 2013 Base | FY 2013 OCO         | FY 2013 Total |
| Previous President's Budget                                                                                                                                                                                                                                                                                                                                                                                                                                      | 10.650  | 11.280                            | 9.943        | -                   | 9.943         |
| Current President's Budget                                                                                                                                                                                                                                                                                                                                                                                                                                       | 10.340  | 9.280                             | 9.720        | -                   | 9.720         |
| Total Adjustments                                                                                                                                                                                                                                                                                                                                                                                                                                                | -0.310  | -2.000                            | -0.223       | -                   | -0.223        |
| • Congressional General Reductions                                                                                                                                                                                                                                                                                                                                                                                                                               | -       | -                                 |              |                     |               |
| • Congressional Directed Reductions                                                                                                                                                                                                                                                                                                                                                                                                                              | -       | -2.000                            |              |                     |               |
| • Congressional Rescissions                                                                                                                                                                                                                                                                                                                                                                                                                                      | -       | -                                 |              |                     |               |
| • Congressional Adds                                                                                                                                                                                                                                                                                                                                                                                                                                             | -       | -                                 |              |                     |               |
| • Congressional Directed Transfers                                                                                                                                                                                                                                                                                                                                                                                                                               | -       | -                                 |              |                     |               |
| • Reprogrammings                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -       | -                                 |              |                     |               |
| • SBIR/STTR Transfer                                                                                                                                                                                                                                                                                                                                                                                                                                             | -0.256  | -                                 |              |                     |               |
| • Other Adjustments                                                                                                                                                                                                                                                                                                                                                                                                                                              | -0.054  | -                                 | -0.223       | -                   | -0.223        |
| Change Summary Explanation                                                                                                                                                                                                                                                                                                                                                                                                                                       |         |                                   |              |                     |               |
| FY11 adjustments for Congressional General Reductions of -\$0.054M                                                                                                                                                                                                                                                                                                                                                                                               |         |                                   |              |                     |               |
| FY12 adjustments for Integrated Aircrew Ensemble (IAE) program received \$2.0M Congressional reduction due to contract award delay.                                                                                                                                                                                                                                                                                                                              |         |                                   |              |                     |               |
| C. Accomplishments/Planned Programs (\$ in Millions)                                                                                                                                                                                                                                                                                                                                                                                                             | FY 2011 | FY 2012                           | FY 2013 Base | FY 2013 OCO         | FY 2013 Total |
| Title: Aircrew Flight Equipment (AFE)                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.824   | 0.100                             | -            | -                   | -             |
| Description: AFE effort investigates the feasibility of using commercial-off-the-shelf/non-developmental item technology. Effort is centered around quick replacement of antiquated Vietnam-era flight equipment. Efforts include EMD tasks associated with equipment engineering, modification, integration, testing, and procurement of test articles. Major initiatives include Low Profile Parachute (LPP) and the Night Vision Goggle Head Harness (NVGHH). |         |                                   |              |                     |               |
| FY 2011 Accomplishments:<br>Began Engineering and Manufacturing Development of LPP.                                                                                                                                                                                                                                                                                                                                                                              |         |                                   |              |                     |               |
| FY 2012 Plans:<br>Continue Engineering and Manufacturing Development of LPP; conduct safe-to-fly certification of LPP.                                                                                                                                                                                                                                                                                                                                           |         |                                   |              |                     |               |
| FY 2013 Base Plans:<br>N/A                                                                                                                                                                                                                                                                                                                                                                                                                                       |         |                                   |              |                     |               |
| FY 2013 OCO Plans:                                                                                                                                                                                                                                                                                                                                                                                                                                               |         |                                   |              |                     |               |

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| Exhibit R-2, RDT&E Budget Item Justification: PB 2013 Air Force                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                                                            |         | DATE: February 2012 |             |               |
| APPROPRIATION/BUDGET ACTIVITY<br>3600: Research, Development, Test & Evaluation, Air Force<br>BA 5: Development & Demonstration (SDD)                                                                                                                                                                                                                                                                                                                                                                                                    |  | R-1 ITEM NOMENCLATURE<br>PE 0604706F: Life Support Systems |         |                     |             |               |
| C. Accomplishments/Planned Programs (\$ in Millions)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  | FY 2011                                                    | FY 2012 | FY 2013 Base        | FY 2013 OCO | FY 2013 Total |
| N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                                            |         |                     |             |               |
| <b>Title:</b> Cold Weather Aviation System (CWAS) - New Start<br><br><b>Description:</b> Multi-layered garment(s), boots and gloves to be utilized by aircrew members performing duties in arctic weather conditions reaching temperatures as low as -49 degrees Fahrenheit.<br><br><b>FY 2011 Accomplishments:</b><br>N/A<br><br><b>FY 2012 Plans:</b><br>N/A<br><br><b>FY 2013 Base Plans:</b><br>Initiate Requests for Information and undergo market research to set groundwork for program.<br><br><b>FY 2013 OCO Plans:</b><br>N/A |  | -                                                          | -       | 0.050               | -           | 0.050         |
| <b>Title:</b> Flash Blindness Goggles<br><br><b>Description:</b> Flash Blindness Goggles effort is for development of eye protection against high intensity, rapid onset flashes encountered during nuclear blast.<br><br><b>FY 2011 Accomplishments:</b><br>N/A<br><br><b>FY 2012 Plans:</b><br>Initiate Requests for Information and undergo market research to set groundwork for program.<br><br><b>FY 2013 Base Plans:</b><br>Continue execution of program.<br><br><b>FY 2013 OCO Plans:</b><br>N/A                                |  | -                                                          | 0.075   | 0.100               | -           | 0.100         |
| <b>Title:</b> Integrated Aircrew Body Armor System - New Start<br><br><b>Description:</b> A single system with the combined capabilities of the survival component carrier; the fixed-wing PCU-17/P harness and HBU-6/P safety strap, rotary-wing gunners belt restraint device; the life preserver                                                                                                                                                                                                                                      |  | -                                                          | -       | 0.050               | -           | 0.050         |

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| Exhibit R-2, RDT&E Budget Item Justification: PB 2013 Air Force                                                                                                                                                      |  |                                                            |         | DATE: February 2012 |             |               |
| APPROPRIATION/BUDGET ACTIVITY<br>3600: Research, Development, Test & Evaluation, Air Force<br>BA 5: Development & Demonstration (SDD)                                                                                |  | R-1 ITEM NOMENCLATURE<br>PE 0604706F: Life Support Systems |         |                     |             |               |
| C. Accomplishments/Planned Programs (\$ in Millions)                                                                                                                                                                 |  | FY 2011                                                    | FY 2012 | FY 2013 Base        | FY 2013 OCO | FY 2013 Total |
| unit (legacy LPU-10/P underarm with low profile horse collar); and Body armor (capable of NIJ level III or mil-std-3027 rating of 4321 type C protection with option for hard strike plates).                        |  |                                                            |         |                     |             |               |
| FY 2011 Accomplishments:<br>N/A                                                                                                                                                                                      |  |                                                            |         |                     |             |               |
| FY 2012 Plans:<br>N/A                                                                                                                                                                                                |  |                                                            |         |                     |             |               |
| FY 2013 Base Plans:<br>Initiate Requests for Information and undergo market research to set groundwork for program.                                                                                                  |  |                                                            |         |                     |             |               |
| FY 2013 OCO Plans:<br>N/A                                                                                                                                                                                            |  |                                                            |         |                     |             |               |
| Title: Integrated Aircrew Ensemble (IAE)                                                                                                                                                                             |  | 6.514                                                      | 5.918   | 7.956               | -           | 7.956         |
| Description: IAE effort is for development of an improved aircrew flight ensemble to replace the existing aircrew flight ensemble.                                                                                   |  |                                                            |         |                     |             |               |
| FY 2011 Accomplishments:<br>Began Engineering and Manufacturing Development contract. Major program events for FY11 were Preliminary Design Review and component level testing.                                      |  |                                                            |         |                     |             |               |
| FY 2012 Plans:<br>Continue Engineering and Manufacturing Development. Major program events for FY12 are Critical Design Review, Developmental Test & Evaluation, Test Readiness Review and Design Verification Test. |  |                                                            |         |                     |             |               |
| FY 2013 Base Plans:<br>Continue Engineering and Manufacturing Development. Major program events for FY13 are Developmental Test & Evaluation, Test Readiness Review and Design Verification Test.                    |  |                                                            |         |                     |             |               |
| FY 2013 OCO Plans:<br>N/A                                                                                                                                                                                            |  |                                                            |         |                     |             |               |
| Title: Modular Aircrew Common Helmet (MACH)                                                                                                                                                                          |  | 1.840                                                      | 0.050   | -                   | -           | -             |
| Description: MACH effort is to develop a common helmet to reduce helmet variants and parts, and increase capability.                                                                                                 |  |                                                            |         |                     |             |               |

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| Exhibit R-2, RDT&E Budget Item Justification: PB 2013 Air Force                                                                                                                                                                                                                                             |  |                                                            |         | DATE: February 2012 |             |               |
| APPROPRIATION/BUDGET ACTIVITY<br>3600: Research, Development, Test & Evaluation, Air Force<br>BA 5: Development & Demonstration (SDD)                                                                                                                                                                       |  | R-1 ITEM NOMENCLATURE<br>PE 0604706F: Life Support Systems |         |                     |             |               |
| C. Accomplishments/Planned Programs (\$ in Millions)                                                                                                                                                                                                                                                        |  | FY 2011                                                    | FY 2012 | FY 2013 Base        | FY 2013 OCO | FY 2013 Total |
| <b>FY 2011 Accomplishments:</b><br>Continued Developmental Test & Evaluation and accomplished Operational Assessment.                                                                                                                                                                                       |  |                                                            |         |                     |             |               |
| <b>FY 2012 Plans:</b><br>MACH program cancelled. Remaining funding used for Program Management Administration costs associated with contract closeout.                                                                                                                                                      |  |                                                            |         |                     |             |               |
| <b>FY 2013 Base Plans:</b><br>N/A                                                                                                                                                                                                                                                                           |  |                                                            |         |                     |             |               |
| <b>FY 2013 OCO Plans:</b><br>N/A                                                                                                                                                                                                                                                                            |  |                                                            |         |                     |             |               |
| <b>Title:</b> Voice in Beacon (ViB)<br><br><b>Description:</b> Voice in Beacon (ViB) will provide two-way, line of sight amplitude modulation voice and personnel locator beacon capability for peacetime operations to allow downed aircrew to communicate with civil and combat search and rescue assets. |  | -                                                          | 0.050   | 0.100               | -           | 0.100         |
| <b>FY 2011 Accomplishments:</b><br>N/A                                                                                                                                                                                                                                                                      |  |                                                            |         |                     |             |               |
| <b>FY 2012 Plans:</b><br>Initiate requests for information and undergo market research to set groundwork for program.                                                                                                                                                                                       |  |                                                            |         |                     |             |               |
| <b>FY 2013 Base Plans:</b><br>Continue execution of program                                                                                                                                                                                                                                                 |  |                                                            |         |                     |             |               |
| <b>FY 2013 OCO Plans:</b><br>N/A                                                                                                                                                                                                                                                                            |  |                                                            |         |                     |             |               |
| <b>Title:</b> Management Services<br><br><b>Description:</b> Program Management Support, Travel, and Test & Evaluation.                                                                                                                                                                                     |  | 1.162                                                      | 3.087   | 1.464               | -           | 1.464         |
| <b>FY 2011 Accomplishments:</b><br>Continuation of listed activities.                                                                                                                                                                                                                                       |  |                                                            |         |                     |             |               |
| <b>FY 2012 Plans:</b>                                                                                                                                                                                                                                                                                       |  |                                                            |         |                     |             |               |

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| <b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2013 Air Force | <b>DATE:</b> February 2012 |
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| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i><br>BA 5: <i>Development &amp; Demonstration (SDD)</i> | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0604706F: <i>Life Support Systems</i> |
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| <b>C. Accomplishments/Planned Programs (\$ in Millions)</b>             | <b>FY 2011</b> | <b>FY 2012</b> | <b>FY 2013<br/>Base</b> | <b>FY 2013<br/>OCO</b> | <b>FY 2013<br/>Total</b> |
|-------------------------------------------------------------------------|----------------|----------------|-------------------------|------------------------|--------------------------|
| Continuation of listed activities.                                      |                |                |                         |                        |                          |
| <b><i>FY 2013 Base Plans:</i></b><br>Continuation of listed activities. |                |                |                         |                        |                          |
| <b><i>FY 2013 OCO Plans:</i></b><br>N/A                                 |                |                |                         |                        |                          |
| <b>Accomplishments/Planned Programs Subtotals</b>                       | 10.340         | 9.280          | 9.720                   | -                      | 9.720                    |

| <b>D. Other Program Funding Summary (\$ in Millions)</b>                                                                                     |                |                |                         |                        |                          |                |                |                |                |                             |                   |
|----------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|-------------------------|------------------------|--------------------------|----------------|----------------|----------------|----------------|-----------------------------|-------------------|
| <u>Line Item</u>                                                                                                                             | <u>FY 2011</u> | <u>FY 2012</u> | <u>FY 2013<br/>Base</u> | <u>FY 2013<br/>OCO</u> | <u>FY 2013<br/>Total</u> | <u>FY 2014</u> | <u>FY 2015</u> | <u>FY 2016</u> | <u>FY 2017</u> | <u>Cost To<br/>Complete</u> | <u>Total Cost</u> |
| • 56: <i>Other Procurement, Air Force, PE 0702833F, Items Less Than \$5M (Safety/Rescue Equipment), Life Support Procurement, WSC 842990</i> | 4.004          | 0.000          | 7.452                   | 0.000                  | 7.452                    | 8.801          | 8.098          | 8.161          | 8.271          | Continuing                  | Continuing        |

**E. Acquisition Strategy**

Acquisition Strategy is carried out at the project level.

**F. Performance Metrics**

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

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| Exhibit R-4, RDT&E Schedule Profile: PB 2013 Air Force                                                                                                      |                                                                   | DATE: February 2012                            |
| APPROPRIATION/BUDGET ACTIVITY<br>3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i><br>BA 5: <i>Development &amp; Demonstration (SDD)</i> | R-1 ITEM NOMENCLATURE<br>PE 0604706F: <i>Life Support Systems</i> | PROJECT<br>65412A: <i>Life Support Systems</i> |
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| <b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2013 Air Force                                                                                                 |                                                                          |                                                       | <b>DATE:</b> February 2012 |
| <b>APPROPRIATION/BUDGET ACTIVITY</b><br>3600: <i>Research, Development, Test &amp; Evaluation, Air Force</i><br>BA 5: <i>Development &amp; Demonstration (SDD)</i> | <b>R-1 ITEM NOMENCLATURE</b><br>PE 0604706F: <i>Life Support Systems</i> | <b>PROJECT</b><br>65412A: <i>Life Support Systems</i> |                            |

Schedule Details

| Events                                                                           | Start   |      | End     |      |
|----------------------------------------------------------------------------------|---------|------|---------|------|
|                                                                                  | Quarter | Year | Quarter | Year |
| Aircrew Flight Equipment - LPP [Engineering and Manufacturing Development]       | 3       | 2011 | 4       | 2012 |
| CWAS [Engineering and Manufacturing Development]                                 | 1       | 2013 | 2       | 2015 |
| Flash Blindness Goggles [Engineering and Manufacturing Development]              | 1       | 2012 | 2       | 2017 |
| Integrated Aircrew Body Armor System [Engineering and Manufacturing Development] | 1       | 2013 | 3       | 2014 |
| IAE [Engineering and Manufacturing Development]                                  | 2       | 2011 | 3       | 2013 |
| IAE [Preliminary Design Review]                                                  | 4       | 2011 | 4       | 2011 |
| IAE [Developmental Test & Evaluation]                                            | 4       | 2012 | 4       | 2012 |
| IAE [Milestone C]                                                                | 4       | 2013 | 4       | 2013 |
| IAE [Low Rate Initial Production]                                                | 4       | 2013 | 2       | 2015 |
| IAE [Initial Operational Test & Evaluation]                                      | 3       | 2014 | 3       | 2014 |
| IAE [Full Rate Production Decision Review]                                       | 2       | 2015 | 2       | 2015 |
| MACH [Developmental Test & Evaluation]                                           | 2       | 2011 | 4       | 2011 |
| MACH [Operational Assessment]                                                    | 4       | 2011 | 4       | 2011 |
| ViB [Engineering and Manufacturing Development]                                  | 1       | 2012 | 4       | 2015 |