Developed By:
The Naval Research Laboratory’s
Military Support Division (Code 1400) &
FLTSCIDEVRON One (VXS-1)
March 2005

This document will be reviewed annually at the NRL FSD Scheduling Conference; changes, deletions and/or additional inputs can be submitted for review.
NRL Project Support Manual

The Naval Research Laboratory (NRL) Military Support Division (MSD) Code 1400, and Scientific Development Squadron One (VXS-1), has developed the “Project Support Manual” for present and potential users of NRL NP-3D aircraft. The Project Support Manual will provide information that will assist past and potential users in utilizing NRL airborne research platforms in pursuit of scientific goals. This manual will also include a portion dedicated to general information for the Project Lead and/or Lead Scientist and appendices on detailed aircraft descriptions by BUNO # as well as a Project Planning Guide. These appendices will describe the responsibilities of the Project Personnel, the Navy, and areas needed to be addressed by the Project Manager to ensure a successful project. The references listed in this manual address the Navy authorized and unauthorized materials, construction methods, and procedures. It also covers the approved hardware and cable installation methods. Lastly, these appendices will provide detailed layout drawings and schematics of each aircraft that will address power availability and locations for the hookups.

In the development of this manual, Code 1400 has consulted with the Commanding Officer, Maintenance Officer, the Special Projects Division, and past and present users to collect and assemble all pertinent information. While this manual is not all inclusive of every detail associated with flying projects on NRL aircraft, it outlines the general procedures required to get a project off the ground and also provides direction for the Project Lead to reference Navy specifications that shall be adhered to. This manual also provides proper direction for the Project Team during assembly times that will ensure every project is a success.

This Project Support Manual should be considered a “Living Document” and when changes are required, users should contact the NRL MSD to submit changes. Additionally, this manual will be reviewed at the annual scheduling conferences for updates and changes.

This manual is presented as a basic guide to users and, when utilized in conjunction with VXS-1 INST 13100.1, will provide every project an in-depth discussion as to the planning, installation, flying, and de-installation of a project on an NRL aircraft. As each project flown on an NRL aircraft has its specific requirements, this manual is to be utilized as a basic guideline that can be referenced in order to address the specific requirements of their individual projects. If there are ever any doubts as to certain specifications, procedures, or capabilities of the aircraft contact the appropriate people at VXS-1 or the NRL MSD.
# Table of Contents

1.0 Scope  

2.0 General Information  
   2.1 Aircraft  
   2.2 Scheduling and Use  
      2.2.1 Military Support Division (MSD)  
      2.2.2 VXS-1  
   2.3 Working Hours  
   2.4 Aircraft Services  
      2.4.1 Requesting Services  
      2.4.2 VXS-1 Special Projects Division  
      2.4.3 Project Planning  
      2.4.4 Project/User Responsibilities  
      2.4.5 Military Responsibilities  
      2.4.6 Scheduling Conferences  
      2.4.7 Aircraft Access  
         2.4.7.1 Aircraft Access  
         2.4.7.2 Gaining A/C access  
         2.4.7.3 VXS-1 Telephone Numbers  
         2.4.7.4 VXS-1 Key Personnel  
      2.4.8 Access to NAS Patuxent River  
         2.4.8.1 Base access  
         2.4.8.2 Visit Requests/Security Clearances  

3.0 Project Equipment/Material Requirements  

4.0 Electromagnetic Environmental Effects (E³)  

5.0 Work Requirements  
   5.1 Referenced Documents  

6.0 Exemptions  

7.0 Summary  

APPENDIX A PROJECT PLANNING GUIDE  

APPENDIX B VXS-1 AIRCRAFT CAPABILITIES
1.0 **SCOPE** - This document will describe the capabilities of the NP-3D Airborne Research Platforms and will explain the procedures required for scheduling, installing, flying, and de-installing projects. The procedures outlined in this manual, and provided in Appendices A and B, address standard Naval Safety Requirements and are the minimum requirements for all aircraft interaction. These procedures will help ensure the workmanship is in accordance with established NAVAIR Safety-of-Flight Standards and keeping with current flight-line safety guidelines. These guidelines are provided in paragraph 5.0 and are maintained at the VXS-1 Special Projects Office.

2.0 **GENERAL** - This section will provide an overview of the aircraft and introduction and location of NRL services. It also provides working hours, an aircraft guide, and access guidelines for entering Naval Air Station (NAS) Patuxent River, MD. Another area covered, is an in-depth description of services that are provided by the NRL MSD and VXS-1. Lastly, it will provide specific project personnel and military responsibilities to assist prospective customers in obtaining flight services.

2.1 Aircraft - NRL owns and operates four research configured NP-3D aircraft that include three heavy weight P3-B’s and one P-3A. These aircraft are assigned to VXS-1, which is located at NAS Patuxent River, MD. All four aircraft are dedicated to supporting airborne science and technology projects. Each aircraft is a uniquely configured research test platform. Differences between the aircraft can be obtained from the VXS-1 Special Projects Office. Detailed descriptions of each aircraft are provided in Appendix B.

2.2 Scheduling and Use - To utilize an NRL Airborne Research Platform, the Project Lead must continually interface with the MSD and VXS-1. The MSD is responsible for scheduling, administration, and billing of the project while VXS-1 is responsible for ensuring the project meets the NAVAIR Safety-of-Flight Requirements, the proper installation procedures, all flight clearances for installed equipment, and the de-installation procedures.

2.2.1 The MSD is located in Bldg 43 at NRL in Washington D.C. and is responsible for scheduling all projects on the VXS-1 research aircraft as per VXS-1 INST 13100.1. The phone number is AUTOVON 297-7511/7512 or commercial 202-767-7511/7512.

2.2.2 VXS-1 Maintenance Control is located at NAS Patuxent River, MD in Hanger 305. The maintenance and hanger spaces are located on the taxiway side of the hanger. The VXS-1 Commanding Officer (C.O.) and Admin. Offices (Bldg. 1581) are located directly across the street from the VXS-1 aircraft hanger. The Special Projects Office (Bldg.2022) is located behind the C.O. and Admin. Office. Vehicle parking is available in the general parking lot across the street from the
hanger. Private vehicles are not authorized on the aircraft line at any time without permission from the VXS-1 Maintenance Officer or VXS-1 Duty Officer.

2.3 Working Hours - Normal working hours for the NRL MSD are Monday through Friday from 0800 – 1600. VXS-1’s normal working hours are Monday through Friday from 0730 – 2100. A security watch is on duty in the VXS-1 Maintenance Control office after normal working hours and on weekends and is located in hanger 305. The security watch may be contacted at AUTOVON 342-3744 or commercially at 301-342-3744. With advanced notice and reasonable justification, working hours may be altered to meet unusual project requirements. This requires advanced approval from the VXS-1 Special Project Liaison Officer (PLO) and the Commanding Officer and will be addressed on a case-by-case basis.

2.4 Aircraft Services - Use of the VXS-1 aircraft is a two-fold process: The first step is obtaining a place on the schedule and the second step is the installation of equipment on the aircraft.

2.4.1 To request a time on the aircraft schedule, the Project Lead must submit a “Flight Services Request” (FSR) to the NRL FSD, which can be requested from Code 1400 or found online at [http://planes www.nrl.navy.mil](http://planes www.nrl.navy.mil) under the field sites FSD tab. Once scheduled, a Naval Projects Officer (PO) from NRL’s MSD or VXS-1 will be assigned to the project. The PO will generate a “RED SHEET” (NDW-NRL 4790/1273) that will be sent to the VXS-1 Special Projects Liaison Officer. The PO will contact the designated Project Lead and review the project details which will then allow the PO to start coordinating the following: Reservation of airspace, country clearances (as required), flight planning, airfield logistical support, lodging and transportation, and any other operational support that may be required. Appendix A provides detailed information for the Project Lead on MSD’s requirements that are required for this scheduling process.

2.4.2 VXS-1 Special Projects Division - The VXS-1 Special Projects Division reports to the Commanding Officer of VXS-1 and is responsible for ensuring that all projects flown on NRL aircraft meet Naval Safety-of-Flight requirements. Their responsibilities also include interfacing with the Project Technical Teams and making sure all installed materials meet NAVAIR requirements. The key to a successful project is early and continued interface between the project personnel and the Special Projects Division. Early contact will not only help ease the installation procedure at VXS-1, but will help ensure all Navy certification requirements are known prior to the installation. It will also help address the sometimes-
complex Electromagnetic Environmental Effects (E)³ problem and ensure the proper analysis/testing has been arranged and completed. The Project Personnel and VXS-1 Special Projects Division responsibilities are detailed in Appendix A.

2.4.3 Project Planning - The Project Planning Guide in Appendix A is used to aid the Project Team in preparing to utilize a VXS-1 aircraft. It will provide basic information and guidance associated with projects flown on VXS-1 aircraft, and it will also include project and Navy responsibilities. Appendix A’s areas of interest include the FSR form, Project Specialist certification guidelines, and other important tips.

2.4.4 Project/Users Responsibilities - Project personnel that are utilizing a VXS-1 aircraft are responsible for all materials and costs associated with installing equipment, flying on the aircraft, and de-installing equipment. VXS-1 will assist the Project Lead in obtaining materials and hardware to ensure the project meets all Naval Safety-of-Flight Requirements. The VXS-1 Special PLO is the sole interface with NAVAIR during the process of obtaining all required Naval Flight Clearances.

2.4.5 Military Responsibilities - The Military PO’s are assigned to the NRL MSD in Washington DC and VXS-1 at NAS Patuxent River, MD. They are responsible for planning, flying, and ensuring that all airborne research projects are safe and in accordance with the standards set by NAVAIR and the Federal Aviation Administration. They will assist each Project Lead in obtaining certification procedures, including Project Specialist training, and all other requirements set forth in Appendix A. The military PO’s are the main point of contact that work with each and every Project Lead to ensure project success.

2.4.6 Annual and Quarterly Planning Conferences - These planning conferences provide a quorum for all prospective and past customers and are held at the NRL Washington D.C. facility. During these conferences, we look at aircraft openings for the upcoming years and resolve any scheduling conflicts that may exist. These conferences are also used to pass new project-related information to all that attend.

2.4.7 Aircraft Access

2.4.7.1 Aircraft access is scheduled through the VXS-1 Special Project Office.
2.4.7.2 In order to gain access to the aircraft for project installation, testing, and removal, a VXS-1 Special Project Coordinator or PLO must be present. This requires advanced coordination and notification with the VXS-1 Special Projects Office and VXS-1 maintenance control.

2.4.7.3 Telephone numbers for VXS-1 and the Special Project Office:

<table>
<thead>
<tr>
<th>Service</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commanding Officer/ Administration</td>
<td>Comm. – 301-342-3751 AUTOVON - 342-3751</td>
</tr>
<tr>
<td>VXS-1 Duty Office</td>
<td>Comm. – 301-342-3744 AUTOVON - 342-3744</td>
</tr>
<tr>
<td>Special Projects Office</td>
<td>Comm. – 301-342-3256 AUTOVON - 342-3256</td>
</tr>
<tr>
<td>FAX</td>
<td>Comm. – 301-342-3959 AUTOVON - 342-3959</td>
</tr>
</tbody>
</table>

2.4.7.4 VXS-1 Special Projects key personnel:

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head, Special Projects/ Project Liaison Officer</td>
<td>Mr. Sam Kogel</td>
</tr>
</tbody>
</table>
| Project Liaison Officers        | Mr. J.T. Daniels  
|                                 | Mr. Joe Henry  |

2.4.8 Access to NAS Patuxent River, Maryland.

2.4.8.1 Access to VXS-1 requires access to NAS Patuxent River MD. Admission to the base requires a formal written visit request and/or security clearances as applicable. These requests must be submitted to the VXS-1 Special Projects Office at least 10 working days in advance for U.S. Citizens. Foreign Nationals need to have their U.S. employer send a visit request to Ms. Audrey Smith at NAS Patuxent River Security. The company’s visit request needs to be on letterhead and addressed to Ms. Smith. She can be reached at (301) 757-2957 for details on the necessary information to be included in the letter. Once the request is approved, the foreign personnel will be required to answer a questionnaire about the visit. The visitors will normally require 100% escort while on base. The VXS-1 Special PLO will be
the primary POC for any questions or problems. Foreign personnel require greater lead time than the 10 days and should be coordinated well in advance to preclude problems with base access.

2.4.8.2 Visit requests and/or security clearances will include names, social security numbers, security clearance level (if applicable), dates of visits, and name of project. These requests and/or security clearances can be faxed to the number listed above or mailed to:

Commanding Officer
Scientific Development Squadron One
NAWC/AD Patuxent River, MD 20670-5409

Attn: Special Projects Division
Bldg 2022

3.0 PROJECT EQUIPMENT/MATERIAL REQUIREMENTS - All projects installed on VXS-1 aircraft are subject to standards and certification requirements set forth by NAVAIR and promulgated in the VXS-1 INST 13100.1. The VXS-1 Special PLO will be responsible for overseeing that flight clearances and NAVAIR certification requirements are met. Together, the Project Lead and PLO are responsible for ensuring all installed equipment and hardware meet NAVAIR specifications. The Project Lead is also responsible for providing required documentation, drawings, wiring diagrams, stress analysis, etc. to the VXS-1 Special Projects Office in order to obtain flight certification and safety clearances. The Project Lead and his/her personnel shall also adhere to the installation and removal standards set forth by NAVAIR. To ensure the Project Lead has a better understanding of the requirements set forth by NAVAIR, he/she should reference Appendix A. This appendix addresses the following areas: Materials, operator/equipment racks, external stores, wiring and cabling, and miscellaneous hardware that relate to installation procedures onboard VXS-1 aircraft.

4.0 ELECTROMAGNETIC ENVIRONMENTAL EFFECTS (E³) - It is required that all projects installed have suitable isolation to prevent aircraft system degradation. This requirement will make sure that there is no interference between the project systems and the aircraft systems. Electronic isolation is defined as Electromagnetic Compatibility Safety-of-Flight (EMC SOFT) and Electromagnetic Vulnerability Safety-of-Flight (EMV SOFT), TEMPEST, and Hazards of Electromagnetic Radiation to Ordnance (HERO). More specific definitions and examples of these environmental effects are provided in Appendix A. The Project Lead is responsible for the E³ analysis/testing and must provide sufficient documentation to the Special Projects Office on this issue.
5.0 **WORK REQUIREMENTS** - When working around aircraft, and/or the flight line, there are specific work requirements that have to be met to ensure a smooth and safe project. These work requirements are not only to protect the people doing the work, but also to provide a safe aircraft environment once the work is done and the mission is flying. To meet these requirements, the Navy and VXS-1 have strict controls in place covering installation, pre-mission, flying, post-mission, and de-installation. These requirements cover tool control and ground safety on the flight line and around the aircraft. Appendix A covers these requirements in more detail.

**Referenced Documents** - The following documents include the NAVAIR standards for project installation and de-installation on VXS-1 aircraft. These documents will help project personnel with their equipment racks and other experimental equipment that will be put on VXS-1 aircraft. The following list of documents can be referenced in the VXS-1 Project Support Office.

### SPECIFICATIONS AND STANDARDS

#### COMMERCIAL

<table>
<thead>
<tr>
<th>Document</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAE-AS-50881</td>
<td>Wiring, Aerospace Vehicle</td>
</tr>
<tr>
<td>ANSI J-STD-001A</td>
<td>Requirements for Soldered Electrical and Electronic Assemblies</td>
</tr>
</tbody>
</table>

#### MILITARY

<table>
<thead>
<tr>
<th>Document</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIL-S-22473</td>
<td>Sealing, Locking and retaining compounds: Single Components</td>
</tr>
<tr>
<td>MIL-HDBK-454</td>
<td>Standard General Requirements for Electrical Equipment</td>
</tr>
<tr>
<td>MIL-T-43435</td>
<td>Tape, Impregnated, Lacing and Tying</td>
</tr>
<tr>
<td>MIL-P-26292</td>
<td>USAF Pitot/Static Pressure Systems Installation and Inspection</td>
</tr>
<tr>
<td>MIL-N-25027</td>
<td>Nut, Self Locking</td>
</tr>
<tr>
<td>MIL-S-23190</td>
<td>Straps, Clamps, Mounting Hardware</td>
</tr>
<tr>
<td>MIL-A-8865</td>
<td>Airplane Strength and Rigidity Miscellaneous Loads</td>
</tr>
<tr>
<td>MIL-A-8591</td>
<td>Airborne Stores, Suspension Equipment and Aircraft-Store Interface (Carriage Phase): General Design for</td>
</tr>
</tbody>
</table>
MIL-STD-27733  Modification and Marking Requirements for Test Equipment In Aerospace Vehicles and Related Support Equipment

TECHINAL MANUALS

NA-01-1A-8  Structural Hardware
NA-01-1A-20  Aviation Hose and Tubing Manual
NA-01-1A-505  Installation Practices, Aircraft Electrical and Electronic Wiring
NA-01-1A-507  General Use of Cements, Sealant and Coatings
NA-00-80T-117  Electromagnetic Compatibility Theory and Practice Manual

INSTRUCTIONS

TAPDSOP 4790.1  Tool Control Program
TAPDSOP 13720  Foreign Object Damage Control Program
NAWCAD  NAWCAD Flight Clearance Policies, Procedures and Responsibilities
INST 13034.1
INST 13100.1  Aircraft Modification/Configuration Control (Pink Sheet) Procedures

6.0  EXEMPTIONS - If any aspect of the project deviates from this manual a waiver must be requested and obtained. Waivers may be requested from the VXS-1 Special PLO. Waiver requests can be appealed and will be referred to the VXS-1 Commanding Officer for a final decision.

7.0  SUMMARY - It is NRL’s goal to provide a safe and reliable airborne research platform to the scientific community to fully support their research goals at the most economical price. The VXS-1 Project Support Division’s goal is to ensure a safe and smooth installation and de-installation of project equipment onboard the VSX-1 aircraft within the requirements set forth by NAVAIR. All VXS-1 project personnel are available to answer any questions referring to the safety of personnel, equipment, and procedures while installing and de-installing projects. The Special Projects Division has all the NAVAIR references listed in paragraph 5.0, and will provide any assistance to project personnel when their project is on the a VXS-1 aircraft.