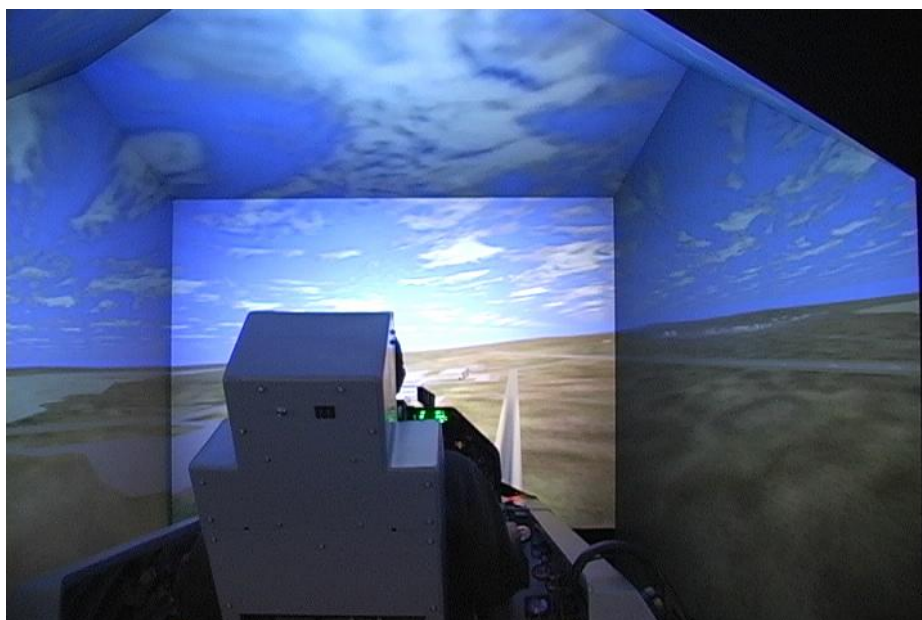




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AIR FORCE FLIGHT TEST CENTER ENGINEERING LOGISTICS PLAN PREPARATION GUIDE



May 2009

TECHNICAL INFORMATION HANDBOOK

Approved for public release; distribution unlimited.
AFFTC-PA-09157

**AIR FORCE FLIGHT TEST CENTER
EDWARDS AIR FORCE BASE, CALIFORNIA
AIR FORCE MATERIEL COMMAND
UNITED STATES AIR FORCE**

This technical information handbook (AFFTC-TIH-08-01, *The Guide to Writing Air Force Flight Test Center Engineering Logistics Plans*) was submitted by the 412th Test Management Group, 412th Test Wing, Edwards AFB, California 93524-6803.

Prepared by:

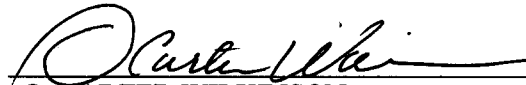


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REPORT DOCUMENTATION PAGE				Form Approved OMB No. 0704-0188	
The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to the Department of Defense, Executive Service Directorate (0704-0188). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
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1. REPORT DATE (DD-MM-YYYY) 20 May 09		2. REPORT TYPE Technical Information Handbook		3. DATES COVERED (From - To) N/A	
4. TITLE AND SUBTITLE Air Force Flight Test Center Engineering Logistics Plan Preparation Guide AFFTC-TIH-08-01				5a. CONTRACT NUMBER N/A	
				5b. GRANT NUMBER N/A	
				5c. PROGRAM ELEMENT NUMBER N/A	
6. AUTHOR(S) Packer, Mark T., Logistics Manager				5d. PROJECT NUMBER N/A	
				5e. TASK NUMBER N/A	
				5f. WORK UNIT NUMBER N/A	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Air Force Flight Test Center, 412th Test Wing, 412th Test Management Group 712 TSS/DRT 195 E. Popson Ave. Edwards AFB, CA 93524-6803				8. PERFORMING ORGANIZATION REPORT NUMBER AFFTC-TIH-08-01	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S) N/A	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.					
13. SUPPLEMENTARY NOTES CA: Air Force Flight Test Center Edwards AFB CC: 012100					
14. ABSTRACT This handbook provides the established guidelines to assist engineering logistics plan authors in writing accurate, precise, and clearly written plans.					
15. SUBJECT TERMS handbooks writing instruction manuals transition turnover technical writing logistics plans plans transition and turnover					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT None	18. NUMBER OF PAGES 97	19a. NAME OF RESPONSIBLE PERSON 412 TENG/EN (Tech Pubs)
a. REPORT UNCLASS	b. ABSTRACT UNCLASS	c. THIS PAGE UNCLASS			19b. TELEPHONE NUMBER (Include area code) 661-277-8615

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PREFACE

This handbook provides the established guidelines to assist engineering logistics plan (ELP) authors in writing accurate, precise, and clearly written documents.

The author would like to thank all of the personnel in the 712 TSS/DRT, Project Support Division, for their input, suggestions, and reviews of this document. It was truly a team effort. We would also like to thank Tom Laquidara and Gay Bessette for their guidance and help.

For illustrative purposes, examples from actual ELPs, illustrations, and tables have been modified from their original form.

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EXECUTIVE SUMMARY

The Air Force Flight Test Center Engineering Logistics Plan Preparation Guide provides established guidelines to assist authors in preparing technically accurate and clearly written transition and turnover documents for acquisition projects. The guide format allows the plan author the flexibility to tailor the engineering logistics plan for various reasons, such as project size and type of system under development.

The goal is to turn over a fully functional and documented system that meets all documented customer requirements. It is imperative that all acquisition and development projects be accurately documented from the time the idea is conceived and requirements established through the turnover of the item to the final owner/customer.

The objective of this handbook is to standardize the required elements and procedures for the preparation of an engineering logistics plan.

The Engineering Logistics Plan Preparation Guide is organized into three sections: Introduction, Sections of an Engineering Logistics Plan, and References. There are nine appendices that include templates, sample documents, and a master list of abbreviations, acronyms, and symbols. A sample engineering logistics plan is provided so the reader can see how all the elements fit together.

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1.0 INTRODUCTION

The Engineering Logistics Plan (ELP) is used by the Air Force Flight Test Center (AFFTC) as a tool for various acquisition and development projects to document the transition and turnover of a system from development status to operational status. The goal is to turn over a fully functional and documented system that meets all documented customer requirements. It is imperative that all acquisition and development projects be accurately documented from the time the idea is conceived and requirements established through the turnover of the item to the final owner/customer. It is also imperative that an ELP be written clearly, accurately, and precisely, and that it adheres to established guidelines to support the transition and turnover process. For any acquisition project for which an ELP has been written, as personnel leave and corporate memory is lost, the ELP can be revisited to determine the original project baseline and referenced documentation.

The ELP should be initiated early in the requirements gathering phase of the project. Although the ELP cannot be finished until the project is complete and ready for turnover, it helps ensure that development is performed in a logical and orderly manner. It will also ensure that no steps are missed in the development process. An ELP is normally closed at the time of turnover and reopened to allow for updates to any follow-on build completion, software update release, or configuration change which reengages the developer.

The primary purpose of this handbook is to standardize the required elements and procedures for the preparation of an ELP. It should be kept in mind that not all acquisition projects are the same; therefore no two ELPs will necessarily be identical. An ELP should be tailored to each project; however, quality should not be sacrificed.

The initiating government office for the ELP should be an independent agency, not the developer or customer. Normally, many different offices will contribute information to develop the ELP. The initiating government office should also either perform or witness all acceptance testing to ensure the system commissioning is credible. As a general rule, bulky project documentation (e.g., drawings, maintenance plan and security package) should be referenced but not included as a physical part of the package. If a document is changed, the reference is still valid and the ELP does not automatically become outdated. Exceptions to this include documents such as the Acceptance Test Plan (ATP) that would not normally change the project baseline.

An ELP will fall into one of three basic categories. The type of ELP will depend on the type of commissioning planned for the project. The different categories of ELPs and commissioning are:

1. Full Operational Capability (FOC): A system that is fully operational and has met all system requirements at the time of turnover will have an AFFTC Information Management Tool (IMT) 5001, *Subsystem/System Test Verification and Commissioning Certificate*, published. Discrepancies that do not affect system operation may exist and should be listed on the AFFTC IMT 5001.
2. Initial Operational Capability (IOC): An IOC is normally used when a project is being developed in phases, with each phase being fielded as it is completed. With the turnover of each phase, an AFFTC IMT 5001 will be published. Discrepancies that do not affect system operation may exist and should be listed on the AFFTC IMT 5001.
3. Conditional Commissioning: A Conditional Commissioning occurs when a system/subsystem is not ready for either IOC or FOC, but has a requirement to enter the operational environment for final acceptance testing or mission critical testing. A Conditional ELP will be written to baseline the system and an AFFTC IMT 5001 will be published indicating the

system has only a conditional commissioning. Conditional Commissions are valid only for the periods of time stated in AFFTC Instruction 99-6, *Commissioning Certificate*.

The balance of this handbook is constructed in sections to match the three major components of the ELP: Introduction, System Description and Interfaces, and Logistics Elements. All components will be presented in the order they would appear from the front cover to the back cover of the ELP. Each of the three major components will be broken down into elements, purpose and suggested format.

2.0 SECTIONS OF AN ENGINEERING LOGISTICS PLAN

The following paragraphs list the different sections of an ELP and describe the make-up of each section.

Hint: This section will vary, depending on the complexity of the system and whether it is a stand-alone system or tied to other systems.

2.1 Introduction

The introduction contains the name of the system/project under development. It also states the purpose of the ELP, which is normally to act as a transition and turnover document between the developer and owner. Project management responsibilities will be laid out with the project office, developer (if different from the project office), owner/customer and project custodian identified.

The ELP working group (ELPWG) will also be listed in the introduction. The ELPWG members should be identified by name, office, function, and telephone number. At a minimum, the following should be members of the ELPWG:

1. Project Manager.
2. System Engineer.
3. Owner's representative.
4. Logistician.

Depending on the project the following offices should also provide members of the ELPWG:

1. The appropriate Safety and Security Offices (Center, Wing, Directorate, etc.).
2. The system owner.
3. The operations organization.
4. The organization responsible for maintaining the system.
5. The organization responsible for configuration management.
6. Other offices as required.

Those individuals and/or offices identified as members of the ELPWG will normally be the individuals providing input for the ELP.

2.2 System Description and Interfaces

The system description should be high level and describe the overall functionality of the system without being overly technical. Depending on the complexity of the system, this description should range from one brief paragraph to a whole page.

The interface description should adequately describe the system interfaces, both internal and external, without being overly technical. Interface descriptions should also be from one paragraph to one page in length. Block diagrams are often helpful in understanding both system and interface descriptions. More detailed interface descriptions should be referenced.

2.3 Logistics Elements

The logistics elements of the ELP describe the equipment (hardware/software) used in the system configuration and the requirements for commissioning the system being developed. All of the listed logistics elements should be addressed, even if only to say that an element was looked at and does not apply to this project.

2.3.1 Equipment

Equipment is normally broken down into two categories: prime mission and support. Each may include both hardware and software. A list of the hardware and software is provided to the owner at the time of turnover and included in an appendix of the ELP.

1. Prime mission equipment is the hardware/software that is required to make the system operational.
2. Support equipment is the hardware/software used to maintain the system in an operational status. Hardware support equipment normally consists of common hand tools, special tools and test equipment (diagnostic and calibration) used to maintain the system in a state of readiness. Software support equipment normally consists of operational/diagnostics programs to either troubleshoot and/or determine the status of the developed system.

See [Appendix A](#) for equipment list templates.

2.3.2 Provisioning

This section identifies the hardware units that the developer has determined should be on hand as spares to minimize system downtime. The spares list should include part/model number, vendor, item description, and recommended quantity. Equipment prices can be included to help the owner with budgeting. Over time, high failure and critical items can be identified and the spares list adjusted accordingly.

A recommended spares list will be provided to the owner and will be included in the ELP as an appendix. The spares list should be prioritized using the following criticality codes:

1. Major impact to system operational capabilities; i.e., the system is not capable of performing its primary mission.
2. Intermediate impact on the system involving more than one resource; i.e., the overall system performance is degraded but the primary mission can still be accomplished.

3. Minor impact to system operational capabilities; i.e., nuisances.

See [Appendix B](#) for a Critical Need Equipment List template.

2.3.3 Documentation

Documentation is the technical data for engineers and technicians to use in managing, supporting, operating and maintaining the developed system. All documentation should be kept in a centralized storage area. The Unit Configuration Management Office makes an excellent documentation storage area.

The developer is responsible for verification of technical publications submitted by contractors. The developer is also responsible for providing all documentation necessary to operate and maintain the system. This documentation includes all engineering drawings and associated lists, specifications and any other configuration documentation that is representative of the developed system. At turnover the complete drawing package will be turned over to the customer. See [Appendix C](#) for a Technical Documentation List template.

Because engineering drawings can be very large and system documentation very voluminous, system documentation is normally referenced in the ELP, but not included as part of the ELP. This also prevents confusion at a later date after system updates. System documentation initially included in the ELP would soon be outdated but if just referenced, the references should still be valid.

2.3.4 Training

Proper training is essential for successful transition and turnover. It provides personnel with the knowledge and skills to derive optimum usage of the system with minimum downtime. There may be projects for which training is not required, but these are few.

Keep in mind that training needs for operators and maintainers are different. There are three types of training to consider: (1) Initial (2) Follow-On and (3) Continual. Initial training is sufficient for most systems. However, if system updates or upgrades are anticipated, follow-on training may also be needed. Continual training is appropriate when Operations and Maintenance (O&M) personnel turnover is significant.

If, due to system complexity, a training plan is needed and developed, include it in the training appendix of the ELP. The training plan should include assumptions and recommendations by the developer and is provided to the owner as guidance. A detailed list of training specifics and locations should be included in the appendix. Also, include in the appendix a list of individuals, by name and office symbol, who have been trained. See [Appendix D](#) for one method of documenting training received.

2.3.5 Configuration Management

Configuration management (CM) ensures that system configuration is established (baselined), accurately documented, kept up-to-date and changed only by following the owning organization's approved CM processes. Before system commissioning, the developer is responsible for CM; after commissioning, the owning organization is responsible for CM. If your organization does not have an approved CM plan, MIL-HDBK-61A(SE), *Configuration Management Guidance*, (reference 1) is an excellent guide.

There are four basic elements to CM: Identification; Change Control; Status Accounting; and Audits. These activities are summarized below:

1. Identification - Specify what equipment items/components (configuration items) will be tracked.
2. Change Control - Baseline the functional and physical characteristics of the system (form, fit, function and interface), and do not allow changes to the baselines without following approved CM procedures
3. Status Accounting - Maintain an up-to-date database of the configuration items.
4. Audits - Perform periodic physical and functional verification of the system configuration

The project manager should ensure that the developer, government or contractor initiates practices that comply with CM requirements during project development. Configuration management requirements will vary with the size, complexity and duration of the system development.

2.3.6 Property Transfer

This section describes how the equipment, materials, documentation and spares are transferred from the developer to the owner/custodian after commissioning has been achieved. The property is normally owned by the developer during the development phase and then transferred to the owner/custodian at the time of commissioning. When the transfer of equipment between the developer and owner/custodian takes place, use a DD Form 1149, *Requisition and Invoice Shipping Document*, AF IMT 2005, *Issue/Turn-In Request*, or other documentation as appropriate.

2.3.7 Site Preparation

Site preparation is essential to ensure the system can safely be installed, operated and maintained in its required environment (facility). Accurate characterization of the facility is essential to planning system design and subsequent transition and turnover. Modification or repair to existing facilities may be necessary to accommodate physical, mechanical, electrical and personnel requirements for the project under development. Any required site preparation should be a joint effort between the developer and owner. Any known site preparation discrepancies at the time of transition and turnover will be annotated on the Commissioning Certificate.

Things to be considered when planning for site preparation:

1. Is site preparation necessary?
2. What preparation is required?
3. Are drawings required?
4. Is facility checkout needed?
5. What is the cost?
6. How long will it take?
7. When is scheduled completion?
8. Who will perform the site preparation?
9. How will site preparation be performed?

Site preparation may be performed by either a contractor or Civil Engineering, depending on the circumstances. Civil Engineering normally requires quite a bit of lead time, so getting them involved early is a necessity.

2.3.8 Acceptance Testing

The acceptance testing is to demonstrate that the system hardware, software and associated interfaces meet or do not meet all documented customer requirements for the project under development. This test is not a substitute for earlier component or subsystem-level development tests. Successful completion of acceptance testing signifies that the developed system is ready for testing in an operational environment (Operational Certification).

Normally the developer prepares the Acceptance Test Plan (ATP) used in the acceptance testing. The ATP needs to test all documented requirements and should be verified by a government quality assurance representative.

Test preparation should begin as soon as the system requirements/specifications are established. In an effort to minimize the need for additional operational certification testing, the owner should participate in the development of the ATP. Testing should be conducted by an independent agency, not the developer or his contractor. Frequently, for practical reasons, acceptance testing is conducted by the developer, but witnessed by an independent quality assurance agency to ensure the test procedures have been followed precisely. The owner should also witness and, if possible, participate in the acceptance testing. The following checklist should help in acceptance test preparation and test plan/procedure evaluation:

1. Is the test a comprehensive evaluation of the entire system?
2. Are all system requirements evaluated adequately through this test?
3. Who will assess the adequacy of the test plans and procedures?
4. Who will witness the test?
5. Where and how will the test be conducted?
6. What special tools/equipment will be needed to support the test?
7. When will the test take place?
8. Do the test procedures allow for the proper documentation of results?

Data Item Descriptions, DI-NDTI-80603A, *Test Procedure*, (reference 2) and DI-QCIC-80553A, *Acceptance Test Plan*, (reference 3) contain guidance on preparing test procedures and acceptance test plans, respectively. Although different formats can be used to write an ATP, [Appendix E](#) provides a good example.

2.3.9 Operational Certification

Operational certification verifies the performance of project hardware, software, and associated interfaces in its operational environment. Operational certification is the responsibility of the owner.

1. This test should give an accurate assessment of the operational effectiveness and suitability of the systems. Operational certification ensures the system will fully satisfy the requirements of the end users.

2. The owner should participate in the development and review of the ATP prior to formal acceptance testing. In cases where it is cost effective and time efficient, the owner may request combined Acceptance and Operational Certification Testing. The combined testing should be accomplished using the owner's operational personnel and in accordance with the developer's and the government's quality assurance acceptance test plan. Operational certification should not duplicate acceptance testing.

2.3.10 Maintenance Planning

Maintenance planning is essential in providing an effective, cost-efficient, maintainable system. Good maintenance planning defines what equipment will be maintained, who will maintain it (maintenance level), and the particular maintenance schedules that must be met. Maintenance training, warranties, and service agreements are also important considerations.

Maintenance responsibilities (who will maintain it) should be defined for the three general maintenance levels:

1. Organizational Maintenance (O-level) - O-level maintenance consists of preventive and corrective maintenance that can be accomplished at the owner's operating location (e.g., removing and replacing faulty components and preventive maintenance inspections).
2. Intermediate Maintenance (I-level) - I-level maintenance consists of bench diagnostic, troubleshooting and more in-depth work.
3. Depot Maintenance (D-level) - D-level maintenance is generally characterized by major refurbishment, overhaul or rebuilding of equipment components. D-level maintenance is normally performed by the vendor or other contracted organization.

The organization responsible for these different levels of maintenance should be identified. Generally, the owner's day-to-day system O&M personnel will be responsible for O-level maintenance. More specialized and skilled Air Force or contractor technicians will be responsible for I-level maintenance. Highly specialized, original equipment manufacturer personnel are usually responsible for D-level maintenance.

Warranties and service agreements should also be addressed. The following questions should be answered:

1. Considering the equipment and environment, would it be economical to purchase a warranty?
2. What is the life expectancy of the system/equipment?
3. If under warranty, how will it be maintained after the warranty expires?
4. Which equipment items are covered by separate warranties?
5. Which equipment items are not covered by warranties?
6. Are there any limitations on the warranty?
7. What are the contingency plans for dealing with warranties that expire before transition and turnover?

In some cases a simple matrix can be used to indicate the system, the level of maintenance and who will be maintaining the system. See [Appendix F](#) for an example.

Normally, a maintenance plan should be written to address all of the issues concerning keeping the system operational after transition and turnover. See [Appendix F](#) for an example.

2.3.11 Safety and Security

Safety and security problems can shut down a program immediately. Therefore, it is imperative that safety and security requirements be addressed up front, and that any issues are resolved as quickly as possible.

The developer should involve safety representatives from the owner's organization early in the logistics planning process. Safety surveys will be conducted to identify specific items that will require attention prior to system commissioning. The owner/custodian will develop and implement safety plans for O&M of the system. If organizational safety and security people cannot properly address safety and security questions, then the AFFTC Safety and Security offices should be contacted for guidance.

Safety issues concerning the facilities in which the project system will be located and the equipment itself must be addressed. A site survey should be performed by the owner's safety office to identify safety hazards. Corrective action should be initiated as soon as possible after problems are identified. If safety issues cannot be mitigated to an acceptable level, precautionary measures should be instituted, or system installation may need to be delayed until these issues are resolved.

Physical, software, and electronic security issues must be addressed. The developer, working with the appropriate security office and in accordance with AFD 33-2, *Information Assurance Program* (reference 4) and AFI 33-200, *Information Assurance Management* (reference 5) will determine if a Department of Defense Information Assurance Certification and Accreditation Process (DIACAP) is required. When a DIACAP is required, it will be initiated as early as possible in the development process and the certification and accreditation control number will be logged here. If at FOC the developer and owner's security office have decided that a DIACAP is not required, then a letter from the owner's security office to that effect should be included to let interested parties know that it was addressed. A copy of the certification and accreditation or a letter stating that a DIACAP is not required should be included in the appropriate appendix.

2.3.12 Commissioning

The AFFTC IMT 5001, *Subsystem/System Test Verification and Commissioning Certificate*, [Appendix G](#), is the document that completes the development process. The completion and signing of the commissioning certificate indicates to the owner and any potential customer that the completed project has been properly documented and the system tested by the initiating government agency and owner, as applicable, and that it meets all documented customer requirements. The initiating government office fills out, coordinates the signing of, and publishes the commissioning certificate.

See the Introduction for the different types of commissioning available. Any discrepancies not resolved before commissioning will be listed on the AFFTC IMT 5001. The original AFFTC IMT 5001 will be maintained by the initiating governing office. The offices responsible for correcting the discrepancies on the commissioned system will inform the initiating government office once the corrections have been accomplished. Specific guidance on filling out and signing the commissioning certificate is in AFFTCI 99-6, *Commissioning Certificate* (reference 6).

See [Appendix H](#) for a sample of an Engineering Logistics Plan.

2.4 Additional Logistics Elements

The logistics elements listed are not all inclusive. The size and complexity of a system may drive a requirement for other logistics elements such as Packaging, Handling, Shipping, and Transportation, Manpower and Personnel, Computer Resources, and Supply Support. Be sure to address all logistics factors.

3.0 REFERENCES

1. MIL-HDBK-61A (SE), *Configuration Management Guidance*, 7 February 2001.
2. DI-NDTI-80603A, *Test Procedure*, 14 November 2006.
3. DI-QCIC-80553A, *Acceptance Test Plan*, 14 November 2006.
4. AFPD 33-2, *Information Assurance Program*, 19 April 2007
5. AFI 33-200, *Information Assurance Management*, 23 December 2008.
6. AFFTCI 99-6, *Commissioning Certificate*, Air Force Flight Test Center, Edwards AFB, California, 2 April 2002.

APPENDIX A – EQUIPMENT LIST TEMPLATES

This appendix will normally consist of the hardware and software (if applicable) prime mission equipment inventories. The hardware inventory identifies the system components included in this transition and turnover.

Table A1 Hardware List

[illegible]

Table A2 Software List

[illegible]

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APPENDIX B – CRITICAL NEED EQUIPMENT LIST TEMPLATE

This appendix will normally identify support components available to the owner from secondary sources when a mission-critical need arises. Also, this appendix includes component criticality rating, description and line replaceable unit/shop replaceable unit (LRU/SRU) type.

Criticality Code Legend

- | | |
|------|---|
| Code | 1 - Major impact to system operational capabilities; i.e., the system is not capable of performing its primary mission. |
| | 2 - Intermediate impact involving more than resource; i.e., the overall system performance is degraded but the primary mission can still be accomplished. |
| | 3 - Minor impact to system operational capabilities; i.e., nuisances. |

Table B1 Critical Components List

[illegible]

APPENDIX C – TECHNICAL DOCUMENTATION TEMPLATE

This appendix will normally contain a list of all pertinent documentation, not the actual documents or drawings.

Table C1 Documentation List

[illegible]

APPENDIX D – TRAINING DOCUMENTATION TEMPLATE

Course:		
Course Number:		
Date:		
Location:		
Time:		
Instructor:		
Source(s):		
Phone:		
Cost:		
Attendees:		

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APPENDIX E – ACCEPTANCE TEST PLAN, SAMPLE

An ATP can be written in several formats, but the following sample works well.

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**AIR TRAFFIC CONTROL COMMUNICATIONS TEST
FACILITY and AVIONICS SYSTEM TEST
(ACTFAST)**

INFORMATION MANAGEMENT TOOL (IMT)

ACCEPTANCE TEST PROCEDURES

8 MARCH 2004

Sample

**Prepared By:
412 TW/DRP**

**Prepared For:
412 TW/DRT
412 TW/ENR**

1. Information Management Tool IOC Tests	2
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1.1. Access the TACC/IMT Database IMT-001	3
1.2. Display Active Sortie Data IMT-002	4
1.3. Display Departure Papers Mission Data IMT-003	5
1.4. Display Airfield Report Data IMT-004	7

Sample

1. Information Management Tool IOC Tests

1.0. Power up and Initialize the IMT Terminal

IMT-INIT

Description	Powers (Cold and Warm Start) and Initializes the IMT for performance of the IMT test procedures.
Date/Time	
Testers	
PC Used	

Special Requirements: Access to the IMT is controlled by TACC. A User ID and Password are required to perform these procedures. If testers do not have access, see an ACTFAST engineer for access procedures and assistance in performing these procedures. “Security Alerts” may appear during the IMT tests. Click the appropriate response when they do occur

Initial Conditions: None

Cold Start (if necessary): 1. Turn on the power switches to the PC to be used for IMT testing. Wait for the desktop to appear. Warm Start: 2. On the desktop, double-click the Internet Explorer icon. Wait for the Internet page to load. The ‘Centernet Portal’ page should be displayed. If not, enter the following address: https://xxxxxxxx.edwards.xx.xxx and “Enter” When the xxxxxxxxx site finishes loading, the PC is ready to perform IMT testing.	Time _____ Time _____
---	-------------------------------------

1.1. Access the TACC/IMT Database

IMT-001

Description	This test verifies that the IMT terminal accesses the mission data at the TACC.
Date/Time	
Testers	
PC Used	

Special Requirements: None.

Initial Conditions: The following conditions are required prior to executing this test procedure:

PC Used: Powered on and initialized
Internet launched and Centernet page displayed.

1. Access the TACC IMT Database: a. On the Centernet Page, click ‘Favorites’ and under the TACC folder click ‘IMT Web’. If ‘Favorites’ does not have TACC/IMT, enter the address in b. b. Wait for the page to load and verify the following address: https://xxx.xxxxx.xxxx.xxx.xxxx.xxx.xxxx.xxxx.xxx (note: ignore	Time _____ _____
---	--------------------------------

Trailing characters on this address). c. Close the 'Favorites' window. d. Verify the IMT Web LOGIN page appears. d. Enter Username/Password and <ENTER>. e. Verify a page appears that displays "IMT" on the left side. This page is referred to as the webMain page in the following procedures. TACC Mission Data is now available	_____ _____
--	---------------------------

1.2. Display Active Sortie Data

IMT-002

Description	This test verifies that "Active Sortie" mission data is filtered for display by time, aircraft type, and departure airport.
Date/Time	
Testers	
PC Used	

Special Requirements: None.

Initial Conditions: The following conditions are required prior to executing this test procedure:

PC Used: Powered on and initialized (procedure 1.0)
 TACC Database accessed (procedure 1.1)

1. Filter by Time Frame, departures and aircraft type: a. On the webMain Page, under "IMT" click "Active Sorties". b. Click the button labeled "Filter Settings". c. Ensure only the "Departures", "Domestic Aircraft" and "External Sorties" fields have checkmarks beside them. If not check or uncheck the fields as needed. d. Clear the DEP/ARR ICAO(S) data field. e. In the Start Time field, click "now" and enter 8 in the data field. f. In the End Time field, click "now +" and enter 4 in the data field. g. Click the button labeled "APPLY". h. Verify Mission data is displayed on webMain page. i. Record the DEP field data for the first sortie on the list. 2. Filter by Departure ICAO: a. Click the button labeled "Filter Settings". b. In the DEP/ARR ICAO(S) field, enter the value recorded in 1.i. above. c. Click the button labeled "APPLY". d. Verify only sorties with the entered DEP are displayed.	Time _____ _____ DEP: _____ _____
--	---

Description	This test verifies that mission data is filtered for display by tail number, Call Sign, Mission Number and ETD.
Date/Time	
Testers	
PC Used	

Special Requirements: None.

Initial Conditions: The following conditions are required prior to executing this test procedure:

PC Used: Powered on and initialized (step 1.0)

TACC Database accessed (step 1.1)

1. Filter by Tail Number and display mission data: - On the webMain Page, under IMT click “Departure papers”. - In the TAIL field, enter “580093”. - Click the button labeled “Find Using Filters”. - Verify Mission data is displayed on the lower part of the screen. - Click on the “Msn #” field for the first sortie listed. - Click “Sortie Information” and verify sortie information is displayed. - Click “ATC Messages” and verify a list of messages is on the left and the selected message is on the right. - Select a different message and verify the message field is updated.	Time _____ _____
2. Filter by Call Sign and display mission data: - Under “IMT”, click “Departure Papers”. In the Call Sign field, enter “ARRIS1” - Click the button labeled “Find Using Filters”. - Verify Mission data is displayed on the lower part of the screen. - Verify all listed missions are for ARRIS14.	 _____ _____ _____
3. Filter by Mission Number and display mission data: - Record a mission number for one of the ARRIS14 missions. - Under “IMT”, click “Departure Papers”. - In the “Recall/Mission#” data field, enter the mission number from step 3.a. - Click the button labeled “Find Using Filters”. - Verify Mission data is displayed on the lower part of the screen. - Verify the only mission displayed is for the entered mission number.	MSN # _____ _____ _____
4. Filter by ETD and display mission data: - On the IMT Page, clear the “Recall/Mission #” data field. - Next to the ETD field, click the Calendar Icon and click 2 Jun. - Click the button labeled “Find Using Filters”. - Verify Mission data is displayed on the lower part of the screen. - Verify the missions are for 2 Jun 2003 (3153121 in ETD column).	 _____ _____

1.4. Display Airfield Report Data

IMT-004

Description	This test verifies that airfield data can be viewed using IMT.
Date/Time	
Testers	
PC Used	

Special Requirements: None.

Initial Conditions: The following conditions are required prior to executing this test procedure:

PC Used: Powered on and initialized (step 1.0)
 TACC Database accessed (step 1.1)

1. Filter by Time Frame and display mission data: a. On the IMT Page, click “Airfield Report”. b. In the Enter ICAO(S) field, enter ‘KEDW’. c. Click the button labeled ‘Get Report’. d. Verify a screen appears with “Sunrise and Sunset”, “Weather Data” and “Notams” for KEDW (NOTE: There may not be “Notams”). e. Close the report window. 2. Logout from IMT: a. On the IMT Page, click “Logout”. b. Close the Internet Explorer application.	Time _____ _____
---	-------------------------

APPENDIX F – MAINTENANCE MATRIX AND MAINTENANCE PLAN SAMPLE

This appendix contains a sample of both a maintenance matrix template and a maintenance plan that can be used to indicate how maintenance will be performed and who will perform it.

Table F1 Maintenance Matrix Template

System	Organizational Level	Intermediate Level	Depot Level	Warranty	Service Agreement #

Sample

This page intentionally left blank.

Cover Page

System Name
Maintenance Plan

Document Number

Sample

Prepared By

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Minimum Information Required for a System Maintenance Plan

(This is not all inclusive. If there are additional requirements or information needed for a specific system, ensure it is included. Keep in mind, this is the information the owner will be using to maintain the system after transition and turnover has occurred, so make it as detailed as necessary.)

1.0 Background

A short narrative of the decision or requirements that led to the system development.

2.0 Purpose and Scope

Purpose and intention of this document.

3.0 System Name (Intrusion Detection System #1)

3.1 Hardware

3.1.1 Periodic Maintenance Requirements: *(If applicable, list any recurring inspections, time change items, maintenance actions, etc; here).*

3.1.2 Skills Requirements: *(If applicable, list any special skills required to maintain this system).*

3.1.3 Responsible Organization: *(i.e., 412 TW/ENRO).*

3.1.4 Contractor: *(If applicable).*

3.1.4.1 Contract Number: *(If applicable).*

3.1.4.1.1 Starts:

3.1.4.1.2 Expires:

3.1.5 Warranty Information: *(If applicable).*

3.1.6 Additional Information: *(Any information that may clarify how the system hardware should be maintained).*

3.2 Software

3.2.1 Responsible Organization: *(i.e., 412 TW/ENRO).*

3.2.2 Anomalies: *(Explain the process for tracking and resolving anomalies).*

3.2.3 Commercial off-the-shelf: *(Who is responsible for repairing anomalies and procuring upgrades).*

3.2.4 Developed: *(Who is responsible for repairing anomalies and upgrading the software when required).*

3.2.5 Skills Requirements: *(If applicable, list any special skills required to maintain the developed software).*

3.2.6 Contractor: *(If applicable).*

3.2.6.1 Contract Number: *(If applicable).*

3.2.6.1.1 Starts:

3.2.6.1.2 Expires:

3.2.7 Warranty Information: *(If applicable).*

3.2.8 Additional Information: *(Any information that may clarify how this software should be maintained).*

4.0 System Name (Intrusion Detection System #2)

4.1 Hardware

4.1.1 Periodic Maintenance Requirements: *(If applicable, list any recurring inspections, time change items, maintenance action etc; here).*

4.1.2 Skills Requirements: *(If applicable, list any special skills required to maintain this system)*

- 4.1.3 Responsible Organization: *(i.e., 412 TW/ENRO).*
 - 4.1.4 Contractor: *(If applicable).*
 - 4.1.4.1 Contract Number: *(If applicable).*
 - 4.1.4.1.1 Starts:
 - 4.1.4.1.2 Expires:
 - 4.1.5 Warranty Information: *(If applicable).*
 - 4.1.6 Additional Information: *(Any information that may clarify how the system hardware should be maintained).*
- 4.2 Software
- 4.2.1 Responsible Organization: *(i.e., 412 TW/ENRO)*
 - 4.2.2 Anomalies: *(Explain the process for tracking and resolving anomalies).*
 - 4.2.3 Commercial-off-the-Shelf: *(Who is responsible for repairing anomalies and procuring upgrades).*
 - 4.2.4 Developed: *(Who is responsible for repairing anomalies and upgrading the software when required).*
 - 4.2.5 Skills Requirements: *(If applicable, list any special skills required to maintain the developed software).*
 - 4.2.6 Contractor: *(If applicable).*
 - 4.2.6.1 Contract Number: *(If applicable).*
 - 4.2.6.2.1 Starts:
 - 4.2.6.2.2 Expires:
 - 4.2.7 Warranty Information: *(If applicable).*
 - 4.2.8 Additional Information: *(Any information that may clarify how this software should be maintained).*

See the following pages for a sample.

**Air Traffic Control (ATC) Communications Test Facility and AVIONICS System Test (ACTFAST)
Maintenance Plan**

Document XYZ-ATC-DEFG-01 34-0001
June 14, 2004

Prepared by
XYZ LLC.
195 E. Popson Ave., Bldg. 2750
Edwards AFB, CA 93524

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1.0 Background

The Air Traffic Control (ATC) Communications Test Facility and AVIONICS System Test (ACTFAST) development project was initiated by the AFFTC in response to projections of a needed test capability to support aircraft avionics flight-testing of Global Air Traffic Management (GATM) systems. The project was tasked to develop or procure the capability required to conduct testing both the data link AVIONICS and software applications utilizing the data links.

2.0 Purpose and Scope

The purpose of this document is to identify the recommended maintenance plan for the ACTFAST System, to identify available maintenance resources, requirements and maintainability issues for the Range Division (412 TW/ENR) support organizations that will be responsible for maintaining the ACTFAST following FOC.

Additional maintenance information is provided for legacy systems such as communications, TECCS and ATM data transport services that are used in conjunction with the ACTFAST.

The specific cost of labor and material support required to maintain the ACTFAST is beyond the scope of this document as this will be determined by the specific maintenance method(s) implemented by 412 TW/ENR Range.

3.0 ACTFAST System Maintenance Concept

The ACTFAST Maintenance Concept contains both hardware and software maintenance elements. The levels of maintenance and methods vary between individual ACTFAST subsystems. It is assumed that any Class 2 hardware or software modifications to the ACTFAST or supporting equipment following FOC will be accomplished in accordance with existing 412 TW/ENR Hardware and Software Configuration Control processes.

3.1 ACTFAST Hardware Maintenance

The 412 TW/ENRO assumes overall responsibility for hardware maintenance of the ACTFAST and supporting systems as defined in this document at FOC. The ACTFAST hardware configuration items should be loaded into a maintenance tracking system and all hardware maintenance activities performed against the system should be accounted for. Hardware maintenance support includes operator, periodic and depot level maintenance tasks as required.

Operator level maintenance consists of periodic tasks involving the cleaning of equipment, cleaning or replacement of equipment air filters, verification of equipment indicators such as power lamps and the verification of equipment and cabinet cooling fans.

Intermediate level maintenance consists of more complex periodic maintenance tasks, such as the accomplishment of system diagnostics, equipment adjustments and verifications. Intermediate Level Maintenance also involves the isolation of equipment anomalies and the removal and replacement of failed equipment or subsystems to the Lowest Replaceable Unit (LRU).

Depot level maintenance consists of complex maintenance activities involving the component level repair, overhaul or refurbishment of end-system equipment. It is recommended that LRU repair of ACTFAST components be performed by qualified Depot repair or original equipment vendors as required.

3.1.1 Prime Contract # F04XXX-XX-D-00XX

Prime Contract # F42XXX-XX-D-00XX with ARINC is included as Appendix X to the ACTFAST ELP and is available to provide hardware maintenance support services and upgrades of the ACTFAST. Elements of Prime Contract # F42XXX-XX-D-00XX cannot currently be exercised under Prime Contract # F42XXX-XX-C-7218.

3.1.2 LOTD 1H022XXX-01XX

Prime Contract # F42XXX-XX-C-7218, Letter of Technical Direction (LOTD) 1H022XXX-01XX, ACTFAST Support provides hardware maintenance and system administration support to ACTFAST subsystems. Section 4 of this document provides additional information on the levels of support currently provided under LOTD 1H022XXX-01XX by individual ACTFAST subsystem.

3.1.3 LOTD 1H022XXX-00XX, Subtask 2

Prime Contract # F42XXX-XX-C-7218, LOTD 1H022XXX-00XX Engineering Support, Subtask 2, Other Engineering Support is available to provide antenna tower maintenance labor as required for the removal, replacement or installation of antenna elements and feed cables for the EAFB Building 4973 and China Lake NAWCWD Building 2025 BIG and the EAFB Building 1440 FANS AVIONICS Shelf Honeywell VHF Radio.

3.1.4 LOTD 1H022XXX-00XX

Prime Contract # F42XXX-XX-C-7218, LOTD 1H022XXX-00XX, Subtask 2 Real-Time Operations Support and Computer Maintenance provides hardware maintenance and system administration support for the TECCS Client Workstation, located in Room 259 and utilized by ACTFAST Operations and UIC personnel.

3.1.5 LOTD 1H022XXX-00XX, Subtask 1

Prime Contract # F42XXX-XX-C-7218, Letter of Technical Direction (LOTD) 1H022XXX-00XX Communications Center, Subtask 1 Technical Control Center/Microwave-Edwards (TCC/Mic-Ed), provides hardware maintenance and configuration support for the ATM Support Network utilized by the ACTFAST to establish connection between the ACTFAST elements located in Building 1440 Room 259, Building 4973, CLNWSWD and the Data-link Service Provider (DSP).

3.1.6 LOTD 1H022XXX-00XX, Subtask 3

Prime Contract # F42XXX-XX-C-7218, Letter of Technical Direction (LOTD) 1H022XXX-00XX Communications Center, Subtask 3 Communications, provides hardware maintenance and configuration support for the Subscriber Terminal Unit (STU) Communications Stations located in Building 1440, Room 259.

3.2 ACTFAST Software Maintenance

The 412 TW/ENRO assumes overall responsibility for the maintenance of ACTFAST Software components at FOC to include, procuring COTS software updates and initiating system software problem resolution to include the operating system and locally developed software. A Microsoft ACCESS based

Software Problem Reporting (SPR) Database “*ACTFAST Anomaly Database*” is currently maintained for the ACTFAST. This SPR Database will be turned over at FOC and should be maintained by the 412 TW/ENRO.

All ACTFAST software, to include Operating System, COTS and locally developed applications should be controlled under existing 412 TW/ENR Configuration Management processes and procedures.

3.2.1 Operating System Software

There is an Air Force Materiel Command (AFMC) wide 5 year contract in place with Microsoft for Software Update Service (SUS) for Windows Operating System (OS) and office application suites. There are currently no active SUS agreements in place for the LINUX or AIX Operating System software utilized on the ACTFAST. Any updates to the embedded pSOS OS utilized with BIGS single board computer systems are provided thru Aeronautical Radio, Incorporated (ARINC). Any OS changes or upgrades should be coordinated with ARINC in advance.

3.2.2 COTS Software

Software maintenance of ARINC developed applications is available through Prime Contract # F42650-01-X-00XX on a time and material basis.

There are currently no active agreements for maintaining any of the non-ARINC COTS software utilized on the ACTFAST. The 412 TW/ENR should arrange for additional COTS support as is deemed necessary. Any changes or upgrades to the non-ARINC COTS software utilized on the ACTFAST should be coordinated with ARINC in advance.

3.2.2.1 Prime Contract # FXXXXX-XX-D-0017

Prime Contract # F0XXXX-XX-D-0017 with ARINC is included as Appendix X to the ACTFAST ELP and is available to provide software maintenance support services and upgrades of the ACTFAST on a time and material basis.

Elements of this Contract are not currently being exercised under Prime Contract # FXXXXX-XX-C-7218.

3.2.3 Locally Developed Software

Locally developed Message Decoder software is hosted on the analysis workstations. The Message Decoder application was developed using Microsoft ACCESS. A system users manual is available.

4.0 ACTFAST Hardware and Software Maintenance by System

The primary hardware subsystems that comprise the ACTFAST are the Communications, Navigation, Surveillance/Air Traffic Management (CNS/ATM) Gateways & Air Traffic Services workstations, analysis workstations & corrupter, MIL COMM Messenger, HERMES, Integrated Management Tool PC, FANS AVIONICS Shelf and the BIGS. Each of these subsystems hosts operating system and applications software.

Additional maintenance information is included for the ACTFAST Support Network, TECCS and Communications Systems utilized in conjunction with the ACTFAST.

Refer to Figure 1, ACTFAST System Block Diagram, for a basic block diagram of the ACTFAST.



The CNS/ATM Gateway Router function is hosted on an International Business Machines (IBM) Reduced Instruction Set Computer (RISC) workstation with standard peripheral, input/output devices and cabling. In addition to hosting the CNS/ATM Gateway Router applications these workstations also host the Air Traffic Service (ATS) applications. These systems may also be referred to as *ATS Workstations*.

Table 1. S/ATM and ATS Workstation Hardware

F-12

Periodic Maintenance Requirements: The IBM RISC workstations require periodic Operator level maintenance to include general cleaning, dust removal and verification that ventilation fans are functioning and unobstructed.

Skills Requirements: Electronics equipment maintenance skills and knowledge of IBM AIX Operating System and general computer system maintenance.

Responsible Organization: The 412 TW/ENRO has overall ACTFAST hardware maintenance responsibility.

Contractor: Initial response to CNS/ATM Gateway Workstation hardware maintenance requests is currently provided by ABC LLC.

Contract Number: Prime Contract # F42XXX-XX-C-7218, Letter of Technical Direction 1H022XXX-01XX.

Starts: LOTD is currently active.

Expires: LOTD expires 30 September 2004.

Warranty Information: Out of Warranty.

Additional Information: The following contract is currently in place, funded and available to provide repair or replacement of LRU components of the CNS/ATM Gateway Workstations:

Vendor: Aeronautical Radio Incorporated (ARINC)

AFFTC Contract No and Delivery Order: F0XXXX-XX-X-XXX-XXX-0022

Actual Cost: \$54,890.50

Expiration Date: 31 December 04, available through 30 September 05

Description: Hardware maintenance contract of 3 Bilingual Integrated Ground Stations (BIGS) and 2 CNS/ATM Gateway Workstations.

4.1.2 CNS/ATM Gateway and AIX Workstation Software

Table 2 CNS/ATM and AIX Workstation Software

CNS/ATM Gateway Router SOFTWARE	Version	Licenses	COTS	Manufacturer	Active SUS
AIX Operating System	3	2	Yes	IBM	RMCC Room 259
Gateway	EDWS_01_01	2	Yes	ARINC	RMCC Room 259
CPDLC	EDWS_01_01	2	Yes	ARINC	RMCC Room 259
GEOMAP	EDWS_01_01	2	Yes	ARINC	RMCC Room 259
Voice Transcription	EDWS_01_01	2	Yes	ARINC	RMCC Room 259

Responsible Organization: The 412 TW/ENRO has overall ACTFAST software maintenance responsibility.

Anomalies: System software anomalies are entered into a locally developed Microsoft ACCESS System Problem Report (SPR) database by Operations, User and Maintenance personnel as they are identified. An ACTFAST Working Group should be instituted to prioritize the SPR items and to recommend and implement corrective actions. A proposed flow for the Software Configuration Management Process for ACTFAST is included in Figure 1.

Commercial-off-the-Shelf: The 412 TW/ENRO has overall responsibility for procuring COTS software updates and upgrades, and initiating system software problem resolution for ARINC Gateway, CPDLC, GEOMAP and Voice Transcription applications.

There is currently no Software Update Service (SUS) for the IBM AIX Operating System. No updates should be made to the AIX Operating System without the concurrence of ARINC.

Developed: There are currently no locally developed software applications or modules on the CNS/ATM Gateway Workstations.

Skills Requirements: N/A

Contractor: N/A

Contract Number: N/A

Starts:

Expires:

Warranty Information: No warranty applies

Additional Information: The following contract is available to maintain the ARINC developed software components of the CNS/ATM Gateway Routers on a time and material basis.

Vendor: Aeronautical Radio Incorporated (ARINC)

AFFTC Contract No.: FXXXXX-XX-D-XXXX 0011

Actual Cost: Time and Materials

Expiration Date: Available through 30 September 05

Description: Hardware and software maintenance support, training and system upgrades.

Sample

APPENDIX G – COMMISSIONING CERTIFICATE

Attached is a copy of a blank AFFTC IMT 5001, *Subsystem/System Test Verification and Commissioning Certificate*.

SUBSYSTEM/SYSTEM TEST VERIFICATION AND COMMISSIONING CERTIFICATE				DATE	LOG NUMBER
TYPE OF COMMISSIONING: ☐ CONDITIONAL ☐ INITIAL OPERATIONAL CAPABILITY ☐ FULL OPERATIONAL CAPABILITY					
1. TEST PLAN CERTIFICATION		2. LOCATION		3. SYSTEM	
SOFTWARE VERSION					
TEST PLAN ID					
4. SUBSYSTEM	5. TASK NUMBER	6. JON NUMBER	7. CONTRACT NUMBER		
8. FACILITIES, SITES, LINKS AND/OR INTERFACES COMPRISING THE SYSTEM AND UTILIZED IN TESTING					
9. NARRATIVE SUMMARY OF RESULTS					
10. TEST CERTIFICATION The subject subsystem/system has been tested in accordance with the approved Acceptance Test Plan/Specification. The undersigned verify that the test was conducted as prescribed and the results are as indicated above. Exceptions are listed on the reverse of this form.					
ORGANIZATION	DATE	RANK, GRADE OR TITLE	SIGNATURE		

11. DISCREPANCIES (Continue on page 3 if necessary)				
DISCREPANCY	DESCRIPTION	RESPONSIBLE ACTIVITY	DATE CORRECTED	INITIALS

12. COMMISSIONING CERTIFICATION			
1. All logistics issues have been addressed.			
2. Completion of this certificate formally commissions the subsystem/system as of the above date.			
ORGANIZATION	DATE	RANK, GRADE OR TITLE	SIGNATURE

DISCREPANCY	DESCRIPTION	RESPONSIBLE ACTIVITY	DATE CORRECTED	INITIALS

APPENDIX H – ENGINEERING LOGISTICS PLAN, SAMPLE

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ENGINEERING LOGISTICS PLAN FOR THE TRANSITION AND TURNOVER OF THE TITLE GOES HERE

If a good picture of the system exists, insert it here. A picture will enable a person to visualize the system they are reading about.

January 2008

Prepared By: 412 TW/DRT
Prepared For: 412 TW/DRP

412 Test Wing

This Engineering Logistics Plan has been reviewed for implementation by the following individuals:

NAME
Logistics Manager
412 TW/DRT

Date

NAME
Systems Engineer
412 TW/ENTR

Date

NAME
Project Manager
412 TW/DRP(ACQ)

Date

NAME
Operations and Maintenance
JT3

Date

NAME
Range Division Engineering Branch
412 TW/ENTR

Date

Sample

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1.0 INTRODUCTION

This Engineering Logistics Plan (ELP) is published to document the implementation of the Link 16 #2 Mobile Ground Station. Full Operational Capability (FOC) and commissioning will be achieved when system training, spares and approved documentation are delivered. At FOC, all equipment will be transferred from 412 TW/DRP(ACQ) Project Office to the Range Division Operations Branch by completing a DD Form 1149, *Requisition and Invoice/Shipping Document*. An AFFTC IMT 5001, *Subsystem/System Test Verification and Commissioning Certificate*, will be issued and the system will be fully operational at this point, closing out the development activities associated with Link 16 #2 Mobile Ground Station.

The logistics elements which describe the support concept for the Link 16 #2 Mobile Ground Station are defined in this document. The appendixes provide specific logistics information, which further fulfill project objectives for an operational capability. Appendix F contains the AFFTC IMT 5001, *Subsystem/System Test Verification and Commissioning Certificate*, which when signed will constitute authentication of system readiness for transition and turnover from developmental to operational status. Any follow-on build completion, software update release, or configuration change which reengages the Developer will require an update to this ELP prior to transition and turnover.

1.1 Purpose

This Engineering Logistics Plan will serve as a transition and turnover agreement between the 412 TW/DRP(ACQ) Project Office, 412 TW/ENRE Range Division Engineering Branch, and 412 TW/ENRO, Range Division Operations Branch, for the Link 16 #2 Mobile Ground Station.

1.2 Project Management

- a. The 412 TW/DRP(ACQ) has overall management responsibility until the assets are formally transferred through the 412 TW/ENR Range Division Configuration Control Board (CCB) to the Range Division Operations Branch. The 412 TW/DRP(ACQ) also has responsibility for coordinating logistics support, tooling, and configuration management (CM) type activities associated with the development of assigned equipment, before TRANSITION AND TURNOVER.
- b. The 412 TW/ENR (Owner) has designated the 412 TW/ENRO Range Division Operations Branch as the user/customer. The user/customer will be responsible for the operation and maintenance (O&M) of the Link 16 #2 Mobile Ground Station and the appointment or delegation of O&M responsibilities to the ultimate Custodian of the system. Configuration Management activities are under control of the 412 TW/ENR Range Division CCB after transition and turnover. The 412 TW/DRP(ACQ) Project Office should work closely with the Range Division CCB to maintain system baseline integrity.
- c. This ELP outlines the logistics and project management responsibilities.
- d. Listed below are key titles used in this document and their responsibilities.
 1. **Project Office:** The organization responsible for managing the development effort. For the Link 16 #2 Mobile Ground Station this is the 412 TW/DRP(ACQ) Acquisition Office.
 2. **Developer:** The 412 TW/DRP(ACQ) Acquisition Office in conjunction with the 412 TW/ENRE, Range Division Engineering Branch is responsible for the design, development and delivery of a product in the customers' environment.

3. **Owner:** That person or function having management responsibility for the resource or product. For the Link 16 #2 Mobile Ground Station, the 412 TW/ENR, Range Division, is the owner and has designated the 412 TW/ENRO, Range Division Operations Branch as the user/customer. For the purposes of this ELP the Range Division Operations Branch will be considered the Owner.
4. **Custodian** - That individual or function having day-to-day responsibility for the resource and is the designated property custodian, if different from the system owner.

1.2 Engineering Logistics Plan Working Group

The following personnel are members of the Engineering Logistics Plan Working Group (ELPWG) for the Link 16 #2 Mobile Ground Station project.

<u>Member</u>	<u>Function</u>	<u>Phone Number</u>
Name	Link 16 Project Manager	(661) 277-7166
Name	Link 16 Systems Engineer	(661) 277-8303
Name	Link 16 Systems Engineer	(661) 277-6524
Name	Link 16 Systems Engineer	(661) 275-9148
Name	Logistics Manager	(661) 275-9081
Name	Logistics Manager	(661) 275-9198

1.3 Points of Contact

The following is a list of current Air Force and Contractor Points of Contact:

1.3.1 Air Force

Name	Director of Acquisition Projects	(661) 277-5445
Name	Link 16 Project Manager	(661) 277-7166
Name	Link 16 Range Division Operations	(661) 277-2727
Name	Systems Engineer	(661) 277-6524
Name	Systems Engineer	(661) 275-9548
Name	Logistics Manager	(661) 275-9081
Name	Logistics Manager	(661) 275-9198

1.3.2 Contractor

Name	JT3/ENR	(661) 275-8303
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2.0 SYSTEM DESCRIPTION AND INTERFACES

The Link 16 #2 Mobile Ground Station is a trailer with the capability to emulate several different aircraft and ships on a Link 16 network (Operational configuration will vary depending on customer needs). Link 16 is a secure tactical digital data communications link that will be used by all DOD platforms as the primary means of communication to exchange almost every kind of information at the tactical level. The primary purpose of the ground station is to provide test support of Link 16 Relative Navigation (RELNAV) test and evaluation. Relative Navigation testing is required to evaluate the aircraft Operational Flight Programs (OFPs) ability to process this data properly. The ground station will also provide data to support OFP off board sensor targeting, track correlation, and fighter-to-fighter data processing evaluation.

2.1 Internal

The main interface for data inside the trailer is a standard 1553 data bus. The Link 16 terminal communicates to the Host Computer, which simulates the host aircraft (or ship) mission computer, over the 1553 data bus the same way it would if it were installed on the weapon system platform. The Host computer is a desktop personal computer (PC) with a 1553 interface card installed running Host Simulation software. A second PC is connected to the 1553 data bus as a bus monitoring and recording station, using monitoring and recording software. The terminal transmits data into a dummy load inside the trailer on one of its antenna interfaces and to a notch filter on the other antenna interface. The notch filter then passes data to the external antenna for transmission into the radio frequency (RF) world.

The Global Positioning System (GPS) receiver is a stand alone receiver and receives data from its own external antenna. The UHF/VHF radio is a stand alone system that transmits and receives data from its own external antenna.

Power is supplied to each of the four rack mounted uninterruptible power supplies (UPS) from the breaker panel inside the trailer. Each rack is then powered from its own dedicated UPS. The GPS receiver and UHF/VHF radio, data bus monitoring and recording PC, and the Host computer PC are each powered in their own rack. The Link 16 terminal is powered by a Remote Power Supply that is part of the Multi-Functional Information Display System Low Volume Terminal (MIDS LVT3) set that would usually be installed in the host aircraft. The Remote Power Supply is powered by a frequency converter that takes power from the UPS in its rack and converts it to standard aircraft power.

2.2 External

Link 16 Network Data is transmitted and received over a dedicated Link 16 antenna mounted on a pneumatic telescoping mast. Global Positioning System time space positioning information (TSPI) is received via a GPS antenna mounted on the roof. Radio traffic is transmitted and received over a UHF/VHF antenna mounted on the roof.

Power is supplied to the breaker box by either the generator mounted on the tongue of the trailer or a commercial power connector mounted on the main power switch box. The main power switch box is used to switch between commercial and generated power and off.

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3.0 LOGISTIC ELEMENTS

Hint: Even though parts of section 3.0 are generic, most of it is tailored to each project/system in development.

This section of the Engineering Logistics Plan will describe the equipment used in the system configuration and the requirements for commissioning the Link 16 #2 Mobile Ground Station System.

3.1 Equipment

This section identifies the hardware and software required to operate and support the Link 16 #2 Mobile Ground Station.

3.1.1 Equipment List

The prime mission equipment (PME) consists of hardware and software for the Link 16 #2 Mobile Ground Station and its interfaces, all of which is listed in Appendix A.

3.1.2 Prime Mission Equipment

The PME consists of all hardware and software integral to system operation. The PME list, see Appendix A, contains a description of the equipment (type, nomenclature, serial number, part number, version [for software], property identification number, and location). See Figure 1 for the hardware relationship.

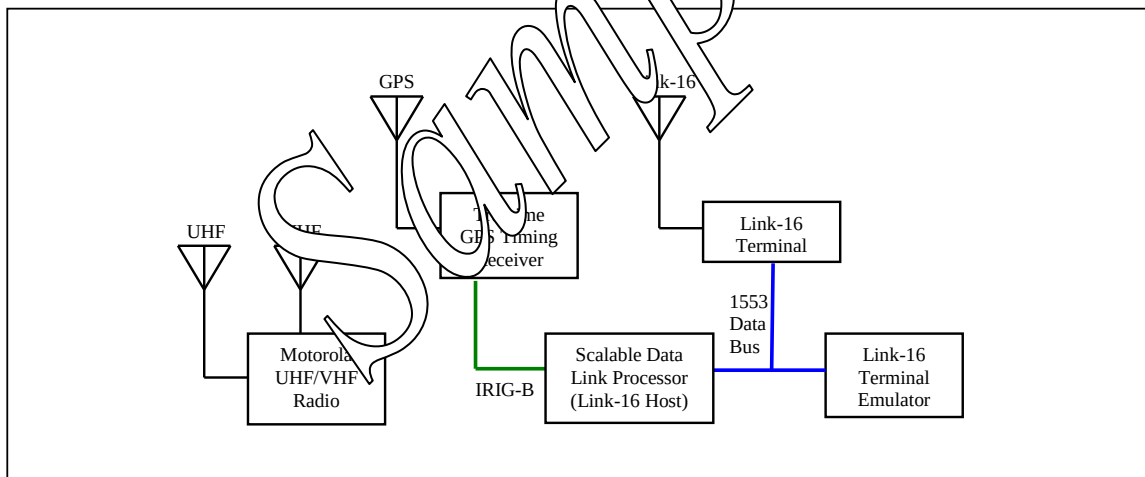


Figure 1 Hardware Relationship Diagram

3.2 Provisioning

This section identifies the provisioning of hardware for the Link 16 #2 Mobile Ground Station with the goal of minimizing system downtime. One way to accomplish this is through appropriate provisioning of Line Replaceable Units (LRU) and Subassembly Repairable Units (SRU), see Appendix B of this ELP. Over time, high failure and critical items can be identified and the spares list adjusted accordingly.

3.2.1 Spares Identification

The developer is responsible for identifying the initial spares required for operation and maintenance of the system. Additionally, a recommended critical spares list will be developed identifying those assets that have the potential to impact system operation. Recommended spares will be based on the maintenance concept outlined in paragraph 3.10 of this document. This will include those peculiar items determined to be critical but not scheduled to be on hand. The code for critical need components will be:

- | | |
|------|---|
| Code | <ol style="list-style-type: none">1 Major impact to system operational capabilities; i.e., the system is not capable of performing its primary mission.2 Intermediate impact on the system involving more than one resource; i.e., the overall system performance is degraded but the primary mission can still be accomplished.3 Minor impact to system operational capabilities; i.e., nuisance problems. |
|------|---|

3.2.2 Considerations

- a. For future provisioning plans, special attention must be given to system design changes that may impact equipment interchangeability and adversely impact future system enhancements.
- b. The recommended spares, based on the criticality of a component to the system, are included in Appendix B. These recommendations are based upon criticality and actual repair analysis data, when applicable. The criticality legend on Appendix B's page one repeats the criticality codes defined in paragraph 3.2.1 and is assigned to each of the components on the spares list. Components listed with the lowest criticality code number are considered the highest priority for spares.

3.3 Documentation

Technical data is information for engineers and technicians to use in managing, supporting, operating, and maintaining the Link 16 #2 Mobile Ground Station. All documentation is located in the Link 16 #2 Mobile Ground Station training manual.

3.3.1 Technical Documentation

- a. A list of the technical publications is provided in Appendix C. It includes a list of hardware/software manuals, developed software media (if applicable), and technical documentation. Some of the documentation is hardcopy, while others are in electronic format with the goal of providing all documentation in an electronic format.
- b. The Owner is responsible for any documents on concept of operation and engineering drawings related to facility site preparation, floor plans, wiring and cable plans, etc.
- c. The Developer is responsible for performing validation and verification of all technical publications submitted by the contractors, if applicable. The Developer is also responsible for providing all documentation necessary to operate and maintain the system.
- d. A joint effort between the Developer and Owner will be required to develop and distribute preventive maintenance inspection procedures for the system, as applicable.

3.3.2 Engineering Data

The Developer is responsible for all engineering drawings and associated lists, specifications, and other documentation required to be representative of the system. Upon completion of commissioning, the complete drawing package shall be turned over to the customer.

3.4 Training

Training will consist of instruction to operators, maintainers, and users and will cover hardware, software, and interfaces. The training objectives will be identified by the Developer and should include skills, experience, and the level of training required. Training will be provided on an as required basis utilizing both in a formal classroom instruction and on-the-job training. A Link 16 Systems basic course is offered by both Northrop Grumman IT and Technology Training Corporation. Also, Understanding Link 16 (Air Force Version) published by Northrop Grumman IT, is available in the Technical Library, Bldg. 1400.

Training which has been accomplished prior to transition and turnover will be documented in Appendix D.

3.5 Configuration Management

Configuration Management (CM) ensures system configuration, hardware and software, are established (baseline), documented accurately, kept up-to-date, and changed only by following approved configuration change procedures. The configuration baseline at turnover is reflected in Appendix A. Before system commissioning, the developer is responsible for configuration management, after commissioning, the owning organization is responsible for configuration management.

There are four activities associated with CM. These activities are summarized below:

- a. Identification - Specifies what equipment item/components, i.e. configuration item (CI), will be tracked for configuration purposes.
- b. Control - Baselines the functional and physical characteristics of the system (form, fit, function or interface) and does not allow changes to the baselines without following approved configuration control procedures.
- c. Status Accounting - Maintains an up-to-date database of CI.
- d. Audits - Performs physical and functional verifications of the system configuration.

3.5.1 Changes to System Configuration after Turnover

Any hardware engineering change, field change, or any other change to the commissioned systems baseline that affects form, fit, function or interface of the system must be brought to the Configuration Control Board (CCB) prior to implementation.

3.5.2 Commercial Off the Shelf Software

- a. Any licenses for commercial off the shelf (COTS) software that have been obtained by the Developer will be passed on to the Owner during transition and turnover.

- b. All changes to the system software baseline and modifications to COTS software should be processed through the Range Division Software Review Board in accordance with their procedures and the CM Plan.

3.6 Property Transfer

This section describes how the equipment, materials, documentation and spares are transferred after commissioning has been achieved. The transfer takes place between the Developer and Owner.

3.6.1 Transfer of Accountability

All Link 16 #2 Mobile Ground Station equipment, materials, documentation, and spares are part of the Project Office account. At the completion of FOC a DD Form 1149, *Requisition and Invoice/Shipping Document*, should be used to transfer all equipment, materials, documentation and spares to the Owner. The property transfer will occur via a full inventory and audit to verify all items listed in Appendix A. The Project Office, Developer, and Owner along with the appointed Custodian should witness this audit. A listing of property to be transferred is provided in Appendix A. Upon completion of the transfer, the Owner will accept responsibility for all the equipment integrated with the system.

3.6.2 Property Management

Items, once transitioned via DD Form 1149, *Requisition and Invoice/Shipping Document*, will be managed in accordance with appropriate AFFTC property management procedures. Equipment control will need to be established for all accountable equipment assigned in Appendix A.

3.7 Site Preparation

Site preparation is essential to ensure the system can safely be installed, operated, and maintained in its required van. Modification or repairs to existing facilities may be necessary to accommodate physical, mechanical, electrical and personnel requirements of the systems. Any van preparation required should be a joint effort between the Developer and Owner. Any known discrepancies at the time of transition and turnover will be annotated on the Commissioning Certificate.

3.8 Acceptance Test

The acceptance test is to demonstrate that hardware, software and associated interfaces meet all contractual requirements for the Link 16 #2 Mobile Ground Station. Successful completion of these tests signifies the developed system is ready for testing in an operational environment (Operational Certification).

3.8.1 Test and Evaluation

The Acceptance Test Procedures (ATP) will demonstrate the Link 16 #2 Mobile Ground Station integrated software and hardware meet all system requirements as identified in the system functional and allocated baselines.

3.8.2 Acceptance Test Procedures

The Developer is responsible for preparing the ATP for the Link 16 #2 Mobile Ground Station. In an effort to minimize the need for additional operational certification testing, the Owner should participate in the development of the ATP. The ATP will be conducted and performed by the Link 16 #2 Mobile Ground Station Developer. The Developer, 412 TW/DRT Quality Assurance, and others as required

should be present at all testing to perform an independent verification function. See Appendix F for a copy of the ATP and test results.

The on-site ATP will focus on the whole Link 16 #2 Mobile Ground Station from the antenna to the data communications system. Personnel from Developer, Owner, and 412 TW/DRT organizations will be present to witness these tests. Signatures of the key players will be captured on the ATP and on the Commissioning Certificate. Full Operational Capability will be awarded when the ATP has been successfully completed, training is complete, and this document has been delivered.

3.9 Operational Certification

Operational certification verifies the performance of system hardware, software, and associated interfaces in an operational environment and is the responsibility of the Owner.

This test should give an accurate assessment of the operational effectiveness and suitability of the systems. Operational certification ensures the system will satisfy the requirements of the end users.

The Owner should participate in the development and review of the ATP prior to formal Acceptance Testing. In cases where it is cost effective and time efficient, the Owner may request combined Acceptance and Operational Certification Testing. The combined testing should be accomplished using the Owners operational personnel and in accordance with the Developer's and the governments quality assurance acceptance test procedures.

3.10 Maintenance Planning

The Owners O&M function will be responsible for the maintenance of the Link 16 #2 Mobile Ground Station. The Developer will provide training and information on formal training, if applicable, to the 412 TW/ENRO, Range Division Operations Branch personnel.

Maintenance planning is the scheduling of maintenance on the Link 16 #2 Mobile Ground Station hardware, software, and trailer. Maintenance is needed to evaluate system performance and correct anomalies and/or failures. Maintenance ensures software and equipment readiness, reliability, and effective use. Maintenance planning is essential to providing an efficient cost effective maintainable system and defines what equipment will be maintained, how it will be maintained and who will perform the required maintenance. In addition, important issues to be considered are warranties and service agreements.

3.10.1 Maintenance Concepts

The two level maintenance concept, Organizational (O-Level) and Depot (D-Level), is normally used to maintain a system.

- a. Organizational maintenance is performed by the owner or contractor if the owner has contracted for this function. This normally will consist of unscheduled removal and replacement of failed components and preventive maintenance.
- b. Depot maintenance will normally be performed by the vendor providing the equipment/software and consists of overhaul, refurbishment, repair, and other work beyond the capabilities of the owner's maintenance personnel.

Cost benefit analysis by the owner should determine when or if D-level maintenance contracts should be entered into with the vendor. Commercial-off-the-Shelf software should be updated with the aid of the vendor.

3.10.2 Trailer

Organizational level maintenance conducted by the owner's O&M function consists of scheduled and unscheduled preventive maintenance. Periodic inspections should be scheduled and the JT3 LWC 942, Preventive Maintenance Work Cards, checklist utilized during these inspections. The owner's O&M function will be the point of contact for all maintenance activities associated with the trailer to include:

- a. Scheduling maintenance downtime
- b. Coordinating repairs
- c. Updating records to reflect changes to the baseline configuration

D-level maintenance conducted by the vendor consists of overhaul, refurbishment, and fabrication of structural parts and other work beyond the owner's maintenance personnel capability.

When the decision is made that the trailer requires D-level maintenance the equipment listed in Appendix A and the racks themselves should be removed, properly packaged in accordance with applicable documentation and stored appropriately until such time as the trailer is returned from D-level maintenance.

3.10.3 Maintenance Responsibilities

- a. The developer will provide all maintenance for the system prior to transition and turnover. After transition and turnover maintenance will be the responsibility of the owner. The major activities associated with O&M maintenance efforts will include:
 1. Management of equipment resources
 2. Preventive maintenance in accordance with the appropriate maintenance manuals.
 3. Coordinating the establishment of contract maintenance support.
 4. Determine spares requirements
 5. Define the strategies for vendor maintenance
- b. Administration and coordination of maintenance contracts and warranty support will be the responsibility of the owner. When approved, D-Level maintenance will be conducted through normal business channels.
- c. Any equipment shipped off site for repair or on loan should be managed in accordance with standard transfer and shipping procedures. It is recommended that if the equipment custodian is not the shipping party, a AF IMT 1297, *Temporary Issue Receipt*, be signed and remain on file until the equipment is returned or disposition instructions have been completed.
- d. See Appendix E for a table of which organization is responsible for the maintenance on the different equipment items.

3.10.4 Warranties

There no warranties in effect for any of the Link 16 #2 Mobile Ground Station equipment.

3.11 Safety and Security

Safety and security practices and procedures are vital to the success of this critical mission support system. Security procedures will be in place to prevent the loss of or inappropriate access to sensitive mission data. Any potential safety and security issues with the Link 16 #2 Mobile Ground Station must be identified as soon as recognized and resolved expeditiously.

3.11.1 Safety

The Developer will involve safety representatives from the owner's organization early in the logistics planning process. Safety surveys will be conducted to identify specific items that will require attention prior to system commissioning. The owner/custodian will develop and implement appropriate safety plans for operation and maintenance of the system.

A safety survey will be conducted jointly by the developer, owner, and 412 TW/DRT before commissioning to identify conditions that could possibly be hazardous to personnel operating or maintaining the systems.

An initial visual safety walkthrough of the trailer was performed by 412 TW/DRT and Developer personnel during PCA of the Link 16 #2 Mobile Ground Station. No defects were noted.

3.11.2 Security

The developer will, working with the appropriate security office, determine if a Department of Defense Information Technology Systems Certification and Accreditation Process (DITSCAP) or an Automated Information System Security Plan (AISSP) is required. When a DITSCAP or AISSP is required, it will be initiated as early as possible in the development process. If at FOC the developer and owner's security office have determined that either a DITSCAP or AISSP is required, then a letter from the owner's security office to that effect is required. This letter or other appropriate documents will be included with the commissioning certificate.

A DITSCAP was completed on the Link 16 #2 Mobile Ground Station resulting in a full accreditation and assigned accreditation control number OS0703F-001, 2 Jul 03.

3.12 Commissioning

See Appendix F for a copy of the AFFTC IMT 5001, *Subsystem/System Test Verification and Commissioning Certificate*, for the Link 16 #2 Mobile Ground Station. See Attachment 1 for a copy of the Conditional Commissioning ELP and Commissioning Certificates.

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APPENDIX A: Equipment List

This appendix consists of the hardware prime mission equipment (PME) inventory, and software PME inventory. The hardware inventory identifies Link 16 #2 Mobile Ground Station components included in this transition and turnover.

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Table A1 Hardware List

Name	Serial Number	Part Number	Version Number	Manufacturer
MIDS LVT3	0816	P600A075-32		BAE
Remote Power Supply	D897	PP-8477/USQ-(V)(C)		BAE
JTIDS Shipboard Antenna	A192	AS-4400		SPAWAR Systems Center
Frequency Converter	350	80-17005-6	PS-94-444-17	Unitron
GPS Receiver	G1166	XE-1 C		TrueTime
UHF/VHF Radio	F1129	01-P36744M 001	URC 200	Motorola
Notch Filter	192	22/61 F	REV. H	RS Microwave Company Inc.
Dummy Load	MT443	428		MCE/Weinshel
Blower Motor	00263373	0101 R X		AMETEK
17" Monitor Rack #2	MX02Y3114760539IDOMT	703F		Dell
17" Monitor Rack #3	MX02Y3114760539IDY 3	1703FP		Dell
1553 Data Bus Analyzer PCI Card installed PC Rack #2	72903	ASF-PCI-1	REV.H VER. 401	SBS Technologies
1553 Data Bus Analyzer PCI Card installed PC Rack #3	2000146	PASS-PCI-1	REV. G VER. 101	SBS Technologies
Desktop PC Rack #2	4FHCS11	DHM	1.8GHz P4	Dell
Desktop PC Rack #3	5FHC511	DHM	1.8GHz P4	Dell
Keyboard / Trackball Rack #2		70-180-10		ELMA
Keyboard / Trackball Rack #3		70-180-10		ELMA
Drive Bay	NI723K2929	500349		Digital Storage Works

Table A2 Commercial Software

Name	Serial Number	Part Number	Version Number	Manufacturer
Windows 2000 Professional service pack 2				Microsoft
PASS 3200			3.00	SBS

Table A3 Developed Government Software

Name	Serial Number	Part Number	Version Number	Manufacturer
Scalable Data Link Processor			192	BAE, maintained by Navy SPAWAR
Data Link Analysis			4.0	BAE

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APPENDIX B: Critical Need Components

This appendix identifies support components available to the Owner from secondary sources when a mission critical-need arises. Also, this appendix includes component criticality rating, description, line replaceable unit/shop replaceable unit (LRU/SRU) type,

Criticality Legend

- | | | |
|------|---|--|
| Code | 1 | Major impact to system operational capabilities; i.e., the system is not capable of performing its primary mission. |
| | 2 | Intermediate impact involving more than 1 workstation; i.e., the overall system performance is degraded but the primary mission can still be accomplished. |
| | 3 | Minor impact to system operational capabilities; i.e., nuisances. |

Without equipment warranties, the following list of critical spares should be considered essential to minimize the impact of system down time.

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Table B1 Critical Components

Name	Part Number	Version Number	Cost (\$K)	Criticality Code	Spares on Hand	Manufacturer
MIDS LVT3	P600A075		200	1		BAE
Remote Power Supply	PP-8477/USD-140 (V)(C)		Included With MIDS	1		BAE
JTIDS Shipboard Antenna	AS-4400		8.6	1		SPAWAR Systems Center
Frequency Converter	80-17005-6	PS-94-444-6	11.5	1		Unitron
GPS Receiver	151-602	XL-DC	4	3		TrueTime
UHF/VHF Radio	01-36744M001	URC 200	17.1	2		Motorola
Rack UPS	GXT2000RT-120B		1.2	3		Liebert
Notch Filter	22761-2F	REV. H	3.3			RS Microwave Company Inc.
Dummy Load	F1428			3		MCE/Weinshel
Blower Motor	010102 X6					AMETEK
1553 Data Bus Analyzer PCI Card installed PC Rack 2	ASF-PCI-1	REV. H VER. 1	15	1		SBS Technologies
1553 Data Bus Analyzer PCI Card Installed PC Rack 3	PASS-PCI-1	REV. G VER. 101	15	1		SBS Technologies
19" Monitor	M991		0.25	1		Dell
Desktop PC	DHM	1.8GHz P4	1	1		Dell

APPENDIX C: Technical Documentation

This appendix identifies Vendor and Developer technical manuals, developed software media, and additional technical documentation. It also provides various drawings and plans associated with the system.

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Table C1 Technical Documentation

Equipment Name	Document Name	Document Number	Version Number	Hard/ Soft Copy	Manufacturer
MIDS LVT3	Interface Control Document For Fighter Data Link	IF76301A328A5068	Rev. A	Both	Boeing
Remote Power Supply	Interface Control Document For Fighter Data Link	IF76301A328A5068	Rev. A	Both	Boeing
JTIDS Shipboard Antenna	Operational and Maintenance Instructions For AS-4400/URC JTIDS Shipboard Antenna	2804	Rev. 1 May 2001	Both	SPAWAR Systems Center
Frequency Converter	Installation and Operation Manual For Model PS-94-444-6 Solid State Frequency Converter P/N 80-17005-6		March 2001	Hard	Unitron
GPS Receiver	Model 151-602 XL-DC Time and Frequency Reciever	XLDCM-N	Rev. E	Hard	TrueTime
Dummy Load					MCE/Weinshel
Blower Motor					AMETEK
19" Monitor					Dell
UHF/VHF Radio	Operations and Maintenance Manual URC-200 Lightweight UHF/VHF Transceiver	68-P36745M	Change 8, March 1999	Hard	Motorola

The following is a list of applicable Link 16 Trailer #2 Engineering Drawings.

Table C1 Technical Drawings

Drawing	Drawing Number
Support Trailer Layout Drawing	EDTLK161FP00001
Rack Elevation Drawing	EDTLK161FE00001

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APPENDIX D: Training

The attached training list for the Link 16 #2 Mobile Ground Station is developed to document the training provided to personnel and to identify recommended training and the available sources.

Course: Future Military Data Links Seminar
Source(s): Technology Training Corporation
1960 East Grand Ave, Suite 1225 Los Angeles, California USA 90245
Phone: (310) 555-1223 Fax: (310) 555-1220

Course: Introduction to Link-16
Instructor: Snow White
Source(s): Dynamics Research Corp.

Attendees: Grumpy Dwarf

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APPENDIX E: Maintenance Planning

The table below lists the major systems for the Link 16 #2 Mobile Ground Station and organizations responsible for maintenance.

System	Organizational Level	Depot Level	Warranty	Service Agreement
Link 16 System	JT3 O&M	BAE	N/A	N/A
Computer Systems	BASE IT	DELL	N/A	N/A
Trailer	JT3 AGE	N/A	N/A	N/A
Developed Software	JT3	N/A	N/A	N/A

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APPENDIX F: Commissioning Certificate

The attached commissioning certificate(s) will finalize the formal transfer of management responsibility for the Link 16 #2 Mobile Ground Station from the developing organization to the owning organization. It includes copies of the completed Acceptance Test Procedures.

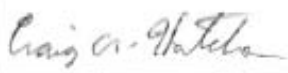
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SUBSYSTEM/SYSTEM TEST VERIFICATION AND COMMISSIONING				DATE 16 Feb 05	LOG NUMBER 005-001
1. TEST PLAN CERTIFICATION		2. LOCATION		3. SYSTEM	
SOFTWARE VERSION N/A		Link 16 Trailer #2		Link 16 #2 Mobile Station	
TEST PLAN ID N/A					
4. SUBSYSTEM N/A		5. TASK NUMBER N/A	6. JON NUMBER N/A	7. CONTRACT NUMBER N/A	
8. FACILITIES, SITES, LINKS AND/OR INTERFACES COMPRISING THE SYSTEM AND UTILIZED IN TESTING					
All system equipment is located in Link 16 Trailer #2					
9. NARRATIVE SUMMARY OF RESULTS					
The Link 16 Trailer # 2 Acceptance Test was conducted on 2,9 and 10 July 03. Members of the Test Team included representatives from 412 TW/ENTR and 412 TW/DRT with the individual names listed below as part of the test certification. This is a conditional Commissioning Certificate to provide the opportunity for the completion of operational testing and support of F-22 Flight Test. On 9 and 10 July limited testing to demonstrate functionality of additional F-22 specific hardware was performed. Full operational testing requires the system to enter a network with an aircraft and another ground station.					
10. TEST CERTIFICATION					
The subject subsystem/system has been tested in accordance with the approved Acceptance Test Plan/Specification. The undersigned verify that the test was conducted as prescribed and the results are as indicated above. Exceptions are listed on the reverse of this form.					
ORGANIZATION	DATE	RANK, GRADE OR TITLE		SIGNATURE	
		Certificate Number 03-006			

11. EXCEPTIONS (Continue on page 3 if necessary)				
DISCREPANCIES	DESCRIPTION	RESPONSIBLE ACTIVITY	DATE CORRECTED	INITIALS

12. COMMISSIONING CERTIFICATION			
1. All exceptions listed above have been corrected. 2. The subsystem/system meets all operational requirements. 3. Complete logistics and operational support is available. 4. Completion of this certificate effects the formal commissioning of the subsystem/system as of the above date.			
ORGANIZATION	DATE	RANK, GRADE OR TITLE	SIGNATURE
412 TW/DRP	14 Feb 05	CRAIG HATCHER Project Manager	
412 TW/ENRO	17 Feb 05	STEVEN G. CRONK Chief, Range Operations Branch	
412 TW/ENR	17 Feb 05	TIMOTHY A. CHALFANT Chief, Range Division	
412 TW/DRP(ACQ)	16 Feb 05	GARY G. JOHNSON Acquisition Portfolio Manager	

DISCREPANCIES	DESCRIPTION	RESPONSIBLE ACTIVITY	DATE CORRECTED	INITIALS

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APPENDIX G: LIST OF ACRONYMS

<u>Abbreviation</u>	<u>Definition</u>
AFFTC	Air Force Flight Test Center
AISSP	Automated Information System Security Plan
ATP	Acceptance Test Plan
CCB	Configuration Control Board
CI	Configuration Item
CM	Configuration Management
COTS	Commercial Off The Shelf
CSCI	Computer Software Configuration Item
DITSCAP	DOD Information Technology Systems Certification and Accreditation Process
DoD	Department of Defense
ELP	Engineering Logistics Plan
ELPWG	Engineering Logistics Plan Working Group
FOC	Full Operational Capability
GPS	Global Positioning System
HVAC	Heating, Ventilation and Air Conditioning
HWCI	Hardware Configuration Item
JTIDS	Joint Tactical Information Distribution System
LRU	Line Replaceable Unit
LVT	Low Volume Terminal
MIDS	Multi-Functional Information Distribution System
O&M	Operations and Maintenance
OPF	Operational Flight Program
PC	Personal Computer
PME	Prime Mission Equipment
POC	Point of Contact
RELNAV	Relative Navigation
RF	Radio Frequency
SRU	Subassembly Repairable Unit
TRANSITION AND TURNOVER	transition and turnover
TSPI	time space positioning information
UPS	Uninterruptible Power Supply

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Sample

APPENDIX I – LIST OF ABBREVIATIONS, ACRONYMS AND SYMBOLS

<u>Abbreviations</u>	<u>Definition</u>
AFFTC	Air Force Flight Test Center
AISSP	Automated Information System Security Plan
ATP	Acceptance Test Plan
CM	Configuration management
DIACAP	Department of Defense Information Assurance Certification and Accreditation Process
DITSCAP	Department of Defense Information Technology Systems Certification and Accreditation Process
ELP	Engineering Logistics Plan
ELPWG	Engineering Logistics Plan Working Group
FOC	Full Operational Capability
IMT	Information Management Tool
IOC	Initial Operationally Capability
LRU	line replaceable unit
O&M	operations and maintenance
SRU	shop replaceable unit
O-level	Organizational Level Maintenance
I-level	Intermediate Level Maintenance
D-level	Depot Level Maintenance