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Data Link Processor (DLP) Project Transition Plan

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April 1990

DOT/FAA/CT-TN89/68

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16. Abstract

The provision for two-way communication with aircraft, via a digital data link, has long been considered a means of providing significant enhancements for safe and efficient flight operations. The Data Link Processor (DLP) currently being tested will initially perform the ground-based data link processing functions necessary to provide appropriately equipped aircraft with pilot requested aviation weather data from a National Weather Data Base via the Mode Select Beacon System (Mode S). The weather data base will contain six products: Surface Observations (SA), Terminal Forecasts (FT), Pilot Reports (UA), Wind and Temperature Aloft Forecasts (FD), Radar Summaries (SD), and Hazardous Weather Advisories.

The DLP Project Transition Plan presents those activities and the organizations that are responsible to effect the transition of the DLP into the Federal Aviation Administration (FAA) Technical Center. This plan identifies the functional interfaces, equipment description, testing, training, and logistics support necessary for an orderly transition at the FAA Technical Center.

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TABLE OF CONTENTS

		Page
1.	INTRODUCTION	1
	1.1 Purpose	1
	1.2 Scope	1
	1.3 Project Management	1
2.	PROJECT CHARACTERISTICS	4
	2.1 Background	4
	2.2 Functional Description	5
	2.3 Interfaces	5
	2.4 Equipment Description	8
3.	PROJECT SCHEDULE AND STATUS	11
	3.1 General	11
4.	SITE PREPARATION AND PROJECT INSTALLATION	11
	4.1 General	11
	4.2 Site Preparation and Installation Responsibilities	11
5.	PROJECT TESTING	12
	5.1 General	12
	5.2 Testing Responsibilities	13
	5.3 System Acceptance at the FAA Technical Center	13
6.	SYSTEM MAINTENANCE AND SUSTAINED OPERATIONS	14
	6.1 General	14
	6.2 System Maintenance and Sustained Operation Responsibilities	14
7.	TRAINING	14
	7.1 General	14
8.	LOGISTICS SUPPORT	15
	8.1 General	15
	8.2 Special Test Tools and Equipment	15
	8.3 Supply Support	15
	8.4 Contractor Data and Technical Manuals	15
9.	DATA LINK PROCESSOR ISSUES	15
10.	ACRONYMS, ABBREVIATIONS, AND DEFINITIONS	15

LIST OF ILLUSTRATIONS

Figure		Page
2.2-1	Data Link Processor System Functional Diagram	6
2.4-1	FAA Technical Center DLP Equipment Footprint	9

LIST OF TABLES

Table		Page
1.3-1	Data Link Processor Personnel Contact List	3
2.4-1	Data Link Processor Equipment Characteristics	10

1. INTRODUCTION.

1.1 PURPOSE.

The purpose of this document is to provide the necessary information required to support facility modifications at the Federal Aviation Administration (FAA) Technical Center for implementation of the Data Link Processor (DLP) project. This information is used to ensure that the DLP implementation at the FAA Technical Center is successful.

1.2 SCOPE.

Project Transition Plans (PTP) present the planning methodology required to assure the orderly and integrated transition of the FAA Technical Center facility for the implementation of individual National Airspace System (NAS) projects.

The FAA NAS Plan for Facilities, Equipment, and Associated Development presents a comprehensive approach to the modernization and improvement of air traffic control (ATC) equipment and airway facilities (AF) services through the 1990s. Project No. 3-05, Aeronautical Data Link (ADL) includes the DLP project. The DLP project will provide pilots with unrestricted access to current weather information.

This plan encompasses the transition of the DLP hardware into the FAA Technical Center Flight Service and Weather Laboratory. It is intended to provide critical information necessary to support this transition, with a minimum of extraneous or redundant information found in other documentation. Project specific information is addressed in the areas of management responsibilities, equipment description, environmental requirements, system interfaces, scheduling, site preparation, testing, training, logistics support, and project transition issues.

1.3 PROJECT MANAGEMENT.

This section defines the organizational roles and responsibilities for implementation of the DLP project at the FAA Technical Center. The overall program management of the DLP is under the auspices of ASA-240. Other major responsibilities are as follows:

Technical Officer. Ron Jones (ASA-240) is the DLP project manager and hardware Contracting Officer Technical Representative (COTR).

Contracting Officer. The ALG-320 designated Contracting Officer (CO) will perform all hardware contract administration and management activities. The ACM-510 designated CO will perform all software contract administration and management activities.

Quality Reliability Officer. The Quality Reliability Officer (QRO) designated by ALG-400 is responsible for quality assurance on the hardware contract.

Contract Officer Technical Representatives. The Contract Officer Technical Representatives (COTRs) (Ron Jones for hardware, Gary Morfitt for software, and Terry Farnstrom for training) will coordinate all contract activities and are responsible for acceptance of all contract deliverables.

Technical Lead. The systems engineering and integration (SEI) Technical Lead designated by ASA-240 is Dennis Weed. He supports the three DLP COTRs in fulfilling their assignments.

ASA-240 Responsibilities:

The ASA-240 Program Office has overall project management, service procurement, configuration management, and hardware acceptance responsibilities.

ACN-220 Responsibilities:

Responsibilities of ACN-220 are to:

a. Monitor development of DLP software,

b. Appoint a test director,

c. Develop the NAS Integration Test Plan (ITP) and Test Procedures,

d. Conduct NAS Integration Test & Evaluation (IT&E) at the FAA Technical Center and first operational site,

f. Deliver the DLP application software to operational sites.

ACN-320 Responsibilities:

ACN-320 is responsible for overall coordination and acceptance of FAA Technical Center site preparation work. This includes Heating, Ventilation, and Air Conditioning (HVAC), power and spatial requirements, engineering services for change order submittal, review of site survey reports, maintenance of accepted systems, configuration control, and monitoring contractor's installation.

ASM-400 Responsibilities:

a. Appoint a test manager for Shakedown Test and Evaluation (ST&E),

b. Develop the ST&E Plans and Procedures (PP) in coordination with the appropriate AF/Air Traffic (AT) elements,

c. Validate the ST&E PP at the FAA Technical Center and the first operational site,

d. Conduct ST&E at the FAA Technical Center and first operational site,

e. Provide approved ST&E PP to all sites for their ST&E,

f. Support the regions during ST&E of DLP sites,

g. Modify FAA Order 6040.15A, National Airspace Performance Reporting, to reflect the DLP as a reportable system,

h. Process daily downtime and maintenance action information through National Airspace Performance Reporting System (NAPRS),

i. Maintain the configuration of the DLP software, hardware, and system documentation after acceptance by the government,

j. Provide field support for all DLP system following acceptance by the government.

A list of personnel assigned to the Data Link Processor project is provided in table 1.3-1.

Table 1.3-1. DATA LINK PROCESSOR PERSONNEL CONTACT LIST

Organization	Name	Telephone FTS Number	Function
FAA:			
Technical Center			
ACN-220	Gary Morfitt	482-5972	Software Contract COTR
ACM-510E	Harriet Lashley	482-6121	Contract Officer-Software
ACN-220	Abby Lew	482-5046	Software Engineer
ACN-220	Norm Watts	482-4174	Integration Test Engineer
ACN-321	Art Holmes	482-4374	Facilities Engineer
ASM-420	Don Shawyer	482-6503	Shakedown Test Lead
ASM-420	Art Oliver	482-5042	Shakedown Test Hardware
ASM-420	Letitia Peters	482-4251	Shakedown Test Software
Headquarters			
ASA-240	Ron Jones	267-8655	Project Manager
ALG-320	De Lynn Farris	267-3637	Contract Officer-Hardware
SEI:			
Technical Center Operations			
	Noel Doucett	482-4477	Project Support
	Larry Pugh	482-5047	Project Support
	Lewis Merkel	482-5607	Planning/Scheduling
Washington, DC			
	Dennis Weed	967-5684	Technical Lead
	Julie Wong	967-2188	Software Engineer
	Paul Klein	967-5909	Hardware Engineer
	Monty Montcalm	967-2022	Installation & Test
	Carol Newman	967-5048	Training

2. PROJECT CHARACTERISTICS.

2.1 BACKGROUND.

The DLP project is an integral part of the FAA's NAS Plan for upgrading of air traffic facilities. The NAS Plan was first established in January 1982 to provide continuing improvement and modernization of the nation's ATC and airway flight services to accommodate increasing numbers of aircraft and aircraft operations.

The DLP program office developed an acquisition strategy to meet requirements based on design-to-cost, schedule, and risk objectives. This approach entails FAA headquarters procurement of commercial off-the-shelf (COTS) hardware on a competitive basis in parallel with the FAA Technical Center procurement of operational software. This approach significantly accelerates the deployment of the DLP over turnkey acquisitions.

The Operational requirements for the DLP were established in the Weather Communications Processor (WCP) Functional Requirements Memorandum (ESFR-WCP/1-85 W-110). Consistent with the procurement approach, the hardware and software requirements were separated into two specifications. The WCP Hardware Specification (FAA-E-2794a) defines the initial state hardware and support software (i.e., operating system, compiler, and system utilities) performance requirements, as well as physical characteristics, maintenance training, documentation, and quality assurance provisions of the DLP hardware and support software. The WCP Software Segment Specification (FAA-OR-2802a) establishes system level functional requirements for WCP application software. This specification references the DLP Weather Data Processing and Retrieval Requirements (FAA-W48-094) document and specifies requirements for processing and storage of weather products within the DLP.

The DLP has been procured through two separate contracts, one for hardware and one for software. The hardware contract was awarded to CONTEL ASC of McClean, VA, on July 13, 1988; while the software contract was awarded to ARCON Corporation of Waltham, MA, on February 8, 1988. Application software for the DLP is being developed by ARCON Corporation under the direction of ACN-220.

Twenty-four DLP systems were procured on this contract. These will be installed at the 20 Air Route Traffic Control Center (ARTCC) sites, Alaska, Hawaii, the FAA Technical Center, and the FAA Academy. The first system was installed at the software contractor's facility in Waltham, MA. This system will be maintained by the hardware contractor during ARCON's software development. At the end of ARCON's software development contract, the system will be relocated to the FAA Technical Center where it will be used by ASM-400 for software maintenance and field support.

The second and third DLP systems were installed at the FAA Technical Center. The second system will initially be used for FAA OT&E. The third system will initially be used for Research and Development (R&D) purposes. Equipment was installed and is being tested at the FAA Technical Center to ensure that the required levels of performance and reliability will be achieved prior to implementation in the field. These two systems will be removed from the FAA Technical Center and installed at Anchorage and Honolulu once the Mode Select Beacon System (Mode S) is accepted from the contractor at those sites.

2.2 FUNCTIONAL DESCRIPTION.

The Data Link Processor is designed to serve as a communications node for the Mode S/Data Link that would reduce the amount of data currently communicated by the ATC. In the present system, current weather information is provided to pilots by flight specialists and ATCs on a time-available basis. The DLP will provide pilots with direct access to weather products in local weather data bases via the Mode S data link.

The principal function of the DLP is to supply pilots with the requested weather information. The DLP must function in an environment containing multiple aircraft whose pilots are simultaneously requesting weather information from the DLP. Those requests will be relayed through Mode S sensors to the DLP. The DLP must be capable of processing those requests and relaying the desired information through the appropriate Mode S sensor to the specific aircraft for which it is intended.

A DLP will be collocated in each ARTCC or Area Control Facility (ACF) and will serve as the initial communication/service processor providing weather information for the Mode S data link. The DLP will receive downlink requests from pilots for weather products via the Mode S data link, decode those requests, format the replies, and return them to pilots via the Mode S data link. This will improve the quality and timeliness of weather information available to the pilots by enabling direct pilot access to desired weather information, as well as reduce the workload on specialists and controllers who currently represent the only means of access to weather information.

In order to make timely response to pilot requests, the DLP maintains a local data base of selected weather products. This weather data base contains six products: (1) surface observations, (2) terminal forecasts, (3) pilot reports, (4) wind and temperature aloft forecasts, (5) radar summary, and (6) hazardous weather advisories.

A DLP System Functional Diagram is depicted in figure 2.2-1.

2.3 INTERFACES.

The DLP system interfaces to five of the FAA's external systems: (1) Mode S, (2) Weather Message switching Center (WMSC) which will be upgraded to the Weather Message Switching Center Replacement (WMSCR), (3) Automated Weather Observing System (AWOS), Data Acquisition System (ADAS), (4) Coded Time Source (CTS), and (5) the Maintenance Processor System (MPS). See figure 2.2-1 for a diagram of the external interfaces. The following paragraphs provide a brief description of these interfaces.

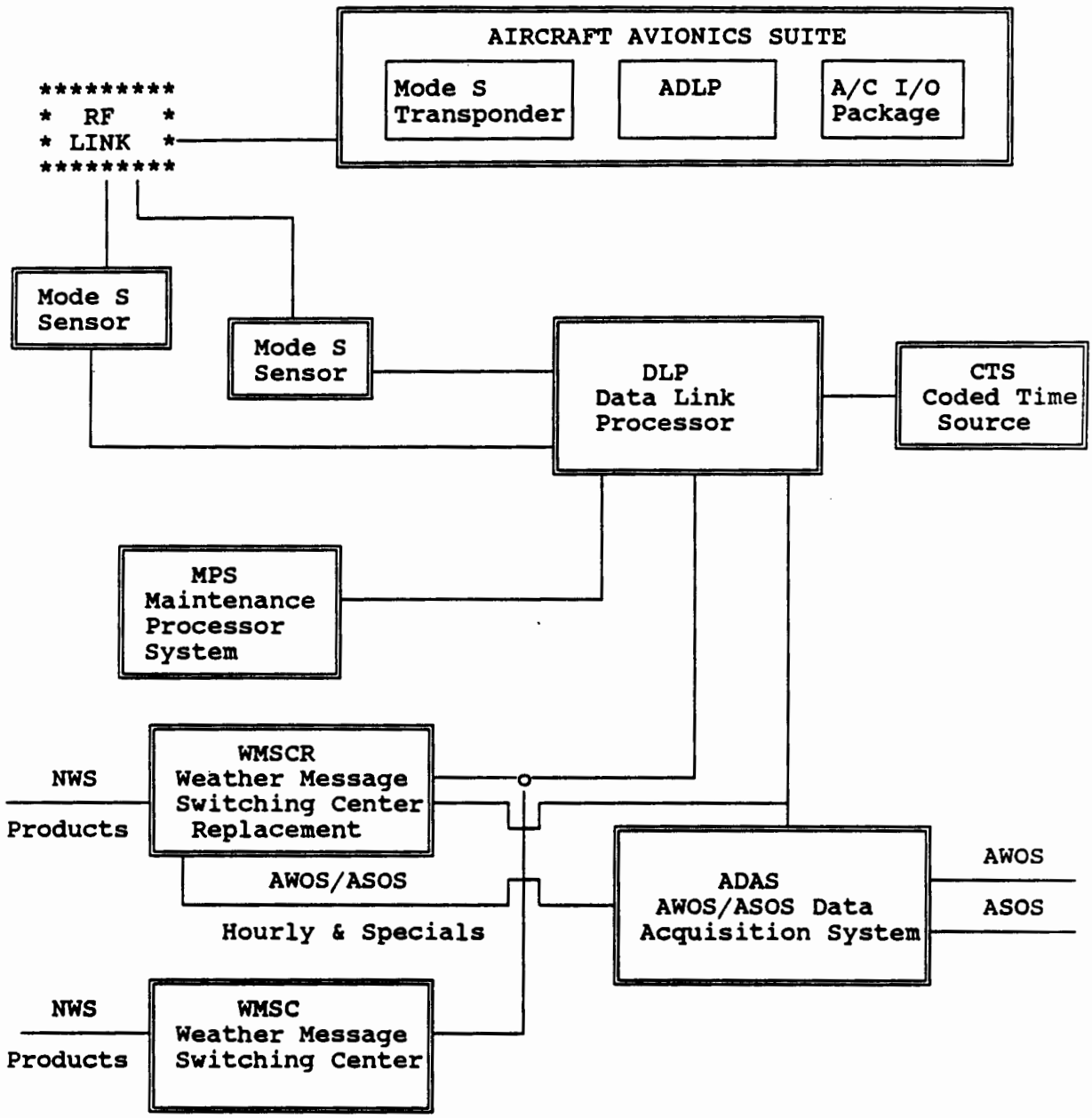


FIGURE 2.2-1. DATA LINK PROCESSOR SYSTEM FUNCTIONAL DIAGRAM

Mode S: The DLP interfaces with Mode S sensors (FAA-RD-80-14A) to receive requests for weather products from pilots and route responses for transmission. The physical interface permits synchronous operation at 9600 baud, with future data rates of 56K baud. Each operational DLP system will interface with up to 18 mode S sensors, providing coverage for an ARTCC region.

Build 1 testing, at the FAA Technical Center, will employ the use of the Data Link and Transponder Analysis System (DATAS). The DATAS is located on the second floor of the Technical and Administration (T&A) Building, column G12. This software can simulate up to six Mode S sensors transmitting data over six multipair cables running from the DATAS area to the DLP Laboratory. This system will be utilized through the completion of testing of build 2 currently scheduled for 1994.

WMSC: The WMSC interface supplies the DLP with alphanumeric weather products. These weather products and message formats are described in the Data Communications Handbook (FAA-HBK-7110.80A) and the Federal Meteorological Handbook 1. The interface to the WMSC uses X3.28 protocol and is in accordance with the WCP/WMSC Interface Control Document (ICD) (NAS-IC-25036403).

Stability testing at the FAA Technical Center will be conducted using live data from the Kansas City WMSC. This data will be received over dedicated telephone lines provided and maintained by ACE-426.

WMSCR: Once the WMSCR replaces the WMSC and becomes operational, the DLP will receive these same weather products from the WMSCR via the National Airspace Data Interchange Network (NADIN) PSN (NAS-IR-43020001). The DLP will interface to the WMSCR in accordance with the WMSCR to WCP Interface Requirements Document (IRD) (NAS-IR-25072503) and the WMSCR to WCP ICD (NAS-IC-25072503).

The MITRE-developed WMSCR emulator transmits over a dedicated telephone line provided by MITRE Washington to the DLP Laboratory. The emulator will transmit weather information over this line for build 1 testing.

ADAS: The DLP will receive automated, minute-by-minute surface observations from AWOS and the Automated Surface Observing System (ASOS), through ADAS via the NADIN PSN node (NAS-IR-43020001). Current ADAS provisions allow up to 137 automated sensors to be connected to a single ADAS (allowing the DLP to receive up to 137 separate surface observations each minute). The DLP will interface to the ADAS in accordance with the ADAS to WCP IRD (NAS-IR-25082503) and the WCP to ADAS ICD (NAS-IC-25082503).

An ADAS data line will be provided from the MITRE emulator in Washington, DC, to the DLP Laboratory. The MITRE ADAS simulator will transmit ADAS weather information for testing of build 1.

CTS: The DLP will interface with the Coded Time Source (CTS) in order to set and verify the accuracy of the DLP's internal system reference time source. The DLP will interface with the CTS in accordance with the CTS to CTS user's IRD (NAS-IR-9202000). The CTS is a part of the Advanced Automation System (AAS) and is independent of the DLP. Maintenance personnel will be able to set the DLP system clock manually when required.

ACN-300 installed a CTS antenna on the roof of the FAA Technical Center's T&A Building, along with a line terminated in the DLP Laboratory. This interface is required for the DLP to function.

MPS: The MPS interface permits remote monitoring of the DLP status/certification based on NAS-MD-790 modified to support Consultative Committee on International Telegraph and Telephone (CCITT) X.25 and will interface in accordance with the DLP to MPS ICD (NAS-IC-25035103). When requested by MPS, the DLP will provide certification data to the MPS, including the following messages:

a. current average response time,

b. current operational state of the DLP system,

c. current hardware status,

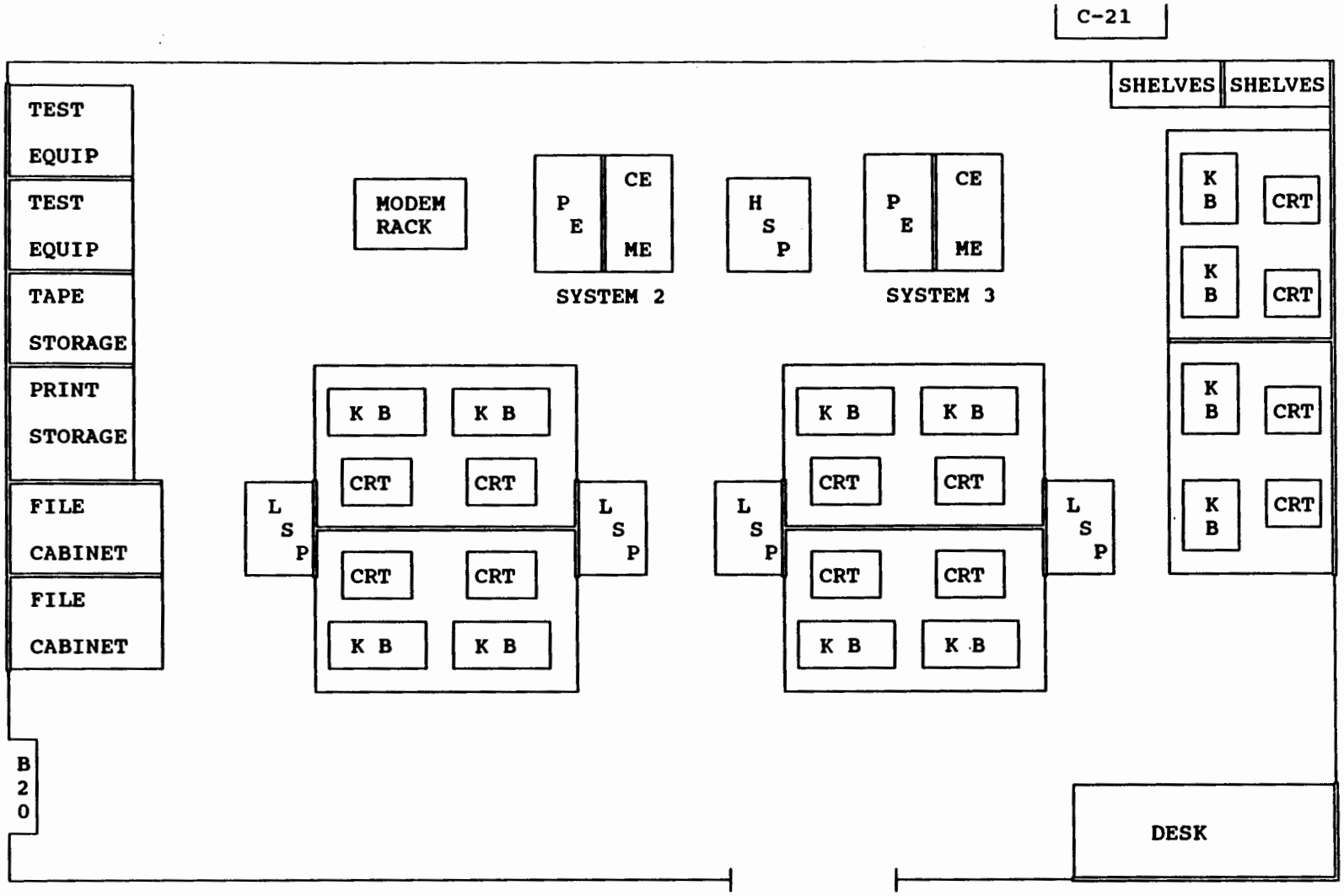
d. current status of communications ports, and

e. number of responses on which average response time is based.

The Remote Maintenance System (RMS) located within the DLP Sequoia system is connected by a full duplex data line to the MPS. The MPS is hosted on the TANDEM computer located within the Remote Maintenance Monitoring System (RMMS) Development Laboratory and will be maintained by ACN-300 after being field deployed.

2.4 EQUIPMENT DESCRIPTION:

The DLP project equipment is located in the Flight Service and Weather Laboratory of the Technical and Administration (T&A) Building on the second floor of the FAA Technical Center. Figure 2.4-1 presents an overall footprint of the DLP equipment. In this diagram, the DLP system is located between columns B-20 and C-21.



LEGEND: LSP = LOW SPEED PRINTER, HSP = HIGH SPEED PRINTER, K B = KEYBOARD,
P E = PROCESSOR ELEMENT, CE = COMMUNICATION ELEMENT, ME = MEMORY ELEMENT

FIGURE 2.4-1. FAA TECHNICAL CENTER DLP EQUIPMENT FOOTPRINT

The hardware contractor has provided COTS equipment for the DLP project. This equipment consisted of a Sequoia System/200 fault-tolerant computer system and associated peripherals. Two configurations of equipment have been installed: (1) an operational configuration for the ARTCCs, and (2) a support system configuration for the FAA Technical Center. Two system consoles are being supplied with both configurations, each consisting of a "Televideo" 965 Video Display Terminal (VDT) and a "Fujitsu" DL 5600 logging printer, which is slaved to the VDTs.

Each of the two configurations is fundamentally the same, except that the Support System Configuration includes five additional (VDTs) and one additional "Printronix" line printer.

The Sequoia System/200 is housed in two cabinets; one for the system equipment and one for the peripheral equipment. The System Cabinet contains four processing elements, two memory elements, two bus adapters, modular power supplies, fan and blower assemblies, and battery backup assembly. The bus adaptor is one of the components of the Input/Output (I/O) element. The multibus adaptor is the other component of the I/O element, but it is located in the Peripheral Cabinet. Each I/O element is connected by a dedicated Extender (E) bus.

The Peripheral Cabinet also contains six controllers that interconnect the System/200 to the external communication interfaces; two disk controllers; two Control Data Corporation (CDC) hard disk drives; one tape controller; one Cipher 19-inch tape drive assembly; a power supply, a battery backup, and an internal cooling fan. A Printronix high-speed line printer and a Kinemetrics Model 468-DC CTS, with antenna, are also provided.

Power, cooling, and spatial requirements for the DLP equipment at the FAA Technical Center are presented in table 2.5-1.

TABLE 2.4-1. DATA LINK PROCESSOR EQUIPMENT CHARACTERISTICS

Equipment	Dimensions (H x W x D)	Weight (LBS)	Volts/Amps	Heat Load (BTUH)
System Cabinet	70"x23"x42"	730	208/14	17,000
Peripheral Cabinet	70"x23"x43"	900	208/5	5,500
Tape Drive Unit	14"x17"x22"	100	120/	N/A
Disk Drive Unit	5"x 9"x22"	35	115/2.3	17,000
VDT Cabinet	14"x13"x14"	18	115/	N/A
VDT Keyboard	2"x18"x14"	3	115/	N/A
Logging Printer	8"x24"x15"	45	100-120 VAC	N/A
Line Printer	17"x30"x24"	185	120-140 VAC	N/A

3. PROJECT SCHEDULE AND STATUS.

3.1 GENERAL.

The DLP hardware contract was awarded in July 1988. The first hardware system was delivered to ARCON in July 1988. Equipment for the second system was delivered and installed in the T&A Building at the FAA Technical Center during June 1989. Equipment for the third system was delivered and installed during August 1989. The hardware for Systems 2 and 3 was accepted by the FAA after successful completion of the site acceptance tests.

Currently, the plan is to remove Systems 2 and 3 in 1994, and relocate System 1 from ARCON in 1995. This plan is being reviewed, as build 2 requirements are being considered, and therefore, subject to change.

Site preparation work for the DLP equipment was completed prior to those system deliveries.

	Scheduled Date	Actual Date
First hardware system delivered to ARCON	July 1988	July 1988
Second hardware system delivered to the Technical Center	June 6, 1989	June 6, 1989
Third hardware system delivered to the FAA Academy	August 7, 1989	August 7, 1989
Fifth hardware system to be delivered to the first operational site	October 23, 1990	

4. SITE PREPARATION AND PROJECT INSTALLATION.

4.1 GENERAL.

Site preparation activities were planned and scheduled to support the overall implementation of the DLPs while avoiding interference with ongoing support activities.

4.2 SITE PREPARATION AND INSTALLATION RESPONSIBILITIES.

Preparation of the DLP FAA Technical Center Laboratory for this project was the responsibility of the Hardware Engineering Branch (ACN-320). Their management and coordination activities (1) provided engineering services for change order submittal, (2) reviewed site survey reports, (3) coordinated site preparation work, and (4) accepted completed modifications to the facility.

CONTEL, the hardware contractor, was responsible for (1) site surveys and reports, (2) identifying any environmental and physical factors that would necessitate facility modifications, (3) preparing detailed plans, specifications, and equipment drawings to enable the FAA to prepare the site, and (4) making recommendations to the FAA for resolution of any problem during installation.

The DLP equipment was shipped by overland carrier. The contractor was responsible for delivery of contractor supplied equipment to the DLP FAA Technical Center Laboratory "in place." Any special handling equipment was provided by the contractor. The contractor unpacked all equipment for FAA inspection and inventoried this equipment against the master invoice.

The contractor performed Installation and Checkout (INCO) of the DLP in accordance with the INCO Plan Contract Deliverable Requirements List (CDRL), item D001. This plan described the efforts of the contractor from delivery of the equipment through completion of acceptance testing at the FAA Technical Center. Installation tasks place the equipment in its operational configuration. Checkout activities included adjustments for environmental control equipment and execution of functional and diagnostic tests which form the installation and checkout phase of site acceptance testing. Site Acceptance Tests include element tests, hardware subsystem tests, and hardware system tests. During the contractor's checkout activities, ACN-320 was responsible for ensuring that a site electrician and HVAC technician were available in the event of any environmental equipment failure.

The contractor was responsible for ensuring that the application of power would not cause damage to the DLP equipment. All switches and circuit breakers were examined for proper positions and the cooling system was checked for proper operation. Initial power-on checks demonstrated that all required functions were available, that current loads were as expected, and that the system was in a condition to permit the execution of diagnostic power.

At the completion of build 2 in 1994, there will only be one system remaining at the FAA Technical Center instead of two, freeing up 150 square feet.

5. PROJECT TESTING.

5.1 GENERAL.

The DLP project will undergo the following testing at the FAA Technical Center; INCO, OT&E/IT&E, and Shakedown.

INCO is the first stage of on-site testing that verifies system integrity prior to interfacing with external systems. It demonstrates that all required functions of the individual units are available, that current loads are as expected, that the system functions are available, and that all required items and documentation have been supplied and installed correctly. System Acceptance testing at the FAA Technical Center verifies that the DLP system satisfies the Hardware Requirements Specifications.

The OT&E/IT&E testing determines the stability and acceptability of the system to operate in a fully integrated DLP environment. Integration testing's primary focus is on the verification of all interfaces and interconnections between the DLP and

all other subsystems. The subsystems that interface to the DLP are Mode S, WMSC/WMSCR, ADAS, MPS, and CTS. Successful completion of Integration testing demonstrates that the requirements identified in the Test Verification Requirements Traceability Matrix (TVRTM) have been achieved.

OT&E/Shakedown testing is to determine the readiness of the system's operational hardware, software, procedures, and personnel in a simulated environment. The areas of the overall system level performance that are evaluated and verified during Shakedown testing are (1) maintenance training and procedures, (2) system support, (3) maintenance support, and, (4) the performance of the DLP hardware and software.

5.2 TESTING RESPONSIBILITIES.

	Test Conduct	Test Monitoring
Installation and Checkout	ASA-240/CONTEL	ASA-240/ASM-160
Operational/Integration	ACN-220	ACN-220/ASM-160
Operational/Shakedown	ASM-160	ACN-220

5.3 SYSTEM ACCEPTANCE AT THE FAA TECHNICAL CENTER.

With the successful completion of contractor conducted INCO, the FAA accepted the hardware systems at the FAA Technical Center from the hardware contractor. Formal acceptance of these systems by the FAA occurred during the System Acceptance Test Review (SATR).

When the Operational and Integration testing is successfully completed, the application software will be accepted from the software contractor. At this point, the entire combined systems will be subject to OT&E Shakedown testing.

When OT&E Shakedown testing is successfully completed by the FAA, the Deployment Readiness Review (DRR) will be conducted. This review is performed to determine if the DLP can perform the functions for which it was designed and if it can be deployed. Final acceptance of the system takes place after successful completion of Site Operational System Test (SOST) during which time the FAA certifies the DLP for NAS utilization.

	Responsibility
Accept hardware system/s from CONTEL after INCO.	ASA-240
Accept total system at completion of Integration testing.	ACN-220
Accept Configuration Management of the application software at completion of Shakedown testing.	ASM-400

6. SYSTEM MAINTENANCE AND SUSTAINED OPERATIONS.

6.1 GENERAL.

Provisions have been made for the contractors to provide technical maintenance support for the hardware and software, and an option is available for hardware maintenance support. The technical support period is for 1 year after successful completion of shakedown testing and system acceptance and is renewable for five 1-year periods at the discretion of the program office where the maintenance contract is currently being administered by ASA-240.

6.2 SYSTEM MAINTENANCE AND SUSTAINED OPERATION RESPONSIBILITIES.

Equipment maintenance for the DLP at the FAA Technical Center is the responsibility of the contractor until completion of Shakedown testing and acceptance of the system by the FAA.

ACN-300 will be responsible for hardware maintenance of the DLP equipment once the project has been accepted; system 2 is currently scheduled for September 1990. The contractor will provide technical maintenance support under provisions of the contract if the FAA accepts the hardware maintenance support option.

The contractor is responsible for maintenance of the DLP software until completion of Shakedown testing and acceptance of the system by the FAA. At that time, ASM-400 will assume responsibility for software maintenance.

7. TRAINING.

7.1 GENERAL.

Training is the responsibility of the two contractors associated with this contract.

The hardware contractor, CONTEL, provided training to the personnel of the FAA Technical Center (ASM-160 and ACN-220), ARCON (the software contractor) and the FAA Academy instructors on software development tools, operating system, and the delivered hardware. One class was conducted in October 1988.

Contel is scheduled beginning August 14, 1990, to provide two courses of training on the system hardware maintenance to personnel of the FAA Technical Center (ASM-160, ACN-220, and ACN-300), and the FAA Academy instructors.

ARCON will provide training at the beginning of September 1990, at the FAA Technical Center on the application software to ASM-160 and ACN-220 personnel and the FAA Academy instructors. CONTEL will also provide the FAA Academy instructors training on the operation/configuration of the operational software. The FAA Academy instructors will then train the FAA field maintenance personnel.

Additional information regarding training can be found in the Project Implementation Plan. Detailed descriptions of the training courses are provided in the Subsystem Training Plan for the Data Link Processor (Revision #4 dated 1/15/90).

8. LOGISTICS SUPPORT.

8.1 GENERAL.

The general philosophy for logistics support is defined in the National Airspace Integrated Logistics Support (NAILS) Master Plan. The NAILS plan for the DLP program details the logistics support for this project.

8.2 SPECIAL TEST TOOLS AND EQUIPMENT.

The hardware contractor was responsible for providing the required special test tools and test equipment. The contractor identified the required common tools and test equipment currently in the FAA inventory. The FAA delivered them to the FAA Technical Center.

8.3 SUPPLY SUPPORT.

The contractor was responsible for supplying all repair parts and spares during testing. Now that the systems have been accepted by the FAA, there will be two levels at which material and spare supplies required for support of the project will be stocked (i.e., FAA Technical Center and FAA Depot). The FAA Technical Center stock will consist of low cost, throwaway items; Line Replaceable Units (LRU), to be used for remove and replace maintenance efforts; and repair parts and expendable supplies for faulty LRU's authorized to be repaired by the work center. The FAA Depot will stock backup and safety stocks of work center authorized items and repair parts needed to support FAA Depot repair efforts. This information is best defined in CDRL E003 (Maintenance Support Plan) from CONTEL.

8.4 CONTRACTOR DATA AND TECHNICAL MANUALS.

Technical documentation required by the FAA from the contractors is detailed in the Statements Of Work for the DLP project. This information includes instruction books and computer manuals, project management data, design and specification documentation, training documents, provisioning technical documentation, and necessary engineering drawings and diagrams.

9. DATA LINK PROCESSOR ISSUES.

There are no outstanding issues for the DLP installation at the FAA Technical Center.

10. ACRONYMS, ABBREVIATIONS AND DEFINITIONS.

AAS	Advanced Automation System
ACF	Area Control Facility
ACN	Engineering Test and Evaluation Service Division
ADAS	AWOS Data Acquisition System
ADL	Aeronautical Data Link
AF	Airway Facilities

ALG	Acquisition and Material Service
APS	Program Engineering Service
ARTCC	Air Route Traffic Control Center
ASA	Advanced System Acquisition Service
ASM	Systems Maintenance Service
ASOS	Automated Surface Observing System
AT	Air Traffic
ATC	Air Traffic Control
AWOS	Automated Weather Observation System
CCITT	Consultative Committee on International Telegraph and Telephone
CDC	Control Data Corporation
CDRL	Contract Deliverable Requirement List
CO	Contracting Officer
COTR	Contracting Officer's Technical Representative
COTS	Commercial off-the-shelf
CTS	Coded Time Source
DATAS	Data Link and Transponder Analysis System
DLP	Data Link Processor
DRR	Deployment Readiness Review
E	Extender
FAA	Federal Aviation Administration
FD	Wind and Temperature Aloft Forecasts
FT	Terminal Forecasts
HVAC	Heating, Ventilation and Air Conditioning
ICD	Interface Control Document
INCO	Installation and Checkout
IRD	Interface Requirements Document
ITP	Integration Test Plan
I/O	Input/Output
IT&E	Integration Test and Evaluation
LRU	Line Replaceable Unit
MODE-S	Mode Select Beacon System
MPS	Maintenance Processor System
NADIN	National Airspace Data Interchange Network
NAILS	National Airspace Integrated Logistics Support
NAS	National Airspace System
NAPRS	National Airspace Performance Reporting System
OT&E	Operational Test and Evaluation
PP	Plans and Procedures
PTP	Project Transition Plan
QRO	Quality Reliability Officer

R&D	Research and Development
RMS	Remote Maintenance System
RMMS	Remote Maintenance Monitoring System
SA	Surface Observations
SD	Radar Summaries
SATR	System Acceptance Test Review
SEI	System Engineering Integration
SOST	Site Operational System Test
ST&E	System Test and Evaluation
T&A	Technical and Administration
TCO	Technical Center Operations
TVRTM	Test Verification Requirements Traceability Matrix
UA	Pilot Reports
VDT	Video Display Terminal
WCP	Weather Communication Processor
WMSC	Weather Message Switching Center
WMSCR	Weather Message Switching Center Replacement