ORDER

6131.3

MAINTENANCE OF THE CONTROLLER-TO-PILOT DATA LINK COMMUNICATIONS BUILD I (CPDLC I) EQUIPMENT

September 23, 2003

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

Distribution: Selected Airway Facilities Field and Regional Offices; ZAF–606 **Initiated By:** AOS–300

RECORD OF CHANGES

DIRECTIVE NO. 6131.3

CHANGE TO BASIC	SUPPLEMENTS			OPTIONAL	CHANGE TO BASIC	SUPPLEMENTS			OPTIONAL

FAA FORM 1320-5 (6-80) USE PREVIOUS EDITION

FOREWORD

1. PURPOSE.

This handbook provides guidance and prescribes technical standards and tolerances, and procedures applicable to the maintenance and inspection of the Controller-to-Pilot Data Link Communications Build I (CPDLC I) system. It also provides information on special methods and techniques that will enable the Airway Transportation Systems Specialist (ATSS) to achieve optimum performance from the equipment. This information augments information available in instruction books and other handbooks and complements the latest edition of Order 6000.15, General Maintenance Handbook for Airway Facilities.

2. DISTRIBUTION.

This directive is distributed to selected offices and services within Washington headquarters, the William J. Hughes Technical Center, the Mike Monroney Aeronautical Center, regional Airway Facilities divisions, and Airway Facilities field offices having the following facilities/equipment: CPDLC I.

3. MAINTENANCE AND MODIFICATION PROCEDURE.

a. The Order 6000.15, this handbook, the applicable equipment instruction book, and other applicable handbooks shall be consulted and used together by ATSS personnel in all duties and activities for the maintenance of the CPDLC I System. These documents shall be considered collectively as the single official source of maintenance policy and direction authorized by Operational Support. References located in the appropriate paragraphs of this handbook entitled Chapter 3, Standards and Tolerances, Chapter 4, Periodic Maintenance, and Chapter 5, Maintenance Procedures, shall indicate to the user whether this handbook and/or the equipment instruction book shall be consulted for a particular standard, key inspection element or performance parameter, performance check, maintenance task, or maintenance procedure.

b. The latest edition of Order 6032.1, Modification to Ground Facilities Systems, and Equipment in the National Airspace System, contains comprehensive direction concerning the development, authorization, implementation, and recording of modifications to facilities, systems, and equipment in commissioned status. It supersedes all instructions published in earlier editions of maintenance technical handbooks and related directives.

c. Modifications to equipment that are listed in NAS-MD-001, National Airspace System (NAS) Configuration Management Document, as baselined under configuration management shall be in accordance with the latest edition of Order 1800.8, National Airspace System Configuration Management.

4. FORMS LISTING.

The FAA Form 6000-8, Technical Performance Record-Continuation or Temporary Record/Report Form, is to be maintained for each facility. FAA Form 6000-8 is available from the FAA Depot under National Stock Number (NSN) 0052-00-686-0001, unit of issue is a pad, 50 sheets per pad.

5. RECOMMENDATIONS FOR IMPROVEMENT.

This handbook is under configuration management control as defined in Order 1800.8 and NAS-MD-001. Any changes to the baseline document or requests for deviation from national standards shall be processed through the NAS Change Proposal (NCP) process. Copies of FAA Form 1800-2, NCP, are provided in the back of this handbook for the convenience of handbook users.

Richard A. Thoma
Program Director for Operational Support, AOS-1

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

LIST OF ILLUSTRATIONS

CHAPTER 1. GENERAL INFORMATION AND REQUIREMENTS

100. OBJECTIVE.

This handbook provides the necessary guidance, to be used in conjunction with information available in instruction books and other handbooks, for the proper maintenance of the Controller-to-Pilot Data Link Communications Build I (CPDLC I) system. It does not cover associated plant, communications, or Alternating Current (ac) power equipment maintenance.

101. SAFETY.

Personnel shall observe all pertinent safety precautions when performing duties on the equipment. Refer to Order 6000.15 for guidance.

102. COORDINATION.

a. Maximum availability is of prime importance to the users of Airway Facilities (AF) systems, services, and equipment. Maintenance should therefore be accomplished, to the extent practicable, on the offline operating equipment. When it is necessary to perform maintenance on the online operating equipment, it shall be coordinated with the appropriate personnel to preclude unanticipated shutdowns.

b. AF personnel shall be familiar with the role of the CPDLC I system in the National Airspace System (NAS) so that facility shutdowns can be coordinated with the proper agency and non-agency personnel. Particularly, AF personnel, such as the Airway Transportation Systems Specialist (ATSS), shall thoroughly coordinate with the Service Operations Center (SOC) specialist or the Operations Control Center (OCC) specialist who shall coordinate with the Air Traffic Operations (ATO) personnel, such as the AT specialist, in advance, any maintenance activity that may adversely affect the use of a commissioned facility. Furthermore, AF personnel must be familiar enough with ATO procedures to ensure that notification is made sufficiently early to allow SOC or OCC and ATO personnel to take appropriate action. It is expected that ATO personnel will recognize the need for releasing equipment at the time scheduled for maintenance and will cooperate in the furtherance of practices that assure continuous and reliable operation. See Order 6000.15 for additional guidance.

c. Once a shutdown is successfully scheduled, the AF SOC or OCC specialist shall gather available information and provide the data to the Automated Flight Service Station (AFSS) personnel, so they may initiate a Notice to Airmen (NOTAM) announcing the shutdown.

d. AF ATSS personnel are also responsible for keeping the operations center SOC or OCC personnel, who in turn are responsible for keeping ATO personnel, advised of the operational status of all system, subsystem, facilities, and equipment. When unscheduled interruptions occur, prompt notification shall be made to the cognizant SOC or OCC, which will coordinate with ATO personnel. The SOC or OCC specialist shall be advised immediately when equipment fails, service is restored, the established tolerances are exceeded, or the established tolerances are expected to be exceeded so that SOC or OCC can advise ATO personnel to issue a NOTAM, reroute air traffic, and/or take other necessary action. This is especially important where standby or spare equipment is not immediately available.

103. CERTIFICATION.

Certification shall be accomplished within the intervals specified in Appendix 1, Certification Requirements, Table 1, ECDAG Service for CPDLC Service and in Appendix 1, Table 2, CPDLC Service Certification for CPDLC System equipment, in accordance with the certification procedures within this directive and Order 6000.15.

104. AIRCRAFT ACCIDENT.

After receiving information that an aircraft accident has occurred within the service area of the facility for which they are responsible, the following minimum actions are required of cognizant AF personnel. See the latest edition of Order 8020.11, Aircraft Accident and Incident Notification, Investigating, and Reporting.

a. Facility Maintenance Log. Check the Facility Maintenance Log (FAA Form 6030–1) to determine the status of the system at the time of the accident.

(1) Record all data as found and any other system parameters considered necessary to establish the operational capability of the system.

(2) Review the Facility Maintenance Log and compile all data pertinent to the accident.

(3) Certify entries of FAA Form 6030–1 and Technical Performance Record (TPR). In all cases have another System Specialist or the supervisor certify the entry, including the date and time of the entry.

b. AF Accident Investigation. Once ATO releases the accident notification message, the AF sector manager will initiate a technical facility evaluation. In addition, the regional AF division will designate a regional AF accident representative as a coordinator of the AF contribution to the accident investigation and as a liaison with the Federal Aviation Administration (FAA) investigator-in-charge. See Order 8020.11, for the details of and the procedures for the investigation and reporting of a CPDLC I-related aircraft accident or incident.

c. Records. All station records such as facility logs, System Analysis Recording (SAR) data, etc., are official documents and, as such, may be required in case of an investigation regarding a local aircraft accident and the local facilities adherence to standard operating practices and therefore should be safeguarded. It is imperative that all records be kept current, concise, and accurate. These checks shall be made rapidly, carefully, and completely. Refer to TI 6131.12, CPDLC I System Level One Maintenance Manual, Section 4.2, for information on reports that are available for use on CPDLC System Recorded Data.

105. TECHNICAL INSPECTION.

Facility inspections are management controls for assuring the required quality level of maintenance work, equipment, and system performance. See Order 6000.15 for general guidance on inspections and the latest edition of Order 6040.6, Airway Facilities NAS Technical Evaluation Program (RIS:AF 6040–8), for details on the intervals and requirements for formal inspections.

106. PERIODIC MAINTENANCE.

Chapter 4, Periodic Maintenance of this order establishes the tasks and schedules that are required for the periodic maintenance of the CPDLC I system. These tasks, as scheduled, are the minimum required for a CPDLC I system to meet minimum performance standards.

107. TEST EQUIPMENT AND TOOLS FOR PERIODIC MAINTENANCE.

a. The test equipment required for performing routine maintenance of a CPDLC I system are managed by the latest edition of Order 6200.4, Test Equipment Management Handbook. Tools and supplies are specified and managed by the latest edition of Order 4630.2, Standard Allowance of Supplies and Working Equipment for NAS Facilities.

b. The following test equipment and special tools are required for the periodic maintenance of the CPDLC I system.

(1) A vacuum cleaner with a small flexible crevice attachment

(2) A damp cloth

(3) A non-toxic and non-abrasive cleanser

(4) A dry, lint-free cloth

(5) Isopropyl alcohol

(6) Service Certification Suite (SCS)

(7) High impedance frequency counter

(8) Cable to connect frequency counter to radio

(9) Radio trimming tool

108. REFERENCES.

a. Instruction Books. The instruction books that apply to the CPDLC I equipment are:

(1) HNL Level 1 Maintenance Manual

(2) TI 6131.12

(3) NetView for AIX Concepts: A General Information Manual, GC31–8160

(4) IBM p Series 640 Installation Guide, 2000, SA38–0579–00

(5) IBM p Series 640 User's Guide, 2000, SA38–0580–00

(6) IBM p Series 640 Service Guide, 2000, SA38–0581–00

(7) IBM RS/6000 p Series Diagnostic Information for Multiple Bus Systems, 2000. SA38–0509–09

(8) AIX Version 4.33 Base Documentation CD, 1999

(9) AIX Version 4.33 Extended Documentation CD, 1999

(10) NetView for AIX User's Guide for Beginners, Version 4, 1995, SC31–8158

(11) NetView for AIX Diagnosis Guide, Version 4, 1995, SC31–8162

(12) NetView for AIX Quick Reference Card, 1995, SX75–0113

(13) NetView for AIX Messages, Version 5, 1995, NetView Program (online Help)

(14) COMPAQ Tru64 Unix, Installation Guide, August 2000

(15) COMPAQ Tru64 Unix, System Administration Manual, August 2000

(16) COMPAQ Tru64 Unix, Command and Shell User's Guide, July 1999.

(17) COMPAQ Tru64 Unix, Common Desktop Environment (CDE) Companion Manual, July 1999.

(18) COMPAQ Tru64 Unix, System Configuration and Tuning Manual, August 2000.

(19) UnixWare 7 Release 7.1 Getting Started Guide, SCO, 1999. UnixWare 7 Release 7.1 System Handbook, SCO, 1999.

(20) VHF Transceiver Type 5525–D8 User Guide Issue 4, Park Air Electronics, November 2000, Part Number 31C35525D80.

(21) WANXL Installation and Administration Guide for UnixWare 7.0 (SDLC + X.25 Driver), SBE, Inc., Revision 1.2, January, 1999, M8210–2.

(22) UPS Uninterruptible Power Supply User Manual, Belkin, P73446–B

b. Websites. The following websites also contain maintenance documentation that is not government approved.

(1) The AlphaServer DS10 applicable documentation may be found on the Compaq website:

http://www3.compaq.com/support/home/index.asp/

(2) The 3Com Hub Model Number 3C16704A User Guide may be found on the 3Com website:

http://support.3com.com/

(3) The Dell OptiPlex GX 110 applicable documentation may be found on the Dell website:

http://premiersupport.dell.com/docs/systems/opgx110/

(4) The Keyboard-Video Mouse (KVM) Switch from Black Box has product data on the Black Box website at:

http://catalog.blackbox.com/

(5) The International Business Machines (IBM) p640s applicable documentation may be found on the IBM website:

http://www-1.ibm.com/servers/eserver/pseries/library/hardware_docs/system/.html/

(6) The Hewlett Packard (HP) Printer applicable documentation may be found on the HP website:

http://www.hp.com

(7) The CISCO Hub applicable documentation may be found on the CISCO website:

http://www.cisco.com/univercd/cc/td/doc/product/fhubs/fh400/index.htm

(8) The Sony Flat Panel Monitor applicable documentation may be found on the Sony website:

http://www.ita.sel.sony.com/support/displays/

(9) The Canon Printer applicable documentation may be found on the Canon website:

http://www.usa.canon.com.

(10) The Belkin Uninterruptible Power Supplies (UPS) applicable documentation may be found on the Belkin website:

http://www.belkin.com

c. IBM. IBM manuals can be obtained through the sales representative or by calling 800–879–2755. Purchase orders may also be mailed to IBM Corporation, P.O. Box 29570, Raleigh, NC 27626.

109.–199. RESERVED.

CHAPTER 2. TECHNICAL CHARACTERISTICS

200. SYSTEM INTRODUCTION.

The CPDLC I as depicted in Figure 2–1, CPDLC System Configuration is a data communications link between air traffic controllers and pilots. The CPDLC processor interfaces with the NAS Host Computer System (HCS) and the communications service provider via the Host Interface Device (HID)/NAS Local Area Network (LAN). Monitor and control of the Data Link Application Processor (DLAP) (CPDLC or Context Management Application (CMA) processors) is accomplished through the Network System Monitor (NSM) component of the HID/NAS LAN (HNL). The DLAP printer provides hardcopy-reporting capabilities. The Supervisor Workstations provide remote access from the Air Traffic Control (ATC) floor for menu build capability. An overview of the CPDLC I components and their operations is defined in the following sections.

201. SYSTEM FUNCTIONAL OVERVIEW.

a. The CPDLC I system consists of the following major equipment:

(1) Two CPDLC Processors

(2) One CPDLC Network Printer

(3) Two CMA Processors

(4) Two Ground Boundary Intermediate System (GBIS) Processors

(5) One SCS

(6) Two Supervisor LAN Hubs

(7) Seven Supervisor Workstations

(8) Seven Supervisor Workstation Printers

b. The CPDLC and CMA processors are used to provide the applications and communications functions necessary to support the CPDLC I service at an Air Route Traffic Control Center (ARTCC). These functions include aircraft session management, maintaining a transaction database of outstanding CPDLC I messages, interfacing with the user to define a list of controller-to-pilot free-text messages, and interfacing with the service provider for message exchange with each aircraft.

c. The CPDLC processor and CMA processor reside on the HNL, which provides communications services between the CPDLC processor and the HCS. It also interfaces with the National Airspace Data Interchange Network II (NADIN II) Wide Area Network (WAN) via the HNL router to reach the service provider's network. The service provider provides the communications link between the controller and pilots to complete the controller-to-pilot communications link. DLAP monitor, control, and report generation is performed via the HNL NSM.

d. The Supervisor Workstations are used to provide area supervisors with remote access to the Menu Build capability of the CPDLC processor. The Menu Build capability allows users to define a list of controller-to-pilot free-text messages.

202. SYSTEM DESCRIPTION.

a. The CPDLC and CMA processors are IBM pSeries 640 running the IBM Advanced Interactive Executive (AIX) operating system. For a complete description of the CPDLC/CMA hardware, refer to TI 6131.12.

b. The DLAP software that is resident in the CPDLC and CMA hardware is used to provide a data communications link between a controller and a pilot. It is responsible for establishing and maintaining sessions with aircraft, transporting messages to the pilot via the GBIS to the NADIN II connection that interfaces with the service provider, transporting downlink responses from the pilot to the controller, and managing free-text message lists. System logging and archiving of DLAP internal and external messages is also a major function of the DLAP software.

c. The SCS is used to certify the end-to-end CPDLC ground based system service from the controller to the facility antenna and back to the controller. The SCS is a stand-alone suite of test equipment. The SCS has two identical sets of redundant radios, processors, monitors, UPS, and antennas. Each set is simultaneously capable of receiving and responding to a test message from the CPDLC system. The SCS uses

Park Air model 5525−D8 Very High Frequency (VHF) transceivers, Dell Optiplex GX−110 processors, Dell 17-inch flat panel monitors, and Cushcraft model PLC−1296 antennas.

d. The DLAP network printer provides printing capabilities for the DLAP reporting functions. It is a HP LaserJet 2100TN network printer.

e. The Supervisor LAN uses Cisco FastHubs, model 424M, that provide a gateway between the Supervisor Workstations on the ATC floor and the CPDLC and CMA processors on the HNL. The Hubs are attached via an Ethernet interface to the CPDLC and CMA processors.

f. The Supervisor Workstations are IBM Netvista 2800 thin clients, model 3864. For a complete description of the Supervisor Workstation hardware, refer to TI 6131.12, subsection 3.5.1.1.1.

g. The Supervisor Workstation printers are Canon LR−1 printers with external HP JetDirect print servers. For a complete description of the Supervisor Workstation hardware, refer to TI 6131.12, subsection 3.5.1.1.4.

h. The HNL consists of a Fiber-Distributed Data Interface (FDDI) LAN providing a communications exchange environment between nodes attached to the HNL via the FDDI concentrator. The HID computer system interfaces with the HCS and is designed to provide a gateway from the HCS to the FDDI LAN, which is a Transmission Control Protocol/Internet Protocol (TCP/IP) based network. Several HNL components are used to support CPDLC I functionality and are described below.

(1) The NSM computer system is an IBM Reduced Instruction Set Computer (RISC) System (RS)/6000 processor running the IBM AIX version operating system. For a complete description of the NSM hardware, refer to HNL−5401−01, HNL Level One Maintenance Manual.

(2) The NSM software is a Commercial Off-The-Shelf (COTS) product developed by IBM known as NetView for AIX. NetView is a comprehensive management tool that can be used to manage heterogeneous, multi-vendor devices on networks that use the IP for communications. NetView provides configuration, fault, security, and performance management functions along with a graphical X−Windows user interface. NetView also provides a complete development package enabling the integration of non-IP devices into the overall, management environment. Refer to GC31−8160, NetView for AIX Concepts: A General Information Manual, for more information on the general features of NetView.

(3) The HNL uses a dual, redundant router system to transport messages across networks. The routers are Cisco Series 4000, model 4500, multi-port routers. Each router is powered by a Millions-of-Instructions-Per-Second (MIPS) RS processor with 16 Megabytes (MB) of system memory and 4 MBs of flash memory. Each router also contains a serial port module with four serial ports configured to utilize an X.25 interface, two RS−232 ports, one console, and one auxiliary port.

203. SYSTEM THEORY OF OPERATION.

a. The CPDLC I creates a data communications link between controllers and pilots. The data link provides for enhanced communications between the controller and pilot, and supplements voice communications. Four primary data link functions are provided: Initial Contact (IC), Transfer of Communication (TOC), Altimeter Setting Message (ASM), and Menu Service.

b. Upon entering airspace serviced by a CPDLC-equipped ARTCC, the aircraft may attempt to logon to the service provider network. The service provider forwards the logon request to the Primary CMA, which authorizes the request. Once the logon is complete and the aircraft enters a sector with CPDLC ON, the controller is notified that the aircraft has logged on and is data-link eligible through the use of a special data-link eligibility character in the aircraft's Full Data Block (FDB).

c. Once an aircraft has logged ON, the CPDLC equipped aircraft will be indicated in the target's FDB being displayed on the controller's Display System Replacement (DSR) workstation and the controller may begin using CPDLC I to perform data communications with the pilot. The controller can select messages from CPDLC Menus on the DSR workstation to the CPDLC equipped aircraft. Messages from the controller are sent by the HCS to the CPDLC processor through the HNL. The CPDLC forwards the message to the service provider via the X.25 connection to NADIN II provided by the HNL multi-port routers. The service provider uplinks the message to the aircraft.

(1) The message is displayed on the flight deck console in the aircraft cockpit. The pilot responds to the message via the flight deck console unit, using one of a limited set of predefined responses, such as

"Roger" or "Wilco". The service provider forwards the response to the CPDLC via NADIN II, which then forwards the response to the controller.

(2) Four sub-channels are adapted in the HCS to provide communications with the CPDLC. Each CPDLC processor in turn maintains a TCP/IP connection with each of the HIDs. Communication with the HIDs is performed using an HID message protocol, implemented in the CPDLC software. The HID strips the protocol information off the message, and forwards the unmodified data portion of the message to the CPDLC application via the adapted subchannels.

(3) The NSM provides monitor and control services for the CPDLC and CMA applications via the NetView for AIX product. It provides the user with visual (colored icons, event reports) and audible indications of errors, and provides tools to investigate and diagnose the problems that can occur. The NSM also provides tools to analyze and reduce historical data stored on the CPDLC and/or CMA processors.

204.–299. RESERVED.

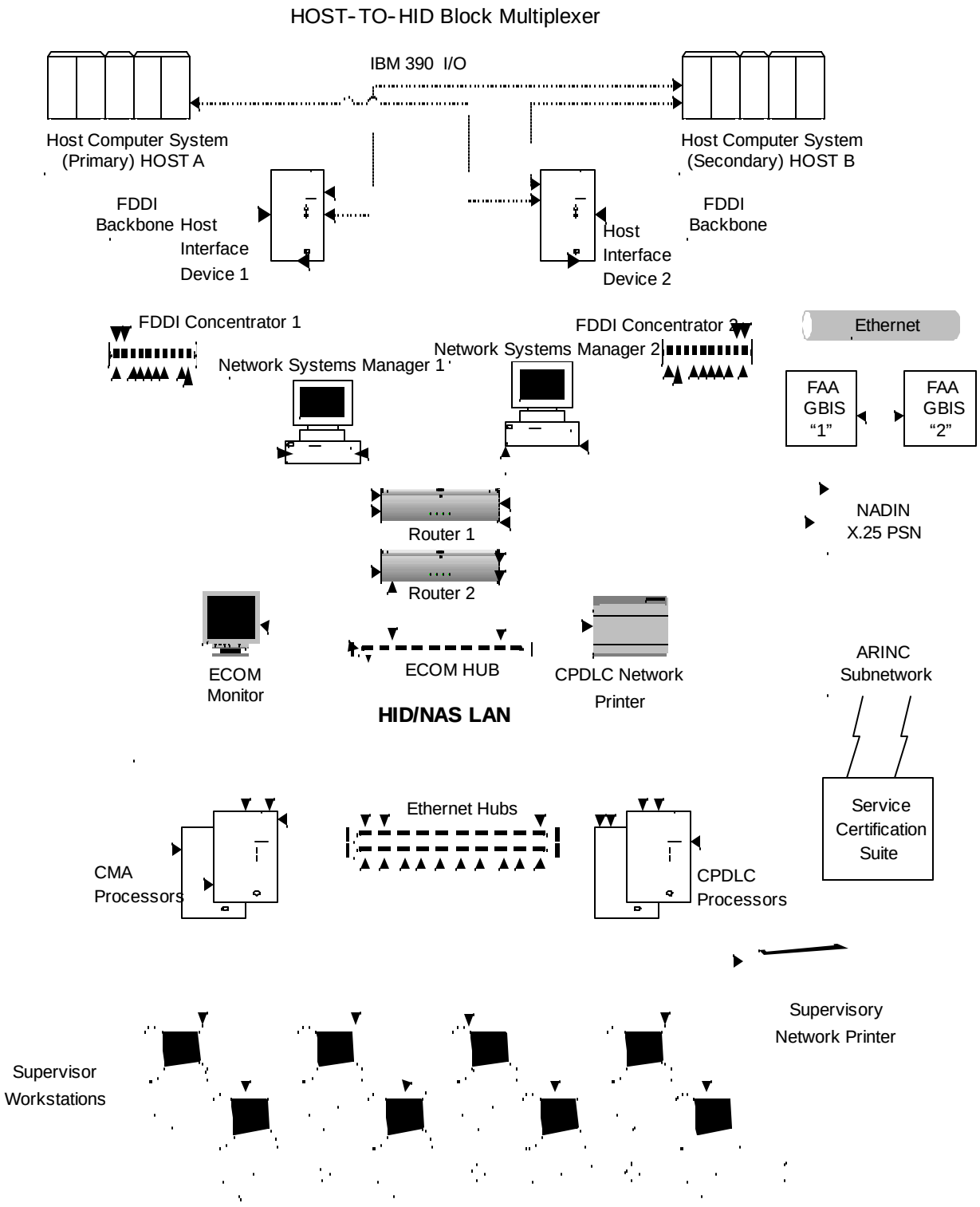

FIGURE 2–1. CPDLC SYSTEM CONFIGURATION

CHAPTER 3. STANDARDS AND TOLERANCES

300. GENERAL.

a. This chapter prescribes the standards and tolerances for the CPDLC I system, as defined and described in Order 6000.15. All key performance parameters and/or key inspection elements are clearly identified by an arrow (!) placed to the left of the applicable item.

b. The equipment is grouped by subsystem, rather than by facility, since all subsystems are duplicated at each facility.

STANDARDS AND TOLERANCES

Parameter	*Reference Paragraph*	*Standard*	*Tolerance/Limit*	
			Initial	*Operating*
301. CPDLC I VERIFICATION.				
a. CPDLC I components ..... are online and protocols are functioning properly.	Par. 502; TI 6131.12, section 4.1.1	Correct icon status displayed on ring topology map. Initial status icon defaults to yellow. Operational status icon is green. Standby status icon is yellow.	Yellow status icon	Green status icon
b. CPDLC Switchover.	Par. 503	Successful redundancy as verified using manual requests.	Same as standard	Same as initial
c. CMA Switchover.	Par. 503	Successful redundancy as verified using manual requests.	Same as standard	Same as initial
d. GBIS components ..... are online and protocols are functioning properly.	TI 6131.12, attachment 2, sections 3.1.1 and 3.1.2	All System Status Class Names are Enabled. X.25 Communication Card Status State for: Link — 0 is “on” Link — 1 is “on”	Same as standard	Same as standard
302. CPDLC AND CMA PROCESSORS.				
a. IBM pSeries 640.	Par. 582			
(1) CPDLC/CMA ..... Server Diagnostics.	IBM pSeries 640 Model Service Guide	Error free completion.	Same as standard	Same as initial
(2) Power-On Self-Test ..... (POST).	TI 6131.12, section 3.4.2	Error free completion.	Same as standard	Same as initial

STANDARDS AND TOLERANCES (Continued)

Parameter	*Reference Paragraph*	*Standard*	*Tolerance/Limit*	
			Initial	*Operating*
b. Verify CPDLC.	Par. 502; TI 6131.12, section 4.1.1	Correct icon status displayed on ring topology map. Initial status icon defaults to yellow. Operational status icon is green. Standby status icon is yellow.	Yellow status icon	Green status Icon
(1) Verify CPDLC ..... Switchover.	Par. 503	Successful redundancy as verified using manual requests.	Same as standard	Same as initial
(2) Verify CMA ..... Switchover.	Par. 503	Successful redundancy as verified using manual requests.	Same as standard	Same as initial
c. HP LaserJet 2100TN.	Par. 575			
Operation.	HP LaserJet 2100TN User's Guide	Error free completion and no accumulation of errors.	Same as standard	Same as initial
303. GBIS PROCESSORS.				
a. POST.	TI 6131.12, attachment 2, section 2.2	User Name prompt is displayed.	Same as standard	Same as standard
b. GBIS Diagnostics.	TI 6131.12, attachment 2, sections 2.4.1 and 3.1.1	All system status class names are enabled.	Same as standard	Same as standard
304. GBIS HUB	Par. 586	Normal port status on Hub indicated by steady green Light Emitting Diode (LED).	Same as standard	Same as standard

STANDARDS AND TOLERANCES (Continued)

Parameter	*Reference Paragraph*	*Standard*	*Tolerance/Limit*	
			Initial	*Operating*
305. SUPERVISOR WORKSTATIONS.				
a. IBM Netvista 2800 Thin ... Client Model 8364.	Par. 583			
POST.	Setting Up IBM Network Station Hardware — Type 8364, July 1999	Error free completion.	Same as standard	Same as initial
b. Canon LR–1 Printer.	Par. 580			
Operation.	Canon LR–1 User's Guide	Error free completion and no accumulation of errors.	Same as standard	Same as initial
306. SUPERVISOR HUBS	Par. 576	Normal port status on Supervisor HUB indicated by steady green LED.	Same as standard	Same as initial
307. SCS.				
a. Verify that all SCS ..... components are online and functioning properly.	TI 6131.12, attachment 1, section 4.1.1	SCS Graphic User Interfaces (GUI) are green for: — Software — CPDLC Connection — PC–VHF Data Radio (VDR) Link — VDR Configuration — Ground Station Link	Black, Blue, or Yellow	Green
b. Verify that the SCS ..... radios are transmitting and receiving properly.	Par. 588; TI 6131.12, attachment 1, section 5.2	20.95 MegaHertz (MHz) +/– 3 Hertz (Hz) Properly receives and responds to Test (TR) message sent from Keyboard Video Display Terminal (KVDT).	Same as standard	Same as initial

STANDARDS AND TOLERANCES (Continued)

Parameter	*Reference Paragraph*	*Standard*	*Tolerance/Limit*	
			Initial	*Operating*
c. UPS	Par. 108a(22)	Output: 115 Volts Alternating Current (Vac) ¦ 8% 60 Hz ¦ 1Hz	Same as standard	Same as standard
(1) Verify proper ..... operation.	Par. 589, User Manual, section 3.0–3.12	LEDs Color: ONLINE: Green.	Same as standard	Same as standard
	TI 6131.12, attachment 1, section 6.1.3	ON–BATTERY: Yellow (when UPS supplies power).		
		OVERLOAD: None.		
		REPLACE BATTERY: None.		
		WIRING FAULT INDICATOR: None.		
(2) POST.	Par. 589, User Manual, section 5.0–5.3	ON–BATTERY:	Yellow & alarm sounds.	None & alarm OFF
	TI 6131.12, attachment 1, section 3.2.1	ONLINE:	None during alarm.	Green
308. END–TO–END ..... SERVICE CERTIFICATION.	Par. 514; appendix 1, table 2	At least one of two test (TR) messages sent simultaneously from KVDT is received.	Same as standard	Same as initial
309. SYSTEM ..... CERTIFICATION.	Par. 515; appendix 1, table 2; TI 6131.12	Error Free completion.	Same as standard	Same as standard
a. NAS Message Statistics .... *Incoming NAS Messages.*	TI 6131.12, section 4.1.4.1	Incoming NAS Messages should dynamically increment.	Same as standard	>0
b. Storage Capability ..... *Aircraft Information Database integrity*	TI 6131.12, section 4.1.3.2	Aircraft Logged On should dynamically increment or decrement providing CPDLC equipped aircraft are in Miami airspace	Same as standard	>0
310.–399. RESERVED.				

CHAPTER 4. PERIODIC MAINTENANCE

400. GENERAL.

a. This chapter establishes all the maintenance activities that are required for the CPDLC I system on a periodic, recurring basis, and the schedules for their accomplishment. The chapter is divided into two sections. The first section identifies the performance checks (i.e., tests, measurements, and observations) of normal operating controls and functions which are necessary to determine whether operation is within established tolerances/limits. The second section identifies other tasks that are necessary to prevent deterioration and/or ensure reliable operation.

b. In addition to the periodic recurring activities specified in this chapter, Order 6000.15 establishes requirements for routine maintenance and other specific maintenance activities that are to be performed for all AF equipment.

c. The following performance checks and maintenance tasks are not to be taken as the minimum work required for proper maintenance, rather as the maximum interval permitted between tasks. Refer to Order 6000.15 for guidance.

d. It is to be understood that, for a given period, the tasks listed for that period and all more frequent periods are to be performed at that time. For instance, on an anniversary, the annual, semiannual, quarterly, monthly, weekly, and daily tasks shall all be performed.

e. All reference paragraphs pertaining to standards and tolerance/limits are found in chapter 3 of this order, unless otherwise stated.

Section 1. PERFORMANCE CHECKS

Performance Checks	*Reference Paragraph*	
	Standards & Tolerances	*Maintenance Procedures*
401. DAILY.		
a. NSM.		
(1) Inspect NSM status display for correct visual indicators and protocols.	Par. 301	Par. 502
(2) Inspect NSM Event log.		Par. 509
b. CPDLC Processors.		
(1) Perform sar_dump.		Par. 506
(2) Inspect audit log file size.		Par. 507
(3) Inspect history file		Par. 508
c. CMA Processors.		
(1) Perform sar_dump.		Par. 506
(2) Inspect audit log file size.		Par. 507
(3) Inspect history file		Par. 508
d. GBIS Processors.		
(1) Perform gather_sar_ksh.		Par. 506
(2) Inspect audit log file size.		Par. 507
(3) Inspect history file		Par. 508
e. NAS KVDT.		
End-to-End CPDLC–I Service Test “ECDAG”.	Par. 308	Par. 514
402. WEEKLY.		
a. CPDLC Processors.		
(1) Perform sar_dump.		Par. 506
(2) Inspect file system status		Par. 505
(3) Check hardware operational error logs		Par. 511

Section 1. PERFORMANCE CHECKS (Continued)

Performance Checks	*Reference Paragraph*	
	Standards & Tolerances	*Maintenance Procedures*
b. CMA Processors.		
(1) Perform sar_dump.		Par. 506
(2) Inspect file system status		Par. 505
(3) Check hardware operational error logs		Par. 511
c. GBIS Processors.		
(1) Inspect file system status		Par. 505
(2) Check hardware operational error logs		Par. 511
d. SCS Processors.		
(1) Inspect file system status		Par. 505
(2) Check hardware operational error logs		Par. 511
403. MONTHLY.		
a. CPDLC Processors.		
Execute COPS and Tripwire software		Par. 510
b. CMA Processors.		
Execute COPS and Tripwire software		Par. 510
c. GBIS Processors.		
Execute COPS and Tripwire software		Par. 510
404. QUARTERLY.		
a. CPDLC and CMA.		
(1) POST	Par. 302a(2)	TI 6131.12, section 3.4.2.1
(2) Internal diagnostics	Par. 302a(1)	IBM pSeries 640 Model Service Guide
b. GBIS.		
(1) POST	Par. 303a	TI 6131.12,attachment2, section 2.2
(2) Internal diagnostics	Par. 303b	TI 6131.12,attachment2, sections 2.4.1 and 3.1.1

Section 1. PERFORMANCE CHECKS (Continued)

Performance Checks	*Reference Paragraph*	
	Standards & Tolerances	*Maintenance Procedures*
c. SCS.		
(1) Processor.		
(a) POST	Par. 307a	TI 6131.12,attachment1, section 3.2.1
(b) Internal diagnostics	Par. 307a	TI 6131.12,attachment1, section 4.1.1
(2) Radio.		
POST	Par. 307b	TI 6131.12,attachment1, section 5.2
d. CPDLC I System.		
Check for satisfactory system operation after manual switchover of either the Primary CPDLC or the Primary CMA processors.	Par. 301b & 301c	Par. 503
e. System Certification “DLS”.	Par. 309	Par. 515
405. ANNUALLY.		
a. CPDLC, CMA, GBIS, and SCS.		
Check power cords, cables, and connectors	Connectors secure and cables undamaged	Par. 504
b. SCS.		
Check radio frequency	Par. 307b	TI 6131.12,attachment1, section 5.2
406. AS REQUIRED.		
a. CPDLC Network Printer.		
Run printer self-test	Error free operation	HP LaserJet 2100 TN User’s Guide

Section 1. PERFORMANCE CHECKS (Continued)

Performance Checks	*Reference Paragraph*	
	Standards & Tolerances	*Maintenance Procedures*
b. SCS.		
Inspect both SCSs for satisfactory operation	Par. 307a	Par. 512, TI 6131.12, attachment 1, section 4.1.1
c. CPDLC System Certification ..... "DLS".	Par. 309	Par. 515
407.–449. RESERVED.		

Section 2. OTHER MAINTENANCE TASKS

Maintenance Tasks	*Reference Paragraph*	
	Standards & Tolerances	*Maintenance Procedures*
450. MONTHLY.		
CPDLC Printers.		
a. Inspect HP2100TN printer	Visual	Par. 552
b. Inspect Canon LR–1 Bubble Jet printers	Par. 302c	Par. 580
451. QUARTERLY.		
CPDLC, CMA, GBIS, and SCS.		
a. Clean and inspect keyboards, monitors, and cabinet surfaces.	Visibly clean	Par. 553
b. Rootvg backup	Successful completion	Par. 584
452. SEMIANNUALLY.		
CPDLC, CMA, GBIS, and SCS.		
a. Inspect fan	Visual	Par. 550
b. Inspect and clean cabinet	Visual	Par. 551
453. ANNUALLY.		
CPDLC, CMA, GBIS, and SCS.		
Check power cords, cables, and connectors	Connectors secure and cables undamaged	TI 6131.12,section 7.6,attachment 1, attachment 2
454. AS REQUIRED.		
a. CPDLC Printers.		
(1) Clean HP2100TN Printer	Visibly clean & good print quality	Par. 554
(2) Clean Canon LR–1 Bubble Jet Printer	Visibly clean & good print quality	Par. 555
b. SCS.		
Inspect both SCS UPSs for satisfactory operation.	Par. 307c	Par. 513, TI 6131.12, attachment 1, section 6.1.3
455.–499. RESERVED.		

CHAPTER 5. MAINTENANCE PROCEDURES

500. GENERAL.

a. This chapter establishes the procedures for accomplishing the various essential maintenance activities that are required for the CPDLC I system on either a periodic or incidental basis. The chapter is divided into three sections. The first section describes the procedures to be used in making the performance checks listed in chapter 4, section 1, of this order. The second section describes the procedures for doing the tasks listed in chapter 4, section 2, of this order. The third section describes the procedures for doing special tasks, usually nonscheduled and not listed in chapter 4. Refer to Order 6000.15 for additional general guidance. Only those procedures not in the equipment instruction books are specified herein.

b. Maintenance procedures shall be performed under conditions that duplicate, as closely as practicable, those present during normal operation.

Section 1. PERFORMANCE CHECK PROCEDURES

501. FAA FORM ENTRIES.

Order 6000.15 contains guidance and detailed instructions for field utilization of FAA Form 6000 series, as applicable to the CPDLC I system. Entries shall be made in accordance with the instructions published in Order 6000.15.

502. INSPECT NSM STATUS DISPLAY.

a. Object. This check is performed in order to verify that all components of CPDLC I are operational.

b. Discussion. Verify that the correct status of icons appear on the ring topology map.

c. Test Equipment Required. None.

d. Conditions. None.

e. Detailed Procedure. From the NSM, check the status of icons for each subsystem (CPDLC, CMA, Concentrators, Routers) by visual inspection. Alternately, the ping tool and Simple Network Management Protocol (SNMP) connectivity tool may be used at user discretion. Refer to TI 6131.12, section 7.5 for procedures on using these tools.

503. CPDLC OR CMA SWITCHOVER.

Prior coordination must be verified via NOM with Air Traffic.

All remote sessions to the standby processor will be terminated during switchover processing. This includes DR&A from the NSM or E Complex Monitor (ECOM), as well as menu build from a remote device. A warning will be sent to each connected terminal to notify the user of the switchover.

a. CPDLC or CMA Switchover. This check is performed to verify the proper operation of the CPDLC or CMA processors in the CPDLC I system after a CPDLC or CMA switchover.

b. Discussion. There are two CPDLCs and two CMAs per En Route site providing for redundancy. Should the operational CPDLC or CMA be shutdown due to manual intervention or failure, the secondary processor will automatically replace the shutdown unit providing application software is executing on that processor.

c. Test Equipment Required. None.

d. Conditions. This procedure may be run during the execution of the operational system provided that there is no interference with ATC. It is suggested that this procedure be executed during light traffic periods. This procedure may also be run during service certification.

e. Detailed Procedure. For detailed procedures on the CPDLC switchover capability, refer to TI 6131.12, section 5, CPDLC Switchover Procedures.

504. POWER CORDS, CABLES, AND CONNECTORS CHECK.

a. Object. This check is performed to verify that all connections are tight and cables are undamaged.

b. Discussion. None.

c. Test Equipment Required. None.

d. Conditions. This procedure should be done with the associated equipment powered down.

e. Detailed Procedure. For detailed procedures on the Power Cords, Cables, and Connectors check, refer to TI 6131.12, section 7.6.

505. INSPECT FILE SYSTEM STATUS.

a. Object. This check is performed in order to verify that the CPDLC or CMA has enough disk space for proper operation of the equipment.

b. Discussion. None.

c. Test Equipment Required. None.

d. Conditions. This procedure may be run during the execution of the operational system provided that there is no interference with ATC.

e. Detailed Procedure.

(1) For detailed procedures on the Inspect CPDLC System File Status, refer to TI 6131.12, section 7.7.

(2) For detailed procedures on the GBIS Displaying File Information, refer to TI 6131.12, attachment 2, section 5.1.1.

506. PERFORM SAR_DUMP.

a. Object. This check is performed in order to store the data link transactions recorded by the CPDLC, CMA, and GBIS processors.

b. Discussion. The data link transactions are archived on external media on a daily basis, and removed from the system's hard drive in order to prevent consuming the system's storage resources. The SAR data will be archived in accordance with data retention requirements.

c. Test Equipment Required. None.

d. Conditions. This procedure may be run during the execution of the operational system provided that there is no interference with ATC.

e. Detailed Procedure.

(1) For detailed procedures on the sar_dump, refer to TI 6131.12, section 7.4.2.2.

(2) For detailed procedures on the GBIS Archiving Log Files to Tape, refer to TI 6131.12, attachment 2, section 3.2.2.

507. INSPECT AUDIT LOG FILE SIZE.

a. Object. This check is performed in order to verify that the CPDLC, CMA and GBIS processors are executing the defined/authorized tasks.

b. Discussion. The audit lot file size contains all the daily actions performed on the processor. On day-to-day operations, the entries recorded in this file should be the same, which will lead to an average file size. Any tasks that are stopped, deleted, added, or changed will impact the size of this file.

c. Test Equipment Required. None.

d. Conditions. This procedure may be run during the execution of the operational system provided that there is no interference with ATC.

e. Detailed Procedure.

(1) For detailed procedures on the Inspect Audit Log File Size, refer to TI 6131.12, section 7.4.2.4.

(2) For detailed procedures on the GBIS Audit File, refer to TI 6131.12, attachment 2, section 3.3.4.

508. INSPECT HISTORY FILE.

a. Object. This check is performed to verify that the CPDLC, CMA, and GBIS processor's security measures have not been compromised through user input.

b. Discussion. The history file contains the daily user inputs performed on the processor. Any unusual commands that compromise system integrity will be captured in this file.

c. Test Equipment Required. None.

d. Conditions. This procedure may be run during the execution of the operational system provided that there is no interference with ATC.

e. Detailed Procedure.

(1) For detailed procedures on inspecting the History file, refer to TI 6131.12, section 7.4.2.5.

(2) For detailed procedures on the GBIS History File, refer to TI 6131.12, attachment 2, section 3.3.5.

509. INSPECT NSM EVENT LOG.

a. Object. This check is performed in order to verify that there are no errors in the HNL Event log that could indicate degraded operation in the CPDLC system.

b. Discussion. None.

c. Test Equipment Required. None.

d. Conditions. This procedure may be run during the execution of the operational system provided that there is no interference with ATC.

e. Detailed Procedure. For detailed procedures on the Inspect NSM Event Log, refer to TI 6131.12, section 7.8.

510. EXECUTE THE TRIPWIRE AND COPS SOFTWARE.

a. Object. This check is performed in order to verify that the NSM, CPDLC, CMA and GBIS processors are not vulnerable to security intrusion.

b. Discussion. COPS is a collection of Open Source software packages that analyzes a system and reports potential security holes. Used to create a baseline configuration that reduces system vulnerability to outsiders without impacting accessibility by authorized users. Tripwire monitors key system files (e.g.,

passwords files) for access or changes, and reports discrepancies.

c. Test Equipment Required. None.

d. Conditions. This procedure may be run during the execution of the operational system provided that there is no interference with ATC.

e. Detailed Procedure.

(1) For detailed procedures on the Inspect Audit Log File Size, refer to TI 6131.12, sections 7.3.4, COPS and 7.3.5, Tripwire.

(2) For detailed procedures on the GBIS File System Maintenance, refer to TI 6131.12, attachment 2, sections 5.1.3, COPS and 5.1.4, Tripwire.

511. CHECK HARDWARE OR SOFTWARE OPERATIONAL ERROR LOGS.

a. Object. This check is performed in order to examine the operational errors for a given processor.

b. Discussion. None.

c. Test Equipment Required. None.

d. Conditions. This procedure may be run during the execution of the operational system provided that there is no interference with ATC.

e. Detailed Procedure.

(1) For detailed procedures on checking the hardware operational error logs, refer to TI 6131.12, section 6.1.3.

(2) For detailed procedures on the GBIS software operational error logs, refer to TI 6131.12, attachment 2, section 3.3.1.

512. INSPECT SCS STATUS.

a. Object. This check is performed in order to verify that both SCSs are operational.

b. Discussion. This is a visual inspection of both SCS systems to ensure that both are operational and online.

c. Test Equipment Required. None.

d. Detailed Procedure. For detailed procedures refer to TI 6131.12, attachment 1, section 4.1.1.

513. INSPECT AND VERIFY UPS STATUS.

a. Object. This check is performed in order to verify that both UPSs are operational.

b. Discussion. None.

c. Test Equipment Required. None.

d. Conditions. This procedure may be run during the execution of the operational system provided that there is no interference with ATC.

e. Detailed Procedure. For detailed procedures on the, refer to TI 6131.12, attachment 1, section 6.1.3.

514. SERVICE CERTIFICATION OF CPDLC I.

a. Certification by Service Certification Suite (SCS) Messaging.

(1) Service certification checks the end-to-end operation of the FAA CPDLC ground system through the use of the SCS. These commands can be used either when Data Link (DL) Service is in an OFF state, i.e., DL OFF or in the ON state i.e., DL ON; see appendix 1, table 1.

(2) At the KVDT:

Enter the command: TR DLAP |TEST

(3) The response message will be echoed at the KVDT i.e., TEST.

(4) The above command is necessary when the CPDLC equipment has been initialized but not in an actual operational state, i.e., CMA 1 or CMA 2 is green and either CPDLC I or CPDLC 2 is green on the ECOM/NSM then the TR DLAP |TEST Message is not necessary to enter.

Enter the command: TR DLAP |CPDLC CERT

(5) The following message response will be displayed at the KVDT:

D1 DT SC1:PASS/FAIL SC2:PASS/FAIL

(6) Either Pass or Fail will be displayed for each SCS.

Only one SCS "pass" is necessary for the Data Link Service certification. That is either SC1:pass or SC2:pass for certification.

(7) Once coordinated the Data Link Service may be enabled by the following.

(8) At the KVDT:

Enter the command: DL ON (if DL is OFF)

b. Alternate Service Certification.

(1) Alternate Service Certification checks the end-to-end operation of the FAA CPDLC Ground System in lieu of the SCS. This method may only be used as an interim certification method due to a failure in the operation of the entirety of the SCS system. It cannot be used to certify the ground system if the DL service has transitioned to the OFF (locked) state for any reason since the last successful certification, either due to HOST ABRT, ground system hardware failure, or routine system maintenance. In any of these events, the DL state MUST REMAIN OFF until such time as certification of the system through the use of SCS messaging is again viable.

(2) Observe CPDLC system in use with CPDLC equipped aircraft in Miami airspace, or at the first window of opportunity. Per Order 6000.15, it is viable that observation of the system working properly is an appropriate means for certification.

515. SYSTEM CERTIFICATION OF CPDLC I.

a. System certification checks the operation of the equipment. System certification is performed when:

(1) Whenever equipment is repaired or replaced and the equipment has successfully passed its maintenance diagnosis test.

(2) At scheduled intervals.

(3) At the discretion of the System Specialist.

b. Perform the system performance check; see appendix 1, table 2.

516. ARCHIVING LOG FILES TO TAPE.

a. Object. This check is performed in order to store the log files recorded by the FAA GBIS routers.

b. Discussion. The data link transactions are archived on external media on a daily basis, and removed from the system's hard drive in order to prevent consuming the system's storage resources.

c. Test Equipment Required. None.

d. Conditions. This procedure may be run during the execution of the operational system provided that there is no interference with ATC.

e. Detailed Procedure. For detailed procedures on the archive_log_files, refer to TI 6131.12, attachment 2, section 3.3.2.

517.–549. RESERVED.

Section 2. OTHER MAINTENANCE TASKS PROCEDURES

550. INSPECT FAN.

a. Object. This check is performed in order to avoid equipment overheating due to fan failure.

b. Discussion. Fan failure usually occurs as a result of bearing failure or winding failure.

(1) Bearings may seize due to lack of lubrication or the accumulation of dirt. This condition can be detected by feeling for overheating while the fan is operating. On AC fans, this can also be detected by manually checking for excessive drag while the fan is stopped. Bearings may get too sloppy due to wear. This condition can be anticipated by listening for excessive noise while the fan is operating or by manually checking for excessive play while the fan is stopped.

(2) Windings may short or open circuit due to continued overheating. This condition can be anticipated by feeling and looking for any signs of overheating while the fan is operating.

c. Equipment Required. None.

d. Conditions. The operating checks shall be performed while the fan is under a typical operational thermal load.

e. Detailed Procedure. For detailed procedures on Inspecting the Fan, refer to TI 6131.12, section 7.9.

551. CLEAN AND INSPECT CABINET.

a. Object. This task is performed so that accumulated debris will not degrade the operation of the enclosed equipment and so that unscheduled interruptions of service will be avoided by detecting pending mechanical failure.

b. Discussion. None.

c. Equipment Required. A vacuum cleaner with a small flexible crevice attachment.

d. Conditions. This procedure may be run during the execution of the operational system provided that there is no interference with ATC.

e. Detailed Procedure. For detailed procedures on Cleaning and Inspecting Cabinets, refer to TI 6131.12, section 7.10.

552. INSPECT HP 2100TN NETWORK PRINTER.

a. Object. This task is performed so debris will not jam the printer.

b. Discussion. None.

c. Equipment Required. None.

d. Conditions. The inspection shall be performed with the printer power OFF.

e. Detailed Procedure. For detailed procedures on Inspecting the HP 2100TN Network Printer, refer to TI 6131.12, section 6.4.

553. CLEAN AND INSPECT KEYBOARDS, MONITORS, AND CABINET SURFACES.

a. Object. This task is performed so that dust and dirt will not degrade the operation of the equipment and so that unscheduled interruptions of service will be avoided by detecting pending mechanical failure.

b. Discussion. None.

c. Equipment Required. A damp cloth.

d. Conditions. The cleaning shall be performed with the equipment powered OFF.

e. Detailed Procedure. For detailed procedures on Cleaning and Inspecting Keyboards, Monitors, and Cabinet Surfaces, refer to TI 6131.12, section 7.11.

554. CLEAN HP2100TN PRINTER.

a. Object. This task is performed so that dust and dirt will not degrade the operation of the equipment and so that unscheduled interruptions of service will be avoided by detecting pending mechanical failure.

b. Discussion. None.

c. Equipment Required.

(1) A damp cloth,

(2) A non-toxic and non-abrasive cleanser, and

(3) A vacuum cleaner with a small flexible crevice attachment, as needed.

d. Conditions. The cleaning shall be performed with the equipment powered OFF.

e. Detailed Procedure. For detailed procedures on Cleaning the HP2100N Printer, refer to TI 6131.12, section 7.12.

555. USING THE HP 2100TN PRINTER CLEANING PROCESSES.

a. Object. This task is performed to correct problems that could cause poor print quality before they occur.

b. Discussion. During the printing process, paper, toner, and dust particles can accumulate inside the printer. Over time, this buildup can cause print quality problems such as toner specks or smearing. This printer has two cleaning modes that can correct and prevent these types of problems.

c. Equipment Required. In order for the printer to work properly, use copier-grade paper, not bond or rough paper.

d. Conditions. The cleaning shall be performed with the equipment powered ON.

e. Detailed Procedure. For detailed procedures on Using the HP2100N Printer Cleaning Processes, refer to TI 6131.12, section 7.12.1.

556.–574. RESERVED.

Section 3. SPECIAL MAINTENANCE TASKS

575. HP 2100TN LASERJET PRINTER.

For detailed procedures on Troubleshooting and Diagnostics for the HP2100N Printer, refer to TI 6131.12, section 6.4.

576. CISCO FASTHUB 400 SERIES.

For detailed procedures on Troubleshooting and Diagnostics for the Cisco FastHub 400 Series, refer to TI 6131.12, section 6.5.

577. YAMAHA CD–ROM READ/WRITE.

For detailed procedures on Troubleshooting and Diagnostics for the Yamaha CD–ROM Read/Write Drive, refer to TI 6131.12, section 6.6.

578. POWER REACH LITE (KVM — 401LT).

For detailed procedures on Troubleshooting and Diagnostics for the Power Reach Lite (KVM — 401LT, refer to TI 6131.12, section 6.7.

579. SONY LCD COLOR MONITOR.

For detailed procedures on Troubleshooting and Diagnostics for the Sony 17-inch Flat Panel LCD Monitor Model 1701 FP, refer to TI 6131.12, section 6.8.

580. CANON LR–1 BUBBLE JET PRINTER.

For detailed procedures on Troubleshooting and Diagnostics for the Canon LR–1 Bubble Jet Printer, refer to TI 6131.12, section 6.9.

581. HP JET DIRECT 300 PRINTER SERVER.

For detailed procedures on Troubleshooting and Diagnostics for the JetDirect Print Server, refer to TI 6131.12, section 6.10.

582. IBM REDUCED INSTRUCTION SET COMPUTER (RISC) SYSTEM/6000 SERIES P, MODEL 640.

For detailed procedures on Troubleshooting and Diagnostics for the IBM RS/6000 Series P, Model 640, refer to TI 6131.12, section 6.11.

583. IBM NETVISTA 2800 THIN CLIENT.

For detailed procedures on Troubleshooting and Diagnostics for the Network Station Series 2800 (Model 8364) Thin Client, refer to TI 6131.12, section 6.12.

584. ROOTVG SYSTEM BACKUP.

The rootvg backup should be performed prior to installation of a new build, prior to adaptation changes or whenever the System Administrator deems the necessity. For detailed procedures on rootvg system backup, refer to TI 6131.12, section 7.1.1.

585. COMPAC ALPHASERVER DS10.

For detailed procedures on Troubleshooting and Diagnostics for the Compaq AlphaServer DS10, refer to TI 6131.12, appendix I, section 1.3.

586. 3COM ETHERNET HUB 4.

For detailed procedures on Troubleshooting and Diagnostics for the 3COM HUB Model 3C16704, refer to TI 6131.12, appendix I, section 1.3, or OfficeConnect Ethernet Hub 4, 4C, 8, 8C User Guide, 3COM Technologies, 1999.

587. DELL OPTIPLEX GX 110.

For detailed procedures on Troubleshooting and Diagnostics for the Dell Optiplex GX 110, refer to TI 6131.12, attachment 1, section 6.

588. PARK AIR TRANSCEIVER 5525–D8.

For detailed procedures on Troubleshooting and Diagnostics for the Park Air Transceiver Model 5525–D8, refer to TI 6131.12, attachment 1, section 6.1.2.

589. UPS.

For detailed procedures on Troubleshooting and Diagnostics for the Belkin UPS Regulator Pro Gold Series Model F6C650–USB refer to TI 6131.12, attachment 1, table 6–3.

590.–599. RESERVED.

CHAPTER 6. FLIGHT INSPECTION

600.–699. RESERVED.

CHAPTER 7. MISCELLANEOUS

700. ABBREVIATIONS AND ACRONYMS.

The following acronyms, abbreviations, and units are used in this document.

ac	Alternating Current
AF	Airway Facilities
AFSS	Automated Flight Service Station
AIX	Advanced Interactive Executive
ARTCC	Air Route Traffic Control Center
ASM	Altimeter Setting Message
ATC	Air Traffic Control
ATO	Air Traffic Operations
ATSS	Airway Transportation Systems Specialist
CDE	Common Desktop Environment
CPDLC	Controller-to-Pilot Data Link Communications
CMA	Context Management Application
COTS	Commercial Off-The-Shelf
DL	Data Link
DLAP	Data Link Application Processor
DLS	Data Link System
DR&A	Data Reduction and Analysis
DSR	Display System Replacement
EC	Equipment Check
ECDAG	En Route Communication Data Air Ground
ECOM	E Complex Monitor
FAA	Federal Aviation Administration
FDB	Full Data Block
FDDI	Fiber-Distributed Data Interface
GBIS	Ground Boundary Intermediate System
GUI	Graphic User Interface
HCS	Host Computer System
HDL	Host Data Link
HID	Host Interface Device
HNL	HID/NAS LAN
HP	Hewlett Packard
Hz	Hertz
IBM	International Business Machines
IC	Initial Contact
IP	Internet Protocol
KVDT	Keyboard Video Display Terminal
KVM	Keyboard-Video Mouse
LAN	Local Area Network
LED	Light Emitting Diode
MB	Megabyte
MHz	MegaHertz
MIPS	Millions-of-Instructions-Per-Second
NADIN	National Airspace Data Interchange Network
NAS	National Airspace System
NCP	NAS Change Proposal
NSM	Network System Monitor
NSN	National Stock Number
NOTAM	Notice to Airmen

OCC	Operations Control Center
PC	Personal Computer
POST	Power-On Self-Test
RISC	Reduced Instruction Set Computer
RS	RISC System
SAR	System Analysis Recording
SCS	Service Certification Suite
SMIT	System Management Interface Tool
SNMP	Simple Network Management Protocol
SOC	Service Operations Center
TCP	Transmission Control Protocol
TOC	Transfer of Communication
TPR	Technical Performance Record
UPS	Uninterruptible Power Supply
Vac	Volts Alternating Current
VDR	VHF Data Radio
VHF	Very High Frequency
WAN	Wide Area Network

701.–799. RESERVED.

APPENDIX 1. CERTIFICATION REQUIREMENTS

1. GENERAL.

This chapter contains certification requirements for communication services provided in the En Route ATC environment, and certification requirements for constituent systems used to provide these services. Refer to Order 6000.15 for general guidance on the certification of services and systems.

2. SERVICES.

A service is defined as an intangible product created when a system or group of systems providing some functional benefit to a user. The communication service provides a means for necessary communications among pilots and ATC personnel regarding aircraft operations. This service is certified as ECDAG Service, in accordance with the tables included in this appendix. ECDAG provides communications using digital data link technology. It depends on systems used to process, display, store, route, and update flight data and weather advisory information.

3. SYSTEMS.

Centralized and distributed automation processing systems, and workstations are utilized to provide these services. The system is certified as a DLS in accordance with this appendix.

4. EXCEPTIONS.

Order 6000.15 permits certification with exceptions where a system provides somewhat less than its full functional benefit but is still useable, e.g., one flight data source is taken out of service, yet another flight data source is being used to contribute to the traffic management service. Outstanding exceptions may be certified in accordance with the following tables, additional guidance is given for the specific purpose of removing the exceptions.

5. FUTURE SYSTEMS.

For future planning purposes, systems that provide the above services or are used for testing or prototyping shall be certified in accordance with Order 6000.15.

TABLE 1. ECDAG SERVICE

Advertised Service	*Certification Parameter*	*Reference Paragraph*
a. ECDAG.	Knowledge that the constituent systems are certified. NOTE: Constituent systems include CPDLC, HNL, DSR, Host, or TX/RX as applicable.	308, 514 (go/no go)
b. Connectivity capability.	Successful read back of data message.	308, 514 (go/no go)
c. Control capability.	Proper data entry and display functions.	308, 514 (go/no go)
	Normal system monitor indications at monitor and control positions.	308, 514 (go/no go)

Maximum Certification Interval: Daily.

Allowable Exceptions: None.

Person Responsible for Certification: AF personnel with certification authority.

Certification Entries in CPDLC Log:

Without Exception:
ECDAG Certified.

Removing Exception:
None.

TABLE 2. CPDLC SYSTEM CERTIFICATION

Advertised Service	*Certification Parameter*	*Reference Paragraph*
a. Message Input Processing.	NAS Message Statistics	Par. 309a
b. Storage Capability.	CMA Connection Status	Par. 309b
c. Message Output Processing.	Output data to ARINC displayed.	TI 6131.12, section 4.1.4.2
	CPDLC Message Statistics Menu Expected Outgoing ATN Service Provider Messages should dynamically increment.	TI 6131.12, section 4.1.4.2
d. Link Quality.	Message error statistics displayed.	TI 6131.12, section 4.1.4.2
	CPDLC Message Statistics Menu Expected Incoming and Outgoing ATN Service Provider Message Errors should = 0. Expected NAS Messages Rejected and Retransmitted should = 0.	TI 6131.12, sections 4.1.4.2 and 4.1.4.1
e. Processing Capability.	CPDLC and CMA application monitoring.	TI 6131.12, sections 4.1.2.1 and 4.1.3.1
	CPDLC Application Status Menu Expected Primary and Secondary Application Status should be Enabled.	TI 6131.12, sections 4.1.2.1 and 4.1.3.1
	CMA Application Status Menu Expected Primary and Secondary Application Status should be Enabled.	TI 6131.12, sections 4.1.2.1 and 4.1.3.1

Maximum Certification Interval: Quarterly.

Allowable Exceptions: Individual CPDLCs, CMAs, GBISs, NSMs, Routers, or Concentrators.

Person Responsible for Certification: AF personnel with certification authority.

Certification Entries in CPDLC Log:

Without Exception:
DLS Certified.

With Exception:
DLS Certified except [Element Designation] [Position Designation].

Removing Exception:
DLS [Element Designation] [Position Designation] Certified.

APPENDIX 2. DOCUMENT IMPROVEMENT PROPOSAL

DOCUMENT IMPROVEMENT PROPOSAL		
1. DOCUMENT NUMBER	2. DOCUMENT TITLE	
3a. NAME OF SUBMITTING ORGANIZATION		4. TYPE OF FACILITY
b. ADDRESS		
5. PROBLEM AREA a. Paragraph Number and Wording: b. Recommended Rewording:		
6. REMARKS:		
7a NAME OF SUBMITTER (Last, First, MI) — OPTIONAL	b. WORK TELEPHONE NUMBER (Include Area Code) — OPTIONAL	
c. MAILING ADDRESS (Street, City, State, ZIP Code) — OPTIONAL	d. E—MAIL ADDRESS	

NOTE: Any changes to the baseline document or requests for deviation from national standards shall be processed through the NAS Change Proposal (NCP) process.

CASE FILE/ NAS CHANGE PROPOSAL

(PLEASE TYPE OR PRINT NEATLY)

Page 1 of _____

1. Case File Number	2. For CM Use — Case File Received Date	NCP Issuance Date	NCP Number

3. Scope of Change

Local National

Test

4. Reason For Change

Safety Technical Upgrade Systems Interface

Requirements Change Design Error Parts Unavailability

Baseline Other

5. Priority

Normal

Time-Critical

Urgent

6. Justification of Time Critical/Urgent Priority

7. Supplemental Change Form

ECR/ECP TES N/A

7a. Supplemental Change No. _____

7b. Supplemental Change Initiation Date _____

8. Case File Originator	9. Originator's Organization	10. Telephone Number	11. Case File Initiation Date

12. Type of Document Affected

CPFS SPEC MTBK _____

TI DWG IRD/ICD

13. Baseline Document Number(s)

14. CI Subsystem Designator	15. FA Type	16. CI Component Designator

17. Facility Identifier (FACID)	18. Facility Code (FACCODE)	19. Cost Center Code	20. Software System Version

21. Title

22. Description: (a) identification of problem, (b) proposed change, (c) interface impact, (d) cost estimate (e) funding source (f) benefits/risks, (g) Schedule (h) Other (e.g. logistics, quality, etc.)

(a)

(b)

(c)

(d)

(e)

(f)

(g)

(h)

Blocks 1 through 22 are to be completed by originator and/or the NCP coordinator. If a block is not applicable, write n/a. Attach additional sheets if necessary. See current revision of NAS-MD-001 for detailed completion instructions.

Case File Number **NCP Number**

23. Name and Title of Originator's Immediate Supervisor (Type/Print Clearly) **Signature** **Date**

24. Facility/SMO Review (AT/AF)

Name	Routing Symbol	Date	Concur	Non-Concur

Routing Symbol **Signature**

Date

Routing Symbol **Signature**

Date

24a. Comments

(Attach additional sheets if necessary)

25. Regional Review

Name	Routing Symbol	Date	Concur	Non-Concur

Recommend Approval (Enter into CM/STAT. Forward to Prescreening) **Disapprove** (Return to Originator)

Routing Symbol **Signature**

Date

Routing Symbol **Signature**

Date

Routing Symbol **Signature/Configuration Mgr/NCP Coordinator/ Reg Exec Sec**

Date

25a. Comments

(Attach additional sheets if necessary)

26.

PRESCREENING

Prescreening Office _____

Prescreening Comments:

(Attach additional sheets if necessary)

Reviewers	Routing Symbol	Date	Concur	Non-Concur

Recommended Must Evaluators

Recommend Approval
New Requirement

Recommend Disapproval (Return original to originating office through the Regional NCP Coordinator)

Routing Symbol **Signature**

Date

27. For Internal Configuration Management Use Only