DEFENSE INFORMATION SYSTEMS AGENCY
701 S. COURTHOUSE ROAD
ARLINGTON, VIRGINIA 22204-2199

DISA CIRCULAR 310-70-1* 25 June 1998

Last reviewed on ~~08 May 2002~~

METHODS AND PROCEDURES

DII Technical Control

1. **Purpose**. This Circular prescribes policy and provides procedures for all DII Facility Control Offices (FCOs), Network Control Offices (NCOs), Technical Control Facilities (TFCs), and Patch and Test Facilities (PTFs) operating at levels 3, 4, and 5 in the Defense Information Systems Agency (DISA) system control hierarchy.

2. **Applicability**. This Circular applies to DISA, the military departments (MILDEPs), other activities of the DOD or governmental agencies, and contractors responsible for the operation and maintenance (O&M) of the Defense Information Infrastructure (DII).

3. **Authority.** This Circular is published in accordance with the authority contained in DoD Directive 5105.19, Defense Information Systems Agency (DISA), 25 June 1991.

4. **References**.

4.1 DoDD 4640.13, Management of Base and Long-Haul Telecommunications Equipment and Services, 5 December 1991.

4.2 DISAC 310-55-1, Status Reporting for DII, 3 October 1989.

4.3 DISAC 310-65-1, Circuit and Trunk File Data Elements & Codes

Manual of the DII, 21 April 1987.

4.4 DISAC 310-D70-30, DII AUTODIN Switching Center and Subscriber Operations, 20 May 1988.

4.5 DISAC 300-85-1, Reporting of DII Facility and Link Data, 6 April 1993.

4.6 DISAC 310-130-1, Submission of Telecommunications Service Requests, 23 July 1992.

4.7 DISAC 310-130-2, DII Management Thresholds and Performance Objectives, 13 February 1979.

4.8 DISAC 310-130-4, Defense User's Guide to the Telecommunications Service Priority System, 8 September 1997.

4.9 DISA-DITCOC 350-135-1, Defense Commercial Communications Acquisition Procedures, 12 February 1996.

4.10 DISAC 300-175-9, DII Operating-Maintenance Electrical Performance Standards, 29 August 1986.

5. **Definitions**. Definitions of terms used in this Circular immediately follow the table of contents.

6. **Policy**. This Circular is the governing directive for exercising transmission control of DII links, trunks, and circuits by the DII FCOs, NCOs, TCFs, and PTFs.

7. **Relationship to Other Publications**.

7.1 The procedures contained in this Circular have precedence over all service publications or other directives regarding control of DII transmission facilities, links, trunks, and circuits.

7.2 Personnel must be familiar with related Allied Communications Publications (ACPs), other DISA Circulars and MILDEP regulations, technical manuals, and technical orders that contain detailed and specific information necessary for effective and efficient operations of DII facilities.

8. **Supplemental Procedures.** Any supplemental procedures to this Circular must be submitted to the Director, DISA, ATTN: D3, 701 S. Courthouse Road, Arlington, VA, 22204-2199, for approval prior to publication.

9. **Procedural Changes.** All DISA activities, MILDEPs, and O&M elements are invited to submit recommended changes to this Circular. The recommendations will be forwarded through the appropriate DISA Regional Control Center (RCC) to the Director, DISA, ATTN: D3, 701 S. Courthouse Road, Arlington, VA, 22204-2199, with an information copy to the appropriate O&M headquarters.

FOR THE DIRECTOR:

A. FRANK WHITEHEAD
Colonel, USA
Chief of Staff

SUMMARY OF SIGNIFICANT CHANGES. This revision includes administrative changes only.

_____

OPR: OP33
DISTRIBUTION: W

Continue to:
Table of Contents

Return to:
Publication Listing
DISA Home Page

Pubs@ncr.disa.mil - Last change: 15 June 1998

TABLE OF CONTENTS

C10.9 Leased Circuit Outage Reporting

TABLE

FIGURES

Return to:

Top of Document
Basic Circular
Publication Listing
DISA Home Page

Michael E. Craft, craftm@ncr.disa.mil - Last revision: 12 June 1998

DEFINITIONS

Area Communications Operations Center (ACOC). The ACOC exercises day-to-day operational direction over the DII control facilities, DII voice and data traffic switching facilities, satellite facilities, and other DII operating elements, either directly or indirectly, through its subordinate regions within the assigned geographical area. The ACOC is part of the DISA Operations Control Complex (DOCC) and exercises responsibilities at level 2 of the DII system control hierarchy.

Communications Control Office (CCO). The CCO is responsible for tasks associated with the initial activation of a circuit/trunk such as accepting leased service on behalf of the U.S. Government and submitting the appropriate completion reports. It is also responsible for coordinating the realignment of the circuit/trunk when necessary to maintain the end-to-end engineered values as stated in the Telecommunications Service Order (TSO). A CCO is assigned to every circuit/trunk, for the life of the circuit/trunk. A CCO is designated in the TSO and will receive copies of subsequent TSO's issued on the circuit.

Communications Facility. A communications facility, normally operated and maintained by an O&M, that provides some communications service and has at least one circuit terminating or passing through the facility.

Critical Control Circuits (CCC). Critical control circuits are voice and data communications circuits used by the DISA Operations Control Complex (DOCC) for operational direction and exchange of DII status information between DOCC elements and between the DOCC and DII technical control, traffic switching or relay facilities, satellite facilities, and other DII operating elements. Critical control circuits represent DISA requirements and are subject to the validation of the Director, DISA.

Defense Information Systems Agency Network Management (DISA RCC) Operations Control Complex (DOCC). The DOCC is the collection of DISA control centers that are assigned the responsibilities of levels 1 and 2 of the system control hierarchy. This includes the DISA RCC's, ACOC's, RCOC's, and associated emergency relocation sites

(ERS's).

Digital Patch and Access System (DPAS). An electronic digital cross-connect system for cross-connecting 64 Kbps signals. DPAS is based on the AT&T Digital Access Cross-connect System (DACS).

Digital Patch and Access System (DPAS) Control Terminal (DCT). A terminal provided with DPAS that uses enhanced software for converting AT&T Man Machine Language (MML) code to DII language.

DII Circuit. Any circuit assigned a CCSD by DISA TSO Action.

DII Facility. A DII facility is any facility that has been identified as a DII facility in DISAC 310-70-61 Identification of Components of the DII. "It could be Government-owned or a combination of Government-owned, fixed, transportable, mobile assets or leased equipments, as appropriate, that provide general purpose, long-haul, point-to-point transmission media system, traffic switching function, or communications support capability. A DII facility is normally operated and maintained by the Government or a contractor through which or to which DII or a combination of DII/non-DII communications links, trunks, or circuits pass or terminate. A DII facility can accomplish a variety of functions including terrestrial or satellite transmission, message switching, circuit switching, circuit restoration, rerouting, trouble isolation, repair, circuit coordination, or facility coordination.

DSCS Operations Center (DSCSOC). The DSCSOC exercises day-to-day network and payload control of the DSCS. The DSCSOC is part of the DOCC and exercises responsibilities at level 2 of the DII system control hierarchy.

Emergency Relocation Site (ERS). An ERS is a designated site for relocation of the NCS/DISAOC and the ACOC's if required during a crisis situation.

End-to-End. As used in this circular, end-to-end refers to the total circuit path, as prescribed in the TSO, from the terminal equipment at one end to the terminal equipment at the far end.

Facility Surveillance. Facility surveillance provides real-time

equipment, transmission network, and terminal data concerning the status of the system, network, and facilities, and their near-term performance over a period of time. It also includes associated near-term data reduction and analysis to support near-term network and technical control. It provides data to support mid- and long-range system management, engineering, operation and maintenance.

Facility Control Office (FCO). The FCO is responsible for day-to-day operation and maintenance of DII facilities within a designated geographical area. FCO's are staffed and equipped by O&M activities and are assigned level 3 responsibilities in the system control hierarchy. FCO's are manned 24 hours a day and must have sufficient communications connectivity (to include a secure means) to fulfill the functions and responsibilities contained in this circular.

Intermediate Control Offices (ICO). If the layout of a circuit or trunk is such that the overall CCO is not in the best position to perform tests and coordinate the activities of some of the intermediate TCF's, another TCF may be designated as an ICO. ICO's will be designated in the TSO at the time the layout is placed in effect and will assume the responsibility for the general service condition of the assigned segment. Temporary ICO's may be designated by the appropriate TSO issuing authority for the specific purpose of completing TSO change actions. Otherwise, the CCO assigned to the circuit will be designated in the TSO to effect the change. ICO's are responsible to the CCO for operational direction.

Interswitch Trunk. A trunking circuit between switching centers. For example, in DSN an IST is any trunking circuit that connects two DSN multi-functions switches together.

Management Control. Management control is the review, evaluation, coordination, and guidance of management actions necessary to fulfill the responsibility of operational direction of the DII.

Monitoring Center (MC). The MTC is located at a DII control facility where one or more trunks terminate or where remotely controllable testing access to all derived channels exists. The MTC exercises technical supervision over switching centers and assigned trunks to the distant end facilities where the trunks break out into individual channels. The MTC is responsible for initial activation, acceptance of leased trunks on behalf of the U.S. Government, and submission of

appropriate completion reports required by the TSO issuing authority. MTC is also responsible for coordinating realignment of the trunk when necessary to maintain end-to-end engineered values stated in the TSO.

National Communications System/Defense Information Systems Agency Network Management Operations Center (NCS/DISA GOSC). The NCS/DISA GOSC is the DISA field activity responsible for exercising day-to-day operational direction over the worldwide DII operating elements. The NCS/DISA GOSC is part of the DOCC and exercises control responsibilities at level 1 of the DII system control hierarchy. The Western Hemisphere ACOC is collocated with the NCS/DISA GOSC and exercises control responsibilities at level 2.

Near-Term. Where "real-time" is the time it takes to react to a situation, "near-term" is a longer period of time in which analyses and more permanent corrective actions are initiated.

Network. An interrelated organization of devices, workstations, switching centers, or facilities tied together to serve a common purpose, capable of intercommunicating.

Network Control. Network control provides real-time and near-term control of switched or special networks; reconstitution, restoral, and extension supervision; and satellite system and payload control; and resource allocation.

Network Control Office. An activity or function assigned network control responsibilities for a specialized DII network. Designation of a network control station/office can only be made by DISA with concurrence of the OPR for DISAC 310-70-1. The network control station/office is normally assigned by function rather than geographic area and is collateral with level 3 functions in the system control hierarchy with responsibilities limited to the assigned network. The network control station/office is required to coordinate with other DISA functions (i.e. ACOC, FCO, and TCF elements), especially when networks cross geographical boundaries. Sufficient manning and communications connectivity must be available to provide proper management and control of the assigned network.

Network Element. A term used to identify any line or path

terminating equipment where automated performance monitoring may be accomplished. Network elements include such equipment as multiplexers, switching devices, cross-connect devices, etc.

Network Management. A set of procedures, equipment, and operations designed to keep a network operating near maximum efficiency when unusual loads or equipment failures would otherwise force the network into a congested, inefficient state.

Network Management Control Center. A centralized control center from which a specific network is monitored and controlled and statistical information is collected.

O&M Elements (O&M Activities). Military Department (MilDep), Department of Defense (DoD), or contracted elements that are responsible for the operation and maintenance (O&M) for a DII facility or system.

Operational Direction. Operational direction includes authority to direct the operating elements of the DII, assign tasks to those elements, and supervise the execution of those tasks; allocate and reallocate DII facilities to accomplish the DISA mission; and develop technical standards, practices, methods and procedures for the performance and operation of the DII.

Operating Elements of the DII. An operating element is a control center staffed and equipped by O&M activities that exercises responsibilities at levels 3, 4, or 5 of the DII system control hierarchy.

Orderwire. Orderwires are those voice and data telecommunications circuits (to include teletype) used for exchange of surveillance and control information between operating elements of the DII.

Patch and Test Facility (PTF). The PTF is the part of a DII facility that functions as a supporting activity normally under the technical supervision of a TCF. PTF's have the same functions and responsibilities as a TCF with the exception that the physical and electrical capabilities may be limited. A PTF is a facility which normally supports one major user or several minor users; is the 2nd, 3rd, 4th, etc. control facility in a GEOLOCO that reports to a TCF;

may or may not be manned 24 hours a day; can access some circuits and trunks traversing the facility for purposes of monitoring, testing, and restoral; has some testing capabilities; may or may not be able to restore major equipment components.

Regional Communications Operations Center (RCOC). The RCOC exercises day-to-day operational direction over the DII elements within its assigned geographical area. The RCOC is part of the DOCC and exercises responsibilities at level 2 of the DII system control hierarchy.

Serving Technical Control/Patch and Test (TCF/PTF). A TCF or PTF that provides direct interface between local users and the DII. The serving TCF/PTF is responsible for coordination with the user and ensuring complete end-to-end service for that user.

System Control. System control ensures user-to-user service is maintained under changing traffic conditions, changing user requirements, natural or manmade stresses and disturbances, and equipment failures or degradations. It includes the interrelated activities of facility surveillance, traffic surveillance, network control, traffic control, and technical control. System control facilities include the DISA control centers, O&M technical control facilities, and other facilities that are capable of providing system control at all levels of the hierarchy.

Technical Control (Tech Control). Technical control includes the real-time transmission system configuration control, quality assurance, quality control, alternate routing, patching, testing, directing, coordinating, restoring, and reporting functions necessary for effective maintenance of transmission paths and facilities. This also includes direction of activities in any work area of the DII station containing distribution frames and associated jacks or switches through which equipment and facilities are patched or switched to provide the required transmission path. The work areas also include any test equipment or testing capability.

Technical Control Facility (TCF). The TCF is the part of a DII station that functions as the interface between the transmission elements of the DII and the users of the system. It has the physical and electrical capabilities necessary to perform the required functions of technical control described in this Circular. A TCF is

a facility which supports more than one major user and; is normally manned 24 hours a day; can access all circuits and trunks traversing the facility for purposes of monitoring, testing, and restoral; has complete testing capabilities; can restore major equipment components (i.e., receivers, transmitters, multiplexers, etc.).

Traffic Control. Traffic control provides real-time and near-term control of traffic flow and routing such as code cancellation, code blocking, alternate route cancellation, line load control, and user prioritization.

Traffic Surveillance. Traffic surveillance provides real-time data concerning systems and network loading, data processing queue status, message backlog, and buffer-fill-rate data and other measures to describe system, network, and facility congestion and traffic load. It also includes associated near-term data reduction and analysis to support traffic control. It provides data to support mid- and long-range system management engineering, operation, and maintenance.

Return to:
Basic Circular
Table of Contents
Publication Listing

Michael E. Craft, craftm@ncr.disa.mil - Last revision: 12 June 1998

CHAPTER 1. DEFENSE INFORMATION SYSTEMS AGENCY (DISA) OPERATIONAL CONTROL COMPLEX (DOCC)

C1.1 **Authority and Mission**. DoD Directive 5105.19 established the Defense Information Systems Agency (DISA) as a Combat Support Agency of the Department of Defense (DOD) under the direction, authority, and control of the Assistant Secretary of Defense for Command, Control, Communications, and Intelligence (ASD(C3I)) and provides the authority to conduct its mission. The Director, DISA, is specifically delegated authority to communicate directly with the heads of the DOD Components and other Executive Departments and Agencies, as necessary, to carry out DISA's responsibilities and functions. The Secretaries of the Military Departments and the Directors of the Defense Agencies shall provide support to include planning, programming, and budgeting; test and evaluation; operations and maintenance; and integrated logistics support for programs, projects, and systems for which the DISA is responsible. DISA is responsible for planning, developing, and supporting command, control, communications, and information systems that serve the needs of the National Command Authorities (NCA) under all conditions of peace and war. It provides guidance and support on technical and operational command, control, and communications (C3) and information systems issues affecting the Office of the Secretary of Defense (OSD), the Military Departments, the Joint Staff, the Unified Commands, and the Defense Agencies. It ensures the interoperability of the Global Command and Control System (GCCS), the Defense Information Infrastructure (DII), theater and tactical command and control systems, North Atlantic Treaty Organization (NATO) and/or allied C3 systems, and those national and/or international commercial systems that affect the DISA mission. It supports national security emergency preparedness (NS/EP) telecommunications functions of the National Communications System.

C1.2 **Defense Information Infrastructure (DII)**.

C1.2.1 The DII is a composite of DoD-owned and DoD-leased telecommunications subsystems and networks as prescribed in DoD Directive 5105.19. DII components include fixed, transportable, and leased equipments that provide long-haul transmission media, traffic switching or relay functions, or communications support capability including assets of the Defense Satellite Communications System

(DSCS).

C1.2.2 Recommendations by DISA or other DOD activities for identifying communications facilities as DII require review and approval by the appropriate unified command and the review of the appropriate component command. If a communications facility or system being considered for inclusion in the DII meets the component criteria but does not meet established DII interface, installation, or engineering standards (e.g., facilities designed for tactical applications), the unified command and Headquarters, DISA Operations Directorate (D3), will approve the inclusion on an excepted basis. Such exception does not relieve responsible elements from upgrading facilities and equipment to meet DII standards as resources and funding permit. Once a communications facility is designated as a DII facility, the DII facility is then responsible for ensuring appropriate reports are submitted to DISA in accordance with DISAC 300-85-1.

C1.3 **Defense Information System Network (DISN)**. As directed by the Office of the Assistant Secretary of Defense for Command, Control, Communications, and Intelligence (OASD(C3I)), DISA has been directed to develop and implement the DISN program to provide a cost effective, efficient, and an interoperable information system network for DOD. Each of the individual military service and DOD agency telecommunications networks (e.g., DCN, AFNET, NAVNET) will be integrated into the DISN under the management control and operational direction of DISA. Integration of the networks and establishment of Network Management Centers (NMCs) began in 1992. As the DISN evolves, most DOD telecommunications requirements will be provided by the DISN.

C1.4 **DISA Operations Control Complex (DOCC)**. The DOCC is the functional element through which the Director, DISA, exercises management control and operational direction of the DII. Management control and operational direction are applied either directly to components of the or through the service/agency responsible for the operations and maintenance (O&M) of the DII. The DOCC includes the HQ DISA staff elements and the DISA network operations centers that are responsible for managing, controlling, and monitoring the DII. The network operations centers are: the DISA Global Operations and Security Center (DISA GOSC); the Regional Control Centers (RCCs); and the Emergency Relocation Sites (ERS).

C1.5 **DISA System Control Hierarchy**. The current DISA system control hierarchy, established by DISAC 310-50-5, is structured within five hierarchical levels as depicted in figure 1.1. The first two levels are normally DISA operated and staffed while the remaining three levels are operated and staffed by the O&M agencies. The exception is that the RCCs are operated and staffed by O&M personnel. The DISA level 1 and 2 elements are described in paragraph C1.4 above. The O&M elements at DISA levels 3, 4, and 5 include Local Control Centers (LCCs), Network Control Offices (NCOs), Technical Control Facilities (TCFs), Patch and Test Facilities (PTFs), DISN Voice and Data Switching Centers, and Satellite Earth Terminals. The day-to-day flow of information such as status reporting and coordination is accomplished through each DISA level depicted by the solid lines in figure 1.1. However, when situations dictate, immediate operational control may flow from the DISA levels 1 or 2 directly to DISN elements operating at DISA levels 3, 4, or 5 as depicted by the dashed lines in figure 1.1.

C1.5.1 **Level 1: Worldwide DISA Global Operations and Security Center (DISA GOSC)**. Worldwide control of the DII is exercised at the DISA GOSC. The DISA GOSC is directly responsible for managing, controlling, and monitoring various networks such as the Internet Protocol (IP) Router Networks (IP Router Networks), the Defense Switched Network (DSN), the Defense Satellite Communications System (DSCS), and the Defense Information System Network (DISN). The DISA GOSC is supported by the Regional Control Center (RCC) staff.

C1.5.2 **Level 2: Theater Regional Control Centers (RCCs)**. DISA level 2 consists of RCCs. RCCs are established in the Pacific and European theaters to provide operational control and direction within those areas to enhance system survivability. Each RCC has a designated Continuity of Operations Plan (COOP) site, or Emergency Relocation Site (ERS), for contingency operations. The RCC also becomes the operations manager for the overseas Commander-in-Chief (CINC) when the CINC assumes temporary operational control of DISA field organizations under his area of responsibility. The RCC also performs DSCS management actions for the satellites and earth terminals within their area. DISN plans for OCONUS have not been developed.

C1.5.3 **Level 3: Local Control Centers (LCCs)**. LCC control is the

highest level of O&M control within the DII. LCCs are designated by each DISA Area to provide operational control and technical supervision over level 4 and 5 DII facilities within a designated geographical area. LCCs report directly to the DISA GOSC or appropriate RCC/RCOC. The control structure parallels the DISA reporting system to provide a logical flow of operational and technical information between the LCC and subordinate facilities. Military service boundaries will not restrict a LCC in fulfilling its responsibilities.

C1.5.4 **Level 3: Network Control Office (NCO)**. An NCO is also an O&M level 3 facility within the DISA system control hierarchy, similar to an LCC, but is assigned on a functional basis rather than geographical. NCOs are designated by DISA to provide necessary monitoring and control of specific DISN subnetworks. The function and responsibility of an NCO is limited to the subnetwork for which it has been assigned. NCOs normally report directly to each area RCC. The functions and responsibilities of an NCO may cross LCC boundaries; therefore, the NCO is required to coordinate all activities with other DISA (i.e., GOSC/RCC) and O&M (i.e., LCC, TCF, PTF) elements.

C1.5.5 **Level 4: Technical Control Facilities (TCFs)**. TCFs operate at DISA level 4 where O&M functions are performed on DII transmission links, trunks, and circuits. TCFs must have the physical and electrical capabilities, in accordance with MIL-STD-188-154, necessary to perform all technical control functions prescribed by this Circular. TCFs report directly to the designated LCC. In those cases where an LCC has not been designated, the TCF will report directly to the DISA GOSC, or appropriate RCC.

C1.5.6 **Level 5: Patch and Test Facilities (PTF), Switching Centers, and Satellite Earth Terminals**. These control facilities are the lowest level of control and are normally associated with a specific function. In many cases a PTF serves one specific user. Level 5 facilities may have the physical and electrical capabilities of a TCF. However, some of these capabilities (i.e., manning, patching, testing, etc.) may be limited. PTFs and other DII facilities normally report directly to a designated DII TCF within the geographical location. In some locations, DII switching centers (e. g., DSN) may not report directly to a TCF, particularly when a DII switch is monitored and controlled from a DISA level 1 or 2

facility. However, if there is a DII TCF within the geographical area, the DII switch personnel must coordinate with the TCF, and advise the TCF whenever any of the conditions contained in this Circular or DISAC 310-55-1 occur. Satellite earth terminals normally report directly to a DII PTF that is collocated with the earth terminal. Otherwise they report to a designated DII TCF or directly to the RCC.

C1.6 **Reporting Responsibilities**. The DISA GOSC, located in Arlington, VA, is the central control element for the DISA. Reporting to the DISA GOSC are the DISN NMCs and RCCs which exercise operational direction over specified geographical areas and networks. Areas may be further reduced to geographic regions under the operational direction of RCCs, LCCs, and NCOs delegated responsibility for exercising operational control over individual geographical areas or specific networks, report to the DISA GOSC or appropriate RCC. TCFs, responsible for exercising operational control over subordinate PTFs and other DII facilities, report to the appropriate LCC or NCO. PTFs and other DII facilities are responsible for reporting directly to the servicing TCF assigned within their specific geographic location. Although the DISA GOSC and RCCs may have remote monitoring and network management responsibilities for some DII switching centers, the DII switching centers are required to report specific requirements contained in this Circular, and DISAC 310-55-1, through the designated TCF.

C1.7 **DISA Operating Messages.**

C1.7.1 **Operational Direction Messages (ODMs)**.

C1.7.1.1 The DISA Operations Centers (i.e., GOSC and RCCs) may issue messages or telephone instructions in exercising operational direction over DII facilities. ODMs direct actions or request additional information involving the operational responsiveness of the DII and normally require direct, immediate actions by the DII operating elements.

C1.7.1.2 ODMs are temporary. If long-term material is initially published by ODM the ODM will be canceled within 90 days and its contents placed in official correspondence or directions.

C1.7.1.3 ODMs will be assigned and released only by the System

Control Officer (SCO) or network controller on duty in the DISA operations centers.

C1.7.1.4 ODMs will be numerically identified by the date/time group (e.g., 010001Z January 98).

C1.7.1.5 ODMs may be transmitted either by record message or by voice, depending upon the urgency of the situation; however, voice ODMs will be followed with a record copy within 24 hours.

C1.7.1.6 Commanders of DISA elements will initiate appropriate instructions to DII facilities to ensure that ODMs are distributed to appropriate personnel for immediate action.

C1.7.1.7 Information copies of ODMs will be sent to the appropriate O&M agencies and to higher and lateral elements of the DISA.

C1.7.2 **Operational Coordination Messages (OCMs)**.

C1.7.2.1 OCMs provide the capability for DII facilities and subordinate DISA elements to respond to ODMs or to furnish nonaction information to higher or lateral elements.

C1.7.2.2 These messages will be identified in the same manner as ODMs.

C1.7.2.3 OCMs may be transmitted either by record message or by voice, depending on the urgency of the situation; however, voice OCMs will be followed with a record copy within 24 hours.

C1.7.2.4 Information copies of OCMs will be sent to other DII facilities, O&M agencies, and DISA elements, as appropriate.

C1.7.3 **Detailed Outage Reports (DOR)**. DORs may be requested by any DISA element to assist in the resolution of problems in the DII. Reporting of communications failures and operational status from the lowest control level, via voice or record orderwires, to DISA elements is absolutely necessary. The purpose of the DOR is to provide immediate outage analysis information to higher level authorities. DORs are normally requested when extenuating

circumstances occur or during extensive outages on high interest circuits. DORs are a nonformatted narrative type report that must be submitted as expeditiously as possible. Local requirements must not delay submissions. As a minimum, the LCC shift supervisor will provide DORs to the appropriate DISA element within 2 hours of request, with the following information:

C1.7.3.1 A brief description of initial symptoms.

C1.7.3.2 An analysis of troubleshooting efforts, test results, and any other pertinent information that occurred during the outage.

C1.7.3.3 A clear reason for outage. If the problem was not isolated to a definite problem then a "probable cause" will be listed.

C1.7.3.4 Any recommendation(s) for improving service or how to prevent reoccurrence of this type problem (i.e., circuit routing, procedures used, etc.).

C1.8 **Orderwires**. Effective operation of DII telecommunications facilities requires frequent coordination among technical controllers and maintenance personnel exercising technical control of the DII. This coordination is accomplished over voice and data circuits as explained below.

C1.8.1 **Critical Control Circuits**. These are voice and data communications circuits between DII and DII elements used in disseminating operational direction over the DII and in receiving DII status reports.

C1.8.2 **Coordination Circuits. (See DISAC 310-50-6, DII Orderwire, 13 November 1980)**.

C1.8.2.1 **System Orderwires**. Communications circuits, either voice or data, between selected nodal TCFs and LCC/NCOs. Functional POC has to evaluate, and do global changes if appropriate.

C1.8.2.2 **Express Orderwires**. Communications circuits, normally voice, between selected LCC's serving as Communications Control Office (CCO) or Intermediate Control Office (ICO) for a large number

of trunks, or circuits.

C1.8.2.3 **Link Orderwires**. Communications circuits, normally voice, between adjacent communications facilities.

C1.8.3 **Temporary Orderwire Circuits**. Temporary orderwires are established as required by the LCC when available orderwires are not adequate for restoral of high priority circuitry or facilities. These orderwires may be voice or data, depending upon station capability. Normally, these temporary orderwires will be established as on-call patches as prescribed in chapter 5 of this Circular. In the event that orderwires cannot be established by on-call patch procedures due to preemption limitations imposed, the TCF will contact the appropriate LCC or DISA element for assistance. Functional POC has to evaluate and do global changes, if appropriate.

C1.8.4 **Intercommunications Circuits**. These are communications circuits between the LCC and selected terminal locations within the DISN station complex at a specific geographic location.

Continue to:
CHAPTER 2. DII CONTROL FACILITIES AND PERSONNEL

Return to:
Basic Circular
Table of Contents
Publication Listing

Michael E. Craft, craftm@ncr.disa.mil - Last revision: 12 June 1998

CHAPTER 2. DII CONTROL FACILITIES AND PERSONNEL

C2.1 **General**. This chapter defines the general configuration criteria, functions, duties, and responsibilities of DII facilities and personnel responsible for performing technical control functions at levels 3, 4, and 5 of the DISA system control hierarchy.

C2.2 **Configuration Concept and Criteria**. All DII Technical Control Facilities (TCFs) and Patch and Test Facilities (PTFs) must be configured and engineered in accordance with the criteria of MIL-STD-188-154. Following are some of the basic concepts and criteria that are designed to provide survivability, flexibility, standardization, and cost effectiveness of the DII. Although non-DII facilities are not required to meet the technical criteria of this document, they must attempt to provide the same technical characteristics for DII circuits traversing their facility, especially when interfacing with DII facilities. Non-DII facilities meeting all the criteria of MIL-STD 188-154 may request identification as DII facilities in accordance with DISAC 310-70-61.

C2.2.1 **Concept**. DII facilities must be configured and engineered to enable technical controllers as well as other operations and maintenance personnel to maximize the full capabilities of the DISN equipment and personnel. These facilities must take into consideration the non-DII tactical missions of the military departments and must be designed to achieve optimum standardization of equipment in terms of layout and procurement specifications, operating procedures, training, manning guidelines, and technical control functions. These facilities must be designed to enable the technical controller to effectively exercise assigned functions and responsibilities.

C2.2.2 **Criteria**.

C2.2.2.1 Each DII TCF is required to perform the functions of technical control of the DII. Several control facilities may exist at a geographical location (GEOLOCO) but only one facility will be designated as the servicing DII TCF. Other DII facilities having patch and test capabilities must be designated PTFs and must be technically compatible with the servicing DII TCF.

C2.2.2.2 All DII trunks and circuits must be routed through existing

DII TCF/PTFs, or be remotely monitored and controlled by another DII facility (e.g., DSN circuits not routed through a TCF can be monitored and tested with a Maintenance and Administration Facility terminal) or through DISA approved commercial control facility. This includes all trunks and circuits, government-owned or leased, ordered by DISA TSO action. At those GEOLOCO's without a DII TCF/PTF, and where remote monitoring and controlling capabilities do not exist, efforts must be made to ensure that DII trunks and circuits are routed through existing non-DII facilities that have similar capabilities or through DISA approved commercial control facilities. The criteria outlined in this paragraph must be adhered to as long as it is technically feasible, cost effective, and does not violate commercial tariffs. This routing doctrine applies equally to leased DII trunks and circuits using GSA procured FTS2000.

C2.2.2.3 All transmission media and interface equipment must meet, and be maintained in accordance with DII performance standards (refer to DISAC 300-175-9). Any portion of a system or circuit that fails to meet DII performance standards must be corrected prior to acceptance. If the system or circuit is accepted with exceptions, the cause must be annotated and appropriate action taken to correct the exceptions or obtain a waiver from the appropriate DISA Allocation and Engineering (A&E) activity.

C2.2.2.4 All circuits and trunks, digital or analog, that traverse DII TCF's must be accessible for purposes of quality control testing, performance monitoring, operational control, rerouting, and restoral. PTF's must be designed with similar capabilities, although some capabilities may be limited.

C2.2.2.5 All user interfaces must be conditioned to meet DII transmission standards. All circuits traversing the DII TCF/PTF in analog form must be conditioned to provide equal transmitting and receiving levels in accordance with MIL-STD-188-154.

C2.2.2.6 The capability for manually patching or electronically switching spare equipment must be provided to permit timely equipment substitution and circuit conditioning. This includes the capability to provide at least 10 percent additional conditioning, interfacing, and ancillary equipment for expansion as required by MIL-STD-188-154. DII TCFs interfacing with long haul transmission media must be configured and equipped to provide at least one standby conditioning

string for every 10 strings (or portion thereof) of the same configuration.

C2.2.2.7 The orderwire networks required for effective technical control of the DII must be configured and installed in accordance with DISAC 310-50-6, Defense Communications System Orderwire. The effective accomplishment of these functions requires a well-designed orderwire communications network within and between the DISA elements and O&M facilities supporting DISA levels 3, 4, and 5 functions.

C2.2.2.8 All unattended alarm indicators essential to performance of DII Network Elements (NE) should appear in the TCF/PTF for performance and alarm monitoring. (Refer to chapter 3 of this circular for a description of a NE). This includes, but is not limited to: radio and multiplex alarms, major and minor alarms from DII switching equipment (e.g., DSN, IP Router Networks), power supply alarms, and timing and sync alarms (e.g., LORAN-C, CDS-10).

C2.2.2.9 Each DII TCF/PTF is required to have systems diagrams that depict signal flow through the facility readily available in the operations area of the TCF/PTF to aid restoration and troubleshooting efforts. At a minimum, these diagrams must include interface, multiplex, timing, and transmission equipment configurations that indicate the required frequencies, transmission level point (TLP), signal levels, and noise levels for analog transmission media. Digital transmission media must include bit rates, bit error rate specification, and timing and sync information.

C2.2.2.10 In-facility circuit layout records (CLRs) must be completed for all trunks and circuits that have a physical patch panel appearance in the TCF/PTF, and for all trunks and circuits for which the TCF/PTF is the servicing TCF/PTF. The CLR must depict "in-facility" equipment and cross-connect information. The reverse side of DD Form 1441 may be used to satisfy this requirement. Other methods, including automated, may also be used. TCF/PTFs with numerous circuits of the same configuration (e.g., DSN IST's) may use one CLR that depicts the common configuration as long as specific cross-connect, conditioning equipment, and other pertinent information is maintained for each individual circuit.

C2.2.2.11 CLRs for analog circuits must include audio signal levels, type signaling, and signaling frequency for each transmission level

point (TLP).

C2.2.2.12 CLRs for digital circuits must include timing and sync information (e.g., synchronous, asynchronous or isochronous), data rate, electrical and mechanical interface type (i.e., RS-232, RS-449, MIL-STD-188-114A, etc.), signal type (i.e., NRZ, Bipolar/AMI, B8ZS, etc.), protocol (i.e., Bisync, HDLC, SDLC, etc.), and source of timing.

C2.3 **Functions and Responsibilities of a Local Control Center (LCC)**. The minimum functions and responsibilities of LCC's are as follows:

C2.3.1 LCCs may designate subordinate facilities as Intermediate Local Control Centers (ILCCs), with the concurrence of the O&M agency, to assist the LCC with the management and control of large geographical areas. When designated, ILCCs have the same basic functions and responsibilities as that of an LCC.

C2.3.2 LCCs must be manned 24 hours per day, have sufficient communications capabilities to coordinate with the appropriate DISA level 2 facility, and be able to provide operational control over subordinate facilities. Each LCC must have at least one means of secure communications capability that is compatible with the DISA level 2 facility.

C2.3.3 Responds to operational direction from the DISA GOSC/RCC.

C2.3.4 Exercises operational direction and management control over all assigned subordinate DII facilities, transmission systems, networks, etc., and performs network management functions as assigned by DISA.

C2.3.5 Functions as the reporting facility for all assigned subordinate DII facilities, transmission systems, networks, etc.

C2.3.6 Develops specific operating procedures pertinent to the area of assigned responsibility. Distributes these procedures to all DISA elements and to subordinate facilities (e.g., DISA GOSC/RCC, ILCC, TCF, PTF) having responsibility within that geographical area.

C2.3.7 Be the focal point for DII Station Reporting Guide and the

DII Facility and Link Reports. The LCC must distribute these products to subordinate facilities and ensure subordinate facilities review and update the products. LCCs must determine if updates will be forwarded back through the LCC or directly to the appropriate DISA element. When Intermediate Local Control Centers (ILCC) are assigned, the LCC must distribute the products to the ILCC and the ILCC must distribute to their subordinate facilities. Reports for unmanned locations must be forwarded to the next higher O&M command element.

C2.3.8 Records and reports all DII outages and degradations occurring at subordinate facilities in accordance with DISAC 310-55-1 and area supplements.

C2.3.9 Maintains a Master Station Log (MSL) to record information on significant events occurring within the area of assigned responsibility. Facilities having dual responsibilities (i.e., LCC/ NCO and TCF/PTF) must maintain two separate logs.

C2.3.10 Maintains cognizance of the current operational status of all subordinate facilities including specific networks (e.g., IP Router Networks, DSN). C2.3.11 Be the focal point for DISA area restoral plans (R-Plans), Minimum Essential Circuit Listings (MECLs), and local restoral plans (LRPs). Assists in the development, coordinate periodic review with subordinate facilities, and ensure subordinate facilities provide corrections to DISA. Approves LRPs for subordinate facilities and maintains current copies of DISA R-Plans, MECL's, and LRP's.

C2.3.12 Directs subordinate facilities to implement restoral plans during major system failures, to support exercises, etc., as directed by the DISA GOSC/RCC. The LCC cannot implement DISA area R-Plans or MECLs without authority from the DISA GOSC/RCC.

C2.3.13 Maintains a listing of all major equipment installed at subordinate DISN facilities. A current copy of each facility's DII Facility and Link report is sufficient.

C2.3.14 Requests and directs special testing to isolate system and network problems.

C2.3.15 Refers system/network problems beyond the capability of the LCC to the DISA GOSC/RCC.

C2.3.16 Acts as the sole approving authority for authorizing temporary removal of diversity equipment at subordinate DISN facilities. Except for emergencies, diversity equipment must not be taken off-line during peak traffic periods unless the LCC deems it absolutely necessary. Other disruptive maintenance actions such as switching to standby equipment is not authorized during peak traffic periods. Any of the above actions have the possibility of causing degradation to DII systems, especially to timing and synchronization signals on digital systems that may affect numerous data circuits.

C2.3.17 Coordinates scheduled service interruptions in accordance with chapter 7 of this circular.

C2.3.18 Reviews performance data of subordinate sites as determined by the DISA or LCC. This should include Performance Monitoring Program (PMP) data, outage trend analysis data, etc. Assists in the resolution of problems identified.

C2.3.19 Hosts an annual meeting with subordinate facilities to address technical, managerial, and administrative issues that affect DII operations.

C2.3.20 Conducts an annual visit to each subordinate manned TCF.

C2.3.21 Maintains a DISA reference library in accordance with chapter 9 of this circular, and any applicable DISA area supplements.

C2.4 **Functions and Responsibilities of a Network Control Office (NCO)**. The minimum functions and responsibilities of an NCO are:

C2.4.1 NCO's must be manned 24 hours per day, have sufficient communications capabilities to coordinate with the appropriate DISA level 2 facilities, and be able to provide network control over subordinate facilities. Each NCO must have at least one means of secure communications capability that is compatible with the DISA level 2 facility and subordinate facilities. NCO's currently report to the DISA GOSC or to an RCC. As DISN evolves, NCO's will report to a DISN NMC.

C2.4.2 Responds to operational direction from the DISA GOSC/RCC.

C2.4.3 Exercises operational control over the assigned network. Performs network management functions as assigned by DISA.

C2.4.4 Develops specific operating procedures pertinent to the network of responsibility. Distributes these procedures to all appropriate DISA elements (e.g., DISA GOSC/RCC) and to subordinate facilities (e.g., TCF, PTF) having responsibility for equipment and circuits supporting the assigned network.

C2.4.5 Maintains cognizance of the current operational status of the assigned network.

C2.4.6 Functions as the reporting facility for all circuits within the assigned network.

C2.4.7 Maintains copies of those DISA area restoral plans and Minimum Essential Circuit Listings (MECL) containing circuits for the specified network.

C2.4.8 Maintains a listing of all circuits supporting the assigned network and major transmission systems that the circuits traverse.

C2.4.9 In coordination with LCCs and TCF/PTFs, requests and directs special testing to isolate network problems. C2.4.10 Refers network problems beyond the capability of the NCO to the DISA GOSC/RCC.

C2.4.10 Coordinates scheduled service interruptions in accordance with chapter 7 of this circular.

C2.5 **Functions and Responsibilities of a DII Technical Control Facility (TCF)**. The minimum functions and responsibilities of a TCF are:

C2.5.1 Responds to operational direction from the DISA and O&M control elements (e.g., DISA GOSC, RCC, LCC/NCO, CCO/CMO).

C2.5.2 Exercises technical control, coordination, and supervision

over subordinate DII facilities, DII transmission systems, trunks, and circuits. Technical control extends to unmanned facilities that are under the control and supervision of a TCF.

C2.5.3 Reports the status of facilities, transmission links, trunks, and circuits in accordance with DISA reporting directives. Submits DISA Status reports in accordance with DISAC 310-55-1 and DISA area supplements.

C2.5.4 Takes immediate action on any deterioration or failure of DII systems, equipment, trunks, or circuits that are causing degradation to or loss of service to users of the DII. Coordinates with the DISA, adjacent facilities, using agencies, maintenance agencies, and commercial vendors to effect restoration of service and isolation and repair of the fault.

C2.5.5 Implements DISA restoral plans, local restoral plans (LRPs), and Minimal Essential Circuit Listings (MECLs) as directed by the DISA element or LCC/NCO. Restores disrupted service to users that are not covered by restoral plans by using any other existing communications capabilities.

C2.5.6 Assists in the development of DISA R-Plans and MECLs as requested. Develops local restoral plans (LRPs). Performs periodic review of all restoral plans and ensures corrections are provided to the DISA element and to the appropriate LCC/NCO. Maintains current copies of these plans.

C2.5.7 Performs quality control tests and measurements on all trunks, channels, circuits, and equipment for which the TCF is responsible.

C2.5.8 Ensures quality of DII transmission, timing and synchronization, multiplex, and switching equipment using installed monitoring capabilities (i.e., TRAMCON, DPAS, MAF terminal, etc.) and appropriate communications test equipment.

C2.5.9 Reviews and analyzes system, trunk, circuit, and equipment performance and cooperates with other facilities in correcting problems or unsatisfactory conditions. Problems or conditions beyond the capabilities or authority of the TCF must be referred to the

appropriate CCO/CMO, LCC/NCO, O&M command, or DISA element (in that order) with recommendations for resolution.

C2.5.10 Activates, changes, and deactivates trunks and circuits in accordance with DISA TSOs or as directed by higher levels of control in times of stress including tactical trunks and circuits. Submits applicable reports (i.e., delayed service, exception, in-effect) in accordance with DISAC 310-130-1.

C2.5.11 Performs network management functions, including bandwidth control, for those networks which responsibility has been assigned.

C2.5.12 Requests authorized outages (AO) for subordinate facilities from the appropriate DISA element in accordance with chapter 7 of this circular. Controls routine downtime for preventive maintenance and other actions requiring equipment substitution.

C2.5.13 Arranges for user release of individual circuits for out-of-service quality control testing, routine maintenance, and other scheduled service interruptions.

C2.5.14 Performs administration and record keeping functions required by the DISA directives.

C2.5.15 Submits Facility/Link data in accordance with DISAC 300-85-1, DISA area supplements, or LCC instructions.

C2.5.16 Submits corrections to DII reporting guide in accordance with DISAC 310-55-1, DISA area supplements, or LCC instructions.

C2.5.17 Submits DD Form 1368 (Modified Use of Leased Communication Facilities) on leased circuit outages when responsibility has been assigned in accordance with DISAC 350-135-1 and DISAC 310-130-1.

C2.5.18 Reports Meaconing, Intrusion, Jamming, and Interference (MIJI) of electromagnetic systems in accordance with service directives on all affected DII systems, with an information copy to the LCC/NCO and the DISA elements.

C2.5.19 Establishes local written procedures for:

C2.5.19.1 Methods of coordination with the DISA, adjacent facilities, user agencies, maintenance agencies, and commercial vendors. Procedures must include telephone numbers and any significant instructions.

C2.5.19.2 Actions to be taken in the event of a contingency or significant communications failure to include reroute plans, reporting, and other procedures required to ensure continuity of service. These instructions must contain actions to take in case of any natural (i.e., fire, flood, hurricane, etc.) or hostile (i.e., terrorist attack, protests, etc.) event that is probable for that area. Instructions must include detailed actions for securing, transporting, or destroying classified material.

C2.5.19.3 Actions to be taken in the event of primary and/or back-up power failures, including procedures for load shedding. Written procedures must be included for operation of back-up power equipment if TCF/PTF personnel are required to perform such tasks.

C2.5.19.4 Operation of network management systems such as the Transmission Monitoring and Control (TRAMCON) and Digital Patch and Access System (DPAS). Procedures should include such actions as:

C2.5.19.4.1 Access policy and password control.

C2.5.19.4.2 Actions to be taken when equipment alarms are received.

C2.5.19.4.3 Procedures for backing up data (tape and/or disc drives.

C2.5.19.4.4 Actions to take if the data becomes corrupted.

C2.5.19.5 Verifying and testing accuracy of timing and synchronization equipment and signals. Refer to chapter 4 of this circular for specific requirements.

C2.5.19.6 Qualification training requirements contained in this chapter.

C2.5.20 Sends DII user notification letters to each user upon activation of a new circuit, and annually thereafter. An updated

letter should also be sent any time information contained in the letter affects the users ability to contact appropriate personnel (i. e., phone number, point of contact, etc.). Figure 2.1 is a sample DII User Notification Letter. If used, the sample letter should be modified to include local requirements.

C2.5.21 Labels all patch bays, test boards, or other circuit access points normally used by technical control personnel. As a minimum, labeling must include the last four characters of the circuit Command Communications Service Designator (CCSD) and the NCS TSP restoration priority. If a NCS TSP is not assigned, then the letters "NA" (none assigned) must be entered with the CCSD to indicate that the circuit has no assigned restoration priority.

C2.5.22 Maintains a current DISA reference library readily accessible to the technical controllers. A list of basic references is contained in chapter 9 of this circular. DISA areas may supplement this list as necessary.

C2.5.23 Publishes and posts notices to technical controllers including:

C2.5.23.1 Additions, deletions, or changes in circuitry and equipment.

C2.5.23.2 Special missions being supported.

C2.5.23.3 Special tests on circuits or equipment.

C2.5.23.4 Changes in operational procedures.

C2.5.23.5 Any additional information considered appropriate.

C2.5.24 Directs and manages High Frequency (HF) radio communications systems in support of the DII. The transmitter and receiver sites are responsible to the technical direction of the TCF.

C2.5.24.1 The TCF is responsible for:

C2.5.24.1.1 Directing frequency changes.

C2.5.24.1.2 Coordinating use of shared frequencies.

C2.5.24.1.3 Ensuring that frequencies are used as specified in the frequency authorization documents, and that they are modulated only with authorized signals.

C2.5.24.1.4 Monitoring antenna utilization.

C2.5.24.2 The transmitter facility is responsible to the TCF for proper frequency use and is specifically responsible for maintaining prescribed tolerances for frequency, modulation, distortion, bandwidth, radiated power, and transmission levels.

C2.5.24.3 The receiver facility is responsible to the TCF for:

C2.5.24.3.1 Determining (by measurement) that frequencies, signal levels, and signal-to-noise ratio are within prescribed tolerances. Measurements are to be made against the receiving system's major components as well as on the derived traffic signal. When measuring system components, the receiver facility must give special attention to antenna performance, receiver-generated distortion, automatic gain control action, and injection frequency.

C2.5.24.3.2 Assisting the TCF in identification of harmful interference. Any available high-frequency direction-finding facilities must be used in identifying interference or jamming.

C2.5.24.3.3 Reporting interference or jamming in accordance with MilDep regulations.

C2.5.24.3.4 Monitoring incoming signals and making recommendations concerning frequency changes.

C2.5.24.3.5 Assisting in performing tests, as required.

C2.6 **Functions and Responsibilities of a DII Patch and Test Facility (PTF)**. DII PTF personnel have the same duties and responsibilities as DII TCF personnel with the exception that the physical and electrical capabilities of the DII PTF may be limited.

C2.7 **Additional Responsibilities of TCF/PTFs**. In addition to the normal functions and responsibilities, level 4 and 5 facilities may be designated control offices for the activation, change, or deactivation of DII trunks and circuits, and have primary responsibility for establishing and maintaining the end-to-end alignment and quality of assigned DII trunks and circuits. These control activities focus on local equipment capabilities and user interface with the DII. The three types of control offices are: Communications Control Office (CCO), Intermediate Control Office (ICO), and Communications Management Office (CMO). A CCO or CMO must be assigned to every DISN trunk and circuit by the DISA Allocation and Engineering activity, and must be included in the Telecommunications Service Order (TSO). The CCO or CMO has primary responsibility for ensuring that transmission facilities provide maximum quality service to users of the DII. This requires testing and monitoring of parameters, threshold violations, alarm status, error rates, and other such indicators of transmission media performance.

C2.7.1 **Communications Control Office (CCO)**.

C2.7.1.1 **General**. A CCO exercises direct technical supervision over assigned DII trunks and circuits. A CCO must have the capability to test and monitor the trunk or circuit, ascertain that the trunk or circuit meets specified technical parameters, direct necessary adjustments, assess operational status, and perform other such functions required to establish and maintain high quality, user-to-user communications. These capabilities may be either manual or automated. All other facilities that the trunk or circuit traverses must respond to the technical direction of the CCO. The CCO is responsible for initially activating the trunk or circuit, accepting leased service on behalf of the U.S. Government, and submitting appropriate completion reports required by the TSO issuing authority. The CCO is responsible for coordinating all realignment when necessary to maintain the end-to-end engineered values stated in the TSO. CCO assignments must be made in accordance with the following guidelines:

C2.7.1.1.1 When a trunk or circuit traverses a DII TCF/PTF, a DII TCF/PTF must be assigned as the CCO.

C2.7.1.1.2 When a trunk or circuit does not traverse a DII TCF/PTF,

but does traverse another DII facility that has testing and monitoring capabilities (e.g., DSN switch, DPAS), then that DII facility must be assigned as the CCO.

C2.7.1.1.3 When a trunk or circuit does not traverse a DII facility, but is remotely accessible by a DII TCF/PTF or other DII facility, then that TCF/PTF or facility must be designated as the CCO.

C2.7.1.1.4 When a trunk or circuit does not traverse a DII facility and cannot be remotely monitored and tested by a DII facility, then a CMO must be assigned in accordance with para C2.7.3 below.

C2.7.1.2 Specific CCO responsibilities include:

C2.7.1.2.1 Coordinate the activation, deactivation, and change of trunks and circuits with applicable DII and non-DII facilities, users, and commercial vendors.

C2.7.1.2.2 Immediately upon receipt of a TSO, or no later than five working days prior to the service date prescribed in the TSO, ensure that each facility, user terminal, and commercial vendor involved must be ready to provide the required service.

C2.7.1.2.3 Ensure the completion of all initial quality control tests, direct necessary adjustments, and ascertain that the trunk or circuit meets the specified technical schedule before acceptance.

C2.7.1.2.4 Prepare and submit completion reports for which control responsibility has been assigned.

C2.7.1.2.5 Immediately advise the TSO issuing authority and all other addressees on the original TSO of any conditions which might affect service activation. Such conditions would include failure to meet TSO specifications, non-availability of leased circuit segments, etc. Ensure service reports (i.e., delay, exception, or in-effect) are submitted in accordance with DISAC 310-130-1.

C2.7.1.2.6 Provide technical assistance to other facilities, users, and commercial vendors when they are unable to isolate degradation(s).

C2.7.1.2.7 Immediately report all instances of unsatisfactory response from other facilities, users, or commercial vendors to the LCC/NCO, Telecommunications Certification Office (TCO), or DISA, whichever is appropriate.

C2.7.1.2.8 Establish local procedures for receiving, monitoring, and completing trunk and circuit activations as well as deactivations.

C2.7.1.2.9 Develop and distribute quality control test schedules with applicable facilities, users, and commercial vendors.

C2.7.1.2.10 Document, analyze, and maintain quality control test data as required by this circular.

C2.7.1.2.11 Conduct trend analysis on performance of assigned trunks and circuits in accordance with chapter 6 of this circular.

C2.7.2 **Intermediate Control Office (ICO)**. If the layout of a circuit or trunk is such that the CCO is not in the best position to test or coordinate activities with intermediate facilities, another facility may be designated as an ICO to assist the responsible CCO. ICO assignments are normally only made on circuits traversing long distances (e.g., one DISA area to another). ICOs must be designated in the segment portion of the TSO. Temporary ICOs may be designated by the appropriate TSO issuing authority for the specific purpose of completing TSO change actions. ICOs are responsible to the CCO for operational direction.

C2.7.3 **Communications Management Office (CMO)**. A CMO is a facility or office that is assigned administrative responsibility for DII trunks and circuits when it is not possible to assign a DII facility as the CCO. The CMO serves as the focal point for day-to-day monitoring of service performance, accepts service on behalf of the U. S. Government, and submits applicable reports in accordance with DISAC 310-130-1. The CMO is responsible for the same basic functions as a CCO with the exception of actual monitoring, testing, and troubleshooting. If any form of monitoring and testing capabilities do exist, the CMO must make every effort to assist when necessary. CMO assignments must be made in accordance with the following guidelines:

C2.7.3.1 When the trunk or circuit traverses, or is monitored by a non-DII facility operated by a MilDep O&M that has capabilities similar to a CCO, then the non-DII facility should be designated as the CMO.

C2.7.3.2 When a CCO cannot be assigned to a IP Router Networks circuit, the Node Site Coordinator (NSC) should be assigned as the CMO.

C2.7.3.3 When a trunk or circuit does not traverse, and cannot be monitored by a DII or non-DII facility, then some office or activity associated with the using agency of the trunk or circuit should be assigned CMO.

C2.8 **Operational Control of Maintenance Support**. The complex nature of the DII requires extensive coordination between the TCF/PTF and maintenance support elements to achieve maximum efficiency of transmission systems. The TCF/PTF must maintain operational control over all equipment supporting the DII operations at all times and will have final authority for determining the operational acceptance of all equipment after maintenance, alignment, or repair; for approval of on-line maintenance; and for approval to remove operational equipment from service. The TCF/PTF is responsible for the following actions:

C2.8.1 Determining the priority of maintenance on all equipment supporting DII operations.

C2.8.2 Ensuring corrective maintenance is performed in the order dictated by the National Communications System/Telecommunications Service Priority (NCS/TSP) system of the trunks or circuits that are degraded.

C2.8.3 Ensuring maintenance schedules are coordinated with the TCF/PTF and that TCF/PTF personnel are aware of maintenance actions affecting DII operations.

C2.8.4 Coordinating maintenance actions with other DII facilities when those facilities are affected.

C2.8.5 Performing appropriate quality control tests when equipment

is returned from maintenance, before putting it back into operation.

C2.8.6 Ensuring maintenance technicians obtain approval from the TCF/PTF shift supervisor before any equipment in support of the DII is taken off-line for maintenance, or before any on-line maintenance is performed. Diversity equipment is not authorized to be taken off-line, nor is any type of disruptive maintenance action allowed, during peak traffic hours without approval of the LCC/NCO. Peak traffic hours are established by each DISA RCC.

C2.8.7 Ensuring strapping, pinning, and programming options on installed DII equipment and cards is documented and available. Maintenance activities will normally have this information. However, if TCF/PTF personnel are responsible for replacing cards, they must have the necessary information available to ensure the cards are properly configured if replacement becomes necessary. This information is especially critical for TDM and data transmission equipment that have specific protocols and interfaces.

C2.9 **Technical Controller Skills and Knowledge**. Technical control personnel must know, understand, and be able to apply the following concepts, theories, and tasks. This list is not all inclusive, and must be supplemented according to local requirements.

C2.9.1 Basic telecommunications principles, protocols (7-layer OSI model), terminology, and concepts.

C2.9.2 Electrical and electronic fundamentals to include theory and operation of solid state devices, and other circuit elements of communications equipment.

C2.9.3 Principles, theory, and characteristics of transmission media including microwave, satellite, tropospheric scatter, high frequency, and metallic and fiber cables.

C2.9.4 High Frequency (HF) radio communications systems propagation charts, forecast data, and sounding techniques.

C2.9.5 Principles and application of analog (e.g., channel, group, supergroup) and digital (e.g., DS-0, DS-1, DS-3) multiplex equipments and transmission media. Be able to test signals through the local

multiplex equipment, and determine if signals meet specifications.

C2.9.6 Principles and applications of Local Area Networks (LAN's), Wide Area Networks (WAN's), Fiber Distributed Data Interface (FDDI), Integrated Services Digital Network (ISDN), and packet switching.

C2.9.7 Principles and applications of digital timing and synchronization.

C2.9.8 Operate a personal computer and use operating system commands and application software programs such as database management systems, word processing, graphics, etc.

C2.9.9 Be able to use local on-site computer terminal(s) for administrative or network specific functions such as TRAMCON, DPAS, DSN MAP, Network Management, etc.

C2.9.10 Fundamentals of transmission monitoring and control terminal equipment (i.e., TRAMCON, DPAS, etc.).

C2.9.11 Common noise power measurements (e.g. dB, dBm, dBm0, dBmC, dBmC0, dBr, dBrn, dBrn0, dBrnC0, dBW), and be able to convert from one to another.

C2.9.12 Function and application of electronic hand tools.

C2.9.13 Diagnose, remove, and replace circuit boards such as amplifiers, pads, equalizers, bridges, channel cards, etc.

C2.9.14 Principles and applications of various types of test devices such as dB/volt/amp meters, oscilloscopes, signal generators, frequency counters, noise meters, delay equalizers, impulse noise sets, bit error rate testers, protocol analyzers, distortion analyzers, etc., and be able to interpret measurement data.

C2.9.15 Principles and application of conditioning and signaling equipment.

C2.9.16 Patch panel and cross-connect (manual and electronic) principles.

C2.9.17 DII connectivity and available reroutes associated with the local facility. Be proficient at rerouting trunks and circuits.

C2.9.18 Read and interpret equipment and patch panel schematic diagrams, and circuit layout records.

C2.9.19 Isolate causes of interference and recognize various types of circuit troubles.

C2.9.20 Determine orderwire capabilities and be able to communicate with connected facilities.

C2.9.21 Understand and follow procedures and requirements for submission of DII reports.

C2.9.22 Perform quality control test measurements and analyze results.

C2.9.23 Initiate telecommunications Request for Service (RFS), review Telecommunications Service Requests (TSRs), and act upon Telecommunications Service Orders (TSO's).

C2.9.24 Understand MilDep supply procedures.

C2.10 **Facility Qualification Training**.

C2.10.1 On-the-job training is necessary to reinforce the theoretical knowledge attained from technical training schools, to enable inexperienced personnel to become proficient with specific equipment installed at that facility, and to ensure experienced technical controllers remain proficient. Each DII TCF/PTF must develop written instructions that outline facility qualification requirements. As a minimum these requirements must address all those items from the above paragraph C2.9 that are applicable to the local facility.

C2.10.2 In addition to the normal training requirements, supervisory personnel are required to meet specific technical qualifications in order to manage DII facilities. The following guidelines must be followed:

C2.10.2.1 A TCF shift supervisor must be a facility-qualified technical controller, and must demonstrate sound technical qualifications, judgment, initiative, and motivation essential to maintaining operational control of the TCF and subordinate facilities.

C2.10.2.2 A TCF Superintendent, Chief, NCOIC, etc., must be knowledgeable and have experience in all aspects of technical control. He/she must be able to provide technical advice and assistance, and be able to make sound technical decisions regarding overall operational capabilities of the TCF and subordinate facilities. He/she must demonstrate all the qualities necessary to maintaining operational control of all resources allocated to the TCF.

C2.11 **Familiarization and Coordination Visits**. All assigned technical controllers should make familiarization visits to connected facilities, remote transmitter and receiver sites, radio relay sites, and high volume users that are collocated with the DII station. Ideally this would be part of an individual's facility qualification requirements. The TCF Chief, and other members of the TCF staff, must make an effort to visit each major user and adjacent DII facilities at least annually. The objective of these visits is to achieve good operating relationships between personnel of each facility and an understanding of each other's capabilities and problems. These visits can often be made when operational requirements dictate the need for a visit.

C2.12 **Responsibilities of DII Users**. Just as the servicing TCF/PTF has a responsibility to each user, each user has a responsibility to the servicing TCF/PTF. Basic responsibilities are outlined in Figure 2.1 of this circular. All users of the DII must cooperate with their servicing TCF/PTF to ensure high quality and reliable service. The servicing TCF/PTF is the critical interface point between the user terminal and the DII transmission media. Restoration of service during degradations may be delayed if sufficient coordination and information is not provided. Specific responsibilities include:

C2.12.1 Immediately reporting service interruptions directly to the servicing TCF/PTF.

C2.12.2 Providing continual coordination with the servicing TCF/PTF

until service has been restored and accepted by the user.

C2.12.3 Cooperating with the servicing TCF/PTF in the performance of circuit quality checks. A circuit is not considered restored until service is extended from user terminal to user terminal and circuit conditioning meet the standards prescribed in DISAC 300-175-9, DII Operation-Maintenance Electrical Performance Standards. Where facilities cannot meet prescribed standards due to inherent or design characteristics, they shall be brought up to the best obtainable quality and, in any case, must be capable of providing the required service.

C2.12.4 Coordinating with DII TCF/PTF personnel prior to performing any equipment changes, maintenance, troubleshooting, or any other actions that may affect the quality or continuity of service.

C2.12.5 Contacting the distant end user when requested to release a circuit(s) for a scheduled downtime, and obtaining their concurrence.

C2.12.6 Obtaining concurrence from higher headquarters for circuit releases when necessary.

C2.12.7 Releasing the circuit(s) to the servicing TCF/PTF.

C2.12.8 Initiating a Request For Service (RFS) to the appropriate Telecommunications Certification Officer (TCO) prior to making any equipment or configuration change(s) to service. This includes such things as changing terminal equipment, transmission speed, user location, etc. If approved, DISA will issue a Telecommunications Service Order (TSO) authorizing the change(s).

Continue to:
CHAPTER 3. DII TERRESTRIAL TRANSMISSION AND NETWORK CONTROL

Return to:
Basic Circular
Table of Contents
Publication Listing

Michael E. Craft, craftm@ncr.disa.mil - Last revision: 12 June 1998

CHAPTER 3. DII TERRESTRIAL TRANSMISSION/NETWORK CONTROL

C3.1 **General**. The DII terrestrial transmission media is a hybrid of analog and digital technologies that will continue to evolve to a mostly digital environment during the 1990's. Automated monitoring of equipment and signal performance will become the normal mode of operation using intelligent Network Elements (NEs). NEs are considered to be any type of line or path terminating equipment where automated monitoring may be accomplished. Common types of NEs used throughout the DII include such equipment as TRANSMISSION Monitoring and CONtrol (TRAMCON), ACORN, Digital Patch and Access System (DPAS), Defense Switched Network (DSN) digital telephone switching equipment, smart multiplexers, etc. As the DII continues migrating towards a digital environment, and the Defense Information System Network (DII) evolves, the data from these NEs will be remoted to network management centers as shown in Figure 3.1. While this chapter cannot address all types of NE equipment, it does provide procedures for two common NEs used in the DII, TRAMCON and DPAS. Procedures for other NEs must be developed in order to maintain operational control over all DII assets. DISA program managers are responsible for ensuring overall procedures are developed when DISA programs are fielded. Depending on the complexity of the system/network, DII facilities may be required to supplement the overall procedures for exercising lower level control.

C3.2 **Bulk Encryption**. The purpose of bulk encryption of DII links and trunks is to protect, during transmission, unclassified information that is related to national security. Bulk encryption of DII transmission links is required in accordance with Department of Defense directives and DISAC 330-115-1. Bulk encryption must be included as part of each MilDep's O&M operations security (OPSEC), communications security (COMSEC), and inspection programs for those DII facilities that are responsible for providing bulk encryption. Compliance with these requirements, and the below procedures, will be reviewed during DISA Performance Evaluations. If a bulk encryption device fails, immediate action must be taken to restore service to all circuits traversing that link. Restoral can be accomplished in three ways:

C3.2.1 Switching to spare encryption devices when available.

C3.2.2 Rerouting circuits in accordance with DISA area or local

restoral plans to a system with active bulk encryption. DISA restoral plans must be initiated by the DISA GOSC, RCC, or RCC.

C3.2.3 Temporarily bypassing the encryption device in accordance with the following. Footnote 1.

C3.2.3.1 Bulk encryption bypasses should not be performed unless it is verified that the bulk encryption device is defective.

C3.2.3.2 Bypassing bulk encryption devices on a DII link or trunk is authorized only for the minimum time required to isolate and replace or repair a defective component in the system. As soon as the bulk encryption device is operable, the bypass must be removed.

C3.2.3.3 All bypasses of bulk encryption devices on government owned, or leased links or trunks, must be reported to the LCC as soon as practical. The LCC must determine if any further action is necessary including notifying the appropriate DISA GOSC/RCC. If it is anticipated that the bypass will be necessary for an extended amount of time (i.e., parts on order, etc.), rerouting of sensitive circuits to a protected path should be considered. This type action may be necessary in accordance with paragraph C3.2.3.4 below. The TCF/PTF implementing the bypass must notify the LCC upon restoral of the bulk encryption device.

C3.2.3.4 The DISA GOSC/RCC or LCC may (at their discretion) require immediate reporting of bulk encryption bypasses. This action is normally required when critical missions or increased tensions occur within a specific theater.

C3.3 Transmission Monitoring and Control (TRAMCON). TRAMCON was developed to support the DII digital transmission media. The main purpose of TRAMCON is to provide automated fault alarm reporting and performance monitoring data for the radio and multiplex equipments located at a local or remoted facility. It also provides the system operator the capability to substitute equipment and to perform fault isolation of components. TRAMCON consists of the master units that perform data analysis and display generation, and remote units that interface with the communications system providing data back to the master. The TRAMCON Master Terminal (TMT) automatically transmits polling signals to the remote units requesting updated status

information on equipment alarms at those locations. Although several facilities in a given segment may be configured to act as TMTs, only one facility can be in the TMT configuration at any given time. Due to the need for close coordination among all facilities, one facility in each TRAMCON segment will be assigned as the primary TMT responsible for that segment.

C3.3.1 Definitions.

C3.3.1.1 **TRAMCON Master Terminal (TMT)**. The equipment, software, personnel, and procedures that make up the control element of the TRAMCON.

C3.3.1.2 **Primary TMT**. The TMT on a segment that has been assigned responsibilities for that segment. This TMT has monitoring (polling) and system control responsibilities until those responsibilities have been handed off to an alternate TMT.

C3.3.1.3 **Alternate TMT**. Alternate TMT location(s) that have been designated responsibility as back-up to the Primary TMT on a specific segment. Alternate TMTs have monitoring capability at all times but not system control until it is handed off by the primary TMT. Segments may have more than one alternate.

C3.3.1.4 **Master Mode**. The particular mode that the TMT having monitoring and system control is in. Either the primary or alternate TMT can be master, but only one at a time.

C3.3.1.5 **Slave Mode**. The particular mode that the TMT having only monitoring capability is in. All TMTs are in the slave mode except for the one TMT in master mode.

C3.3.1.6 **Polling TMT**. The TMT polling and controlling the segment.

C3.3.1.7 **Monitor TMT**. The TMT or set of TMTs on a segment operating in the monitor mode.

C3.3.1.8 **Handoff**. The process of exchanging the control of the polling function from one TMT to another.

C3.3.1.9 **Simultaneous Polling**. The mode of operation where more than one TMT is performing polling mode on a segment. Simultaneous polling should only occur when there is a loss of connectivity between TMTs and separate TMTs are polling individual segments.

C3.3.2 **Procedures and Responsibilities**.

C3.3.2.1 The DISA area must designate one facility in each segment as the primary TMT and one or more facility as alternate TMT. TCFs are normally assigned primary and alternate TMT responsibilities.

C3.3.2.2 The primary TMT facility for the monitored segment(s) is responsible for developing overall TRAMCON system operation and restoral procedures for all facilities having TRAMCON capability within their segment. The primary TMT must distribute those procedures to other TRAMCON facilities within their segment, to LCCs responsible for those geographical areas, and to the DISA area transmission division.

C3.3.2.3 The DII facility performing primary or alternate TMT functions must be manned on a 24 hour basis. The TMT control terminal must be located in an area where it can be observed at all times.

C3.3.2.4 The primary TMT must be fully aware of which facility is operating in the master mode if it is not the master. In any given system configuration employing two or more TMTs, only one terminal will have full monitoring and control capability. Two or more TRAMCON terminals operating in a master mode will cause the system to malfunction.

C3.3.2.5 The primary TMT must schedule times of periodic transfer (rotational schedule) of control to the alternate TMTs, handoff and simultaneous polling procedures. This will ensure that operational training and experience are afforded to all TRAMCON system operators. However, the primary master station may assume control of the system at any time. The schedule must be included in the procedures required by paragraph C3.3.2.2 of this chapter.

C3.3.2.6 The primary TMT must be assigned as Communications Control Office (CCO) for the TRAMCON polling channel, inter-processor

communications (IPC) channel, and remote display terminal (RDT) channel. The primary TMT, as CCO, must ensure quality control testing is conducted in accordance with the assigned parameter code. These channels are not exempted from QC requirements contained in chapter 6 of this circular.

C3.3.2.7 The polling TRAMCON master terminal (TMT) must monitor and analyze the status of the monitored segments at all times using the entire capability of the TRAMCON system. Refer to chapter 6 for network element performance monitoring requirements.

C3.3.2.8 A hazardous condition (HAZCON) must be opened when the master TMT cannot be backed up 100 percent by an alternate TMT.

C3.3.2.9 TMT facilities must utilize the full capability of the TRAMCON terminal to isolate faults and restore degraded services. Notification must be made to appropriate control facilities responsible for O&M at locations found or suspected to have faulty equipment. Many unmanned sites may now be monitored and controlled by a TMT from another O&M agency. Although an unmanned site may fall under the O&M cognizance of one particular service, emergency restoral actions may better be effected by organizational personnel of a different service. Specific procedures between inter-service O&M managers must be coordinated, especially when emergency maintenance is necessary. These procedures may be included in the procedures required by paragraph C3.3.2.2 of this chapter or may be included in a separate memorandum of understanding (MOU) or inter-service support agreement.

C3.3.2.10 The master TMT must immediately notify the responsible O&M agency anytime a site's equipment is reconfigured and, if necessary, request emergency maintenance when faulty transmission or multiplex equipment is discovered at a site.

C3.3.2.11 In the event of a total system outage, the TMT may be capable of determining the failed link, and restoring it. However, if the fault lies beyond the capability of the master terminal to effect restoral, a TRAMCON slave must be brought on-line in the master mode and effect the necessary restoral action.

C3.3.2.12 The TMT is responsible for implementing bulk encryption

key changeovers. The changeover must be coordinated with all involved facilities and with the appropriate LCC.

C3.3.2.13 At the beginning of each shift the off-going supervisor must provide the on-coming supervisor a complete status briefing for the monitored segment. The on-coming supervisor must then log onto the TMT and examine the current performance of the monitored segment (s). Particular attention must be given to unmanned facilities on the segment. At a minimum, the on-coming supervisor must:

C3.3.2.13.1 Examine all station status and alarm displays for the segment monitored by the TMT upon assuming the shift, and at least every two hours thereafter.

C3.3.2.13.2 Examine all current link parameter displays for the segment monitored by the TMT.

C3.3.2.13.3 Notify other TMT operators on the monitored segment of any conditions which may indicate potential problems during the coming shift (e.g., fading, multiplex reframe attempts, etc.).

C3.3.2.14 In the event of a station, line, or mission bit stream failure, the master TMT must immediately attempt to restore service by:

C3.3.2.14.1 Coordinating with the affected manned facility and assisting in overall system fault isolation.

C3.3.2.14.2 Switching to back-up or secondary equipment if the affected manned facility cannot be contacted.

C3.3.2.15 The master TMT will not normally switch equipment at other facilities without coordinating with the affected facility unless it is an unmanned site. However, the master TMT is authorized to switch equipment without prior approval from the affected site when conditions warrant, but the affected facility must be notified as soon as time permits.

C3.3.2.16 The master TMT must ensure that the appropriate LCC is kept abreast of all conditions affecting overall DII systems and that appropriate reports are initiated. If the master TMT is not a TCF,

then the master TMT must also notify the local TCF. If neither the local TCF nor LCC can be contacted, notify the appropriate DISA GOSC/ RCC of any facility, link, or mission bit stream outages.

C3.3.2.17 When control is transferred between the primary and alternate TMTs, or control of the system is split, all monitored facilities must be notified of which TMT has master control.

C3.3.2.18 When master control is transferred, the current status of maintenance actions in progress must be reported to the new master facility.

C3.3.2.19 Station personnel must notify the master TMT prior to beginning any preventive maintenance, or other action, which could result in a HAZCON.

C3.3.2.20 Normal Polling Handoff Procedure.

C3.3.2.20.1 Operators at the master TMT must contact operators at the other TMT on the segment and establish a time for the handoff of the polling function. The master TMT must control all handoff procedures.

C3.3.2.20.2 The master TMT relinquishing the polling function must first switch to the monitor mode. The TMT assuming the polling function must then switch from the monitor mode to the master (polling) mode. All other TMTs in the segment must remain in the monitor mode.

C3.3.2.21 Simultaneous Polling.

C3.3.2.21.1 Simultaneous polling is not a normal mode of operation. Use simultaneous polling only in extreme circumstances. If not entered carefully, this mode of operation has a high probability of mutilating real-time status and alarm data from the remote units by message collision. No harm or damage will occur to system components, but data will lose synchronization. The possibility also exists that message collision will cause unwanted switching of equipment.

C3.3.2.21.2 Simultaneous polling of a segment without message collision can only occur if the polling channel is segmented in both

the transmit and receive directions. This segmentation of the polling channel has the result of isolating one or more of the remote units from the polling master. The segmentation also isolates the remaining remote units from the monitor master.

C3.4 **Digital Patch and Access System (DPAS) Procedures**. DPAS is an electronic cross-connect system consisting of an AT&T Digital Access Cross-Connect System (DACS) with an Enhanced DPAS Control Terminal (EDCT) for use within the DII. DPAS, configured with AT&T's DACS II, will cross-connect DS-0 (64 Kbps) circuits at DS-1 (1.544 Mbps) and DS-1E (2.048 Mbps) rates. DPAS, configured with AT&T's DACS III, provides cross-connections at the DS-3 (44.736 Mbps) rate. DPAS was employed in the early 1990's to provide an efficient method of routing trunks and circuits through the DII, and to provide a method of rapid restoral. DPAS is also capable of being remoted to other DPAS locations, thereby reducing the number of personnel required at the remoted location. Basic procedures regarding trunk and circuit responsibilities, as stated elsewhere in this Circular, remain the same. The TCF, however, has additional responsibilities to manage, control, and maintain DPAS resources. When DPAS sites are remoted to a main DPAS facility the main DPAS facility assumes all responsibilities for the remoted DPAS site, including CCO responsibilities. DII TCFs are responsible for the following functions, including remoted DPAS sites:

C3.4.1 The DII TCF responsible for DPAS control must be manned on a 24 hour basis. The Enhanced DPAS Control Terminal (EDCT) must be located in an area where it can be observed at all times.

C3.4.2 Perform equipment provisioning in response to operational requirements.

C3.4.3 Perform trunk and circuit provisioning as required by TSO or verbal requests from TSO issuing authorities. When provisioning a digroup or circuit, all fields in the DCT provisioning database must be completed. The designated CCO or CMO must be included in remarks.

C3.4.4 Create, name, edit, and execute restoration plans as required. Restoration plans must be created for each of the applicable DISA area restoral plan(s), and must be executed in accordance with the appropriate DISA area procedure.

C3.4.5 Set facility performance monitoring thresholds for each digroup in accordance with DISAC 300-175-9. If specifications are not established, then DPAS default values must be used. If unique transmission equipment characteristics (e.g., tropo, satellite) cannot meet the default values, O&M's may request approval from the DISA transmission branch to use other thresholds based on documented test and evaluation data. Thresholds may be changed temporarily for maintenance or troubleshooting alarm conditions. Any changes to thresholds must be documented in the master station log (MSL). The parameter counter should be cleared (set to 0, INT-REG) on in-service Network Processing Circuits (NPC) before changing the threshold to avoid the generation of false alarms.

C3.4.6 Attend to performance monitoring threshold alarms in a timely manner. Refer to the digital in-service performance monitoring requirements contained in chapter 6 of this circular.

C3.4.7 Attend to alarm conditions. The alarm log must be verified every two hours to determine if any new alarms have occurred, and to verify the status of any previous alarm conditions. All alarms must be cleared as soon as possible to avoid double contingency conditions and to maintain quality service. Critical and major equipment alarms must be given priority over all other alarms, and must be reported to the LCC as soon as possible.

C3.4.8 Print and attend to autonomous alarm messages. Autonomous messages do not remain on the DCT screen display and may be missed if they are not printed out. These messages may contain significant information for troubleshooting faults.

C3.4.9 Establish Test Access Digroup (TAD) positions for testing DS-0 circuits. TADs must be extended to a patch panel appearance and be clearly labeled. TADs must be configured to allow signal flow through the test position when working in the test access monitor mode.

C3.4.10 Establish input command priorities to limit access to DPAS commands in order to maintain control and security of the DII. O&M's must determine access limitations at each DPAS location. Generally, the system administrator should be the only individual authorized full access to all commands, especially equipment and circuit provisioning commands. Special procedures should be established to authorize limited access or temporary provisioning access, when

required, at remoted locations.

C3.4.11 Perform the following preventive maintenance routines as recommended in the AT&T Digital Access and Cross-Connect System (DACS) II Generic 2 Operation and Maintenance Manual. The routines must be performed prior to 2400Z each day and should be performed in the order listed.

C3.4.11.1 **ROUTINE #1**, Presently Equipped Entity. Provides a print out of the present configuration of the DACS frame for review.

C3.4.11.2 **ROUTINE #2**, Frame History. Provides a history of frame events. As a minimum the history file should be reviewed for the last 24 hours for any diagnostic detect (DGNDET) messages.

C3.4.11.3 **ROUTINE #3**, Frame Alarm. Provides frame alarm report indicating the sources of all alarms currently on the DACS frame. Each alarm must be verified and corrective actions initiated to clear the alarm if these actions have not already been initiated.

C3.4.11.4 **ROUTINE #4,** Out-of-service, Failed and Pested Alarms. Checks all alarms on the entire frame such as out-of-service, failed, and pested components. Footnote 2.

C3.4.11.5 **ROUTINE #5**, Synchronizer Status. Verify that the mode fields for both sides are normal, that the source status fields are MATE,TLI or TLI,MATE and the active link status fields indicate 10,-- or --,10.

C3.4.11.6 **ROUTINE #6**, Facility Parameters. Facility parameters report the performance of each Facility Terminating Module (FTM). The facility parameter report must be obtained each day prior to 2400Z as the cumulative values are reset at 2400Z. The facility parameter report may be tailored by each DII facility to filter out non-significant data. Each report must be reviewed for any non-zero counts. Corrective actions should be taken to correct any abnormal conditions. The facility parameter reports must be kept for 7 days.

C3.4.11.7 **ROUTINE #7**, Cross-Connect Network (CCN) side 0. Checks and exercises the status register of CCN side 0.

C3.4.11.8 **ROUTINE #8**, CCN side 1. Checks and exercises the status register of CCN side 1.

C3.4.11.9 **ROUTINE #9,** Back-up DCT database.

C3.4.11.9.1 Ensure the consistency between the DCT and DACS frame using the DCT verification function. All inconsistencies must be corrected at the earliest opportunity.

C3.4.11.9.2 The DCT database must be backed up daily using back-up disks. Two sets of back-up disks must be maintained. Each set must be marked and alternated every other day.

C3.4.11.10 **ROUTINE #10,** Back-up DACS frame database.

C3.4.11.10.1 The volatile memory in the DACS RAM must be backed up daily to a secondary magnetic tape back-up device. At sites that are remoted from a DCT, the magnetic tape must be left in the DACS frame in order for the DCT to accomplish back-ups. The DACS frame back-up procedure takes approximately 20 minutes. A MSL entry must be made to indicate completion of the back-up and which tape was backed-up.

C3.4.11.10.2 Before starting the back-up procedure, the DACS frame should be brought as close as possible to its "baseline" state by clearing as many outstanding troubles and alarms as possible. Use of scheduled (automatic) back-up is not recommended as alarms may be present and cause contaminated back-up copies. With manual back-up the DPAS operator has more control over the state of the frame prior to the back-up than in the automatic mode.

C3.4.11.10.3 Each DPAS facility must maintain two back-up magnetic tapes. Each tape must be individually marked and alternated every other day. The magnetic tape at unmanned remoted sites must be alternated, as a minimum, each time O&M personnel visit the site.

C3.4.11.10.4 Do not back-up tapes during peak traffic conditions or other sensitive time periods such as crypto changeovers, restoral plan implementations, etc.

C3.4.12 Establish written instructions to provide clear and concise

operational guidance for the DPAS. As a minimum, instructions must contain the following:

C3.4.12.1 Appointment of a system administrator and designation of the system administrator responsibilities.

C3.4.12.2 DCT access policy and password security.

C3.4.12.3 Procedures for troubleshooting and restoring equipment, digroups, and circuits.

C3.4.12.4 Procedures for daily magnetic tape back-up, and actions to take if the hard disc becomes corrupted. Procedures must include all remoted DPASs.

C3.4.12.5 Procedures for using the TAD.

C3.4.12.6 Specific actions to take for alarm conditions.

C3.4.13 Develop training plans for operation of the DCT/DPAS equipment. Personnel responsible for operating the DCT/DPAS equipment must be fully trained and competent on DCT/DPAS operations and procedures prior to being given password access.

Continue to:
CHAPTER 4. DII TIMING AND SYNCHRONIZATION (T&S)

Return to:
Basic Circular
Table of Contents
Publication Listing

Michael E. Craft, craftm@ncr.disa.mil - Last revision: 12 June 1998

CHAPTER 4. TIMING AND SYNCHRONIZATION (T&S)

C4.1 **General**. Timing and synchronization (T&S) is considered an integral component to any digital transmission system. Achieving bit and time slot synchronization between transmitting sources and receiving devices is complex. Network synchronization is maintained by a system of clocks and transmission facilities (used to distribute timing information). The digital DII systems and networks such as the DII digital terrestrial transmission system, the Digital Patch and Access System (DPAS), the Defense Satellite Communications System (DSCS), the Defense Switched Network (DSN), the IP Router Networks, and the Data Transmission Network (DTN) utilizing Low Speed Time Division Multiplexers (LSTDM) all require precise synchronization. In order to understand T&S networks, it is first necessary to understand how T&S is derived and distributed.

C4.2 **Long Range Aid to Navigation (LORAN) C**. The LORAN C will be the DII Primary Reference Standard (PRS) clock source until all necessary equipment is installed at DII facilities to obtain timing signals from the Global Positioning System (GPS). For terrestrial nodes collocated with DSCS sites, existing OSCS cesium beam standards can be used as an alternate reference for the Master Station Clock. LORAN C was selected primarily because of its off-the-shelf availability, compatibility with existing clocks, and proven performance. LORAN C is a pulsed, low frequency, radio navigational system operated worldwide. All LORAN C transmitting stations are equipped with cesium beam frequency standards. Synchronization among these standards is maintained by monitoring and updating each standard in comparison to the Universal Coordinated Time (UCT). Typical frequency accuracy of 1 part 1012 is easily reached. This type of performance is not attainable from independent free running atomic clocks.

C4.3 **Station Clock**. The station clock consists of the LORAN C receiver, the frequency multiplier, and dual oscillators. Refer to Figure 4.1.

C4.3.1 **LORAN C Receiver**. The LORAN C receiver provides automatic acquisition and tracking of the selected LORAN C signal. This signal may be used as a reference against other frequency standards for comparison. The receiver will automatically acquire the operator selected LORAN C station, acquire the signal, and go into the

tracking mode. The receiver will continue to track the incoming signal unless it fades beyond the sensitivity of the receiver or the operator manually halts the tracking process. In the event that the signal is lost, the receiver will automatically try to reacquire the selected station or find a secondary signal.

C4.3.1.1 **Receiver Output**. Using the LORAN C ground wave, the LORAN C receiver (Austron 2100F) provides a 1 MHz signal output that tracks the long term accuracy of the LORAN C signal. The 1 MHz signal is phase locked to the received LORAN C signal. The 1 MHz reference output has typical accuracies of at least 1 part in 1011 in one hour, and 1 part in 1012 in one day, maintained in respect to the received signal. The accuracy and stability of the frequency reference is a function of not only the cesium standard at the transmitter, but also the propagation effects over the distance traversed, the received noise level, the receiver time constant, and the oscillators' time constants.

C4.3.1.2 **Redundancy**. To satisfy performance objectives for timing availability, clock accuracy, clock stability, timing slips, and buffer lengths, the station clock provides redundancy in the form of two precision oscillators to compensate for any loss of LORAN C due to equipment failure or signal loss. The station clock may be configured to accept the external reference, such as a DSCS cesium beam standard when available.

C4.3.2 **Frequency Multiplier**. The frequency multiplier provides the functions of frequency synthesis, distribution, manual selection and failure mode operation. The frequency multiplier also provides all the necessary interfaces within the station clock, to include the LORAN C receiver, the external source, the primary and backup oscillators, and the distribution amplifier.

C4.3.2.1 **Redundancy**. If the primary reference fails, the frequency multiplier will automatically switch to the alternate reference (cesium beam) if available. The frequency multiplier will then continue to operate using the alternate reference until it is manually reset. If both the primary and the alternate references fail, all reference input signals to the oscillators will stop, and the oscillators will operate unlocked.

C4.3.2.2 **Operation**. The frequency multiplier provides each

oscillator with a 1 Mhz signal. The frequency multiplier accepts a 5 MHz square wave signal from each of the two local oscillators (primary and backup). If either the primary or backup local oscillator fails, switch over to the remaining oscillator occurs automatically. Manual intervention is required to restore either oscillator after failure.

C4.3.3 **Precision Oscillators**. The two oscillators (primary and backup) are provided as separate independent components. Each oscillator is locked to its respective input from the frequency multiplier. If the reference signal is lost, reacquisition of phase lock is automatic after the reference signal is restored. The oscillators accept the reference input and provide outputs that assume the long term stability of the reference signal. If the reference signal is removed, the oscillators will continue to provide output signals without immediate degradation greater than 1 part in 1012. The oscillators should not degrade in accuracy by more than 3 parts in 1011 each day. The TAU switch determines how quickly the LORAN C signal updates the oscillators. A TAU I setting updates the oscillator more often than a TAU 2 setting.

C4.3.3.1 The oscillators should be set in the TAU I (one) position during acquisition of the LORAN C signal and stabilization of the oscillators. After the frequency standards have stabilized (approximately five days), the TAU setting on the oscillators should be set to TAU 2 (two), and left in that position for normal operation.

C4.3.3.2 If the frequency standards do not maintain the required accuracy (1 part in 1011) in TAU 2, the standards may need to be realigned or replaced.

C4.4 **Clock Distribution Subsystem (CDS)**. The COS interfaces with the station clock to generate and distribute timing signals to transmission and user equipment. The COS generates over 155 clock frequencies and can distribute up to 84 different frequencies at once. These frequencies range from 50 Hz to 3.072 MHz. Special frequencies are optionally available that increase this range to 12.928 MHz. The COS may operate as a slave to another COS. The master unit provides three separate signals from the triplicated master divider cards. These signals are delivered via a fiber optic interface module and cable to the slave unit master divider cards. The slave unit then uses the same techniques to produce clock outputs

as the master unit. This text will deal solely with the clock signal generated by a single COS and the timing provided to a single DII node facility. The following describe the components of the CDS; the frequency synthesizer, and the distribution amplifier.

C4.4.1 **Frequency Synthesizer**. The COS frequency synthesizer accepts three 1 MHz or 5 MHz signals that may or may not be phase coherent sinusoidal or square wave outputs from the station clock or other frequency standards. The frequency synthesizer also accepts three 1.544 MHz square wave signals that may or may not be phase coherent inputs from external sources (e.g., AN/FCC-98 or DPAS). Simultaneous inputs of any combination of 1.544, 1, or 5 MHz can be used by the frequency synthesizer. The frequency synthesizer can also interface with the Hewlett Packard Frequency/Time Standard in the DSCS. If one frequency synthesizer is found to disagree with the other two synthesizers, its output is removed from the input to the distribution amplifier. To return the off-line frequency synthesizer to service, operator intervention is required. If two or more frequency synthesizers are found to agree, the voting logic will select any one of the synthesizers that agree for output to the distribution amplifier. If all frequency synthesizers disagree, the voting logic will lock to a single synthesizer output.

C4.4.2 **Distribution Amplifier**. The distribution amplifier accepts the output of the frequency synthesizer voting logic and has the capability of deriving the specific frequency outputs required. The output frequencies are then provided as individually buffered outputs. Failure of any single output will not affect other buffered outputs. A typical OCS application would require one or two outputs for only a few of the frequencies Specified. For this reason, the distribution amplifier is modularized so that the specifically needed outputs and mix of frequency rates can be obtained.

C4.5 **Synchronization Networks**. The general system design for DII timing and synchronization provides station clocks at all major DII nodes (facilities) and selected minor nodes. Minor nodes and end user locations will be slaved (loop timed) to major nodes unless they are being provisioned with a station clock. The dispersed configuration of station clocks with their stability and reliability, provide a robust and survivable approach to DII timing and synchronization. The network does not require every node to have a LORAN C receiver or other primary referenced standard. The current

implementation will provide primary clock sources at major nodes, with minor nodes slaved (looped) to them. Refer to Figure 4.2. This type of system design is not truly synchronous in that the network nodes are not always slaved to a single common timing source. Even if they were, some data buffers would be required to account for transmission delay variations. Therefore, the DII network synchronization is actually a plesiochronous network.

C4.5.1 **Major (Master) Node Timing**. Each major node, has a station clock with a clock distribution system. The station clock provides T&S signals to each major transmission and switching terminal equipment. T&S signals are then cascaded down to lower level equipment (i.e., multiplex, crypto, etc.). In simplest terms, cascading means to pass the timing signal from one piece of equipment to another, allowing each piece of equipment to step the timing down to the next equipment level. Refer to Figure 4.3.

C4.5.2 **Minor (Slave) Node Timing**. The minor timing node would typically be either at a terminating site off the backbone or at a repeater with no VF breakout. This type of node does not have the ability to generate transmission rates other than those used in the radio and multiplexer. The minor transmission node does not have a stand-alone timing system. This node uses the timing generation and distribution capability inherent in the transmission equipment. Refer to Figure 4.4.

C4.6 **Network Applications**.

C4.6.1 **DTN Timing and Synchronization**. Digital channels are provided for the DTN by the Low Speed Time Division Multiplexer (LSTDM), AN/FCC-100, which interfaces with the low speed data circuits and time division multiplexes them into data trunks up to a maximum of 256 Kbps. Data trunks and medium speed data circuits are provided digital channels for transmission with multi-rate synchronous data channel modules in the multiplexers. These data channels are multiplexed along with voice signals that have been digitized using pulse code modulation (PCM) into 1.544 Mbps digroups. The digroups are then multiplexed into mission bit streams (MBS) at 3.232, 6.464, 9.696, 12.928, or 12.6 Mbps for transmission across DII links.

C4.6.2 **DSN Timing and Synchronization**. DSN multi-function switches and some end offices will operate in the plesiochronous mode from station clocks. The remaining switches will recover timing from those switches operating in the plesiochronous mode. Where feasible, DSN switches will be connected to a primary and alternate external timing source. At sites that have a station clock, the primary external T&S source for the DSN switch will be the station clock. The alternate external source will be the clock signal recovered from received T-1 trunks.

C4.6.3 **DPAS Configurations**. Figure 4.5 shows a typical DPAS facility (transmit timing). Although this diagram does not show all the redundancy between the Timing Extractor (TXB) and the Digital Phase Locked Loops (Sync 1,0) or the Time Base (TB) and the Syncs, it provides a standard timing flow chart. The duplicated synchronizer (SYNC) is a reliable, flexible circuit that provides accurate clock signals to the DPAS frame subassemblies. The DPAS unit normally uses the facility's station clock to extract the 1 MHZ clock signal from the clock distribution system. Four timing leads from the CDS are terminated (two on each SYNC). As an alternate timing source, two backup timing signals are recovered from receive T-1 trunks. if all external timing sources become unavailable, the DPAS will derive timing from an internal source. It is important to note that DSN T-1 trunks which pass through the DPAS units are retimed on the outgoing side by the DPAS units.

C4.6.4 **IP Router Networks Timing and Synchronization**. IP Router Networks connectivity to the DII is typically achieved through a 50, 56, or 64 Kbps digital channel using Time Division Multiplexing (TDM). Typical multiplexers used in the DII present an interface that is compatible with the MIL-STD-188-114A balanced signaling used by a IP Router Networks Packet Switched Node (PSN). This permits direct connections to be made to PSNs within 200 cable feet.

C4.6.4.1 The data and timing signals are routed from a PSN port through the encryption cabinet to the Digital Patch Panel Communications (DPPC) for any host or interswitched trunk (IST) that requires a modem channel. Two 4-wire circuits are required for each direct connection to a DII multiplexed channel.

C4.6.4.2 The channel cards used by the multiplexers for full duplex 56 or 64 kbps synchronous circuit support are the Synchronous Data

Channel Unit and the Multi-rate Synchronous Data Module. The use of these cards to support DDN high speed ISTs require every multiplexer in the end-to-end circuit to be timed by a master clock system.

C4.6.4.3 For those DII sites where a master clock system is not yet installed under the DII timing and synchronization program, asynchronous data channels are used by the IP Router Networks. The channel cards used by the multiplexers for full duplex asynchronous operation are the 50 kbps Asynchronous Data Channel Unit with modification 10, and the 50 kbps Data Interleaving Channel Module with revision C, respectively. An external clock generator is usually required for these cards, but they do not require that the transmission timing of the individual channel be related to the timing of the transmission facility. These asynchronous facilities will be phased out of the DDN program as timing and synchronization systems are installed.

C4.7 **Timing and Synchronization Performance**. Signal degradation will be experienced on DII transmission systems if T&S is not properly maintained. The most common impairment is referred to as a slip, which is the insertion (or deletion) of data bits into (or from) the data stream. Slips are directly related to Loss of Bit Count Integrity (LBCI). Timing slips are often caused by signal Jitter and wander. Testing for digital jitter will often determine the cause of slips and LBCI. Although T-1s have buffers to control the effects of jitter and wander, the buffers will overflow or underflow when T&S signals are impaired. Slips can be either controlled or uncontrolled. Controlled slips do not disrupt frame synchronization whereas uncontrolled slips do. An uncontrolled slip results in a Change of Frame Alignment (COFA). It must be noted that slips can also result from impairments that are unrelated to network synchronization such as coding impairments, low signal levels, noise, and excessive jitter. Thus, it is important to periodically verify accuracy of the station clocks. The following procedures will be implemented by all DII facilities that have a station clock. If the installed station clock is other than LORAN C, then similar procedures must be developed locally.

C4.7.1 **Visual Inspection**. A visual inspection of the timing and distribution equipment will be performed at least daily or detection of any alarms or abnormal conditions. On LORAN C equipment this includes checking the LEDs on the 210OF Frequency Monitor, 2084 LF

Multiplier, 6016 Frequency Multiplier, 2010B RF Oscillator, and Power Supply for proper operation.

C4.7.2 **LORAN C Performance**. To make sure the timing and synchronization subsystem operates properly and does not deviate, each DII facility must maintain a log and record the following readings weekly. If more frequent O&M preventive maintenance schedules apply, then those schedules will be used in lieu of this requirement. For unmanned facilities, record the values when visiting the facility for normal maintenance actions.

C4.7.2.1 Date/Time.

C4.7.2.2 Frequency Offset.

C4.7.2.3 Receiver Gain.

C4.7.2.4 Receiver Noise.

C4.7.2.5 Frequency Standard Control Volts for each oscillator.

C4.7.2.6 Frequency Standard Aging for each oscillator.

The Frequency Offset, Receiver Gain and Receiver Noise can be read on the eight digit LCD display on the front of the model 210OF Frequency Monitor. The Frequency Standard Control Volts and the Frequency Standard Aging can be taken from the model 2010B RF Oscillators.

C4.7.3 **LORAN C Performance Measurement Procedures**.

C4.7.3.1 **Frequency Offset**. The frequency offset should not be less than 1 x 10-11. To measure the frequency offset, push the FREQ OFFSET button. The frequency offset is a determination of the frequency difference between the reference supplied to the receiver from the RF Oscillators, and the cesium standard used by the LORAN C station being tracked. The receiver calculates the frequency difference and displays the results; for example, 1 x 1011, 5.6. Explained, that means at 10 raised to the eleventh power, there will be a difference of 5.6 seconds between the local RF Oscillators and the LORAN C frequency standard. The sign of the frequency offset

indicates the direction of the offset. A negative sign indicates the local reference is lower in frequency than the LORAN C reference, and no sign indicates a high frequency. A frequency offset of less than 1 x 10-11 (e.g., 1 x 10-10) can be caused by the loss, and then recovery of receiver tracking.

C4.7.3.2 **Receiver Gain**. Push the STATUS button, then "3", to see the current gain of the receiver on the LCD display. The receiver gain is adjusted to keep the amplified signal strength at a level which is determined when the receiver first entered the tracking mode. A fluctuation of plus or minus 8 dB will disrupt tracking of the LORAN signal. Corroded connectors on the antenna cable, water in the antenna cable, or damage to the receiving antenna can cause receiver gain fluctuations.

C4.7.3.3 **Receiver Noise**. Push the STATUS button, then '2'. The relative signal-to-noise ratio (SNR) is calculated by the receiver and displayed. The receiver noise will range from zero (true SNR greater than +10 dB) to over 4000 (true SNR lower than -21 dB). Receiver noise variations or high noise levels can be caused by the conditions described above for receiver gain variation, or sporadic interference. A spectrum analyzer should be used to monitor output of the multi-filter for possible carriers near the LORAN C frequency.

C4.7.3.4 **Frequency Standard Control Volts**. To begin, set the control voltage switch position to X1, X10, X102, and 103. Record the meter indication for each. The X1 reading should not be outside the range of 1 to 9. Refer to the equipment specifications for the range of other switch positions. Crystal aging can cause the control volts to exceed the tuning range of the standard after long term operation. If the specified range is exceeded, the frequency standard must be taken off line, initialized and mechanically retuned.

C4.7.3.5 **Frequency Standard Aging**. Set the control voltage switch position to AGING and record the meter indication. Frequency standard aging rates should be stable for a system that has been in tracking mode for more than three days. Age readings should settle to near zero (within plus or minus 3 small scale divisions of zero). A defective 5 MHZ Variable Control Oscillator (VCO) card is a likely cause for fluctuations or readings greater than plus or minus 3.

C4.7.4 **Mutual Clock Offset Measurement**. Mutual clock offset is a

measurement that can be made to compare the local station clock against a far end station clock over a digital radio system. Clocks often drift in relation to each other which causes Loss of Bit Count Integrity (LBCI) and clock slips, resulting in loss of service to digital users. Mutual clock offset should be checked whenever network timing problems are suspected. Network timing problems should be suspected anytime a network element indicates that inservice parameters are exceeding threshold settings at regular intervals. Refer to chapter 6 of this Circular for network element performance monitoring requirements. The presence of clock offset problems are usually seen as a loss of synchronization at regular intervals. Seeing these intervals is easy when only two master station clocks are involved, but over long segments the distinction is more difficult. There may be more than one set of offsets and the buffer dump periods overlap other buffer dump periods making it difficult to see. Whenever a mutual clock offset problem is suspected the clocks should be measured. Mutual clock offset can be measured with a dual trace oscilloscope. However, it is a time consuming test, and not as accurate as digital test equipment capable of measuring mutual clock offset. Footnote 3. If test equipment is not available to measure mutual clock offset, then testing for digital jitter and frame slips is the best alterative to isolating clock offsets.

Continue to:
CHAPTER 5. CONTINGENCY OPERATIONS

Return to:
Basic Circular
Table of Contents
Publication Listing

Michael E. Craft, craftm@ncr.disa.mil - Last revision: 12 June 1998

CHAPTER 5. CONTINGENCY OPERATIONS

C5.1 **General**. This chapter provides the policy and procedures necessary to provide maximum communications during contingency conditions. Continuity of communications service is the primary mission of the TCF/PTF under stressed conditions. The reliability and survivability of the DII depends to a great degree on the skill and knowledge of technical control personnel. Contingency operations must be planned to maximize effectiveness in maintaining service continuity for as many users as possible. Preplanned actions permit personnel to practice and develop skills and knowledge required to achieve efficiency under adverse conditions.

C5.1.1 Each TCF must have documented plans available that provide precise actions to take during contingency situations.

C5.1.2 Authority must be delegated to the TCF shift supervisor to implement contingency plans when conditions require such action.

C5.1.3 Personnel must be capable of implementing contingency plans. Practical exercises must be conducted periodically to ensure efficiency. Under no conditions should user traffic be interrupted during exercises.

C5.2 **Telecommunications Service Priority (TSP)**.

C5.2.1 The TSP system ensures priority treatment of our nation's critical telecommunications services. TSP assignments are obtained from the National Communications System (NCS) which is collocated with HQ DISA, Arlington, VA. Only those telecommunications services meeting the NCS criteria are eligible for TSP assignments. Refer to DISAC 310-130-4, Defense User's Guide to the Telecommunications Service Priority (TSP) System, for details.

C5.2.2 The NCS TSP system assigns a provisioning and/or restoration priority level. Provisioning level assignments are identified in position 11 of the TSP authorization code. Restoration priority level assignments are identified in position 12 of the TSP authorization code. TSP restoration priority levels are 1, 2, 3, 4, and 5 with 1 being the highest priority. It is possible that a TSP assignment can be made for provisioning purposes but have no

restoration priority level assigned, in which case a "0" will appear in position 12 of the TSP authorization code. If a circuit or trunk does not qualify for TSP provisioning or restoration, a TSP authorization code is not assigned. Refer to Figure 5.1 for an explanation of the TSP authorization code.

C5.2.3 Previously assigned NCS Restoration Priorities (RP) remain valid and must be treated accordingly until the RP to TSP transition period is complete (9 March 1993). Any circuit or trunk not having an assigned TSP authorization code after 9 March 1993 will not receive priority treatment.

C5.3 **Circuit Restoration**. Individual circuits are restored in accordance with their assigned NCS TSP, or RP level. During the RP to TSP transition period, TSP restoration priorities are equal to the highest RP subcategory within equal categories. For example, a TSP 1 must be treated as RP 1A, TSP 2 must be treated as RP 2A, etc. TSP 5 must receive priority treatment over a RP "00". A TSP assignment with a "0" restoration priority, and circuits with no TSP assignment, must be treated the same as existing RP "00". Prudent decisions must be made based on existing situations when restoring circuits with like TSP and/or RP priorities, especially when essential mission requirements exist. DISA Area restoral plans and minimum essential circuit list (MECL), when implemented, have precedence over all other restoral actions. In all cases, the primary DII orderwire circuit between facilities must have priority over all other circuits. If conflicts arise during normal or emergency restoral actions, the problem should be elevated to the next level of the DII hierarchy (i.e., PTF - TCF - LCC - DISA RCC - DISA GOSC).

C5.4 **Minimum Essential Circuit List (MECL)**. MECLs are used by Commanders in Chief (CINCs) in the overseas theaters to assign certain priority circuit requirements during stressed conditions. MECLs are controlled by the CINCs and are implemented by the DISA Area at the direction of the CINC. Only government owned DII circuits within a CINC's area of responsibility may be included on the MECL. MECLs cannot be enforced on commercially provided leased service. Each MECL must be submitted to the MGR, NCS (TSP Program Office) for TSP assignment in accordance with DISAC 310-130-4. Once the MGR, NCS assigns a TSP restoration priority level for MECL purposes, the CINC may assign sub-priorities to determine an order of precedence by which services or circuits of equal TSP level should be

restored during stressed conditions. Sub-priority assignment is not authorized by any service or agency below the CINC level. DISA Areas must maintain a copy of the approved MECL and distribute it to O&M commands, LCC/NCOs, and appropriate DII facilities. Each DISA Area must provide guidance regarding distribution and implementation of MECLs to the DII facilities responsible for implementing MECLs.

C5.5 **Restoral Plans (R-plans)**. The extent of any restoral plan depends on the restoration capabilities within a geographical location. DISA Area R-Plans are developed to restore service to as many high priority user circuits as possible. Those circuits with NCS TSP restoration priority 1 and 2, priority multichannel trunks, and other CINC directed circuits are normally included on the DISA Area R-Plans. Footnote 4 If additional communications capabilities exist, NCS TSP restoration priority 3 circuits may be included in the R-Plan. Each DISA Area Commander is the approving authority for the DISA Area R-Plans. In the event of conflicts every effort must be made to resolve the conflict at the DISA Area level. If it cannot be resolved it should be addressed to the area CINC for resolution. DII facilities are required to provide inputs during development of the R-Plans, as requested by the DISA Area, and are responsible for reviewing the R-Plans upon receipt to ensure accuracy. Inaccurate information must be reported immediately to the DISA element responsible for the R-Plan.

C5.5.1 **Responsibilities**.

C5.5.1.1 Each DISA Area is responsible for:

C5.5.1.1.1 Developing, maintaining, and distributing R-Plans for their area of responsibility in concert with Commander-in-Chief (CINC) requirements.

C5.5.1.1.2 Assisting the area CINC with the development of MECLs.

C5.5.1.1.3 Assisting other DISA Areas in development of inter-area R-Plans.

C5.5.1.1.4 Directing intra-area and inter-area restorals. Inter-area restorals must be coordinated with other DISA Areas.

C5.5.1.1.5 Directing periodic tests of DISA R-Plans as necessary.

C5.5.1.1.6 Resolving restoral problems at subordinate facilities within appropriate DISA Area of responsibility.

C5.5.1.1.7 Providing operational guidance and assistance to DII facilities to ensure timely restoral service for DII users.

C5.5.1.1.8 Notifying the DISA GOSC when restoral problems that affect the worldwide DII cannot be resolved.

C5.5.1.2 DII Facilities are responsible for:

C5.5.1.2.1 Executing DISA R-Plans, MECLs, and LRPs as directed by the area RCC or LCC. LRPs may be implemented without direction from the LCC in order to restore service to local users. However, the LCC must be advised as soon as time permits.

C5.5.1.2.2 Submitting status reports on restoral activities as required by DISAC 310-55-1.

C5.5.1.2.3 Developing local R-Plans for partial or complete facility, inter-site, and communication link failures that are not part of a DISA Area R-Plan. Local R-Plans must be approved by the LCC responsible for the particular geographical area of concern.

C5.5.1.2.4 Reviewing applicable DISA R-Plans and MECLs and advising appropriate DISA Area personnel of restoral actions that are incorrect, or restoral actions that cannot be implemented because of equipment or other limitations.

C5.5.1.2.5 Maintaining current copies of DISA R-Plans, MECLs, and LRPs. Copies must be maintained for easy accessibility to TCF personnel responsible for implementing the plans. If a DISA R-Plan is automated using the DPAS capabilities then the TCF must also maintain a hard copy backup.

C5.5.2 **R-Plan Formats**. The R-Plans developed by each DISA Area should be similar in format for worldwide standardization. Due to unique requirements within each area, some flexibility must be

allowed in each DISA Area. The following guidelines are recommended:

C5.5.2.1 The long title of the R-Plan will be Defense Information Systems Agency Restoral Plan. The short title will be DISA R-Plan.

C5.5.2.2 Each intra-area R-Plan must be assigned a unique numerical identifier (e.g., R-Plan 2400). Each revision to the identifier must have an alpha suffix beginning with A for the first revision (e.g., R-Plan 2400A).

C5.5.2.2.1 DISA-Pacific will assign numerical identifiers from 1000 to 1999 for DISA Areas 7 and 8.

C5.5.2.2.2 DISA GOSC will assign numerical identifiers from 2000 to 2999 for DISA Areas 1, 2, 6, and 9.

C5.5.2.2.3 DISA-Europe will assign numerical identifiers from 3000 to 3999, 4000 to 4999, and 5000 to 5999 for DISA Areas 3, 4, and 5.

C5.5.2.3 Figure 5.2 is a sample DISA R-Plan. Explanations of each item are as follows:

C5.5.2.3.1 The left column number/alpha/number indicates the DISA R-Plan number (04A) and line number (001).

C5.5.2.3.2 The first lines indicate the transmission link or DII Station failure that prompts implementation of the R-Plan.

C5.5.2.3.3 The following headings will precede circuits to be restored and the restoral paths to be used.

C5.5.2.3.3.1 **RESTORE**. Precedes circuits to be restored by the plan.

C5.5.2.3.3.2 **PATCHING STATIONS**. The DII facilities required to make actual patches or those facilities where a circuit passes directly through a facility. When a circuit traverses a facility where a patch is not required, the facility designation will be in parentheses

C5.5.2.3.3.3 **PREEMPT**. The preempted trunk and channel designations.

C5.5.2.3.3.4 **CCSD**. The preempted circuit CCSD. Whenever a preempted circuit is already out because of the failure of the link or station the R-Plan is restoring, an asterisk (*) will appear next to the preempted circuits. Many times it will appear that a low priority circuit is preempting a higher priority circuit. Often, the circuit is already out and restored via another path.

C5.5.2.3.3.5 **RP**. The circuits Restoration Priority (RP) or Telecommunications Service Priority (TSP).

C5.5.2.3.3.6 **FROM**. The restored or preempted circuit's "from" end terminal.

C5.5.2.3.3.7 **TO**. The restored or preempted circuit's "to" end terminal.

C5.5.2.3.3.8 **NOTES**. The final column may have note keys for unique requirements.

C5.5.2.3.4 Several lines are usually necessary to show the patches required to reestablish a complete path for circuit restoration.

C5.5.2.3.4.1 The following provides an explanation of how Figure 5.2 is used. Croughton (CRO) takes circuit 2019 (running between SITE R and SHAPECST) from the normal path and patches it to group 34CN02 channel 0N0 toward Landstuhl (LDL) preempting circuit 9CKB (which runs between MTLSHMHT and FELDBERG). 9CKB normally passes directly through Landstuhl to Bann (BAN). These stations do not patch as indicated by the parentheses around their station indicators. Langerkopf (LKF) will pick up circuit 2019 coming from Bann on group 44JMH4 channel 009 and patch it to Schoenfeld (SCH) on the 44JM15 channel 006 preempting circuit 6D4K (which runs between PIRMASNS and CHIEVRES). 6D4K is a circuit already out because of the link outage, indicated by the asterisk following the CCSD. Schoenfeld (SCH) receives the 2019 on group 44JM15 channel 006 and patches it back to the normal path going to SHAPECST. The notes referred to on lines 04A163 and 04A168 are explained at the end of the plan.

C5.5.2.4 In addition to the normal R-Plan format, each DISA Area should also provide an abbreviated sequential patching scheme for each R-Plan. The sequential scheme provides an easy to use list to

allow rapid restoral. The listing is alphabetic by facility and indicates patching requirements for each facility on each circuit. Figure 5.3 is an example of a sequential patching scheme which is explained as follows:

C5.5.2.4.1 The first column "PS" indicates the patching stations for a given R-Plan. All patches required by a particular station will be listed sequentially. For example, if Alconbury (ANY) has a requirement to make 10 patches for a given R-Plan, then the 10 patches required by ANY will be listed sequentially. The technical controller making the patches simply reads each line across which indicates where the circuit is to be patched from and where it is to be patched to. The following paragraph explains the first line.

C5.5.2.4.2 The first patch for ANY in Figure 5.3 requires ANY to restore circuit 254D that has a 1D RP. 254D is riding the "normal path" on the receive side. Thus, a "from" patch is not required. 254D is to be patched to Martlesham Heath (MAM) pre-empting trunk/ channel number 33JM10/005. Circuit 26Q1 which normally rides 33JM10/005 is pre-empted.

C5.5.3 **Implementation Procedures**.

C5.5.3.1 The DISA GOSC, RCC, or RCC must notify appropriate LCCs to implement a specific DISA R-Plan in accordance with mission requirements. The LCC must then notify all subordinate facilities to implement applicable DISA R-Plans. The DISA GOSC/RCC may also notify the DII facilities directly depending on the situation, however, the LCC must be notified as soon as possible. DISA R-Plans may be implemented immediately or at a designated time as determined by the DISA GOSC/RCC.

C5.5.3.2 Each DII facility must coordinate reroutes (manual and automated) with adjacent facilities to ensure circuit continuity is maintained. DPAS facilities must ensure precise implementation between adjacent facilities to prevent multiple outages.

C5.5.3.3 The first and last TCF/PTFs listed for the reroute of a circuit must make continuity checks and coordinate with the servicing TCF/PTFs to determine if the user service is acceptable on the new path. Normal troubleshooting procedures will apply when problems are

encountered.

C5.5.4 **Call-Back Verification**. The sole authority for implementation of DISA R-Plans is the DISA GOSC, RCC, or RCC although LCCs may direct implementation for subordinate facilities once the DISA GOSC/RCC has directed the LCC to do so. Any facility directed to implement a DISA R-Plan must verify the directive by calling the LCC or DISA GOSC/RCC back prior to implementation. Each facility must authenticate the DISA R-Plan implemented by identifying the edition letter used at the station (e.g., 2400F). Secure means must be used if directed by the DISA GOSC/RCC or LCC.

C5.5.5 **Authorized Outages**. Use the following procedures when implementing a DISA-Plan in conjunction with an authorized outage (AO):

C5.5.5.1 The DISA GOSC/RCC can direct the implementation of an R-Plan up to four hours before the start of a scheduled AO. The System Control Officer (SCO) must, on a case by case basis, determine the appropriate time to implement a particular DISA R-Plan.

C5.5.5.2 The first and last TCF/PTFs listed on the R-Plan for each circuit must conduct a test tone level test on the transmit and receive portion of the reroute path on voice grade circuits once the reroutes have been completed. For data circuits the TCF/PTFs must conduct a one minute BER test on the transmit and receive portion of the reroute path. The reroute path should meet the same parameter requirements as that of the circuit being restored.

C5.5.5.3 Place the restored circuit on the DISA R-Plan reroute only after verifying the quality of the reroute. The TCF/PTFs at each end of the reroute must coordinate with the servicing TCF/PTFs to ensure the user service is acceptable.

C5.5.5.4 If user service is not acceptable on a designated reroute the TCF/PTFs must establish an alternate path. The end TCF/PTFs responsible for rerouting the circuit must report circuits that do not operate properly on a designated reroute path in accordance with DISAC 310-55-1 and applicable DISA Area supplements.

C5.5.6 **Classification Guidance**. DISA R-Plans will be classified in

accordance with appropriate DoD regulations. As a minimum, the information contained in R-Plans is For Official Use Only (FOUO). Safeguard information identified FOUO in accordance with applicable regulations and directives.

C5.6 **Joint On-Call Service**.

C5.6.1 **General**. On-call service provides a temporary path, using existing circuitry, between authorized users to fulfill unanticipated or special communications requirements. On-call service is not intended as a substitute to meet known communications requirements and normally should not be activated for a period exceeding 7 days. If it is known that service will be required for more than 7 days the requesting activity should submit an emergency Telecommunications Service Request (TSR) in accordance with DISAC 310-130-1, or contact the appropriate DISA element and obtain approval for extended service.

C5.6.2 **On-Call Service Procedures**.

C5.6.2.1 Requests for on-call service should be placed through the appropriate DISA element within the theater where service is required. In certain instances when time does not allow coordination through the DISA element, the requesting activity may coordinate directly with the local communications element.

C5.6.2.2 Upon receipt of a request for assistance, the appropriate DISA element must determine the type of service required. The following information must be obtained from the requestor:

C5.6.2.2.1 Priority of the on-call request in accordance with the NCS-TSP priority system.

C5.6.2.2.2 Originator of the request and addressee desired.

C5.6.2.2.3 Type of service required (e.g., voice, data, etc.). If voice service is requested, the level of precedence in accordance with the NCS Voice Precedence System must be determined.

C5.6.2.2.4 Type of signal (e.g., required levels for voice, data rate, etc.).

C5.6.2.2.5 Type of security equipment required, if applicable.

C5.6.2.2.6 Time the on-call service is required.

C5.6.2.2.7 Estimated duration of the on-call service.

C5.6.2.3 Once the type of service is determined, the DISA element must:

C5.6.2.3.1 Determine the route to be used. If required, coordination will be effected with other DISA elements. In determining the route, consideration must always be given to selection of the most direct route available. This must be accomplished by an analysis of available DII circuits, irrespective of military department affiliation.

C5.6.2.3.2 Notify DII facilities that are required to provide the requested service/assistance.

C5.6.2.4 Each DII TCF must ensure that all requests for on-call service are acted upon immediately. Authority and priority of the service can be verified with the appropriate DISA element if necessary.

C5.6.2.5 When requested in advance, the TCF must make appropriate connections, conduct tests, and notify the user at least 15 minutes prior to the scheduled activation time.

C5.6.2.6 Normally, on-call service will be provided by utilizing spare capacity, or circuits specifically allocated for on-call purposes. When spare capacity or circuits are not available, circuits with lower restoration priorities may be preempted for this purpose. When the on-call service cannot be established within the means available to the TCF, the TCF should contact the DISA GOSC/RCC for assistance.

C5.6.2.7 If the user reports circuit trouble, prompt action must be taken to clear the trouble or provide an alternate circuit in accordance with normal restoration priorities.

C5.6.2.8 When notified by the user that the on-call service is no longer required, the TCF must coordinate with the distant end to break down any special circuit arrangements used and restore the circuit path to its normal function. The TCF must notify the appropriate DISA element when on-call service is terminated.

C5.6.3 **Preemption Capabilities**. On-call service with validated NCS-TSP priorities have pre-emption authority over circuits with lower priorities. Prior to preemption of any existing user circuit for on-call service, the user must be notified of the impending action. Immediately upon termination of the on-call service, coordination between the affected TCFs must be accomplished and the preempted circuit restored to service.

C5.6.4 **NCS Voice Precedence System**. Whenever on-call service requires connectivity into DII voice switching systems, the category of NCS Voice Precedence System must be verified and programmed into the switch software. The voice precedence category must be verified by the appropriate DISA elements. The DISA elements will then program the proper precedence category (if remote capability exists), or direct O&M switch personnel to program the precedence category. The NCS Voice Precedence System categories are as follow:

C5.6.4.1 **FLASH**.

C5.6.4.1.1 Application. FLASH precedence is generally reserved for command control of military forces essential to defense and retaliation; critical intelligence essential to national survival; conduct of diplomatic negotiations critical to the arresting or limiting of hostilities; dissemination of critical civil alert information essential to national survival; continuity of Federal Government functions essential to national survival; fulfillment of critical United States internal security functions essential to national survival; catastrophic events of national or international significance.

C5.6.4.1.2 Preemption Capability. Has precedence over any other type of on-call voice service having an immediate, priority, or routine precedence.

C5.6.4.2 **IMMEDIATE**.

C5.6.4.2.1 Application. IMMEDIATE precedence is reserved generally for situations which gravely affect the security of national and Allied forces; reconstitution of forces in a post-attack period; intelligence essential to national security; conduct of diplomatic negotiations to reduce or limit the threat of war; implementation of Federal Government actions essential to national survival; situations which gravely affect the internal security of the United States; civil defense actions concerning direction of our population and their survival; disasters or events of extensive seriousness having an immediate and detrimental effect on the welfare of the population.

C5.6.4.2.2 Preemption Capability. Has precedence over any other type of on-call voice service having a priority or routine precedence.

C5.6.4.3 **PRIORITY**.

C5.6.4.3.1 Application. PRIORITY precedence is reserved generally for expeditious action requirements by the originator and for furnishing essential information for the conduct of Government operations.

C5.6.4.3.2 Preemption Capability. Has precedence over any other type of on-call voice service having a routine precedence.

C5.6.4.4 **ROUTINE**.

C5.6.4.4.1 Application. ROUTINE designation applies to those official Government communications which require rapid transmission, but do not require preferential handling.

C5.6.4.4.2 Preemption Capability. Has no precedence over any other type of on-call voice service.

C5.6.5 **Reports**. On-call service will be reported in accordance with instructions contained in DISAC 310-55-1, when required by DISA. Temporary CCSDs for reporting purposes will be assigned by the appropriate DISA element.

C5.6.6 Recording of On-Call Patches. The Master Station Log (MSL) must be used to record all activity associated with the initial on-

call service request, activation, and subsequent deactivation. A DD Form 1443 must be completed to record activation, outage, and deactivation information pertaining to the on-call service for the entire period of activation.

C5.7 **Tactical Circuits**. The capability now exists for rapidly interfacing tactical communications equipment with the DII. Many TCF/PTFs have permanently installed facilities to provide this capability. It is also possible for a tactical facility to interface with the DII and then be designated as a DII facility. As such, it is important for DII TCF/PTFs to provide assistance and direction to personnel of tactical units when interfacing with the DII. The following guidelines, procedures, and responsibilities are to be used to support the interface of tactical and DII technical controls and patch and test facilities:

C5.7.1 **Procedures**.

C5.7.1.1 Coordination between the tactical van equipment operators is of utmost importance. An orderwire between the tactical van and DII TCF/PTF is crucial and must be established immediately.

C5.7.1.2 The TCF/PTF supervisor and the tactical team chief must perform all connections of signal and grounding cables at the tactical interface box (TIB) in addition to discussing transmission level point (TLP) differences. All circuit levels must be engineered or conditioned to DII specifications when interfaced with the DII.

C5.7.1.3 The tactical equipment operator should follow normal lineup procedures while aligning the tactical radio and carrier equipment. The team chief, after satisfied the equipment is prepared to accept traffic, must coordinate with the TCF/PTF to turn the system over for DII acceptance testing. TCF/PTF personnel must check continuity and verify system and channel integrity between the DII facility and tactical equipment.

C5.7.1.4 After determining the TLP interface requirements for VF circuitry of the tactical carrier, TCF/PTF personnel must adjust pads and amplifiers to satisfy the DII TLP requirements (zero dBm at the equal level patch) and the tactical carrier inputs and outputs channel requirements.

C5.7.1.5 The TCF/PTF must transmit a -10 dBm0 test tone at 1004 Hz over each VF circuit and coordinate with the tactical van carrier operators to have them adjust the channel gain for each channel at both carrier terminals to meet the prescribed level in accordance with the appropriate TSO.

C5.7.1.6 Once the tactical system has been turned over to the TCF/PTF for operational traffic the tactical van carrier operator must coordinate with TCF/PTF personnel prior to performing any equipment changes, maintenance, system troubleshooting, or any other steps which may affect the quality or continuity of the systems and circuits.

C5.7.2 **Responsibilities**.

C5.7.2.1 Tactical equipment personnel must:

C5.7.2.1.1 Be responsible for testing all external hookup cables and cable pairs. TCF/PTF personnel must be notified of any transposed, grounded, or otherwise bad pairs which will affect circuit termination.

C5.7.2.1.2 Be responsible for establishing the tactical system and aligning the carrier equipment.

C5.7.2.1.3 Work closely with TCF/PTF personnel until all systems and circuits have been aligned, patched through, and are passing traffic.

C5.7.2.1.4 Inform the TCF/PTF immediately if any changes occur in system and circuit status.

C5.7.2.1.5 Ensuring that all tactical equipment is properly grounded. Grounding should be made to the DII facility ground to prevent separate ground loops.

C5.7.2.1.6 Ensuring that all power is properly connected. If DII facility power is required it must be coordinated, preferably prior to arrival, with respective DII facility personnel.

C5.7.2.2 TCF/PTF personnel must:

C5.7.2.2.1 Ensure that cable or wiring connections to include ground hookups are securely fastened at the site tactical interface box.

C5.7.2.2.2 Assist the tactical personnel with connecting their cables into the tactical interface box.

C5.7.2.2.3 Condition circuits once channels are accepted from the tactical van equipment operator.

C5.7.2.2.4 Report all system and circuit activation and outages, in accordance with current DISA circulars and instructions.

C5.7.2.2.5 Contact and coordinate with adjacent TCF/PTFs and users while activating or restoring circuits.

C5.7.3 **System Control**. After the tactical van equipment operators have aligned their systems the control of system must be passed over to the TCF/PTF, at which time the following procedures must be in effect:

C5.7.3.1 The TCF/PTF assumes full responsibility of the tactical circuits.

C5.7.3.2 The DII CCSD trunk identifier must be used in both the DII and tactical environment to identify each trunk and circuit.

C5.7.3.3 Tactical equipment operators must notify the TCF/PTF of any known degradations or outages.

C5.7.3.4 The TCF/PTF must report all DII circuit and trunk outages in accordance with policy and procedures established by DISAC 310-55-1.

C5.7.3.5 Any maintenance actions or removal of on-line equipment must be coordinated with the TCF/PTF. The TCF/PTF must approve the actions.

C5.7.4 **Excessive Signal Levels**. The provisions of chapter 6 must be followed when excessive signal levels are detected. Appropriate line

conditioning equipment, attenuators, amplifiers and/or equalizers must be utilized at the DII TCF/PTF providing DII entry at the tactical interface point.

Continue to:
CHAPTER 6. QUALITY CONTORL AND PERFORMANCE STANDARDS

Return to:
Basic Circular
Table of Contents
Publication Listing

Michael E. Craft, craftm@ncr.disa.mil - Last revision: 12 June 1998

CHAPTER 6. QUALITY CONTROL AND PERFORMANCE STANDARDS

C6.1 **General**. This chapter provides the policies and procedures for performing quality control on DII trunks and circuits, and the application of established performance standards to those trunks and circuits. Performance of quality control and applicability of performance standards encompasses three DISA Circulars: DISAC 310-70-1, provides quality control testing requirements; DISAC 310-70-1, Supplement 1, provides detailed test descriptions for performing quality control tests; and DISAC 300-175-9, DII Operating-Maintenance Electrical Performance Standards, provides test parameters and technical specifications for each type of trunk and circuit. Each DII TCF/PTF must maintain a copy of these circulars for use by O&M personnel responsible for supervising or performing test measurements of DII trunks and circuits. Non-DII facilities responsible for performing test measurements on DII trunks and circuits that traverse their facility should also maintain a copy of the above circulars.

C6.2 **Parameter Codes**. Parameter codes are assigned to every circuit established by a DISA Telecommunications Service Order (TSO), Government-owned or leased, with the exception of voice circuits provided over high frequency radio systems. Parameter codes are also assigned to trunks that have a cross reference Command Communications Service Designator (CCSD) assigned. The TSO is the only vehicle that assigns parameter codes. DISA Allocation and Engineers (A&Es) use the description of service contained in DISAC 300-175-9 to determine applicable parameter codes when ordering trunks and circuits. The parameter codes, test parameters, and technical specifications contained in DISAC 300-175-9 parallel those used by CONUS commercial carriers. DISAC 300-175-9 also contains technical specifications for internationally leased service. Technical specifications for leased service outside the CONUS are dependent upon the country providing the service. Since the divestiture of AT&T there may be some difference in parameters and specifications between DISAC 300-175-9 and commercial carriers. Conflicts between DII specifications and commercial carrier specifications will be resolved in favor of the commercial carrier unless the TSO states particular specifications. Circuits traversing Government-owned facilities, from user to user, are required to meet each test parameter specification for the type of service specified in the TSO, or other specifications that may be

contained in the remarks section of the TSO.

C6.3 **Test Tone Power Levels**.

C6.3.1 **Standard Test Tone Frequency/Power Level**. The standard test tone power level for testing voice frequency DII circuits is -10 dBm0 at 1004 Hz. Tests at this power level should be limited to 30 minutes or less.

C6.3.2 **Non-Standard Test Tone Frequency/Power Level**. Certain test equipment (e.g., portable test sets) may not have the capability to provide a standard test tone frequency of 1004 Hz. When the standard test tone frequency is not available an alternate test tone frequency of 1010 Hz may be used. Use of test tone power levels higher than the standard level is permissible whenever such tests are required to measure parameters that are level sensitive. Such tests are permitted only on systems which are out-of-service, or during non-busy hours to minimize degradation to other users of the system. The use of nonstandard test tone levels is also permissible whenever testing leased commercial facilities and the carrier representative requests a specified level.

C6.3.3 **Monitor Test Tone Power Level**. If a standard test tone is required for longer than 30 minutes the level should be reduced to a -15 dBm0.

C6.3.4 **Test Tone at Data Level**. When testing leased circuits with commercial carriers the TCF/PTF may utilize a test tone at data level (e.g., -13 dBm0) if the commercial carrier requests it. The TCF/PTF must be aware that the commercial carrier transmission level point (TLP) may be different than the DII TLP. It is advisable to check with the local commercial carrier to determine the proper test tone level and frequency.

C6.4 **Excessive Signal Levels**. Excessive signal levels are frequently introduced into the DII from user equipment, misaligned conditioning equipment, transmission equipment, etc. Excessive signal levels are normally detected during in-service monitoring or during baseband sweeps on FDM systems. One excessive signal level can cause cross-talk across the entire baseband of a FDM system. Detection and correction of excessive signal levels interfacing with

TDM systems is equally important to prevent signal clipping and degradation. Whenever any excessive signal level(s) are detected, immediate action must be initiated to locate the source and correct the level. The serving TCF/PTF must immediately notify the user or other TCF/PTF that is originating the excessive signal level and request that immediate action be taken to correct the level. The TCF/PTF must take appropriate actions to include denial of service if necessary. Action of this nature must be properly documented and immediately reported to the appropriate LCC. Denial of service for the above reason will be exercised judiciously according to the following guidelines:

C6.4.1 In all situations, the TCF/PTF should attempt to reduce excessive signal levels by use of pads, attenuators, or other devices until permanent corrective action can be taken.

C6.4.2 The normal speech level for voice is -10 dBm0 with peaks to 0 dBm0. Maximum voice peaks should not exceed + 5 dBm0 more than 15 times per 15 minute period. If a voice circuit is peaking above 0 dBm0 refer to the maximum operating signal level test, contained in Supplement 1 to this circular, for procedures. If the circuit fails the maximum operating signal test, immediate action must be taken to correct the level or remove the circuit from the transmission path.

C6.4.3 For circuits with constant levels the standard signal level should be in accordance with DISAC 300-175-9 (e.g., Dual Frequency Idle Tone, 2800/2600 Hz, should be -20 dBm0; data levels should be -13 dBm0). Anytime the signal level exceeds the standard by 3 dB or more the level must be corrected as soon as possible. Anytime the signal level exceeds the standard by 6 dB or more the level should be corrected immediately, or taken out of service.

C6.5 **Quality Control (QC)**. To provide quality service to users of the DII each individual segment of the system must be operated and maintained at its optimum performance level. The method to achieve optimum performance is through an effective quality control (QC) program. The DII QC program consists of in-service performance monitoring, out-of-service testing, and trend analysis. An efficient QC program may prevent interruption to user service by detecting and correcting adverse trends before user service is affected. The two types of QC testing prescribed in this section are in-service performance monitoring and out-of-service testing. Automated

performance monitoring and/or testing that satisfies requirements contained in this document and specifications contained in DISAC 300-175-9 is encouraged. The automated capability must be capable of providing a record copy of the monitoring or testing results.

C6.5.1 **End-to-End Testing**. End-to-end testing, as used in this Circular, refers to the point nearest the user terminal equipment at each end of the trunk or circuit where a test point is accessible to perform required testing. The term "terminal equipment" refers to the physical location prescribed in the TSO where the terminal equipment is located. Ideally the test access point should be at the user premises. The test access point may be physically accessed (e.g., patch panel, main frame) or electronically accessed (e.g., matrix switch, DSN MAF terminal, DPAS). When testing at a location other than a TCF/PTF where normal patching facilities are not available, modified test procedures may be required (e.g., test equipment may have to be connected to the terminal equipment or a main frame using clips or test probes). Removal of wires from user terminal equipment or the user main frame should not be accomplished without permission of the user and any contractor responsible for maintenance of the equipment. If in doubt, do not modify equipment installation for testing. Conduct the testing at the nearest test access point.

C6.5.2 **Availability of Personnel to Perform QC Testing**. Performance of quality control testing is an inherent function of every DII facility (e.g., TCF/PTF, DCO, Microwave, Switching Facility, Satellite Terminal) that has DII circuits routed through the facility. Individuals in charge of DII facilities must ensure trained personnel are available during every shift to perform scheduled and unscheduled QC testing. Although some facilities have a "quality control section" established as part of their staff, shift personnel must still be capable of performing QC tests. The TCF/PTF shift supervisor is responsible for ensuring that scheduled testing is completed and that every effort is made to conduct unscheduled testing as necessary. When testing is required at an unmanned facility the CCO must coordinate with the TCF/PTF responsible for the unmanned facility to ensure personnel are available at the unmanned facility for testing.

C6.5.3 **Availability of Test Equipment**.

C6.5.3.1 Every effort must be made to ensure that all required test

equipment is available, and is calibrated, for conducting quality control testing. If required test equipment is not available, appropriate actions must be taken to postpone or reschedule to a time when all test equipment is available. Each TCF/PTF must maintain an up-to-date status of available test equipment with calibration status, and actively pursue replacement of non-available test equipment.

C6.5.3.2 Each O&M is responsible for ensuring that their facilities have the necessary test equipment to perform required tests in accordance with this chapter and that the test equipment is compatible with other DII facilities. A basic listing of test equipment requirements and common manufacturers is contained in Supplement 1 to this circular. When an item of test equipment is inoperative or turned in for recalibration and a compatible substitute is not available, the test equipment should be declared "mission essential" and an attempt made to obtain a replacement so that fault isolation, quality control, and performance monitoring functions are not impaired.

C6.5.4 **Test and Acceptance (T&A) Testing**.

C6.5.4.1 All DII circuits, and trunks assigned parameter codes, must be tested prior to acceptance for service by the U.S. Government unless a waiver condition applies. The CCO/CMO assigned in the TSO is responsible for ensuring T&A testing is completed. Refer to paragraph C6.5.8 of this chapter for waiver conditions.

C6.5.4.2 The CCO/CMO must ensure that the required in-effect, delayed service, or exception reports are submitted upon completion of the T&A test in accordance with DISAC 310-130-1.

C6.5.4.3 The TSO issuing authority may grant a temporary T&A waiver when cutting over existing circuits in support of a major project. When a temporary T&A waiver is issued T&A testing must be performed during the next scheduled periodic out-of-service QC, or within 180 days, whichever is sooner.

C6.5.4.4 Trunks or circuits that do not have government test access points (e.g., commercially provided end-to-end) are waivered for T&A testing. The CCO/CMO is responsible for verifying that U.S. Government test access points do not exist. The trunk or circuit

should be in-effected once the user advises that the requested service has been provided and that service is satisfactory in accordance with the TSO and any contractual documents.

C6.5.4.5 Trunks or circuits failing to meet any test parameter specification during T&A testing will not be accepted for service by the U. S. Government. When a trunk or circuit fails to meet specifications an exception report must be submitted. The CCO/CMO will include extracts from the appropriate portions of DD Form 1697: Circuit Parameter Test Data in the exception report. Extracts will include identification of any tests where a parameter failed to meet specifications, specific measurements obtained, and other appropriate comments.

C6.5.4.6 Once notified that a trunk or circuit does not meet T&A test parameter specifications the TSO issuing authority must determine, or will require the Telecommunications Certification Office (TCO) to determine, if the measured parameter specifications are adequate to meet user requirements. If the parameter specifications are determined to be adequate, the CCO/CMO may be directed to accept service on behalf of the U.S. government. The TSO issuing authority or TCO must advise whether service will be temporarily accepted until the parameter(s) are corrected, in which case an exception report must be submitted, or whether service is to be permanently accepted with the degraded parameter(s), in which case an in-effect report must be submitted. If the parameter specifications are not adequate, the circuit will not be accepted for service until satisfactory service can be provided.

C6.5.4.6.1 The O&M must provide any necessary technical or equipment procurement assistance to correct local problems.

C6.5.4.6.2 DISA will provide any engineering assistance if the problem is determined to be with the circuit design.

C6.5.4.7 If the TSO issuing authority or the TCO determines the service is satisfactory and service is to be accepted, the initial T&A data will be used as the baseline for future testing.

6.5.4.8 The CCO/CMO must maintain current listings of circuits that were accepted for service but not meeting required parameters, and

must ensure that outstanding exception(s) are cleared by an in-effect report at the earliest possible date. The CCO/CMO must submit follow up reports every 30 days until the exception(s) are cleared. Refer to chapter 8 of this circular for specifics.

C6.5.5 **Equipment Test and Acceptance Testing**. Technical and operational compatibility of all equipment interfacing with the DII is imperative to providing reliable and quality service. Therefore, technical control personnel must be involved with installation and T&A teams responsible for accepting DII communications systems and subsystems. The following guidelines are provided for TCF/PTFs:

C6.5.5.1 Coordinate with other DII facilities concerning the addition of new equipment into the system.

C6.5.5.2 Perform appropriate quality control tests on the new equipment to ensure it is capable of supporting user service. If the design capability of the equipment permits satisfactory operation at lower specifications than those specified in DISAC 300-175-9, then the specifications contained in the equipment technical manual may be used. Test results must be maintained until such equipment is removed.

C6.5.5.3 Perform back-to-back, and looped tests, as appropriate.

C6.5.5.4 Supervise the cutover of all trunks and circuits to the new equipment. When service must be interrupted for cutover of new equipment, the procedures outlined in chapter 7 of this circular must be followed.

C6.5.6 Out-of-Service Testing. Out-of-service testing removes user traffic from the transmission media to allow complete access and end-to-end testing of the trunk or circuit. The purpose of out-of-service testing is to periodically verify the quality of prescribed specifications (in accordance with DISAC 300-175-9) from terminal equipment to terminal equipment, and to make necessary end-to-end adjustments to interface and transmission equipment.

C6.5.6.1 Test Requirements. Periodic end-to-end out-of-service testing must be performed in accordance with the following requirements on all DII circuits, and trunks assigned a parameter

code, unless a QC waiver conditions applies.

C6.5.6.1.1 DII trunks or circuits traversing analog transmission media (total or segmented) between serving TCF/PTFs must be scheduled for periodic end-to-end testing in accordance with Table 6.1 (analog) or Table 6.2 (digital).

C6.5.6.1.2 DII trunks or circuits traversing all digital media, from serving TCF/PTF to serving TCF/PTF, are exempt from periodic end-to-end testing. The only exception is those circuits that require special conditioning (e.g., C3, CT, and C5 parameter coded circuits) such as amplitude/delay equalizers to meet high speed transmission rates.

C6.5.6.1.3 Although out-of-service testing is not normally required for trunks and circuits traversing all digital media, there may be occasions when testing is prudent (e.g., during degradations, customer complaints).

C6.5.6.1.4 Each servicing TCF/PTF should establish some form of periodic testing, or method to verify the signal quality, of those trunks and circuits that are extended from the TCF/PTF to the user terminal. This is particularly important for those circuits traversing tail segments and on those circuits that are extended off the installation.

C6.5.6.1.5 Segmented testing may be required when end-to-end performance of the trunk or circuit cannot be determined by normal end-to-end testing. An example is when a circuit traverses a mix (hybrid) of analog and digital transmission media where analog testing would be required on the analog segment(s) and digital testing would be required on the digital segment(s). Segmented testing may also be required when it is necessary to separate the circuit into identifiable segments such as tail segments, transoceanic segments, U. S. Government-owned versus leased segments, etc., or for circuits assigned "Q" parameter codes as explained in paragraph C6.5.6.1.6 below.

C6.5.6.1.6 Hybrid circuits assigned a "Q" parameter code require segmented testing. Q parameter codes are normally assigned when the terminal device generates a digital signal that is converted through

a modem, or other such device, to an analog signal for transmission. The Q parameter code should only be assigned when the modem is U.S. Government-furnished equipment (GFE), allowing Government personnel test access to both the digital and analog side of the modem. An example of a typical Q parameter coded circuit is an AUTODIN/DMS circuit. The AUTODIN/DMS Switching Center (ASC) generates a digital signal that normally traverses an AUTODIN/DMS PTF. The digital signal is then converted at the AUTODIN/DMS PTF to an analog signal, with a modem, for transmission to the Primary TCF, or to a commercial carrier. DISAC 300-175-9 prescribes specific analog and digital parameters applicable to each Q parameter code (e.g., a Q1 equates to a C1/J1). Q parameter codes must be tested in accordance with the following paragraphs (refer to Figure 6.1).

C6.5.6.1.6.1 For T&A, Q parameter coded circuits must be tested for both parameter codes applicable to the circuit (e.g., Q1 circuits require testing for C1 and J1 parameters). The circuit must be tested for digital parameters end-to-end and then tested for analog parameters between the analog side of the modems. If the modem is located somewhere other than the TCF/PTF, and technical control personnel do not have access to the digital side of the modem, then a testing waiver should be granted for the digital test requirement. However, analog testing is still required. For AUTODIN/DMS circuits that have the modem installed at the AUTODIN/DMS PTF, the AUTODIN/DMS PTF is responsible for performing end-to-end digital and analog testing. However, if the AUTODIN/DMS PTF is collocated with a primary TCF, the primary TCF should perform the analog testing if it is not economically feasible for the AUTODIN/DMS PTF to acquire a complete set of analog test equipment.

C6.5.6.1.6.2 Periodic out-of-service testing requires end-to-end digital tests. Footnote 5. If the end-to-end digital tests fail specifications, then analog testing should be conducted to isolate any possible faults.

C6.5.6.2 **Procedures**.

C6.5.6.2.1 The CCO assigned to the trunk or circuit must schedule periodic out-of-service QC tests in accordance with the assigned parameter code and tables contained in this chapter. The CCO is responsible for scheduling and maintaining an out-of-service perpetual QC testing schedule for all trunks and circuits for which

control responsibility is assigned. The CCO must ensure test schedules are fully coordinated with other required facilities and that a copy of the schedule is provided to those facilities.

C6.5.6.2.2 Periodic testing must be scheduled within the same month as when the circuit was activated. For example, if a circuit was activated on 15 March 1997, then annual testing would be due anytime during March of successive years.

C6.5.6.2.3 Test schedules must be sufficiently flexible to allow for non-completion due to reasons beyond the control of a facility. However, efforts must be made to ensure testing is completed within 30 days of the original activation date.

C6.5.6.2.4 QC testing performed in accordance with other DISA or O&M programs (e.g., DISA Performance Evaluations, O&M Inspections) or complete realignment of a trunk or circuit as the result of an outage will satisfy QC test requirements if the testing is accomplished within 30 days of a scheduled QC.

C6.5.6.2.5 Out-of-service testing requires user release of the circuit if a reroute is not available. When testing multi-channel trunks (e.g., FCC-100 channel packs) user release must be obtained from each user on the trunk.

C6.5.6.2.6 Circuits failing to meet parameter specifications during scheduled quality control testing must be optimized and brought back within DII parameter specifications. If the trunk or circuit cannot be brought back within specifications, the problem should be identified to the TSO issuing authority and the O&M for assistance.

C6.5.6.2.7 Those circuits not meeting DII parameter specifications during the initial T&A, but were accepted for service, are only required to meet initial T&A test results. If T&A data is not available, the data from the first complete out-of-service QC test must be recorded and retained as T&A.

C6.5.6.2.8 Whenever T&A data is invalidated due to major realignment of equipment, change in transmission path, etc., the CCO must initiate end-to-end testing to establish new T&A baseline data.

C6.5.6.2.9 DII facilities must develop QC procedures for testing local equipment if the procedures are not contained in another document. Training plans suffice if they contain procedures for testing local equipment.

C6.5.6.2.10 Order of Testing. The sequence for digital parameters is not significant as most digital tests are performed simultaneously. The sequence of testing for analog parameters, however, must be performed in a logical sequence. Since most analog problems are level or noise sensitive, this is where testing should begin. Analog testing must be performed in the following sequence:

C6.5.6.2.10.1 Net Loss.

C6.5.6.2.10.2 Idle Channel Noise or C-Notched Noise.

C6.5.6.2.10.3 Impulse Noise (with holding tone if necessary).

C6.5.6.2.10.4 Envelope Delay (when applicable).

C6.5.6.2.10.5 Frequency Response.

C6.5.6.2.10.6 All other required tests.

C6.5.6.2.11 DD Form 1697 (Circuit Parameter Test Data - Analog) or DD Form 1697-1 (Circuit Parameter Test Data - Digital) will be used to record T&A and periodic QC data. TCF/PTFs may use automated products in lieu of these forms if all the information required on the DD Form(s) is contained in the substitute. The CCO and serving TCF/PTF must retain DD Form 1697s or automated products on file in the circuit history folder. T&A data must be maintained for the life of the trunk or circuit. Periodic data must be maintained for all tests performed during the previous 12 months. Once the next annual QC test is performed, all previous periodic QC data may be discarded.

C6.5.6.2.12 All outages attributed to QC testing must be reported in accordance with DISAC 310-55-1 and applicable supplements.

C6.5.6.2.13 Out-of-service QC testing does not include time to troubleshoot and correct problems discovered during the QC test. When

it is determined that a circuit does not meet the specified parameters and requires corrective action, the testing effort must be terminated. The circuit must be logged back "in" with the RFO for authorized outage. A new "out" report must then be submitted with the actual reason for outage (e.g., defective equipment). The "out" time must be the same as the previous "in" time to reflect continuous outage.

C6.5.6.2.14 Scheduled quality control testing is required for all communications equipment supporting DII trunks and circuits, including spares. Communications equipment testing ensures that equipment meets the technical specifications contained in applicable technical manuals. All quality control testing on communications equipment must be coordinated with the TCF/PTF supervisor on duty whether the equipment is located in the TCF/PTF or another portion of the communications facility.

C6.5.6.2.14.1 Operational equipment is normally tested in accordance with O&M preventive maintenance procedures. Upon completion of any preventive maintenance, operational equipment must be tested in conjunction with TCF/PTF personnel before it is put back on-line.

C6.5.6.2.14.2 Spare communications equipment (e.g., conditioning equipment, multiplexers, printers) with test access points appearing in the TCF/PTF must be scheduled for QC testing by the TCF/PTF. Time interval used by O&M preventive maintenance procedures can be used as criteria for developing the schedule.

C6.5.7 **In-Service Performance Monitoring**. The purpose of in-service performance monitoring is to provide performance information that indicates the quality of the operating signal traversing the network "without interruption" to the signal. In-service performance monitoring is mostly a manual function on analog systems whereas it is normally automated on digital systems. Automated in-service performance monitoring of digital systems may eventually negate the requirement to perform periodic out-of-service testing.

C6.5.7.1 **Analog**.

C6.5.7.1.1 **Requirements**. In-service performance monitoring must be performed weekly on the send signal levels of all active analog

circuits by each servicing TCF/PTF. Footnote 6. Each servicing TCF/PTF must establish and maintain an in-service performance monitoring test schedule and work sheet for all analog circuits terminating at or traversing the DII facility in a manner that provides trending information. Results will be recorded by exception. If a user's signal level is not within DISA specified standards or the circuit has an abnormal condition present, record circuit CCSD, the signal level or abnormal condition, and the corrective actions taken. Significant problems should be documented in the Master Station Log.

C6.5.7.1.2 High impedance (e.g., 10K ohms) measurements are made at monitoring points to prevent interruption of user service. Normal user traffic signals, telephone supervisory signals, and composite transmission levels are some of the parameters which can be measured without interruption of service and compared to levels normally found at the transmission level point (TLP). Circuits must also be monitored for abnormal conditions (e.g., hybrid howl, cable hum) when user signals are not present. In-service performance monitoring must be performed as follows:

C6.5.7.1.2.1 On the transmit line monitor jack of the VF patch bay, monitor the send signal level entering the transmission path. The transmit tolerance for signals originating from users at the local installation served by the TCF/PTF will be + .5 dB unless otherwise stated in DISAC 300-175-9. If an improper level is identified, the receive signal level at the cable patch bay (from the local user) should be checked. The faulty level must either be between the user and TCF/PTF, or between the cable and VF patch bays within the TCF/PTF. Transmit tolerance for circuits originating at another facility that are routed through the TCF/PTF must be in accordance with link and multi-link standards in DISAC 300-175-9 (+ 1 dB for single-link paths, + 2 dB for multi-link paths). If an improper level is identified, the level of the receive signal from the cross-connect link should be checked to determine if the fault is in house or from another facility. Once the source of the faulty level is found appropriate action must be taken to have it corrected. When troubleshooting problems that require signal adjustments, every facility along the entire transmission path must attempt to bring signals within + .5 dB.

C6.5.7.1.2.2 On the transmit line monitor jack of the cable (local user) patch bay, monitor the send signal level to the local user.

Levels should be in accordance with link and multi-link standards in DISAC 300-175-9 (+ 1 dB for single-link paths, + 2 dB for multi-link paths). If an improper level is identified the receive level from the transmission path should be checked to determine if the fault is in-house or from another facility. Once the source of the faulty level is found appropriate action must be taken to have it corrected. When troubleshooting problems that require signal adjustments every facility must attempt to bring signals within + .5 dB along the entire transmission path.

C6.5.7.2 **Digital**. The concept within the digital environment is to utilize available in-service performance monitoring capabilities provided by Network Elements (NE). The monitoring may be performed locally or at a centralized Network Management Center as indicated in chapter 3, Figure 3.1. Figure 6.2 shows typical DII configurations using various NEs. As indicated, once a user signal traverses a NE, the signal is monitored by one or more higher level NEs. The performance information obtained from the NEs will indicate when a degradation in performance occurs. Therefore, it is imperative that each DII facility having NE equipment establish an effective in-service performance monitoring program. Figure 6.3 is a list of typical performance parameters monitored by most NEs. These performance parameters, and applicable thresholds, can be found in DISAC 300-175-9. The following procedures must be followed:

C6.5.7.2.1 NE performance monitoring thresholds must be set in accordance with DISAC 300-175-9. If DISAC 300-175-9 does not contain appropriate thresholds then default values specified in equipment manuals must be used. If established thresholds cannot be met due to unique transmission equipment characteristics then O&Ms may request site specific thresholds based on test and evaluation data. The request, as well as justification, must be submitted through the appropriate LCC to the DISA area transmission division for approval. If approved, the original data and justification must be maintained as long as non-standard performance monitoring thresholds are being used.

C6.5.7.2.2 Each DII facility with NE performance monitoring equipment must establish an in-service performance monitoring program using the following guidelines:

C6.5.7.2.2.1 Each DII facility is responsible for ensuring NE alarm

conditions are continually monitored. As a minimum, the alarm condition(s) of each NE must be verified every 2 hours. Although alarm conditions for each NE may be monitored by a centralized Network Management Center (NMC), each DII facility is still responsible for monitoring the NEs under their responsibility. NMCs do not necessarily receive all alarms generated from NEs. Completion of the alarm verifications must be documented. Any significant conditions, and corrective actions taken, should also be documented.

C6.5.7.2.2.2 Immediate action must be taken on service affecting alarm conditions (normally critical and major alarms). The appropriate LCC must be notified of any service affecting conditions. Normally, traffic will be rerouted and the degraded trunk or circuit taken out of service. Appropriate testing must be conducted to isolate and repair the fault.

C6.5.7.2.2.3 All other alarm conditions must be correlated with other data and corrected as soon as possible. Whenever in-service performance monitoring thresholds are exceeded, that particular trunk or circuit must be closely monitored and appropriate actions taken. If available, on-demand type monitoring should be implemented to provide additional data for fault isolation purposes.

C6.5.7.2.2.4 Historical alarm condition reports generated by each NE must be reviewed for each 24-hour period and maintained a minimum of 7 days. Corrective actions must be taken to correct abnormal trends.

C6.5.7.2.2.5 Performance reports generated by each NE must be reviewed for each 24-hour period and maintained a minimum of 7 days. These reports may be tailored by each facility to provide only that information necessary to perform an analysis of system performance. Corrective actions must be taken to correct abnormal trends.

C6.5.8 **Quality Control Waivers**. QC waivers may be granted for T&A, and for periodic out-of-service testing, if the capability for testing does not exist. Footnote 7. QC waivers can be obtained from DISA in the original TSO in accordance with paragraph C6.5.8.1 below, after the TSO has been issued in accordance with paragraph C6.5.8.2 below, or for any of the conditions listed in paragraph C6.5.8.3 below that the CCO/CMO determines justifiable. Footnote 8. Each CCO/CMO is responsible for maintaining a complete list of all circuits that are waivered from testing (T&A and/or periodic). The waiver

list must be available to personnel responsible for performing QC tests and must include the reason for the waiver and the effective date. Each circuit added to the waiver list must be validated by the facility Chief. Circuits must be deleted from the list anytime the condition that caused the waiver changes. The entire waiver list must be revalidated annually by the facility Chief and submitted to the highest level O&M command within their area, and to the appropriate LCC, for review during the first quarter of each calendar year. Waiver lists must be provided to DISA upon request. The list and waiver conditions are subject to review during DISA or O&M evaluations.

C6.5.8.1 If it is known at any organizational level within the RFS/ TSR/TSO process that the capability to test the circuit will not exist, a QC waiver may be included as part of the RFS/TSR/TSO. Although testing capabilities may not be known at the RFS/TSR level, there are cases involving specialized circuits where it is known that testing will not be performed. In these cases the requesting organization or Telecommunications Certification Office (TCO) may include the waiver request in the RFS/TSR. If a waiver is not requested in the RFS/TSR, the DISA A&E is authorized to provide a test waiver in the TSO if the DISA A&E is aware, or can verify with the O&M organization responsible for testing, that testing capability will not exist. The waiver should be included in the paragraph 5 of the TSO. Inclusion of a waiver in the TSO precludes the necessity of issuing an administrative waiver once the circuit is activated.

C6.5.8.2 Once a TSO is issued without a waiver it becomes the CCO/ CMOs responsibility to justify a waiver in accordance with paragraph C6.5.8.3 below, or to obtain a waiver from DISA when conditions warrant. DISAC 310-65-1, chapter 77, contains a listing of available waiver codes. Detailed justification must be provided when requesting a waiver from DISA. The CCO/CMO designated in the TSO must identify the specific circumstances pertaining to each waiver request to their O&M command for concurrence or nonconcurrence. If the O&M concurs, the O&M must forward the request to the appropriate DISA area approval authority (DISA-EUR, Code DE00; DISA-PAC, Code DPIE; DISA RCC, Code DONC) with an information copy to the appropriate TCO. Waiver requests on circuits traversing more than one DISA area will be granted by the DISA area approval authority that has jurisdiction over the CCO/CMO, after coordination with the other DISA area. Copies of waiver-related correspondence must be

retained in the circuit history folder.

C6.5.8.3 The CCO/CMO may apply any of the following conditions once the CCO/CMO has verified that the condition exists and once the facility Chief validates the waiver. Any condition other that the following requires approval from DISA in accordance with the procedures listed above.

C6.5.8.3.1 Circuits that cannot be tested due to lack of test point (s) accessible by government personnel are waivered for T&A and periodic testing. This includes end-to-end commercially leased circuits that do not traverse government facilities. If the waiver is not included in the TSO, the CCO/CMO must verify that test access points are not available or that the circuit does not traverse any government facility before waiving test requirements.

C6.5.8.3.2 IP Router Networks circuits are waivered from periodic testing. T&A testing must be performed before accepting service. Once the circuit is accepted for service, IP Router Networks circuits will only be QC'd when directed by the appropriate IP Router Networks Monitoring Center. Routine quality control is the responsibility of the appropriate IP Router Networks Monitoring Center utilizing installed software.

C6.5.8.3.3 Any circuit assigned a service availability code, where an electrical path is not available until the circuit is activated, is waivered for periodic testing. T&A testing must be accomplished.

C6.5.9 **FDM Wideband Systems Quality Control**. The DII Quality Assurance (QA) program outlined in DISAC 310-70-57 encompasses DII policy for monitoring DII analog terrestrial transmission links. Each DII TCF/PTF must maintain a copy of DISAC 310-70-57, and applicable supplements, and perform necessary tests and measurements.

C6.5.9.1 **Baseband Sweeps**. Send and receive baseband sweeps must be performed on each FDM baseband at least once per radio day during peak traffic periods. The sweep should be accomplished with a frequency selective voltmeter (FSVM), preferably with a spectrum display, and where possible at a test point which includes the radio's supervisory orderwire signals so that all signals can be measured. The sweep is intended to identify baseband signals

constantly exceeding -10 dBm0 (signals such as voice peaks may sporadically exceed -10 dBm0 as specified in DISAC 300-175-9). When a signal that constantly exceeds -10 dBm0 is identified, normal fault isolation procedures must be initiated to correct the level problem. Since there are numerous level adjustments along the signal path, special care must be taken to ensure the level at each point is correct. Completion of the baseband sweep must be annotated in the Master Station Log (MSL) with any significant problems and corrective actions taken. Baseband sweep results must be recorded in some format such as local worksheets, automated print-outs, etc.

C6.5.9.2 **Pilot Levels**. Transmit pilot levels originating at each DII facility must be measured a minimum of once every 7 days. These measurements must be made at baseband test points and must include each FDM group, supergroup, and mastergroup level as appropriate. Pilot levels must be maintained within military standards. When the military standards exceed the T.O. specifications, the T.O. specifications must be used. Completion of pilot level measurements must be annotated in the MSL as well as identification of out-of-tolerance levels and corrective action(s) taken.

C6.6 **Trend Analysis**. Trend analysis must be performed at the lowest level possible where the customer interfaces with the DII. The following procedures must be established by all DII TCF/PTFs:

C6.6.1 All DII TCF/PTFs must establish an aggressive trend analysis program on all circuits for which they are the CCO or servicing TCF/PTF, and on all trunks and links which terminate at their station. CMOs should also perform trend analysis for the circuits they are assigned responsibility. The program must trend number of outages, outage times, reason for outage, calculate availability and reliability, and determine if circuit reliability meets management thresholds (MT) on a monthly calendar basis. In accordance with DISAC 310-130-2, availability includes all outages while reliability excludes outages attributed to authorized outages, switch outages and preemptions (A, X or R in the first position of the DISAC 310-55-1 RFO code).

C6.6.2 MTs established in DISAC 310-130-2 are categorized according to transmission media, network, or circuit restoration priority. These MTs must be used for trending DII trunks and circuits. Footnote 9. If a circuit is part of a specific DII network that has

MTs established for that network, then the MT for that network must be used for that circuit. All other circuits must use the MT established for circuit restoration priority. The MT for each level of the Telecommunications Service Priority (TSP) system, and for each level of the Restoration Priority (RP) system until it is phased out, are contained in Figure 6.4.

C6.6.3 Anytime a link, trunk, or circuit fails monthly MT, the outages must be analyzed to determine if corrective actions are required. If a problem has been identified and additional action(s) cannot be taken (e.g., awaiting parts) then further actions are not necessary. Every effort must be made to ensure optimum reliability at all times.

C6.6.4 If a link, trunk, or circuit fails MT for two consecutive months and the problem has not been identified, the CCO and/or servicing TCF/PTF must coordinate with the user and take appropriate actions to resolve the degradation. The CCO and/or serving TCF/PTF may have to perform QC tests on the user equipment, tail segment, and transmission system to isolate the fault. Once isolated, the problem must be turned over to the appropriate organization responsible for maintaining the specific equipment. If actions are not deemed necessary, the CCO and/or serving TCF/PTF should document why further actions are not necessary (e.g., problem corrected). The CCO, or servicing TCF/PTF, must notify the appropriate LCC/NCO of all circuits, trunks, and links that fail MT for 2 consecutive months. Method of notification is at the discretion of the LCC/NCO. If the servicing TCF/PTF is not the CCO, the CCO must also be notified of each circuit on the list at which time the CCO should become involved with the problem.

C6.6.5 If the circuit fails MT for three or more consecutive months the CCO, or servicing TCF/PTF, must take immediate action to improve circuit reliability if action has not already been taken. Once the fault is isolated, or if the fault has already been isolated but not corrected, aggressive action must be taken to correct the situation. This may include involvement of the LCC, O&M command, or the DISA. When assistance is required from the DISA, the request should come from the LCC or O&M command. The CCO, or servicing TCF/PTF, must notify the appropriate LCC/NCO and O&M command of all links, trunks, and circuit that fail MT for 3 or more consecutive months. Method of notification is at the discretion of the LCC/NCO and O&M command.

Continue to:
CHAPTER 7. SERVICE INTERRUPTIONS

Return to:
Basic Circular
Table of Contents
Publication Listing

Michael E. Craft, craftm@ncr.disa.mil - Last revision: 12 June 1998

CHAPTER 7. SERVICE INTERRUPTIONS

C7.1 **General**. All DISA, MilDep, and contracted O&M elements share responsibility for ensuring reliable communications service to users of the DII. Therefore, it is imperative that service interruptions be kept to a minimum. When service interruptions are necessary, plan the interruption to minimize the inconvenience to users.

C7.2 **Functions and Responsibilities**. Listed are some of the functions and responsibilities of DII facilities and personnel to ensure minimum service interruptions to DII users:

C7.2.1 The local Technical Control Facility/Patch and Test Facility (TCF/PTF) is responsible for all transmission media entering, terminating, or traversing a DII facility. Chapter 2 of this circular requires DII circuits to be routed through the TCF/PTF for maximum flexibility and survivability.

C7.2.2 The local O&M communications element, normally the serving TCF/PTF, is responsible for all circuits terminating at the geographical location of concern. If a TCF/PTF is not available, the local O&M activity assigned for circuit control is responsible. For example, the Node Site Coordinator (NSC) would be responsible for all IP Router Networks circuits traversing the Packet Switch Node (PSN) at that location, the Defense Switched Network (DSN) maintenance activity would be responsible for all DSN circuits traversing the DSN switch at that location, etc. If there is no local O&M element assigned responsibility for circuit control, the Communications Control Office (CCO) or Communications Management Office (CMO) is ultimately responsible.

C7.2.3 The serving TCF/PTF is responsible for requesting and scheduling Authorized Outages (AOs) for all communications in the local area of responsibility, to include subordinate sites if a TCF/PTF is not located at that site. If a serving TCF/PTF is not situated in the local area then the next lower O&M element described in paragraph C7.2.2 above assumes responsibility for requesting and scheduling authorized outages.

C7.2.4 In addition to the above, some DII networks have centralized monitoring, management, and control centers with remote access to

switched circuits for monitoring, testing, and restoration purposes. These centralized centers are responsible for coordinating with the appropriate element (e.g., TCF, PTF, NSC, CCO, or CMO) at a specific location when network service is, or will be, interrupted.

C7.2.5 When actions can be predicted (e.g., scheduled maintenance), the user must be notified in advance so that traffic may be stopped at the scheduled time.

C7.2.6 Occasionally, traffic will be interrupted due to unforeseen events such as transmission media degradation or equipment failure. Traffic may also be interrupted by preemption of the circuit to restore a higher priority user or denial of network access to lower priority users. In all such cases, users must be notified immediately of the transmission failure or preemption to permit them to terminate transmission of traffic. Users must be notified when service is restored.

C7.2.7 When a circuit(s) is unusable, or the user complains of unacceptable degradation, the user must relinquish control of the circuit to the responsible DII control element (e.g., TCF/PTF) for corrective action.

C7.2.8 Any time a DII control element requests a user to release a circuit due to conditions described in this chapter, the user must make every effort to arrange release of the circuit(s).

C7.3 **Scheduled Service Interruptions**. DISA policy requires that the best possible communications service be provided to users commensurate with available equipment and facilities. Maintenance of this service may, at times, require removal of equipment from service or, in cases of major engineering changes, may require the complete shutdown of a communications facility. These outages (which will be held to a minimum) are known in advance and every effort should exerted to provide continuity of service during the time a facility is out of service. Whenever possible, user service will be maintained using available reroute capabilities in accordance with the NCS TSP or RP. When it is absolutely necessary to remove communications equipment, facilities, or a DII station from service, the planning, notification, supervision, and restoral must be thoroughly coordinated.

C7.3.1 **Planning**. Service interruption will normally be scheduled when minimum communications impact will occur to users and will provide, where possible, for maximum circuit restoration via alternate routes. Planned actions will be time-phased to allow control to be maintained at all times and to ensure that communications capabilities are maximized. Planning will include recovery actions should an emergency arise which would prevent the completion of planned actions. In addition, planning will consider the leasing of additional circuits, as necessary, to provide uninterrupted service. However, funding for these circuits must normally be certified in advance by the cognizant O&M element.

C7.3.2 **Notification**.

C7.3.2.1 It is of the utmost importance that all users of the DII be informed of any action that will or may degrade their service. Particular emphasis must be placed upon the notification of higher headquarters, CINCs, JCS, DoD, NSA, and any Federal agencies whose service will or may be degraded. USNMR SHAPE CASTEAU, BE must be included as an addressee on all scheduled outages involving NATO circuits (also include internal passing instructions "USNMR SHAPE PASS TO NICS-COA FOR INFO").

C7.3.2.2 Anytime an O&M element develops a plan that requires user service interruption, the O&M must advise the appropriate DISA GOSC/ RCC of the planned service interruption at the earliest possible date. Failure to provide advance notification may result in denial of the service interruption and increased cost to the O&M. This is especially true when O&M elements enter into contractual agreements.

C7.3.3 **Supervision**. TCF/PTFs and other O&M elements have direct control and supervisory responsibilities for control and implementation of a scheduled service interruption. These elements must keep the appropriate DISA GOSC/RCC advised on the status of service interruptions, and must follow DISA circulars and instructions as requested.

C7.3.4 **Restoral**.

C7.3.4.1 **No Interruption to User Service**.

C7.3.4.1.1 When there cannot be any interruption of user service and sufficient spare or backup equipment is available during the affected period, no additional action, other than normal control practices, is necessary.

C7.3.4.1.2 When there cannot be any interruption of user service and sufficient spare or backup equipment is not available during the affected period, the TCF/PTF or other responsible O&M element must notify the appropriate LCC/NCO and DISA GOSC/RCC of the situation, especially if it constitutes a hazardous condition (HAZCON) in accordance with DISAC 310-55-1. The DISA GOSC/RCC or LCC/NCO may cancel or direct rescheduling of this type of interruption. Furthermore, the DISA GOSC/RCC is authorized to require the users be notified of all hazardous conditions.

C7.3.4.2 **Circuit or Trunk Outage (1.544 Mbps or less)**. Prior coordination and approval by the DISA GOSC/RCC is not required for release of individual circuits or trunks, with data rate equal to or less than 1.544 Mbps, if concurrence is obtained from the users at both terminals. Interruptions to transoceanic and/or inter-area Interswitch Trunks (ISTs), providing common user service (e.g., DSN, IP Router Networks), must be coordinated and approved by the DISA GOSC/RCC at least 30 minutes prior to the interruption.

C7.3.4.3 **DII Tail Segment Outage**. DII facilities that are end terminals for a single link or trunk(s) off the DII backbone are considered DII tail segments. The following procedures apply to tail segments:

C7.3.4.3.1 The TCF/PTF or O&M element requiring the service interruption must obtain verbal user concurrence or nonconcurrence from all connected users at least 7 days prior to the scheduled interruption.

C7.3.4.3.2 DII users affected by the service interruption are responsible for notifying the distant end user and, as appropriate, higher command echelons of the impending service interruption.

C7.3.4.3.3 The TCF/PTF or O&M element requiring the service interruption must then submit a message request for service interruption to the appropriate DISA GOSC/RCC at least 5 days prior

to the scheduled interruption. The message must contain the following information:

C7.3.4.3.3.1 Desired date and inclusive time for the service interruption and an alternate date and time.

C7.3.4.3.3.2 Reason for service interruption.

C7.3.4.3.3.3 Identification of users nonconcurring with the scheduled outage and for whom no reroute is available.

C7.3.4.3.3.4 Estimated maximum recovery time.

C7.3.4.3.4 The DISA GOSC/RCC must coordinate the outage request with applicable CINCs and other command elements, as required, after evaluating the impact of the interruption on known planned exercises, other authorized outages, etc. The DISA GOSC/RCC must then advise appropriate subordinate DISA activities and the responsible TCF/PTF or O&M element, of approval for the scheduled interruption, and the authorized date and time the interruption may take place; or deny the scheduled interruption and propose an alternate date and time.

C7.3.4.3.5 Upon receiving approval or disapproval for the service interruption, the responsible TCF/PTF or O&M element must notify affected users of the decision.

C7.3.4.3.6 The TCF/PTF or O&M element requesting the service interruptions must obtain final approval for the scheduled interruption from the appropriate DISA GOSC/RCC 30 minutes prior to the interruption.

C7.3.4.4 **DII Switching Equipment/Centers**. DII switching equipment/ centers can generally be classed as either end terminals (e.g., DSN end offices, IP Router Networks Terminal Access Controller), or as tandem facilities (e.g., DSN multi-function, IP Router Networks packet switch node). If a switching center terminates traffic from the network to provide service to local users, then it is considered the same as a tail segment. Service interruptions for DII switching equipment/ centers that terminate traffic will be scheduled using the same procedures as a tail segment in paragraph C7.3.4.3 above. Those switches that process traffic through the network are considered

tandem facilities. Service interruptions for tandem facilities will be scheduled using the same procedures as a DII transmission facility in paragraphs C7.3.4.5 and C7.3.4.6 below. (See paragraph C7.3.4.9 for exceptions to IP Router Networks service interruptions.)

C7.3.4.5 **DII Transmission Facility Outage (Partial)**. The following procedures apply to DII Transmission Facilities when the interruption to user service is of a greater magnitude than an individual circuit or trunk, but less than a complete facility outage.

C7.3.4.5.1 No later than 21 days before a scheduled service interruption, the DII TCF/PTF, or other responsible O&M element, must notify the appropriate DISA GOSC/RCC of the requirement for the outage and request preliminary approval for the AO. The 21-day time factor may be waived by the appropriate DISA GOSC/RCC to correct hazardous conditions (HAZCONs), or degradations, when the capability exists at the facility to accomplish the required repair action. All affected DISA, LCC/NCO, and O&M elements will be information addressees on this request and on all subsequent communications regarding downtime. When NSA circuits are involved, "NSACSS FORT MEADE MD" will be included as an information addressee. Requests must include the following information:

C7.3.4.5.1.1 The date and inclusive times of the scheduled interruption, and an alternate date and time.

C7.3.4.5.1.2 The purpose of the scheduled interruption. Provide detailed information to fully explain the purpose of the interruption.

C7.3.4.5.1.3 A statement that all required parts and/or equipment are on-hand to complete the repair action, or the expected delivery date for the parts or equipment.

C7.3.4.5.1.4 A statement that all avenues of bypass capability (e. g., use of portable generators) have been considered.

C7.3.4.5.1.5 Identification of the organization that will accomplish repair actions (e.g., military or civilian contractor).

C7.3.4.5.1.6 Identification of specific links, trunks, and circuits (not provided by an automated authorized outage program) that will be

disrupted and the point where they will be disrupted.

C7.3.4.5.1.7 Name and telephone number(s) of the station project officer for the outage.

C7.3.4.5.1.8 Estimated maximum recovery time. Sound judgement must be used when estimating recovery time. If unrealistic times are used, it may not be possible to restore service to users in support of mission requirements.

C7.3.4.5.2 The DISA GOSC/RCC must evaluate the impact of the service interruption on the DII, considering such things as contingency requirements, exercises, other scheduled interruptions, etc.

C7.3.4.5.3 Within 4 days of receipt of the request, the DISA GOSC/ RCC must notify the requester of its tentative approval or disapproval. When disapproved, a recommended alternate date will be provided with rationale. If the reason is classified, it will be passed only to those with an identified need to know.

C7.3.4.5.4 When the request for a scheduled service interruption is tentatively approved, the DISA GOSC/RCC must assist the TCF/PTF or other O&M element in preparation for the outage. This assistance must include:

C7.3.4.5.4.1 Provision of circuit information on the affected transmission media to include the users of the circuit and identification of contacts (e.g., TCFs, PTFs, NSCs, CCOs, or CMOs) for obtaining circuit releases. Footnote 10.

C7.3.4.5.4.2 The addresses of all elements that must be notified of the outage.

C7.3.4.5.4.3 Special instructions for requesting user release for special purpose networks. Indicate if a Network Control Station (NECOS) or joint headquarters must approve circuit releases.

C7.3.4.5.5 No later than 14 days before the outage, the TCF/PTF or other O&M element requesting the outage must forward a message request to each user that will be affected by the AO. When NSA circuits are affected, include NSACSS FORT MEADE MD, as an

information addressee. When such a request for user release is received by the user, that user must coordinate all affected circuit outages within its area of responsibility. The users affected by the AO must be advised to contact the distant end of the circuit for verification of concurrence to release the circuit and, if required, the concurrence of higher headquarters prior to user certification of circuit release. Nonreceipt of a message granting user release from the responsible O&M element will not be construed as a concurrence.

C7.3.4.5.6 Within 5 calendar days, the user must provide the requesting TCF/PTF or O&M element the following information:

C7.3.4.5.6.1 The CCSD and NCS TSP of the circuits that have been released by the users.

C7.3.4.5.6.2 The CCSD and NCS TSP of the circuits which have not been granted a release by the users. A reason will be provided, or a point of contact if the reason is classified, to explain why the circuit(s) cannot be released. An alternate date and time must be provided when the user can release the circuit(s).

C7.3.4.5.6 Five to seven days prior to the actual outage, the TCF/ PTF or O&M element requesting the AO must submit a final request to the appropriate DISA GOSC/RCC. The request will specify if the users have released all circuits affected by the outage. When user nonconcurrence is indicated, the information submitted in accordance with paragraph C7.3.4.5.8.2 will be provided. If user release of circuits and services is not obtained as a result of direct coordination, the DISA GOSC/RCC may refer the matter to the appropriate CINC (or, in the case of CONUS, appropriate command or agency) for action. Prior to contacting the CINCs or other appropriate agencies, the DISA GOSC/RCC must attempt to resolve the matter through direct contact with the using agency or command.

C7.3.4.5.7 Upon receipt of final request, and after review of the current situation, the DISA GOSC/RCC must provide the requesting TCF/ PTF or O&M element with approval or disapproval of the requested AO by record means.

C7.3.4.5.8 Thirty minutes before the initiation of the actual outage, the TCF/PTF or O&M element requiring the outage must request final approval from the appropriate DISA GOSC/RCC, through the LCC/

NCO hierarchy. The DISA GOSC/RCC or LCC/NCO has the authority to cancel a scheduled interruption at any time prior to and during the actual outage.

C7.3.4.6 DII Transmission Facility Outage (Complete). The following procedures apply to DII Transmission Facilities when the entire facility will incur an outage.

C7.3.4.6.1 Paragraphs C7.3.4.5.1 through C7.3.4.5.11 apply, except that the appropriate DISA GOSC/RCC must be notified as soon as the need for the interruption is known.

C7.3.4.6.2 The DISA GOSC/RCC may require the DII facility to prepare and forward a written plan which includes, in addition to the action in 3d(6)(a) above, the following:

C7.3.4.6.2.1 Reroutes to be made.

C7.3.4.6.2.2 Temporary lease requirements or other reroute requirements which cannot be satisfied, and for which DISA assistance is required.

C7.3.4.6.3 The supervising DISA area element must, by record means, provide notification as soon as the aforementioned request or plan is approved. Further communication is required when:

C7.3.4.6.3.1 The interruption is canceled. The DISA GOSC/RCC or DII facility canceling the interruption must notify all concerned (ALCON). Verbal directives must be followed up by record means within 72 hours.

C7.3.4.6.3.2 The interruption is rescheduled. The requesting DII facility must provide record notification to ALCON and comply with paragraphs C7.3.4.6.1 and C7.3.4.6.2.

C7.3.4.6.3.3 The scheduled interruption is extended beyond the approved time. The requesting DII facility must notify ALCON immediately.

C7.3.4.6.3.4 Unanticipated degradations occur prior to the scheduled

AO. The requesting DII facility must provide immediate notification citing problems and actions with estimated time of solution. Severe degradation without possibility of timely resolution may be sufficient cause for cancellation.

C7.3.4.7 **Emergency Interruption of Service**. In emergency situations, when loss of life or property might occur through lack of immediate action, the DII facility is authorized to suspend service without the prior coordination indicated in paragraphs C7.3.4.2 through C7.3.4.6. However, the circumstances involved must be reported to the appropriate DISA and O&M elements (LCC/NCO, TCF, PTF, etc.), as well as adjacent DII facilities, as soon as possible. The appropriate DISA GOSC/RCC must then make any other necessary notifications.

C7.3.4.8 **Interruption of Service to Correct Hazardous or Degraded Conditions**. The 21-day prior notification requirement is waived for service interruptions to correct hazardous or degraded conditions, when it will not exceed 2 hours, provided all of the following conditions are satisfied. Any service interruption expected to take longer than 2 hours will follow the 21-day requirement.

C7.3.4.8.1 If service is to be interrupted to correct a hazardous condition, the facility must have first reported a HAZCON to appropriate DISA and O&M elements in accordance with DISAC 310-55-1.

C7.3.4.8.2 If service is to be interrupted to correct a degraded condition, the facility must first report the degradation to the responsible LCC/NCO, and other O&M elements as appropriate. The LCC/NCO must concur with the service interruption, and provide the following information to the appropriate DISA GOSC/RCC:

C7.3.4.8.2.1 Identification of the link, group, supergroup, digroup, etc. to be interrupted.

C7.3.4.8.2.2 Nature of the degradation and effect it has on the DII and customer service.

C7.3.4.8.2.3 Estimated time required to correct the problem.

C7.3.4.8.2.4 Time service interruption is requested.

C7.3.4.8.2.5 Identification of users failing to provide releases. If necessary, the DISA GOSC/RCC must obtain user releases from O&M commands, agencies, or CINCs.

C7.3.4.8.3 All necessary equipment and technical expertise must be available, on-site, to correct the hazardous or degraded condition.

C7.3.4.8.4 Users must be provided altroutes to the maximum extent possible. The DISA GOSC/RCC may decide to implement area restoral plans. If altroutes are not available, user concurrences must be obtained.

C7.3.4.8.5 The interruption is not scheduled during peak traffic hours.

C7.3.4.8.6 Appropriate DISA GOSC/RCC is informed, through the LCC/ NCO hierarchy, that the above requirements have been met before the interruption occurs. The DISA GOSC/RCC must provide final concurrence before any service interruption occurs.

C7.3.4.9 **IP Router Networks Backbone Service Interruptions**. Service interruptions affecting IP Router Networks backbone and PSNs are scheduled in accordance with paragraph C7.3.4.4 above. When a serving TCF/PTF is not collocated with IP Router Networks users, the Node Site Coordinator (NSC) or DII supporting agency requesting a IP Router Networks facility to be taken out of service is responsible for accomplishing service interruption responsibilities contained in this chapter. The only exceptions are to paragraphs C7.3.4.4:

C7.3.4.9.1 Interruption of service of one (1) hour or less. Requests for service interruption must be verbally passed to the appropriate DISA GOSC/RCC when the projected service interruption is expected to be 1 (one) hour or less and impairs the operational capability of any IP Router Networks backbone element.

C7.3.4.9.1.1 This coordination shall be accomplished no later than 24 hours prior to the start of the outage.

C7.3.4.9.1.2 All approved service interruption requests must be documented in the master station log in each affected DISA GOSC/RCC.

C7.3.4.9.1.3 The appropriate IP Router Networks Monitoring Center (MC) must notify affected node site coordinators (NSC) no later than 18 hours prior to an approved outage. Any downtime adjustments will be made during this coordination and final downtime will be set.

C7.3.4.9.1.4 Thirty minutes prior to the actual outage, the person (s) taking the element(s) out of service must telephone the appropriate DISA GOSC/RCC for final approval. This is necessary to confirm current network posture and avoid any operational conflicts caused by real-time operating problems.

C7.3.4.9.2 **MC directed cancellations**. Any service interruption request which may cause or contribute to a problem which will seriously impact the operational capability of the respective IP Router Networks backbone, must be canceled by the respective DISA GOSC/RCC. The appropriate MC must immediately notify the service interruption requester of any cancellations. The affected NSC must be notified of cancellations, as time permits.

C7.3.4.9.3 **Relocation of PSN(s)**. To accommodate changes at the local site level, relocation of a PSN is occasionally required. Due to the lead-time needed to move the PSN equipment and supporting telecommunications, a 1-year notification is required in addition to the notification requirements of this chapter. One year advance notice of a proposed PSN equipment relocation is required to properly plan, schedule, survey, and accomplish the relocation. Notice must be made by the PSN sponsoring command or agency via AUTODIN/DMS message to "DISA WASHINGTON DC//DOD//" with an information copy to the appropriate DISA area and O&M command. This message must contain, as a minimum, the following information:

C7.3.4.9.3.1 Node name and number.

C7.3.4.9.3.2 Node site coordinator (NSC): Name, DSN and commercial phone numbers, AUTODIN/DMS plain language address (PLA) and E-mail address.

C7.3.4.9.3.3 Current node location: Building, room, address.

C7.3.4.9.3.4 Proposed node location: Building, room, address.

C7.3.4.9.3.5 Date relocation must be completed.

C7.3.4.9.3.6 Reason relocation required: Include impact if not accomplished by date specified.

C7.3.4.9.3.7 TSR actions: Explain, in detail, all circuit actions that will be required as a result of the relocation.

C7.3.4.9.3.8 Proposed schedule: Begin with proposed site survey date and show complete sequence of required actions. Include resource requirements (i.e. local communications unit, engineering and installation unit, IP Router Networks contractor, etc.) proposed for accomplishing the relocation.

C7.3.4.9.3.9 Office of primary responsibility: Name, DSN and commercial phone numbers, AUTODIN/DMS, and E-mail address.

C7.3.4.9.4 Exceptions to the 1-year advance notice will be made on a case by case basis. For example, a shorter lead time may be possible if all actions can be accomplished by the sponsoring command or agency and only record TSR(s) are needed. Minimum lead time will be the 21 days required for a service interruption request. The service interruption request will be modified to include the information above.

C7.3.4.9.5 Headquarters, DISA/DOD in concert with the appropriate DISA area, must review and approve all relocation requests. When approved, the responsible DISA IP Router Networks Installation Management Branch must issue scheduled service interruption request notifications, following the procedures identified paragraph C7.3.4.6 above.

C7.3.4.9.6 At no time is the site authorized to move equipment without prior DISA approval. Normally, a site survey must be performed and relocations accomplished with DISA, sponsoring O&M service agency, local command, and support contractor participation. Additionally, the requesting organization may be required to provide funding to support the cost of the site survey.

C7.4 **User Service Outage**. It is the user's responsibility to

notify the TCF/PTF of unscheduled service interruption(s), to log the circuit out, and to allow the TCF/PTF to troubleshoot the fault. It is the TCF/PTFs responsibility to report any known service interruptions or degradations, and take appropriate action to restore user service with minimum loss of operating time. Service interruptions must be documented accordingly.

Continue to:
CHAPTER 8. SERVICE PROVISIONING

Return to:
Basic Circular
Table of Contents
Publication Listing

Michael E. Craft, craftm@ncr.disa.mil - Last revision: 12 June 1998

CHAPTER 8. SERVICE PROVISIONING

C8.1 **General**. This chapter describes the procedures necessary to activate, change, or deactivate the various basic types of services and circuits in the DII as prescribed by DISAC 310-130-1. Refer to DISAC 310-130-1 for detailed information on other types of services. The basic circuit design information for all new or changed circuits will be provided in Telecommunications Service Orders (TSOs). The TSO may also be used as the authority for the O&M agency to procure specific devices and ancillary equipment necessary to install the circuit or service at a DII facility. In order to effect the very close coordination required to activate circuits in the DII, one DII TCF/PTF is normally assigned responsibility for activating the circuit from end-to-end. Intermediate facilities are assigned the responsibility for coordinating all actions necessary to activate the circuit within their facility. All DII facilities have the continuing responsibility for maintaining the circuits terminating at, or traversing their facility, at the highest possible level of performance. Although procedures in the following paragraphs describe circuit activation, these same procedures apply to activation of other DII services.

C8.2 **Telecommunications Service Orders (TSO)**. The TSO is the authorization from a DISA Allocation and Engineering (A&E) activity to start, change, or discontinue circuits, trunks, links, or systems; to amend previously issued TSOs; and to effect administrative changes. Verbal TSOs are issued when there is not sufficient time to prepare and distribute a record TSO. A verbal TSO will be issued as an Operational Direction Message (ODM) when possible and confirmed by record TSO within 5 working days of issue. Changes to circuit configurations are not authorized without an approved TSO from a DISA AE. The following explanations are provided for a TSO. (Refer to Figure 8.1.1, Figure 8.1.2 , Figure 8.1.3, and Figure 8.1.4 for a sample TSO.)

C8.2.1 **Numbering**. Each TSO will be assigned an alpha/numeric TSO number (e.g., D10474/26WU-01) derived as follows:

C8.2.1.1 The beginning letter designates the issuing office: DISA Headquarters - C, D; DISA-Europe - E, F, G, H, Y; DISA-Pacific P, Q; and NCS/DISA TMSO - A, B, X, or W.

C8.2.1.2 The first digit designates the year in which the TSO is issued, such as 7 for 1997.

C8.2.1.3 The next four digits represent sequential TSO serial numbering within the year, beginning 1 January.

C8.2.1.4 Following the diagonal slash are the last four characters (circuit number) for the CCSD of the circuit, or the entire six-character designator of the trunk being acted upon.

C8.2.1.5 Following the dash is a two-digit number to identify the sequential action being taken on the circuit or trunk. The number 01 is used as the first action or start; numbers 02 through 99 are used in sequential order to indicate changes, with discontinuance of the service as a last action.

C8.2.1.6 A message may contain one or more TSOs. Each circuit or trunk action for each service availability involved will carry a separate TSO number, with each TSO of a multiple TSO in a separate part of the message.

C8.2.2 **Format**. The TSO is prepared for electrical transmission in message format. The following paragraphs describe the entries for each paragraph of the TSO and are keyed to like-numbered paragraphs and subparagraphs of the TSO.

C8.2.2.1 **Subject**. TSO number (TSO D10474/26WU-01) or "Multiple TSO." Multiple TSOs can be written on circuits which have some commonality such as several circuits of the same type between the same user terminals. If the subject is a "Multiple TSO," each circuit action will be contained in a separate part of the message, and each part will be a complete TSO (e.g., Part I TSO D10474/26WU-01).

C8.2.2.2 **References**. Message or letter identification of those items directly related to the TSO(s).

C8.2.2.3 **Paragraph 1**.

C8.2.2.3.1 States the purpose of the TSO (e.g., "This TSO is issued to establish a 56 Kbps leased circuit between the Langley AFB, VA,

PSN and the Sembach AB, GE, PSN" or "This TSO is issued to amend TSO D60019/A350-01").

C8.2.2.3.2 Used for TSO coordination.

C8.2.2.3.3 Used for DISA Control Number.

C8.2.2.4 **Paragraph 2**. General circuit or trunk information used by the TCF/PTF for preparing circuit records, and by DISA for updating the circuit and trunk files in the DII Data Base. The following paragraphs are keyed to like-numbered paragraphs of the TSO. Descriptions of coded entries are contained in DISAC 310-65-1.

C8.2.2.4.1 CCSD or Trunk ID. If changing from one CCSD to another, or from one trunk ID to another, the old CCSD is listed first and the new CCSD is identified after the diagonal slash (/).

C8.2.2.4.2 NCS Telecommunications Service Priority (TSP) authorization code. The TSP authorization code has 12 positions. Positions 1 through 9 is a TSP control ID used by the NCS. Positions 11 and 12 are the TSP provisioning and restoration priority codes. An example of a TSP authorization code would be "TSP12345C-03." Refer to Figure F5.1 and DISAC 310-130-4 for more detailed information.

C8.2.2.4.3 Type of action; e.g., start, change, or discontinue.

C8.2.2.4.4 Service date by day, time (ZULU), month, year (e.g., O1OOO1Z JAN 97). For temporary service (30 days or less) or for exercise circuits, the discontinue date and time (optional) will be entered in the second set of blocks. (The service date and discontinue date must be separated by the word "THRU.")

C8.2.2.4.5 User terminal locations by contracted geographical location (GEOLOCO), user terminal code, facility code (ENR), state and country code, and DII area code. Included are user contacts at each terminal by name or title and telephone number. Commercial and DSN telephone numbers for commercial carriers are provided, if possible.

C8.2.2.4.6 Circuit parameter code (in accordance with Technical

Schedules in DISAC 300-175-9).

C8.2.2.4.7 Type operation (e.g., full duplex, half duplex).

C8.2.2.4.8 Control office by type, GEOLOCO, and en route facility code (e.g., CCO, CMO, ICO).

C8.2.2.4.9 Circuit modulation rate (e.g., 56 Kbps) or trunk channel capacity (e.g., 12 channels).

C8.2.2.4.10 Security equipment nomenclature short title (e.g., KG-13, KG-34, KG-81).

C8.2.2.4.11 Service availability (e.g., full period, on-call).

C8.2.2.4.12 Signaling mode (e.g., 2-way dial, 2-way ring-down), or trunk bandwidth or bit rate in trunk TSOs.

C8.2.2.4.13 Not used.

C8.2.2.4.14 TSR number assigned by the TCO whose mission the circuit supports (e.g., DU24APR910772).

C8.2.2.4.15 Trunk or circuit cross-reference (e.g., CCSD/trunk number assigned to package system trunk).

C8.2.2.4.16 Circuit or trunk set identification code. Used to identify the database set in the circuit or trunk files. For starts, "A" is used; for changes, the next alpha character following the one in the current file is used; for total discontinuances, "AL" is used for circuits; and for selective discontinuances, the circuit set which is to be discontinued is identified.

C8.2.2.4.17 Circuit Routing Code. Used by DISA circuit allocators and engineers to identify whether or not the circuit is routed in an optimum manner.

C8.2.2.4.18 Program Designator Code (PDC). The code provided by the TCO to indicate the account for billing purposes on leased circuits or circuits under industrial funding.

C8.2.2.4.19 DoD Code for Agency Requiring Service.

C8.2.2.4.20 Diverse Routing. The circuit number (last four characters of CCSD) of up to three circuits which must be diversely routed from the circuit being described in the TSO.

C8.2.2.4.21 Avoidance Routing and Transmission Media Avoidance.

C8.2.2.4.21.1 Avoidance Routing. Contracted GEOLOCO and associated state and country codes of locations which must be avoided by this circuit.

C8.2.2.4.21.2 Transmission Media Avoidance. Specific types of transmission media which must be avoided by this circuit.

C8.2.2.4.22 Contingency/OP Plan. Contingency plan number(s) which this circuit supports. The first digit identifies the originating activity. (DISA activities will use the first character of the TSO number; "0" is used for all others.)

C8.2.2.4.23 Not used.

C8.2.2.4.24 Type trunk modulation. The type of modulation used on the transmission pathway between the two terminals of a trunk (e.g., FDM, TDM). This paragraph is "NA" for circuit TSOs.

C8.2.2.4.25 General class of service. Used to identify DII (D) or non-DII (N) service.

C8.2.2.4.26 Cost Indicator. Code used to identify DII and non-DII or a combination of both.

C8.2.2.4.27 MSO URDB Number. For DSCS service.

C8.2.2.4.28 IP Router Networks URDB Waiver Number. If the TSR/TSO is for data service other than IP Router Networks.

C8.2.2.4.29 through C8.2.2.4.50 TSO paragraphs 2AC through 2AX apply to trunk TSOs only. Information will be supplied by AE personnel.

C8.2.2.5 **Paragraph 3**. Facility and Circuit Equipment Information or Facility and Trunk Equipment Information. This paragraph contains information on each facility through which the circuit or trunk is routed. The paragraph includes the equipment to be used at each facility, the transmission level point (TLP) in each direction, and routing information. Circuit routing information includes the trunk and channel over which the circuit is routed. Trunk routing information includes the link, master group, supergroup, and group over which the trunk is routed, where applicable. Level values preceded by a minus sign (-) will be negative; absence of a sign indicates the value is positive (e.g., -16/7 indicates negative 16 in one direction and plus 7 in the other direction).

C8.2.2.5.1 Facility by contracted GEOLOCO, state and country code, terminal or enroute facility code, multi point code, and Intermediate Control Office (ICO) or no data base entry (NDB) as appropriate, followed by building and room number, and the typical configuration code. Transmission level point (TLP) values in dBm are entered in both the A to Z and the Z to A direction. This refers to the layout of the circuit in relation to the paragraph designations of the TSO. A to Z direction would be from the first facility listed under paragraph 3 to the last facility listed under paragraph 3 (e.g., paragraph 3a to paragraph 3z). Z to A would be in the opposite direction. A to Z equates to direction one in the DISA data base circuit file; Z to A equates to direction two. Levels are entered as the last item on a given line and always include a diagonal (/) (e. g., -16/7, -4/4, or 0/0, etc.). Numbers indicating levels or coefficient values in the A to Z direction precede the "/", those in the Z to A direction follow the "/".

C8.2.2.5.1.1 Equipment Information, Paragraph 3X1A. Each item of equipment required to make up the circuit or trunk at the facility. Equipment is always shown in the A to Z direction as it appears in the circuit. Included are the appropriate TLPs. Levels are converted to absolute values as required to help ensure proper circuit layout and operation. For example, a data signal level (absolute) of -13 dBmO at a -16 dBm TLP would be -29 dBm.

C8.2.2.5.1.2 Trunk or Link Information, paragraph 3X2A. For circuit TSOs, the trunk designator and the channel to which the circuit is allocated are shown. Also, the type signaling, (supervisory, on-

hook, off-hook) commercial circuit number, type segment, alternate PDC, and type operation, as appropriate. For trunk TSOs, the link designator for the trunk and the mastergroup, supergroup, and group of the link to which the trunk is allocated are shown. For example, "M1029 023" indicates that the trunk is routed by way of link M1029, mastergroup 10, supergroup 2, group 3. If a mastergroup does not exist, the mastergroup position will be blank. For example, the previous example "M1029 023" would read "M1029 23."

C8.2.2.5.1.3 Trunk or link information 3X2B. Explanatory remarks are provided, as required for circuit orders. Trunk TSOs will use this paragraph to identify the type media, trunk cross-reference, and link mileage between terminals.

C8.2.2.5.1.4 Trunk or link information 3X2C. Contains cross-reference to another nation's circuit identifier when a particular portion of a circuit is routed over another nation's system.

C8.2.2.5.2 For multipoint circuits, TSOs are written from one user terminal to a bridge point and then to a distant user; the bridge point is repeated and another subscriber added, either directly or through another bridge point and so on, until all users are described. The multipoint code behind a specific GEOLOCO, state and country code, and enroute and facility code indicates whether a terminal or hubbing point is at that location.

C8.2.2.6 Paragraph 4. Other specified data.

C8.2.2.6.1 (4A) Channel Designations. This paragraph is used to tell computer software to build trunk channel records.

C8.2.2.6.2 (4B) Not used.

C8.2.2.6.3 (4C) CSIF Trunk and Channel Numbers Released.

C8.2.2.6.4 (4D) CCCI/ALLA Numbers Discontinued.

(Note: TSO paragraphs 4E-4J are used in trunk TSOs for entry of trunk Port Channel Engineering (PCE) information.)

C8.2.2.6.5 (4E) AN/GSC-24 PCE Data (side 1).

C8.2.2.6.6 (4F) AN/GSC-24 PCE Data (side 2).

C8.2.2.6.7 (4G) AN/FCC-lOO PCE Data (side 1).

C8.2.2.6.8 (4H) AN/FCC-lOO PCE Data (side 2).

C8.2.2.6.9 (4I) AN/FCC-98 PCE Data (side 1).

C8.2.2.6.10 (4J) AN/FCC-98 PCE Data (side 2).

C8.2.2.7 Paragraph 5. Other specific directions to include:

C8.2.2.7.1 Statement(s) to direct testing, direct submission of completion reports, establish proper levels, or cover interface requirements.

C8.2.2.7.2 Directions to the leasing agency.

C8.2.2.7.3 Data base responsibility.

C8.2.2.7.4 If TSO is for a trunk, directions for pilot stop and reinjection, and group regulation if not otherwise covered in paragraph 3.

C8.2.2.7.5 Any other narrative data that will help ensure understanding of the circuit or trunk to which the TSO pertains.

C8.2.2.7.6 Statement(s) used by the DISA computer program to set the type of data field for either automatic or contingency execution on the date specified in the TSO.

C8..2.7.7 Statement(s) used to assist DECCO in automatically processing TSOs.

C8.2.2.7.8 Statement(s) pertaining to Test and Acceptance and Quality Control.

C8.2.2.8 **Paragraph 6**. DII Switched Voice Network. Information will include the following:

C8.2.2.8.1 Subscriber ID number (JCS sequence number) from the DRSN Subscriber and Implementation List, as appropriate.

C8.2.2.8.2 Subscriber Rate Code from TSR item 208 or from table 7, DISAC 310-130-1.

C8.2.2.8.3 Service Mode from TSR item 209.

C8.2.2.8.4 Preempt In, YES or NO, to indicate if the line is arranged for preemption for incoming higher precedence calls.

C8.2.2.8.5 In Hunt, YES or NO, to indicate if the line is in a hunt sequence. "ORG" indicates that subscriber only originates calls.

C8.2.2.8.6 MCA. Appropriate maximum calling area indicator.

C8.2.2.8.7 MCAP. Indicates the precedence code within the maximum calling area.

C8.2.2.8.8 COI indicates the appropriate community of interest code from table 4, DISAC 310-130-1. If no community of interest groups have been identified, 0 is shown.

C8.2.2.8.9 COIP. Appropriate precedence code within the community of interest from table 5, DISAC 310-130-1.

C8.2.2.8.10 Instrument. Appropriate type of terminal instrument, if known.

C8.2.2.8.11 In Rotary With. The telephone number this access line is to be placed in rotary with, in the same room or office.

C8.2.2.8.12 Number of Extensions. Appropriate number of extensions excluding the main instrument from TSR item 214.

C8.2.2.8.13 Line Load Control. Appropriate line load control code from DISAC 310-65-1.

C8.2.2.8.14 Conference Code. Appropriate code for conference service.

C8.2.2.8.15 Data Rate. The maximum data rate in bps or baud, as appropriate, if the circuit is to be used for data or alternate voice/ record.

C8.2.2.8.16 Subscriber Telephone Number. The telephone number assigned to the subscriber, to include the area code (NYX code) if necessary for clarity or for offhook service (7 or 10 digits for DSN, 4 or 7 digits for DRSN).

C8.2.2.8.17 Encode. The encoding identification used in preparing the switch encoding data for this particular subscriber.

C8.2.2.8.18 Dual Home With. The full CCSD of the subscriber's present or other DSN circuit if the subscriber has access to a second DSN switch.

C8.2.2.8.19 Trunk Group. The appropriate 2-digit number to show trunk group assignment.

C8.2.2.8.20 Trunk Number. The appropriate 2-digit number to show trunk number assignment.

C8.2.2.8.21 Traffic Volume. Estimated average busy day traffic volume.

C8.2.2.8.22 If Abbreviated Dialing is requested, affected numbers are listed here.

C8.2.2.8.23 O/P Digits. Number of digits outpulsed (O/P) to PBX.

C8.2.2.8.24 Manufacturer, Model, and Type PBX or PABX.

C8.2.2.8.25 Intentionally left blank.

C8.2.2.8.26 GFE or Leased PABX.

C8.2.2.8.27 Operator Assistance Number.

C8.2.2.8.28 Access Code. C8.2.2.8.29 Thousand Levels for class "A" and "C" facilities that can receive DSN calls.

C8.2.2.8.30 Number of Class "A" Facilities having dial access to DSN.

C8.2.2.8.31 PABX Size (e.g., number of terminations).

C8.2.2.8.32 Switched services capacity.

C8.2.2.9 **Paragraph 7**. DII Switched Record Network (AUTODIN/DMS). Paragraph 7 is used by DISA AEs during development of the TSO. The information contained in paragraph 7 is converted and appears as paragraph 6 in the TSO. Information will include the following:

C8.2.2.9.1 Subscriber ID Number. The identification number from the AUTODIN/DMS Subscriber Access Line Listing (ASALL).

C8.2.2.9.2 Subscriber Rate Code. The appropriate code from TSR item 306 or table 8, DISAC 310-130-1.

C8.2.2.9.3 Routing Indicator. The assigned routing indicator from ASALL.

C8.2.2.9.4 Channel Code. The appropriate mode plus MSU, MSU-M, or HYBRID from TSR item 303.

C8.2.2.9.5 Mode. BK/BK or CONT to indicate block-by-block or continuous when the channel code is Mode I; otherwise NA is indicated.

C8.2.2.9.6 Line Code. The appropriate code used on link between the subscriber terminal and the switching center (from item 331 of the TSR).

C8.2.2.9.7 Security Level. Indicates the highest security classification of traffic to be handled.

C8.2.2.9.8 Configuration. Government or commercial equipment nomenclature.

C8.2.2.9.9 Message Format. Indicates the format of messages originated or received by the subscriber terminal.

C8.2.2.9.10 Channel Linking. YES or NO is indicated for channel parameter linking.

C8.2.2.9.11 Dual Homed With. Provides the circuit number (last four CCSD characters) of the other circuit involved, if any, when the subscriber is homed to two switches.

C8.2.2.9.12 Type Terminal. If the circuit is dual.homed, indicate if one terminal set is switched between two circuits, or if two sets of terminals are available for simultaneous use.

C8.2.2.9.13 ECP Message Input Authority. YES or NO indicates whether this terminal is authorized to transmit Emergency Command Precedence (ECP) (FLASH preempt) messages.

C8.2.2.9.14 Restoral Information. CAT I, CAT II, or CAT III followed by 0,1,3,5,7, or N for each type of traffic (narrative, data, or mag tape or Q/R Host), followed by the highest security level of traffic to be altrouted. The RI of the tributary facility which will accept each type of traffic is also indicated.

C8.2.2.9.15 Off-Line Equipment. The off-line or peripheral equipment required from TSR item 324. Narrative format may be used.

C8.2.2.9.16 Discontinued Circuits. Associated circuits which will be discontinued, by CCSD and CSA or CCCI number from TSR item 327. Separate TSRs and TSOs are required to effect their discontinuance.

C8.2.2.9.17 AMPE Approval. Approval for Automatic Message Processing Exchange (AMPE) system, including Local Digital Message Exchange (LDMX), Automatic Multimedia Exchange, (AMME), and Intermediate Capacity Automated Telecommunications Systems (ICATS), from TSR item 513.

C8.2.2.9.18 Number of RIs. The number of routing indicators that the terminal equipment is capable of receiving, from TSR item 328.

C8.2.2.9.19 Type of Query/Response (Q/R) Service from TSR item 335.

C8.2.2.9.20 Dual-Homed Host. "YES" or "NO" to denote whether the terminal is a dual-homed Q/R host, from TSR item 336 (DIN).

C8.2.2.9.21 Precedence (Genser). The precedence of the traffic for the general service community, from TSR item 340.

C8.2.2.9.22 Normal Destination RI (Genser). The routing indicator of the normal destination for the general service community, from TSR item 341.

C8.2.2.9.23 Security, Normal Query Header (Genser). The security desired for normal query header built by the AUTODIN/DMS Switching Center (ASC), from TSR item 342.

C8.2.2.9.24 Content Indicator Code (Genser). The normal content indicator code for the general service community, from TSR item 343.

C8.2.2.9.25 RI Exceptions (Genser). Up to three destination RIs for the general service community, from TSR item 345.

C8.2.2.9.26 RI Exceptions (DSSCS). The number of DSSCS exception RIs, from TSR item 346.

C8.2.2.9.27 Sequential Delivery of Multi-segment Messages indicated by "YES" or "NO."

C8.2.2.10 **Paragraph 8**. DII Switched Record Network (IP Router Networks). Paragraph 8 is used by DISA AEs during development of the TSO. The information contained in paragraph 8 is converted and appears as paragraph 6 in the TSO. Information will include the following:

C8.2.2.10.1 URDB Identification Number. The 9-digit host or 12-digit terminal identification number listed in the DISA IP Router Networks User Requirements Data Base (URDB) that is associated with

this requirement. The first two digits represent the Agency code, the third through sixth digits represent the ADP Unit (DPI) number, the seventh through ninth digits represent the Host System number and tenth through twelfth digits (for terminals only) represent the terminal number.

C8.2.2.10.2 System Name. The system name that this requirement pertains to (e.g., IGMIRS, JOINS, JUMPS).

C8.2.2.10.3 Data Link Protocol. Terminals only (e.g., character ASYNCHRONOUS, BSC (Binary Synchronous Communications).

C8.2.2.10.4 Dual Home Requirements indicated by YES or NO.

C8.2.2.10.5 Security Classification. The highest traffic security level to be handled.

C8.2.2.10.6 Host Interface Type. IP Router Networks interfaces will be of the following general types:

C8.2.2.10.6.1 Full Service Network Interfaces. Both of these interface configurations allow full use of network capabilities.

C8.2.2.10.6.2 Host Implementation (HI). In this type, the networking software is resident in the host system itself, and the interface is completed via a host interface device which includes any additional hardware needed.

C8.2.2.10.6.3 Host Front End Processor (HFEP). The networking hardware/software capability is primarily resident in a Host Front End Processor, rather than in the host itself.

C8.2.2.10.6.4 Terminal Emulation Processor (TEP). This type of interface supports dedicated line mode host-terminal traffic only. It serves only as a wireline replacement for connecting terminals to a host, and does not allow full use of the network. The TEP imposes minimum impact upon the users system. (Not available from ATT.)

C8.2.2.10.7 Interface Type. Indicates if interface is TEMPEST or non-TEMPEST approved (host only).

C8.2.2.10.8 Circuit to be discontinued. If applicable, identifies circuits or service to be discontinued coincident with the provision of IP Router Networks service. Listed by CCSD and CSA number.

C8.2.2.10.9 Message, Mailing Address of the activity operating the system.

C8.2.2.10.10 Code Set. Terminals only, e.g., ASCII, EBCDIC, etc.

C8.2.2.10.11 Precedence. The maximum precedence level at which the host or terminal may transmit a packet.

C8.2.2.10.12 Crypto Account Number.

C8.2.2.10.13 Crypto Account Custodian.

C8.2.2.10.14 Crypto Account Custodian Mailing Address.

C8.2.2.10.15 Crypto Account Custodian Plain Language Address (PLA) Message Address.

C8.2.2.10.16 IP Router Networks Subnetwork. The name of the subnetwork (DIIET, NIPRNET, WINCS, ARPANET), to which the user desires to be connected.

C8.2.2.10.17 Host Name. Up to 24 characters (TSR Item 368).

C8.2.3 **Distribution**. The TSO is normally sent for action to each user, DII facility on the trunk or circuit, the designated DII control office, the leasing agency, if applicable, and the other DISA circuit allocation and engineering offices if the trunk or circuit enters their area of responsibility. An information copy of the TSO is also sent to the O&M agency headquarters of the DII facilities, the TCO, and the using agency of the circuit. Additional distribution will be made only as necessary to meet specific requirements that may arise within a DISA area, or to support a major project wherein engineering or logistic considerations are involved.

C8.3 **Circuit Installation, Alignment, and Test Procedures**.

C8.3.1 The many variations found in the configurations of DII facilities prevent the development of standard procedures which could apply to all types of circuits and to every DII facility. However, there are certain functional steps in activating circuits which are common to all facilities. Upon receipt of a TSO, the following steps should be taken to install, align, and test the circuit.

C8.3.1.1 Administrative processing and logging of receipt of the TSO.

C8.3.1.2 Determinations from all concerned, including users, of capability to provide service as specified in the TSO. If capabilities do not exist follow procedures in paragraph 3c.

C8.3.1.3 Preparation of the detailed in-facility layout designating specific cross-connects and specific equipment to be used as required by the TSO.

C8.3.1.4 Preparation of work orders, or instructions, to personnel or work centers responsible for performing in-facility configuration.

C8.3.1.5 Performance of in-facility continuity checks by the TCF/PTF to ensure compliance with work orders. Ensure the circuit is installed as indicated by the TSO and that it is properly documented on the circuit data card, DD Form 1441, and on any local equipment assignment or wiring records.

C8.3.1.6 Performance of circuit alignment tests by the TCF/PTF on in-facility circuitry and associated transmission links in conjunction with adjacent TCFs. Continuity and transmission level adjustments on the in-facility installation will be performed first. When the in-facility portion of the circuit is properly adjusted, the input and output levels on all external transmission channels assigned to the circuit must be adjusted to the proper value. Additional checks will be made as required to ensure proper functioning of conditioning and signaling equipment. When the internal and external alignments and checks are completed, an overall recheck of the complete installation will be made. In the specific cases where a PTF is located between the TCF and the user, the TCF is responsible for ensuring that the transmission levels, signaling, and conditioning of the circuit are properly adjusted between the user and the PTF.

C8.3.1.7 Notification of the CCO or ICO that in-facility and adjacent link tests have been completed and meet required criteria.

C8.3.1.8 Participation in user-to-user testing as directed by the CCO.

C8.3.2 Each circuit installed in the DII will be tested in accordance with the criteria specified in the DII Technical Schedule for the type of circuit (circuit parameter code) in the TSO, or Status Acquisition Message (SAM) Footnote 11, as applicable. Upon notification from all intermediate TCFs that in-facility and adjacent segment tests are complete, the TCF designated as the CCO will initiate end-to-end tests of the circuit. All the specific test procedures required for ensuring compliance with the DII circuit Technical Schedule parameters are shown in Supplement 1 to this circular.

C8.3.3 The TCF/PTFs concerned will immediately notify the CCO or the ICO when, for any reason, delays are encountered or anticipated in activation of circuits. The notification will contain detailed information on reasons for delay or inability to activate circuits. Pertinent recommendations on methods of providing service should also be included. Within 72 hours of notifying the CCO of delays, the facility not able to provide service as specified by the TSO will provide the originator and all addressees of the TSO, all pertinent information which precludes activation of TSO specified service. The CCO may use this information in the preparation of a delayed service report which should be submitted immediately.

C8.3.4 O&Ms assigned operating responsibility for Government-owned portions of the DII are responsible for providing Government-owned equipment and supplies required to install, terminate, condition, test, operate, and maintain such portions of the system in a manner that meets transmission standards for the worldwide DII. The responsibility includes DISA Government-owned channels that are used to extend leased circuits.

C8.3.5 In the day-to-day process of acting on TSOs, DII facilities may become aware that items of equipment needed to condition or make circuits operational are not on hand or are becoming in short supply. In these instances, DII facilities involved will take the necessary action prescribed by the parent military department

directives to obtain the required equipment. Such actions must be processed through the O&M commands. If the O&M command is unable to locate such equipment, then the highest O&M level within a DISA area should request assistance from the appropriate office within that DISA area.

C8.3.6 Certified, programmed, or anticipated telecommunications requirements may be of such magnitude as to require expansion of Government-owned DII facilities. DISA action agency commanders will monitor the use of facilities, correlate requirements to availability of facilities and, when necessary, submit a Subsystem Project Plan to the Director, DISA, who will obtain the necessary approvals and concurrences and forward the plan, with further implementing instructions as necessary, to the appropriate military department for action.

C8.3.7 Deactivation of circuits will be accomplished in accordance with TSO directions.

C8.4 **Completion Reports**.

C8.4.1 Use. A completion report (CRP) is required for every TSO issued, unless specified differently in the TSO (e.g., AUTODIN/DMS Action Notices (AANs) submitted in accordance with DISAC 310-D70-30 constitute an in-effect report, and no separate report under this circular is required). In the case of TSRs for leased equipment only, TSOs are not issued. In these cases completion reports will be submitted as directed in the TSR. The report tells the office that issued the order that action has been completed or that additional action may be required. Three different reports have been devised to cover all situations. They are designed to be processed by computer insofar as possible. Therefore, the formats must be followed precisely. These reports are exempt from reports control under the provisions of DISAI 630-225-2, Information Requirements Management.

C8.4.2 **Submission**. Completion reports will be submitted by AUTODIN/DMS (if available) directly to the originator and all addressees of the TSO. Include only one type of report in any one message (e.g., do not submit an in-effect report and exception report in the same message).

C8.4.3 Format. Entering the appropriate DISA activity as shown on

the TSO, which should follow one of the examples below (with content indicator code (CIC) DJBT), will help to ensure the reports are correctly routed for further processing.

DISA TSR-TSO-CRP TRAFFIC WASHINGTON DC

DISA TMSO TSR-TSO-CRP TRAFFIC SCOTT AFB IL

DISA EUR TSR-TSO-CRP TRAFFIC VAIHINGEN GM

DISA PAC TSR-TSO-CRP TRAFFIC WHEELER AFB HI

C8.4.4 Types of Completion Reports.

C8.4.4.1 **In-Effect Report**. The facility or activity designated in the TSO (normally the CCO or CMO) will, within 72 duty hours (based on 24-hour workday not including weekends and holidays) of completion of action on the TSO, forward an in-effect report directly to the originator and all addressees of the TSO. If the service being in-effected has been assigned a TSP, the in-effect report, containing the applicable TSP Authorization Code, must be submitted to: "MGR NCS-TSP WASHINGTON DC." This report will be submitted either when the service is provided end-to-end and accepted, meets all details of the TSO, and meets all technical parameters of the specified technical schedule, or to clear previously submitted exception or delayed service reports. One service will be covered by one in-effect report. An example of an in-effect report is shown in Figure F8.2. In-effect reports will contain the following information:

C8.4.4.1.1 Subject: In-Effect Report, or Multiple In-Effect Report. (Submit multiple report only if TSO was multiple.)

C8.4.4.1.2 Reference: Identification of the message forwarding the TSO.

C8.4.4.1.3 Item 1: Complete TSO number.

C8.4.4.1.4 Item 2: TSR number from TSO paragraph 2N.

C8.4.4.1.5 Item 3: CCSD or trunk ID from TSO paragraph 2A.

C8.4.4.1.6 Item 4: Commercial carrier and commercial circuit number from TSO paragraph 3X2A or other sources, or enter NA.

C8.4.4.1.7 Item 5: Type action from TSO paragraph 2C.

C8.4.4.1.8 Item 6A: Date, time, month, and year of completion of action.

C8.4.4.1.9 Item 6B: Date, time, month, and year commercial service was provided, or enter NA when no commercial service has been requested.

C8.4.4.1.10 Item 7: Remarks. Note any administrative comments or minor changes authorized under DISAC 310-130-1, chapter 2, paragraphs 7.2.2 and 7.2.3.

C8.4.4.1.11 Item 8: Point of contact. Name, organization, and DSN/ commercial telephone number of person submitting the in-effect report.

C8.4.4.1.12 Item 9: NCS assigned TSP Authorization Code from item 102 of the TSR and/or paragraph 7.2.2 of the TSO.

C8.4.4.2 **Exception Report**. The facility or activity designated in the TSO (normally the CCO or CMO) will, within 72 duty hours (based on 24-hour workday not including weekends and holidays) of completion of action on the TSO, submit an exception report if end-to-end service is provided and accepted with some exceptions to, or deviations from, the details of the TSO or technical parameters of the specified technical schedule. Prior to accepting service, the designated facility or activity will advise the TSO issuing authority of those technical parameters failing to meet established standards, who will in turn advise the facility or activity if service is to be accepted with these exceptions. Exception reports will be forwarded directly to the originator and all addressees of the TSO. Follow-up reports will be submitted every 30 days until the exception(s) is cleared. If a firm date is known when the exception(s) will be cleared (e.g., equipment on order), and that information is contained in the follow-up, then subsequent follow ups are not required until the firm date indicated. All exception reports must be followed by an in-effect report when the exceptions are cleared. An example of

an exception report is shown in Figure F8.3. Exception reports will contain the following information:

C8.4.4.2.1 Subject: Exception Report or Multiple Exception Report. (Submit multiple report only if TSO was multiple.)

C8.4.4.2.2 Reference: Identification of the message forwarding the TSO.

C8.4.4.2.3 Item 1: Complete TSO number.

C8.4.4.2.4 Item 2: TSR number from TSO paragraph 2N.

C8.4.4.2.5 Item 3: CCSD or trunk ID from TSO paragraph 2A.

C8.4.4.2.6 Item 4: Commercial carrier and commercial circuit number from TSO paragraph 3X2A or other sources, or enter NA.

C8.4.4.2.7 Item 5: Type action from TSO paragraph 2C.

C8.4.4.2.8 Item 6A: Date, time, month, and year of completion of action.

C8.4.4.2.9 Item 6B: Date, time, month, and year commercial service was provided, or enter N/A when no commercial service has been requested.

C8.4.4.2.10 Item 7: Exception code from chapter 20, DISAC 310-65-1.

C8.4.4.2.11 Item 8: Rationale (mandatory). Enter narrative remarks to include which items are not as specified in the TSO; reason allocated channel was changed; a statement of which parameters could not be met with actual readings compared to required readings; identification of the authority or activity that authorized acceptance of substandard service; statement of which specifications could not be measured, with reason and location; lack of response by a commercial carrier by name and location; proposed corrective action, if any, with estimated date and time for completion of corrective action; and any other remarks which will explain the exceptions. Footnote 12.

C8.4.4.2.12 Item 9: Point of contact. Name, organization, and DSN/ commercial telephone number of person submitting the exception report.

C8.4.4.3 Delayed Service Report.

C8.4.4.3.1 If leasing actions are involved:

C8.4.4.3.1.1 The facility or activity designated in the TSO to report on or accept the circuit will contact the local sales office of the vendor providing the service 5 working days prior to the scheduled service date to ascertain that the service date will be met.

C8.4.4.3.1.2 If the commercial vendor indicates the service date cannot be met due to vendor difficulties, a delayed service report will be telephoned to the TCO by the facility or activity designated in the TSO to report on or accept the circuit. The TCO will telephonically advise DECCO or the appropriate DECCO field activity. The verbal report will be confirmed by delayed service message to the TCO and to the originator and all addressees of the TSO within 72 hours.

C8.4.4.3.1.3 If the established service date cannot be met due to governmental causes, a delayed service report will be transmitted by the CCO or TSR/TSO designated activity for reporting on or accepting the circuit. This report will be sent to the TCO and to the originator and all addressees of the TSO, as soon as the inability to meet the required service date is known. When possible, this message report should be preceded by a verbal notification to the TCO, who can issue an amended TSR reflecting the new or revised required service date.

C8.4.4.3.2 If leased services are not involved:

C8.4.4.3.2.1 When the established service date cannot be met due to governmental cause, the CCO or the TSR/TSO designated activity for reporting on or accepting the circuit will submit a delayed service report. This report will be sent to the TCO, the originator, and all addressees of the TSO. It will be sent as soon as the inability to meet the required service date becomes known. When possible, this message report should be preceded by a verbal notification to the

TCO. C8.4.4.3.2.2 If the forecasted delay as reported in item 8 of the delayed service report is excessive (e.g., unknown), a report will be submitted each 30 days until a firm date is established. The problem may be resolved by exceptional procedures as outlined in DISAC 310-130-1, chapter 2, paragraph 2.4.2.

C8.4.4.3.2.3 Delayed service reports must always be followed by either an in-effect report or an exception report.

C8.4.4.3.2.4 An example of a delayed service report, which will contain the following information, is shown in Figure F8.4. Delayed service reports will contain the following information:

C8.4.4.3.2.4.1 Subject: Delayed Service Report or Multiple Delayed Service Report. (Submit multiple report only if TSO was multiple.)

C8.4.4.3.2.4.2 Reference: Identification of the message forwarding the TSO.

C8.4.4.3.2.4.3 Item 1: Complete TSO number.

C8.4.4.3.2.4.4 Item 2: TSR number from TSO paragraph 2N.

C8.4.4.3.2.4.5 Item 3: CCSD or trunk ID from TSO paragraph 2A.

C8.4.4.3.2.4.6 Item 4: Commercial carrier and commercial circuit number from TSO paragraph 3X2A or other sources, or enter NA.

C8.4.4.3.2.4.7 Item 5: Type action from TSO paragraph 2C.

C8.4.4.3.2.4.8 Item 6A: Date, time, month, and year specified in TSO paragraph 2D.

C8.4.4.3.2.4.9 Item 6B: Date, time, month, and year commercial service was provided, or enter NA when no commercial service has been requested. This information is required even if the service, end-to-end, is not established. This information will be used by DECCO for billing purposes when a leased service is provided/accepted and the U. S. Government is obligated for payment, and by the TCO/TSO preparing office to determine whether or not the leased service should be

discontinued and restarted at a later date. Every effort must be made to amend TSR and TSO service dates to preclude unnecessary expenditures (See DISAC 310-130-1, chapter 2, paragraph 2.10.4.3.1.3.

C8.4.4.3.2.4.10 Item 7: Delayed service code from DISAC 310-65-1, chapter 20.

C8.4.4.3.2.4.11 Item 8: Date, time, month, and year service is expected to be provided, or enter UNKN.

C8.4.4.3.2.4.12 Item 9: Cause (mandatory). If the delay is attributable to a commercial carrier, enter the reason for delay provided by the carrier and the name of the company; if user equipment or facilities are not installed or capable of operation, so state; enter any other amplifying remarks which will explain the delay.

C8.4.4.3.2.4.13 Item 10: Point of contact. Name, organization, and DSN/commercial telephone number of person submitting the delayed service report.

Continue to:
CHAPTER 9. ADMINISTRATION

Return to:
Basic Circular
Table of Contents
Publication Listing

Michael E. Craft, craftm@ncr.disa.mil - Last revision: 12 June 1998

CHAPTER 9. ADMINISTRATION

C9.1 **General**. This chapter prescribes the various forms, logs, and publications required by each manned DII facility. Automated forms and logs are authorized in accordance with paragraph C9.2 below. The prescribed forms are necessary for maintaining complete operational status of DII facilities, links, trunks, circuits, and equipment. Upon completion, the forms also provide significant historical data that can be used to identify and correct recurring problems, or problems that may require higher level assistance. All forms, with the exception of DD Form 1697, 1697-1, and 1753 must be retained for 90 days beyond the end of each month. Retention of DD Form 1697, 1697-1, and 1753 are explained in paragraph C9.3 of this chapter. The number and type of forms used in a DII facility may vary somewhat with each facility, depending on that facility's particular mission. Each O&M agency is responsible for producing and distributing the forms to subordinate units. The forms prescribed by this circular are listed below and are available on the INTERNET at http://web1.whs.osd.mil/icdhome/DDEFORMS.HTM..

C9.1.1 . DD Form 1441, Circuit Data.

C9.1.2 . DD Form 1443, Outage and Restoration Record.

C9.1.3 . DD Form 1697, Circuit Parameter Test Data - Analog.

C9.1.4 . DD Form 1697-1, Circuit Parameter Test Data - Digital.

C9.1.5 . DD Form 1753, Master Station Log.

C9.2 Automated Recordkeeping. Automated recordkeeping using automated data processing (ADP) hardware/software is encouraged as it enhances efficiency and analysis capabilities, especially when integrated with other requirements contained in this circular. O&M agencies responsible for operating and maintaining DII facilities may develop application software to automate and integrate the requirements of the above forms with other DISA requirements such as testing, trend analysis, etc. Application software may emulate the above forms and contain the same data, but cannot use the DD Form number. The DoD forms management office is the only authority for use of DoD form numbers. Application software must have sufficient

capabilities to meet all DISA requirements and have approved life cycle maintenance. DISA is not responsible for evaluating or approving application software. However, application software programs such as those developed and distributed by the Air Force Systems Control Software Management Office (SCSMO), NCTS Washington (C-STAT), and DISA Technical Control Automation Proof of Concept System (TCAPS) are considered adequate and are highly recommended. It is the responsibility of each DII facility to ensure the ADP system is engineered and configured in such a manner to provide efficient use and cover contingencies. In general, any ADP system for recordkeeping purposes must conform to the following guidelines:

C9.2.1 The ADP system must provide for adequate backup capability so that computer failure will not prevent the maintenance of required records or the retrieval of information. Data stored on magnetic media must be duplicated on backup media at least once each day to minimize the chance of loss. The backup process should be an automated procedure, or should at least prompt the operator to perform the required actions.

C9.2.2 The ADP system must be redundant with a second computer immediately available to replace a failed unit. If this is not possible, a hard copy of all records stored in the ADP system must be manually retained on file for the same length of time as the form it replaces.

C9.2.3 If ADP systems are used to maintain TCF/PTF records, all personnel must also be trained to use the paper forms required by this chapter. A 90-day supply of paper forms must be maintained and accessible to personnel on duty. Contingency procedures must be developed to include instructions on how and when to revert to manual recordkeeping.

C9.2.4 Detailed outage records, sufficient to reconstruct events during the outage, must be retained in memory a minimum of 90 days. After this time, the detailed information may be purged from the records, and the information necessary for long term analysis retained. The minimum information required for long-term analysis is the circuit, trunk, link, or facility designator, the date and time out, the date and time in, the RFO code and location, and a brief narrative RFO.

C9.3 **Required Forms**.

C9.3.1 **Circuit Data, DD form 1441 (Figure 9-1)**. The purpose of DD Form 1441 is to provide quick access to appropriate trunk and circuit engineering information such as end terminals, channel numbers, type circuit, modulation/data rates, etc. A DD Form 1441 is required for all trunks and circuits that have a physical patch panel appearance in the TCF/PTF and for all trunks and circuits for which the TCF/PTF is the CCO/CMO or servicing TCF/PTF. TCFs with Enhanced DPAS Control Terminal (EDCT) equipment, or functional equivalent, are not required to maintain DD Form 1441's on through facility trunks and circuits as long as the database contains circuit provisioning fields and those fields are completed. For the EDCT, the CCO/CMO must be included in the circuit provisioning "remarks" field until CCO/CMO in included as a data element in the provisioning field. Information for preparing the circuit data form should be taken from the TSO as a primary source. In-house facility equipment and circuit appearances must be added as required. DD Form 1441's should be filed alpha/numerically by CCSD and trunk designator for quick reference. DD Form 1441 must be maintained in a "dead file" for 3 months after the circuit has been deactivated. The following procedures must be followed when completing the form.

C9.3.1.1 **CCSD**. Enter the CCSD from the TSO.

C9.3.1.2 **Landline Channel Number**. Enter multiplex trunk and channel number or cable designation for each direction from the TSO.

C9.3.1.3 **Terminals**. Enter user terminal facilities by geographical location and enroute facility code from the TSO.

C9.3.1.4 **Control Facilities**. Enter the geographic location of the TCFs adjacent to the user terminal location from the TSO.

C9.3.1.5 **NCS TSP**. Enter the NCS TSP restoration priority from the TSO.

C9.3.1.6 **Term Station**. Enter geographical location of each terminal facility from the TSO.

C9.3.1.7 **Operating Agency**. Enter the O&M agency of each terminal

facility, if known.

C9.3.1.8 **User Term Equipment**. Enter type or model of user terminal equipment from the TSO.

C9.3.1.9 **User Contact**. Enter user contacts from the TSO or as available.

C9.3.1.10 **Type Circuit**. Enter circuit parameter code from the TSO.

C9.3.1.11 **Use.** Enter AUTODIN/DMS, DSN, IP Router Networks, etc.

C9.3.1.12 **CCO**. Enter the CCO or CMO from the TSO.

C9.3.1.13 **Modulation Rate**. Enter modulation rate from the TSO.

C9.3.1.14 **Crypto Service**. Enter security equipment nomenclature from the TSO.

C9.3.1.15 **Activation Authority**. Enter the TSO number.

C9.3.1.16 **Date and Time Installed (Activated)**. Enter the date and ZULU time shown in the In-Effect Report.

C9.3.1.17 **Deactivation Authority**. Enter the TSO number discontinuing the circuit.

C9.3.1.18 **Date and Time Ceased**. Enter date and ZULU time circuit discontinued.

C9.3.1.19 **CKT Modifications**. Enter the latest TSO number directing changes to the circuit, and date and ZULU time change completed.

C9.3.1.20 **Conditioning Equipment**. Enter conditioning and signaling equipment locations (rack number, jack number, strapping options etc.) for all in-facility equipment.

C9.3.1.21 **Remarks**. Enter circuit routing and trunk, link, and channel assignment of each facility from the TSO.

C9.3.1.22 **Bottom Line of Card**. The bottom line of the card must be completed, using the entries on the top line, when a Kardex type file is used.

C9.3.1.23 **Reverse Side of Card**. The reverse side of the DD Form 1441 may be used for the purpose of the circuit layout record (CLR) required by chapter 2, paragraph 7.2.2 of this circular.

C9.3.2 **DD Form 1443, Outage and Restoration Record (Figure 9.2 and Figure 9.3)**. DD Form 1443 must be used to record all facility, link, trunk, circuit, channel, or equipment outages. The form provides a synopsis of the outage or degradation and a historical record for trending. Outage and restoration records must be maintained for 90 days after the end of each month. Detailed explanations of each entry are as follows:

C9.3.2.1 **Reportable**. Indicate if the outage is reportable to the Defense Information System Agency and/or to the Defense Commercial Communications Office (DECCO) by circling the corresponding "YES" or "NO."

C9.3.2.2 **Ticket Number**. Indicate the ticket number assigned to the fault or outage report to which this form applies. A ticket number must be assigned by the control facility responsible for recording the outage. Ticket numbers will consist of the Julian date for the RADAY the ticket was opened on and the sequential number for that RADAY (e.g., 158-001). If there is more than one control facility at the same location, it is permissible to precede or succeed the number by an alpha character to identify the specific facility.

C9.3.2.3 **Facility**. Indicate the facility designator for the send (SND) and receive (RCV) terminals of the link, trunk, circuit, channel, or equipment affected. (Leave blank for facility outage.)

C9.3.2.4 **Facility/Link/Trunk ID**. Indicate the applicable designator for the type of outage.

C9.3.2.5 **CHNL NBR**. Indicate the channel number for circuit affected if applicable.

C9.3.2.6 **CCSD/CSA**. Indicate the Command Communications Service Designator and/or Communications Service Authorization identifier for the circuit affected.

C9.3.2.7 **TSP**. Indicate the Telecommunications Service Priority (TSP) restoration priority code for the circuit affected. During the Restoration Priority (RP) to TSP conversion the old RP should be entered if it has not been converted to TSP. If a neither a TSP or RP assigned, enter NA (Not Assigned).

C9.3.2.8 **Time Out**. Indicate the time that the outage began, in date time group (DTG) format (e.g., 111300Z JAN 97).

C9.3.2.9 **Time In**. Indicate the time that the outage was terminated, in date time group (DTG) format (e.g., 111300Z JAN 97).

C9.3.2.10 **RFO**. Indicate the Reason for Outage (RFO) for the associated Time Out and Time In entries.

C9.3.2.11 **Coordination**. Indicate the designator of the facilities or agencies coordinated with during the course of the outage under the "FAC" column. The "USER" and "TCF" coordination are already indicated. Other facilities or agencies can be documented in the blank blocks. Indicate the initials of the individual who was coordinated with at the other facilities or agencies during coordination of the "OUT" and "IN" times.

C9.3.2.12 **Reported Trouble**. Indicate the trouble, fault, discrepancy, or HAZCON as applicable to this ticket.

C9.3.2.13 **Equipment Nomenclature**. Used for workorder information or as applicable for outages. Indicate the equipment nomenclature that is at fault or under repair.

C9.3.2.14 **Workorder Number**. Indicate the workorder number assigned by maintenance for equipment under repair. For commercial carrier outages this block can be used to document the commercial order or reference number.

C9.3.2.15 **Maint Start**. Indicate when maintenance repairs begin, in

date time group format. For commercial carrier outages this block is used to indicate when the outage was reported to the carrier. This is the beginning of the time chargeable to the carrier in accordance with DECCO procedures contained in DISAC 350-135-1.

C9.3.2.16 **Equipment ID**. Used to record the specific equipment identification if a local equipment identification has been assigned.

C9.3.2.17 **Maintenance Activity**. Indicate the maintenance activity responsible for performing the repairs. For commercial carrier outages this block is used to identify the commercial activity responsible for the circuit.

C9.3.2.18 **Maint End**. Indicate when maintenance repairs are complete, in date time group format. For commercial carrier outages this block is used to indicate when the commercial carrier turned control of the circuit back to the user for verification. This is the end of the time chargeable to the carrier in accordance with DECCO procedures contained in DISAC 350-135-1. If the circuit is unacceptable after the commercial carrier turns the circuit back, it must be reported back out to the carrier within 30 minutes in which case the outage time chargeable to the carrier will be continuous from the initial time it was reported to the carrier.

C9.3.2.19 **Hazardous Condition**. Indicate whether or not the "reported trouble" constitutes a Hazardous Condition (HAZCON) as prescribed in DISA Circular 310-55-1. Circle "YES" or "NO."

C9.3.2.20 **ETR.** Indicate the estimated time of return for equipment under repair or HAZCON as applicable.

C9.3.2.21 **Initials**. Enter the initials of the maintenance individual who the problem was reported to, and the initials of the maintenance individual who the corrective action was cleared with. If the problem is with a commercial carrier this block is used to record the initials of the contractors representative when the outage was reported out to the contractor, and when the contractor turned it back upon completion of repairs.

C9.3.2.22 **Corrective Action**. Indicate the actual action taken to restore the service. Do not merely restate the RFO code.

C9.3.2.23 **Circuit Rerouted**. Indicate the CCSD/CSA of the circuit rerouted.

C9.3.2.24 **Patch Up**. Indicate the actual time, in date/time group format, that the circuit was patched to the alternate route.

C9.3.2.25 **Patch Down**. Indicate the actual time, in date/time group format, that the patch was removed.

C9.3.2.26 **Circuit Pre-empted**. Indicate the CCSD/CSA of the circuit being pre-empted. If a spare channel is used, indicate that it is spare.

C9.3.2.27 **Reroute Remarks**. Indicate any remarks that are pertinent to the reroute.

C9.3.2.28 **Supervisor's Review**. This block must be signed by the shift supervisor when commercial carrier outage is incurred.

C9.3.2.29 **Reverse Side, Date/Time Group**. Indicate the time, in date/time group format, that the remarks are entered.

C9.3.2.30 **Reverse Side, INT**. Indicate the initials of the person making the entry.

C9.3.2.31 **Reverse Side, Remarks**. Enter significant outage information necessary to document actions taken during fault isolation and restoration of service. The remarks must be detailed enough to reconstruct the events during later analysis.

C9.3.3 **DD form 1697, Circuit Parameter Test Data - Analog (Figure 9.4 and Figure 9.5)**. The purpose of DD Form 1697 is to record Test and Acceptance (T&A) data for initial acceptance of service and for recording periodic quality control test data on analog trunks and circuits. CCO/CMOs and serving TCF/PTFs are required to maintain DD Form 1697s. A copy of the T&A report must be filed with the corresponding TSO in the circuit history files and be maintained for the life of the circuit. Periodic QC test data must also be maintained in the circuit history files until the next annual QC is

performed, at which time previous periodic QC forms may be discarded.

C9.3.3.1 **Block 1, CCSD**. The full Command Communications Service Designator for the circuit or trunk, as specified in the TSO.

C9.3.3.2 **Block 2, Type Test**. Type of test being performed on the trunk or circuit as specified in the QC schedule (e.g., T&A for Test and Acceptance, A for Annual, SA for semi-annual).

C9.3.3.3 **Block 3, Parameter Code**. Parameter code designated in the TSO for the circuit or trunk under test.

C9.3.3.4 **Block 4, Time Start (DTG)**. Date and time in Date/Time Group (DTG) format (e.g., 010001Z JAN 97) that test began.

C9.3.3.5 **Block 5, Time Finish (DTG)**. Date and time in Date/Time Group (DTG) format that test was completed.

C9.3.3.6 **Block 6, Receive Station/Initials**. Local facility designation and initials of operator performing the test at that facility.

C9.3.3.7 **Block 7, Transmit Station/Initials**. Distant facility designation and initials of operator performing the test at that facility.

C9.3.3.8 **Test**. Specific test to be performed from Chapter 6, Table 6.1.

C9.3.3.9 **Specifications**. Technical specifications of trunk or circuit in accordance with DISAC 300-175-9.

C9.3.3.10 **Receive**. Readings recorded at the local facility. Initial reading taken and reading after adjustment was made, if necessary.

C9.3.3.11 **Transmit**. Readings recorded at the distant facilities receive (your transmit). Initial reading taken and reading after adjustment was made, if necessary.

C9.3.3.12 **Block 8, Test Tone Level**. Self-explanatory (1004 Hz, -10 dBm0).

C9.3.3.13 **Block 9, C-MSG Noise**. Noise reading taken strictly on C3 or CT circuits that are analog end-to-end. If there are any PCM segments on the circuit, C-notched noise must be used. Refer to DISAC 300-175-9 for details.

C9.3.3.14 **Block 10, C-Notch Noise**. Noise reading taken on all analog and digital circuits, except those C3 and CT circuits that are analog end-to-end. Refer to DISAC 300-175-9 for details.

C9.3.3.15 **Block 11, Sig/Noise Ratio**. Signal to C-notched noise ratio. A ratio of the difference between actual signal level and C-notched noise level, measured in dB. Refer to DISAC 300-175-9 for details.

C9.3.3.16 **Block 12, Impulse Noise (IPN)**. Measurement made to detect significant noise bursts. DISAC 300-175-9 specifies a maximum of 15 counts in 15 minutes above the reference level.

C9.3.3.17 **Block 13, Envelope Delay**. Readings taken to determine absolute delay caused by active components in transmission lines, measured in microseconds.

C9.3.3.17.1 **Spectrum**. Range of acceptable delay in accordance with standards specified in accordance with DISAC 300-175-9.

C9.3.3.17.2 **Relative Delay**. Amount of delay allowed for a specific frequency range where each reading in that range is compared to a common, or relative, reading. Refer to DISAC 310-70-1, Supplement 1 for detailed instructions.

C9.3.3.18 **Block 14, Frequency Response**. Amplitude versus frequency measured in dBs.

C9.3.3.18.1 **Spectrum**. Range of operating frequency response as prescribed in DISAC 300-175-9 and DISAC 310-70-1, Supplement 1.

C9.3.3.18.2 The + and - columns are tolerances allowed for each

frequency range in accordance with DISAC 300-175-9. Allowances are relative to 1004 Hz.

C9.3.3.19 **Block 15, Net Loss Variation**. The variation in the receive level normally measured with a strip chart recorder in dBs over a 15 minute period.

C9.3.3.20 **Block 16, Change in Frequency**. The difference between the transmitted frequency and received frequency to nearest 0.1 Hz (recorded over 10 second period).

C9.3.3.21 **Block 17, Remarks**. Additional space for the tester to include any significant remarks concerning the tests. This is valuable for future analysis, especially if abnormalities were found.

C9.3.3.22 **Block 18, Signature of Tester**. Signature of individual who performed the test and recorded the test data.

C9.3.3.23 **Frequency Response (reverse side)**. Individual frequency response readings taken during actual test in accordance with DISAC 310-70-1, Supplement 1, must be recorded on the graph.

C9.3.3.23.1 **Receive**. Readings recorded at local facility's receive. Actual received levels are recorded in one column, then the relative (to 1004 Hz) is recorded in another column. For example, if the 1004 Hz reading was -10 dBm0 and the 500 Hz reading was -9.5 dBm0, the relative reading at 500 Hz would be -.5 dB. Remember, relative readings for frequency response are noted as more loss and less loss. Thus, a -9.5 dBm0 compared to a -10 dBm0 is .5 dB less loss, or -.5 dB.

C9.3.3.23.2 **Send**. Readings recorded at the distant facility's receive. Readings recorded in the same manner as receive readings.

C9.3.3.24 **Envelope Delay (reverse side)**. Individual envelope delay readings taken during actual test in accordance with DISAC 310-70-1, Supplement 1, must be recorded on the graph.

C9.3.3.24.1 **Receive**. Readings recorded at local facility's receive. Actual delay readings are recorded in one column, the relative delay

is recorded in another column.

C9.3.3.24.2 **Send**. Readings recorded at the distant facility's receive. Readings recorded in the same manner as receive readings.

C9.3.3.25 **Frequency vs Amplitude**. Graph relative frequency versus amplitude response in dB.

C9.3.3.26 **Frequency vs Delay**. Graph relative frequency versus delay distortion in microseconds.

C9.3.4 **DD Form 1697-1, Circuit Parameter Test Data - Digital (Figure 9.4 and Figure 9.5)**. DD Form 1697 is used for the same purpose as the DD Form 1697 except it is to record results of digital trunks and circuits. Retention requirements are the same.

C9.3.4.1 **Block 1, CCSD**. The Command Communications Service Designator (CCSD) assigned to the circuit or trunk, as specified in the TSO.

C9.3.4.2 **Block 2, Type Test**. Type of test being performed on the circuit or trunk (e.g., T&A, annual, semi-annually).

C9.3.4.3 **Block 3, Time Start (DTG)**. Date and time in Date Time Group (DTG) format (e.g., 010001Z JAN 97) that test began.

C9.3.4.4 **Block 4, Time Finish (DTG)**. Date and time in Date Time Group (DTG) format that test was completed.

C9.3.4.5 **Block 5, Parameter Code**. Parameter code designated in the TSO for the circuit or trunk under test.

C9.3.4.6 **Block 6, Data Rate**. Data rate used for testing the circuit or trunk (e.g., 9.6 Kbps, 64 Kbps).

C9.3.4.7 **Block 7, Type Interface**. Type of physical interface used on the circuit or trunk (e.g., RS-232, RS-449, V.35, MIL-STD 188-114).

C9.3.4.8 **Block 8, Type Sync**. Type of synchronization utilized by

the circuit under test (e.g., asynchronous, synchronous, isochronous).

C9.3.4.9 **Block 9, Type Signal**. Type of signal or coding utilized on the circuit or trunk being tested (e.g., NRZ, bipolar, AMI, B8ZS).

C9.3.4.10 **Block 10, Test Pattern**. Test pattern being used to test the circuit (e.g., 511, 2047, 1 X 10-20 -1).

C9.3.4.11 **Block 11, Block Size**. Block size being used to test the circuit (e.g., 100 bits, 1000 bits).

C9.3.4.12 **Block 12, Receive Station/Initials**. Local facility designation and initials of operator performing the test at that facility.

C9.3.4.13 **Block 13, Transmit Station/Initials**. Distant facility designation and initials of operator performing the test at that facility.

C9.3.4.14 **Test Column**. Specific test to be performed in accordance with chapter 6.

C9.3.4.15 **Specifications**. The required test time in minutes and standards for the circuit or trunk as listed in DISAC 300-175-9.

C9.3.4.16 **Error Data.** Describes the type of error data to be recorded.

C9.3.4.17 **Receive**. Readings observed on the receive (local) end of the trunk or trunk.

C9.3.4.18 **Transmit**. Readings observed on the distant end receive of the trunk or trunk.

C9.3.4.19 **Block 14, Bit Error Rate**. Results of bit error rate test (BERT) as defined in Supplement 1 to this circular.

C9.3.4.20 **Block 15, % Error Free Seconds**. Results of percentage (%) of error free seconds (%EFS) as defined in Supplement 1 to this

circular.

C9.3.4.21 **Block 16, % Block Error**. Results of percentage (%) of block errors as defined in Supplement 1 to this circular.

C9.3.4.22 **Block 17, Telegraph Distortion**. Results of telegraph distortion test as defined in Supplement 1 to this circular, typically a low speed (less than 150 baud) d.c. circuit.

C9.3.4.23 **Block 18, Remarks**. Indicate whether the circuit or trunk passed or failed the quality control tests as required by the specifications. Include any additional remarks regarding problems encountered during testing, remarks which may assist someone else in troubleshooting a specific problem, or any other comments which would aid another individual when testing this circuit or trunk.

C9.3.4.24 **Block 19, Signature of Tester**. Signature of the individual at the receive facility who completed and recorded the test data.

C9.3.5 **DD form 1753, Master Station Log (Figure 9.7)**. The Master Station Log is the official narrative record maintained to record significant events (e.g., power failures, complete system outages, major equipment outages or impairments such as HAZCONs, and any other event that may have an impact on operation of the DII), time verification, shift or watch changes, special tests, etc. Every DII TCF/PTF and LCC/NCO must maintain a MSL. TCFs and LCC/NCOs must maintain separate MSLs when collocated. Other DII facilities such as transmitter/receiver sites, microwave and radio relay sites, maintenance support activities, etc., must also maintain MSLs. When facilities are collocated, only one MSL is required as long as the MSL contains the narrative record for all collocated facilities. Reference may be made to supporting documents (outage tickets, equipment work orders, DISAC 310-55-1 reports, etc.). Entries must be made in chronological order. The shift supervisor is normally required to sign "on" and "off" duty on the MSL. If the MSL is automated, the system should use passwords and require the shift supervisor to log "on" and "off" duty. It is also advisable to design the system so that it does not allow alterations. A hard copy of the MSL must be filed at the end of each RADAY. MSLs must be maintained for 11 months after the end of each month. The following

items must be entered on the master station log:

C9.3.5.1 **Facility**. The name and function of the facility (e.g., McClellan TCF, Brandywine Receiver Site).

C9.3.5.2 **Date**. Current day, month, and year (e.g., 21 March 1997).

C9.3.5.3 **Time Period**. ZULU time of the first log entry (From) and ZULU time of the last log entry (To) on this page.

C9.3.5.4 **Subject**. Identification of the communications channels, circuit, trunk, system, link, etc., pertaining to the log entry.

C9.3.5.5 **ZULU (Z) Time**. Greenwich Mean Time (GMT) time of the event or action.

C9.3.5.6 **Operator Initials**. Initials of the individual making the log entry.

C9.3.5.7 **Action or Event**. Narrative explanation of the action or event. Enter sufficient detailed information to fully explain the situation. Common abbreviations may be used.

C9.4 **Service Provisioning Records**. This paragraph provides a summary of records used in activating, changing, and deactivating service when a DISA TSO is issued. Each TCF/PTF must establish and maintain permanent history files for all links that terminate at their facility, for all trunks and circuits that have physical patching capabilities within the TCF/PTF, and for all trunks and circuits for which the TCF/PTF is the CCO/CMO or servicing TCF/PTF. Footnote 13. Circuit history files are not required for through facility trunks and circuits that do not have physical patch appearances, unless the TCF/PTF is the CCO/CMO or servicing TCF/PTF. Temporary circuit history files must be established on all trunks and circuits by each TCF/PTF addressed in the DISA TSO, regardless of patching capabilities. The temporary file must be maintained until the link, trunk, or circuit has been in-effected. Once in-effected, the temporary file may be discarded, unless a permanent history file is required by the above criteria. Collocated facilities (within the same building) are only required to maintain one history file. Each history file must contain a copy of:

C9.4.1 The initial test and acceptance data (DD Form 1697 or 1697-1).

C9.4.2 Copies of the latest TSO that reflects the current end-to-end configuration, control office assignment, etc.

C9.4.3 In-effect, exception, and delayed service reports applicable to the latest TSO. When an exception or delayed service report is submitted that pertains to an intermediate facility, the intermediate facility must maintain their history file until the condition causing the report to be rendered is cleared and an in-effect report is submitted.

C9.4.4 Status Acquisition Message (SAM). Footnote 14.

C9.4.5 Copies of quality control waiver requests and approvals.

C9.4.6 Copies of any appropriate documentation (i.e., QC results, letters, etc.) resulting from action(s) taken to resolve degradations when a trunk or circuit fails management threshold for two consecutive months or more. Documentation must be kept on file for 1 year.

C9.5 **Reference Library**. A basic reference library must be maintained in each DII TCF, LCC, and NCO. Other manned DII facilities responsible for performing technical control functions (e. g., PTF, radio relay sites, switching centers) are only required to maintain a limited library. Unmanned DII facilities are not required to maintain a reference library. Collocated facilities may maintain a common library if it is easily accessible to those personnel performing technical control functions. DISA areas, using the guidelines established in this chapter, should develop publications requirements for each type of facility within their area of responsibility (e.g., TCF, PTF, DSN, AUTODIN/DMS, wideband facility, HF facility).

C9.5.1 **DISA Publications**. The current editions of the following DISA publications are required for a basic library. DISACs preceded by an asterisk (*) are required for limited libraries.

C9.5.1.1 *DISAN 210-0-1, DISA Circulars and Notices.

C9.5.1.2 DISAC 310-50-6, Defense Communications System Orderwire.

C9.5.1.3 *DISAC 310-55-1, Status Reporting for the Defense Communications System.

C9.5.1.4 DISAC 310-65-1, Circuit and Trunk File Data Elements and Codes Manual of the Defense Communications System (DII).

C9.5.1.5 *DISAC 310-70-1, DII Technical Control.

C9.5.1.6 DISAC 310-D70-30, DII AUTODIN/DMS Switching Center and Subscriber Operations (if applicable).

C9.5.1.7 DISAC 800-70-1, Operation and Control of the Defense Satellite Communications System (DSCS) (if applicable).

C9.5.1.8 DISAC 310-70-57, DII Quality Assurance Program, and applicable supplements.

C9.5.1.9 *DISAC 300-85-1, Reporting of DII Facility and Link Data. RCS: DISA(AR) N330-3.

C9.5.1.10 DISAC 310-90-1, Physical Security Measures for DII Facilities.

C9.5.1.11 DISAC 310-130-1, Submission of Telecommunications Service Requests.

C9.5.1.12 DISAC 310-130-2, Defense Communications System Management Thresholds (MT) and Performance Objectives (PO).

C9.5.1.13 *DISAC 310-130-4, Defense Uses Guide to the Telecommunications Service Priority (TSP) System.

C9.5.1.14 DISAC/DITCO 350-135-1, Defense Commercial Communications Acquisition Procedures. (For DII facilities having leased facilities or circuits.) This publication is available on the DISA/DITCO Home Page, http://www.ditco.disa.mil/asp/news.asp.

C9.5.1.15 *DISAC 300-175-9, DII Operation-Maintenance Electrical Performance Standards.

C9.5.1.16 *DISAC 350-195-2, Exercise of Auxiliary Electric Power Systems.

C9.5.2 **Military Standards**. The following military standards (MIL-STDS) are available for distribution. Those DII facilities required to maintain a basic reference library are encouraged to maintain the following MIL-STDs designated with an asterisk (*). Footnote 15.

C9.5.2.1 MIL-STD-188-110A, Equipment Technical Design Standards for Common Long Haul/Tactical Data Modems.

C9.5.2.2 MIL-STD-188-111A, Subsystem Design and Engineering Standards for Common Long Haul/Tactical Fiber Optics Communications.

C9.5.2.3 MIL-STD-188-112, Subsystem Design and Engineering Standards for Common Long Haul/Tactical Cable and Wire Communications.

C9.5.2.4 MIL-STD-188-113, Inter-operability and Performance Standards for Analog-to-Digital Conversion Techniques.

C9.5.2.5 MIL-STD-188-114A, Electrical Characteristics of Digital Interface Circuits.

C9.5.2.6 MIL-STD-188-115, Inter-operability and Performance Standards for Communications Timing and Synchronization Subsystems.

C9.5.2.7 MIL-STD-188-124B, Grounding, Bonding and Shielding for Common Long Haul/Tactical Communications Systems Including Ground Based Communications-Electronics Facilities and Equipments.

C9.5.2.8 MIL-STD-188-140A, Equipment Technical Design Standards for Common Long Haul/Tactical Radio Communications in the Low Frequency Band and Lower Frequency Bands.

C9.5.2.9 MIL-STD-188-145, Interoperability and Performance Standards for Digital LOS Microwave Radio Equipment.

C9.5.2.10 *MIL-STD-188-154A, Subsystem Equipment and Interface Standards for Common Long Haul and Tactical Telecommunications Control Facilities.

C9.5.2.11 MIL-STD-188-161D, Interoperability and Performance Standards for Digital Facsimile Equipment.

C9.5.2.12 MIL-STD-188-190, Methods for Communications Systems Measurement.

C9.5.2.13 MIL-STD-188-200, System Design and Engineering Standards fpr Tactical Communications. (Replaces MIL-STD-188-100 and MIL-STD-188C)

C9.5.3 **Military Handbooks**. The following military handbooks (MIL-HDBK) are available for distribution. Those DII facilities required to maintain a basic reference library are encouraged to maintain the following MIL-HDBKs designated with an asterisk (*).

C9.5.3.1 MIL-HDBK-188, Guide for Developers and Users of Communications Systems Standards.

C9.5.3.2 MIL-HDBK-232A, RED/BLACK Engineering-Installation Guidelines.

C9.5.3.3 *MIL-HDBK-411B, Power and Environmental Control for the Physical Plant of DoD Long Haul Communications.

C9.5.3.4 MIL-HDBK-412, Site Survey and Facility Design Handbook for Satellite Earth Stations.

C9.5.3.5 MIL-HDBK-413, Design Handbook for High Frequency Radio Communications Systems.

C9.5.3.6 MIL-HDBK-415, Design Handbook for Fiber Optic Communications Systems.

C9.5.3.7 MIL-HDBK-416, Design Handbook for Line of Sight Microwave Communication Systems.

C9.5.3.8 MIL-HDBK-417, Facility Design for Tropospheric Scatter (Transhorizon Microwave System Design).

C9.5.3.9 *MIL-HDBK-419A, Grounding, Bonding and Shielding for Electronics Equipment and Facilities.

C9.5.3.10 MIL-HDBK-420, Site Survey Handbook for Communications Facilities.

C9.5.4 **Federal Standards**. The following Federal Standards are recommended for facilities with basic reference libraries. Footnote 16.

C9.5.4.1 FED-STD 1033, Digital Communications Performance Parameters.

C9.5.4.2 FED-STD 1037C, Glossary of Telecommunications Terms.

C9.5.5 **Allied Publications**. The current edition of ACP 131, Communications Instructions Operating Signals, must be maintained in each DII facility using teletypewriter orderwires or critical control circuits.

C9.5.6 **Technical Orders and Manuals**.

C9.5.6.1 Technical orders or manuals for each item of test equipment installed or used by personnel performing technical control functions must be available in the DII facility.

C9.5.6.2 Technical orders or manuals for all terminal and ancillary equipment installed in the DII facility must be available to personnel performing technical control functions.

Continue to:
CHAPTER 10. COMMERCIALLY LEASED CIRCUITS

Return to:
Basic Circular
Table of Contents

[Publication Listing]

Michael E. Craft, craftm@ncr.disa.mil - Last revision: 12 June 1998

CHAPTER 10. COMMERCIALLY LEASED CIRCUITS

C10.1 **General**. This chapter provides guidance for coordinating circuit actions for those circuits provided by commercial carriers. DISAC 350-135-1, Defense Commercial Communications Acquisition Procedures, is the prescribing directive for leasing commercial circuits. Refer to it for details on leasing commercial circuits. For the purposes of this Circular leased circuits are divided into three categories: circuits provided by U.S. domestic carriers, circuits provided by U.S. international carriers (USICs), and circuits provided by foreign (non-U.S.) carriers.

C10.1.1 U.S. domestic leased communications services are usually procured from common carriers in accordance with the tariff provisions established with the Federal Communications Commission (FCC) and other regulatory bodies. Domestic carriers may not tariff the full range of parameters contained in the DII Technical Schedules (DISAC 300-175-9). Only those parameters that are tariffed are guaranteed. For services within CONUS, the Defense Commercial Communications Office (DITCO) converts parameter codes contained in the TSO to the tariff offering of the carrier which will meet or exceed the parameters of the applicable DII Technical Schedule.

C10.1.2 USICs generally bid to provide service, and contracts for the service are based on the parameters contained in the TSO. The USIC awarded the contract is then responsible for installing and maintaining the leased service within the cited parameters. The USIC may designate a representative to receive and act upon trouble reports in those areas where the carrier does not have an office. The DITCO Status Acquisition Message (SAM) Footnote 17. will provide telephone numbers of commercial activity locations that will accept collect calls for trouble reporting purposes at both end terminals. Refer to DISAC 350-135-1.

C10.1.3 The Defense Commercial Communications Office (DITCO) procures the portion of international leased services provided by foreign carrier through the USIC whenever possible. Foreign carriers are frequently owned by the Government of the country in which they operate. Their methods of operation are prescribed by the foreign Government, and the service offered under the rates, rules, and regulations of the foreign carrier administrations may or may not conform to International Telegraph and Telephone Consultive Committee

(C.C.I.T.T.) recommendations. In many areas, foreign carriers do not provide for working overtime, during weekends, or during national holidays. However, the USICs have a 24 hour central trouble call desk.

C10.1.4 Upon completion of circuit leasing action required by the TSO, DITCO will transmit a Status Acquisition Message (SAM) Footnote 18. to all addressees of the TSO. SAMs are required for the initial activation and subsequent major modification of all leased circuits, and must be filed in the circuit history folder.

C10.2 **Responsibility for Meeting and Maintaining Technical Sufficiency**.

C10.2.1 **Within CONUS**. Circuits are normally leased from one carrier under a "single Communications Service Authorization (CSA)" concept. This means that, to the extent possible, DITCO selects a single carrier to provide for the overall service and to make arrangements as necessary with other carriers participating in providing the service to furnish modems, conditioning, transmission paths, etc., as appropriate. Terminal equipment may either be leased under the same CSA or separately, or may be Government furnished. The carrier selected is responsible for performing all coordination necessary to establish and maintain the quality of service ordered between terminals shown in the CSA, and for providing required signals and signal levels (as specified in the CSA) where Government and leased facilities interface. The carrier is not responsible for end-to-end service when the circuit specified in the CSA is a segmented lease and is extended past the end terminals shown (i.e., by DII multiplex or channel packing systems, by military facilities, etc.).

C10.2.2 **CONUS-Alaska and CONUS-Canada**. Circuits leased between CONUS and Alaska are procured on a single lease. Circuits leased between CONUS and Canada are normally procured on a segmented basis from different carriers. Carriers are responsible only for the portion of the service specified in their contracts. In the event a carrier providing service fails to respond to TCF/PTF requests to isolate and correct circuit problems, contact the Systems Control Officer (SCO) at message address "DISA GOSC WASHINGTON DC" or call immediately for assistance.

C10.2.3 **Transoceanic Circuits**. For leased services provided entirely by common carrier facilities, the USIC is responsible for technical sufficiency end-to-end, including connecting facilities provided by arrangement with the U.S. domestic and with foreign carriers.

C10.2.3.1 For transoceanic services, the composition of which is predominantly common carrier, as determined by the Government, but which contains Government-owned segments, the carrier awarded the contract is responsible for the technical sufficiency of the service end-to-end, including connecting facilities provided by arrangement with U.S. domestic, USICs, and with foreign carriers. The responsibilities are (for Government-owned):

C10.2.3.1.1 The carrier awarded the contract will engineer the service on an end-to-end basis and will provide the Government with the technical parameters necessary to condition the Government-owned segment to meet the overall transmission requirement. The Government will provide, install, and maintain the equipment necessary to condition and terminate Government-owned segments.

C10.2.3.1.2 The Government and the carrier will establish a demarcation point for determining outages chargeable to the carrier for all transoceanic circuits. The demarcation point will be the location where the Government-owned segment meets the common carrier segment. However, where the demarcation point does not clearly separate Government and commercial equipment or facilities, ownership of the equipment or facilities will determine maintenance responsibility.

C10.2.3.1.3 The USIC awarded the contract will perform all testing and other actions necessary to maintain the continuity and quality of service end-to-end without regard to the demarcation point established between Government-owned segments and common carrier segments.

C10.2.3.2 For transoceanic service, the composition of which is predominantly Government owned, as determined by the Government, but which contains a common carrier segment, the Government is responsible for the technical sufficiency end-to-end. The responsibilities are (for carrier segments):

C10.2.3.2.1 The Government will engineer the service end-to-end and will order from the commercial carrier the tariffed offering which meets or exceeds the parameters required to meet the overall transmission requirements when the segments are connected in tandem. The carrier awarded the contract will provide, install, and maintain the equipment necessary to condition and terminate the carrier-owned segment, except when the Government specifies that Government-furnished equipment will be used.

C10.2.3.2.2 The Government and the carrier will establish a demarcation point for determining outages chargeable to the carrier. The demarcation point will be designated in the TSO submitted to DITCO, and will be made a matter of record in the order or contract covering the service. The demarcation point will be the location where the Government-owned segment meets the common carrier segment. However, when the demarcation point does not clearly separate Government and commercial equipment or facilities, ownership of the equipment or facilities will determine maintenance responsibility.

C10.2.3.2.3 The Government will control all testing and other actions necessary to maintain the continuity and quality of service end-to-end without regard to the demarcation point established. The Government will accomplish the testing of common carrier segments in coordination with the control office designated by the international carriers.

C10.2.4 **Foreign Leases**.

C10.2.4.1 The TSO will designate a facility which will accept leased service on behalf of the Government.

C10.2.4.2 Initial test and acceptance (T&A) data will be used as the baseline for those circuits unable to meet all parameters specified in the appropriate Technical Schedule. Whenever a major realignment of facilities which the circuit traverses is accomplished, or when measured performance of facilities is obtained as a result of a Technical Evaluation Program visit, the new data obtained for circuit performance will be used as the baseline.

C10.2.4.3 Circuits failing to meet all parameters specified in the appropriate Technical Schedule when T&A is performed will not be

accepted for service by the CCO/CMO without approval of the TSO issuing authority. Procedures contained in chapter 6 and chapter 8 of this circular must be followed.

C10.3 **Initial Acceptance of Leased Service**. The TSO will designate a DII facility which will accept leased service on behalf of the U.S. Government. If the leased service traverses a DII TCF/PTF, or is remotely accessible by a DII TCF/PTF, then the DII TCF/PTF will be assigned as the Communications Control Office (CCO) responsible for accepting service. Otherwise, the TSO must designate a Communications Management Office (CMO) to accept service. The CCO or CMO will:

C10.3.1 Ensure that leased circuit segments meet all circuit parameters for the type of service specified in the SAM.

C10.3.2 Contact the TSO issuing authority when the carrier fails to meet all required circuit parameters. The TSO issuing authority will determine whether service will be accepted or will obtain such a determination from the TCO or TSR issuing authority.

C10.3.3 Submit required completion reports.

C10.3.3.1 If the circuit meets all required parameters and the user has satisfactory service, an In-effect Report will be submitted. The circuit will be maintained within these parameters.

C10.3.3.2 If the circuit does not meet all required parameters and the TSO issuing authority advises that the circuit must meet these parameters prior to accepting the service, a Delayed Service Report will be submitted if the carrier is unable to provide required service on the date specified in the TSO.

C10.3.3.3 If the circuit does not meet all required parameters and the TSO issuing authority advises that the circuit may be accepted for service, an Exception Report will be submitted. Until the Exception Report is cleared (e.g., the carrier corrects all circuit deficiencies or TCO authorizes a change in parameters or other technical aspects), measured test data during the initial T&A will be maintained as temporary baseline data until the responsible carrier corrects all circuit deficiencies. The TSO issuing authority is

responsible for necessary action to ensure that the Exception Report is subsequently cleared. Once all exceptions are cleared, an In-Effect Report will be submitted.

C10.4 **Circuit Problems**.

C10.4.1 Upon activation of a circuit, users are responsible for reporting degradations and outages to the serving TCF/PTF for corrective action.

C10.4.2 When a leased service is interrupted or fails to meet the parameters prescribed in the DITCO SAM (for reasons other than customer negligence or failure of facilities furnished by the customer), the serving TCF/PTF will immediately log the circuit out of service with the responsible carrier. If there is no serving TCF/PTF the user is responsible for reporting the degradation or outage directly to the carrier and for informing the CCO or CMO of the situation. If satisfactory action is not taken by the carrier on problems that affect service, the situation should be documented on DD form 1368 Footnote 19. and forwarded in accordance with DISAC 350-135-1. In cases where the circuit has a history of substandard performance, the DITCO may elect to change carriers based on submission of DD form 1368 and in accordance with the procedures of the leasing activity.

C10.4.3 Prior to reporting an outage to the commercial carrier, the TCF/PTF will attempt to isolate the trouble if any Government-furnished terminal equipment or circuit segment is used. When the trouble is isolated to the Government-furnished segment or equipment, including equipment leased under Federal Supply Schedules, the failure will not be reported to the common carriers. The Government is subject to a maintenance-of-service charge when trouble reported to the carrier is subsequently isolated to equipment or facilities provided by the Government.

C10.4.4 Whenever an outage attributable to a leased segment occurs, regardless of the direction of outage (send or receive), the carrier providing end-to-end technical sufficiency or an authorized representative will be notified of the outage. The serving TCF/PTF, or user when there is no TCF/PTF, will notify the appropriate carrier representative of the outage to preclude unnecessary delay in circuit restoration. The time the carrier or authorized representative is

first notified of the outage by the TCF/PTF or user is the time that the commercial segment is considered to be out of service. Leased circuits logged out of service are considered to be out in both directions and reroute actions must include send and receive paths.

C10.4.5 When the carrier returns the circuit to service, the TCF/PTF will perform those quality control tests which are necessary to establish that the circuit meets required parameters. When the user establishes end-to-end contact on the circuit and is satisfied with the performance, the TCF/PTF will log the circuit back to service.

C10.4.6 Care must be exercised when turning a circuit over to the carrier to "check" circuit operation. Unless the carrier is specifically advised that the circuit is "logged out" of service, the carrier may decline to accept circuit outage even though the cause for degraded service is subsequently identified as a carrier problem. Outage time chargeable to the carrier begins at the time the TCF/PTF or user notifies the carrier that the circuit is out of service. Chargeable outage time is considered terminated when the carrier notifies the TCF/PTF or user that the problem has been corrected, unless the carrier is notified within 30 minutes that the problem still exists.

C10.5 **TCF/PTF Cooperation With Commercial Carrier**s.

C10.5.1 TCF/PTFs are required to cooperate with the carriers to activate circuits and to restore disrupted service as soon as possible. However, it is not the responsibility of the TCF/PTF to perform unlimited test measurements for the carrier after a circuit has been logged out of service. Once the TCF/PTF has determined that a circuit is out of service due to leased facilities, it becomes the carrier's responsibility to isolate and correct all circuit problems.

C10.5.2 The TCF/PTF will provide the carrier with test measurement data obtained when carrier facilities are determined to be the cause of the outage. These data may assist the carrier in isolating the trouble, but does not necessarily indicate that other parameters are within required specifications. When the carrier returns the circuit to the TCF/PTF, the carrier is, in effect, stating that the circuit meets all of the circuit parameters contained in the SAM. If subsequent tests performed by the TCF/PTF show that the carrier has not fully restored the service, the TCF/PTF may request the carrier

to perform test measurements on the leased segment(s) of the circuit from the point of interface between the Government and the carrier. Difficulties in obtaining the cooperation of the carrier must be fully documented and immediately reported to appropriate TCO for further action.

C10.5.3 Since DII procedures and standards cannot be imposed on commercial entities, an understanding of commercial procedures and standards is frequently necessary when dealing with U.S. and foreign carrier personnel. TCF/PTF supervisory personnel should arrange to meet with representatives of commercial carriers providing leased services to their facilities.

C10.6 **Scheduled Outages**.

C10.6.1 The DOCC is responsible for coordinating the scheduling of planned commercial facility outages which will affect DII leased circuits. Planned outages must be coordinated with individual users as required in chapter 7 of this circular.

C10.6.1.1 **Planned Commercial Facility Outage**. The carriers occasionally require that certain multichannel facilities be removed from service to perform necessary repairs, cutovers, power improvements, quality control testing, etc. The carrier must reroute or otherwise provide service to DII users during facility outages, and the outages should be scheduled for the non-busy period of the users. When the carrier cannot reroute the individual services on an uninterrupted basis during a planned facility outage, the carrier must notify the DOCC of the nature and estimated duration of the outage. The DOCC element approving the outage will ensure that affected TCF/PTFs and control offices are advised of the approved outage.

C10.6.1.2 **Circuit Releases**. A circuit release is granted for the time requested by a carrier to perform periodic routine maintenance, implement required circuit changes, or accomplish other actions that require removing a circuit from service on a previously scheduled basis. Circuit releases are granted for a specified time which is mutually agreeable by the user and the carrier. Circuit releases are not granted to correct deficiencies on circuits previously logged out of service by the TCF/PTF or for those circuits being used on an

impaired basis.

C10.6.1.2.1 USICs will direct all requests for DII circuit release to the NCS/DISA RCC or appropriate RCC. The NCS/DISA RCC or RCC will effect necessary coordination with subordinate DOCC elements, TCF/PTFs, and users to obtain the circuit release, and will confirm the approval of the request with the carrier or schedule an alternate release time.

C10.6.1.2.2 Domestic carriers will direct all requests for DII circuit releases to the NCS/DISA GOSC. The NCS/DISA GOSC will initiate necessary coordination with TCF/PTFs and users in DISA areas 1, 2, 6, and 9 to obtain the circuit release. The decision rendered by the NCS/DISA GOSC and RCC will be disseminated by telephone to the facilities, users, and agencies involved.

C10.6.1.2.3 Foreign carriers will direct all requests for circuit release to the appropriate servicing TCF/PTF. Serving TCF/PTFs will obtain user concurrence and advise other TCF/PTFs in the circuit and appropriate DOCC elements of the scheduled outage prior to notifying the foreign carrier that the release time is acceptable.

C10.6.1.3 **Requests for Extensions of Authorized Outages**. When a carrier is unable to complete necessary actions within the time period authorized, requests for extension for the planned facility outage or circuit release will be processed as outlined above.

C10.6.2 Commercial carrier outages, scheduled or unscheduled, must be reported on DD form 1368 by the facility designated in the TSO for reimbursement of service not provided.

C10.7 **Impaired Service**.

C10.7.1 Occasionally, it is necessary to accept service from a commercial carrier on an impaired-service basis when quality control tests indicate one or more Technical Schedule parameters are out of tolerance and the carrier is not in a position to fully restore the service. The following guidelines apply:

C10.7.1.1 TCF/PTFs may accept circuits for service on an impaired basis when the user is able to pass required traffic on the circuit

and agrees to accept the service on an impaired basis, and the carrier estimates that normal service can be provided within 3 days.

C10.7.1.2 When corrective action has not been accomplished by the carrier within 3 calendar days of the date service was accepted on an impaired basis, the TCF/PTF will initiate action with the appropriate DOCC element to escalate the problem to higher levels for assistance in expediting restoration of service to normal.

C10.7.1.3 Appropriate DOCC elements will be notified whenever a circuit is placed in an impaired-service status. Notification will include identification of the carrier, the nature of the impairment, and the date the circuit is scheduled to be fully restored to service. Appropriate DOCC elements will also be notified when service has been fully restored.

C10.7.1.4 Circuits accepted for service on an impaired basis are not considered out of service for DISAC 310-55-1 or DD form 1368 reporting purposes.

C10.7.1.5 Circuits that fail to pass required traffic will be logged out of service, and the carrier will be required to restore service as soon as possible.

C10.7.1.6 Excessive occurrences of a circuit being placed in an impaired service status will be documented and reported to the TSO issuing authority for corrective action.

C10.7.2 Accepting circuits for service on an impaired basis is a judgment decision made by the CCO acting as the agent of the Government. DOCC elements will assist the CCO in making this decision, if required.

C10.7.3 The Government is liable for the payment of the full recurring charges for the service during all periods of acceptance on an impaired basis.

C10.8 **Quality Control (QC) Testing of Commercially Leased Circuits**. The requirement for QC testing of leased circuits is identical with that required on Government-owned circuits. Refer to chapter 6 of this circular for specific test requirements.

C10.8.1 **Test Schedules**.

C10.8.1.1 The Communications Control Office (CCO) will coordinate QC test schedules with commercial carriers to ensure that the carriers will have personnel and test equipment available to conduct QC tests. Refer to paragraph C10.8.3 of this chapter for DSN IST testing.

C10.8.1.2 The CCO will notify the appropriate TCO of any commercial carriers refusing to participate in scheduled out-of-service QC testing. The TCO should then verify the terms of the lease and either contact the carrier to arrange scheduling or initiate a request for QC testing.

C10.8.1.3 When the TCF/PTF is relieved of the responsibility for conducting QC tests on specific circuits, all outages attributed to the carrier on those circuits will be reported to the carrier as "not providing required service."

C10.8.2 **Segmented Testing of Commercial Leased Circuits**. Leased international and transoceanic circuits for channel-packed trunks extend from serving TCF/PTF to serving TCF/PTF. The commercial lease and the channel-pack lease are separate contracts and are tested and reported separately. The commercial carrier awarded the contract is responsible for the technical sufficiency of the circuit between serving TCF/PTFs. Leased circuits between serving TCF/PTFs and users are ordered by separate DITCO action. The domestic or foreign carriers providing tail segments are responsible only for the technical sufficiency of the tail segments they provide. Refer to chapter 6 for segmented testing requirements.

C10.8.3 **Quality Control (QC) Testing Requirements of Commercially Leased Defense Switched Network (DSN) ISTs**.

C10.8.3.1 Provisions for QC testing by the USIC are outlined in individual CSAs which are issued by DITCO to the commercial agency providing the service. The CSA constitutes a written agreement between the Government and the commercial carrier to conduct fault isolation, restoration, and quality control testing on DSN ISTs.

C10.8.3.2 QC testing of DSN ISTs connecting an overseas military switching center with a commercial switching center in the CONUS is accomplished by personnel at military TCF/PTFs in conjunction with personnel at commercial facilities in the CONUS and Hawaii. QC testing of DSN ISTs between overseas switching centers (excluding Hawaii) is accomplished by personnel at military TCF/PTFs. The military TCF/PTFs responsibility for participating in QC testing is outlined in chapter 6. Additional QC requirements for CONUS and overseas ISTs are prescribed in the following paragraphs:

C10.8.3.2.1 Testing will be scheduled quarterly by the CCO, normally the servicing military technical control in the overseas area. The CCO will forward the quarterly schedule to the appropriate DISA Area 90 days prior to the start of the quarter. The DISA area will review the CCOs schedules, resolve possible conflicts and incorporate all inputs into an area QC schedule, to be forwarded to HQ DISA, Code DOV, 60 days prior to the start of the quarter. Schedules will include, as a minimum, the CCSD, commercial CSA number, circuit parameter, from/to GEOLOCO and scheduled test time. HQ DISA/DOV will review the area QC schedules, arrange coordination with the CONUS commercial agencies, resolve any conflicts, and notify the area QA Division of required changes, or approval, no later than 30 days prior to start of the quarter. Deviation from the approved schedule must be coordinated with DOV, responsible RCCs, USIC, CONUS switching centers and participating DII TCF/PTFs. CCOs must initiate advance coordination of scheduled tests to ensure availability of personnel and equipment necessary to meet testing requirements contained in chapter 6. Test schedule changes will be coordinated well in advance of scheduled time to minimize impact on personnel and equipment and to prevent the Government from incurring additional charges from the vendor. All scheduled quality control testing will be accomplished end-to-end under the purview of the CCO, who will order testing with the CONUS switching centers on behalf of the Government and will maintain strict accounting of the start and end times of testing to facilitate billing verification. The CCO will not, under any circumstances, order testing on behalf of USIC during fault isolation or correction.

C10.8.3.2.2 Intentional disruptions to DSN ISTs for any length of time are not authorized unless:

C10.8.3.2.2.1 Quality control tests are to be conducted on the

circuit in accordance with the DISA schedule.

C10.8.3.2.2.2 Isolation and correction of a circuit problem is required.

C10.8.3.2.3 The commercial carrier is allocated 3 hours for the to perform QC tests on each IST.

C10.8.3.2.4 If a leased DSN IST fails to meet specifications during a scheduled QC test and the circuit cannot be realigned to specifications during the allocated 3 hours, the CCO has two options:

C10.8.3.2.4.1 Normally, the CCO will log the circuit out to the USIC and the circuit will remain out of service until all specifications are met.

C10.8.3.2.4.2 When operational circumstances dictate, the CCO may return the circuit to service in an "impaired" status if the circuit is capable of providing service for which it was leased. Prior to returning the circuit to service, the TCF/PTF will coordinate with the USIC and establish a firm date and time (within 3 days) when the impairment will be corrected.

C10.8.3.2.5 Only one IST between two switches should be removed from service for QC testing at a given time. The first circuit will be logged out and returned to service before the next IST is removed for testing.

C10.8.3.2.6 Test results will be recorded on DD form 1697 and maintained in the appropriate circuit history folders.

C10.9 **Leased Circuit Outage Reporting**.

C10.9.1 General. DISAC 350-135-1, Defense Commercial Communications Acquisition Procedures, contains requirements for the submission of Modified Use of Leased Communications Facilities Reports (DD form 1368) to DITCO, HQ DISA, and the TCO. TCF/PTF and CCO/CMO management personnel should be thoroughly familiar with the provisions of that Circular.

C10.9.2 **Responsibility to Report.** DII TCF/PTFs, CCO/CMOs, users, or other agencies designated in the TSO must, in accordance with DISAC 350-135-1, submit a report each month on those leased circuits experiencing outage attributed to the carrier. Footnote 20. Outages caused by the failure of Government-provided equipment or facilities, or due to negligence of Government personnel, will not be included in this report.

C10.9.3 **Extended or Frequent Outages**. A DD form 1368 may also be submitted for services that suffer extended or frequent interruptions or when DITCO assistance is desired in seeking to improve the reliability of the leased service.

Return to:
Basic Circular
Table of Contents
Publication Listing

Michael E. Craft, craftm@ncr.disa.mil - Last revision: 12 June 1998

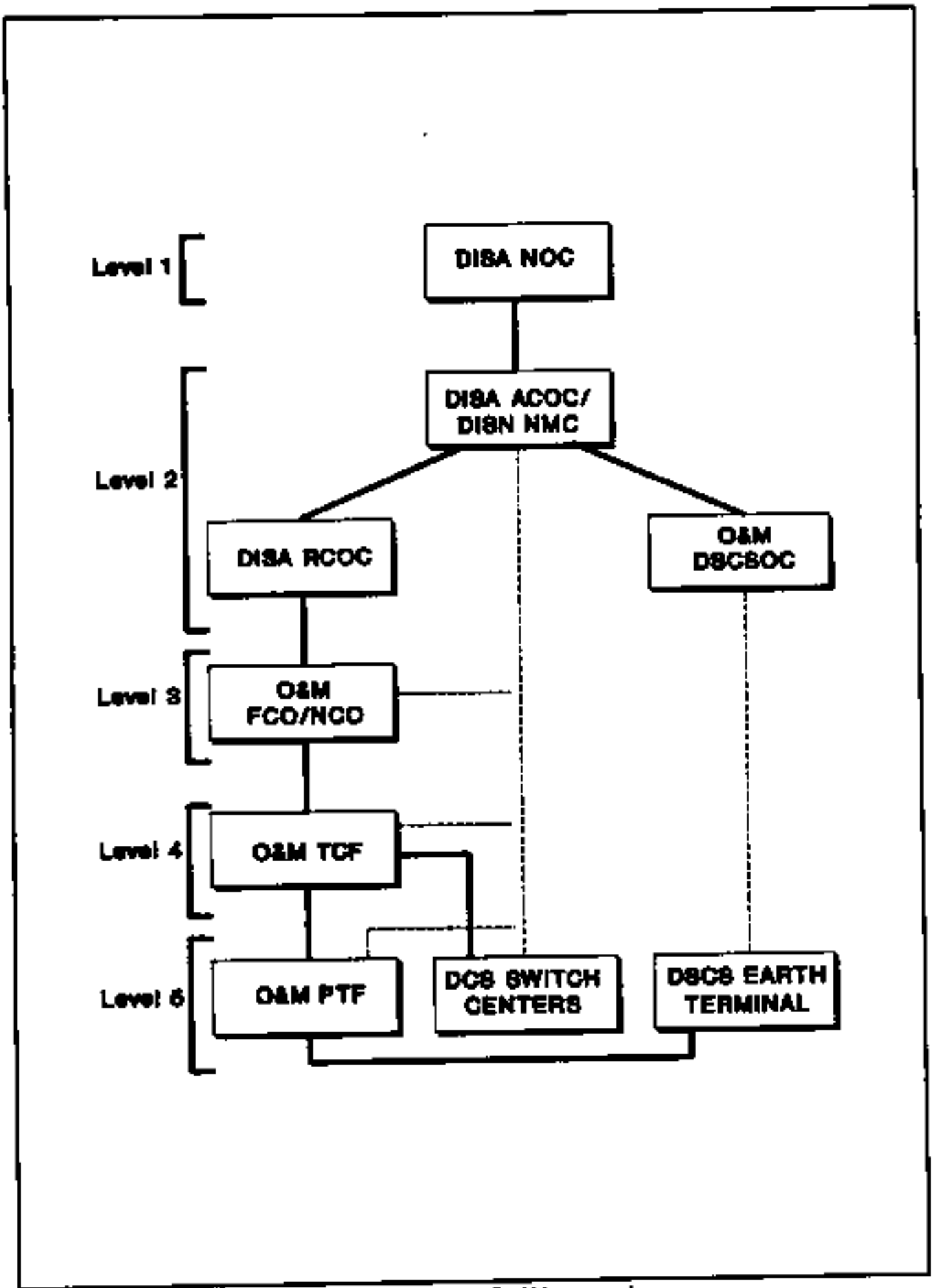


Figure 1-1. DISA System Control Hierarchy.

TO: (Enter unit designation and address of the user)

SUBJECT: Defense Communications System (DCS) User Responsibilities

REF: Defense Information Systems Agency (DISA) Circular 310-70-1

1. Your circuit (CCSD) to (location) identifies you as a user of the DCS. As a DCS user you share the responsibility of ensuring reliable and quality service.

2. Please notify your servicing DCS Technical Control Facility (TCF) as soon as service interruptions or circuit problems are encountered. Your servicing TCF is (facility name/O&M organization), at telephone number (commercial and DSN). You should expect to work with your servicing DCS TCF when it is necessary to remove your circuit from service. This is normally required for fault isolation purposes during degradation or outages and for performing quality control testing. If you cannot release the circuit due to mission requirements, advise your servicing DCS TCF when you can release the circuit. Please provide your servicing DCS TCF with the telephone number(s) to be used for contacting your facility. Changes should be promptly reported to your servicing DCS TCF.

3. You must initiate a Request For Service (RFS) by coordinating with your servicing DCS TCF, or local telecommunications office, prior to making any equipment or configuration change(s) to your service. This includes such things as changing terminal equipment, transmission speed, user location, etc. The RFS must be submitted to the appropriate Telecommunications Certification Office (TCO). If approved, the TCO will submit a Telecommunications Service Request (TSR) to the DISA. The DISA will then issue a Telecommunications Service Order (TSO) authorizing the change(s). Refer to DISAC 310-130-1 for details on TSR's.

4. If your servicing DCS TCF fails to satisfy your requirements, you should contact the local telecommunications office at (telephone number).

5. Thank you for using the DCS. Please feel free to contact your servicing DCS TCF for assistance at any time.

DCS Facility Chief

Figure 2-1. Sample DCS User Notification Letter

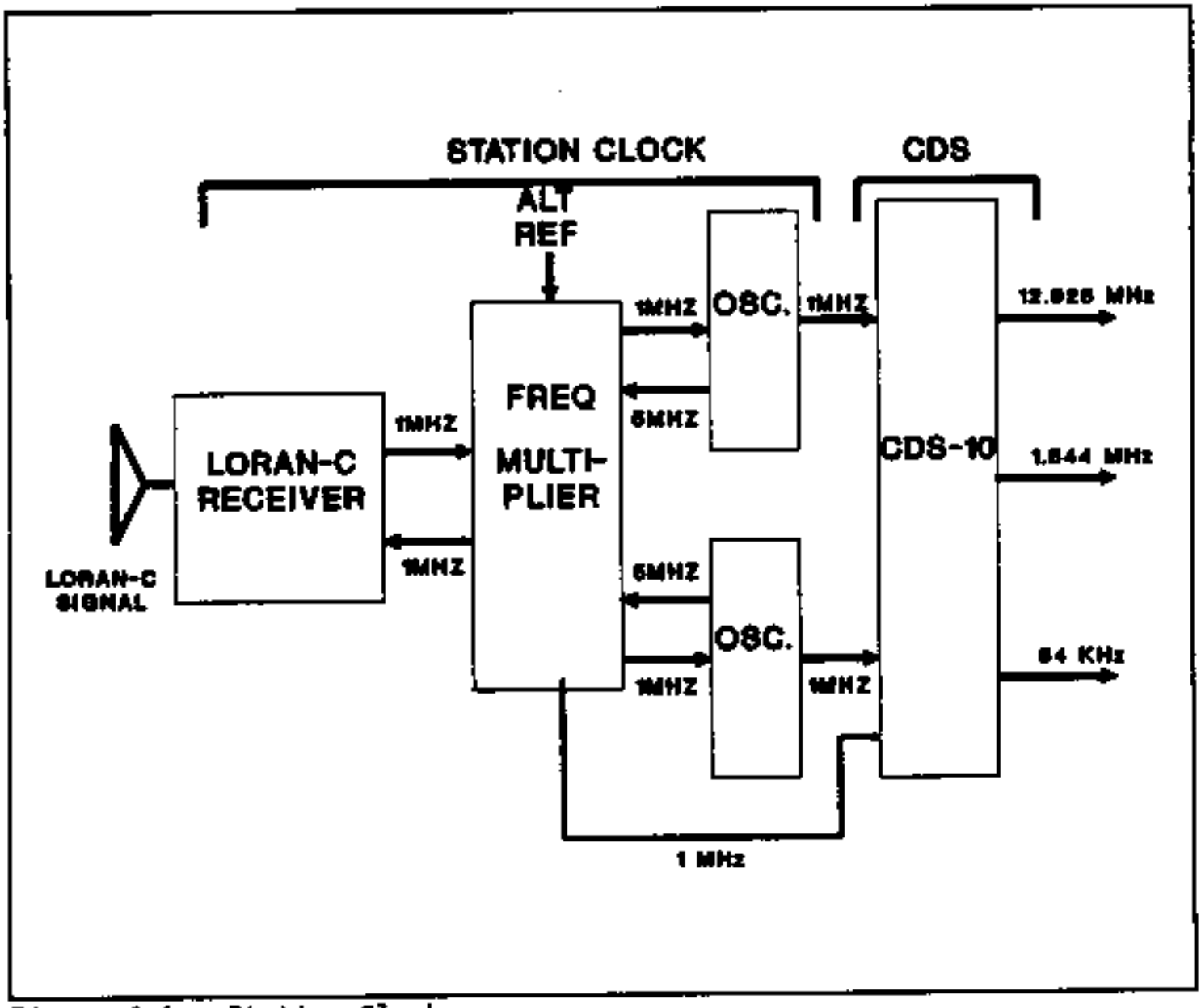


Figure 4-1. Station Clock.

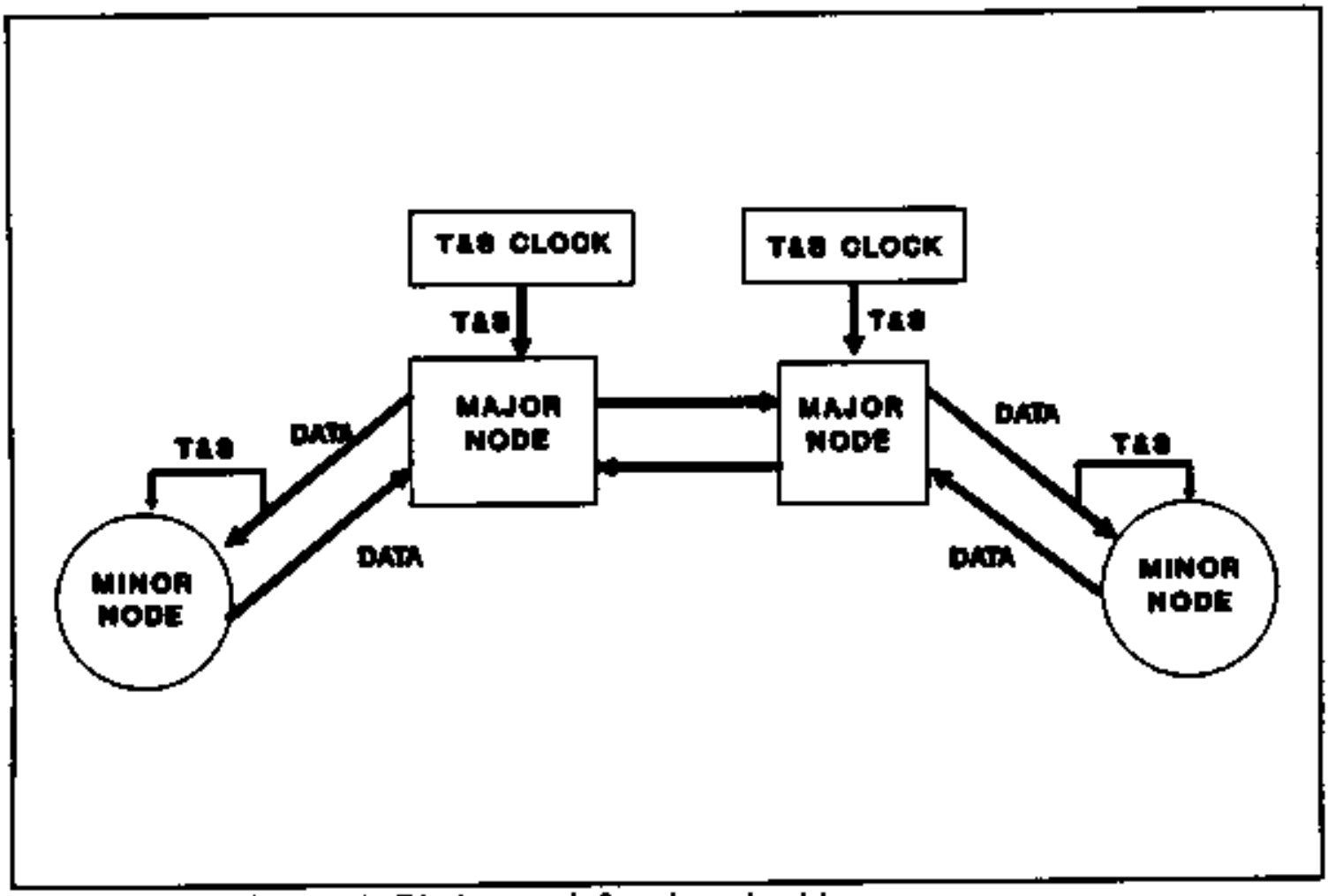
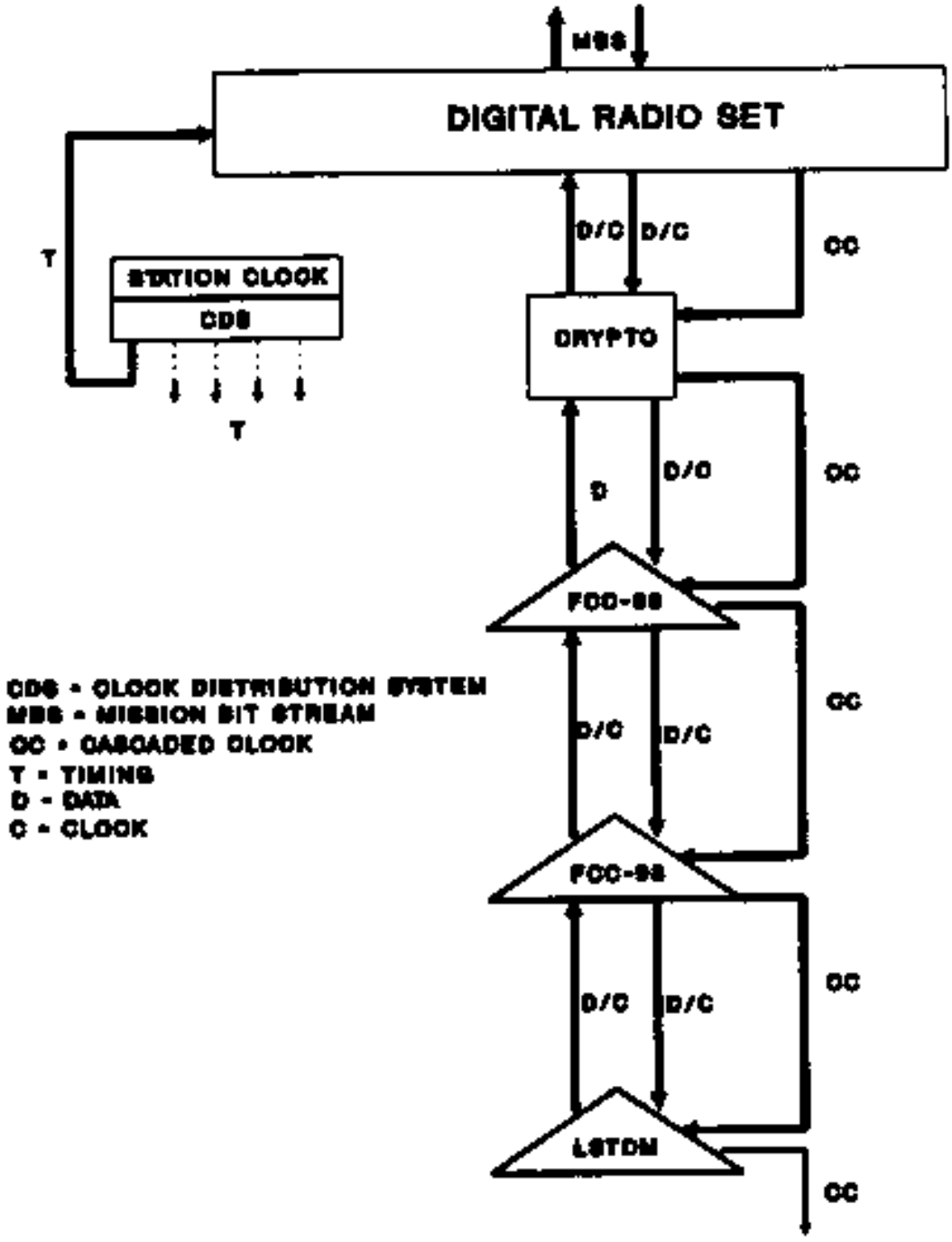


Figure 4-2. Network Timing and Synchronization.


MBS
DIGITAL RADIO SET
D/C
D/C
CC
T
STATION CLOCK
CDS
CRYPTO
T
D
D/C
CC
FOC-SS
CDS = CLOCK DISTRIBUTION SYSTEM
MBS = MISSION BIT STREAM
CC = CASCADED CLOCK
T = TIMING
D = DATA
C = CLOCK
D/C
D/C
CC
FOC-SS
D/C
D/C
CC
LSTDM
CC

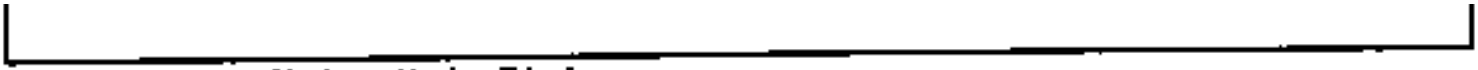
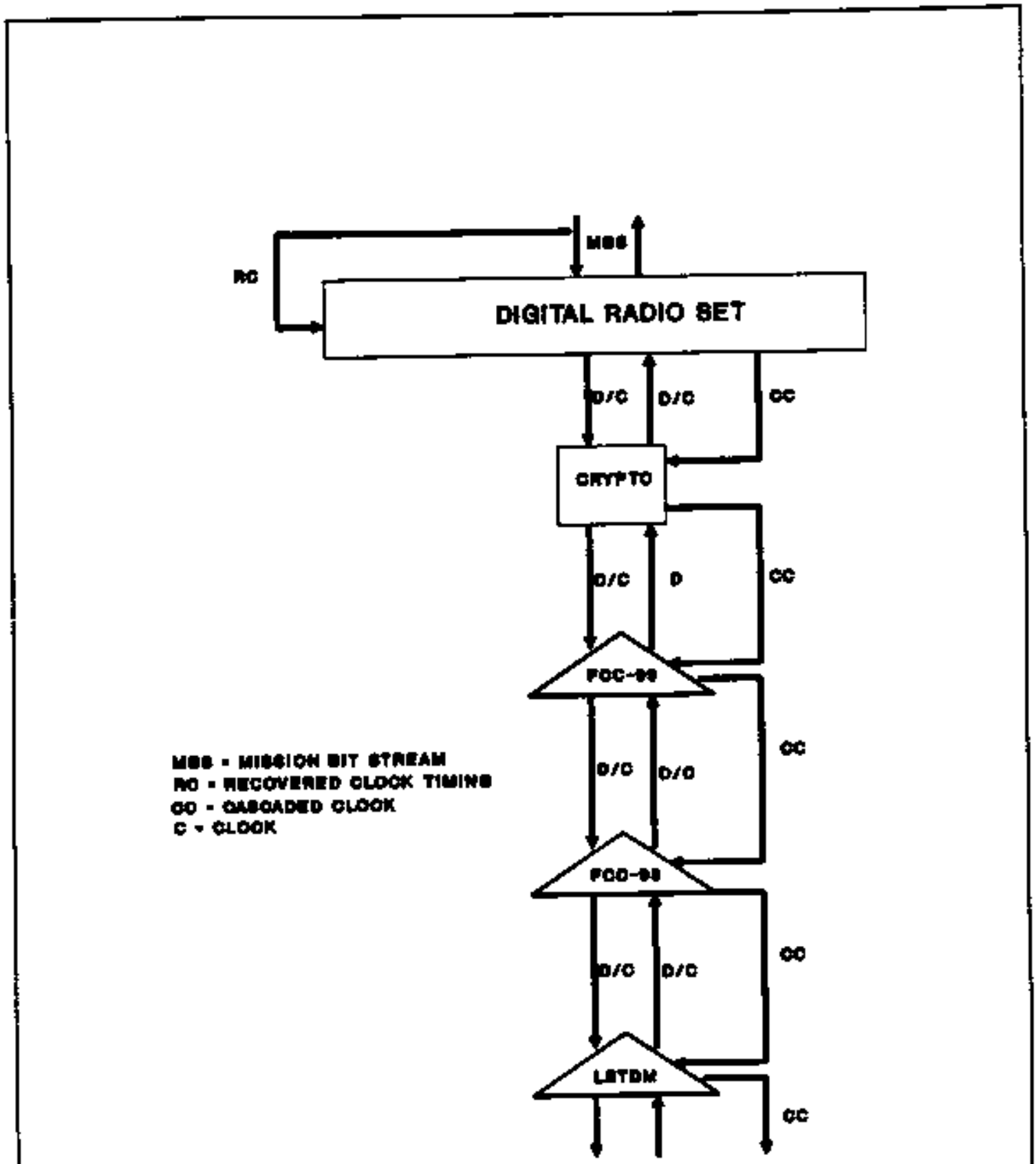


Figure 4-3. Major Node Timing.


MBS
RC
DIGITAL RADIO SET
D/C
D/C
CC
CRYPTO
D/C
D
CC
FCC-96
D/C
D/C
CC
FCC-96
D/C
D/C
CC
LSTDM
CC
MBS = MISSION BIT STREAM
RC = RECOVERED CLOCK TIMING
CC = CASCADED CLOCK
C = CLOCK

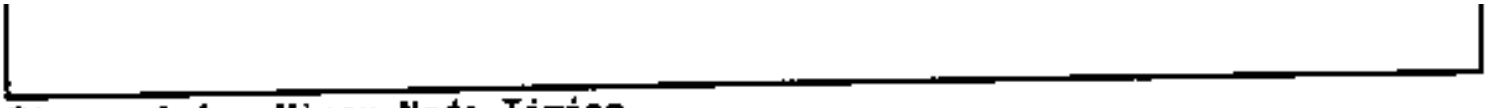
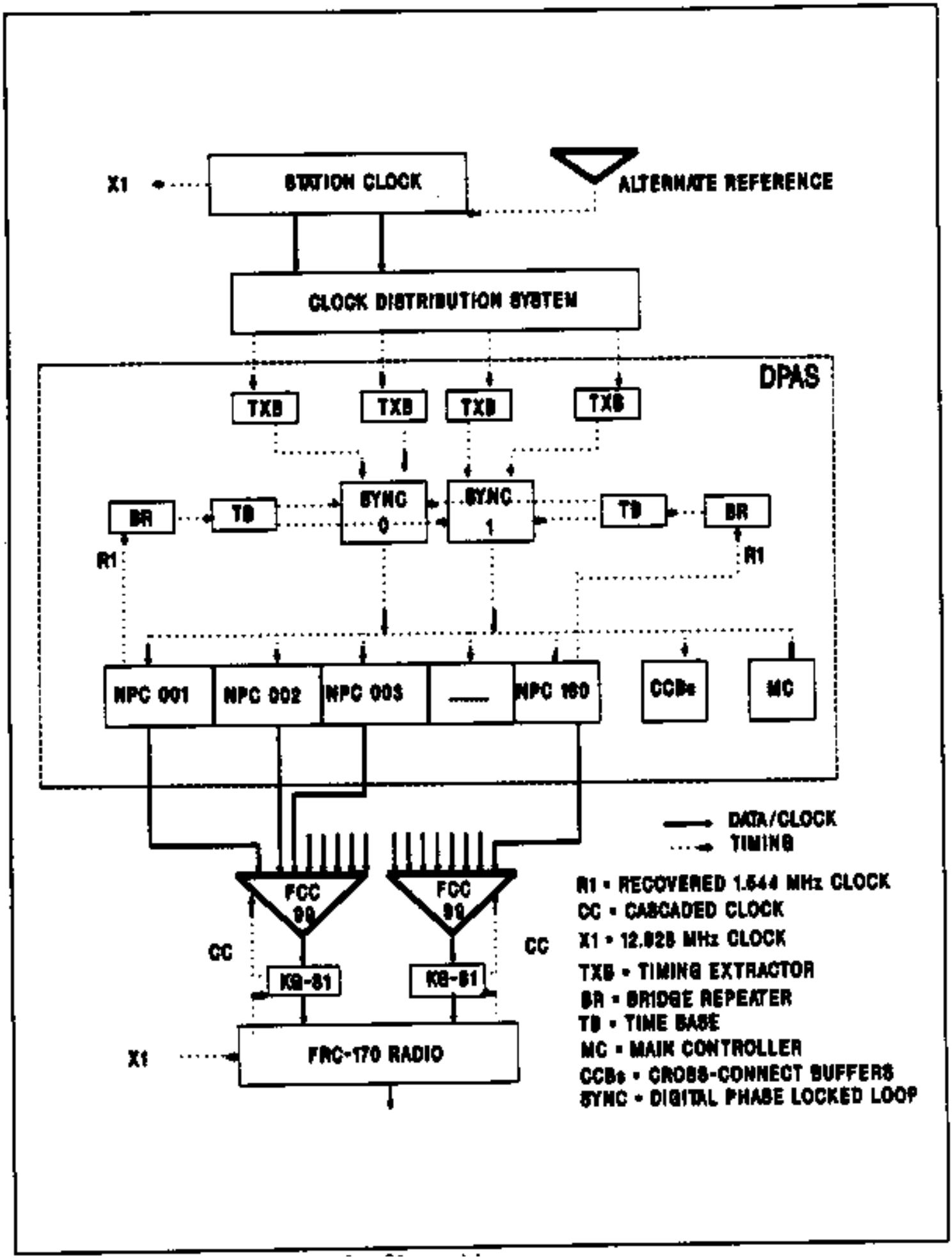


Figure 4-4. Minor Node Timing.


X1
STATION CLOCK
ALTERNATE REFERENCE
CLOCK DISTRIBUTION SYSTEM
DPAS
TXB
TXB
TXB
TXB
BR
TB
SYNC 0
SYNC 1
TB
BR
R1
R1
NPC 001
NPC 002
NPC 003
NPC 160
CCBs
MC
DATA/CLOCK
TIMING
FCC 99
FCC 99
CC
CC
KS-61
KS-61
X1
FRC-170 RADIO
R1 = RECOVERED 1.544 MHz CLOCK
CC = CASCADED CLOCK
X1 = 12.928 MHz CLOCK
TXB = TIMING EXTRACTOR
BR = BRIDGE REPEATER
TB = TIME BASE
MC = MAIN CONTROLLER
CCBs = CROSS-CONNECT BUFFERS
SYNC = DIGITAL PHASE LOCKED LOOP

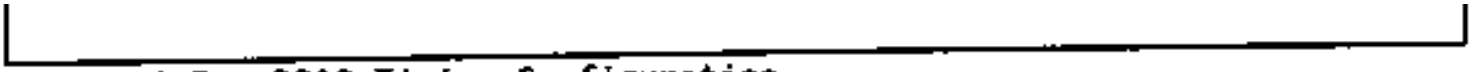


Figure 4-5. DPAS Timing Configuration.

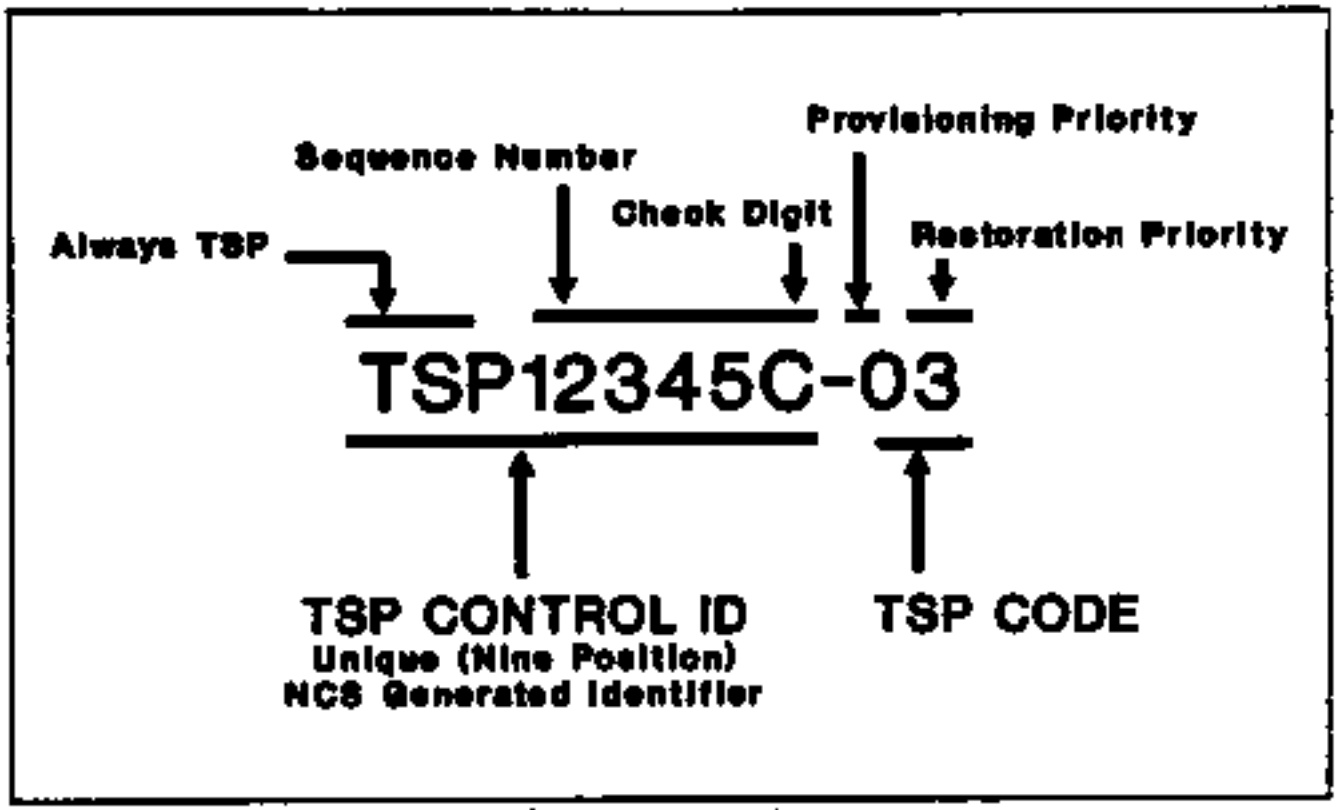
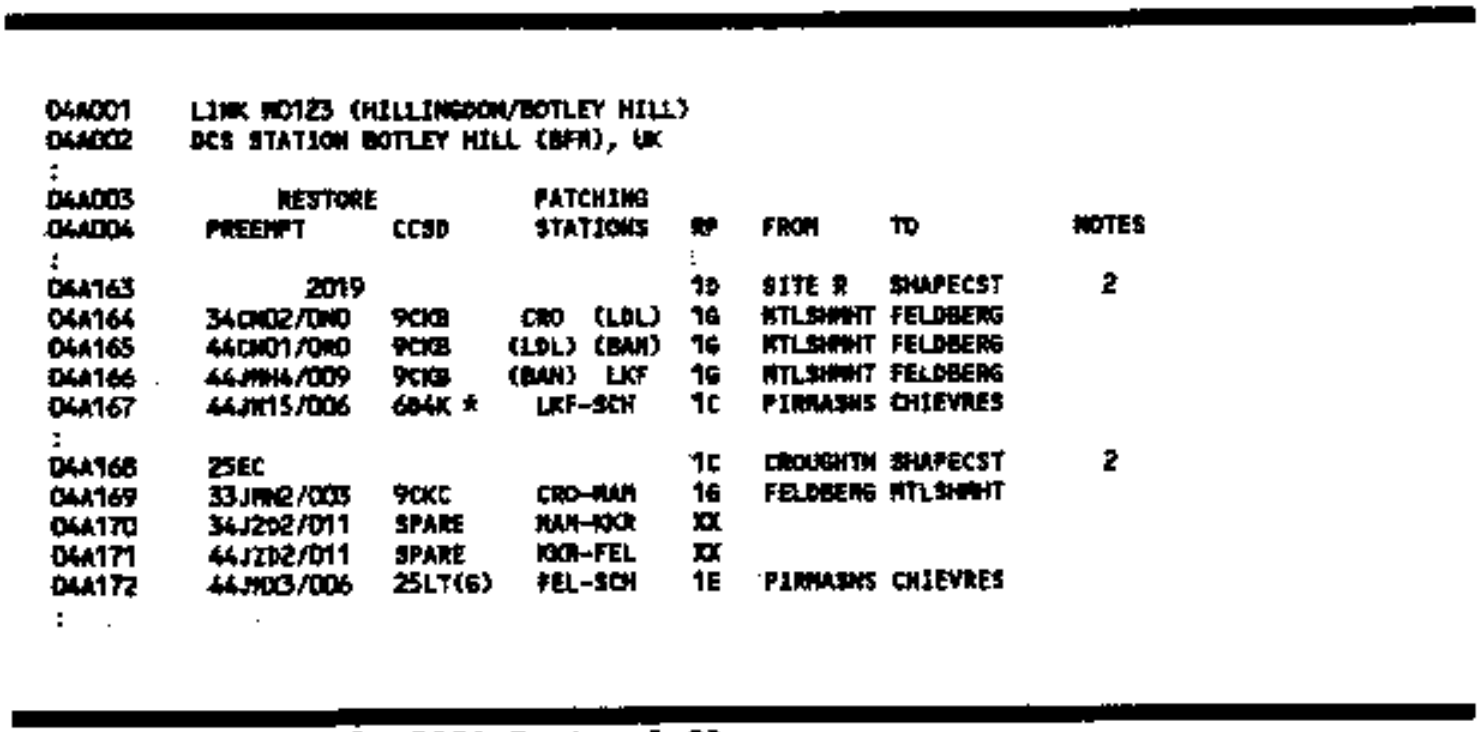
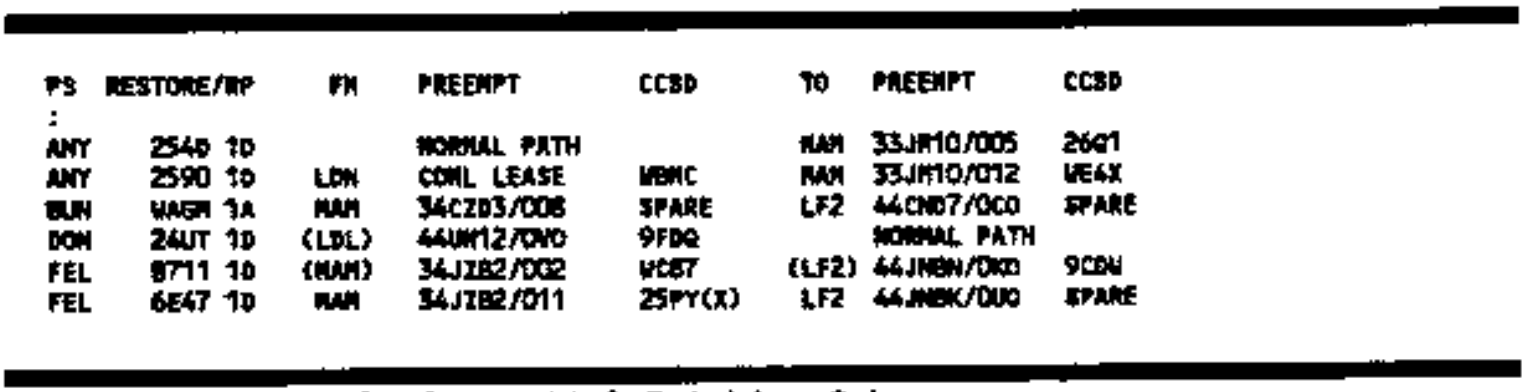


Figure 5-1. TSP Identification Code.



```
:
D4A001    LINK NO123 (HILLINGDON/BOTLEY HILL)
D4A002    DCS STATION BOTLEY HILL (BFH), UK
:
D4A003          RESTORE                PATCHING
D4A004    PREEMPT       CCSD           STATIONS     RP   FROM       TO          NOTES
:                                                    :
D4A163          2019                                 1B   SITE R     SHAPECST      2
D4A164    34CN02/CN0    9CKB        CRO   (LDL)    1G   NTLSHWNT   FELDBERG
D4A165    44CN01/CN0    9CKB      (LDL)   (BAN)    1G   NTLSHWNT   FELDBERG
D4A166    44JN14/009    9CKB      (BAN)   LKF      1G   NTLSHWNT   FELDBERG
D4A167    44JN15/006    64K *       LKF-SCH        1C   PIRMASNS   CHIEVRES
:
D4A168    25EC                                     1C   CROUGHTN   SHAPECST      2
D4A169    33JN02/CX5    9CKC        CRO-MAN        1G   FELDBERG   NTLSHWNT
D4A170    34J202/D11    SPARE       MAN-KKR        XX
D4A171    44JZD2/D11    SPARE       KKR-FEL        XX
D4A172    44JN03/006    25LT(6)     FEL-SCH        1E   PIRMASNS   CHIEVRES
:
```

Figure 5-2. Sample DISA Restoral Plan.



PS	RESTORE/RP	FN	PREEMPT	CCBD	TO	PREEMPT	CCBD
:							
ANY	2540 1D		NORMAL PATH		NAM	33JM10/005	2601
ANY	2590 1D	LDN	CONL LEASE	WBMC	NAM	33JM10/012	WE4X
BUN	WASH 1A	NAM	34CZD3/008	SPARE	LF2	44CN07/0C0	SPARE
DON	24UT 1D	(LDL)	44UM12/CNO	9FDQ		NORMAL PATH	
FEL	8711 1D	(NAM)	34JZB2/DG2	WC87	(LF2)	44JN8N/0K0	9CDN
FEL	6E47 1D	NAM	34JZB2/011	25PY(X)	LF2	44JN8K/0U0	SPARE

Figure 5-3. Sample Sequential Patching Scheme.

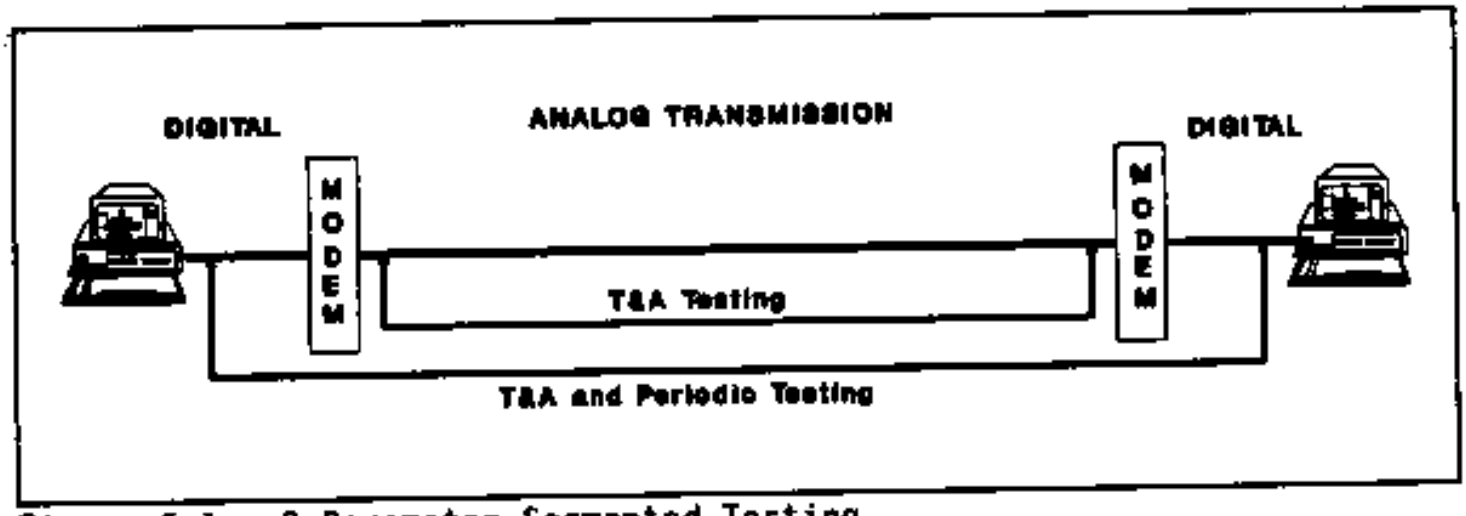


Figure 6-1. Q Parameter Segmented Testing.

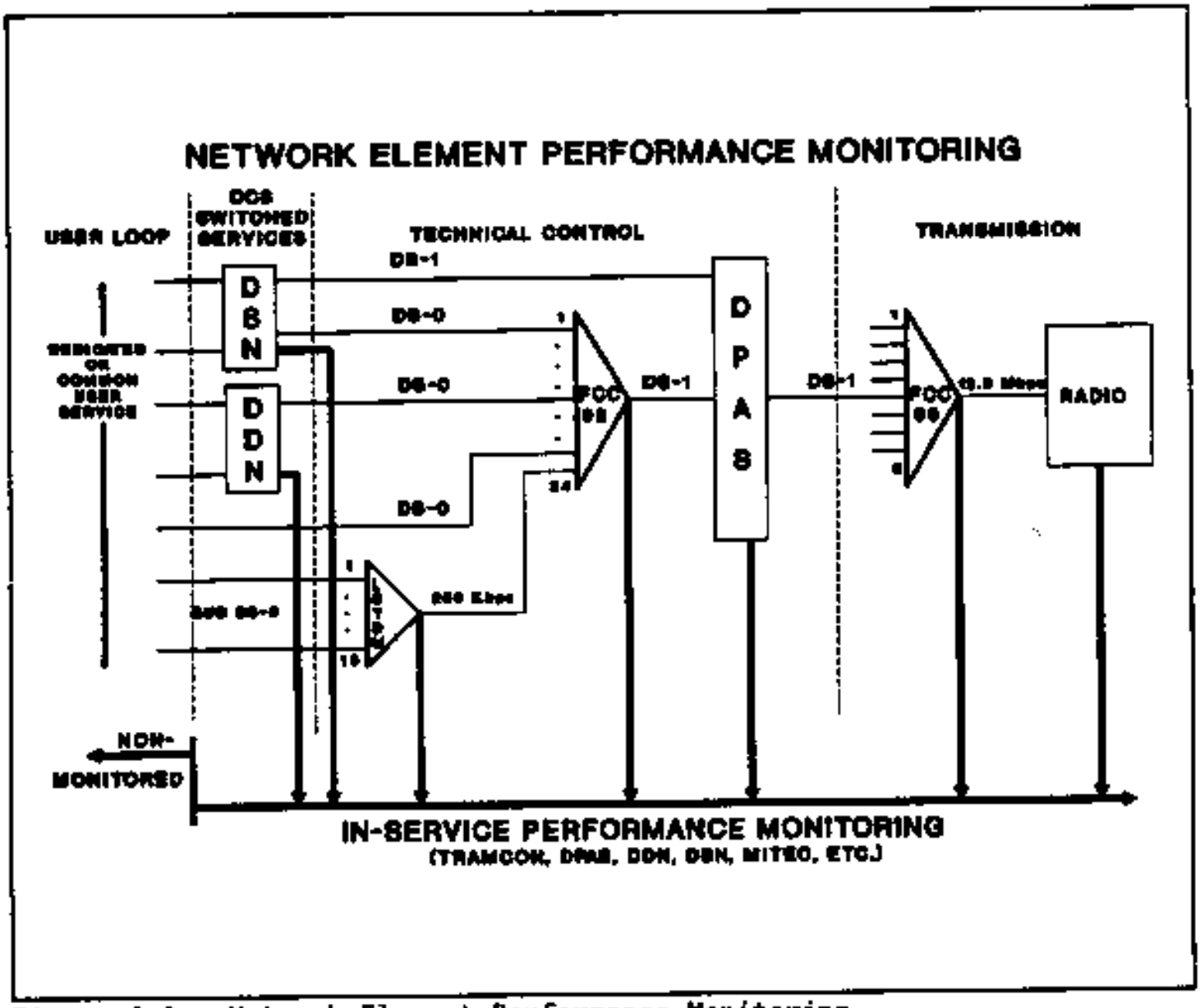


Figure 6-2. Network Element Performance Monitoring

DPAS	IRAMCON
Bit Error Rate (BER)	Received Signal Level (RSL)
Change of Frame Alignment (COFA)	Signal Quality Monitor (SQL)
Frame Slip	Frame Error Count (FEC)
Errored Seconds (ERS)	Frame Error Seconds (FES)
Severely Errored Seconds (SERS)	
Cyclic Redundancy Check-6 (CRC-6)	
Out of Frame (OOF)	
Bipolar Violations (BPV)	

Figure 6-3. Performance Monitoring Parameters

ISP	RP	MT (%)
1 AND 2	1	99%
3	2	95%
4	3	92%
5	4	90%
All Others		80%

Figure 6-4. Management Thresholds

```
                                        **UNCLASSIFIED**          PAGE001
ST
UNCLAS
TSO 010474/26AU-01

A. DCSTCO TSR-CRP TRAFFIC WASHINGTON DC//NSG 0215192 MAY 91
B. MGR NCS-TSP WASHINGTON DC//NSG 1320462 MAY 91
C. TELCON D SANDERS DISA/DOCA AND R BURKE DISA/DOCT
1. PURPOSE
   A.  THE PURPOSE OF THIS TSO IS TO:
       (1)  PROVIDE, INSTALL AND MAINTAIN A 56KB LEASED CIRCUIT BETWEEN THE
            LANGLEY AFB VA PSN (3.A) AND THE SEMBACH GE PSN (3.B) IAW REF "A".
       (2)  DECCO: LEASE INTERNATIONAL 56KB CIRCUIT AND DSU/CSU'S, WITH
            INTERFACES AND NECESSARY CONDITIONING EQUIPMENT, BETWEEN THE LANGLEY
            AFB VA TEF (3.B) AND THE SEMBACH GE TCF (3.C). DSU/CSU'S AND
            INTERFACES WILL BE LOCATED AT LANGLEY AFB VA DOI (3.A) AND SEMBACH GE
            DOI (3.D).
       (3)  PER REF "C" CIRCUIT IS TO BE COMMERCIAL LEASE IN ORDER TO PROVIDE UDH DISNET
            BACKBONE CIRCUIT ROUTING DIVERSITY AND NETWORK SUSTAINABILITY.
       (4)  ESTABLISH TSP AUTHORIZATION CODE (TSP CONTROL ID AND TSP
            AUTHORIZATION NUMBER) FOR THIS IST CIRCUIT IAW REF "A" AND "B".
       (5)  DISA/D1SP8: PROVIDE GFE CRYPTO AND APPROPRIATE CABLES AT 3.A AND
            3.D.
       (6)  SEE REMARKS (5.I) FOR ADDITIONAL INFORMATION.
   B.  NA
   C.  NA
2. GENERAL CIRCUIT/TRUNK INFORMATION
   A. DU16826AU      B. TSP007JT4-02     C.  START
   D. 1416001 OCT 91 (SIP)
   E. (1)  LNGLYAFB DOI 51/1      CONTACT:  NODE SITE COORDINATOR (V) 574-7225,
                                            (C) 804-764-7225
      LNGLYAFB TEF 51/1  CONTACT:    CIRCUIT ACTIONS (C) 804-764-7225,
                                     (V)574-7225
      SEMBACH TCF GE/4   CONTACT:    CIRCUIT ACTIONS (C) 063-0267-6484,
                                     (V)314-496-7830/ 6484
      (2)   SEMBACH DOI GE/4 CONTACT: NODE SITE COORDINATOR        (C) 063-0267-6484,
                                     (V) 314-496-7830/6484
   F.  J1                         G. FULL DUPLEX
   H.  CCO LNGLYAFB/51/TEF/(V)574-7225, (C)804-764-7225
   I.  56KBS J. KG-84A                        K.       FULL PERIOD
   L.  NO SIGNALING
   M.  NA     N. DU24APR910772   O. NA       P. A    Q. A
   R.  YSAB   S. DK              T. 26AN, 26AP, 26AQ
   U.  (1) NA
```

Figure 8-1. Sample TSO.

```
                          **UNCLASSIFIED**              PAGE 002

   AC. NA                          AD. NA
   AE. NA                AF. NA              AG. N                       AH. NA
   AI. NA                AJ. NA              AK. NA
   AL. NA                AM. NA              AN. NA
   AO. NA                AP. NA              AQ. NA          AR. NA
   AS. NA                AT. NA              AU. NA          AV. NA      AW. NA
   AX. NA
3. FACILITY AND EQUIPMENT INFORMATION
   A. LANGLEY 511801
        BLDG: 768
        RM: 22B
        CONTACT:  NODE SITE COORDINATOR, (C)804-764-7225, (V)574-7225
        MAIL ADDRESS: COMMANDER L912CSGP
        ATTN: DON
        LANGLEY AFB, VA 23665-6345 (DU910772)
        (1)    (A) 88M C/3D INP
               (B) TERM: 4W
               (C) UNIQUE INST FACT: THIS CIRCUIT WILL TERMINATE ON PORT 3 OF
                   INP 21.
               (D)  RS-B4A
               (E)  INSIDE WIRE INSTL/MAINT: CPIUI-NO/CPIUM-NO
               (F)  ASSOC LEASED EQPT: BOTH
               (G)  COML ACCESS: WILL NOT LEAK
               (H)  INTERFACE:
                    56KB VENDOR PROVIDED EQUIPMENT, MILSTD 188-114A, BALANCED
                    SYNCHRONOUS
               (I)  CROSS-CONNECT
        (2)    (A) 11 C NO SIG
               (B) IN-HOUSE CABLE
   B. LANGLEY 511TEF
        BLDG: 768
        RM: 22A
        CONTACT: NODE SITE COORDINATOR, (C)804-764-7225, (V)574-7225
        MAIL ADDRESS: COMMANDER L912CSGP
        ATTN: DON
        LANGLEY AFB, VA 23665-6345 (DU910772) NPA/NXX: 804/764
        REMARK: MDF
        (1)    (A) TERM: 4W
               (B) CROSS-CONNECT
               (C) BLACK DIGITAL PATCH/TEST PANEL
               (D) INTERFACE: MILSTD 188-114A, BALANCED, SYNCHRONOUS
               (E) INSIDE WIRE INSTL/MAINT: CPIUI-NO/CPIUM-NO
               (F) ASSOC LEASED EQPT: NONE
               (G) COML ACCESS: WILL NOT LEAK
               (H) CROSS-CONNECT
        (2)    (A) 14D      L NO SIG  UNKN         D NEW
               (B) DECCD: LEASE CIRCUIT, DSU/CSU, AND INTERFACE EQUIPMENT AS SPECIFIED BETWEEN LANGLEY
AFB TEF AND SEMBACH GE.
   C.  SEMBACH GE4TCF
        BLDG: 713
```

Figure 8-1. Sample TSO (Continued).

BLDG: 113
RM: 10
CONTACT: CIRCUIT ACTIONS (C)063-0267-6484,
(V)314-496-7830/ 6484
MAIL ADDRESS: COMMANDER 2134CS
ATTN: LGU
SEMBACH AB, GE APO NEW YORK 09136 (DU910772)
NPA/NNX: 063/267
REMARK: MDF
(1)(A) TERM: 4W
(B) CROSS-CONNECT
(C) BLACK DIGITAL PATCH/TEST PANEL
(D) INTERFACE: MILSTD 188-114A, BALANCED, SYNCHRONOUS
(E) INSIDE WIRE INSTL/MAINT: CPIWI-NO/CPIWM-NO
(F) ASSOC LEASED EQPT: NONE
(G) COML ACCESS: WILL NOT LEAK
(H) CROSS-CONNECT
(2)(A) 44 C NO SIG UNKN Z
(B) IN-HOUSE CABLE

D. SEMBACH GE4801
BLDG: 113
RM: 10
CONTACT: NODE SITE COORDINATOR (C)063-0267-6484,
(V)314-496-7830/ 6484
MAIL ADDRESS: COMMANDER 2134CS
ATTN: LGU
SEMBACH AB, GE APO NEW YORK 09136 (DU910772)
(1)(A) TERM: 4W
(B) ASSOC LEASED EQPT: BOTH
(C) INTERFACE: 56KB VENDOR PROVIDED EQUIPMENT, MILSTD 188-114A, BALANCED SYNCHRONOUS
(D) KG-84A
(E) BBN C/30 IMP
(F) UNIQUE INST FACT: THIS CIRCUIT WILL TERMINATE ON PORT 5 OF IMP 100.
(G) INSIDE WIRE INSTL/MAINT: CPIWI-NO/CPIWM-NO
(H) COML ACCESS: INTERNATIONALE MIETLEITUNG

4. NUMBER CONTROL
NA
5. OTHER SPECIFIC DIRECTIONS
A. SVC APPLIES TO: CIRCUIT ONLY/SINGLE VENDOR
B. NETWORK SVC: DDN
C. COMMERCIAL/GFE DATE: 301600Z SEP 91 (SIP)
D. CCCI/CSA: NEW LEASE
E. TSR CONTACT: DCSTCO/NMI CONTRACTOR SUPPORT POC IS K. BARNETT (KB)
(C) 703-359-9400, (V) 289-0860 (EXT 3941)
F. STATION DESIGNATED IN PARAGRAPH 2H AS CCO/CNO OR FCO WILL SUBMIT COMPLETION REPORT IAW DCAC 310-130-1, SUPP 1, 2, 3 FORMAT OR DCAC 310-70-1 VOL II CHAPTER 20 PARA 4. REPORT WILL BE ADDRESSED TO ORIGINATOR AND ALL ADDRESSEES OF THIS TSO.
G. CA: CONNECTION APPROVAL IN GERMANY FOR KG-84AS IS A3023428, DTD 15 JUL 87.

Figure 8-1. Sample TSO (Continued).

Figure 8-1. Sample TSO (Continued).

UNCLASSIFIED PAGE 004

H. "WARNER EXEMPT." THIS SERVICE IS FOR A COMMON USER SYSTEM. TO ASSURE INTEROPERABILITY IN SUPPORT OF INTELLIGENCE AND COMMAND AND CONTROL OF MILITARY FORCES, REQUIREMENTS IN SUPPORT OF THE DEFENSE DATA NETWORK "DDN" SYSTEM "DOD COMMON USER USER SYSTEM" ARE CONSIDERED WARNER EXEMPT FROM FTS2000.

I. REMARKS:

(1) FOR THE VENDOR: THE USA CARRIER SHALL BE TOTALLY RESPONSIBLE FOR END-TO-END TECHNICAL SUFFICIENCY, AND IS RESPONSIBLE TO PROVIDE ANY ASSOCIATED EQUIPMENT, TO INCLUDE OBTAINING CONNECTION APPROVAL, AS REQUIRED. ADDITIONALLY, THE NORTH AMERICAN TERMINAL WILL BE ENGINEERED, CONFIGURED, INSTALLED, TESTED, AND MAINTAINED IN A MANNER THAT IS COMPATIBLE WITH THE EUROPEAN TERMINAL THROUGH WHATEVER TRANSMISSION SYSTEMS NECESSARY.

(2) THE SERVICE ORDERED BY THIS ACTION WILL HANDLE INTER-STATE TRAFFIC. CONTRACTOR(S) WILL TELEPHONICALLY COORDINATE SITE VISITS WITH SITE POCS AT LEAST 24 HOURS IN ADVANCE. ALL EQUIPMENT AND CIRCUIT PROBLEMS WILL BE REPORTED BY PHONE CITING DSNETI LINE NUMBER 182 TO THE DISNET MONITORING CENTER (DMC) (703)746-1849/1850. THE CIRCUIT VENDOR SHALL MARK AND TAG THE CIRCUIT WITH CIRCUIT IDENTIFICATION AT ALL DEMARCATION POINTS AT BOTH ENDS OF THE CIRCUIT. INSTALLATION OF EQUIPMENT AND CIRCUITS TO BE ACCOMPLISHED BETWEEN THE HOURS OF 0900 AND 1600 LOCAL TIME EACH WORK DAY ONLY.

(3) DSNETI LINE NUMBER 184 IS TO BE CANCELLED WHEN THIS CIRCUIT IS OPERATIONAL.

(4) EARLIER SERVICE DATE IS DESIRABLE AND ACCEPTABLE.

J. EST SVC LIFE: 60 MONTHS

K. RFS 0: DSNET1 MC LINE NUMBER 182

L. DATA BASE ACTION WILL BE TAKEN BY DISA/DOCA.BB

M. ANY ADDRESSEE HAVING ACTION ON THE TSO WILL NOTIFY ALL OTHER ADDRESSEES BY MESSAGE IMMEDIATELY OF PROBLEMS WHICH MAY AFFECT THE SPECIFIED ACTION.

N. HQ DISA TSO POC IS D SANDERS (DOCA.S) COML 703-692-6106, DSN 222-6106.

6. SWITCHED RECORD NETWORK INFO (DDN)

A. NA B. N/A C. NA D. NA

E. SECRET F. NA G. NA

H. NA

I. NA

J. NA K. R L. NA

M. NA

N. NA

O. NA

P. DSNET1 Q. NA

BT

UNCLASSIFIED

Figure B-1. Sample TSO (Concluded).

```
FM 1912 CSGP LANGLEY AFB VA//DON//
TO DISA TMSO TSR-TSO-CRP TRAFFIC SCOTT AFB IL
INFO "ALL ADDRESSEES IN TSO"
BT
UNCLAS
SUBJ:  IN-EFFECT REPORT
A. REFERENCE TSO MESSAGE
1. D10474/26WU-01
2. DU24APR9110772
3. DU1826WU
4. ALLA DP010334V
5. START
6. A. 141600Z OCT 91
   B. 141200Z OCT 91
7. REMARKS
8. POC INFORMATION
```

Figure 8-2. Sample In-Effect Report

```
FM 1912 CSGP LANGLEY AFB VA//DON//
TO DISA TMSO TSR-TSO-CRP TRAFFIC SCOTT AFB IL
INFO "ALL ADDRESSEES IN TSO"
BT
UNCLAS
SUBJ:  EXCEPTION REPORT
A. REFERENCE TSO MESSAGE
1. D10474/26WU-01
2. DU24APR9110772
3. DU1826WU
4. ALLA DP010334V
5. START
6. A. 141600Z OCT 91
   B. 141200Z OCT 91
7. B.
8. REGEN CURRENTLY BEING PROCURED.  EXPECT INSTALLATION
APPROX 30 OCT 91.
9. POC INFORMATION
BT
```

Figure 8-3. Sample Exception Report.

```
FM 1912 CSGP LANGLEY AFB VA//DON//
TO DISA TMSO TSR-TSO-CRP TRAFFIC SCOTT AFB IL
INFO "ALL ADDRESSEES IN TSO"
BT
UNCLAS
SUBJ:  EXCEPTION REPORT
A. REFERENCE TSO MESSAGE
1. D10474/26WU-01
2. DU24APR9110772
3. DU1826WU
4. ALLA DP010334V
5. START
6. A. 141600Z OCT 91
   B. 141200Z OCT 91
7. A
8. UNKN
9. EXPEDITED ACTION IS BEING TAKEN TO INSTALL USER
TERMINAL EQUIPMENT.  DATE OF INSTALLATION NOT YET FIRM
BUT ANTICIPATED APPROX 30 OCT 91.
10. POC INFORMATION
BT
```

Figure 8-4. Sample Delayed Service Report.

DD FORM 1441, 1 JAN 65

CIRCUIT DATA

CCSD	LANDLINE/CHAN NO	TERMINALS	CONTROL FACILITIES	NCS RP

TERM STATION	OPERATING AGENCY	USER TERM EQUIPMENT	USER CONTACT
TERM STATION	OPERATING AGENCY	USER TERM EQUIPMENT	USER CONTACT

TYPE CIRCUIT	USE	CCD (SCCO)	MODULATION RATE	CRYPTO SERVICE

ACTIVATION AUTHORITY	DATE AND TIME INSTALLED	CKT MODIFICATIONS *(Continue on reverse side)*	
		AUTHORITY	DATE AND TIME COMPLETED
DEACTIVATION AUTHORITY	DATE AND TIME CEASED		

CONDITIONING EQUIPMENT	REMARKS
PAD	
REPEAT COILS	
LINE AMPLIFIER	
DELAY EQUALIZER	
AMPLITUDE EQUALIZER	
REGENERATIVE REPEATER (TTY)	
4 WAY 4 WIRE BRIDGE	
4 WAY TERMINAL SET	
ECHO SUPPRESSOR	
OTHER	

CCSD	LANDLINE/CHAN NO	TERMINALS	CONTROL FACILITIES	NCS RP

Figure 9-1. DD Form 1441, Circuit Data.

OUTAGE AND RESTORATION RECORD

1. REPORTABLE — Yes / No
a. DISA
b. DECCO

2. TICKET NUMBER

3. FACILITY a. SND	3. FACILITY b. RCV	4. FACILITY/LINK/TRUNK ID	5 CHNL NBR	6. CCSD/CSA	7. TSP	8. TIME OUT DATE TIME GROUP	9. TIME IN DATE TIME GROUP	10. RFO	11. COORDINATION a' FAC	b. OUT	c IN
									USER		
									TCF		

12. REPORTED TROUBLE

13. EQUIPMENT NOMENCLATURE

14. WORK ORDER NUMBER

15. MAINTENANCE START

16. EQUIPMENT ID

17. MAINTENANCE ACTIVITY

18. MAINTENANCE END

19. HAZARDOUS CONDITION (X one)
YES NO

20. ETR

21. INITIALS

22. CORRECTIVE ACTION

23. CIRCUIT REROUTED CCSD/CSA	24. PATCH UP DATE TIME GROUP	25. PATCH DOWN DATE TIME GROUP	26. CIRCUIT PRE-EMPTED CCSD/CSA	27. REROUTE REMARKS (Outage Remarks on reverse)

28. SUPERVISOR'S REVIEW

DD Form 1443, MAY 92

Replaces DD Form 1445, 1 Aug 63, and DD Form 1698, 1 Jan 69, and DD Form 1443, 1 Jan 69, which are obsolete

Figure 9-2. DD Form 1443, Outage and Restoration Record (Front).

20. OUTAGE REMARKS

a DATE TIME GROUP	b INITIALS	c REMARKS

LEGEND *(Explanation of Acronyms)*

DISA	- Defense Information Systems Agency	CHNL NBR	- Channel Number	RFO	- Reason for Outage
DECCO	- Defense Commercial Communications Office	CCSD	- Command Communications Service Designator	FAC	- Facilities
SND	- Send	CSA	- Communications Service Authorization	ETR	- Estimated Time of Return
RCV	- Receive	TSP	- Telecommunications Service Priority	TCF	- Technical Control Facility

DD Form 1443 (Back), MAY 92

Figure 9-3. DD Form 1443, Outage and Restoration Record (Reverse).

CIRCUIT PARAMETER TEST DATA - ANALOG

1. CCSD	2. TYPE TEST	3. PARAMETER CODE	4. TIME START (DTG)	5. TIME FINISH (DTG)

6. RECEIVE STATION / INITIALS	7. TRANSMIT STATION / INITIALS

TEST	SPECIFICATIONS		RECEIVE		TRANSMIT	
			INITIAL	ADJUSTED	INITIAL	ADJUSTED
8. TEST TONE LEVEL	1004 Hz -10 dBm0	± dB	dB	dB	dB	dB
9. C-MSG NOISE	ANALOG CX / CT MILES	dBrnC0	dBrnC0	dBrnC0	dBrnC0	dBrnC0
10. C-NOTCH NOISE	1004 Hz	dBrnC0	dBrnC0	dBrnC0	dBrnC0	dBrnC0
11. SIG/NOISE RATIO	1004 Hz	dB	dB	dB	dB	dB
12. IMPULSE NOISE	REF LEVEL dBrnC0	≤ 15 COUNTS IN 15 MINS				
13. ENVELOPE DELAY	SPECTRUM	REL DELAY	REL DELAY	REL DELAY	REL DELAY	REL DELAY
	- Hz	usecs				
	- Hz	usecs				
	- Hz	usecs				
	- Hz	usecs				
14. FREQUENCY RESPONSE	SPECTRUM	- +	- +	- +	- +	- +
	- Hz					
	- Hz					
	- Hz					
15. NET LOSS VARIATION	1004 Hz	± dB IN 15 MINS	dB	dB	dB	dB
16. CHANGE IN FREQ	1004 Hz	Hz	Hz	Hz	Hz	Hz

17. REMARKS

1. TTL, NOISE, IMP NOISE, ENV DLY, FREQ RESP WILL BE ACCOMPLISHED IN THAT ORDER, THEN OTHER TESTS.
2. EXCEPTIONS WILL BE CIRCLED IN RED.

18. SIGNATURE OF TESTER

Figure 9-4. DD Form 1697, Circuit Parameter Test Data - Analog. (Front)

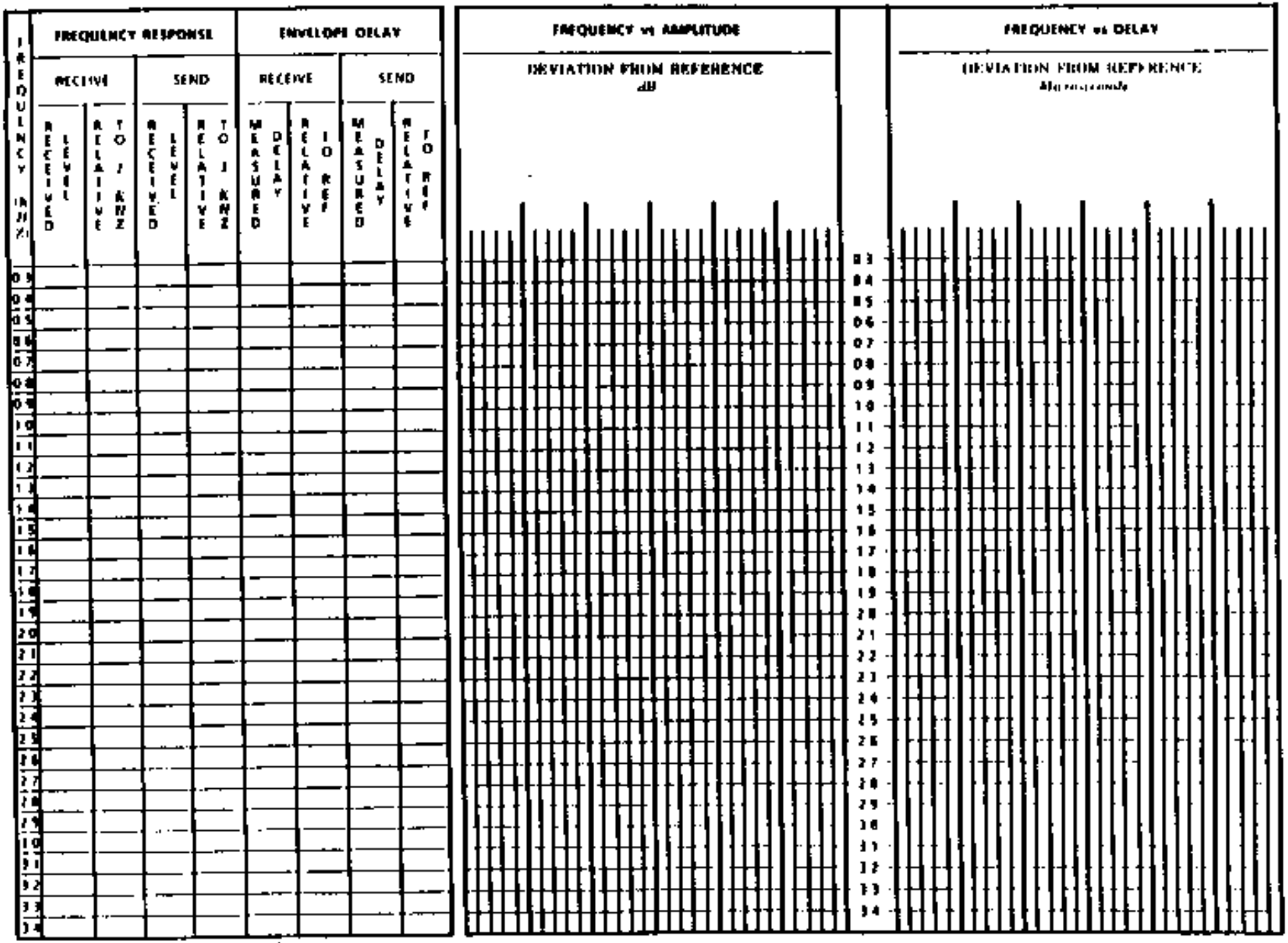


Figure 9-5. DD Form 1697, Circuit Parameter Test Data - Analog. (Reverse)

CIRCUIT PARAMETER TEST DATA - DIGITAL

1. CCSD	2. TYPE TEST	3. TIME START (DTG)	4. TIME FINISH (DTG)
5. PARAMETER CODE	6. DATA RATE	7. TYPE INTERFACE	8. TYPE SYNC
9. TYPE SIGNAL	10. TEST PATTERN	11. BLOCK SIZE	
12. RECEIVE STATION / INITIALS		13. TRANSMIT STATION / INITIALS	

TEST	SPECIFICATIONS		ERROR DATA	RECEIVE	TRANSMIT
14. BIT ERROR RATE	Minm	1 X 10	Total Errors		
			Error Rate		
15. % ERROR FREE SECONDS	Minm	%	Errored Seconds		
			% EFS		
16. % BLOCK ERROR	Minm	%	Errored Blocks		
			% Block Error		
17. TELEGRAPH DISTORTION	Total Peak	20%	Receive %	Transmit %	
	Bias	5%	Receive %	Transmit %	

18. REMARKS ☐ PASS ☐ FAIL

PERFORM ALL TESTS SIMULTANEOUSLY WHENEVER POSSIBLE.

19. SIGNATURE OF TESTER

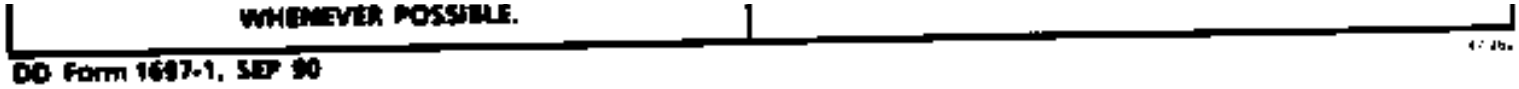


Figure 9-6. DD Form 1697-1, Circuit Parameter Test Data - Digital.

PAGE

MASTER STATION LOG	FACILITY	DATE	TIME PERIOD FROM	TIME PERIOD TO

CHANNEL OR CIRCUIT	ZULU TIME	OP INIT	ACTION/EVENT

DD FORM 1 SEP 70 1753 REPLACES AF FORM 1353, NOV 68 AND DCA FORM 101 JUL 68, WHICH WILL BE USED UNTIL SUPPLY IS EXHAUSTED.

Figure 9-7. Master Station Log.

TABLE 6-1. ANALOG CIRCUIT QUALITY CONTROL TEST SCHEDULE

Parameter Codes	CO[2], C1, C2 C4, M1, M2			C3, C5, CT, D1, D6, M3		
Frequency[1]	T&A	IN	OUT	T&A	IN	OUT
Test Parameter						
Transmission Level[3]	I	W		I	W	
Net Loss	I		A	I		SA
C-Message Noise or C-Notched Noise	I		A	I		SA
Signal to C-Notched Noise Ratio	I		A	I		SA
Impulse Noise	I		A	I		SA
Envelope Delay	I		A	I		SA
Frequency Response	I		A	I		SA
Max Change in Audio Frequency	I		A	I		SA
Maximum Net Loss Variation	I		AR	I		AR
Terminal Impedance	I		AR	I		AR
Nonlinear Distortion[4]			AR			AR
Phase Jitter[4]			AR			AR
Gain Hits[4]			AR			AR
Phase Hits[4]			AR			AR
Drop Outs[4]			AR			AR
Gain Linearity at Input[4]			AR			AR
Signal to Quantizing Distortion[4]			AR			AR
Circuit Continuity[4]			AR			AR
Cross Modulation[4]			AR			AR
[illegible] Signal Level[4]			AR			AR

Maximum Opertaing Signal Level[4]	AR	AR

TABLE 6-2. DIGITAL CIRCUIT QUALITY CONTROL TEST SCHEDULE

Parameter Codes	Y1,Y2,Y3,Y4, S1,S2,S3,S4 S5,R1,R2,R3	J2, J5	J1, J3[5], J4[5], W1	N1
Frequency[1]	T&A OUT	T&A OUT	T&A OUT	T&A IN OUT
Test Parameter				
Bit Error Rate	I AR	I SA	I A	
% Error Free Sec	I AR	I SA	I A	
Availability	I AR	I AR	I AR	
% Block Error	I AR	I AR	I AR	
Jitter	I AR	I AR	I AR	
Loss of Bit Count Integrity (LBCI)	I AR	I AR	I AR	
Sync Time[6]		I AR		
Interchannel Differential Delay[6]		I AR		
Loop Transport Delay[6]		I AR		
Total Peak Telegraph Dist[7]				I W AR
Bias Distortion (Mark/Space)				I AR

TABLE 6-3. FDM GROUP (60 - 108 kHz) QUALITY CONTROL TEST SCHEDULE

Parameter Codes	X1, X2		
Frequency[1]	T&A	IN	OUT
Test Parameter			
Frequency Response	I	AR	
Envelope Delay	I	AR	
Amplitude Stability	I	AR	
Maximum Frequency Offset	I	AR	
Impedance	I	AR	
Return Loss	I	AR	
Interface Transmission Level Point	I	AR	
Phase Jitter	I	AR	
Random Noise Unweighted	I	AR	
Impulse Noise	I	AR	
Average Long-term Power	I	AR	
Maximum Operating Signal Power	I	AR	
Maximum Test Tone Power	I	AR	
Pilot Frequency	I	W	AR
Line-up Loss	I		AR