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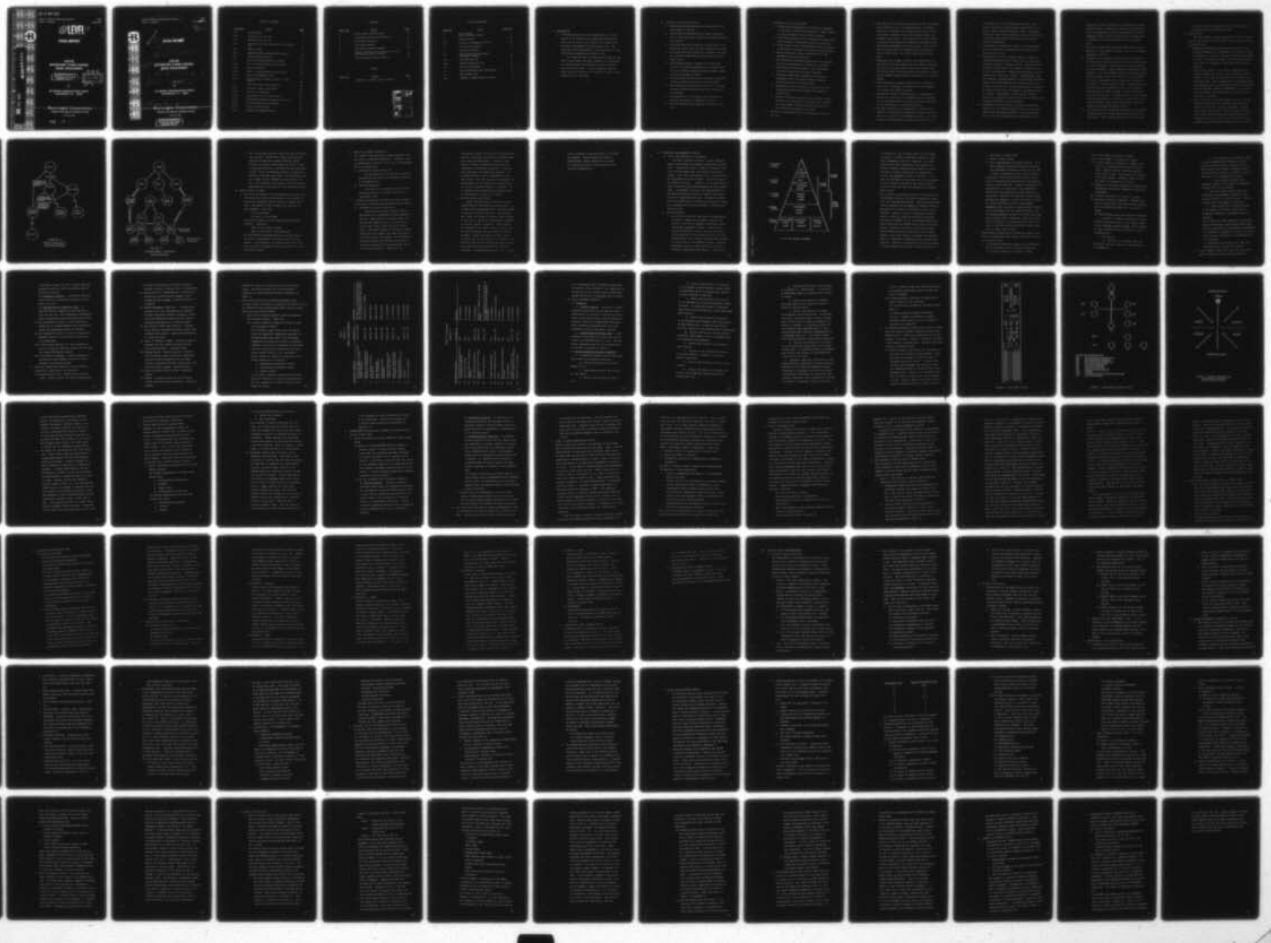

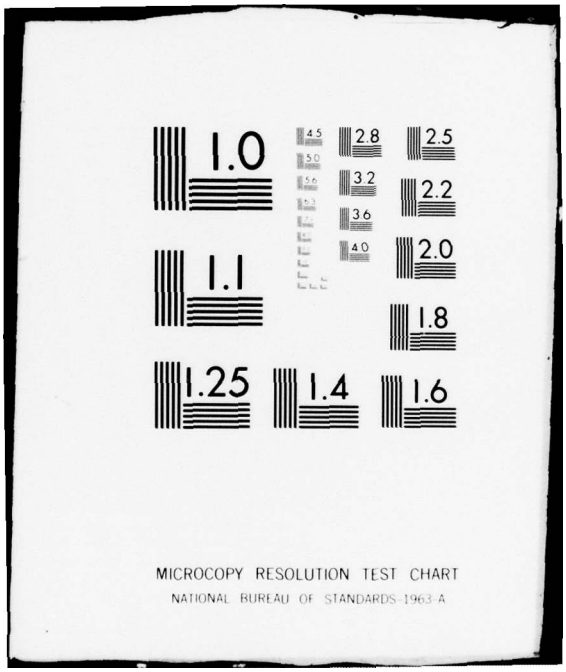
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Appendix A UTEK Report on Defense Communication System

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FINAL REPORT

FOR THE EXPLORATORY SYSTEM CONTROL MODEL DEVELOPMENT

for

THE DEFENSE COMMUNICATIONS AGENCY
WASHINGTON, D.C. 20305

Burroughs Corporation
Federal and Special Systems Group
Paoli, Pa. 19301

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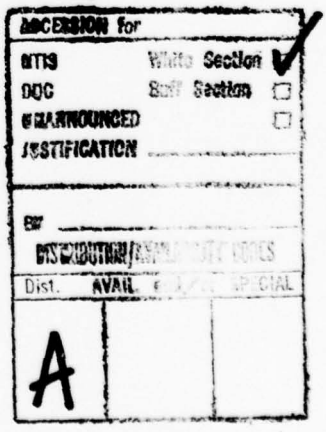


LIST OF APPENDICES

I. INTRODUCTION

A. UTEK Systems, Inc. has completed Task 1 of the study for the Exploratory Systems Development Model. This study is based on the present day policies and procedures promulgated and published by DCA. The study has been accomplished in the perspective of the 1980 Defense Communication Systems (DCS).

It recognizes that the reporting policies for the future would remain the same, however, the mechanisms for reporting and the information content of these reports may well vary. It also recognizes that the basic purpose of the DCS is to provide a level of performance to all customers.

B. Operation of the DCS includes:

1. Monitoring and maintaining the connectability of subscribers to the DCS.
2. Monitoring and maintaining the channel apertures of all DCS circuits and trunks at prescribed acceptable quality.
3. Monitoring and maintaining the connectivity of all switching centers with the DCS transmission network.
4. Monitoring and maintaining the throughput and traffic volumes through DCS switching centers at adequate levels.
5. Establishing circuit, network, or system level re-route or restoral alternatives to maintain service at a reduced capability during circuit outage or switch blockage intervals.
6. Monitoring and reporting all occurances concerning traffic movement problems or network hazards.
7. Overviewing all network level problems to provide assistance and coordination during the resolution of problems.
8. Implementation of contingency plans supporting tactical situations or mobility exercises.
9. Maintaining day by day status of the DCS for the JCS.

C. Management of the DCS includes:

1. Establishing requirements for additions, upgrades or deletions to DCS/customer service. These include non-DOD customers as well as DOD customers.
2. Validating customer service requirement changes and, when necessary, establishing restoral priorities.
3. Establishing circuit implementation plans including, as necessary, amendments to existing restoral plans.
4. Monitoring status changes regarding use of DCS dedicated circuits and assets.
5. Monitoring the operating efficiency of the DCS and the level of performance afforded its customers.
6. Monitoring the effectiveness of DCS operational doctrine and policies and their execution.
7. Performing statistical analyses of quality and throughput data to evaluate present technical criteria and plan for future growth.
8. Participate in the planning of exercises and contingency operations which impact DCS loading or connectivity.
9. Develop long term planning for the upgrade, modernization, or re-direction of the DCS; this includes the establishment of policies and procedures for the operation and quality of the DCS.

D. Factors concerning operations and management data and its uses:

1. Data bases will be distributed within the DCS (including staff elements) with a strong geographic orientation. They will be resident at the lowest appropriate levels (locations) compatible with their storage, usage, compilation, and utility. Data bases will be kept current by selected reporting from responsible organizations at appropriate management levels of the DCS. Data will be kept reliably accurate by administrative procedures, on-site spot checks, and cross checks against other data.
2. Techniques for storage, retrieval and manipulation of distributed data and computation algorithms already are required to process traffic volume data obtained from the Traffic Data Collection System of AUTOVON, to attain useful AUTOVON network analysis information in a timely manner.
3. Both software and hardware resources are required at Level III to implement the responsibilities assigned to it under the SYSCON structure.
4. Appropriate security mechanisms may be implemented to protect the structure of accumulated data and computational algorithms where necessary to insure survivability of information or analysis procedures.
5. The ATEC System will be operational to provide data inputs or a data base of transmission media status for use by the control and management structure. Its implementation should provide a status information file at

the working level for transmission systems. This status file must be paralleled by improvements in the switch network status information files. Presently these files have limited mobility and lack the ability to quickly reduce their contents to operationally oriented information.

6. Presentation of operational data to controllers must be real time where as management data presentation may be non-real time.
7. The evolution to an all digital DCS will require a network perspective rather than a station prespective presently employed in analog systems. Failures within a digital system appear at a number of stations relatively simultaneously. Analog system failures are more regulated to one or two stations. Additionally, digital systems, although capable of sustaining performance longer than analog systems under similar adverse conditions, will fail in a catastrophic manner as compared to analog systems which are prone to degradation prior to failure. Consequently a more network oriented approach is required to define the point of failure and reassign resources to affect restoral.
8. Management by exception will be used, only deviation reports will be submitted based on pre-conceived procedures and operating standards. All data reported will be used for operational and management control.

Operational control status will be inputted on a time threshold basis. Reaction to these status reports will occur as appropriate based on circumstances in being. Management data will be derived from the analysis and correlation of all reported data on an as required basis.

9. Bulk data storage and processing capabilities will be prevalent at the middle and upper levels of the SYSCON management structure.

10. Programs are in progress, or systems are in place in the DCS network control facilities which provide status of traffic movement, volume and the resources supporting these elements. These systems and programs include AUTODIN I & II, the AUTOVON Central Alarm System (ACAS) and the AUTOVON Traffic Data Collection System (TDCS). As stated, algorithms will be necessary to establish the TDCS as a viable source of data. Additionally, all systems may require upgrade to insure the automated data reported is equal in depth to that data derived from the ATEC System. A proper balance in time thresholds and data detail is required to assure viable correlation between traffic and transmission control in support of systems operational control.

11. DCS evolution into the SYSCON operations and management concept is possible within existing DCA policies and procedures. Their implementation and use may require

modification to be compatible with evolving the technologies which are upgrading the DCS.

E. Types of Data:

The data needed to manage and operate the DCS is basically of three types: Facility Data, Service Data, & Status Information Data.

1. Equipment/communications facility data refers to the installed hardware at a government owned facility which is committed to the DCS. The data describes the station in terms of installed equipment and associated capabilities, and the transmission link which the equipment supports.
2. DCS services refers to the circuit connectivity and traffic capacity of the DCS. The transmission media services of the DCS are described in the Circuit Link and Trunk files. When combined with the switching station capabilities, the combination relates the switched network (AUTOVON, AUTODIN, AUTOSEVOCOM) to the transmission systems, thus describing the overall service structure of the DCS.
3. Status information provides summary and real time performance reports for the equipment, facilities and services of the DCS. That is, equipment, facility, link, trunk, and circuit, switch outages and degradations, and traffic volumes are reported by each DCS reporting station on a near real time and as a daily summary when pre-established thresholds or standards

are violated. Quality assurance data on transmission equipment is also transmitted daily by each reporting station.

F. Organizational and Reporting Concepts:

1. Staff Element Participation

The DCS provides communication service for the Joint Chiefs of Staff (JCS), the Military Departments (MILDEP) and other Government agencies. Accordingly, DCA staff agencies are responsible for the planning and engineering of present and future requirements of the DCS. Customer communication requirements determine the structure of the DCS and provide guidelines for its operation (i.e. speed-of-service, reliability, survi-ability etc.) DCS future requirements are derived from customer generated Telecommunication Service Requests (TSR). These are submitted in letter format through the customer's Telecommunications Certification Office (TCO). TSR's for overseas theatre support are directed to staff circuit engineers at the cognizant overseas DCA area. Continental U.S. requirements are staffed at the Defense Commercial Communications Office (DECCO) as are all non DOD users of the DCS. The TSR is translated into a Telecommunications Service Order (TSO), entered into the circuit, link and trunk files and also forwarded to the field elements for implementation. Leased cir-cuit segments are implemented by DECCO or DECCO field elements. Military supplied circuit segments are

implemented by DECCO or DECCO field elements. Military supplied circuit segments are implemented via facilities established through previous planning and programming actions. Figure 1 provides a functional flow of the staff participation.

2. Operational Element Participation: (See Figure 2)

   a. The DCS stations are operated and maintained (O&M) by the MILDEPS with operational direction and control from DCA. The installation of DCS stations, equipment and logistical support is also O&M agency provided but the management of DCS resources is retained by DCA. Thus each DCS station has normal MILDEP reporting channels to support its functional operation and has DCS reporting channels for operation of the DCS. Within the DCS reporting system, each station is either a reporting station or a reported-on station (by a reporting station).

   b. For the transmission media (except satellite) a reporting station may also be DCA designated as an Intermediate Control Office (ICO/nodal control) or a Facility Control Office (FCO/sector control). Each station reports to and takes direction from the next higher level of control. The MILDEP FCO reports to the RCOC (which may be co-located), RCOC reports to the ACOC which reports to the DCAOC. DCA satellite stations report direct to the ACOC.

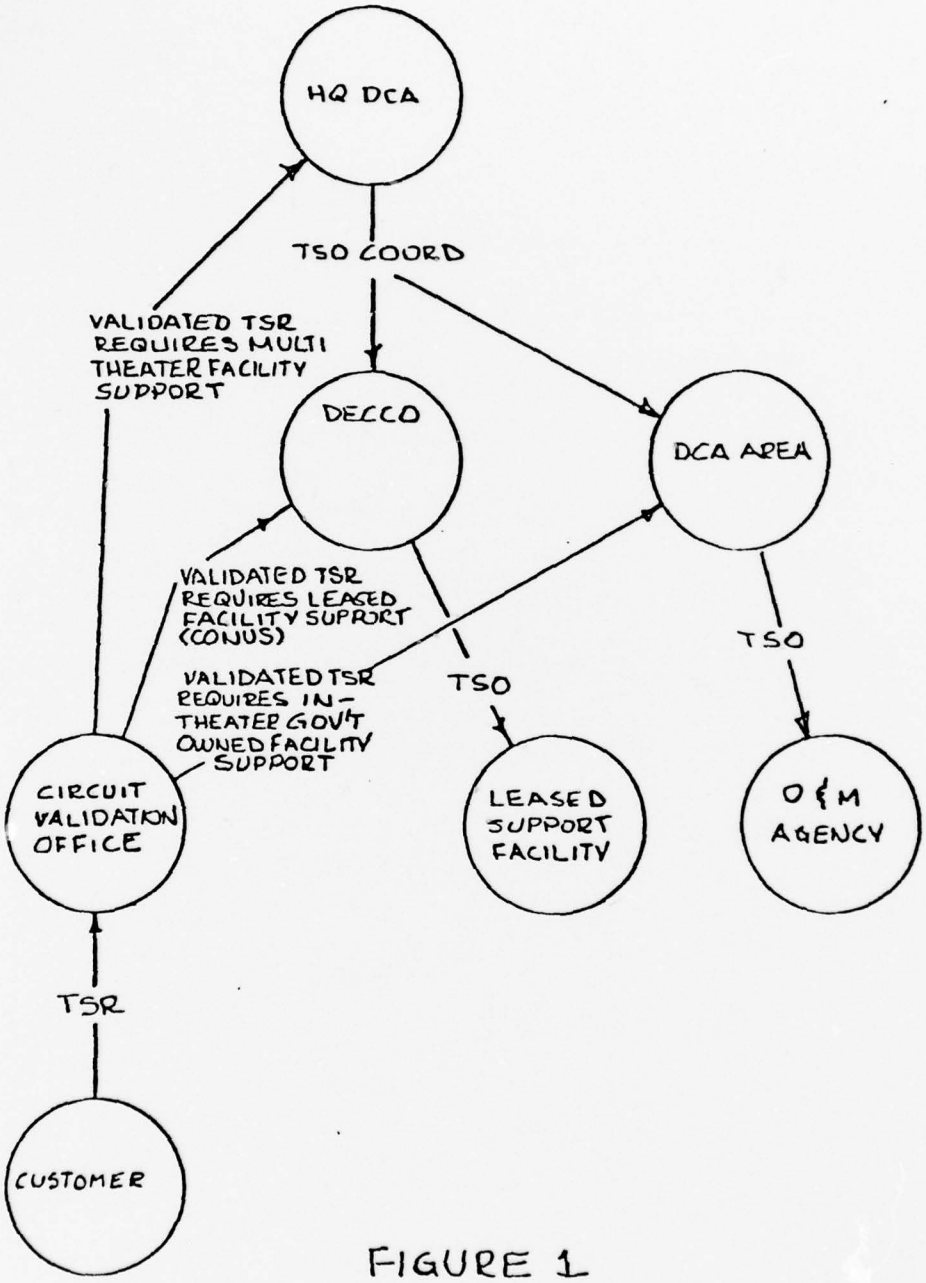


FIGURE 1
STAFF ELEMENT
PARTICIPATION

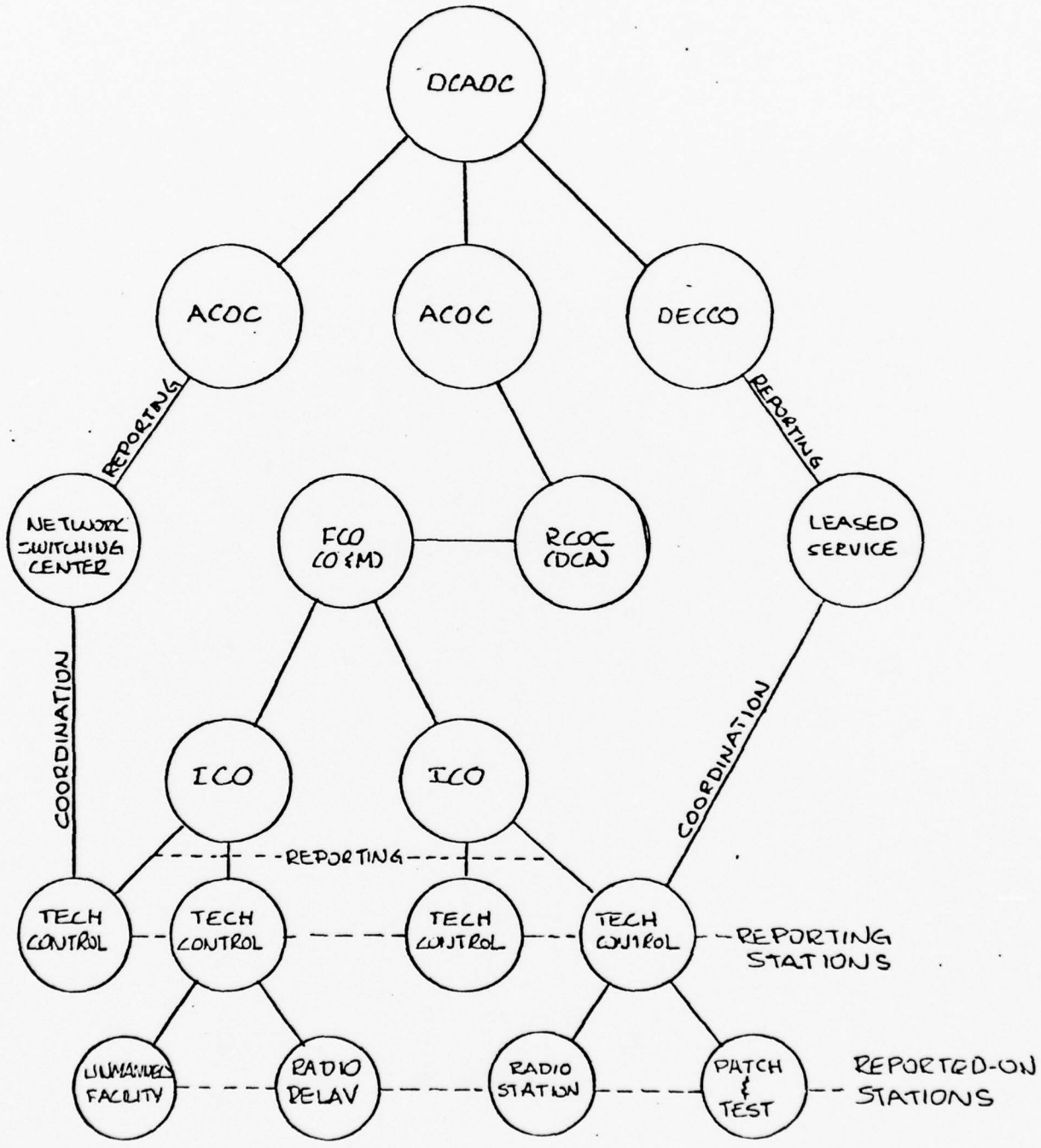


FIGURE 2

OPERATIONAL ELEMENT PARTICIPATION

c. For the switched networks, there are two DCS reporting channels. Transmission media conditions are reported through the serving technical control facility and switch status data and traffic volume is reported directly to the ACOC from the switching center. Since the DCS/base interface is generally defined as the base main frame, user equipments and the on-base circuit segments are not part of the DCS. User problems are reported to the DCS station providing DCS connectivity for the affected service.

G. Basic Sources for Data:

1. The two basic sources of data available within the DCS from which DCS status may be derived is the status of DCS station equipment and the status of traffic movement. Two general status elements are reported for the equipment. These are:

   · Is it available?

   · How well is it working?

   Two status elements are also reportable for traffic movement. These are:

   · What is the traffic volume?

   · What is the traffic flow direction?

   All information reflecting the status of the DCS and its level of performance is derived from these two factors. As an adjunct, the effectiveness of how well this resource is managed can also be derived from this information source.

2. Reporting Element Perspective

Two elements view and report status resources, but each with a different perspective. However, a common denominator for both is the level of performance. The two elements are;

a. Transmission Media Facilities -

The perspective is the quality of service provided and the ability to maintain service at a reasonable level.

b. Network Facilities -

This view is to the grade of service and subsequent ability to sustain service at a reasonable level.

3. A further description of these facilities, responsibilities, structure and reporting methods follow;

a. Transmission Control Facilities -

These facilities are the prime element responsible for transmission system quality of service. They reside at stations within the DCS and are organized into a Sector Control (FCO) Nodal Control (ICO) and Local Control (TCF). The Local Control or Technical Control facility is the lowest level that the quality of service can be determined. The information reported becomes more refined as the flow of data goes upward in the organizational chain to the Sector Control. Quality of the

transmission media is their prime responsibility includes reporting the status of resources from which they provide service. Status as used herein, includes equipment availability and readiness of operational personnel. Presently this reporting is accomplished manually. An automated method is to be implemented in the near future. The ATEC system will automate the measurements of the transmission system which in turn will determine quality of service. It is probable both an automated and manual form of reporting will exist in the future.

b. Network Control Facilities -

These facilities are structured at those communications nodes where switches reside. It is their prime responsibility to provide a grade of service to users of the DCS. Accordingly, they report the grade of service being provided as well as the status of the resources required to provide a grade of service. These reports are directed to the ACQC. Status in this case is traffic movement and resources for traffic movement. Traffic movement includes traffic volume as well as the direction of traffic flow. Resources for traffic movement includes, equipment availability and operational personnel readiness. Automated methods are used to report

traffic movement volume and status for AUTODIN and AUTOVON. Manual methods are used for AUTOSEAVOCOM. Manual methods are followed for reporting status of other resources not reported automatically.

II. FUNCTIONAL REQUIREMENTS OF SYSCON

A. Use of Existing Policy & Procedures

The basic function of DCA is to plan, engineer, operate and maintain the Defense Communication System (DCS). Toward this effort a number of concepts, policies and procedures have been implemented and published. Over their long period of use, these policies and procedures have been refined. As the function of the SYSCON structure, Figure 3, is as stated above, these refined policies and procedures are still applicable. Accordingly, evolution and implementation of the SYSCON structure should not consider abolishing previously established policies. The major consideration for SYSCON must be towards providing more practical, immediate and efficient methods of implementing these policies.

B. Data Utilization

1. Two distinct functions that must be accomplished in order to manage the resources, services and future of the DCS are systems operational control and systems management control. Specifically, systems operational control concerns the operational direction of the resources within the DCS. Appropriately, this control is distributed throughout each level of the SYSCON structure. Systems management concerns longer term actions such as planning, engineering and analysis. This control

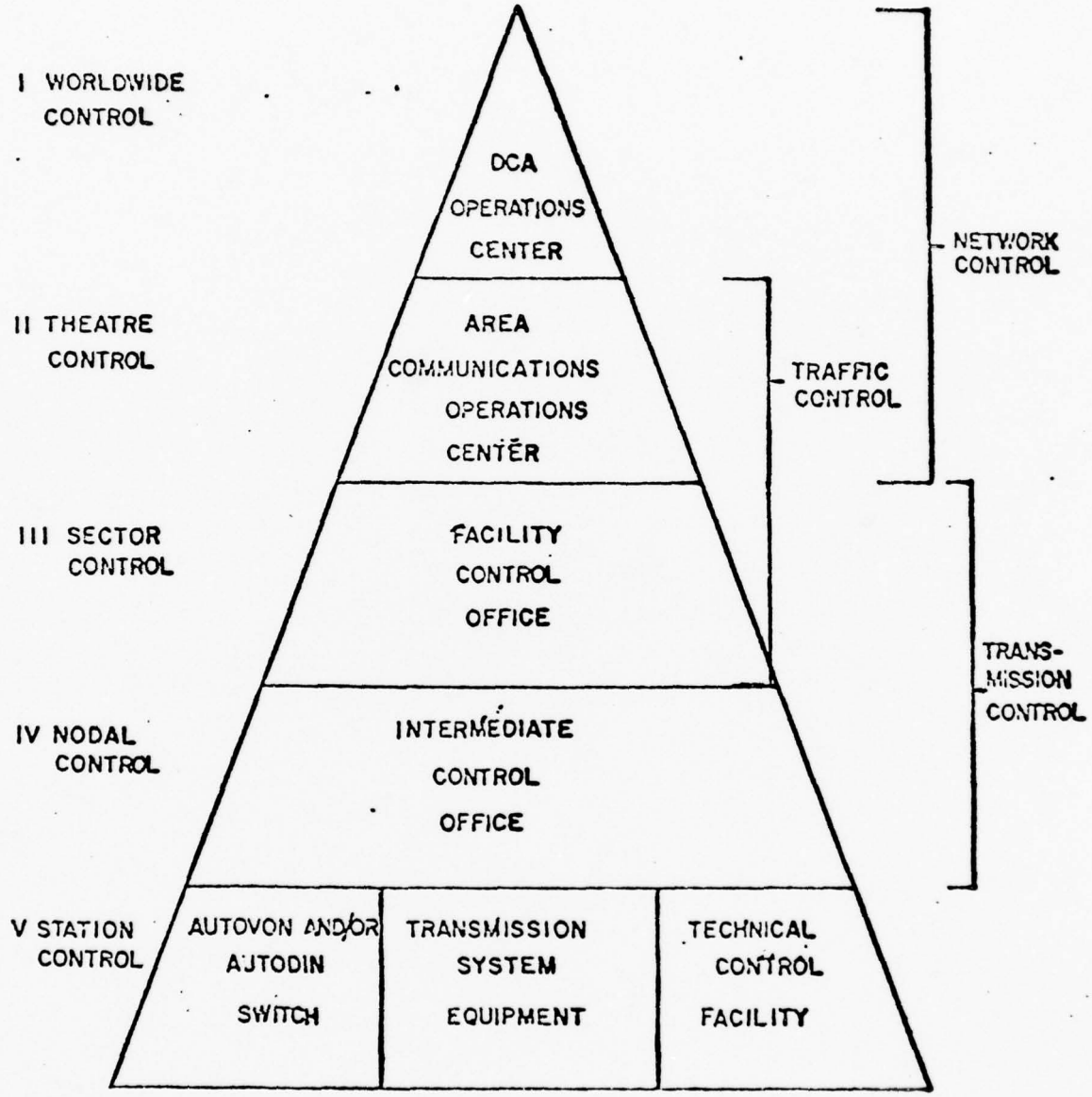


Fig 3 DCS SYSCON HIERARCHY

is resident at the two upper levels of the SYSCON structure. In short, operational control is real-time, management control is long-term. All data generated by status reporting, file updates and circuit requests, generated from within or outside the DCS, is useful toward both the operational control and management control of the DCS. It is only the timeliness of the data, how it is processed and its eventual correlation that differentiates the use of the same data for operational or management control.

2. By its nature, operational control is time sensitive. Accordingly, status of the DCS is reported by exception on a time-threshold basis. Effective operational control requires the correlation of grade of service and quality of service to determine a level of performance. Grade of service is reported by network control facilities using the automated techniques available in AUTODIN I & II, the AUTOVON Centralized Alarm System and the AUTOVON Traffic Data Collection System. Quality of service is reported by transmission media facilities which shall use the ATEC system, in the near future, to automate all measurements of transmission systems presently accomplished manually. Effective correlation of the data reported by these systems requires that the data be equal in:

1. Timeliness or update rate
2. Detail in data content
3. Equal highlighting of critical factors. (i.e. time-threshold reporting criteria for network and transmission facilities should be the same in order to adequately assess cause & effect.)

Surfacing of operational problems can be accomodated by analyzing and processing all data against specific time-thresholds. Elements exceeding time-thresholds are so outputted to the responsible SYSCON level for appropriate control measures and resolution. Therefore all data must be processed analyzed and managed on a real time basis in order to surface operational control requirements. Management data, however is long-term and therefore can be processed on an "as required" basis. The following paragraphs describe the status reporting data available from transmission media and network control faclities, the time-thresholds (when) the data is reported, and the conditions (what) under which a report must be made.

3. Time-threshold reporting for transmission media facilities is accomplished when certain conditions occur or on a periodic basis.

   a. A nonformatted narrative report will be submitted within 10 minutes on the following conditions:

      (1) A station outage of 1 minute or longer.

(2) A link outage 10 minutes or longer.

(3) A trunk outage of 10 minutes or longer.

(4) A user outage of 10 minutes or longer if the circuit is identified as a special interest item. Special interest items are justified by the user to DCA. Justification is required every three months. Nominally these circuits are CINC's or command post circuits.

(5) Changes in status and termination of authorized recoverable subjects as designated in DCA area supplements.

(6) A station isolation of 1 minute or longer.

(7) Hazardous Conditions (HAZCONS). HAZCONS apply only to DCS stations and links and are reported when the HAZCON has lasted for 30 minutes or longer.

(a) The following constitute reportable HAZCONS:

1. Partial or complete evacuation of communications facilities due to fire, smoke, enemy action, jamming, physical damage, severe weather or other conditions which threaten the loss of communications.

2. The loss of:

a. Diversity to the degree that any additional loss will result in system failure or degradation.

b. Any combination of primary, backup or spare communications equipment or power facilities when failure of another like component would cause outage or degrade service, and sufficient equipment to sustain or restore operation is not immediately available.

c. Environmental equipment when immediate restoral is necessary for equipment operation but is not possible.

3. The last onsite stocked spare part supporting a nonredundant configuration is placed in service at a DCS facility. "Onsite" includes local base support activities.

4. Other situations or conditions which in the opinion of the shift supervisor or designated responsible individual should be reported.

(b) To assist the O&M commanders in resolving supply difficulties, particularly those which involve interservice or interagnecy arrangements, the responsible commander will report the estimated time of termination of the HAZCON within 5 working days.

(c) Inquiries by DCA elements for additional information will be made as required.

b. Format summary reports are submitted as periodic reports reporting the following conditions:

(1) All items previously reported by narrative report will normally be reported daily as of 2400Z. DCA areas are authorized to direct submission of additional periodic reports as required.

(2) Performance monitoring data, which are submitted as Q-line information, will be reported in DCA area supplements.

(3) Restoration priority (RP) 2 or higher and special interest item reroutes will be reported.

(4) Channel outages of 30 minutes or longer will be reported.

(5) Outages and reroutes previously reported by periodic report that continue from one raday into the next will be reported as specified by the DCA area.

(6) Outages of 30 minutes or longer on interswitch trunks which have restoration priorities below RP2 or are not designated special interest items will be reported.

(7) Outages of 10 minutes or longer on all circuits with purpose and use code DN. (CRITCOM Circuits)

(8) All other outages of 10 minutes or longer on circuits with RP2 or higher.

4. Time threshold reporting for AUTODIN I, a network control facility, are also on an "as occurs" or periodic basis.

a. "As occurs" reporting is accomplished for the following conditions.

(1) When the switching equipment is unable to process traffic due to environmental equipment failing, ASC equipment malfunction or failure, or personnel error. The outage terminates when the first interswitch circuit and the first channel are returned to service.

(2) At the time system dry-up procedures are initiated. The outage terminates when the first interswitch circuit and the first customer channel are are placed in service.

(3) When a planned or unplanned reload is performed. The outage terminates when the first interswitch circuit and the first customer channel are placed in service after reload.

(4) When an automatic or manual restart is initiated which prohibits the switching equipment from processing traffic. The outage terminates when service is restored after restart.

(5) When all crypto facilities fail. The outage terminates when the first interswitch circuit and the first secure customer channel are returned to service.

(6) On the following other reportable subjects:

(a) Switch Isolation. A switch isolation occurs when all interswitch connectivity

(interswitch trunks) is lost. Switch isolation terminates when the first interswitch trunk is returned to service.

(b) Hazardous Condition. A hazardous condition occurs under the conditions specified in paragraph 3.a(7)(a).

(c) Impaired Service Condition (ISC). An impaired service condition occurs when one or more, but not all, Line Termination Coordinators and/or Accumulation and Distribution Units fail.

(7) Any interswitch circuit or trunk sustains an outage and it becomes apparent that restoration cannot be accomplished within 10 minutes.

(8) An interswitch circuit or trunk is restored by AUTOVON circuit or the circuit is restored to its normal path.

(9) A failure and restoral of a user terminal, a circuit outage and restoral between the user and the nearest DCS access station.

(10) Critic Service Message - A service message is generated at each AUTODIN switch as a CRITIC message is processed through.

b. Periodic reports are submitted on the following. Frequency of reporting is as indicated.

(1) Header Extract Data - submitted one day each month - used as source for traffic engineering -

provides an indication of traffic direction (inward, outward to switch, user vs interswitch).

(2) Action notice of implementation of system modification including circuit changes, table changes and new programs - within 24 hours of occurance.

(3) AUTODIN Management Index File - Provides characteristics of the configuration of AUTODIN. Includes subscriber terminal equipment, access lines and interswitch connectivity in detail - submitted periodically 2-3 times per week.

(4) DCS Circuit, Trunk Link Inventory - Provides static data on interswitch trunks, access lines equipment and routing - submitted periodically 2-3 times per week.

(5) Report of Traffic volumes - totals in terms of messages and line blocks sent/received per trunk and subscriber - submitted daily.

(6) Summary Report - Based on specific criteria and thresholds, report identifies significant problems being encountered such as, media failures, equipment problems, switch node failures and traffic queues - submitted daily.

(7) High Precedence Traffic Delays - submitted weekly.

(8) COMOPS - A monthly report of all tributary traffic and effeciency information - submitted monthly.

5. AUTODIN II Phase II is presently in the development stage. The specifications for this development required the time-threshold and data information in Table I.

6. Rules and conditions for reporting AUTOVON status include; status reporting in accordance with DCAC 310-55-1, the AUTOVON Central Alarm System (ACAS) and the Traffic Data Collection System (TDCS).

   a. DCAC 310-55-1 status reports include nonformatted and formatted reports. These are;

      (1) A switch (station) outage and restoral, under the following criteria:

         (a) A station outage occurs when the switch loses the capability (engineered capacity) to process automatically any of the following categories of traffic as a result of problems internal to the switch (Isolation of the switch from the network due to failure of all inter-switch trunks [IST's] is not considered a switch outage but should be reported by recoverable subject as an isolation.):

            1. Originating interswitch traffic.

            2. Terminating interswitch traffic.

            3. Tandem traffic.

         (b) A station restoral occurs when the switch gains the capability to process automatically all the categories of traffic listed in paragraph (a), above.

TABLE I

AUTODIN II

Phase I Switch Reports

Information Elements	Recorded At	Frequency
1. Packet Throughput by Precedence (including format errors) (Header Extract)	Switch, WWOLS	Periodic or when Threshold exceeded; (Normally monthly for analysis or as required by NCC for control)
2. Number of Retransmissions (incomplete transmission)	Switch, NCC	Threshold or on demand
3. Input Buffer Activity Utilization	Switch, NCC	Same as above
4. Trunk Buffering Hi/Lo Distribution	Switch, NCC	Same as above
5. Termination Buffer Utilization	Switch, NCC	Same as above
6. Throttling Control/Input (Logical Line Limit)	Switch, NCC	On occurrence
7. Throttling Control/Input Precedence Access Denial	Switch, NCC	On occurrence
8. Routing Selection Status/Orbiting Detection	NCC	On occurrence
9. Timeouts	Switch, NCC	On occurrence
10. Security Mismatch	Switch, NCC	On occurrence

TABLE I (continued)

AUTODIN II

Information Elements	Recorded At	Frequency
11. NCC Directive Implemented for add/change parameters	NCC	On occurrence
12. Switch/Line Outage	NCC	On occurrence
13. Switch Hazardous Condition (HAZCON)	NCC	On occurrence
14. Dual Homing Implemented	Switch, NCC	On occurrence
15. Subscriber and Line Status Change	Switch, NCC	Periodic on demand, or as change occurs
16. Software Verification	Switch, NCC	To be specified by DCAC 310-D70-13, "DCS AUTODIN Software Management Procedures"
17. Program Reload/Restart	NCC	On occurrence
18. Packet Preemption/Discard	Switch, NCC	On occurrence, periodic
19. Traces	NCC	On demand
20. Switch Add/Change Parameters effected	NCC	On occurrence
21. Routing Update	NCC	On occurrence
22. Category I Non-Critical Traffic Restriction effected	Switch, NCC	On occurrence
23. Improper Line Patching	TCF, NCC	On occurrence

(c) An impaired service condition occurs when the switch loses a portion of its capability to process any of the traffic types listed under outage definitions in paragraph 6a(1)(a) above.

(2) Other reportable subjects:

(a) Isolation.

1. Switch isolation. A switch or station isolation occurs when all interswitch trunk connectivity is lost due to failure not attributed to the switch itself, such as failure of technical control or transmission facilities. Switch isolation terminates when the first interswitch trunk is returned to service.

2. Private Branch Exchange (PBX). A PBX isolation occurs when all access line connectivity to an AUTOVON switch is lost. PBX isolation terminates when the first access line to the PBX is returned to service.

(b) Station Hazardous Condition (HAZCON).

1. A hazardous condition occurs and terminates under the following conditions:

a. Failure and restoral of switch marker A or B.

b. Simultaneous failure and restoral of two logics.

c. Failure and restoral of memory X or Y.

d. Failure and restoral of 25 percent of the equipped register-sender junctors (RSJ). An amplifying report is required upon failure and upon restoral of each RSJ.

e. Failure and restoral of 25 percent of the equipped dual tone multifrequency (DTMF) receivers. An amplifying report is required upon failure and upon restoral of each additional DTMF receiver.

f. Failure and restoral of 25 percent of the equipped multifrequency (MF) transceivers. An amplifying report is required upon failure and upon restoral of each additional MF transceiver.

g. Failure and restoral of dial service assistance (DSA) marker A or B (if equipped with an operational DSA subsystem).

h. Failure and restoral of the maintenance monitor.

i. Failure of the traffic data collection system (TDCS) to operate in the rapid memory reload mode.

j. Failure and restoral of the d.c.-a.c. inverter.

k. Failure and restoral of a power rectifier, even though the remaining units are carrying the load.

l. Failure and restoral of the primary or secondary a.c. power source. If both fail, an amplifying report is required upon restoral of either.

m. Failure and restoral of primary and backup power which caused the switch to operate on battery power.

n. Failure and restoral of primary environmental control facilities. An amplifying report is required when a cabinet temperature of 90°F and/or a relative humidity of 75 percent is reached. An amplifying report is also required upon implementation of a subsystem "power down" and upon implementation of a subsystem "power up." The "power" report will identify specific subsystems de-energized.

o. Failure and restoral of 25 percent of the interswitch trunks (IST's) on an engineered route. An amplifying report is required upon failure and restoral of each additional 25 percent of the IST's.

2. Hazardous conditions identified in paragraph 6a(2)(b)1, apply only to actual failures. Switches are not placed in HAZCON by taking subsystems or equipment "off-line" for routine or preventive maintenance as long as the subsystem or equipment can be immediately restored to service, if required. Further, placing a

switch in "manual" mode when performing routine or preventive maintenance does not place the switch in HAZCON.

(3) A formatted report (FR) will be submitted to report status for the following:

(a) All NR status information outlined in paragraph 6.

(b) Switch equipment outage and restoral (E-line). Outages attributed to schedule preventive maintenance that do not exceed 24 hours are not reportable.

b. The AUTOVON Centralized Alarm System (ACAS) provides real-time traffic movement indications within each AUTOVON switch. These are telemetered over 75 BPS Circuits to the ACOC. Figure 4 represents the ACAS strip display discussed below. Specific areas and threshold criteria follows:

(1) Traffic Pressure and Flow within the switch is provided by the Switch Cluster Display. Lamp displays are assigned to specific pools of equipment within the switch. A visual alarm is given when equipment use reaches a preset use threshold during a 1-8 second scan of the equipment pool. Figure 5 & 6 (excerpted from DCAC 310-V70-44) reflects the switch display cluster. Figure 5 depicts the actual display. Figure 6 represents how the visual actuation

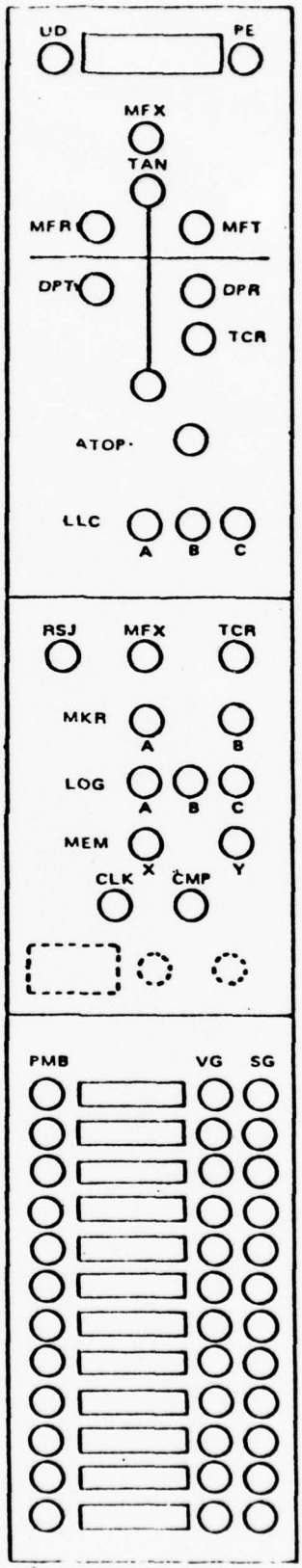
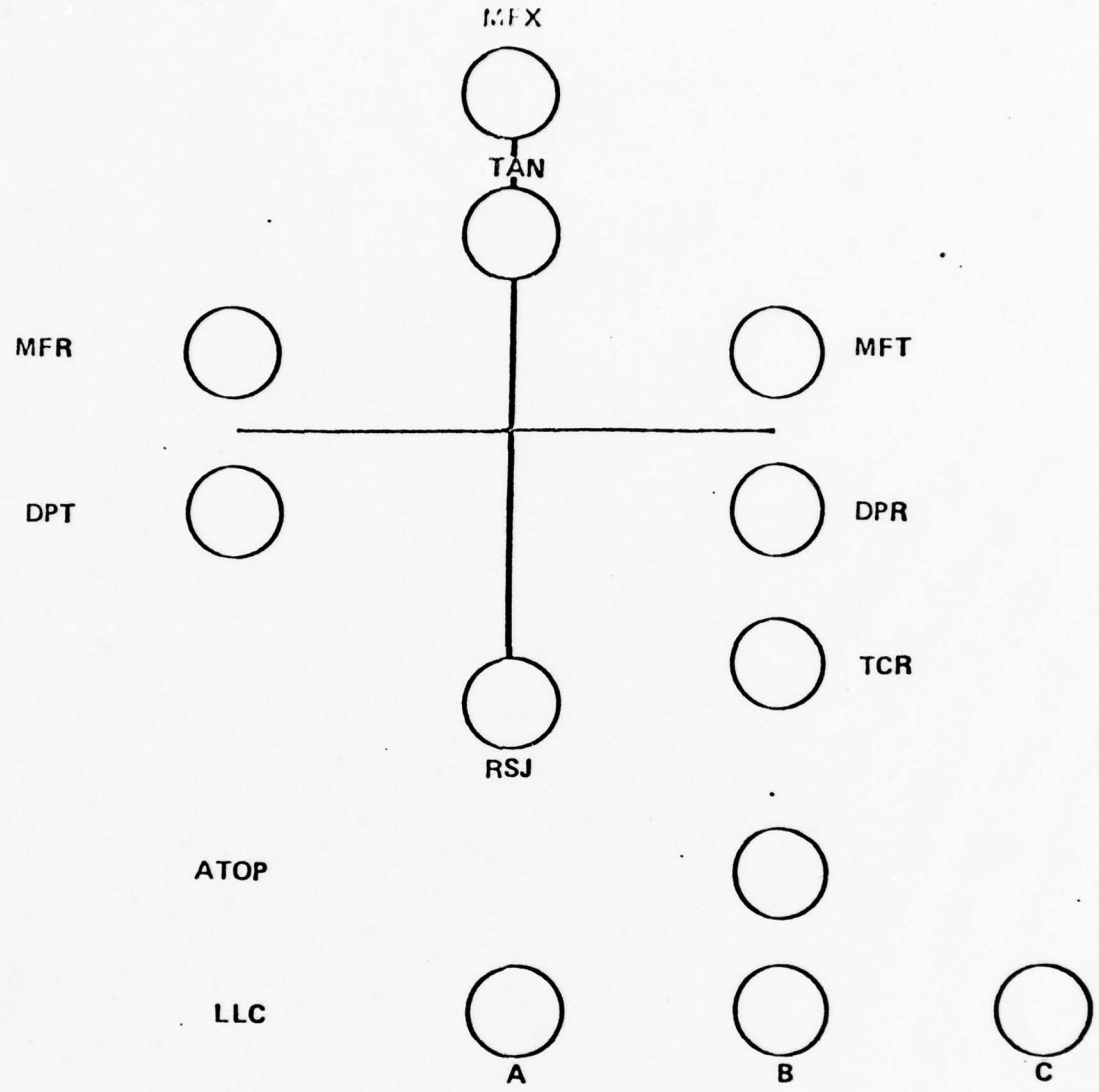


FIGURE 4. ACAS STRIP DISPLAY



LEGEND FOR LAMP INDICATIONS

MFX	MULTIFREQUENCY TRANSCEIVER
MFR	MULTIFREQUENCY RECEIVER
MFT	MULTIFREQUENCY TRANSMITTER
DPT	DIAL PULSE TRANSMITTER
DPR	DIAL PULSE RECEIVER
TCR	TOUCH CALL RECEIVER
RSJ	REGISTER SENDER JUNCTOR
TAN	TANDEM
ATOP	AUTOMATIC TRAFFIC OVERLOAD PROTECTION
LLC	LINE LOAD CONTROL

FIGURE 5. ACAS SWITCH CLUSTER DISPLAY

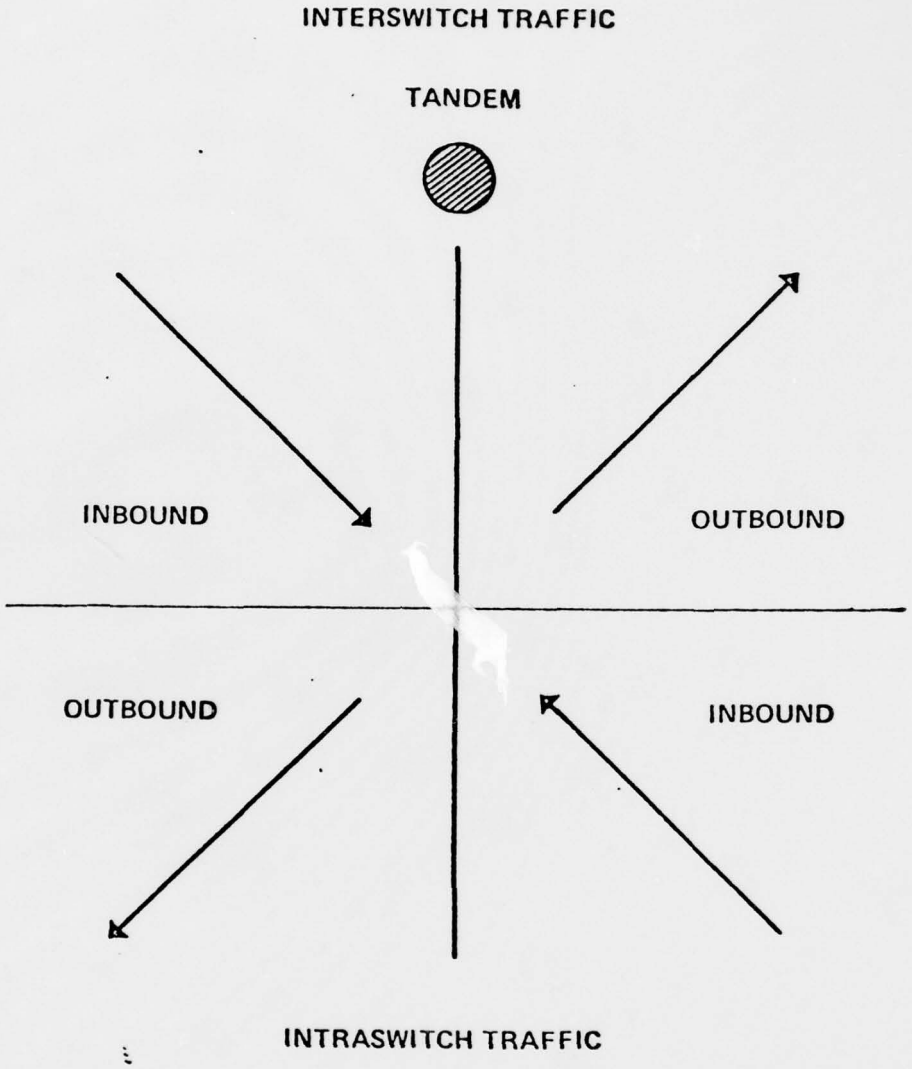
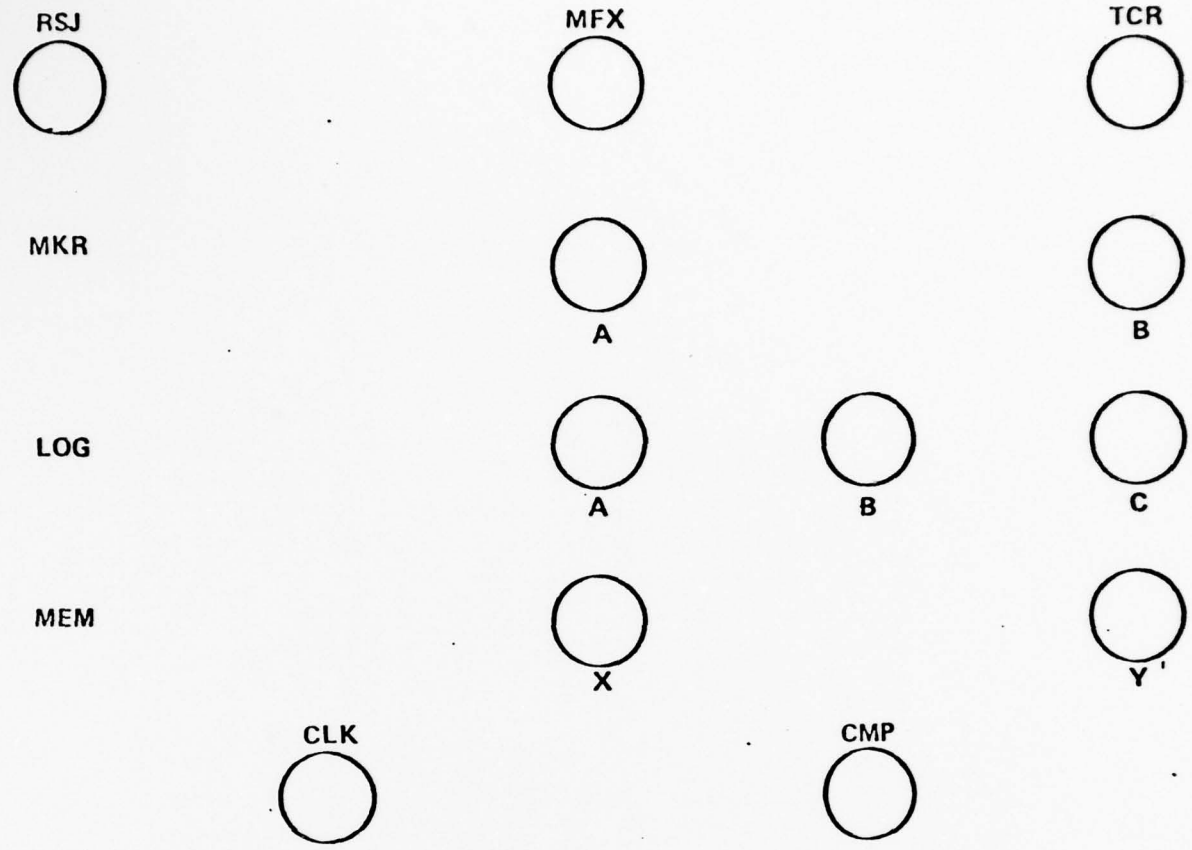


FIGURE 6. TRAFFIC PRESSURE/FLOW INDICATIONS ON THE ACAS SWITCH CLUSTER DISPLAY



LEGEND FOR LAMP INDICATORS

RSJ	REGISTER SENDER JUNCTOR
MFX	MULTIFREQUENCY TRANSCEIVER
TCR	TOUCH CALL RECEIVER
MKR	MARKER
LOG	LOGIC
MEM	MEMORY
CLK	CLOCK
CMP	COMPARATOR

FIGURE 7. SWITCH COMPONENT STATUS DISPLAY

of the display represents specific traffic direction. The top half of the display represents inbound/outbound user traffic. Terms & conditions for alarms are provided in Appendix I.

c. Components out-of-service display - The visual display, Figure 7, is activated based on non-availability of critical equipment within the switch. The RSJ, MFX and TCR visual displays indicate one or more of these pieces are non-available. Segregated displays of the marker, logic and memory (A or B) provide indicators of which of the dual systems are not available. Switch operation in the manual mode can occur with one marker, logic and memory out-of-service. These are considered HAZCONS (hazardous conditions) per paragraph 6a(2)(b), thus requiring station personnel to report this condition in accordance with DCAC 310-55-1 reporting conditions.

d. Trunk Status Display - A visual alarm is present indicating that all trunks in one trunk group are occupied simultaneously. A Pilot-Make-Busy (PMB) alarm, representing indicators installed on those interswitch trunks using a carrier with a group pilot, provides an alarm when transmission in one direction is lost. Two related alarms for connected switches indicates transmission is lost in both directions

A ATB & PMB alarm simultaneously indicates failure of transmission facilities for the alarmed trunk group. Although coarse, a correlation of grade of service and quality of service is provided with these two slarms. As only those trunks serviced by carrier are alarmed with PMB, other trunks not so serviced may indicate heavy traffic flow (ATB) which in reality may be transmission media failure.

e. As stated, all the above are real time indicators. Short term & long term correlation is accomplished between multiple ACAS displays using pen recorders. Selected elements of a switch display are connected to a single pen recorder. A visual alarm deflects the pen. Correlation of similar events for connected switches represent a coarse definition of traffic data. Display activity may require a specific control action or a call for specific traffic data in an attempt to identify the network impact of the abnormal condition. Long term analysis of the recordings define low and high traffic periods, (hour to hour, day to day). This analysis defines the normal histogram for AUTOVON traffic movement. Comparison of this long term normal operation to real time

indicators provides indications of the nature and severity of abnormal conditions.

f. Traffic Data Collection System (TDCS). Analysis of events displayed by ACAS, may require specific traffic data in order to best assess the problem and appropriate control action. An automated means for providing this traffic data is the Traffic Data Collection System (TDCS). Prior to the TDCS implementation, traffic data requests were honored by switch personnel with data obtained from the switch memory. Narrative reports were provided to the ACOC over critical control circuits.

(1) Traffic information obtained from the switch memory includes

(a) Traffic Registrations for Each Interswitch Group

1. Outgoing Trunk Connections
2. Overflow
3. Prempt Count
4. Incoming Trunk Connections

(b) Traffic Registrations for each PBX Access Line Group

1. Terminating Connections
2. Overflow
3. Preempt

(c) Traffic Registrations for the Switch

1. Tandem Call Attempts

2. Lost Precedence

Data reported is used to calculate the call rate, call connections per circuit per hour (CCH) and attempts per circuit per hour (ACH). Standards calculated for AUTOVON are used for comparison. These standards are constantly reviewed and updated as required from statistical data obtained. Refer to Chapter 2, paragraph 5, of DCAC 310-V70-44 for calulations.

(2) Automated traffic data collection can be obtained, from the TDCS. Additional to the functions of traffic and call data collection, the TDCS has the capability of rapid memory reload to allow for swift restoral of an AUTOVON switch to operational status, if memory reload is required. Traffic data may be collected on an immediate basis for a short list of items, or long term for two thousand items of usage, duration and count data. Special requests for short term items are printed locally and through use of a call-up AUTOVON circuit and communication interface, directly to the ACOC. Long term data is placed on magnetic tape. The call data collection function of the TDCS collects data on

calls orginated by local subscribers and calls to DSA operations. Details of the data collected for each function is represented in Appendix II.

7. AUTOSEVOCOM reporting also includes both status reporting and traffic data.

   a. Status reporting is provided under the rules stated below.

      (1) When a total AUTOSEVOCOM facility outage or restoral occurs. A total facility outage occurs when the switching equipment is unable to process any traffic due to malfunction or failure. A facility is restored upon the return of the equipment capability to normal operation, even though a redundant component may be out of service. A station outage automatically implies isolation from the network.

      (2) On the following other reportable subjects:

         (a) Switch Isolation. A switch or station isolation occurs when all interswitch connectivity (interswitch trunk and AUTOVON access line) is lost, due to failure not attributed to the switch itself, such as failure of technical control or transmission facilities. Switch isolation terminates when the first interswitch trunk or AUTOVON access line is returned to service.

(b) Hazardous Condition. In addition to the conditions specified in paragraph B.3a(7), a hazardous condition occurs whenever actual or suspected security compromise of COMSEC material or devices occurs.

(c) Impaired Service Condition. An impaired service condition occurs when the switch loses the capability to process traffic in the automatic mode either with its subscriber access lines, AUTOVON access lines, or interswitch trunks due to a switching facility malfunction or failure. An impaired service condition terminates when the switch regains the capability to process all traffic in the automatic mode.

(d) Outage or isolation of an NBST homed on a switch other than an AUTOSEVOCOM switch (AUTOVON switch, JOSS, 5D switchboard) when it becomes apparent that restoration cannot be accomplished within 30 minutes.

b. Traffic Data for AUTOSEVOCOM is a once a month sample of switchboard traffic that is collected by the switch board operator and mailed to the ACOC. The ACOC directs the schedule for data collection.

8. All status data described in previous paragraphs reside in the WWOLS at the ACOC and DCAOC for a period of 10 days. Presently neither the ACAS or TDCS information

is available in the data base. The ACAS system does not provide for recording and filing of data in an automated data base. Presently only the pen recordings and log entries can be used to provide a base for analysis. TDCS data recorded on magnetic tape is available once a month.

C. Scope of Systems Operational Control

Systems operational control, for purposes of this report, can be defined and excercised in two modes. Mode 1 involves identification of DCS events and conditions which result in short term re-allocation of DCS resources that does not significantly degrade service to users. Mode 2 involves a short term denial or a significant degradation of service to a user. Either mode is entered whenever any degradation or failure occurs within the DCS. Mode 1 would occur if traffic volume in the system is low. Mode 2 status would occur when traffic volume is high. Timely detection and resource allocation is required during Mode 1 to preclude entry into Mode 2. Corrective actions under Mode 1 is entirely within the authority of DCA. This authority includes call-up of overflow trunks, rerouting of switched traffic around degraded portions of the network, use of spare equipment and spare channels to reroute or re-establish circuits and circuit segments. Coordination for these activities is not required outside the communications community.

Entry into Mode 2, however, requires external coordination with the effected theatre military commanders (J6

staff) for the appropriate action authority. This coordination includes the period the degraded or denial of service will occur. In all cases theatre commander authority is implemented via pre-coordinated plans specifying reroute, pre-emption and restoral actions. The use of this authority is reported daily via the information networks of the SYSCON Structure. Timely reporting, analysis and subsequent reallocation of resources sustains system operation within Mode 1, affording a number of advantages. These are;

1. Customer service is sustained at a desired level.
2. Entry into Mode 2 is averted.
3. Coordination outside the communications community is eliminated.

In order to sustain a Mode 1 status, the following would be required on a real-time basis;

- Current configuration and capacity of transmission media facilities.
- Current traffic flow information for switched networks.
- Current operational status of equipment in both transmission media & network control facilities.
- Correlation of transmission media facilities, status traffic flow, and equipment status to determine current and potential system problems.
- System restoral and contingency status at each control node were actions may be involved.

All the above are impacted by the amount of data reported, time-thresholds and conditions invoked for reporting,

correlation of traffic and transmission status data and flagging of potential problem areas.

D. Scope of Management Data

Systems management involves the longer term actions of planning, engineering and analysis. It includes establishment of standards, practices, methods and procedures to more efficiently sustain the performance of the DCS. System management also includes future requirements, system surviability, system reliability and any other operational constraints. Inherent in these tasks is a review of the data collected and analyzed at each level of the SYSCON structure to determine if the level of performance is equal to, better than or worse than goal requirements. Additionally, systems management must look at how to improve the system performance level, not only through technological improvements of the DCS, but through iterative analysis of the cause and effects of systems operational control to determine the point where more efficient control can be derived. Toward this goal, management data should be derived to determine

- How often was Mode 2 averted.
- How efficient was Mode 1 accomplished.
- What additional data is required at any level to avert Mode 2.
- What improvements in time threshold reporting could assist in averting Mode 2.
- How efficient was Mode 2 implemented.

Appendix III, Chapter 5, DCAC 310-70-57 provides guidelines and insights to the actions and management reports required by DCA to develop management actions.

Background staff function also require the development of management data. Primarily these concern the servicing of customer Telecommunications Service Requests and commenserate circuit engineering. Status data is required to determine if the level of performance requested by the customer can be satisfied. Facility and service data is required by staff elements to determine channel connectivity and equipments available to satisfy customer requests.

E. Relationship of Types of Data to SYSCON Levels

The following is a brief description of the responsibilities inherent to each level of SYSCON, the type of data (defined in Section I) used and how their responsibilities interact with these data:

1. Level V - This level is in direct contact with the transmission and network control facilities.
   a. Transmission media facilities are responsible for providing a quality of service to users of the DCS. They use the status information and service data to report the status of station transmission facilities and equipment to Level IV.
   b. Network control facilities are responsible for providing a grade of service to users of the switched networks. Status information and service data is used to report status of the traffic flow and switch equipment to Level II.

2. Level IV - This level is responsible of insuring that resources available to subordinate stations are used to sustain a quality of service to customers of the DCS over a specific geographic area. Status information and service data reported by subordinate stations is consolidated and refined for submission to Level III.
3. Level III - Level III is the pinnacle point of operations control for transmission systems and the baseline point for traffic control. Presently Level III receives summary reports from transmission media facities on the quality of service from subordinate levels. Status information and service data is used to consolidate and refine transmission facility reports for submission to Level II. The responsibility of correlating quality of service data with grade of service data cannot be accomplished at this level. Operational control data reflecting grade of service information is directed to Level II. Hardware and software resources are also not available to provide analysis and correlation of data. Presently grade of service status information is directed to Level II. As Level III span of control is over very large segments of the DCS with numerous network and transmission nodes, it is at this level that the operational control of Mode 1 and 2 can occur. Real time traffic volume and network facility status data can be correlated with real time transmission facility status data to provide

the direction and resource re-allocation necessary to sustain Mode 1 operational status and avert Mode 2 status.

4. Level II - Level II is the terminal point for all service and status information data in the DCS. Manned by DCA personnel and geogrpahically placed in three areas, Europe, Pacific and Continental U.S., it prime responsibility is to monitor the management of resources that provide satisfactory performance of the DCS. It presently correlates the quality of service and grade of service status information to affect this responsibility. All service and status information is resident in the data base of the World Wide on Line System (WWOLS). Status information and service data is used to provide reports to Level II. Facility data along with service data is used to satisfy requests for change of service by customers within their area of responsibility. Facility and service data is used to assist specified commands in developing contingency plans.

The contintntal U.S. Level II has an additional field element, the Defense Commercial Communication Office (DECCO). DECCO is responsible for the circuit engineering of all non-DOD customer requests, the contracting and payment of leased contracts for equipment or facilities. It uses facility, service and status information data to compute appropriate contract

payment penalities based on equipment or service availability. Facility and service data is used to accomplish circuit engineering and, if necessary, as justification for additional leased equipment or services.

5. Level I - Level I is maintained at the DCAOC. Systems operational control and systems management reside at this level. Systems operation control emphasis is in the DCAOC, with management control delegated to DCA staff elements. Service and status information is used by the DCAOC to determine and manage the level of performance for the DCS. The same data is refined and used to inform the Joint Chiefs of STAFF (JCS) of the status of the DCS. Facility, service and status information data is used by staff elements to plan and engineer the future configuration and performance level of the DCS.

F. Detail Description of Data Files vs SYSCON Levels

1. The following describes the data files within the DCS, the point within SYSCON that these files are resident and in what form, which level updates the files and which files are necessary to accomplish the responsibilities assigned each level. The term data files as used herein refers to any compilation of information used or required to plan, engineer, operate and manage the resources of the DCS.

2. Facility and Link Data

The Facility and Link Data file is a description of equipment installed in each station or site within the

DCS. Cross reference to DCS transmission links derived from specific equipment is also provided. The file is resident in automated form in the WWOLS at Levels I & II. Levels III, IV & V have print-outs of this data. The amount of facility and link data at each level is restricted to the geographic area of responsibility for each level. For example, a Level V transmission media facility (Technical Control Facility) will only have facility data for their station, Level IV will have the data for the stations in their area, etc. A one time report is rendered for initial configurations with updates provided when changes occur. Updates are provided by Level V stations. Mandatory reviews and updates are provided quarterly.

3. Circuit Link & Trunk Files

The Circuit, Link and Trunk (CLT) files details all the circuits, trunks and links that form the DCS. New requirements are derived from Telecommunications Service Orders (TSO) written by DCA or DCA Area circuit engineers to satisfy customer requests. These new circuit requirements are entered into the file by staff elements for future implementation and deletions. Implementation of the specific TSO is accomplished by the O&M agencies at Level V. The CLT is resident in automated form at Levels I & II in the WWOLS. It is in manual (print-out) form at Level V for their station, at Level IV for the node area and at Level III for sector geographic area.

The manual print-out of the CLT at Levels III, IV & V is a reduction of the total CLT file. This "operational" file contains the necessary information in a format that allows the task of DCAC 310-55-1 status format reporting easier. These formats are described in Section III of this report. Changes (addition or deletions) to the CLT are directed downward from Levels I & II to Level V in the form of the TSO. The update, upon implementation of the change, is orginated by Level V.

4. Status Data Files

The majority of the status data file consists of status reporting required under DCAC 310-55-1. This covers exceptions to normal operating conditions, quality assurance data and switch traffic data. Exceptions reported include: switch, equipment, link, trunk or circuit outages, degradations or restorals; circuit or traffic reroutes and service restorals. All and any condition the aversely affects DCS level of performance is reported. The form of the data, how orginated and its location varies based on the type of facility. Accordingly, the following discussion is facility oriented for transmission media facilities and network control facilities. Network control facilities are further subdivided by specific networks, in order that differences in status data configurations can be highlighted. Also discussed as status data, are the summary reports developed by higher levels of the SYSCON Structure.

a. Transmission Media-Status Data

(1) This data includes;

(a) As occurs and periodic reports providing status of transmission equipment

(b) Quality assurance measurements of circuits, links and trunks

(c) Test & acceptance data-initial status of circuit, link or trunk at time implementation

(d) Performance evaluation data reflecting descrepancies found during periodic or as required evaluations of DCS stations, conducted by DCA Area and Regions

(e) Technical Evaluation Program - status data derived from scheduled technical evaluations of DCS stations conducted by the military departments.

(2) Current status, quality assurance and test and acceptance data is presently in manual form at Levels III thru V. It is in automated form, via the WWOLS at Level II, with the same detail as reported by lower level stations. The automated form available at Level I, consisits of summary reports (COMSTATS) from Level II. Detail data is available at Level I through use of key word entry into the Level II data base. Current status and quality assurance data is orginated by Level V reporting stations,

providing the status of its station and reported-on stations. Reported-on stations are small special purpose facilities which are lightly manned or unmanned. These facilities can not support operational reporting. Consequently they detect the event, funnel the status to the reporting station and in turn implement any specific operational direction. Implementation of the ATEC system shall provide an automated data base for this data at Levels III thru V. Automatic measuring devices at selected reported-on stations, (strictly transmission facilities) will report equipment status to the reporting station.

(3) Technical evaluation and performance monitoring data is maintained in manual form at all levels. It is orginated by the respective evaluation team implementing the technical evaluation or performance monitoring program for DCS stations.

b. Network Control Facilities - Status Data

(1) This data consists of:

(a) Current status & periodic status reports of equipment facilities.

(b) Traffic data.

This data is resident at Level V switched nodes and at Level II in the same detail. None of

the status or traffic data for network control facilities is available at Level III. Summary status data is resident at Level I, derived from COMSPOT reports orginated by Level II. Traffic data is available at Level I through key word usage via the WWOLS, from the data base at Level II. Exceptions, if any, to the above are stated below for specific switched networks.

(2) AUTODIN I - Overseas

Status data is both automated and manual at Level V. "U" Line reports per DCAC 310-55-1, are automated, all other AUTODIN I status reports are manual. Traffic data in the form of Header extract reports, covering one day a month, are written to magnetic tape and mailed from Level V to Level I. Traffic volume totals are submitted automatically by each Level V switch to Level II. All data, status and traffic volume data is automated at Level II. Header extract data is automatically processed at Level I, to develop traffic engineering and performance data.

(3) AUTODIN I - CONUS

Leased facilities of AUTODIN I in the Continential U.S. (CONUS) have similar responsibilities to Level V AUTODIN I facilities overseas. All

status reports are generated manually by the switches or reporting stations. Reporting station authority in the CONUS would be assigned to the gateway station. Header extract and traffic volume information is derived in the same manner as overseas AUTODIN. All data is reported to Level II where it resides in automated form within the WWOLS. The periodic, 2-3 times per week, reports for AUTODIN management Index File and AUTODIN Circuit, Link, Trunk Inventory are also reported to DECCO via AUTODIN. Other Status data is available to DECCO through key word requests from the WWOLS data base.

(4) *AUTODIN II - CONUS*

Reported from the functionally equal Level V station, however facilities are leased. Reports orginated from Level V go directly to the AUTODIN II Network Control Center. The AUTODIN II NCC and Level II CONUS ACOC shall use the common data base of the WWOLS. Assigned alarm and threshold conditions are automatically generated by the AUTODIN II packet switch. Status data including traffic data flagged for automatic transmission via the Packet Switched Network, are semi-automatically (under controller release) sent via AUTODIN I to the WWOLS. All

data will be in automated form at Level II WWOLS. The AMIE data and AUTODIN CLT Inventory will also be directed to DECCO. DECCO's requirements for other status data for AUTIDIN II shall be from the WWOLS data base.

(5) AUTOVON - Overseas

Status data is orginated from Level V to Level II. Data is in manual form at Level V and automated at Level II. Traffic data is available from a number of sources. Traffic data (peg counts, etc) is available in card form at the Level V switches, however it is derived automatically from the switch memory. Narrative traffic data information is provided to Level II, based on their request. The ACAS display provides perishable status and traffic indicators at Level V and Level II. No permanent record of the displays are made, other than pen recordings on an as-required basis. Logs reflecting action events implemented provide a historical data base, in manual form, of significant problem events. These logs are resident at Levels II & V. The Traffic Data Collection System has the capability of providing traffic data in automated and manual form at Levels II and V. Presently data is written to magnetic tape and mailed to Level II.

(6) AUTOVON - CONUS

Leased switches, functionally equal to Level V, provide status data to the AT&T-operated Dranesville Operations Control Center. Status data is in manual form at the switches and Dranesville Operations Control Center. Real-time-indicators, similar to the ACAS for Overseas AUTOVON, are also provided to the Dranesville Operations Control Center. Summary status reports in manual form are provided the CONUS ACOC, Level II. Status data is in automated form at Level II. Traffic data is available in manual form at the Level V switch, although automated in the switch memory. Traffic data is provided Level II on request in manual form.

(7) AUTOSEVOCOM

Status and traffic data is in manual form at Level V and automated in the WWOLS data base at Level II. All data is generated by Level V stations.

c. Communication SPOT (COMSPOT) Report

A COMSPOT report is summary in nature, orginated by Level II, directed to Level I. All status data exceeding time-threshold conditions of DCAI 310-85-1 are reported. This data is a synopsis of all status data reported by Levels III-V, highlighting specific events. The data is in automated form at Level II

via the WWOLS data base. Key word subject codes are used in generating the report to allow for data capture at Level I. The data is in automated form at Level I.

d. Communication Status (COMSTAT) Report

A COMSTAT report is orginated at Level I and used to inform the Joint Chiefs of Staff and other specified agencies of global DCS status. Data derived for the report is in automated form at Level I.

III. FILES AND THEIR CHARACTERISTICS

A. Circuits, Links, and Trunks

The transmission of information by the DCS is accomplished over a network of wideband and narrow band channels which are the transmission system. These transmission channels are arranged in a hierarchical pattern based on the information capacity represented in each of these channels:

1. Circuit - The base communication channel. The circuit is capable of narrowband voice communication data communication at 2400 Bbs or less.
2. Trunk - A grouping of circuits in transmission systems which is achieved by multiplexing. (Trunks can also be established within a switching center when a path through the switch matrix is established to support a volume of traffic.)
   a. 12 narrow-band voice channels which are frequency division multiplexed into a "group".
   b. 24 narrow-band channels which are time division multiplexed into a "di-group".
   c. Up to five groups of twelve narrow-band channels which can be combined into a "super group".
   d. Up to 16 low speed (maximum 90Bps) data circuits frequency or time division multiplexed into a trunk occupying one narrow band channel.
3. Link - The route from baseband input to baseband output traversed by communication signals between two stations.

4. Thus a group of multiplexed circuits become a trunk and the transmission of one or more trunks between sites by radio or wideband cable traverse a link. The demarkation point between circuits and trunks and between trunks and links are interfaces. The monitoring, maintenance of the interface is a primary responsibility of Level V Tech Controls. The interconnection of circuits to trunks and trunks to links represents a detailed network structure of the DCS. To maintain operations and management continuity for the control of this network a commonly recognized road map characterizing each interface and interchange is necessary. This is the function of the Circuit and Trunk file (CLT file).

   a. The CLT file is maintained in the WWOLS using policy outlined in DCAC 310-65-1. Its stated uses support the following activities:

      (1) Allocation of circuits.

      (2) Reporting by NCS/DCAOC (DCAC 310-55-1).

      (3) Planning and engineering of circuits.

      (4) Statistical analysis of DCS resources.

      (5) Simulation studies.

      (6) Daily operation of DCS operation centers.

      (7) Certification of restoration priorities.

      (8) Provision of inventory of resources to operating agencies.

b. The CLT files may be said to contain all pertinent non-technical data required for defining the allocation of DCS resources. Appendix IV provides an example of a circuit file, its information content, and a Chapter reference to DCAC 310-65-1 which illuminates the source information each coded element may represent. Appendix V provides the same for the trunk file.

B. CLT File Presentation

1. The data base of the WWOLS allows CLT data to be presented in various formats, depending on those data elements withdrawn from the file, and the method of sort. Appendix VI provides a breakdown of possibilities using a typical operating location; Vaihingen, Germany.

a. Pages 1-22 provide a "station makeup" compilation taken from information extracted from the circuit and trunk file. Note that information is sorted by trunk number. This is beneficial to operational control since it portrays the station "multiplex plan", which is equipment oriented.

b. Page 22 contains a circuit summary showing circuit quantities and their restoration priorities. This is an analytical compilation of information in the circuit file.

c. Page 23 contains a network summary showing the circuits passing through the station by quantity and the user networks they support. This is an analytical compilation.

d. Some modifications in the printout column headers are present these are tabulated below

(1) Header "OP" in the Station Makeup is the same as "TO" in the Standard Circuit Listing.

(2) Header "MR" in the Station Makeup is the same as "MD" in the Standard Circuit Listing.

(3) Header "ENR" in the Station Makeup is the same as "FAC" in the Standard Circuit Listing.

(4) Header "Network" in the Network Summary Listing in the same as the Purpose Use Code "PU" in the Standard Circuit Listing.

2. Appendix VII is a Link Makeup List. It is a variation of the information in the Station Makeup List, however it is compiled against the Link number found in the Standard Trunk Listing. Note that it also closes with a circuit and network summary.

C. Significance of CLT Presentation

1. Information contained in the attached printouts is a truncated version of CLT file information in

c. Level III would be concerned with the ability of that sector's transmission networking to support traffic movement within its area of responsibility.

d. Level II would be concerned with the status of area switches and the ability of transmission systems to support inter sector traffic movement.

e. Level I would be concerned with the ability of all aspects of the DCS, however a primary operational concern would be the ability of the networks to support out of the ordinary service requirements.

f. At all levels, summary data could prove beneficial for providing "impact" data. This could be required whien testing solutions to operational problems prior to their implementation.

D. Operating Equipment Dedicated to the DCS

1. The ability of the DCS to provide its assigned mission support is determined largely by the serviceability of individual equipments. The quality and characteristics of these equipments are reflected in the Facility/Link Data Base established via the Communications Resource Data (CREDATA) reporting system, presently implemented by DCAC 300-85-1. This reporting system establishes

a modified format. This is done for two reasons:

a. Much of the information is management oriented Consequently that data has been deleted from printouts scanned within SYSCON operational elements because it is not useful.

b. The format is arranged such that the information presented to a person scanning the printout is arranged much the same as the flow of a station oriented multiplex plan. (Appendix VIII provides an example of such a plan.) Thus the controller finds a single printout representative of file data which reasonably identifies with the physical plant in his station.

2. Summary data provided assits the user in making a quick assessment of this operational status. Basic concern would be the operational status with relationship to Model (degraded service) and Mode 2 (curtailed service). Summary data should be a variable, based on the users position in the SYSCON structure.

a. Level V sites would be concerned with station level support.

b. Level IV would be concerned with the support afforded by that mode of the transmission system.

and maintains an ADP data base of related files for collecting, storing, updating, processing and disseminating information concerning the communication resources of the DCS. The data base pertains principally to:

a. The quantity and characteristics of the equipment used in the DCS

b. The sites/buildings/vans used

c. The organization of the equipment to provide the transmission links that are the basic service elements of the DCS.

The data base is maintained by the DCAOC Level I, within the WWOLS. The data base is based on the initial report and quarterly or as-occurs updates from all reporting DCS stations including automatic switching centers (negative quarterly update reports are required). Commercial interfaces are included but not commercial facilities.

2. The DCS station reports which initiate or update the file records are form letters. These reports are rendered in nine sections. The report format is reflected in Appendix IX as Figures 1a through 9a. Examples of completed reports are shown as Figures 1b through 9b. The nine sections of the report are;

a. Station Profile: location, higher O&M headquarters, addresses and any contractor identification.

b. Site Profile: location, geographic coordinates and elevation, DCS facilities on site. These latter are identified by type, eg. TCF, MUX etc.

c. Rooms Housing Facilities: structure and room number, room size, DCS facilities there-in and when manned.

d. Van or Shelter Housing DCS Facilities: same as c.

e. Power Sources: location, type, capabilities.

f. Technical Control/Patch and Test Facility (TCX/PTF): location, subordinate PTF's and associated facilities and patching standards. The latter includes level and impedances for each type of patching (DC, voice frequency, baseband etc.)

g. Equipment Inventory: nomenclature, stock number, quantity in use and associated link numbers.

h. Link and frequencies: DCS Link numbers, path connecting location, channel capacity/in-use, frequencies assigned, emission type and power authorized/in-use.

i. Antennas and Reflectors: DCS link number, antenna type/size/nomenclature/geographic coordinates/height/azimuth/tilt/gain/frequency range, associated transmission lines by

type/impedance/length and the connecting location (distant terminal).

3. Accordingly, the Facility/Link data base provides a very comprehensive picture of the facilities within the DCS. It can be cross-referenced to the Circuit/Trunk file by the station 8-character geographic name (DCAC 310-65-1 Chapter 33). Additionally, the DCS link number associated with equipment inventory and configurations (Figure 7 of Appendix IX) are identical as those used in the trunk file. Table I of Appendix IX delineates the type of reportable facilities. All DOD units or DOD-contracted civilian organizations responsible for operating or maintaining a DCS station are required to submit Facility/Link data base reports. If two or more different O&M units at the same DCS station have responsibility for different DCS facilities, each unit must file a report for their responsible area. Specific definitions apply only to DCAC 300-85-1. These are rendered only to determine what agencies must originate the Facility/Link data base report. These definitions are;

   a. DCS Station - One or more DCS sites under a single operating and maintaining unit. This includes stations totally operated and maintained by civilians under DOD contract.

b. DCA Site - One or more DCS facilities in a one square-mile area. Sites may be located on a large military base or installation, in areas remote to the base but considered part of the main base, or in rooms or buildings not located on a military installation. If a "DCS station" is only one site, the site shall carry the geographical name of the station. If more than one site exists at a station, one of the sites must carry the same name as the station. In most cases a DCS station consists of a single site.

c. DCS Facility - An arrangement of equipment which produce;

- a long-haul transmission media
- a common-user traffic switching center (or relay)
- associated communication support facility.

Table 1 of Appendix IX reflects the type of facilities reported. The arrangement of equipment may be DOD-owned, leased, or a combination of both. No base terminal facilities are reportable. These include;

- base communication centers
- base telephone switchboards
- subscriber terminal facilities
- command and control centers

- weather and logistic relay facilities
- intelligence traffic handling facilities
- satelite tracking facilities
- air-ground-air facilities
- ship-shore-ship facilities
- tactical facilities

Although these facilities are allocated DCS circuits for service, they are not part of the DCS, therefore not subject to Facility/Link reporting. AUTOSEVOCOM subscriber facilities (secure telephone facilities) although part of the DCS are also exempt from reporting.

4. One major use of the Facility/Link data file is to provide long term visibility to the planning of operations and the programming of new service for customers of the DCS. The Facility/Link data file provides the definition of those communication equipment resources presently in use, those that can be allocated spare equipment for restoral purposes, and those equipments that are non-allocated for operational use or restoral but are available for supporting additional customers. Additionally, once knowing the specific life expectancy of certain equipments, the data base is the source from which the population of these equipments that require replacement and their location can be determined. Accordingly long

term funding and planning actions are defined using the file. All of these actions are long term, therefore supporting the management staff elements of DCA.

5. A more significant use of the Facility/Link data base is for the support of operational activities, thus more short-term in its use. As the data base maps the equipment used in the DCS, correlatable to specific circuit/link service it supports, it provides a positive overview of station to station equipment configuration. Although pre-coordinated restoral plans and policies are established to insure rapid restoral of service, there are many times these pre-planned activities cannot be consumated, consequently loss of service occurs. Failure can occur due to;

   a. Dynamic changes in the equipment configurations not yet covered by restoral plans.
   b. New equipment configurations incorrectly identified in restoral plans.
   c. Extraordinary failures in service not envisioned by a restoral plan.

   Introduction of new equipment into the DCS normally requires a five year learing curve before immediate understanding of fault conditions and effective corrective actions can be effected easily. As the DCS evolves from an analog, to

a hybrid analog/digital, to an all digital system, new equipment will be implemented into the DCS. Existing restoral plans can not be effective during the transition. It is under these type conditions that the Facility/Link data base can be used at the respective operational levels of SYSCON to support day to day operations, and consequently sustain a Mode 1 operation. The Facility/Link data base is presently provided as a print-out to each level and station in SYSCON. However the file must be sufficiently dynamic to assist in defining a operational problem within the DCS. This would include identifying in detail;

- the proper site where the problem exists
- the correct equipment failure condition
- identifying the proper restoral method.

6. The dynamicism discussed above would require an active data base at each level of the SYSCON structure. Each level of the SYSCON structure would require only the amount of information for their specific area of responsibility. A graphic display of the equipment supporting specific link segments would provide the most efficient method of portraying the information to site personnel.

E. Status Reporting Data Formats

1. As previously stated, status reporting for the DCS is established in-accordance with DCAC 310-55-1. DCS operating elements submit periodic and "as occurs" reports up the SYSCON structure. Reports are either non-formatted (narrative) or formatted with or without narrative remarks. A non-formatted report of DCS status is required as soon as feasible after a reportable event occurs. Formatted reports contain status information on previously reported items and other DCS status information. Specifics regarding conditions and time thresholds for non-formatted and formatted reports are discussed in Section II, paragraph B of this report. Definitions for terms applicable to DCS reporting information are rendered in Appendix X.

2. Narrative reports are forwarded up the SYSCON structure to appropriate elements via critical control or orderwire circuits by teletype of telephone. These reports are screened by each level of the structure. Information is rendered to the next level along with requests for assistance in resolving problems which can not be resolved locally, and any other information of a non-routine nature not identified in DCAC 310-55-1.

3. Formatted reports are sent via AUTODIN to the appropriate SYSCON level. Formatted reports are keyed as to their type by the report information line, the first line of the message report. Specific requirements for each information report line are;

   a. Begin with the appropriate information line symbol.

   b. Adhere strictly to the prescribed format.

   c. Contain DCS facility designators specified in DCS directories and reporting guides, as amended.

   d. Contain a slant bar (/) to separate adjacent data elements.

   e. Use G.M.T. (Z-time) throughout.

   f. Not contain spaces or blanks between data elements.

   g. Not exceed 69 characters. Additional report information lines will be added if more information is to be reported than can be contained on a single line.

   h. End with two carriage returns (2CR) and one line feed (1LF).

   Specific information line symbols are provided as part of Appendix X. The following list shows the report information lines with the required preceding lines.

Information Line	Required Preceding Lines
S	None
L	S
K	S
C	K & S
A	S
U	S
Q	S
E	S

The order in which information lines are rendered in a formatted report are part of Appendix X.

4. Formatting guidelines are established in DCAC 310-55-1. A synopsis of these guidelines are rendered herein, with example formats and explanatary notes part of Appendix X. Criteria for each of the report information lines follows.

   a. Station Information Line (S-Line) - an S-Line is required;

      (1) As the first information line on every report to identify the station preparing the report.

      (2) To identify a reported-on station.

      (3) To report a reproted-on station outage and restoral.

      (4) To report an AUTODIN station restart.

      (5) To report an AUTODIN station reload.

      (6) To report an AUTODIN station recovery.

(7) To report narrative recoverable subject status information concerning a station. These reports provide the means of supplying narrative status for a specific station.

(8) To report narrative information on specific recoverable subjects. These reports are characterized by a 10 character or less code identifying the specific recoverable subject. These specific codes form a part of Appendix X. Note that this type report is used to submit AUTOVON switch traffic data (VONDATA) and traffic data for an AUTODIN Switch (VONDATA). The other recoverable subject codes concern outage restorals or hazardous conditions for;

(a) AUTOVON Switch

(b) AUTODIN Switch

(c) AUTOSEVOCOM Station

(d) Reporting & Reported-on Stations

(e) Joint Overseas Switch

(f) Submarine Cable

(g) Cables other than submarine

(h) Military satellite station

(i) Commercial satellite station

(j) DCS station isolation, isolation of CINC's, embassies, unified commands and specified commands from the DCS

(k) Specific equipment

(l) Specific circuits designated by SYSCON elements.

The S-line is paramount as all following information lines are dependent upon it. Reporting station outages and restorals are automatically posted by the WWOLS to all links, trunks, channels and circuits traversing or terminated in that station. Link, trunk and channel outages reported prior to a station outage and which continue out after a station has been restored, must be reported out again by the appropriate L-line, K-line, or C-line report.

b. Link Information Line (L-line) - A L-line is required to;

(1) Report a link outage and restoral

(2) Report narrative recoverable subject status information on a link

A L-line must be preceded by a S-line. Link outages are automatically posted to all trunks channels and circuits traversing the reported link. Again if trunk and channel outages are reported out prior to the link outage and continue out after the link restoral, appropriate K-line or C-line type reports must be rendered. A link consisting of only a single

trunk is reported by L-line rather than by K-line.

c. Trunk Information Line (K-line) - A K-line is required to;

(1) Report a trunk outage and restoral

(2) To identify the trunk associated with a subordinate channel information line (C-line)

(3) To report narrative recoverable subject status information concerning a trunk.

A K-line must be preceded by an S-line. The WWOLS automatically posts outages and restorals to all channels and circuits traversing the reported trunk. Outages and restorals of a trunk with only one channel is reported by K-line rather than C-line. Outage and restorals of a VFCT trunk is reported by K-line at the terminating station using the assigned trunk identifier. A VFCT trunk outage is terminated at the time service is restored through reroute. An A-line report is than generated using the VFCT CCSD to indicate restoral action.

d. Channel Information Line (C-line) - A C-line reports the outage and restoral of a channel, either analog or digital. It must be preceded with an S-line and a K-line. Channel outages

and restorals are posted by WWOLS to the circuits which traverses the reported channel.

e. Allocation Information Line (A-line) - An A-line is used to report;

(1) Restoral, on a spare channel, of a circuit previously reported out by L-line, K-line or C-line. The A-line is also used to report return of the circuit to its normal path.

(2) Restoral of a circuit through pre-emption of another circuit. The pre-empting circuit was previously reported out by L-line, K-line or C-line. Return of pre-empting circuit to its normal path is also reported by A-line.

(3) Activation and deactivation of an on call circuit when an active circuit is pre-empted.

(4) Activation and deactivation of an on call patch.

f. User Information Line (U-line) - A U-line is used to report;

(1) A failure and restoral of a user terminal due to a circuit outage and restoral between the user and the nearest reporting on reported-on station (DCS access station)

(2) To report narrative recoverable subject status information concerning a circuit.

A U-line outage must be terminated upon restoral by reroute.

g. Equipment Information Line (E-line) - The E-line is required to report the outage and restoral of specified items of equipment within individual switched networks (AUTOVON & AUTODIN). Specific equipment codes are provided in Chapters 4 & 5 of DCAC 310-55-1.

h. Quality Control Information Line (Q-line) - The Q-line is used to report the quality assurance information obtained from measurements conducted per DCAC 310-70-57.

5. Each type of formatted report can be segregated to determine the status of the two elements, quality of service and grade of service, that constitute the overall level of performance for the DCS. As each type report is keyed by a specific code identification, correlation and separation of the reports are possible. All reports provide indications of the quality of service available within the DCS. Critical transmission media related reports however have the following information lines.

a. S-Line

b. L-Line

c. K-Line

d. C-Line

e. A-Line

These type reports reflect station outage, link, trunk and channel outages with Q-line reports rendering measurement data. Grade of service reports are determined from;

a. S-Line reports indicating AUTODIN restart, reload or recovery

b. S-Line reports providing traffic data on AUTOVON & AUTODIN

c. E-Line reports

d. C-Line reports where the channel outage effect switched network operation.

These type reports indicate switch network outages, equipment failures within a switch that may effect grade of service, quantitative traffic data reflecting message (analog or digital) throughput and channels that carry AUTOVON & AUTODIN switch to switch or customer to switch circuits.

6. Status information data of all types must be made available to all levels of the SYSCON structure. Critical data, properly flagged can provide each level of the structure the information required to determine if Mode 1 (curtailed service) or Mode 2 (lack of service) level of operation is about to occur. To provide such a "early warning" however will require the development of a significant histogram to assure repeatibility of cause and effect. Through this technique the elements

causing the effect (i.e. curtailment of loss of service) could be detected prior to the effect and corrective action be initiated. This certainly would be an ambitious undertaking and would, if comsumated, support the axiom of "fix before failure." A more practical approach and definitely the first step towards this goal, is to establish a flexible status information data base, available (transportable) as necessary to, specific stations within Level V, at Level IV and Level III. In this manner, status of other stations within the network can be made available to any station at Level V, even within different sectors (two different Level IV's). Additionally, other levels within the structure can be made aware of the problems at an early stage. Essentially, all available resources of the structure can be brought to bear on the problem(s) at the earliest possible time. Additionally, transmission media status data should be correlated with network systems status data, thus establishing a relationship that is equatable to overall level of performance. Through the use of a mobile and dynamic status data base, experience levels of cause and effect can be easily established.

F. Grade of Service Data

1. Grade of service data is that report data generated by network control facilities indicating their status and traffic loading. Some of this data is reported following the report structures defined in DCAC 310-55-1 and discussed in paragraph E. The AUTOVON Central Alarm System (ACAS) and the Traffic Data Collection System (TDCS) are status reporting systems separate from DCAC 310-55-1 reports.

2. The Traffic Data Collection System (TDCS) provides for the automated collection of traffic data within the AUTOVON switch. As stated previously, this system is located at the overseas AUTOVON switches and at the two ACOC's (Level II). HQ DCA has elements for developing computer programs. The TDCS provides rapid memory reload of the AUTOVON switch memory and traffic data collection.

   a. The rapid memory reload function of the Switch Site Unit (SSU) is normally generated by reading switch memory cards with a modified IBM 026 key punch/card reader to the RMR tape of the SSU. Memory card format information is provided as Figure 1 of Appendix XI. This operation is referred to as Mode 3. Mode 4 operation consists of switch memory being

loaded at 2500 words a minute. Other modes are;

- Mode 1 - Loads the 026 output to the switch and SSU simultaneously
- Mode 2 - Loads the 026 output to the switch only
- Mode 5 - Off line use of the 026

Each switch memory card provides for two messages, of the same switch memory word. These two messages are compared and used for error detection by the switch and SSU. Print outs of switch memory can be accomplished while in Modes 2 or 5, to verify stored data. All data, specified sections or single word data can be printed. All print outs except single word print outs, provide four entries per line, with each entry consisting of a memory address and the memory data associated with the address. Single word print out provides all 34 stored characters of a memory data record. Examples of full or section print out format and single word print outs are provided as Figures 2 and 3 of Appendix XI.

b. The traffic data collection function is of two types; call collection information and switch operation. Call data collection can be initiated either at the SSU or by the ACOC,

only when the SSU is not otherwise in use. Data is collected and blocked for magnetic tape storage for future analysis. Call data is recorded based on the final switch connection for an initiated call and when each call terminates. Data is collected for all calls locally penetrated and consists of;

- Initial entry-originating trunk* number (4 digits)
- Precedence Digit
- Route Digit
- Called number
- Terminating trunk* digit
- Time (minutes and seconds) of final switch matrix connection
- Release time entry originating trunk number
- Time (minutes and seconds) when call terminated

* Trunk numbers, consisiing of four digits, correspond to the trunk group number (2 digits) assigned within the switch for each external circuit accessing the switch.

The format for call data is presented in Figure 4 of Appendix XI. As call orginations and completions occur randomly but are recorded chronologically, call duration must be computed

through comparison of the trunk number originating time and the same trunk number completion time. Switch traffic data is sensed by leads from the SSU to: external switch circuits, supervisory equipments and register-sender junctors (RSJ). RSJ data must be processed through core memory of the SSU using look-up tables to provide useful data. Two thousand events can be programmed for detection and reporting by the SSU at one time. These events can be programmed at the SSU or at the ACOC and transmitted to the SSU. The program describes the event combinations to be monitored and assigns each output count to a 200 x 10 matrix. The output of the matrix is the long report format (Figure 5 of Appendix XI) for local reporting or for reporting to the ACOC. A six character element in the matrix and the long report represents a count of an event or combination of events as assigned by the program. Usage and duration of events are sensed in multiples of 1 to 10 seconds (as assigned by the program) and are reported as a count of time multiples. Once the program defining the long report, with the

necessary tables for RSJ data processing, are resident at the SSU, three types of reports can be generated by either the SSU or ACOC. These are;

(1) Scheduled Traffic Data Collection for the full long-report where the schedule specifies a number of consecutive 60 minutes intervals for collection during each day of a specified period starting at a specified date and time. A period may be up to 7 consecutive days and up to 12 separate periods may be scheduled in the same request. Data is collected for each 60 minute interval into core memory (200 x 10 matrix) from which it is later copied onto tape for future read-out/transmission (to ACOC). Successive 60 minute intervals are collected into alternating matrixes each of which is zeroed after the data is copied to tape. Taped data is printed at the SSU and transmitted to the ACOC on specific request. This long report is Figure 5 of Appendix XI.

(2) Special Request Data Collection: is a maximum of 20 different elements of the long report (Figure 6 of Appendix XI). Since each instruction for the long report

is associated with output matrix coordinates for the long report, those instructions (elements) desired in the special request are specified by reference to the matrix coordinates of the long report. The special request by the SSU or ACOC is a one-time collection of 15 minutes of data which is executed independent of long report. It also starts on receipt of the request and is reported immediately upon completion. Only one special request can be executed at the SSU at one time.

(3) Single items: Single element extracts of the long report being collected, can be requested by the SSU or ACOC by using the long report matrix coordinates.

3. The AUTOVON Central Alarm System (ACAS) does not provide any formatted data nor real time record of events, as it is strictly a visual display of switch activity. The visual displays are available at the respective switches, Level V, with all switch displays available at the ACOC, Level II. Only the ACOC has any network visibility of traffic flow. Some correlation of events is accomplished at the ACOC, through the use of pen recorders connected to different displays. No

correlation is accomplished with transmission media status data.

4. Presently the ACAS provides real time event status of the AUTOVON System, with the TDCS regulated to a long term definition of AUTOVON events. Neither are correlated to the transmission media events, which provide the communication channels for the AUTOVON switched network. Neither system provides reports to Level III of the SYSCON structure. A more dynamic, transportable automated data base is required for the ACAS system. Events and conditions at switches resident at Level V need to be made available to other interconnecting switches. In this manner, abnormal traffic densities at specific switches can be realized at the operating level and thus more timely restoral actions can be initiated. Correlation with transmission media status can also provide more visibility towards cause and effect. Due to its nature, traffic data collection requires a sufficient amount of time to obtain useful information. A more useful tool to real time information is the changes in traffic loading. Whereas the TDCS provides traffic data, verifying the design structure of the AUTOVON system as well as providing a histogram of traffic movement for future AUTOVON trunk assignments and interswitch trunk densities,

the same data could be processed to reveal only changes in traffic movement and density. Availability of this imformation within the same time thresholds available under DCAC 310-55-1 reports for the transmission media, would present an overall picture of AUTOVON system operation.

G. COMSPOT and COMSTAT reports

1. Communication Spot (COMSPOT reports are assembled/compiled by the ACOC's (Level II) at the WWOLS and sent as occurs via AUTODIN to the DCAOC Level I and effected theatre command and services. It is used to advise;

   a. Threatening or disruptive situations affecting the DCS

   b. Any major change in the status of a previously reported situation

   c. Time disruption or threat was terminated.

   The message is a narrative formatted message, classified according to content, consisting of eight paragraphs. Transmission via AUTODIN is with an immediate precedence to action addressees for conditions currently in process and routine procedence for advance notification of imposing conditions. Routine precedence is used for information addressees. If conditions warrant, voice communications are used. The report format is provided in Apprendix XII.

2. Communication Status (COMSTAT) Reports are assembled at Level I for reporting summary information of global communication events to the Joint Chiefs of Staff and other designated command. This report discloses;

   a. Cases of existing or impending degradation of important facilities of the DCS.

   b. Cases where failure of the DCS will or has impaired user service.

   c. Conditions that threaten the ability of the DCS to provide service.

   The COMSTAT is narrative formatted in four parts, each part submitted as a separate message. The report is normally classified confidential unless content warrants higher classification. It is normally transmitted with a priority precedence to action addressees and routine to information addressees. During exercises, war and national emergencies, and immediate precedence is used for action addressees and priority for information addressees. Its format is developed in Appendix XII.

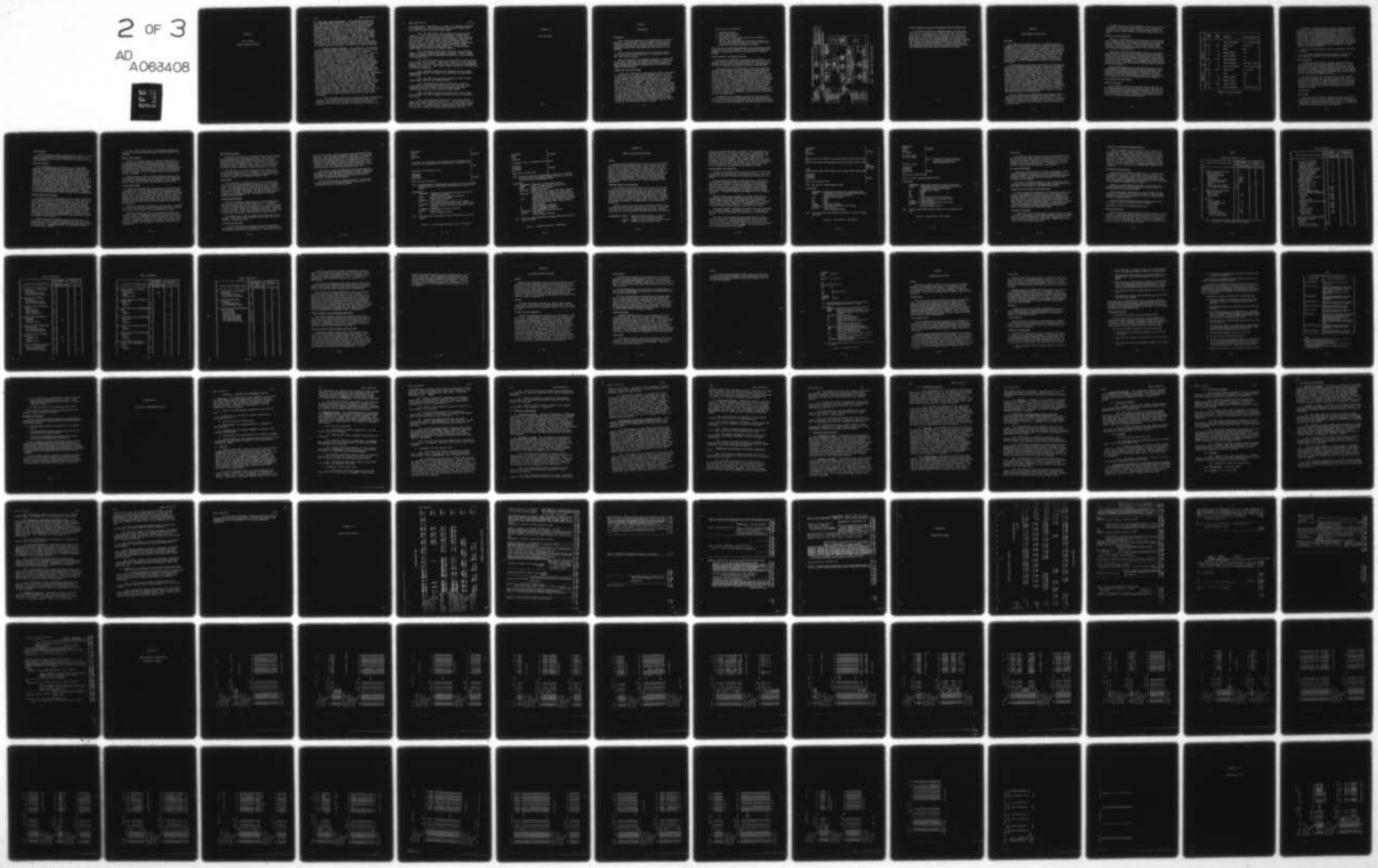
3. The COMSPOT and COMSTAT reports are management reports and have no operational support significance under normal conditions. Levels I & II under non-crisis situations are manned by managers, consequently the reports are used only to identify

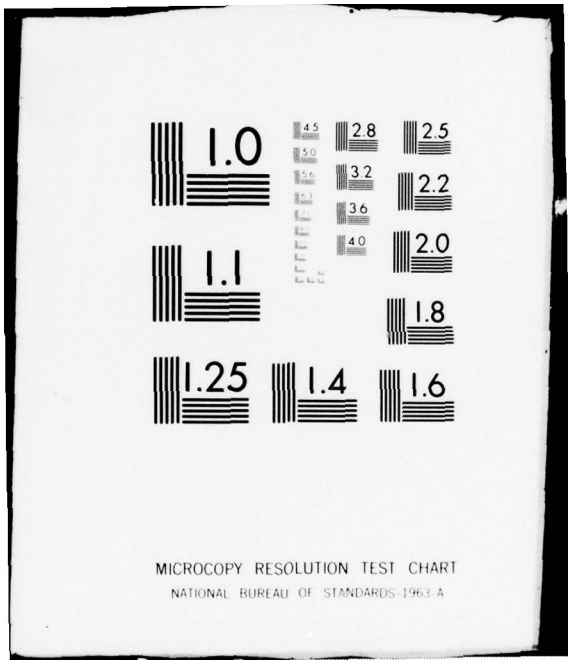
the condition of the DCS. During periods of crisis, decision makers become available at these levels. These reports then can be used to determine what the status of the DCS is, how it effects the crisis, what corrective actions can be accomplished and the results of the actions.

AD-A063 408 BURROUGHS CORP PAOLI PA FEDERAL AND SPECIAL SYSTEMS GROUP F/G 17/2
EXPLORATORY SYSTEM CONTROL MODEL DEVELOPMENT. VOLUME II. FILE D--ETC(U)
JAN 78 DCA100-76-C-0081

UNCLASSIFIED 64295-VOL-2-APP-A SBIE-AD-E100 143 NL

2 OF 3
AD A063408

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5.0
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

APPENDIX I

ACAS DISPLAY

SWITCH CLUSTER DISPLAY

4. Near Real Time Indicators. The AUTOVON Centralized Alarm System (ACAS) provides the network controller the near real time indicators necessary for network control. The ACAS display installed in the DCA-Europe and DCA-Pacific ACOC's provides the network controller an indication of the traffic flow within an AUTOVON switch, the service availability of critical switch common equipment and the trunk group status. Figure 2-3 is a strip display for one switching center. Each ACOC is provided a strip display for each AUTOVON switch within the area. For convenience in explaining the use of the strip display, it can be divided into three sections (from top to bottom); the switch cluster display, the out-of-service of common equipment display, and the trunk status display.

a. Switch Cluster Display. The purpose of the switch cluster display which is shown in figure 2-4 is to provide the network controller an indication of the traffic pressure within a switching machine and its flow. Each of the lamps (visual alarms) is associated with a pool of common equipment in the AUTOVON switch. A visual alarm is given when the utilization of the equipment exceeds a preset utilization threshold during a 1-8 second scan of the equipment pool. The use of the switch cluster display can best be understood if it is viewed as shown in figure 2-5. The top half of the cluster reflects interswitch traffic, tandem inbound and outbound. The bottom half of the cluster display shows intraswitch traffic inbound from subscribers or users and outbound to users. There is no indication of heavy outbound traffic to four-wire subscribers. Figure 2-4 is the complete switch cluster display. The visual alarms for the MFX, MFR, MFT, RSJ, DPR, DPT, and TCR lamps are activated by the seizure of equipment in processing a call. A multifrequency transceiver can only be used in the receive or transmit mode at one time, never both simultaneously. The same is true of the register-sender junctor (RSJ) and the dial pulse receivers (DPR) and transmitters (DPT). When a MFR or DPR is busy, its associated MFX or RSJ is busy. Since the visual alarms are very important in monitoring traffic pressure and flow, the network controller must know what each visual alarm indicates.

(1) The MFX visual alarm indicates heavy interswitch traffic. The threshold setting for the MFX alarm is 100 percent utilization of the multifrequency transceivers regardless of the mode (receive or transmit) in which they

I-1

are being used. Therefore, if traffic is balanced inbound and outbound, it may be possible for the MFX lamp to be on without either the MFR or MFT lamps.

(2) The TAN visual alarm indicates heavy tandem traffic. It is related to multifrequency transceiver utilization but has no direct relationship to the utilization of either the individual multifrequency transmitters or receivers. The TAN visual alarm is derived from a tandem flip-flop circuit in the multifrequency transceiver which recognizes office codes other than those which terminate at the switch being observed. It shows above normal MFX utilization for tandem traffic.

(3) The MFR and MFT lamps indicate heavy inbound (MFR) or outbound (MFT) interswitch traffic. These visual alarms indicate above normal MFX utilization in the receive or transmit mode.

(4) The RSJ visual alarm is activated by 100 percent utilization of the RSJ's. When this lamp is on, all register-senders are busy and the switch cannot process any additional demands for service. This visual alarm indicates a possibility of switch congestion.

(5) The DPT visual alarm indicates above normal terminating traffic for PABX's with network-in-dial (NID) capability.

(6) The DPR visual alarm indicates above normal originating traffic from PABX's/PBX's.

(7) The TCR visual alarm threshold is set at 100 percent utilization of the touch call receivers and indicates that the switch cannot process additional originating traffic from four-wire subscribers.

(8) The ATOP visual alarm shows that the switch has exceeded its RSJ occupancy setting and is in the ATOP condition.

(9) The LLC visual alarms are activated anytime the switch enters ATOP or manual LLC. If the switch is in ATOP, all three lamps will be on for the period the switch is in ATOP. If manual LLC is implemented, only the lamps for the LLC categories denied dial tone will be on.

APPENDIX II

TDCS FUNCTIONS

SECTION I

INTRODUCTION

REQUIREMENTS

Proper network planning and control requires access to comprehensive, accurate and timely traffic information that can only be efficiently obtained from an automatic system. Accumulating the traffic data required for this purpose involves the collection of hundreds of event counts, many measures of duration and use, and call data.

Swift restoral of an AUTOVON switch to operational status, when for any reason the switch memory must be reloaded, requires very rapid memory reloading.

These two objectives, the efficient collection of traffic data and the rapid reloading of the AUTOVON switch memory, have been met by designing a system called a Traffic Data Collection System or TDCS. The TDCS will become an integral part of the 490L Overseas AUTOVON Switching System.

TRAFFIC DATA COLLECTION SYSTEM

Units of the Traffic Data Collection System (TDCS) are designed for installation at the 490L Overseas AUTOVON Switch sites and at the DCA Overseas Area Communications Operation Centers. The TDCS units assigned to Switch Sites (Switch Site Units) are referred to as SSU's and the units assigned to Area Communications Operation Centers are referred to as ACOC's. There will be 16 functional SSU's and 2 functional ACOC's. In addition, both an SSU and an ACOC will exist at DCA Headquarters in Arlington, Virginia for developing computer programs and at Sheppard AFB in Texas for training purposes. The functional ACOC's will be at Kunia, Hawaii and Stuttgart, Germany. The SSU's communicating with the Kunia ACOC will be at Finegayan Bay on Guam, Dau in the Phillipines, Fuchu in Japan, Futema on Okinawa, and Grass Mountain on Taiwan. The SSU's communicating with the Stuttgart ACOC will be at Feldberg, Langerkopf, Donnersburg and Schoenfeld in Germany, Hillingdon and Martlesham Heath in England, Coltano and Naples in Italy, Humosa in Spain and in Athens, Greece. In addition, one SSU will be located in Panama.

The functions of the TDCS are:

1. Rapid Memory Reload
2. Traffic Data Collection
3. Call Data Collection
4. Communication, that permits the moving of information between SSU's and an ACOC.
5. Control, that permits SSU data collection functions to be exercised from either the SSU or its ACOC and that further permits data retrieval from SSU's by an ACOC.

These functions are indicated graphically in the Traffic Data Collection System illustration, Figure 1. All of the above functions are embedded in program modules that may be modified as requirements dictate.

SALIENT FEATURES OF THE SWITCH SITE UNIT

The heart of the TDCS SSU is a Lockheed SUE minicomputer. Its resident program functions are initiated by local operator action at the SSU's control panel or the SSU's teletype, or by transmitted instruction initiated by remote operator action at the SSU's ACOC.

The minicomputer is interfaced with a scanner that senses the states of usage, duration and count leads and a scanner that senses the states of RSJ leads. Scanning is enabled by the program to collect traffic or call data. It is also interfaced with leads that connect to the AUTOVON Switch Maintenance Monitor Console. The setting of particular switches at this console permits the minicomputer to gain access to the IBM 026 card reader data leads, to read AUTOVON memory data cards; or to the AUTOVON Switch memory data input leads to load memory data to the Switch. Actions that relate to storing switch memory data to tape from cards or loading the switch memory from tape are enabled by a combination of switch settings at the AUTOVON Switch Console and the program actions of initiated functions in the SSU. Finally, the minicomputer interfaces with a MODEM that can be cut through to an AUTOVON line to permit the SSU to communicate with its associated ACOC.

Peripherals of the minicomputer include two tape units (that serve as repositories for switch memory data and reports generated by the data collection functions) and a teletype (through which operator requests are made and program responses and outputs are received).

VG-37,071

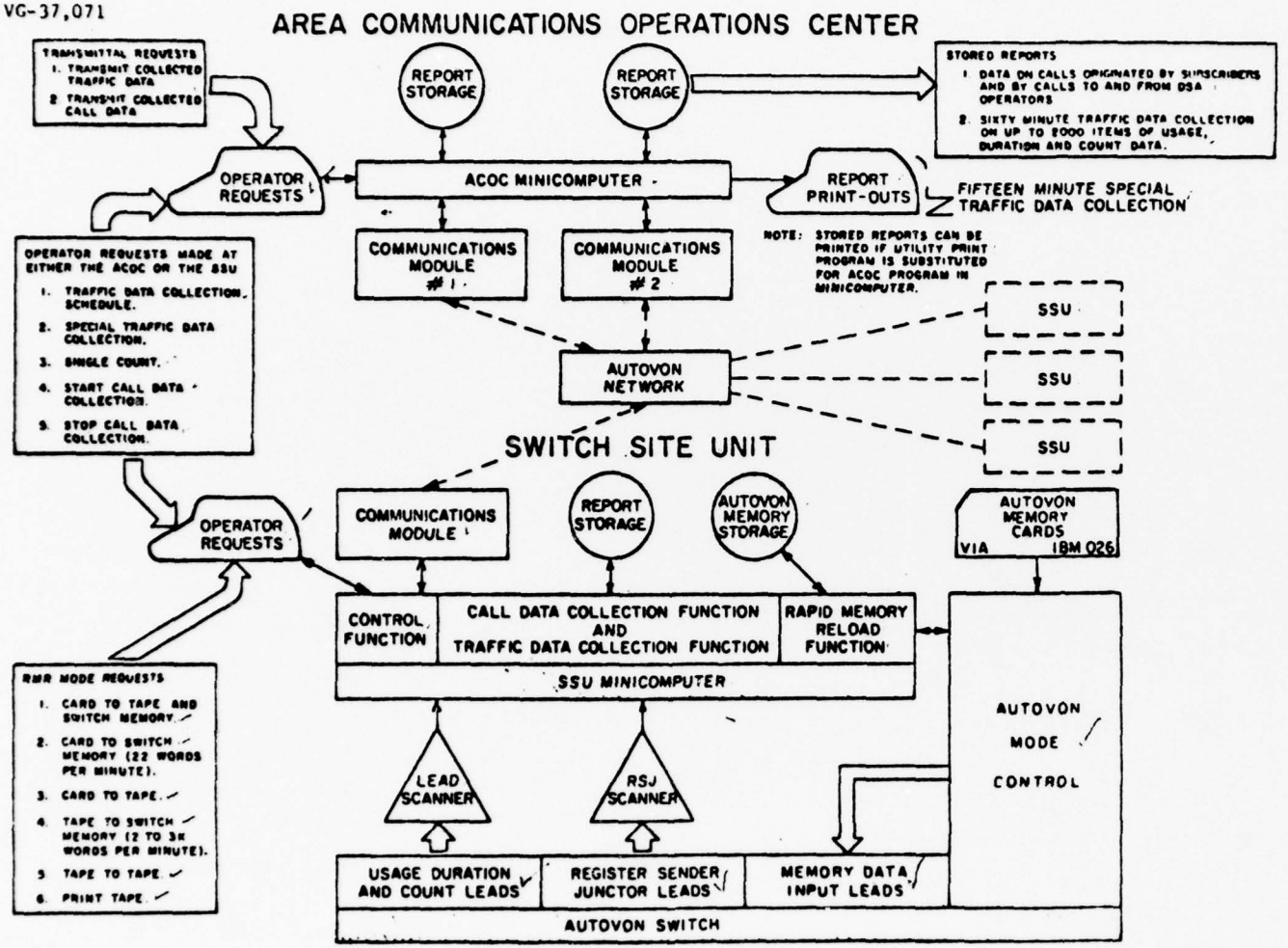

Figure 1 TRAFFIC DATA COLLECTION SYSTEM

SALIENT FEATURES OF THE AREA COMMUNICATIONS OPERATION CENTER UNIT

The TDCS ACOC consists of a SUE minicomputer, two tape units (that serve as repositories for traffic or call data collection reports from its associated SSU's), a teleprinter (that is used to print special traffic data collection reports), two communications MODEMs (that interface with separate AUTOVON lines over which the ACOC communicates with its associated SSU's), and a teletype (through which requests are made and program responses are received). The ACOC performs two essential functions: it forwards instructions to its associated SSU's, and it receives and stores on tape or prints, the individual reports that SSU's are directed to transmit.

SECTION II

RAPID MEMORY RELOAD FUNCTION

BACKGROUND

Each 490L Overseas AUTOVON Switch has, as original equipment, a modified IBM 026 Printing Card Punch for loading its Switch memory. A modification to the machine's duplicating capability permits it to function as a low speed card reader. It reads cards, each containing a Switch memory word, into Switch memory at a rate of approximately 22 cards per minute. At this rate, over two and one-half hours are required to load or reload a typical 3456 word Switch memory. This rate of loading is acceptable for initial memory loading; but it has proven to be unacceptable for memory reloading necessitated by Switch outages or serious degradations of service caused by memory mutilations.

A temporary higher speed memory load capability was provided to the Switch by adding an RP-152/G card reader, taken from the AUTODIN Data Subscriber Terminal Equipment (DSTE). The RP-152/G required modification to output Hollerith code, rather than its normal ASCII code, to meet the data needs of the Switch. The Switch required modification to provide an interface suitable for the RP-152/G and to permit accepting data at a higher rate. This modified RP-152/G card reader loaded data into memory from punched cards at a rate in excess of 200 cards per minute. This 88% increase in loading rate reduced the length of outages and service degradations, resulting from memory mutilations, significantly. However, this arrangement does not represent a completely satisfactory solution. The RP-152/G is a large unit for which there is no fully satisfactory location at most Switch sites; and this equipment has been made available for this particular use on a temporary basis only. Removal is expected when the RMR capability has been proven.

The basic function of the Rapid Memory Reload (RMR) portion of the SSU is to provide rapid reloading of the Switch memory. The reload rate will be in excess of 2000 words per minute. This rate is achieved by reloading the Switch from tape. The Switch is modified to provide an interface for the SSU and to permit accepting data at a very high rate.

The RMR function will use the IBM-026 for input of both new and revised data. Data can be loaded from this source simultaneously into both the SSU and the Switch. Provision is made, however, for loading data into either the Switch or the SSU without loading the other.

STORAGE OF SWITCH MEMORY DATA

The key to the RMR function is the storage of the Switch memory data on magnetic tape. This storage is done either at the time the data is initially loaded into the Switch or in a special loading operation. The data are stored on tape in ASCII code in blocks. Each block contains information relating to the location and content of one word of switch memory data.

When a word of data is changed either a new tape can be made or the changed word can be added to the tape following the last entry. Making a new tape requires complete reloading of the updated deck of punched cards, whereas only a single card is loaded to add a change to the end of the existing data. It is expected that revisions will normally be placed at the end of the existing data and that new tapes will be made after a specified number of revisions have been made or at periodic intervals.

During normal operation, one of the two tape drives in the SSU is dedicated to the RMR function and contains the RMR tape. Under these circumstances data on the RMR tape is always available for loading or restoring the Switch memory. In the event of a tape drive failure, the tape drive dedicated to RMR can be changed either by a teletypewriter entry or by changing two plug-in connectors.

SWITCH MEMORY DATA ERROR CHECKS

Switch Error Checks

Data related to a Switch memory word is carried redundantly in two separate messages, on both card and tape records. The card format of this memory record, along with the positions read by the Overseas AUTOVON Switch, is shown in Figure 2. When a memory record is read by the Switch, it verifies that both messages have the correct start and end characters, and identical data.

	CARD COL.	READ POS.	FUNCTION	LEGAL CHARACTERS
Message 1	1	1	Start of Message 1	@ (4 and 8 Punch)
	2-11	2-11	Memory Word	0-9 and A-F
	12	--	None	None
	13	12	Memory Address	1-8
	14	13	Memory Address	1-4
	15-17	14-16	Memory Address	1-6
	18	17	End of Message 1	/ (0 and 1 Punch)
Message 2	19	18	Start of Message 2	* (4, 8 and 11 Punch)
	20-29	19-28	Memory Word	0-9 and A-F
	30	--	None	None
	31	29	Memory Address	1-8
	32	30	Memory Address	1-4
	33-35	31-33	Memory Address	1-6
	36	34	End of Message 2	# (3 and 8 Punch)

Figure 2. Memory Card Data

The Switch, accepting characters serially, reads the characters of message 1. If the start and end characters of message 1 are correct, the Switch stores the memory word of message 1 into Switch memory at the address designated by message 1. The Switch then reads message 2. If the start and end characters of message 2 are correct, the Switch verifies that the addresses of message 1 and 2 are identical. Following this verification, the Switch extracts the word stored to memory during the processing of message 1 and confirms that it is identical with the memory word in message 2. The Switch finally stores the verified memory word of message 2 into Switch memory at the verified address.

Failure of any verification terminates processing at the point of failure.

These checks are made whether Switch memory is loaded from cards through the IBM-026 or from tape through the TDCS SSU.

SSU Error Checks

The TDCS SSU checks the data for legal character values for each position and for the correct number of characters. It also compares the two address and data entries on each punched card or word record from tape. If data is being received from the IBM-026 and an error is found, an alarm is generated that stops the reading of cards. If data is being sent to the Switch from the SSU when an error is found, Switch loading is stopped.

When data is being sent to the Switch from the SSU, a parity check is made on the data as it is read from the tape. When a parity error is detected, two additional attempts are made to read the word. If these fail, an error message is sent to the operator. The operator can then type in the correct memory word record and continue the loading, continue the loading skipping the bad record, or stop the loading.

LOADING RATES

Data to SSU

The normal rate at which the IBM-026 can read cards into the TDCS SSU is 22 cards per minute. The SSU circuitry is designed to accept data at rates of up to 300 cards per minute. With minor modifications to the Switch, this fact makes it possible to replace the IBM-026 with a higher speed reader in the future.

Data to Switch

The TDCS SSU will load the Switch memory from tape at an average rate in the neighborhood of 2500 words per minute. This is considerably above the lower limit of 1050 words per minute set by the SSU specification.

MODES OF OPERATION

Five numbered RMR modes are indicated on the "TDCS MODES" switch on the AUTOVON Maintenance Monitor Panel. Except for the IDLE mode, all of the modes provide for loading memory data to the Switch memory or to tape storage. Those modes involving storing memory data on tape require a New Data or Revised Data specification. The remaining modes, normally specified by SSU teletype entries in conjunction with the IDLE mode, are supportive in nature. These deal with duplicating the RMR tape or printing portions of memory data from tape. All RMR functions are selected by an AUTOVON Maintenance Monitor Panel switch setting and, in most cases, SSU teletype entries. RMR functions, including the SSU, take precedence over other TDCS SSU functions. This results in interrupting traffic or call data collection and limiting the transmission function to the answering of incoming calls with a busy indication. Procedures for initiating RMR modes are covered in Section XII and Appendix III.

Mode #1 026 to TDCS + Switch

In the 026 to TDCS + Switch mode, card data read by the IBM-026 goes to Switch memory and the RMR tape of the SSU. This mode is set on the TDCS MODES switch on the AUTOVON Maintenance Monitor Panel. One of two data specifications must be made, New Data or Revised Data. This data specification is set by an entry on the SSU teletype. When New Data is specified, the TDCS SSU writes a new magnetic tape erasing any old data on the tape. This specification is used only when the Switch memory is being completely rewritten. When Revised Data is specified, entries are added to the existing entries on the tape and only the words addressed by the revised data entries are changed in switch memory.

In this mode, data is checked by the Switch and the SSU. If either finds an error, an alarm is generated that stops the reading of punched cards by the IBM-026 and prevents the storage of the word in Switch memory. An optional printout is provided by the SSU for errors detected by the SSU.

The 026 to TDCS + Switch mode will be used when entering revisions and for making a new tape when major changes are made in the encoding.

Mode #2 026 to Switch

The 026 to Switch mode sends card data read by the IBM-026 to the Switch memory without sending it to the SSU. This mode is set on the TDCS MODES switch on the AUTOVON Maintenance Monitor Panel. All RMR leads from the Switch to the SSU are open, precluding any data checking by the SSU. Detection of an error by the Switch stops the reading of cards. This mode does not require participation by the SSU. Therefore, the SSU is available for other functions when this mode is active.

This mode will be used for entering temporary changes such as those used for special tests. It may also be used when changes are to be tested in the Switch before being placed on tape or when data is to be loaded into the Switch and the SSU is not operational.

Mode #3 026 to TDCS

In the 026 to TDCS mode the card data read by the IBM-026 goes to the RMR tape of the SSU. Data does not enter the Switch memory. This mode is set on the TDCS MODES switch on the AUTOVON Maintenance Monitor Panel. Open leads prevent the transfer of data to the Switch memory. One of two data specifications must be made, New Data or Revised Data. This data specification is set by an entry on the SSU teletype. When New Data is specified, a new RMR tape is generated. When Revised Data is specified, entries are added at the end of the existing data.

Entries are checked by the SSU but not by the Switch. The detection of an error stops the reading of data and prevents the storage of the entry with the error. An error printout is provided.

The 026 to TDCS mode will be used for making new tapes when a sufficient number of changes have accumulated or when entries previously entered into the Switch (but not recorded on tape) are to be recorded. It can also be used to make a new tape or revise a tape before the changes are entered into the Switch. This would be done when major changes are subsequently to be loaded in the shortest possible time.

Mode #4 TDCS to Switch

In the TDCS to Switch mode, the Switch memory is loaded with the memory data read from the RMR tape of the SSU. This mode is set on the TDCS MODES switch on the AUTOVON Maintenance Monitor Panel. Initiation is by SSU teletype entry. In this mode, the leads providing data from the IBM-026 are open. Data is checked by both the SSU and the Switch. Loading is stopped when an error is detected by either the SSU or the Switch. An error printout is provided.

This mode will be used for reloading the Switch memory when words in Switch memory are lost or mutilated. It can also be used for the rapid loading of new data, provided the new data has been prestored on magnetic tape using mode #3 (026 to TDCS).

Mode #5 IDLE

In the IDLE mode, no memory data is sent to the Switch memory from any source and no memory data is sent to the SSU. This mode is set on the TDCS MODES switch on the AUTOVON Maintenance Monitor Panel. The leads connecting the SSU, the Switch memory, and the input from the IBM-026 are all open. The SSU is available for other functions in this mode. This will be the normal mode when modes 1 through 4 are not being exercised. This mode does not require participation by the SSU.

Duplicate RMR Tape Modes

The Duplicate RMR Tape modes may be exercised by appropriate SSU teletype entries when the TDCS MODES switch on the AUTOVON Maintenance Monitor Panel is set to modes 2 or 5. Duplicating modes are part of the RMR function and cannot be used to duplicate traffic or call data tapes. There are two duplicate tape modes. The first results in the tape, on the drive dedicated to RMR, being duplicated on the second drive's tape. The second is the reverse of this.

These modes will be used to prepare back-up tapes for off-line storage. These tapes will be available if the on-line RMR tape is damaged or accidentally erased.

Print from RMR Tape Mode

The Print from RMR Tape mode may be exercised by appropriate SSU teletype entries when the TDCS MODES switch on the AUTOVON Maintenance Monitor Panel is set to modes 2 or 5. This mode is used to

print out memory data, stored on magnetic tape, on the ASR-37 teletypewriter. There are four variations of this mode: (1) print all data, (2) print prespecified section, (3) print operator specified section, and (4) print single word. In specifying a section or single word for printing, the address or addresses may be specified in either the Switch format code or its decimal equivalent. Any revisions at the end of the tape, applicable to the words specified for the printout, are printed following the initial data.

All printouts, except the single word printout, provide four entries per line with each entry consisting of a memory address and the memory data associated with the address, as shown in Figure 3. The single word printout provides all 34 stored characters of a memory data record, as shown in Figure 4.

This mode will be used to verify stored data. It will also provide a visual record of what is stored on the tape that can be compared with what is in the Switch memory.

```
VONSWMEMORY                                                          }
AAAAAA                                                               }
tttt                                                                 } Heading
mm/dd/yyyy                                                           }
#                                                                    }

xxxxxxxxxx zzzzz xxxxxxxxxx zzzzz xxxxxxxxxx zzzzz xxxxxxxxxx zzzzz  }
xxxxxxxxxx zzzzz xxxxxxxxxx zzzzz xxxxxxxxxx zzzzz xxxxxxxxxx zzzzz  }
.                                                                    } Data
.                                                                    }
.                                                                    }
xxxxxxxxxx zzzzz xxxxxxxxxx zzzzz                                    }

ENDVONTDCM                                                           }
mm/dd/yyyy                                                           }
nnnnnnntttt                                                          } Ending
E                                                                    }
(ends with ten blank lines).                                         }
```

SIZE: Variable-depends on whether full or section printout is requested, whether printout is interrupted or aborted and the number of revisions

DEFINITIONS:

VONSWMEMORY	= Alphabetic characters identifying the output as a 490L Memory printout
AAAAAA	= Switch at which printout was generated
tttt	= Time printout is started
mm/dd/yyyy	= Month, day and year
#	= Part number, print in parts if interrupted
xxxxxxxxxx	= Positions two (2) thru eleven (11) - Memory data
zzzzz	= Positions twelve (12) thru sixteen (16) - Memory address
ENDVONTDCM	= Identifier for finish of printout
nnnnnnn	= Day of week
E	= End of message character

USE: Page copy output from magnetic tape of 490L Memory at Operator request

Figure 3. Full or Section Printout Format - 490L Memory

```
VONSWMEMORY                                          }
AAAAAA                                               } Heading
tttt                                                 }
mm/dd/yyyy                                           }

@ xxxxxxxxxx zzzzz /* xxxxxxxxxx zzzzz #             } Data

ENDVONTDCM                                           }
mm/dd/yyyy                                           }
nnnnnnntttt                                          } Ending
E                                                    }
(ends with ten blank lines)                          }
```

SIZE: Normally 27 lines of varying length as shown but if revisions have been made to the specified address they will be included in the data section as additional lines.

DEFINITIONS:

VONSWMEMORY	= Identifier for 490L Memory printout
AAAAAA	= Switch at which printout was generated
tttt	= Time printout is started
mm/dd/yyyy	= Month, day and year
@	= Position one (1) - start of message 1 character
xxxxxxxxxx	= Positions (2) thru eleven (11) - Memory data from message 1 and positions nineteen (19) thru twenty-eight (28) - Memory data from message 2
zzzzz	= Positions twelve (12) thru sixteen (16) - Memory address from message 1 and positions twenty-nine (29) thru thirty-three (33) - Memory address from message 2
/ \	= End of message 1 character
*	= Start of message 2 character
#	= End of message 2 character
ENDVONTDCM	= Identifier for finish of printout
nnnnnnn	= Day of week
E	= End of message character

USE: Print out stored information for single 490L Memory address at Operator request

Figure 4. Single-Word Printout - 490L Memory

SECTION III

TRAFFIC DATA COLLECTION FUNCTION

GENERAL

The basic Traffic Data Collection function of the TDCS collects traffic data during scheduled periods. The information collected consists of up to two thousand items of usage, duration and count data.* This information is placed on magnetic tape, in a form suitable for further computer processing. If requested, it is also printed. In addition to this basic function, provision is made for traffic data collections on a short list of items upon special request and for interrogating discrete items for their associated tallies on an immediate basis. Procedures for initiating Traffic Data Collection modes and options are covered in Section XII and Appendix III.

SCHEDULED TRAFFIC DATA COLLECTION

The schedule for Scheduled Traffic Data Collections is loaded through the teletypewriter at the SSU or by an instruction message transmitted via the AUTOVON system from the ACOC to the SSU. The schedule specifies a number of consecutive sixty-minute intervals in which collections are to be made, during each day of a specified period starting on a specified date at a specified time. A period may consist of up to seven consecutive days. Up to twelve separate periods may be scheduled in a single request for scheduled data collection.

The data collected in a sixty-minute interval consists of up to two thousand items of usage, duration, and count data. All measures are at zero at the start of each sixty-minute interval. Data is collected into, and stored within, the SSU core memory in independent

---

*DEFINITIONS: Usage - Measure of time a circuit or group of circuits are in use handling calls.
Duration - Measure of time a specific condition exists.
Count - Number of times an event occurs.

areas for successive sixty-minute intervals, This allows data for a preceding interval to be read out to tape, and, if requested, to the teletype, while data for a current interval is being collected. The output for this data is placed in a 10 column x 200 line matrix. Data associated with individual items occupy specific line and column positions. Lines are numbered. This format, illustrated in Figure 5, is referred to as the long report format. This report will be printed on the teletypewriter, at the time of the hourly core-to-tape read out, if a request for such action has been made at the SSU.

SPECIAL REQUEST DATA COLLECTION

During a Special Request data collection, data on a maximum of 20 selected items is collected over a fifteen minute interval. The items selected are identified in terms of the item's position in the long report.

Special Request item values are kept separately. The Special Request neither interferes with nor is subject to interference by a scheduled data collection. Items for each Special Request period start with zero values. Items are prespecified but are changeable (by SSU teletypewriter entry or by an instruction message from the ACOC) at any time a Special Request data collection is not already in progress. Prespecified items may be changed as part of a Special Request.

Special Requests may be initiated at the SSU from either the teletypewriter or the Alarm and Control Panel (by depressing the SPECIAL REQUEST pushbutton). The outputs of Special Requests initiated at the SSU are printed on the SSU teletypewriter in the short report format, as shown in Figure 6. If specified in the request, the Special Request output also goes to the ACOC for printout.

On a Special Request initiated from an ACOC, the outputs generated at the specified SSU go to the ACOC for printout. If previously requested at the SSU, this report is also printed on the SSU teletypewriter.

The fifteen minute collection period starts when the Special Request is processed. Only one Special Request can be processed at a time at an SSU. If a new Special Request is received at an SSU while one is in progress, only the output of the collection in progress is routed to the source of the new request. New items specified in such an overlapping request are ignored.

```
VONSCHEDTDC                                                          )
AAAAAA                                                               )
tttt                                                                 ) Heading
mm/dd/yyyy                                                           )

(1)                                                                  )
xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx )
(2)                                                                  )
xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx )
.                                                                    ) Data
.                                                                    ) 200 pairs
.                                                                    ) of lines
(200)                                                                )
xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx )

ENDVONTDCM                                                           )
mm/dd/yyyy                                                           )
nnnnnnntttt                                                          ) Ending
E                                                                    )
(ends with ten blank lines)                                          )
```

SIZE: 426 lines of varying length as shown

DEFINITIONS:

VONSCHEDTDC	= Identifies the output as a long-format report
AAAAAA	= Alphanumeric characters identifying the Switch at which the report was generated
tttt	= Ending time of report
mm	= Month
dd	= Day
yyyy	= Year
xxxxxx	= 2000 count readings
ENDVONTDCM	= Identifies the finish of the message
nnnnnnn	= Day of the week
E	= End-of-message character

USE: Scheduled traffic data collection reports on optional teletype page copy.

Figure 5. Output Format - Long Report

```
VONSPREQTDC                    ┐
AAAAAA                         ├ Heading
tttt                           │
mm/dd/yyyy                     ┘

(01 111c) xxxxxx               ┐
(02 111c) xxxxxx               │
.                              ├ Data - 20 lines (if less than 20 items
.                              │        specified for report, 111c and
.                              │        xxxxxx replaced with X's)
(20 111c) xxxxxx               ┘

ENDVONTDCM                     ┐
mm/dd/yyyy                     │
nnnnnnntttt                    ├ Ending
E                              │
(ends with ten blank lines)    ┘
```

SIZE: 65 lines of varying length as shown

DEFINITIONS:

VONSPREQTDC	= Identifies the output as short format report
AAAAAA	= Alphanumeric characters identifying the Switch at which the report was generated
tttt	= Ending time of report
mm	= Month
dd	= Day
yyyy	= Year
111	= Line number of item in long format
c	= Column number of item in long format
xxxxxx	= Count readings
ENDVONTDCM	= Identifies the finish of the message
nnnnnnn	= Day of the week
E	= End-of-message character

USE: Special-request data collection reports on the teletype page copy.

Figure 6. Output Format - Short Report

SINGLE ITEMS

Extracting the current value of a specific item (identified by row and column long report item position or short report item number) may be initiated by teletype entry at the SSU or by an instruction message from the ACOC. The value is printed promptly on the teletypewriter of the requesting TDCS unit. A Traffic Data Collection must be in progress for this request to have validity.

DATA COLLECTION CONTROL

Traffic data collections are initiated by appropriate requests and are controlled by the processor through stored programs. A clock and calendar are included for use in controlling the scheduled collection of data, and for providing appropriate time and date information where required.

The source of working information for the traffic data collection function is the state of individual leads and data derived from the Register-Sender Section of the AUTOVON Switch memory.

MEASURES AND COUNTS BASED ON INDIVIDUAL LEADS

An SSU is capable of handling up to 1534 individual leads. The number of leads depends on the Switch size. Each individual lead indicates the state of a circuit or the presence or absence of a specific condition. The individual leads used in conjunction with the traffic data collection function are used to provide data for COUNTS, USAGE measures or DURATION measures. In some cases, a number of individual leads are sampled to provide a single item of data. Traffic Data generated from individual leads are identified in Table 1 in the data source column labeled LEAD.

Individual Lead Counts

A COUNT based on an individual lead or group of leads is pegged each time a lead assigned to that COUNT item goes from open to ground, where the open has existed for at least forty milliseconds and the ground lasts for at least forty milliseconds. COUNTS relate to the number of times specific events occur.

Individual Lead USAGE and DURATION Measures

USAGE and DURATION are both measures of time. USAGE refers to the length of time a circuit or group of circuits are in use handling calls. DURATION refers to the length of time a specific condition exists. USAGE and DURATION are determined by examining the state of leads at either one or ten second regularly spaced intervals. The USAGE or DURATION measure is actually a count of the number of times a particular state is encountered at the specified (1 or 10 sec.) time interval. Intervals applicable to individual items are as indicated in the ACCUMULATION INTERVAL column of Table 1.

Site Peculiar Time Measures

At any given site, USAGE is recorded on up to one hundred and ten separate trunk groups. Individually, these trunk groups are designated for scanning on either a one or ten second basis. The fact that the USAGE accumulation interval associated with any particular trunk group is site peculiar is indicated by the use of asterisks in the ACCUMULATION INTERVAL column of Table 1.

Subject to a three hundred trunk limit, up to thirty trunk groups, consisting of no more than eighteen trunks per group, can be designated for one second scanning.

Other trunk groups, consisting of no more than 100 trunks per group, can be designated for ten second scanning. Leads not designated for one or ten second scanning are not used in the generation of USAGE or DURATION measures.

The procedures for grouping trunks and assigning scan timing are covered in Appendix II, under Directory Loading.

DEVELOPMENT OF COUNTS FROM REGISTER-SENDER DATA

Register-Sender Data

The Switch presents data relating to its Register-Sender Junctors cyclically. Depending on whether a Switch is set to handle a maximum of 12 or 24 RSJ's, time from one cyclic presentation to another is either 19.2 or 38.4 milliseconds. Thus, if a switch is equipped and set for 12 RSJ's, activity at all 12 RSJ's will be presented in order by the switch over a 19.2 millisecond period.

Table 1

Traffic Data Collection Items

Traffic Data Collection Items	Data Source		Accumulation Interval	
	Lead	RSJ (Count Group Indicated)	1 Sec	10 Sec
1. Traffic Data by Trunk Group (110 Trunk Groups)				
Originating Attempts		I		
Terminations		VIII		
Preemptions		VIII		
Non-Preemptive Overflow		VIII		
Preemptive Overflow		VIII		
Usage	x		* or	*
All Trunks Busy Count**	x			
All Trunks Busy Duration**	x		x	
2. Traffic Data by Destination (200 Destinations)				
Voice Grade		VI		
Special Grade		VI		
3. Counts				
Local Attempts		I		
Line Permanent Signal (Time outs)		IV		
False Start		IV		
Partial Dial				
Timed Out		VIII		
Call Abandoned		IX		
Intra-Office Attempts (Local Terminations)		VI		

NOTE: *Indicates Accumulation Interval Assignment by Trunk Group.
**Applicable to no more than 30 Trunk Groups.

Table 1 (Continued)

Traffic Data Collection Items	Data Source		Accumulation Interval	
	Lead	KSJ (Count Group Indicated)	1 Sec	10 Sec
Local Voice Grade Calls				
Priority Precedence		V		
Immediate Precedence		V		
Flash Precedence		V		
Flash Override Precedence		V		
Local Special Grade Calls				
Priority Precedence		V		
Immediate Precedence		V		
Flash Precedence		V		
Flash Override Precedence		V		
Incoming Attempts		I		
Tandem Attempts		VI		
Trunk Permanent Signal (Time outs)		IV		
Preemption Exercised				
Voice Grade		VIII		
Special Grade		VIII		
No Start Signal Indicator		VII		
Preemption Failed, Voice Grade				
Priority		VIII		
Immediate		VIII		
Flash		VIII		
Flash Override		VIII		
Preemption Failed, Special Grade				
Priority		VIII		
Immediate		VIII		
Flash		VIII		
Flash Override		VIII		
Routine Overflow				
Voice Grade		VIII		
Special Grade		VIII		
4. Traffic Data by Register-Sender (24 Register-Senders)				
Attempts		I		
Usage	x		x	
Out-of-Service Count	x			
Out-of-Service Duration	x			x

Table 1 (Continued)

Traffic Data Collection Items	Data Source		Accumulation Interval	
	Lead	RSJ (Count Group Indicated)	1 Sec	10 Sec
5. Traffic Data by DSA Marker (2 Markers)				
Out-of-Service Count	x			
Out-of-Service Duration	x			x
6. Traffic Data by Memory (2 Memories)				
Out-of-Service Count	x			
Out-of-Service Duration	x			x
7. Traffic Data by Answer Time Recorder				
Calls Sampled	x			
Calls Answered	x			
Calls Not Answered	x			
8. Traffic Data by DSA Class (5 Classes)				
Attempts		VI		
Overload Counts	x			
9. Traffic Data by DTMF Receiver (15 Receivers)				
Out-of-Service Count	x			
Out-of-Service Duration	x			x
10. Traffic Data for All DTMF Receivers				
Attempts Count		III		
Usage	x		x	
Overflow Count		II		
11. Traffic Data by MF 2/6 Transceiver (15 Transceivers)				
Out-of-Service Count	x			
Out-of-Service Duration	x			x

Table 1 (Continued)

Traffic Data Collection Items	Data Source		Accumulation Interval	
	Lead	RSJ (Count Group Indicated)	1 Sec	10 Sec
12. Traffic Data for All MF 2/6 Transceivers				
Attempts Count		III		
Usage	x		x	
Overflow Count		II		
13. Traffic Data for All Register-Senders Busy				
Count	x			
Duration	x		x	
14. Traffic Data for All DTMF Receivers Busy				
Count	x			
Duration	x		x	
15. Traffic Data for All MF 2/6 Transceivers Busy				
Count	x			
Duration	x		x	
16. Traffic Data for Heavy Traffic				
Count	x			
Duration	x		x	
17. Traffic Data by Pilot Make Busy (30 Pilots)				
Count	x			
Duration	x		x	
18. Traffic Data by Line Load Control Class (3 Classes A, B and C)				
Count	x			
Duration	x		x	

Table 1 (Concluded)

Traffic Data Collection Items	Data Source		Accumulation Interval	
	Lead	RSJ (Count Group Indicated)	1 Sec	10 Sec
19. Traffic Data by Switch Marker (2 Markers)				
Out-of-Service Count	x			
Out-of-Service Duration	x			x
20. Traffic Data by Logic (3 Logics)				
Out-of-Service Count	x			
Out-of-Service Duration	x			x
21. Traffic Data by DSA Position/ Link (20 Links)				
Position Count	x			
Position Usage	x		x	
Link Group Busy Count	x			
Link Group Busy Usage	x		x	
All Links Busy Count	x			
All Links Busy Duration	x		x	

This data is presented to the SSU by the Switch via 40 data leads. Each of these leads represents one bit position of a 40 bit word. Ten of these 40 bit words (2 of which are redundant), representing current data associated with one RSJ, are transmitted consecutively, at 160 microsecond intervals, over a period of 1.6 milliseconds.

The 40 data leads (together with 5 leads that identify the RSJ number, 4 leads that identify the word number and one lead that provides a data available signal) are the switch interface leads that connect to the RDI (RSJ Data Interface) unit of the TDCS SSU.

When Traffic or Call Data Collection is enabled, the SSU automatically places Register-Sender data into its core memory. It does this in such a manner that a full 8 words of data relating to a particular RSJ is alternately placed in one of two separate storage areas. Thus, each RSJ has two separate SSU core storage areas assigned to it and the processor has both current and immediately prior data for all RSJ's available to it for the purpose of identifying transitions. Storage is also provided on an RSJ basis for items that need to be retained for later use. The items contained in the 8 words representing the immediate state of an RSJ and which are used by the TDCS SSU are indicated in Chart 1 of Appendix I.

Tables Required to Process Register-Sender Data

Processing of Register-Sender data requires frequent table look-ups. Core storage is provided for trunk group, route sequence, route number, telephone number, and destination tables that are required in the processing. These tables are itemized in Chart 2 of Appendix I. Table data may be set up or changed by utilizing the directory load procedures outlined in Appendix II.

Counts Derived from Register-Sender Data Processing

Processing of Register-Sender data to obtain counts is controlled in part by Register-Sender sequence state changes. There are forty-one legal sequence states numbered one to forty-one. These sequence states are itemized in Chart 3 of Appendix I. Sequence state jumps may be either forward or back and some states may occur more than once during the processing of a call. Since counts are made while call processing is in progress, and individual calls are processed at varying rates, this requires inter-leaving the processing of data ssociated with individual RSJ's. When all

conditions satisfy the requirements for a particular count, one is added to that count. Table 1 identifies all RSJ derived counts. The conditions required to satisfy the requirements of these RSJ derived counts are indicated in Chart 4 of Appendix I. The Roman numeral in the RSJ derived column of Table 1 identifies the count as a member of one of the nine groups of counts listed in Chart 4 of Appendix I.

SECTION IV

CALL DATA COLLECTION FUNCTION

GENERAL

The Call Data Collection function of TDCS collects data on calls originated by local subscribers and collects data on calls to DSA operators. The data collected consists of call identification, time of connection and release time information. This information is placed on tape in a form suitable for off-line printing, transmission, and further computer processing. Call Data Collections are made during selected periods when no other TDCS SSU functions are in progress. Procedures for initiating and terminating Call Data Collections are covered in Appendix III.

CONTROL

Call Data Collection is started and stopped by SSU teletypewriter entry or by an instruction message from the ACOC. Call Data is collected and blocked for recording on magnetic tape as it becomes available.

ENTRIES AND THEIR GENERATION

Entries are generated under program control when specific conditions exist. INITIAL ENTRIES are generated when the sequence state for any Register-Sender Junctor advances from Sequence State 35 to Sequence State 36 indicating a final matrix connection. RELEASE TIME ENTRIES are generated when any designated release lead goes from ground to open. Since ENTRIES are stored on tape in the order in which they are collected, the INITIAL ENTRY and the associated RELEASE ENTRY for a given call can be separated on the tape by entries for other calls. HOUR ENTRIES are generated each time the hour advances during collection. In addition, time entries are generated at the start and termination of a Call Data Collection. Matching an INITIAL and RELEASE ENTRY permits calculating the holding time of a call to the nearest second. If the Call Data Collection is interrupted, an interrupt message is generated and placed on tape, and collection continues following the interruption.

Initial Entry

An INITIAL ENTRY consists of data identifying a call (locally originated or going to a DSA position) and its time of connection. There is a separate INITIAL ENTRY for each call. Call Identification Data is obtained from the register-sender function of the AUTOVON Switch via the register-sender leads that provide traffic data collection count data.

The data identifying a call consists of the Originating Trunk Number, the Precedence Digit, the Route Digit, the Called Number and the Terminating Trunk Number.

The Time of Connection is determined when the Register-Sender Junctor sequence state (Item CS) advances from state thirty-five (35) to state thirty-six (36), indicating that the final switch matrix connection has been made. All items of the initial entry are placed in the output area at this time. Time is obtained from the system clock and is expressed in minutes and seconds. Reference to the preceding time entry provides the associated hour. The format of INITIAL ENTRY items is indicated in Figure 7.

Release Time Entry

A RELEASE TIME ENTRY consists of an identifying Trunk Number and its Release Time. The time of release is determined when a designated release lead goes from ground to open. Each release lead is associated by the program with a Trunk Number. All items of the RELEASE TIME ENTRY are placed in the output area at this time. Time is obtained from the system clock and is expressed in minutes and seconds. Reference to the preceding time entry provides the associated hour. The format of RELEASE TIME ENTRY items is indicated in Figure 7. The procedure for designating release lead association with a Trunk Number is covered in Appendix II, under Directory Load.

Time Entries

A time entry is placed in the collecting block at the start of call data collection, each time the hour advances during call data collection, and at the end of call data collection. Time entry formats are indicated in Figure 7.

REPORT

All elements of a Call Data Collection report that are placed on tape are illustrated in Figure 7. This information can be read from tape and printed by using the Utility Print Program (UPP) with any idle TDCS equipment.

VONSAREQCDC AAAAAA hhkkll	Heading
mm/dd/yyyy HH cc	Hour Entry
II oooo p r ddddddddd TTTT ssss	Initial Entry
RT nnnn qqqq	Release Time Entry
ENDASREQCD mm/dd/yyyy hhkkll E	Ending

SIZE: Variable-determined by number of hour, initial and release time entries between start and end or interruption.

DEFINITIONS:

VONASREQCDC	= Identifier for start of call data collection
AAAAAA	= Switch at which report was generated
hhkkll	= Numeric characters giving the time the heading or ending was recorded in hours, minutes and seconds.
mm/dd/yyyy	= Month, day and year
HH	= Identifier for hour entry
cc	= Numeric characters giving hour
II	= Identifier for initial entry
oooo	= Numeric characters giving originating trunk identity
p	= Numeric character giving precedence
r	= Numeric character giving route
ddddddddd	= Numeric characters giving dialed digits
TTTT	= Numeric characters giving terminating trunk
ssss	= Numeric characters giving final matrix connection time in minutes and seconds
RT	= Identifier for release time entry
nnnn	= Numeric characters giving release time in minutes and seconds
qqqq	= Numeric characters identifying line or trunk to which the entry applies
ENDASREQCD	= Identifier for end of call data collection
E	= End of message character

USE: Call Data Collection reports on magnetic tape and for printing on teletype.

Figure 7. Output Format - Call Data

SECTION V

COMMUNICATION FUNCTION

GENERAL

TDCS SSU's and ACOC's interface with each other over the 490L AUTOVON as subscribers to that system. As a subscriber, an ACOC has access to two AUTOVON line circuits. An SSU has access to a single AUTOVON line circuit. Calls may be initiated at either an SSU or ACOC. The modes of initiation may be automatic, semi-automatic or manual.

AUTOMATIC MODE

The automatic mode can be considered the normal communications mode. During automatic operation no action is required by the operator and only the lighting of the AUTO and SUPV lamps on the alarm and control panel will indicate that a communications link has been established and that data is being transmitted or received. During this mode the MANUAL DIAL switch must be set to OFF and the MAKE BUSY-OPERATE switch must be set to OPERATE. When, on occasion, calls canot be completed after several tries, an explanatory message will be printed on the teletypewriter.

SEMI-AUTOMATIC MODE

The semi-automatic mode allows the operator to establish voice calls from a TDCS unit to selected AUTOVON stations. Utilization of this mode blocks the normal automatic mode of TDCS communications. Its use should be constrained by this understanding. This mode has value in testing the dial up operation and in testing transmission facilities.

During this mode, the MANUAL DIAL switch must be set to OFF and the MAKE BUSY-OPERATE switch must be set to OPERATE. The TEL NO SEL thumbwheel switch must be set to the code (01 to 15) that corresponds to the selected AUTOVON telephone. Pressing the AUTO DIAL EXECUTE pushbutton initiates the call. Headset or test equipment plugs should be inserted into the HDST jacks prior to pressing this button and should be removed as soon as the call or testing is completed to avoid remaining in a busy-out condition that prevents normal TDCS communications.

MANUAL MODE

The manual mode allows the operator to establish a voice call from a TDCS unit to any AUTOVON telephone. Utilization of this mode blocks the normal automatic mode of TDCS communications. Its use should be constrained by this understanding. This mode has value in testing transmission facilities and allows connections to test terminations.

During this mode, the MANUAL DIAL switch must be set to ON and the MAKE BUSY-OPERATE switch must be set to OPERATE. Headset or test equipment plugs should be inserted into the HDST jacks and the desired AUTOVON telephone number should be dialed on the DTMF keyset. The MANUAL DIAL switch should then be set to OFF. When the call or testing is completed, the headset or test equipment plugs should be removed to avoid remaining in a busy-out condition that prevents normal TDCS communications.

MAKE BUSY

During normal operation the MAKE BUSY-OPERATE switch must be in the OPERATE position. When for any reason it is desired to inhibit incoming calls, the MAKE BUSY-OPERATE switch should be placed in the MAKE-BUSY position.

NORMAL OPERATION

The transmission of instructions and data between a TDCS SSU and a TDCS ACOC is fully automatic and is accomplished in three steps. These are setting up the connection, transmitting the data and releasing the connection.

Setting up the Connection

A connection is set up when an SSU or an ACOC has information to transmit and an idle line is available. The connection set up is controlled by program through Call Control Units (CCU's) that perform signaling, dial-up, and modem cut-through functions. The calling site is the ACOC except when the SSU is ready to forward collected special request data. Connection set up is as follows.

a. The calling site sends an off-hook signal on its AUTOVON line.

b. The calling site, on receipt of wink start from its AUTOVON Switch, outpulses the telephone number of the called site.

c. The called site, upon receipt of an alerting signal from its AUTOVON Switch, cuts in its modem and returns an off-hook signal.

d. The calling site, upon receipt of a signal from its AUTOVON Switch indicating that the called site has gone off hook, cuts in its modem completing the establishment of a communications link between the computers of the two TDCS units.

e. The called site sends an answering message to the calling site.

f. The calling site receives the answering message and verifies the called site identity.

If no wink start is received in step (b) or no answer supervision (steady off-hook from the switch) is received in step (c) and either of these conditions persist through three (3) attempts to set up a connection, the message and the cause for failing to send the message are printed out at the calling site.

Transmitting the Data

Two procedures are used for the transmission of data.

Transmission Procedure I is used for the transmission of requests from an ACOC to an SSU to initiate a special traffic data collection, to load a schedule for scheduled traffic data collection or to start or stop a call data collection. It is also used to forward collected special request data from an SSU to an ACOC.

Transmission Procedure I consists of the following steps.

a. The calling site transmits the instruction or data to the called site.

b. The called site receives the instruction or data and checks it.

c. The called site sends an acknowledge message to the calling site.

d. The calling site receives the acknowledge message from the called site and checks it.

Several special conditions can arise during Transmission Procedure I. These are itemized in Table 2.

Transmission Procedure II is used for the transmission of requests from an ACOC to an SSU for the transmission of the value of a single count, the transmission of data from scheduled traffic data collection, and the transmission of data from call data collection. It also includes the responses and transmissions resulting from these requests.

Transmission Procedure II consists of the following steps.

a. The ACOC transmits the instruction requesting the transmission of a single count, scheduled traffic data, or call data.

b. The called SSU receives the instruction from the ACOC and checks it.

c. The called SSU sends an acknowledge message to the ACOC and, if the instruction is a request for scheduled traffic data or call data, it positions the magnetic tape containing this data for reading the first entry.

d. The ACOC receives the acknowledge message from the called SSU and checks it.

e. The called SSU obtains the desired count, if the request is for a single count, or an entry from the tape, if the request is for scheduled traffic or call data.

f. The called SSU transmits the entry to the ACOC.

g. The ACOC receives the entry and checks it.

h. The ACOC returns an acknowledge message to the called SSU and records the entry received from the SSU on magnetic tape, if scheduled traffic or call data was requested, or it prints the entry, if a single count was requested.

i. The called SSU receives the acknowledge message and checks it.

Table 2

Transmission Procedure I and II, Special Conditions

Action Message*	Condition Requiring Action
No answer Message	3 time-outs, no answer message from called site.
Transmission Errors	3 tries, sending message, getting answer message OR error message which is garbled. OR 3 tries, sending message, getting error message. OR 4 received messages with errors at called Site.
Wrong Site Reached	3 tries, sending message, getting answer message with wrong identification of called Site.
Multiple Problems	6 tries, any combination of above problems which did not fall in group of 3 alike.
Collection in Progress	"collection in progress" message from called Site instead of acknowledge.
**SSU Interrupted	delay message received from called Site no data received within 10 minutes.
***No Response	Time-out after error message sent to called Site, which sent no acknowledge message during 30 sec time-out after message (other than acknowledge). OR no message or "on-hook" before time-out after any message except acknowledge after delay.
Transmission Interrupted	in procedure I only, 3 tries getting on-hook before acknowledge message from called Site.
Type Data Wrong Type	data on collection tape unit at SSU does not match requested data transmission.

NOTES:
Time-out periods can be modified for various waits. Procedures for changing these are covered in Appendix II.
*messages are preceded by "message not sent-"
**preceded by printout of instruction "message not completed-", and or data to be transmitted.
***preceded by "message not completed-" (applies to Transmission Procedure II only)

j. If the called SSU has additional data to send, the processing goes to step (e) above for the next entry. If the called SSU has no additional data to transmit, it sends an end-of-data message.

k. The ACOC receives the end-of-data message and checks it.

Several special conditions can arise during Transmission Procedure II. These are itemized in Table 2.

Releasing the Connection

When the transmission has been completed and a proper acknowledge has been returned, the connection between the SSU and the ACOC is released as follows.

a. The calling site sends an on-hook request to the AUTOVON Switch.

b. The AUTOVON Switch returns the on-hook signal to the calling site and the line becomes idle.

c. The line at the called site upon receipt of an on-hook signal from the AUTOVON Switch, becomes idle.

If for any reason the called site does not receive an on-hook signal from its AUTOVON Switch, the time release feature at the called site will automatically disconnect the line 10 seconds after it has returned a proper acknowledge to the calling site. If during this 10 second period an error message is received and the acknowledge is retransmitted, the 10 second count down will restart with the resending.

Only one special condition should arise during the connection release. This is disconnect received at the calling site before on-hook is sent to the Switch. This will result in on-hook being sent to the Switch, with any processing of the message remaining to be done completed as if it were a normal release of connection.

APPENDIX III

ANALYSIS & MANAGEMENT FOR DCA

CHAPTER 5. ANALYSIS AND MANAGEMENT FOR DCA

1. Objective. The objective of this chapter is to provide the basic analytical and management guidelines for DCS upon which the details of short- and long-term management can be developed. These detailed procedures will be developed as this Circular is implemented to provide visibility of the following:

a. Grade of service being provided the users of the DCS.

b. Capability of the DCS to support high quality data grade service.

c. Switched network traffic flow.

d. Requirements for reconfiguration or upgrade of DCS resources.

e. Requirements for design changes in equipment and network configuration.

f. Requirements for modification of existing equipment.

g. Participation of the various levels of DCA, military department, and O&M agency commands in the DCS Quality Assurance Program.

2. General.

a. Quality assurance is but one of the tools by which management maintains visibility of current operating conditions and evolving requirements which effect or will effect user services. Using this knowledge, managers formulate actions involving realignments, upgrades, and new facilities to alleviate continuing operational problems. The DCS Quality Assurance Program, established by this Circular, supplements existing DCA staff management functions and responsibilities to allow DCA management at all echelons to accomplish these functions in a more efficient and timely manner.

b. A very important result of this Program is the integration, correlation, and analysis of performance data. Without this result, management is deprived of the details required to formulate complete plans and actions.

To ensure that the results of the analysis serves management effectively, guidelines and procedures must be carefully developed based on the requirements of the various echelons of management, the missions of DCA activities, and the requirements of the users of the DCS.

c. The types of analysis described in this Circular do not preclude the use of different techniques for analysis and preparation of management reports; however, it is DCA's goal to standardize the analytical procedures and reports to the extent possible and practical.

3. Responsibilities. The responsibilities for analysis and management action relating to quality assurance will cross organization lines within each DCA echelon. This Circular does not specify the specific organization of the various DCA elements, but rather specifies the overall organizational responsibilities for analysis and management action.

a. The Director, DCA will:

(1) Provide the overall management of the DCS Quality Assurance Program.

(2) Publish and revise Program documentation as required.

(3) Resolve technical, operational, and management problems with the appropriate military department and O&M agency, as required.

(4) Analyze quality assurance data as required for efficient management of DCS resources, and provide briefings for high level DCA and DoD managers.

(5) Develop subsystem project plans for improvement of the DCS using the technical and operational justification provided by quality assurance data.

(6) Identify the DCA staff element responsible for analysis and management actions.

b. Commanders of DCA areas will:

(1) Coordinate with the appropriate O&M headquarters on the resolution of technical, operational,

and management problems which cannot be resolved at lower echelons. Refer problems which cannot be resolved at the DCA area level to the Director, DCA, ATTN: Code 510, Washington, D.C. 20305.

(2) Analyze technical evaluation, performance monitoring, and performance evaluation data as required for effective management of DCS resources within their geographical area of responsibility.

(3) Prepare the management reports discussed in this chapter, as required.

(4) Provide recommendations for additions, deletions, or changes to the types of analysis and management reports discussed in this chapter.

(5) Provide the appropriate CINC, military components, lateral O&M headquarters, and users of the DCS with the results of quality assurance data analysis, as required.

(6) Provide planning input to Headquarters, DCA for preparation of subsystem project plans for upgrading substandard facilities. These inputs will be fully supported with operational and technical justification based on the analysis of quality assurance data and other related information.

(7) Provide technical and engineering assistance, as requested, to analyze, identify, and correct operational problems.

c. Commanders of DCA regions will:

(1) Plot daily and analyze transmission media idle channel noise readings for each quality assurance route within their geographical area of responsibility.

(2) Coordinate directly with lateral O&M elements on substandard and degrading conditions. Before contacting the O&M element, a thorough examination will be accomplished of all available information pertaining to technical evaluation, performance monitoring, performance evaluation, status reports, and similar sources. If the cause of the substandard or degraded condition cannot be determined from this information, the O&M elements will then be contacted to determine the cause of the problem and when corrective actions will be completed.

(3) Provide technical and engineering assistance, as requested, to analyze, identify, and correct operational problems.

(4) Analyze technical evaluation, performance monitoring, and performance evaluation reports and information, as required.

(5) Prepare charts, tables, graphs, and reports discussed in this chapter, as required.

4. Technical Evaluation.

a. Information Input. Technical evaluation information is provided in a report prepared and distributed by the O&M agencies. The information provided by the report includes the measured performance parameters that describe the performance capability of the DCS facility or transmission link evaluated. Tables and graphs depict the operational performance of certain parameters. A narrative portion of the report describes test conditions and problems encountered during the evaluation. The long range objective is to adapt this information to automatic data processing techniques to allow efficient filing, manipulation, retrieval, and analysis.

b. Analysis of Data. The technical and operational performance data provided in the technical evaluation report can be analyzed in many ways, limited only by the imagination of the persons accomplishing the analysis and the time available. The effectiveness of analytical techniques will be greatly enhanced when automatic data processing techniques are used. The following represent examples of the types of analysis to be performed:

(1) The technical evaluation report may be analyzed and evaluated to identify operational and design deficiencies discovered during the evaluation. The content of the report should also be examined to identify omissions, errors, incomplete test results, and similar deficiencies which detract from the technical integrity and validity of the findings of the evaluation.

(2) The technical evaluation reports will be used to determine the performance standard for each facility evaluated.

(3) The operating capability of major equipment groups or components will be used to determine performance

trends in equipment. Normally, such an analysis will be directed toward identification of problems among specific equipment types and manufacture.

(4) Statistical analysis of transmission link technical evaluation reports will highlight the number of links operating below the required standard. This can be accomplished by preparing charts and graphs of the individual link median operating capability. Preparation of a bar graph showing the number of links performing with predetermined variations relative to the required standard will focus management attention on those links which are most in need of upgrading. These graphs should depict the number of links operating below DCS standards (i.e., 1 to 3 dB, 4 to 6 dB, 7 to 10 dB, and greater than 10 dB), categorized by type of transmission media and responsible O&M agency.

c. Correlation of Technical Evaluation Data. Correlation of performance data from several sources is an effective means of validating the data and identifying problem areas.

(1) Correlation of individual performance parameters contained in the technical evaluation report will indicate errors made in taking measurements or incomplete data which is not representative of the installed capability of the equipment. When either of these conditions exist, it is necessary to determine which data elements are valid and manually calculate the required performance parameters using the valid measured data as the basis. Technical evaluation data serves as performance capability baselines for all other quality assurance functions. It is imperative that all technical evaluation data elements representing facilities and transmission links performance capability be correct.

(2) Correlation of new technical evaluation data with test and acceptance and previous technical evaluation data will show the deterioration of equipment with time. Should a significant deviation be indicated and the data has been determined to be accurate, a determination of the proper corrective actions can be made. Such actions include minor engineering modifications or equipment adjustments, antenna alignments, and planning and programing for upgrades and new facilities. Other performance data such as DCAC 310-55-1 status information,

HAZCON reports, and customer complaints should be reviewed and correlated with the technical evaluation data to determine the effects on operational performance resulting from corrective measures accomplished by O&M agencies subsequent to technical evaluation team visits.

d. Management Reports. Management reports resulting from the technical evaluation data consist of technical reports, tables, charts, and graphs depicting the various performance characteristics of the facilities evaluated, and statistical tables, charts, and graphs resulting from the analysis of the data. The following are examples of management reports resulting from technical evaluation data:

(1) The technical evaluation test data report prepared and distributed by the O&M agencies.

(2) Charts showing performance capability of the evaluated facility relative to required performance standards.

(3) Charts and tables showing the operational performance baseline for performance monitoring.

(4) Bar graphs showing the deviation from the established performance standards for the evaluated facilities.

(5) Tables or graphs showing the variation of measured performance from design specifications for major equipment types and principal manufacture.

e. Management Utilization of Technical Evaluation Data.

(1) The measured performance parameters serve as an engineering data base that describes the performance capability of the DCS.

(2) Mathematical models of the DCS can be developed, and using actual operation performance data, the actual effects of the DCS on a particular type of service can be predetermined. Also, the effects of engineering modifications, upgrades, and major realignments on overall system performance can be predetermined.

(3) Substandard facilities are readily identified by bar graph representatives showing variations from required standards. The engineering data will provide additional justification for modification and upgrade actions.

(4) Transmission link performance serves as the basis for determining single and tandem link operational performance standards for performance monitoring of transmission facilities.

(5) Transmission link performance data can be used to determine the best routing for special grade circuit and service requirements.

(6) The technical evaluation data file can be cross-referenced with failures of specific types of equipment to determine the need for equipment replacement.

(7) Statistical reports can be used to brief management elements on the performance capability of DCS facilities, transmission media, and equipment.

5. Performance Monitoring.

a. Information Input. Performance monitoring data provides a sample of the actual operating performance of the facility being monitored. Data elements selected for monitoring provide a gross indication of operational performance and, therefore, must be supplemented by direct coordination with lateral O&M elements when problems are indicated. The amount of data gathered must be limited to ensure that all data reported is properly utilized. Although the performance monitoring data is a gross indicator of operational performance, careful analysis of this data on a continuing basis will provide a highly reliable overview of system performance.

b. Analysis of Data. Performance monitoring provides the performance information required by the various DCA management echelons responsible for taking prompt action to correct deficiencies. The principle analytical techniques involve daily analysis for short-term purposes and computer statistical analysis for long-term trending and preparation of management reports. The frequency and type of analysis will vary for the transmission media and the switched networks. The following are some examples of analysis required.

(1) Transmission Media.

(a) Daily plots of idle channel noise measurements will be accomplished by the cognizant DCA region for each route identified in table 1-5 of Supplement 4 of this Circular. These daily measurements, when plotted on a continuous basis, will provide an excellent indicator of the operational performance of the transmission route. The chart used to plot the daily measurements should have the route standard indicated for ready comparison

(b) Statistical analysis of the individual route performance will be accomplished by the computer to provide various DCA and O&M activities with management visibility of the transmission media performance. The time frame of the computer analysis will coincide with a practic level of management reaction time. Examples of computer developed statistical reports are weekly, semiannual, and annual trend reports of idle channel noise measurements for each route; and, the number of routes in green, amber, and red zones for a defined period of time and categorized by region, area, O&M activity, and type media.

(2) AUTOVON. Performance monitoring information reported for the AUTOVON is considered generally perishable in that the ACAS does not currently provide for recording and filing of data. However, the significant actions taken by the network controller in response to the ACAS are recorded in a permanent log. A periodic analysis of the significant actions recorded in this log may develop trends of recurring problems which can be resolved by management action. The statistical reports derived from traffic data, which is available on request from AUTOVON switches, are listed in section 4 of the DCA Automated Reports Catalog. The analysis and management reports obtained from the TDCS will be listed in this chapter as inputs are received from the various DCA management echelons requiring the information.

(3) AUTOSEVOCOM. Performance monitoring information is provided by DCAC 310-55-1 status reports, ANAF reports, and AUTOSEVOCOM technical evaluation team reports. The principal form of analysis of this data is periodic statistical reports generated by computer analysis. The type of computer reports are listed in section 4 of the DCA Automated Management Reports Catalog. Individual switch performance in terms of outage time and reasons

for outage should be developed using DCAC 310-55-1 status information and plotted monthly. Additionally, the AUTOSEVOCOM network circuit reliability should be analyzed monthly.

(4) AUTODIN. Analysis of the AUTODIN performance monitoring information is limited primarily to historical analysis of traffic elements, switch reliability, switch configuration, and similar type of information to determine network reliability. The types of analysis and management reports generated are contained in the DCA Automated Management Reports Catalog.

c. Correlation of Performance Monitoring Data. Correlation of all performance data submitted for transmission media with all other status information available will be accomplished prior to contacting the O&M element for additional information. Examples of such data correlation follow:

(1) Correlation of idle channel noise, receive signal, and baseband loading measurements with the route performance standard and the route design standard (developed from test and acceptance data) to determine the degree of degradation from normal.

(2) Correlation of degraded conditions with HAZCON reports to determine if equipment malfunctions or loss of transmission diversity are causing the degradation.

(3) Correlation of degraded transmission facility performance with switched network traffic throughput and reported data error rates to determine the effect of transmission facility performance on user services. The effects of tandem route performance making up an entire customer connection must be considered when correlating transmission facility performance with user service problems.

(4) Correlation of reverse path measurements for each route should be made to determine if the degradation is caused by poor propagation. Poor propagation will normally cause both directions of the route to be degraded equally and simultaneously.

(5) The effect of the individual link received signal level on the tandem link route idle channel noise should be predetermined to correlate the route idle channel noise with the individual link receive signal level.

d. Management Reports. The management reports resulting from analysis of performance monitoring data will be listed in this paragraph as they are developed. The following is an example of the types of management reports that will be listed:

(1) Transmission Media.

(a) Graphs of daily idle channel noise measurements plotted by each DCA region for each route within their geographical area of responsibility.

(b) Trend charts will be provided by computer analysis to indicate weekly and biannual summarizations of the measurements. Trend charts will show the route standard; the high, low, and media reading for the period; and the mean and standard deviation for the past 6 months. This type report will be routinely available at DCA areas and regions, and as required at Headquarters, DCA.

(c) Periodic computer developed reports showing the number of routes in green, amber, and red conditions for each DCA area, O&M activity, and type of media.

(2) AUTOVON.

(a) The network controller log.

(b) Analyzed reports showing significant actions taken by the network controllers.

(c) Charts and graphs depicting network traffic conditions for each switching center, such as call completion rates, call attempts, calls preempted by higher precedence calls, access line busy, and trunk busy. These reports will be identified at a later date when input is received from DCA elements.

(d) The reports identified in section 4 of the DCA Automated Management Reports Catalog.

e. Management Utilization of Performance Monitoring Data. This paragraph discusses the major functional uses of the data and established a degree of standardization among the various DCA activities in their approach to management and operational direction of the DCS. This paragraph will be expanded as inputs are received from the various DCA activities.

(1) Transmission Media.

(a) Maintain daily cognizance of the operational condition of DCS transmission facilities by plotting, monitoring, and analyzing performance monitoring information.

(b) Determine operational areas requiring engineering assistance, logistical support, personnel and training support, operational or maintenance procedure revision, and similar areas, and initiate appropriate actions with the O&M elements.

(c) Tandem routes can be analyzed to determine the effects of the transmission media performance on specific customer complaints. Circuit reengineering can be accomplished by the DCA activity having circuit allocation and engineering authority.

(d) The actual operating performance data can be utilized in conjunction with technical evaluation data to identify substandard transmission facilities requiring upgrade or replacement.

(e) The actual operational performance data can be utilized to determine the effects of meteorological conditions on the transmission media performance. This type of information can be utilized by the DCA activity in adjusting the route standard for different times of the year, or by engineering research activities to correlate transmission media performance with meteorological data.

(f) Provide briefings to interested management activities (such as CINC's, NSA, O&M agencies, etc.) on the actual operational performance of the transmission media within the geographical area of interest.

(2) AUTOVON.

(a) Maintain real time cognizance of AUTOVON network operations within the area of responsibility and take immediate corrective actions to resolve problems.

(b) Additional items to be developed.

(3) AUTOSEVOCOM. To be developed.

(4) AUTODIN. To be developed.

6. Performance Evaluation.

a. Information Input. Performance evaluation information is provided by a narrative report prepared by the DCA area or region that conducts the evaluation. The report contains a detailed description of deficiencies identified during the evaulation with appropriate technical test results included to support findings. In addition to the published report, the detailed notes and test data collected by the evaluators are available to the DCA activity that performed the evaluation. A memorandum of deficiencies is presented to the facility commander and is available to evaluation personnel.

b. Analysis of Data. Analysis of performance evaluation data falls into two categories: system and statistical. The following are examples of the types of analysis which can be performed:

(1) The data contained in the discussion of the deficiency, supporting back up data, and proposed corrective actions should be analyzed by a systems engineer to determine the effect of the evaluated facility on the system or network operational performance.

(2) Analysis of performance evaluation reports which indicate degraded operational conditions existing during the same time frame at other facilities should be conducted for the entire area of responsibility to develop charts and graphs that will indicate the degraded elements within the overall system or geographical area of concern.

(3) Analysis of the effects on system and network performance of subsequent corrective actions should be accomplished, and previously prepared reports, charts, and graphs updated as required.

(4) Periodic analysis of deficiencies involving major equipment groups should be accomplished to determine deteriorating trends in the operational capability of the equipment due to aging, logistics, procedures, etc. This will require that attention be devoted to an examination of this area during the evaluation and the preparation of the written reports.

(5) Periodic analysis of the reported deficiencies categorized by major problem areas expressed as a percentage of the total reported deficiencies for a particular area and O&M activity.

(6) Additional types of analysis unique to AUTOVON, AUTOSEVOCOM, and AUTODIN will be developed at a later date.

c. Correlation of Performance Evaluation Data. The performance evaluation data represents highly technical and reliable data which was measured or observed by DCA personnel onsite. Such information provides a known reference for correlating operational performance information obtained from other sources. Thorough correlation of performance evaluation data with other performance data available can isolate degraded conditions and focus management attention on those areas in need of action. The following are some examples of correlation:

(1) Test data should be reviewed and correlated to verify the cited deficiencies.

(2) Data pertaining to individual facilities can be correlated with data taken from other facilities within the same area during the same time period to isolate the cause of degradations. For example, performance data taken from two facilities which are interconnected (such as AUTOVON switches or terminal radio stations) can be used to isolate degraded performance to the causing facility.

(3) Correlation of performance evaluation data taken during test and acceptance or technical evaluation will reveal the degree of operational degradation of the evaluated facility and identify the major components or equipment contributing to the degradation.

(4) Correlation of performance evaluation data with performance monitoring data will allow evaluation of subsequent corrective actions accomplished by the O&M agencies and their effect on system or network performance. This will allow the DCA element to verify whether actions taken were sufficient and meet with predicted levels of improvement.

(5) Correlation of the performance evaluation data with periodic statistical reports from HAZCON data will provide a comparison of the measured performance capability of major equipment components with the operational reliability of the equipment.

d. Management Reports. Management reports consist of the performance evaluation report and the memorandum of deficiencies prepared in accordance with chapter 4 of this Circular, and charts, graphs, tables, etc., providing

statistical results of the data analysis effort. At the present time there are no requirements for submission of management reports using performance evaluation data to Headquarters, DCA, other than the prescribed submission of the performance evaluation report. The reports described below are examples of those which can be prepared for local use:

(1) The performance evaluation report prepared by the DCA area or region conducting the evaluation.

(2) Charts, tables, line route drawings, and graphs to provide the current status of degraded facilities within the geographical area of concern. Such reports can be combined with similar reports noted for performance monitoring and technical evaluation.

(3) Charts, tables, line route drawings, and graphs to indicate the current status of corrective actions on deficiencies.

(4) Charts, tables, line route drawings, and graphs that indicate performance capability, as observed by the performance evaluation team, of major equipment components by type and manufacture in relation to the equipment design specifications.

(5) Charts, tables, line route drawings, and graphs indicating the total number of deficiencies noted within a particular time interval, plotted by deficiency, area, O&M activity, etc.

e. Management Utilization of Performance Evaluation Data.

(1) Utilize performance evaluation data in conjunction with technical evaluation and performance monitoring information to provide technical justification for planning and programing actions to correct substandard or degraded facilities.

(2) Utilize the performance evaluation data to identify major deficiencies to O&M commanders for corrective action.

(3) Utilize the statistical analysis of the performance evaluation data to identify major problem areas with a geographical area to appropriate CINC's, user organizations, high level management, and O&M organizations.

(4) Use the performance evaluation data to identify technical deficiencies and assist in providing engineering assistance to site personnel in correcting degraded conditiors.

APPENDIX IV

CIRCUIT FILE EXAMPLE

STANDARD CIRCUIT LISTING

(LEVEL 0, REC 00-02)

CCSD OPUS CKNR	S A	C S	T O	USER CKT TERM LOCATION	SC	A	SE QP	USER CKT TERM LOCATION	SC	A	SE QP	CKT PR	MD	RP NR	C	TCO NR DATE	OFFICE	TSO -NUMBER-	ACTIVE R	-DATE	TRUNK X-REF-	R S	T I	CHG DATE-	C L	HEADER I	NR
XXXX XXXX	X	X	X	XXXXXXXX	XX	X	XX	XXXXXXXX	XX	X	XX	XX	XX	XX	X	YYMM	AANNNN	XXXXXXXX	X	YYNNN	XXXXXX	X	X	YYNNN	X	X	XX

(STATIC CIRCUIT DATA (CH-1) HEADER CARDS)

AG RS	R A	D S	E X	FM PAC	TO PAC	M S	DTSO -NUMBER-	DEACT R	-DATE	GYBK REF-	HEADER I	NR
XX	X	X	X	XXX	XXX	X	XXXXXXXX	X	YYNNN	XXXX	X	02

(LEVEL 0, RECORDS 3-99) CIRCUIT TERMINAL DATA

T O	TRAFFIC TERMINAL- LOCATION	FAC	SC	A	TRAFFIC TERMINAL EQUIPMENT SEND-1	SEND-2	RECV-1	RECV-2	-MCA- ID-	SV P	I MO	L P	I L	TEL NUMBER-	NR EX	SP CD	I H	TK OP	TK NR	USER EQP I	NR
X	XXXXXXXX	XXX	XX	X	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXX	X	XX	X	X	XXXXXXX	XX	XX	X	XX	XX	X	XX

(LEVEL 1, RECORDS AA-ZZ) DIRECTION OF TRANSMISSION

(LEVEL 2, REC AA-ZZ) OPPOSITE DIRECTION OF TRANSMISSION ONE RECORD PER CIRCUIT SEGMENT

T O	SEGMENT TERMINAL- LOCATION	FAC	SC	A	M P	TRUNK --ID--	CHNL NR-	C T	O	E Q	E S	R R	T S	PDC ------	S T	COMCL SERVICE ID/CSIF COMP	PRE	TSVC	NUMBER	SUF	SEGMENT I	NR
X	XXXXXXXX	XXX	XX	X	X	XXXXXX	XXX	X	X	X	X	X	X	XXXXXX	X	XXXX	XXX	XXXX	XXXXXX	XXX	X	XX

(LEVEL 3, REC 00-99) LOCATIONS TO BE AVOIDED WHEN ROUTING CIRCUIT (CH-4)

1STD CKNR	2NDD CKNR	3RDD CKNR	-FIRST- AVOIDLOC	SC	-SECOND- AVOIDLOC	SC	-THIRD- AVOIDLOC	SC	-FOURTH- AVOIDLOC	SC	AVD DIV I	NR
XXXX	XXXX	XXXX	XXXXXXXX	XX	XXXXXXXX	XX	XXXXXXXX	XX	XXXXXXXX	XX	X	XX

(LEVEL 4, REC 00-99) CONTINGENCY PLAN INFORMATION ASSOCIATED WITH CIRCUIT (CH-17)

DCA HEADQTRS--	DCA EUROPE----	DCA PACIFIC---	DCA WEST-HEM--	OTHER ----------	PLAN REF I	NR
XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	X	XX

FIGURE 1. Standard Circuit Listing

COMMAND COMMUNICATIONS SERVICE DESIGNATOR (CCSD): FILE KEYWORD: SORTED ON CIRCUIT NUMBER (CH-14)	USING AGENCY CODE eg D = DCA PURPOSE/USE CODE eg TX = VFCT SYSTEM TYPE SERVICE CODE eg E = AUTODIN ACCESS LINE CIRCUIT NUMBER (AAAA → 9999)	CCSD PUS CKNR
CIRCUIT SERVICE AVAILABILITY eg A = FULL PERIOD, H = PROGRAMED REROUTE (CH-49)		S C T A S O
CIRCUIT SET: PERMITS FUTURE CIRCUIT CONFIGURATIONS IN FILE (CH-11)		
TYPE OPERATION eg F = FULL DUPLEX - DIRECTIONS 1 AND 2 MIRROR IMAGE (CH-73)		
FROM GEOGRAPHICAL LOCATION (CH-33) OF END OF CIRCUIT		USER CKT LOCATION
STATE AND COUNTRY eg CA = CANADA, 29 = MISSOURI (CH-51)		TERM SC A
DCA AREA NUMBER OR LETTER (CH-19) eg 7 = FAR EAST, A = NORTHEASTERN U.S.A.		
SECURITY EQUIPMENT ON CIRCUIT AT TERMINAL (CH-46 AND SUPPLEMENT 1)		SE QP
TO GEOGRAPHICAL LOCATION (CH-33) OF END OF CIRCUIT		USER CKT LOCATION
STATE AND COUNTRY eg 11 = DISTRICT OF COLUMBIA (CH-51)		TERM SC A
DCA AREA NUMBER OR LETTER (CH-19)		
SECURITY EQUIPMENT ON CIRCUIT AT TERMINAL (CH-46 AND SUPPLEMENT 1)		SE QP
CIRCUIT PARAMETERS BY CIRCUIT TYPE (CH-10) eg V1, S1, D2		CKT PR MD
CIRCUIT MODULATION RATE (CH-9) eg AF = 61.12 BAUD, CD = 16 CHANNELS, BB = 9600 BAUD		
CIRCUIT RESTORATION PRIORITY (CH-43) eg 1A, 2E, 4A, 00		RP NR C
CERTIFICATION OF RESTORATION PRIORITY (CH-42)		
TELECOMMUNICATIONS CERTIFICATION OFFICE (CH-54)	DATE OF LATEST TELECOMMUNICATIONS SERVICE REQUEST (TSR) OFFICE CODE NUMBER TSR SEQUENCE NUMBER	TCO NR DATE OFFICE
TELECOMMUNICATIONS SERVICE ORDER NUMBER (CH-55)		TSO -NUMBER-
CIRCUIT ACTIVATION DATE	TYPE OF DATE (CH-72) eg A = ACTIVATION, C = CONTINGENT DATE (CH-18)	ACTIVE R -DATE
TRUNK CROSS-REFERENCE NUMBER (CH-62) ONLY USED WHEN CIRCUIT ITSELF IS A TRUNK eg VFCT (DTXX6N01)		TRUNK X-REF-
TYPE OF RECORDS AND COMBINATIONS NEEDED FOR COMPUTER (CH-75)		R T S J
IDENTIFIES TYPE OF DATA ENTRY AND AGENCY RESPONSIBLE (CH-57)		CHG DATE-
CLASSIFICATION OF CIRCUIT (CH-13) eg S = SECRET		C L
		HEADER I NF

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GOVERNMENT AGENCY REQUIRING SERVICE (CH-3) eg DA = DEPARTMENT OF ARMY	AG RS XX
CIRCUIT ROUTING APPLIED (CH-44) eg A = PREFERRED, M = COST EFFECTIVE	R A X
REASON FOR DELAYED ACTIVATION (CH-20) eg A = NO USER EQUIPMENT	DE S X
CIRCUIT ACTIVATED WITH EXCEPTION TO (TSO) SPECIFICATION (CH-2)	E X
FROM LOCATION WHERE CIRCUIT TERMINATES (CH-23) WITHIN NAMED GEOGRAPHICAL LOCATION eg TCG = ARMY TECHNICAL CONTROL FAC.	FM FAC XXX
TO LOCATION WHERE CIRCUIT TERMINATES (CH-23)	TO FAC XXX
MODE OF SIGNALING (CH-36) eg V = VOICE/DIAL, E = RINGDOWN	M S X
	DTSO -NUMBER- XXXXXXX
TYPE OF DATE (CH-72) eg D = DEACTIVATION	X
DATE (CH-18)	DEACT R -DATE YYNNN
NOT USED (CH-25)	GYBK REP- XXXX
	HEADER I -NR X 02

5-1

		T O	TRAFFIC TERMINAL-LOCATION	FAC	SC	A	TRAFFIC TERMINAL EQUIPMENT SEND-1	SEND-2	RECV-1	RECV-2
TYPE OF OPERATION (CH-73) eg M = MULTIPOINT FULL DUPLEX (MIRROR IMAGE)		X								
CIRCUIT TERMINATION POINT	GEOGRAPHICAL LOCATION (CH-33)		XXXXXXX							
	TERMINAL FACILITY IDENTIFICATION (CH-23)			XXX						
	STATE AND COUNTRY (CH-51)				XX					
	DCA AREA NUMBER OR LETTER (CH-19)					X				
CIRCUIT TRAFFIC TERMINAL EQUIPMENT (CH-12) (6-DIGIT MERL NUMBERS eg 000150 = AN/FGC-25)							XXXXXX	XXXXXX	XXXXXX	XXXXXX

	-MCA- ID	SV P	I MO	L P	TEL NUMBER	NR EX	SP CD	I H	TK GP	TK NR	USER EQP I NR
AUTOVON SUBSCRIBER CIRCUITS ONLY (INCLUDES AUTOSEVOCOM)											
MAXIMUM CALLING AREA CODES (CH-34) eg 01 = GLOBAL	XXX										
MAXIMUM CALLING AREA PRECEDENCE CODE (CH-35) eg 1 = FLASH		X									
SERVICE MODE (CH-50) eg DY = FOUR-WIRE DATA, PRECEDENCE IN AND OUT			XX								
INCOMING PREEMPTION CODE (CH-26) eg N = NO PREEMPT				X							
LINE-LOAD CONTROL CODE (CH-30) eg N = NOT SUBJECT TO LINE-LOAD CONTROL					X						
TELEPHONE NUMBER ASSIGNED TO ACCESS LINE (CH-51) (INCLUDES AUTOSEVOCOM SUBSCRIBERS)					XXXXXXX						
NUMBER OF TELEPHONE EXTENSIONS (CH-38)						XX					
SUBSCRIBER COST CODE (CH-52)							XX				
INDICATES WHETHER LINE IS ONE OF SEVERAL SEQUENCED NUMBERS (CH-27)								X			
GROUP NUMBER IN AUTOVON SWITCH WHERE ACCESS LINE TERMINATES (CH-65)									XX		
POSITION IN AUTOVON TRUNK GROUP WHERE ACCESS LINE IS TERMINATED (CH-67)										XX	
											X XX

Description	Format	Field
TYPE OF OPERATION (CH-73) eg H = HALF DUPLEX - TRANSMIT BOTH DIRECTIONS DIRECTIONS 1 AND 2 ARE MIRROR IMAGE	X	TO
LOCATION OF START POINT OF EACH CIRCUIT SEGMENT. ALSO IDENTIFIES LOCATION OF END OF LAST CIRCUIT SEGMENT — GEOGRAPHICAL LOCATION (CH-33)	XXXXXXXX	SEGMENT TERMINAL-LOCATION
FACILITY IDENTIFICATION IN WHICH CIRCUIT SEGMENT BEGINS (CH-23)	XXX	FAC
STATE AND COUNTRY (CH-51)	XX	SC
DCA AREA NUMBER OR LETTER (CH-19)	X	A
MULTIPOINT CIRCUIT FLAG (CH-37) eg H = HUB ONLY, Y = HUB AT SEND POINT	X	MP
IDENTIFICATION OF TRUNK THAT CIRCUIT SEGMENT IS WITHIN	XXXXX	TRUNK --ID--
CHANNEL NUMBER IN TRUNK FOR CIRCUIT SEGMENT (CH-5)	XXX	CHNL NR-
TYPE OF CHANNEL (CH-7) eg T = TELETYPE/DATA	X	T
INDICATES WHETHER THIS LOCATION IS CIRCUIT CONTROL OFFICE (CH-8) eg C = CCO	X	CO
INDICATES WHETHER THIS LOCATION HAS CIRCUIT EQUALIZER (CH-22) eg E = YES	X	EQ
INDICATES WHETHER CIRCUIT HAS ECHO SUPPRESSOR THIS LOCATION (CH-21) eg S = YES	X	ES
INDICATES WHETHER CIRCUIT HAS REGENERATIVE REPEATER THIS LOCATION (CH-41)	X	RR
INDICATES TYPE OF FREQUENCY SIGNALING BETWEEN SEGMENT TERMINALS (CH-76) eg C = 2600 HZ, H = OUT OF BAND, V = VOICE, X = DTMF	X	TS
FUNDING OFFICE CODE (CH-46)	XXXXX	PDC -----
SEGMENT TYPE (CH-48) eg D = DECCO LEASE, P = GOVT OWNED-REIMBURSEMENT REQ.	X	ST
	XXXX XXX XXXX XXXXX XXX	COMCL SERVICE ID/CSIP COMP PRE TSVC NUMBER SUP
	X XX	SEGMENT I NR

APPENDIX V

TRUNK FILE EXAMPLE

STANDARD TRUNK LISTING

TYPE 0

TRUNK --ID--	D I	T S	S A	R C	TRK FROM TERM LOCATION	FAC	SC	TRK TO TERM LOCATION	FAC	SC	F C	CAPA CITY	BAND WIDTH	DIST MILE	TRK COST-	CCSD -X-REF--	ACTIVE R -DATE	T 1	CHG DATE-	C L	HEADER I NR
XXXXXX	X	X	X	X	XXXXXXXX	XXX	XX	XXXXXXXX	XXX	XX	X	XXXX	XXXXX	XXXX	XXXXX	XXXXXXXX	X YYNNN	X	YYNNN	X	X XX

STATIC TRUNK DATA (CH-1) (HEADER CARD)

T O	D S	E X	TKT EQP	TKT EQP	ROUTE NUMBER	CRG/ -CRI-	TSO -NUMBER-	ORIG DATE-	HEADER I NR
X	X	X	XXX	XXX	XXXXXX	XXXXX	XXXXXXXX	YYNNN	X XX

(TYPE 1, RECORDS 1-99) TRUNK TERMINAL EQUIP AND CONNECTING LINKS

TRAILER LOCATION	-TERMINAL FAC	SC	A	T	XMN MED	T	-LINK- -NR-	C	SYDIV M	S	G	TRUNK X-REF-	COMCL SERVICE ID/CSIF COMP	PRE	TSVC	NUMBER	SUF	TRAILER I NR
XXXXXXX	XXX	XX	X	X	XXX	X	XXXX	X	X	X	X	XXXXXX	XXXX	XXX	XXXX	XXXXXX	XXX	X XX

(TYPE 2, RECORDS 1-99) LISTS AVAILABLE OR ASSIGNED CHANNELS

CHNL NR-T	CHNL NR-T	CHNL NR-T	CHNL NR-T	CHNL NR-T	CHNL NR-T	CHNL NR-T	CHNL NR-T	CHNL NR-T	CHNL NR-T	CHNL NR-T	CHNL NR-T	CHNL NR-T	NOSEQ CH 1 NR
XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	X XX

(TYPE 7) CHANNEL ASSIGNMENT RECORDS SIX NEEDED PER CHANNEL

CHNL NR-T	CCSD OPUSCKNR	S A	C S	RP NR	RECD I	NR	T O	CK MD	C O	USER CKT TERM LOCATION	FAC	SC	USER CKT TERM LOCATION	FAC	SC	ACTIVE R -DATE	TRUNK X-REF-	C L	CH ASSN I
XXXX	XXXXXXXX	X	X	XX	X	XX	X	XX	X	XXXXXXXX	XXX	XX	XXXXXXXX	XXX	XX	X YYNNN	XXXXXX	X	X

(TYPE 8) MISC.

FREE FORM	REMARKS 1 NR
XXXXXXXXXX XXXX XXXX XX X	X XX

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FIGURE 2. Standard Trunk Listing

KEYWORD: SPELL ALL 6 CHARACTERS	FROM - TO CODE (CH-6) AREA NUMBER (CH-5)	
	AGENCY PROVIDING TRUNK eg E = NAVY	
	TYPE OF TRUNK eg S = SATELLITE RELAY	TRUNK --ID-- XXXXXX
	TRUNK NUMBER	
INDICATES DIRECTION OF TRUNK (CH-63) eg LOW DCA AREA # TO HIGH # = 1		D I R X
TRUNK SET PERMITS MORE THAN ONE TRUNK CONFIGURATION IN FILE (CH-69)		T S X
TRUNK SERVICE AVAILABILITY eg A = FULL PERIOD, G = ON CALL (CH-49)		I A X
		R C X
FROM GEOGRAPHIC LOCATION (CH-33) OF START OF TRUNK		TRK FROM LOCATION XXXXXXX
TRUNK TERMINATING FACILITY (CH-23) eg AVC = AUTOVON TECHNICAL CONTROL		TRK FROM TERM FAC XXX
STATE AND COUNTRY (CH-51) eg GE = FEDERAL REPUBLIC OF GERMANY		TRK FROM TERM SC XX
TO GEOGRAPHIC LOCATION (CH-33) OF END OF TRUNK		TRK TO LOCATION XXXXXXX
TRUNK TERMINATING FACILITY (CH-23) eg TCG = ARMY TECHNICAL CONTROL		TRK TO TERM FAC XXX
STATE AND COUNTRY (CH-51)		TRK TO TERM SC XX
INDICATES WHICH END OF TRUNK HAS CONTROL OF THE TRUNK (CH-24) eg F = FROM TERM.		F C X
NUMBER OF CHANNELS IN TRUNK (CH-60)		CAPA CITY XXXX
TYPE OF CHANNEL (CH-7) eg V = VOICE, L = LEASED		
BANDWIDTH OF TRUNK (CH-54) NUMERIC VALUE		BAND WIDTH XXXX
UNIT OF MEASURE eg KH = KILOHERTZ, BS = BITS/SECOND		
AIRLINE MILES BETWEEN TERMINALS (CH-64)		DIST MILE XXXX
COST OF TRUNK FROM DECCO RECORDS (CH-61), COMMERCIAL LEASE ONLY		TRK COST- XXXXX
CIRCUIT CROSS-REFERENCE NUMBER ONLY USED WHEN TRUNK IS ITSELF A CIRCUIT WITHIN ANOTHER TRUNK		CCSD -X-REF-- XXXXXXX
ACTIVATION DATE OF TRUNK	TYPE OF DATE (CH-72) eg C = CONTINGENT ACTIVATION	ACTIVE R -DATE X
	DATE (CH-18)	YYNNN
INDICATES AGENCY RESPONSIBLE FOR DATA ENTRY AND WHETHER DATA IS ADDITION OR CHANGE (CH-57)		T CHG I DATE- X
	DATE (CH-18)	YYNNN
INDICATES CLASSIFICATION OF TRUNK (CH-13) eg U = UNCLASSIFIED		C L X
		HEADER NUMBER X XX

TYPE OPERATION eg G = FULL DUPLEX - DIRECTIONS 1 AND 2 NONMIRROR IMAGE (CH-73)	TYP OPS
REASON FOR DELAYED ACTIVATION (CH-20) eg H = TRUNK AWAITING TESTING	RSN DLY ACT
TRUNK ACTIVATED WITH EXCEPTION (CH-2) eg C = ACTIVATED UNDER MARGINAL COND	EXC TKT
FROM STATION, MULTIPLEX EQUIPMENT ON TRUNK (CH-70) eg T10 = AN/FGC-19	FRM TKT EQP
TO STATION, MULTIPLEX EQUIPMENT ON TRUNK (CH-70) eg T29 = TELESIG 2150	TO TKT EQP

ROUTE NO.	FROM/TO	LINK NO.
J27080	FUCHU/ITAZUKE	D1014, M1017, M1018, M1215, T1216, T1217
J27081	ITAZUKE/FUCHU	

eg

NUMBER ASSIGNED TO A TRUNK TO INDICATE DIRECTION, PATH AND MEDIA TRAVERSED (CH-45). ALL TRUNKS ON SAME PATH HAVE SAME NUMBER. REVERSE DIRECTION TRUNKS HAVE DIFFERENT NUMBER.	ROUTE NUMBER
NOT USED (CH-16)	CRG/ -CKT-
TELECOMMUNICATIONS SERVICE ORDER ACTIVATING TASK (CH-55)	TSO -NUMBER-
DATE OF TRUNK ACTIVATION (CH-18)	ORIG DATE-
	HEADER LINE

(TRAILER RECORD)
IDENTIFIES EACH
END OF EACH LINK
IN TRUNK
(ONE RECORD PER END)

GEOGRAPHIC LOCATION (CH-33) OF ONE END OF LINK — TRAILER -TERMINAL LOCATION XXXXXXXX

FACILITY WHERE TRANSMISSION LINK TERMINATES (CH-23)
eg RRS = RADIO RELAY STATION — FAC XXX

STATE AND COUNTRY (CH-51) — SC XX

DCA AREA NUMBER OR LETTER (CH-19) eg 7 = FAR EAST — A X

TRUNK TRANSIT (CROSS-OFFICE) MODE (CH-71) eg B = BASEBAND FREQ., Ø = VOICE FREQ. — T X

TRANSMISSION MEDIA OF LINK — (CH-58) eg SAH = INTELSAT IV F3, MWØ = MICROWAVE — XMN MED XXX

LINK (MEDIA) IDENTIFICATION
LINK NUMBER (CH-32)
TYPE LINK eg Q = SUBMARINE CABLE — -LINK- T X
NUMBER — -NR- XXXX
IDENTIFES CONTROL OFFICE FOR LINK (CH-31) — C X

SYSTEM DIVISION IDENTIFIES MASTERGROUP, SUPERGROUP AND GROUP NUMBER ASSIGNED TO TRUNK TRAVERSING LINK (CH-53)
MASTERGROUP NUMBER — SYDIV M X
SUPERGROUP NUMBER — S X
GROUP NUMBER — G X

TRUNK X-REP- XXXXXX

COMCL SERVICE ID/CSIF
COMP PRE TSVC NUMBER SUP
XXXX XXX XXXX XXXXXX XXX

TRAILER
I NR
X XX

THIS CHANNEL NUMBER ASSIGNED TO THIS CIRCUIT →	CHANNEL NUMBER (CH-6)	CHNL NR-T: XXXX
	CHANNEL TYPE (CH-7)	
CIRCUIT (CCSD) ASSIGNED TO THIS CHANNEL	USING AGENCY - PURPOSE/USE - TYPE SERVICE (CH-14)	CCSD OPUSCKNR: XXXXXXX
	CIRCUIT NUMBER	
CIRCUIT SERVICE AVAILABILITY (CH-49) eg A = FULL PERIOD		I,S C A S: X X
CIRCUIT SET (CH-11) DIFFERENTIATES BETWEEN PRESENT AND FUTURE CONFIGURATION		
CIRCUIT RESTORATION PRIORITY (CH-43) eg 2C, 1E		RP NR: XX
		RECD I NR: X XX
TYPE OPERATION (CH-73) eg F = FULL DUPLEX CIRCUIT		T O: X
CIRCUIT MODULATION RATE (CH-9) eg AP = 1200.0 BAUD, CF = 28 CHANNELS		CK MD: XX
INDICATES WHETHER FROM LOCATION IS CIRCUIT CONTROL OFFICE (CH-8)		C O: X
FROM GEOGRAPHIC LOCATION (CH-33) OF END OF CIRCUIT SEGMENT		USER CKT LOCATION: XXXXXXX
CIRCUIT SEGMENT TERMINATING FACILITY (CH-23) (WHERE CIRCUIT IS AT AUDIO OR DC LEVEL)		TERM FAC: XXX
STATE AND COUNTRY (CH-51)		SC: XX
TO GEOGRAPHIC LOCATION (CH-33) OF END OF CIRCUIT SEGMENT		USER CKT LOCATION: XXXXXXX
CIRCUIT SEGMENT TERMINATING FACILITY (CH-23)		TERM FAC: XXX
STATE AND COUNTRY (CH-51)		SC: XX
CIRCUIT ACTIVATION DATE	TYPE OF DATE (CH-72) eg A = ACTIVATION	A I-DATE: X
	DATE (CH-18)	YYNNN
TRUNK CROSS REFERENCE NUMBER (CH-62) ONLY USED WHEN CIRCUIT IS ITSELF A TRUNK eg VFCT		TRUNK X-REF-: XXXXX
		CH ASSI L I: X X

APPENDIX VI

STATION MAKE-UP COMPILATION

VAIHINGEN, GERMANY

STATION - VAIHINGN VFN

FROM-BOEBLNGN MCF

TO-VAIHINGN MCF

TRUNK-44UP48

ACTIVE DATE - 77119

CHAN	CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
001 V	*SPARE CHANNEL										
002 V	*SPARE CHANNEL										
003 V	*SPARE CHANNEL										

CAPACITY - 003V CROSS REFERENCE -

FROM-CROUGHTN TCF

TO-VAIHINGN TCG

TRUNK-34CX06

ACTIVE DATE - 76088

CHAN	CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
001 T	UOOAWDMK	A	B	1A	F	AG		CROUGHTN	TCF	VAIHINGN	TCG
002 T	NCIL25EC	A	E	2A	F	AF		CROUGHTN	MSU	BRUSSELS	CCT
003 T	CCCWWCJK	A	B	3A	R	AH		KILLNGDN	SCA	VAIHINGN	DAC
004 T	CCCWWCJL	A	B	3A	R	AH		MTLSHMHT	TCF	VAIHINGN	DAC
005 T	NCNA1196	A	F	1C	F	AF		**FT MEADE	CCP	VAIHINGN	SSC
005 T	NCNA1196	A	E	1C	F	AF		FT MEADE	CCP	VAIHINGN	SSC
006 T	JQCAWOC9	A	H	3C	N	AG		CROUGHTN	WRC	AVIANO	BWS
007 T	CCCA9GNZ	A	E	1A	F	AF		CROUGHTN	MSU	VAIHINGN	DAC
008 T	HCSAB094	A	A	1C	F	AH		CROUGHTN	RRF	VAIHINGN	DTS
009 T	JQCAW8C0	A	T	3A	N	AG		CROUGHTN	WRC	SCHBSCHL	BWS
010 T	CCCAWAHU	A	K	1A	N	AH		CROUGHTN	DCR	VAIHINGN	DAC
011 T	TQNAWESC	A	D	1C	F	AH		CROUGHTN	RRF	SHAPE	RRF
012 T	CCCAF520	A	A	1A	F	AG		LAJES	STE	VAIHINGN	DAC
013 T	NCNA1J28	A	A	2A	F	AF		CHCKSNDS	CCC	VAIHINGN	SSC
014 T	CGAA2010	A	C	1D	F	AD		FTRITCHI	ZXZ	SHAPE	JCC
015 T	IZAAC294	A	D	3A	F	AC		DAKHANGR	STE	VAIHINGN	DAC
016 T	REUAWA5T	C	C	1D	F	AG		LNDTMNDL	JTF	VAIHINGN	CCT
016 T	NCIL25EQ	A	E	3A	F	AF		CROUGHTN	MSU	MCHRINGN	AYA

**FUTURE ACTIVATION

CAPACITY - 016T CROSS REFERENCE - DTXX6D02

FROM-CROUGHTN TCF

TO-VAIHINGN TCG

TRUNK-34MC05

ACTIVE DATE - 771C5

CHAN	CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
0A0 T	RCYE9HBT	A	M	1C	F	AP		CROUGHTN	MSU	VAIHINGN	DPC
0B0 T	RCYE9HPP	A	A	1C	F	AR		**CROUGHTN	MSU	VAIHINGN	CCC
0C0 T	*SPARE CHANNEL										
0D0 T	*SPARE CHANNEL										
0E0 T	*SPARE CHANNEL										
0F0 T	*SPARE CHANNEL										
0G0 T	*SPARE CHANNEL										
0H0 T	*SPARE CHANNEL										

**FUTURE ACTIVATION

CAPACITY - 008T CROSS REFERENCE - DTYX6E19

FROM-DNNRSBRG TCL

TO-VAIHINGN TCG

TRUNK-44UZA1

ACTIVE DATE - 69176

CHAN	CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
001 V	DCAVWBVN	A	H	CC	F	HA		SEMBACH	DEC	VAIHINGN	SWB
002 V	REUVC740	C	K	1D	F	HA		BERLIN	SVS	VAIHINGN	SVS
002 V	REUVW066	A	G	3A	F	HA		BERLIN	SWC	VAIHINGN	SWC
003 V	TQNVWGHL	C	A	1D	F	HA		**LNDTMNDL	TLC	VAIHINGN	CGC
004 V	REUV9R76	C	L	1D	G	HA		VAIHINGN	CCC	UNDTMNDL	JTF
004 V	JCWVWHAN	A	A	CC	F	HA		**TORREJCN	CCP	RAMSTEIN	CPA
005 V	UKKN9DCZ	A	I	1D	F	DC		DNNRSBRG	SCA	SCHBSCGM	AGP
006 V	CTXX6E25	A	S	1D	F	CD	44UX4C	PIRMASNS	TCG	VAIHINGN	TCG
007 V	CVPR21FU	A	B	1B	M	HA		WASHNGTN	CBA	VAIHINGN	SWC
008 V	UUCN9DCT	A	M	1G	F	DC		DNNRSBRG	SCA	VAIHINGN	SVS
009 V	RCYVCY58	A	D	3A	F	HA		SHAPE	DTE	VAIHINGN	DTE
010 V	REUVC014	A	H	3A	M	HA		TEHERAN	ACB	VAIHINGN	SWC
011 V	REUVWA58	C	H	2C	F	HA		LNDTMNDL	JTF	VAIHINGN	SVS
011 V	REUVWA5B	C	H	2C	G	HA		VAIHINGN	SVS	UNDTMNDL	JTF
011 V	REUVWBY7	C	C	1D	F	HA		LNDTMNDL	JTF	VAIHINGN	SVS
011 V	RCYVWE8E	A	C	CC	F	HA		CHIEVERS	SBU	VAIHINGN	SBU
012 V	UUEB9DCW	A	I	CC	F	HA		DNNRSBRG	SCA	VAIHINGN	SWB
012 V	REUVWA6B	C	H	1D	F	HA		LNDTMNDL	JTF	VAIHINGN	CCC

**FUTURE ACTIVATION

CAPACITY - 012V CROSS REFERENCE -

FROM-DNARSBRG TCL

TO-VAIHINGEN TCG

TRUNK-44UZA2

ACTIVE DATE - 69176

CHAN		CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
001	V	UUEVC232	C	D	CC	F	HA		PIRMASNS	TIP	VAIHINGN	SWB
001	V	UUEVWFC3	A	I	CC	F	HA		HALMHLDR	SBU	STUTTGRT	SBU
002	V	NCIC2593	A	E	2A	F	AT		LINDSEY	CIN	VAIHINGN	CEU
003	V	UUEN9DGW	A	H	CC	F	DC		DNARSBRG	SCA	VAIHINGN	SVS
004	V	UUEE9GKM	A	U	CC	F	AP		COLTANC	MSU	NELLINGN	DPC
005	V	UUEVWADE	A	C	CC	F	HA		PIRMASNS	TCG	VAIHINGN	SWB
006	V	CTXX6E26	A	S	1C	F	CD	54FXC1	NAPLES	DFC	VAIHINGN	TCG
007	V	CCCCFO59	A	A	1A	F	AP		LAKEHRST	SYT	VAIHINGN	DAC
008	V	RCYVW291	A	D	3A	F	HA		HRLSSELS	SWB	VAIHINGN	SWC
009	V	CCJE2443	A	E	1C	F	AR		FELDBERG	SCA	VAIHINGN	JCC
010	V	CUEVW540	A	G	CC	F	HA		SHAPE	SBU	VAIHINGN	SBU
010	V	CVPV21FS	C	B	3A	F	HA		PIRMASNS	NCA	VAIHINGN	SWC
011	V	RCYVW111	A	C	3A	F	HA		RAMSTEIN	SWB	VAIHINGN	TBD
012	V	TLRVW821	A	E	3A	F	HA		SHAPE	SBU	VAIHINGN	SBU

CAPACITY - 012V CROSS REFERENCE -

FROM-DNARSBRG TCL

TO-VAIHINGEN TCG

TRUNK-44UZA3

ACTIVE DATE - 69344

CHAN		CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
001	V	*SPARE CHANNEL										
002	V	TLRVW531	A	N	1D	F	HA		SHAPE	JCC	VAIHINGN	CDC
003	V	REUVWA65	C	D	2C	F	HA		LNDTMNDL	JTF	VAIHINGN	SVS
004	V	JOOVCL24	A	A	1A	F	HA		DNARSBRG	TCL	VAIHINGN	TCG
005	V	RCYVW692	A	E	2C	F	HA		**CHIEVERS	SBU	VAIHINGN	SWB
006	V	UUEN9DGU	A	K	2C	F	DC		DNARSBRG	SCA	VAIHINGN	SVS
007	V	UUEE9ARU	A	F	CC	F	HA		LANGRKPF	SCA	VAIHINGN	SWB
008	V	CCCCWCVG	A	C	1A	F	AL		LANDSTHL	SYT	VAIHINGN	DAC
009	V	UUEE9BCG	A	I	CC	F	HA		LANGRKPF	SCA	VAIHINGN	SWC

CHAN	CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
010 V	RCYB9DPF	A	F	CC	F	HA		DNNRSBRG	SCA	VAIHINGN	EAC
011 V	JUBVWDM7	A	H	CC	F	HA		LINDSEY	SWB	STUTTGRT	SWB
012 V	REUVWA68	C	C	1D	F	HA		LNDTMNDL	JTF	VAIHINGN	CCC

**FUTURE ACTIVATION

CAPACITY - 012V CROSS REFERENCE -

FROM-DNNRSBRG TCL

TO-VAIHINGN TCG

TRUNK-44UZA5

FUTURE DELETE DATE - 77207

CHAN	CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
001 V	*RESVD CHANNEL										
002 V	UUEB9RCH	A	I	CC	F	HA		LANGRKPF	SCA	VAIHINGN	SWC
003 V	UUEB9AXB	A	F	CC	F	HA		LANGRKPF	SCA	VAIHINGN	SWB
004 V	UUEB9ARW	A	F	3A	F	HA		LANGRKPF	SCA	VAIHINGN	SWB
005 V	UUEB9ARX	A	F	CC	F	HA		LANGRKPF	SCA	VAIHINGN	SWB
006 V	*RESVD CHANNEL										
007 V	UUEB9ARY	A	F	CC	F	HA		LANGRKPF	SCA	VAIHINGN	SWB
008 V	UUEB9ARZ	A	G	CC	F	HA		LANGRKPF	SCA	VAIHINGN	SWB
009 V	UUEB9ASA	A	G	CC	F	HA		LANGRKPF	SCA	VAIHINGN	SWB
010 V	UUEB9ASB	A	G	CC	F	HA		LANGRKPF	SCA	VAIHINGN	SWB
011 V	RCYVW250	A	I	2C	F	HA		RAMSTEIN	CCC	VAIHINGN	CCC
012 V	RUBVW256	A	I	3A	F	HA		RAMSTEIN	SWB	VAIHINGN	SWC

CAPACITY - 012V CROSS REFERENCE -

FROM-DNNRSBRG TCL

TO-VAIHINGN TCG

TRUNK-44UZF1

ACTIVE DATE - 73102

CHAN	CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
001 V	UUMB9BCP	A	E	CC	F	HA		DNNRSBRG	SCA	VAIHINGN	CEU
002 V	RCYB9BCQ	A	I	1D	F	HA		DNNRSBRG	SCA	VAIHINGN	CCC
003 V	RCYVW116	A	G	1D	F	HA		RAMSTEIN	CPA	VAIHINGN	SWC
004 V	UUEB9BCS	A	G	3A	F	HA		DNNRSBRG	SCA	VAIHINGN	SWB
005 V	*SPARE CHANNEL										
006 V	UUEB9CZK	A	H	CC	F	HA		LANGRKPF	SCA	VAIHINGN	SWC

CHAN	CCSD	SA	CS	RP	OP	MR	VECT	FR-STA	ENR	TO-STA	ENR
007 V	UUEN9DCV	A	G	CC	F	DC		DNNRSBRG	SCA	VAIHINGN	SVS
008 V	UUEE9BCW	A	G	3A	F	HA		DNNRSBRG	SCA	VAIHINGN	SWB
009 V	UUEE9BCX	A	G	CC	F	HA		DNNRSBRG	SCA	VAIHINGN	SWB
010 V	UUEE9BCY	A	G	CC	F	HA		DNNRSBRG	SCA	VAIHINGN	SWB
011 V	UUEE9BCZ	A	F	CC	F	HA		DNNRSBRG	SCA	VAIHINGN	SWB
012 V	UUEE9BCA	A	G	CC	F	HA		DNNRSBRG	SCA	VAIHINGN	SWB

CAPACITY - 012V CROSS REFERENCE -

FROM-FELDBERG TCF

TO-VAIHINGEN TCG

TRUNK-44CZF1

ACTIVE DATE - 73102

CHAN	CCSD	SA	CS	RP	OP	MR	VECT	FR-STA	ENR	TO-STA	ENR
001 V	*SPARE CHANNEL										
002 V	RCYVCG31	A	C	1D	M	HA		**HLMOSA	TCF	VAIHINGN	CCC
002 V	RCYVCG31	A	B	1D	M	HA		HLMOSA	TCF	VAIHINGN	CCC
003 V	CTXX6F41	A	A	1C	F	CD	44CX16	HAHN	RRS	VAIHINGN	TCG
004 V	RUEVW538	A	E	CC	F	HA		SHAPE	SBL	VAIHINGN	SBU
004 V	RCYVW698	C	G	1D	F	HA		**CHIEVERS	CCB	VAIHINGN	CCC
004 V	RCYVW698	C	F	1D	F	HA		**CHIEVERS	CCC	VAIHINGN	CCC
005 V	JUEVF276	A	A	CC	F	HA		PENTAGON	SWB	VAIHINGN	SWC
006 V	CCJV23E8	A	B	1C	F	HA		SHAPE	CCA	VAIHINGN	CCC
007 V	RCYCCG59	A	D	1D	M	HA		**HLMOSA	TCF	VAIHINGN	CEU
007 V	RCYCCG59	A	C	1D	M	HA		HLMOSA	TCF	VAIHINGN	CEU
008 V	CCAB9DCQ	A	G	CC	M	HA		FELDBERG	SCA	VAIHINGN	DCW
008 V	CCAB9DCQ	A	F	CC	M	HA		**FELDBERG	SCA	VAIHINGN	DCW
009 V	CCJV23E9	A	B	1C	F	HA		SHAPE	CPA	VAIHINGN	CCC
010 V	CTYX6E19	A	A	1G	F	DG	34MCC5	**CROUGHTN	TCF	VAIHINGN	TCG
010 V	RCYE9HBT	C	B	1G	F	AP		COLTANC	PSL	VAIHINGN	DPC
011 V	RCYE9CPP	A	F	CC	F	HA		FELDBERG	SCA	VAIHINGN	EAC
012 V	RUEVW532	A	E	3A	F	HA		SHAPE	SWB	VAIHINGN	SWC

**FUTURE ACTIVATION

CAPACITY - 012V CROSS REFERENCE -

FROM-FTCETRCK TCG

TO-VAIHINGEN TCG

TRUNK-14UJ04

ACTIVE DATE - 75211

CHAN		CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
0A0	T	CDCAA895	A	B	1A	M	AH		FTDETRCK	TCG	VAIHINGN	TCG
0B0	T	*SPARE CHANNEL										
0C0	T	NCIA2572	A	C	1C	F	AF		PENTAGCN	IIC	VAIHINGN	CEU
0D0	T	CCCAA035	A	A	1A	F	AG		CLARK	SYT	VAIHINGN	DAC
0E0	T	NCNA1197	A	F	2A	R	AF		**FT MEADE	CCP	VAIHINGN	SSC
0F0	T	NCNA1197	A	G	2A	R	AF		FT MEADE	CCP	VAIHINGN	SSC
0F0	T	*SPARE CHANNEL										
0G0	T	JUMAF366	A	C	3A	F	AC		ST LOUIS	DMA	KASTEL	DMA
0H0	T	NCNA1M47	A	B	2A	R	AF		**FT MEADE	CCC	RAMSTEIN	CCC
0H0	T	NCNA1M47	A	A	2A	R	AF		FT MEADE	CCC	RAMSTEIN	CCC
0I0	T	CCMA2604	A	E	1C	P	AF		FTRITCHI	JEM	NAPLES	BCR
0J0	T	CCCAF769	A	B	1A	M	AH		NORFOLK	SAT	VAIHINGN	DAC
0J0	T	CCCAF769	A	C	1A	M	AH		**NORFOLK	SAT	VAIHINGN	DAC
0K0	T	JEAAA470	A	D	3A	F	AF		KELLY	CCC	VAIHINGN	SSC
0L0	T	CCCAA1C2	A	C	1A	F	AG		**FT MEADE	TCP	VAIHINGN	DAC
0L0	T	CCCAA102	A	B	1A	F	AG		FT MEADE	TCP	VAIHINGN	DAC
0M0	T	*SPARE CHANNEL										
0N0	T	CKXA29C0	F	A	1C	M	AH		PENTAGCN	ZAZ	AFLCAT	CCT
0N0	T	CKXA29C0	G	A	1C	M	AH		PENTAGCN	ZAZ	AFLCAT	CCT
0C0	T	JYMAA191	A	C	1C	V	AH		CHYANNTN	TCP	VAIHINGN	CEU

**FUTURE ACTIVATION

CAPACITY - 015T

CROSS REFERENCE - DTLX6A1F

FROM-HAHN RRS

TO-VAIHINGN TCG

TRUNK-44CX16

ACTIVE DATE - 76183

CHAN		CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
001	T	NCNA1124	A	F	1C	F	AF		HAHN	CPV	CHCKSNDS	CCF
002	T	NCNA1J19	A	C	2A	F	AH		**HAHN	CCF	FT MEADE	CCF
002	T	NCNA1J19	A	B	2A	F	AH		HAHN	CCF	FT MEADE	CCF
003	T	*SPARE CHANNEL										
004	T	NCNA1J18	A	C	2A	F	AH		HAHN	AFT	RAMSTEIN	CCC
005	T	*SPARE CHANNEL										
006	T	NCNA1J23	A	A	2A	F	AF		HAHN	CCC	BCERFIAK	CCC
007	T	*SPARE CHANNEL										
008	T	*SPARE CHANNEL										
009	T	*SPARE CHANNEL										
010	T	*SPARE CHANNEL										
011	T	*SPARE CHANNEL										
012	T	*SPARE CHANNEL										
013	T	*SPARE CHANNEL										

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  CHAN      CCSD    SA CS RP OP MR    VFCT    FM-STA  ENR  TO-STA  ENR

  014 T   *SPARE CHANNEL
  015 T   *SPARE CHANNEL
  016 T   *SPARE CHANNEL

**FUTURE ACTIVATION

CAPACITY - 016T                              CROSS REFERENCE - DTXX6F41

FROM-HEIDLBRG TCG

TO-VAIHINGN TCG

TRUNK-44UMJG

        ACTIVE          DATE - 75243

  CHAN      CCSD    SA CS RP OP MR    VFCT    FM-STA  ENR  TO-STA  ENR

  001 V   UUEVC636   A  D CC  F HA            HEIDLBRG DTE VAIHINGN DTE
  002 V   DTXX6D15   A  T CC  F CD   44UX31   HEIDLBRG TCG VAIHINGN TCG
  003 V   DTXX6E11   A  T 1C  F CD   44UX16   HEIDLBRG TCG VAIHINGN TCG
  004 V   UUEVWCWT   A  C CC  F HA            HEIDLBRG SBU VAIHINGN SBU
  005 V   RCYVW376   A  B 1D  F HA            HEIDLBRG SWB VAIHINGN SWC
  006 V   UUEVC643   A  C CC  F HA            HEIDLBRG DTE VAIHINGN DTE
  007 V   UUEVC644   A  C CC  F HA            HEIDLBRG DTE VAIHINGN DTE
  008 V   UUEVC645   A  D CC  F HA            HEIDLBRG DTE VAIHINGN DTE
  009 V   UUEVC646   A  E CC  F HA            HEIDLBRG DTE VAIHINGN DTE
  010 V   UUEVC647   A  C CC  F HA            HEIDLBRG DTE VAIHINGN DTE
  011 V   UUEVC648   A  C CC  F HA            HEIDLBRG DTE VAIHINGN DTE
  012 V   UUEVC649   A  C CC  F HA            HEIDLBRG DTE VAIHINGN DTE
  013 V   UUEVC650   A  C CC  F HA            HEIDLBRG DTE VAIHINGN DTE
  014 V   UUEVC651   A  C CC  F HA            HEIDLBRG DTE VAIHINGN DTE
  015 V   DTYX6J75   A  A CC  F DG   14UCC3   FTRITCHI FWM VAIHINGN WWN
  016 V   NDIC2594   A  E 2A  F AT            HEIDLBRG HSA VAIHINGN CEU
  017 V   RUEVW245   A  D 3A  F HA            HEIDLBRG SWB VAIHINGN SWC
  018 V   *SPARE CHANNEL
  019 V   NDIC2599   A  A 2A  F BB         **SHAPE    SPJ VAIHINGN CEU
  020 V   UKKCWGS7   A  A CC  F AR         **HEIDLBRG CMC MCHRINGN EAC
  021 V   *SPARE CHANNEL
  022 V   *SPARE CHANNEL
  023 V   UOOVWF35   A  A 1A  F HA            HEIDLBRG TCG VAIHINGN TCG
  024 V   FCWCWFC5   A  A CC  F AT            HEIDLBRG CCG VAIHINGN CCG

**FUTURE ACTIVATION

CAPACITY - 024V                              CROSS REFERENCE -

FROM-FTRITCHI WWM
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TO-VAIHINGN WWN

TRUNK-14UC03

ACTIVE DATE - 77126

CHAN	CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
080 T	CWCD24HJ	C	A	2A	F	DC		FTRITCHI	WWW	VAIHINGN	WWW
0B0 T	CDJD24HK	G	A	2A	F	DC		FTRITCHI	WWW	VAIHINGN	WWW
0C0 T	CWCD24HL	C	A	2A	F	DF		**FTRITCHI	WWW	VAIHINGN	WWW
0D0 T	CWCD24HL	C	A	2A	F	DE		**FTRITCHI	WWW	VAIHINGN	WWW

**FUTURE ACTIVATION

CAPACITY - 004T CROSS REFERENCE - DTYX6J75

FROM-HEIDLBRG TCG

TO-VAIHINGN TCG

TRUNK-44UX16

ACTIVE DATE - 76C08

CHAN	CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
001 T	*SPARE CHANNEL										
002 T	DDDWWCS7	A	B	3A	R	AH		DNNRSBRG	SCA	VAIHINGN	DAC
003 T	CKXA29C0	F	A	1C	M	AH		AFLOAT	CCT	PENTAGCN	ZAZ
004 T	NDNA1J29	A	A	2A	F	AH		MARINFLD	CCC	BCERFINK	CCC
005 T	DDDAWAHR	A	E	1A	M	AG		RHEINMAN	CMC	VAIHINGN	DAC
006 T	JUMAWGZF	A	A	3A	F	AG		TEMPELHF	CBA	BCERFINK	CBA
007 T	*SPARE CHANNEL										
008 T	*SPARE CHANNEL										
009 T	NDNA1N62	A	A	2A	F	AF		HEIDLBRG	CCC	VAIHINGN	CCC
010 T	DDDAWA8E	A	G	1A	M	AG		COLTANC	TC1	VAIHINGN	DAC
011 T	UKKAWF62	A	A	CC	F	AH		KARLSRLH	SCC	VAIHINGN	CCA
012 T	DDDWWCJR	A	A	3A	R	AH		SCHONFLD	SCA	VAIHINGN	DAC
013 T	*SPARE CHANNEL										
014 T	*SPARE CHANNEL										
015 T	CKXA29C0	F	A	1C	M	AH		AFLOAT	CCT	PENTAGCN	ZAZ
016 T	CKXA29C0	F	A	1C	M	AH		AFLOAT	CCT	PENTAGCN	ZAZ

CAPACITY - 016T CROSS REFERENCE - DTXX6E11

FROM-HEIDLBRG TCG

TO-VAIHINGN TCG

TRUNK-44UX31

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PAGE 009                    STATION MAKEUP                    77173  S-8

        ACTIVE          DATE - 76CCF

  CHAN      CCSD    SA CS RP OP MR   VFC1     FM-STA    ENR  TC-STA   ENR

  001 T  UDCAWCMJ   A  B CC  F AG              HEIDLBRG  TCG  VAIHINGN RRS
  002 T  CCCAA391   C  D 1A  M AF              FTRITCHI  ERS  CHYNNMTN DAC
  002 T  CCCAA391   A  L 1A  M AF              ARLINGTN  DCA  WHEELER   DAC
  002 T  CCCAA391   A  M 1A  M AF            **ARLINGTN  DCA  WHEELER   DAC
  003 T  *SPARE CHANNEL
  004 T  CCCAWERG   A  B 1A  F AH              BERLIN    TCG  VAIHINGN DAC
  004 T  CCCAWERG   A  C 1A  F AH            **BERLIN    TCG  VAIHINGN DAC
  005 T  JCWAW527   A  D CC  F AD              KINDSBCH  CCT  SHAPE     CCT
  006 T  CCCAWACB   A  I 1A  M AG              DIYARBKR  TCF  VAIHINGN DAC
  007 T  *SPARE CHANNEL
  008 T  *SPARE CHANNEL
  009 T  *SPARE CHANNEL
  010 T  *SPARE CHANNEL
  011 T  *SPARE CHANNEL
  012 T  RCYACF18   A  K 3A  M AG            **BOERFINK  CCC  LONDCN    SSC
  012 T  RCYACF18   A  J 3A  M AG              RAMSTEIN  CCC  LONDCN    SSC
  013 T  CCCAWG6V   A  A 1A  F AH            **HARROGAT  SYT  VAIHINGN DAC
  014 T  CCCAWG78   A  A 1A  F AH            **CROUGHTN  SYT  VAIHINGN DAC
  015 T  CCCAWA8D   A  E 1A  M AG              WORMS     CCC  FRANKFRT TCG
  016 T  *SPARE CHANNEL

**FUTURE ACTIVATION

CAPACITY - 016T                          CROSS REFERENCE - DTXX6D15

FROM-HILLNGDN TCF

TC-VAIHINGN TCG

TRUNK-34CZA1

        ACTIVE          DATE - 771C9

  CHAN      CCSD    SA CS RP OP MR   VFC1     FM-STA    ENR  TC-STA   ENR

  001 V  RCYVWEKM   A  D 3A  F HA              MILDNHLL  RSA  VAIHINGN RCC
  002 V  CVPV21FG   A  A 1C  F HA            **LONDCN    SWB  VAIHINGN SWB
  002 V  JOCVWEUR   A  C 1A  F HA              HILLNGDN  TTB  VAIHINGN TTB
  003 V  NCIC2590   A  B 1D  F AT              LONDCN    CLE  VAIHINGN CEU
  004 V  JCMVC674   A  H 3A  F HA              MILDNHLL  CPA  RAMSTEIN MTC
  005 V  *SPARE CHANNEL
  006 V  CTXX6E94   A  N 1C  F CD  34FXC1      LONDCN    BFC  VAIHINGN TCG
  007 V  UCOVWF2B   A  B 1A  F HA              LONDCN    BBX  VAIHINGN ATE
  007 V  REUVWA5S   C  D 2C  F HA              LNDTMNDL  JTF  VAIHINGN SVS
  008 V  CUEV27C3   F  E 1C  F HA              PENTAGCN  TBD  VAIHINGN SWB
  009 V  CTPX6D32   A  D CC  F CV  34UI13      ALCONBRY  EPC  MUNCHWLR EPC
  010 V  REUVWA5V   C  B 1D  F HA              LNDTMNDL  JTF  VAIHINGN CCC
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PAGE 010                    STATION MAKEUP                    77173  S-8

  CHAN      CCSD    SA CS RP OP MR    VECT    FM-STA  ENR  TO-STA  ENR

  011 V  NDNC1R13   A  F 1C  F BC          CHCKSNDS CCF GABLINGN CCM
  012 V  RCYVC458   A  G 1C  F HA          MILDNHLL CCC VAIHINGN CCC

**FUTURE ACTIVATION

CAPACITY - 012V                           CROSS REFERENCE -

FROM-ALCONBRY EPC

TO-MUNCHWLR EPC

TRUNK-34UI13

        ACTIVE          DATE - 76315

  CHAN      CCSD    SA CS RP OP MR    VECT    FM-STA  ENR  TO-STA  ENR

  001 V  UZNVM755   A  F CC  F HA          ALCONBRY SWB MUNCHWLR SWB
  002 V  UZNAWBYA   A  B CC  F AC          ALCONBRY SWB MUNCHWLR SWB

CAPACITY - 002V                           CROSS REFERENCE - DTFX6D32

FROM-HOHNSTDT RRS

TO-VAIHINGN TCG

TRUNK-44UM29

        ACTIVE          DATE - 73273

  CHAN      CCSD    SA CS RP OP MR    VECT    FM-STA  ENR  TO-STA  ENR

  001 V  UUBVWA2N   A  E CC  F HA          HOHNSTDT RRS STUTTGRT SBU
  002 V  UZGVWDA5   A  V CC  M HA          MANNHEIM TST NUERNBRG TST
  003 V  RCYRM235   A  A 1D  M AC          MTPARNIS RRC VAIHINGN CCC
  004 V  RCYRM236   A  B 1D  M AC          MTPARNIS RRC VAIHINGN CCC
  005 V  RCYRM431   A  G 1C  M AC          MTPARNIS RRC VAIHINGN CCC
  006 V  RCYRM432   A  H 1C  M AC          MTPARNIS RRC VAIHINGN CCC
  007 V  EDDVM234   A  D 1A  M HA          MTPARNIS RRC VAIHINGN CCC
  008 V  EDCVWG6S   A  A 1A  F HA        **HOHNSTDT RRS VAIHINGN TCG
  009 V  UUEE9BCB   A  H CC  F HA          DNNRSBRG SCA VAIHINGN SWB
  010 V  EUEE9BCC   A  G CC  F HA          DNNRSBRG SCA VAIHINGN SWB
  011 V  UUEE9BCD   A  H CC  F HA          DNNRSBRG SCA VAIHINGN SWB
  012 V  UUEE9CWC   A  G CC  F HA          LANGRKPF SCA VAIHINGN SWB

**FUTURE ACTIVATION

CAPACITY - 012V                           CROSS REFERENCE -
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PAGE 011                    STATION LABELS                    77173  5-6

FROM-KONCSTHL TCG

TO-VAIHINGN TCG

TRUNK-44UZF5

        ACTIVE          DATE - 75136

  CHAN      CCSC    SA CS RP OP MR    VFCT    FR-STA  ENR  TO-STA  ENR

  001 V  UKKVWFRU   A  D CC  F HA             KARLSRUH SCC VAIHINGN AGU
  002 V  UUEB9BCJ   A  F CC  F HA             LANGRKPF SCA VAIHINGN SWC
  003 V  UUEVW780   A  F CC  F HA             WORMS    SBL VAIHINGN SBU
  004 V  DTPX6D32   A  D CC  F CV   43UI13    MUNCHWLR EPC ALCONBRY EPC
  005 V  *UNUEQPT
  006 V  *UNUEQPT
  007 V  *UNUEQPT
  008 V  *UNUEQPT
  009 V  *UNUEQPT
  010 V  *SPARE CHANNEL
  011 V  UCMVWG6B   E  A CC  F HA          **WORMS    CMC VAIHINGN SWB
  012 V  *RESVD CHANNEL

**FUTURE ACTIVATION

CAPACITY - 012V                          CROSS REFERENCE -

FROM-MUNCHWLR EPC

TO-ALCONBRY EPC

TRUNK-43UI13

        ACTIVE          DATE - 76315

  CHAN      CCSC    SA CS RP OP MR    VFCT    FR-STA  ENR  TO-STA  ENR

  001 V  UZNVM755   A  F CC  F HA             MUNCHWLR SWB ALCONBRY SWB
  002 V  UZNAWBYA   A  B CC  F AC             MUNCHWLR SWB ALCONBRY SWB

CAPACITY - 002V                          CROSS REFERENCE - DTPX6D32

FROM-LONDON   BFC

TO-VAIHINGN TCG

TRUNK-34FX01

        ACTIVE          DATE - 76091

  CHAN      CCSC    SA CS RP OP MR    VFCT    FR-STA  ENR  TO-STA  ENR
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FACE 012 STATION MAKEUP 77173 5-8

001	T	EECAEL50	A	A	1A	F	AC		LONDEN	BFC	VAIHINGN TCG
002	T	BWEAWC7K	A	B	3A	F	AG		EPISKOPI	ASW	AGNANC ASW
003	T	BOCAWE2B	A	B	1F	F	AH		LONDEN	BFC	NAPLES CAM
004	T	CKZA26C5	C	C	2C	P	AF		PENTAGCN	ZAZ	NAPLES BCR
004	T	CCMA26C5	A	F	2C	P	AF		FTRITCHI	JEM	NAPLES BCR
005	T	BUEAWGXB	C	B	1D	R	AD		LONDEN	BFC	NEAMAKRI BFC
005	T	BYEAWERT	A	A	CC	F	AH		LONDEN	BFC	NAPLES BFC
006	T	EYEAWERS	A	A	CC	F	AH		LONDEN	BFC	NAPLES BFC
007	T	RCYACF18	A	J	3A	M	AG		LONDEN	SSC	RAMSTEIN CCC
007	T	RCYACF18	A	K	3A	M	AG	**LONDEN	SSC	BOERFINK CCC
008	T	BUEAWG53	C	A	CC	F	AF	**LONDEN	BFC	NAPLES BFC
009	T	*SPARE CHANNEL									
010	T	CKXA29C0	C	A	1C	M	AH		AFLOAT	CCT	PENTAGCN ZAZ
010	T	CKXA29C0	F	A	1C	M	AH		AFLOAT	CCT	PENTAGCN ZAZ
011	T	BOCAWERU	A	A	CC	F	AH		LONDEN	BFC	NAPLES BFC
012	T	*SPARE CHANNEL									
013	T	EBEAF8C5	A	I	1D	F	AH		NORFOLK	CSS	NAPLES CUF
013	T	EBEAF8C5	C	C	1D	P	AH		NORFOLK	CSS	NAPLES CUF
014	T	BFCAWCEB	A	B	2C	F	AH		LONDEN	CCC	AFLOAT SHC
014	T	EZCAWCXA	C	A	1D	F	AH		LONDEN	BFC	NEAMAKRI BFC
015	T	JHEAAO22	A	A	CC	F	AH		STPTRSBG	RDV	LANGRKPF TCF
016	T	CVPA21FM	A	A	1B	F	AH	**MILDNHLL	AFA	VAIHINGN CEU
016	T	NCNA1N12	A	A	2A	F	AF		LONDEN	CCF	VAIHINGN CCF

**FUTURE ACTIVATION

CAPACITY - 016T

CROSS REFERENCE - DTXX6E94

FROM-NAPLES BFC

TO-VAIHINGN TCG

TRUNK-54FX01

ACTIVE DATE - 77042

CHAN		CCSD	SA	CS	RP	OP	MR	VECT	FM-STA	ENR	TO-STA	ENR
001	T	UOCAC686	A	B	1A	F	AG		NAPLES	BFC	VAIHINGN	TCG
002	T	BWEAWC7K	A	B	3A	F	AG		AGNANO	ASW	EPISKOPI	ASW
003	T	EBEAW7C1	A	C	3A	F	AC		NAPLES	CUF	SHAPE	SPE
004	T	REUAWA59	C	B	1D	F	AG		LNDTMNDL	JTF	VAIHINGN	CCT
004	T	BYEAWERS	A	A	CC	F	AH		NAPLES	BFC	LONDEN	BFC
005	T	BFCAWCEB	A	B	2C	F	AH		AFLOAT	SHC	LONDEN	CCC
006	T	BOCAWE2B	A	B	1F	F	AH		NAPLES	CAM	LONDEN	BFC
007	T	BCUAWCS6	A	I	3A	M	AD		SIMRORCH	CGL	AGNANO	CGG
008	T	EBEAF8C5	C	C	1D	P	AH		NORFOLK	CSS	NAPLES	CUF
008	T	EBEAF8C5	A	I	1D	F	AH		NAPLES	CUF	NORFOLK	CSS
009	T	REUAWA5C	C	A	1D	F	AG		LNDTMNDL	JTF	VAIHINGN	CCT
009	T	REUAWP1N	C	A	1D	F	AG		LNDTMNDL	JTF	VAIHINGN	CCT
009	T	BYEAWERT	A	A	CC	F	AH		NAPLES	BFC	LONDEN	BFC

PAGE 013 STATION MAKEUP 77173 S-8

CHAN	CCSC	SA	CS	RP	OP	MR	VECT	FM-STA	ENR	TC-STA	ENR
010 T	BUAAWG59	C	A	CC	R	AF		**NAPLES	BFC	LONDON	BFC
011 T	CKXA29CO	C	A	1C	M	AH		AFLOAT	CCT	PENTAGON	ZAZ
012 T	CKXA29CO	C	A	1C	M	AH		AFLOAT	CCT	PENTAGON	ZAZ
013 T	NCIL25NB	A	E	3A	F	AF		AGNANO	SPN	PIRMASNS	MSU
014 T	CKXA29CO	C	A	1C	M	AH		AFLOAT	CCT	PENTAGON	ZAZ
014 T	BOCAWERU	A	A	CC	F	AH		NAPLES	BFC	LONDON	BFC
015 T	CCCWWCJM	A	A	3A	R	AH		HUMOSA	SCA	VAIHINGN	DAC
016 T	EFOAC462	C	C	1C	F	AH		NAPLES	BFC	VAIHINGN	CCT

**FUTURE ACTIVATION

CAPACITY - 016T CROSS REFERENCE - DTXX6E26

FROM-PIRMASNS TCG

TO-VAIHINGN TCG

TRUNK-44UC01

ACTIVE DATE - 75239

CHAN	CCSC	SA	CS	RP	OP	MR	VECT	FM-STA	ENR	TC-STA	ENR
080 T	*SPARE CHANNEL										
080 T	NCIC2551	A	E	3A	F	AP		ARLINGTN	SPJ	VAIHINGN	SPJ
0C0 T	CTLX6N1F	A	F	1A	F	CN	14UJC4	FTDETROIT	TCG	VAIHINGN	TCG
0C0 T	RCYE9GWY	A	C	1C	F	AP		PIRMASNS	MSU	VAIHINGN	DPC

CAPACITY - 004T CROSS REFERENCE - DTYX6D81

FROM-PIRMASNS TCG

TO-VAIHINGN TCG

TRUNK-44UX05

ACTIVE DATE - 76CC8

CHAN	CCSC	SA	CS	RP	OP	MR	VECT	FM-STA	ENR	TC-STA	ENR
001 T	CCCAA7S5	A	D	3A	M	AF		**ARLINGTN	DCA	WHEELER	DAC
001 T	CCCAA7S5	A	B	3A	M	AF		ARLINGTN	DCA	WHEELER	DAC
001 T	CCCAA7S5	C	H	3A	M	AF		**FTRITCHI	DAC	WHEELER	DAC
001 T	CCCAA7S5	C	F	3A	M	AF		FTRITCHI	DAC	WHEELER	DAC
002 T	CCCWWCJX	A	A	3A	R	HA		COLTANC	SCA	VAIHINGN	DAC
003 T	CCCWWCJZ	A	B	3A	R	AH		MTPATERS	SCA	VAIHINGN	DAC
004 T	NCIL25JG	A	H	3A	F	AH		COLTANC	MSU	MCHRINGN	AYA
005 T	NCNA1U27	A	A	2A	F	AF		GABLINGN	CCG	VAIHINGN	SSC
006 T	BCUAWC96	A	I	3A	M	AD		AGNANO	CGG	SIMRCRCH	CGL

PAGE 014 STATION MAKEUP 77173 S-8

CHAN		CCSC	SA	CS	RP	OP	MR	VECT	FM-STA	ENR	TC-STA	ENR
007	T	NCNA1H18	A	C	2A	F	AF		VIENTHILL	CCC	GABLINGN	CCC
008	T	BUAAWG53	C	A	CC	F	AF		**NAPLES	BFC	LONDON	BFC
009	T	*SPARE CHANNEL										
010	T	NCNA1N20	A	B	2A	F	AF		ROTA	SGD	VAIHINGN	SSC
011	T	UKKE9GKV	A	J	1D	F	AH		COLTANC	MSU	MCHRINGN	DPC
011	T	UKKE9GKV	C	B	1D	F	AH		PIRMASNS	MSU	MCHRINGN	DPC
011	T	UKKE9GKV	C	A	1D	F	AF		CROUGHTN	MSU	MCHRINGN	DPC
012	T	NCIL25LL	A	A	2A	F	AF		PIRMASNS	MSU	SHAPE	SPE
013	T	NCIL25LM	A	B	2A	F	AF		PIRMASNS	MSU	VAIHINGN	CEU
014	T	NCNA1J19	A	C	2A	F	AH		**FT MEADE	CCF	HAHN	CCF
014	T	NCNA1J19	A	B	2A	F	AH		FT MEADE	CCF	HAHN	CCF
015	T	CCCAWAH1	A	F	1A	M	AG		NEAMAKRI	BFC	VAIHINGN	DAC
016	T	*SPARE CHANNEL										

**FUTURE ACTIVATION

CAPACITY - 016T

CROSS REFERENCE - DTXX6F48

FROM-PIRMASNS TCG

TO-VAIHINGN TCG

TRUNK-44UX32

ACTIVE DATE - 76008

CHAN		CCSC	SA	CS	RP	OP	MR	VECT	FM-STA	ENR	TO-STA	ENR
001	T	JRSAF696	A	A	CC	N	AC		WASHNGTN	LPI	KARAMRSL	AFN
002	T	*SPARE CHANNEL										
003	T	UUAAWFZ7	A	A	CC	F	AH		TEMPELHF	CCA	VAIHINGN	CCA
004	T	CCCAWCKD	A	E	1A	M	AH		LANDSTHL	SYT	VAIHINGN	DAC
005	T	NCIL25LT	C	B	2F	F	AF		PIRMASNS	MSU	CHIEVERS	ERS
005	T	CCAE9GLN	A	F	CC	F	AF		COLTANC	MSU	VAIHINGN	DAC
006	T	JQCAWCNT	A	T	3A	N	AD		**CROUGHTN	WRC	ZWEBRCKN	RCS
006	T	JQCAWCNT	A	S	3A	N	AD		CROUGHTN	WRC	ZWEBRCKN	RCS
007	T	NCNA1M78	A	G	2A	F	AF		**FT MEADE	CCH	VAIHINGN	CCC
007	T	NCNA1M78	A	F	2A	F	AF		FT MEADE	CCH	VAIHINGN	CCC
008	T	TLCAWAK5	A	D	2C	F	AH		BERLIN	CCT	SHAPE	CCT
009	T	UCCAWA82	A	B	1A	F	AG		PIRMASNS	TCG	VAIHINGN	TCG
010	T	CCCWWCJY	A	B	3A	R	AH		MTVERGIN	SCA	VAIHINGN	DAC
011	T	CKXA2740	C	D	CC	F	AF		PENTAGCN	ZAZ	VAIHINGN	JCC
011	T	UPPAF582	C	A	3A	F	AF		PENTAGCN	CRY	VAIHINGN	CEU
012	T	BZCAWGXA	C	A	1D	F	AH		NEAMAKRI	BFC	LONDON	BFC
013	T	*SPARE CHANNEL										
014	T	NCNA1124	A	F	1C	F	AF		CHCKSNDS	CCF	HAHN	CPV
015	T	RCYE9HNV	E	D	1D	F	AF		**PIRMASNS	MSU	CHIEVERS	CCB
016	T	*SPARE CHANNEL										

PAGE 015 STATION MAKEUP 77173 S-8

**FUTURE ACTIVATION

CAPACITY - 016T CROSS REFERENCE - DTXX6D04

FROM-PIRMASNS TCG

TO-VAIHINGN TCG

TRUNK-44UX40

ACTIVE DATE - 76008

CHAN	CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
001 T	*SPARE CHANNEL										
002 T	CCCAWEEV	A	E	1A	M	AH		DIYARBKR	SYT	VAIHINGN	DAC
003 T	JQCAW163	A	L	3A	V	AG		CROUGHTN	WRC	SEMBACH	BWS
003 T	REUAWA66	C	B	1D	F	AG		LNDTMNDL	JTF	VAIHINGN	CCT
004 T	EBEAF963	A	F	1D	F	AD		NORFOLK	CSS	SHAPE	SPE
005 T	CCCA9GPA	A	C	1A	F	AF		PIRMASNS	CRP	VAIHINGN	DAC
006 T	UKKAWF7B	A	C	CC	F	AF		ALGSBURG	CCC	LDWGSBRG	CCC
007 T	NCNA1M74	A	A	2A	F	AF		FRANKFRT	CCC	VAIHINGN	CCC
008 T	UUAE9GMZ	A	K	3A	F	AF		COLTANC	MSU	GCEPPNGN	ACA
009 T	CCCAWAHW	A	G	1A	M	AG		AVIANO	TCF	VAIHINGN	DAC
010 T	REUAC741	A	K	1D	F	AF		BERLIN	ACA	VAIHINGN	ACA
011 T	CCCA9GXG	A	C	1A	F	AF		COLTANC	CRP	VAIHINGN	DAC
012 T	*SPARE CHANNEL										
013 T	CCCAWFYC	A	A	1A	F	AG		TEHERAN	TCG	VAIHINGN	DAC
014 T	NCIL25NB	A	E	3A	F	AF		PIRMASNS	MSU	AGNANC	SPN
015 T	TQNAE717	A	A	1D	F	AD		NORFOLK	SAQ	CASTEAU	SPE
016 T	HOCAE172	A	A	1A	F	AG		BRNDYSTN	RRF	VAIHINGN	DAC

CAPACITY - 016T CROSS REFERENCE - DTXX6E25

FROM-RAMSTEIN TCF

TO-VAIHINGN TCG

TRUNK-44CX01

ACTIVE DATE - 75239

CHAN	CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
001 T	UOCAWAF2	A	B	1A	F	AH		RAMSTEIN	TCF	VAIHINGN	TCG
002 T	CCCAWAHM	A	K	1A	M	AH		BERLIN	TCG	VAIHINGN	DAC
003 T	RCYACF18	A	J	3A	M	AG		RAMSTEIN	CCC	LONDON	SSC
003 T	RCYACF18	A	K	3A	M	AG		**BOERFINK	CCC	LONDON	SSC
004 T	NCNA1J18	A	C	2A	F	AH		RAMSTEIN	CCC	HAHN	AFT
005 T	CCCAWAHR	A	E	1A	M	AG		RHEINMAN	CMC	VAIHINGN	DAC
006 T	CCCWWCJS	A	A	3A	R	AH		FELDBERG	SCA	VAIHINGN	DAC

FACE 016 STATION MAKELP 77173 S-8

CHAN		CCSC	SA	CS	RP	OP	MR	VECT	FM-STA	ENR	TC-STA	ENR
007	T	NCNA1J29	A	A	2A	F	AH		BOERFINK	CCC	MARINFLD	CCC
008	T	*SPARE CHANNEL										
009	T	*SPARE CHANNEL										
010	T	NCNA1JC4	A	A	2A	F	AF		RAMSTEIN	SSC	VAIHINGN	SSC
011	T	CCCWWCJT	A	A	3A	R	AH		LANGRKPF	SCA	VAIHINGN	CAC
012	T	JHBAAO22	A	A	CC	F	AH		LANGRKPF	TCF	STETTRSBG	RDV
013	T	JUMAWGZF	A	A	3A	F	AG		BOERFINK	CBA	TEMPELHF	CBA
013	T	JUMAWGZW	A	B	3A	F	AG		**BOERFINK	CBA	SHAPE	CBA
014	T	NCNA1J33	A	A	2A	F	AF		BOERFINK	CCC	HAHN	CCC
015	T	NCNA1M19	A	A	2A	F	AH		BOERFINK	CCC	VAIHINGN	CCC
016	T	*SPARE CHANNEL										

**FUTURE ACTIVATION

CAPACITY - 016T CROSS REFERENCE - DTXX6F09

FROM-SHAPE TCF

TO-VAIHINGN TCG

TRUNK-44CX06

ACTIVE DATE - 75323

CHAN		CCSC	SA	CS	RP	OP	MR	VECT	FM-STA	ENR	TO-STA	ENR
001	T	NCIL25EC	A	E	2A	F	AF		BRUSSELS	CCT	CROUGHTN	MSU
002	T	RCYAW962	G	G	3A	F	AF		CHIEVERS	CCB	VAIHINGN	CEU
003	T	JCWAW527	A	C	CC	F	AD		SHAPE	CCT	KINDSBCH	CCT
004	T	NCIL25LT	G	B	2H	F	AF		CHIEVERS	ERS	PIRMASNS	MSU
004	T	EBEAW7C1	A	C	3A	F	AC		SHAPE	SPE	NAPLES	CUF
005	T	TCNAWE9C	A	D	1C	F	AH		SHAPE	RRF	CROUGHTN	RRF
006	T	JUMAWGZW	A	B	3A	F	AG		**SHAPE	CBA	BOERFINK	CBA
007	T	EBEAF963	A	F	1D	F	AD		SHAPE	SPE	NCRFCLK	CSS
008	T	TCNAB717	A	A	1D	F	AD		CASTEAL	SPE	NCRFCLK	SAC
009	T	RCYAWE7Z	A	A	3A	F	AD		SHAPE	CCA	VAIHINGN	CCA
009	T	RCYE9HNV	E	D	1D	F	AF		**CHIEVERS	CCB	PIRMASNS	MSU
010	T	RCYAEP59	G	C	1D	H	AG		SHAPE	SBA	VAIHINGN	CCC
010	T	RCYAEP59	A	B	1D	H	AC		SHAPE	SBA	VAIHINGN	CCC
011	T	TLOAWAK5	A	D	2C	F	AH		SHAPE	CCT	BERLIN	CCT
012	T	CCAA2010	A	D	1D	F	AD		SHAPE	JCC	FTRITCHI	ZXZ
013	T	NCIL25LL	A	A	2A	F	AF		SHAPE	SPE	PIRMASNS	MSU
014	T	TLNAW327	A	E	2C	F	AF		SHAPE	ACA	VAIHINGN	ACA
015	T	*SPARE CHANNEL										
016	T	UOCAWBTH	A	C	1A	F	AC		SHAPE	NTT	VAIHINGN	TCG

**FUTURE ACTIVATION

CAPACITY - 016T CROSS REFERENCE - DTXX6D78

FROM-STUTTGRT TCG

TO-VAIHINGN TCG

TRUNK-44UMJH

ACTIVE DATE - 75243

CHAN		CCSC	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
001	V	UUEV9SSS	A	B	CC	F	HA		STUTTGRT	DTE	VAIHINGN	DTE
002	V	CUEVW054	A	E	CC	F	HA		BERLIN	SWB	VAIHINGN	SWB
003	V	UUEV9SST	A	B	CC	F	HA		STUTTGRT	DTE	VAIHINGN	DTE
004	V	UUEV9SSU	A	B	CC	F	HA		STUTTGRT	DTE	VAIHINGN	DTE
005	V	*SPARE CHANNEL										
006	V	UUEVW239	F	H	CC	F	HA		ANKARA	SWB	VAIHINGN	SWC
007	V	RCYVW265	A	D	3A	F	HA		MADRID	SWB	VAIHINGN	SWC
008	V	UUEVWCCQ	A	B	CC	F	HA		STUTTGRT	DTE	NELLINGN	DTE
009	V	UUEV9SSV	A	B	CC	F	HA		STUTTGRT	DTE	VAIHINGN	DTE
010	V	COCVWGXT	A	C	1A	M	HA		**FELDBERG	TCF	RSAGSBRG	TCG
010	V	COCVWGXT	A	B	1A	M	HA		FELDBERG	TCF	VAIHINGN	TCG
011	V	UUEVWCCW	A	B	CC	F	HA		STUTTGRT	DTE	NELLINGN	DTE
012	V	UUEVWCC3	A	B	CC	F	HA		STUTTGRT	DTE	NELLINGN	DTE
013	V	RUEYWCMH	A	H	CC	F	HA		SHAPE	SBL	VAIHINGN	SBU
014	V	UZCVWCA5	A	V	CC	M	HA		NUERNBRG	TST	MANNHEIM	TST
015	V	UUEVWFE3	A	I	CC	F	HA		STUTTGRT	SBU	BALMHLDR	SBU
016	V	UUEVWCCD	A	B	CC	F	HA		STUTTGRT	DTE	NELLINGN	DTE
017	V	CTXX6F48	A	V	2A	F	CD	44LXC5	PIRMASNS	TCG	VAIHINGN	TCG
018	V	UUEVC6C2	A	D	CC	F	HA		WORMS	DTE	VAIHINGN	DTE
019	V	CUEV21CL	A	J	1B	F	HA		PENTAGON	CSS	VAIHINGN	SWB
020	V	UUMVWGWE	A	A	3C	F	HA		STUTTGRT	CCP	VAIHINGN	CCP
021	V	RCYVW1C8	A	S	1D	F	HA		AGNANO	CUF	VAIHINGN	CCC
022	V	JCJJW156	A	I	2F	N	GP		**RAMSTEIN	TCF	MCHRINGN	WAS
022	V	JCJJW156	A	H	2F	N	GP		RAMSTEIN	TCF	MCHRINGN	WAS
023	V	UUEV9SSR	A	B	CC	F	HA		STUTTGRT	DTE	VAIHINGN	DTE
024	V	UUEV9SSZ	A	B	CC	F	HA		STUTTGRT	DTE	VAIHINGN	DTE

**FUTURE ACTIVATION

CAPACITY - 024V CROSS REFERENCE -

FROM-STUTTGRT TCG

TO-VAIHINGN TCG

TRUNK-44UMJI

ACTIVE DATE - 75243

CHAN	CCSC	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR

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001	V	UUEVWCAD	A	B	CC	F	HA			STUTTGRT	DTE NELLINGN DTE
002	V	UUEVC6C3	A	E	CC	F	HA			WORMS	DTE VAIHINGN DTE
003	V	JUEVWCM7	A	H	CC	F	HA			STUTTGRT	SWB LINDSEY SWB
004	V	CCCC9CXJ	A	G	3A	F	HA		**LANGRKPF	SCA	VAIHINGN CCR
004	V	CCCC9CXJ	A	F	3A	F	HA			LANGRKPF	SCA VAIHINGN CCR
005	V	*SPARE CHANNEL									
006	V	JUEVWENX	A	B	CC	F	HA			RAMSTEIN	SWB VAIHINGN SWB
007	V	CTYX6E18	A	A	2A	F	DG	34MCC4	**CROUGHTN	TCF	VAIHINGN TCG
007	V	NCIL25PU	A	A	2A	F	AN			CROUGHTN	MSU VAIHINGN SSC
008	V	UUEVWCAK	A	B	CC	F	HA			STUTTGRT	DTE NELLINGN DTE
009	V	UUEVWCAR	A	B	CC	F	HA			STUTTGRT	DTE NELLINGN DTE
010	V	RCYVW124	A	H	3A	F	HA			ROME	AEB VAIHINGN SWC
010	V	REUV9R82	G	H	1C	F	HA			LNDTMNDL	JTF VAIHINGN CCC
011	V	UUEVWCAX	A	B	CC	F	HA			STUTTGRT	DTE NELLINGN DTE
012	V	UUEVWCA4	A	B	CC	F	HA			STUTTGRT	DTE NELLINGN DTE
013	V	UUEVWCBA	A	B	CC	F	HA			STUTTGRT	DTE NELLINGN DTE
014	V	CUEVCA79	A	C	CC	F	HA			STUTTGRT	SBU VAIHINGN SBU
015	V	UUEVWCCJ	A	C	CC	F	HA			STUTTGRT	DTE VAIHINGN DTE
016	V	CUEVCA80	A	C	CC	F	HA			STUTTGRT	SBU VAIHINGN SBU
017	V	UUEVWCBG	A	B	CC	F	HA			STUTTGRT	DTE NELLINGN DTE
018	V	RCYVC653	A	H	1D	F	HA			LONDON	NCR VAIHINGN CCC
019	V	UUEVWCBN	A	B	CC	F	HA			STUTTGRT	DTE NELLINGN DTE
020	V	CUEVCA81	A	C	CC	F	HA			STUTTGRT	SBU VAIHINGN SBU
021	V	UUMB9CXX	A	F	3A	F	HA		**LANGRKPF	SCA	VAIHINGN CCA
021	V	UUMB9CXX	A	E	3A	F	HA			LANGRKPF	SCA VAIHINGN CCA
022	V	CTXX6C02	A	M	1C	F	CD	34CXC6	CROUGHTN	TCF	VAIHINGN TCG
023	V	RCYCWFXV	A	C	2C	F	HA			SHAPE	SWB VAIHINGN CEU
024	V	FCWCWF31	A	A	CC	F	AT			STUTTGRT	CCG VAIHINGN CCG

**FUTURE ACTIVATION

CAPACITY - 024V CROSS REFERENCE -

FROM-STUTTGRT TCG

TO-VAIHINGEN TCG

TRUNK-44UMJJ

ACTIVE DATE - 75243

CHAN		CCSC	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
001	V	UUCVWCML	A	C	CC	F	HA		STUTTGRT	TCG	VAIHINGN	TCG
002	V	CUEVCAE3	A	C	CC	F	HA		STUTTGRT	SBU	VAIHINGN	SBU
003	V	CUEVCAS1	A	C	CC	F	HA		STUTTGRT	SBU	VAIHINGN	SBU
004	V	JUEVWENY	A	G	CC	F	HA		RAMSTEIN	SWB	VAIHINGN	SWB
005	V	CUEVCAS5	A	C	CC	F	HA		STUTTGRT	SBU	VAIHINGN	SBU
006	V	CUEVCAS6	A	C	CC	F	HA		STUTTGRT	SBU	VAIHINGN	SBU
007	V	NCIL25JJ	A	K	1C	F	AN		CROUGHTN	MSU	VAIHINGN	SSC
007	V	NCIL25JJ	G	B	1C	F	AN		PIRMASNS	MSU	VAIHINGN	SSC

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CHAN		CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
008	V	UUEVWCBU	A	B	CC	F	HA		STUTTGRT	DTE	NELLINGN	DTE
009	V	UUEVWCB1	A	B	CC	F	HA		STUTTGRT	DTE	NELLINGN	DTE
010	V	UUEVWCE7	A	B	CC	F	HA		STUTTGRT	DTE	NELLINGN	DTE
011	V	JCMVC674	A	F	3A	F	HA		RAMSTEIN	MTC	MILDNHLL	CPA
012	V	UUEV9SSW	A	B	CC	F	HA		STUTTGRT	DTE	VAIHINGN	DTE
013	V	UUEV9SSP	A	B	CC	F	HA		STUTTGRT	DTE	VAIHINGN	DTE
014	V	UUEV9SSX	A	B	CC	F	HA		STUTTGRT	DTE	VAIHINGN	DTE
015	V	UUEV9SSY	A	B	CC	F	HA		STUTTGRT	DTE	VAIHINGN	DTE
016	V	UUEV9SSQ	A	B	CC	F	HA		STUTTGRT	DTE	VAIHINGN	DTE
017	V	UUEV9SSN	A	B	CC	F	HA		STUTTGRT	DTE	VAIHINGN	DTE
018	V	CUEB9ECY	A	B	CC	F	DA		LANGRKPF	SCA	VAIHINGN	DAC
019	V	UUEVWA2N	A	E	CC	F	HA		STUTTGRT	SBU	HCHNSTDT	RRS
020	V	NCNC1R13	A	F	1C	F	BC		GABLINGN	CCM	CHCKSNDS	CCF
021	V	UUEE9HQD	A	A	CC	F	AT		COLTANC	MSU	NELLINGN	ACA
022	V	JCWVWHAN	A	A	CC	F	HA		**RAMSTEIN	CPA	TCRREJCN	CCP
023	V	UUEB9EWG	A	A	3A	F	HA		**LANGRKPF	SCA	TEHERAN	ACB
024	V	*SPARE CHANNEL										

**FUTURE ACTIVATION

CAPACITY - 024V

CROSS REFERENCE -

FROM-STUTTGRT TCG

TO-VAIHINGN TCG

TRUNK-44UMJK

ACTIVE DATE - 75243

CHAN		CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
001	V	*SPARE CHANNEL										
002	V	RCYB9EEK	A	A	2E	F	HA		LANGRKPF	SCA	VAIHINGN	CCC
003	V	RCYRM431	A	G	1D	M	AC		VAIHINGN	CCC	MTPARNIS	RRC
004	V	RCYRM432	A	F	1D	M	AC		VAIHINGN	CCC	MTPARNIS	RRC
005	V	RUEVW534	A	G	3A	F	HA		SHAPE	SWB	VAIHINGN	SWC
006	V	*SPARE CHANNEL										
007	V	UUEB9CFS	A	G	CC	F	HA		LANGRKPF	SCA	VAIHINGN	SWB
008	V	COCVM234	A	D	1A	M	HA		VAIHINGN	CCC	MTPARNIS	RRC
009	V	CAPV2319	C	C	1C	F	HA		PIRMASNS	TCG	VAIHINGN	SWC
010	V	UUMB9BAY	A	J	3A	M	HA		LANGRKPF	SCA	VAIHINGN	NSA
011	V	CCCB9BAX	A	F	1A	F	HA		LANGRKPF	SCA	VAIHINGN	DAC
012	V	CCAE9FCC	A	F	1G	F	AP		PIRMASNS	MSU	VAIHINGN	DPC
013	V	UUEB9CZP	A	F	CC	F	HA		LANGRKPF	SCA	VAIHINGN	SWC
014	V	UUEB9CZQ	A	F	CC	F	HA		LANGRKPF	SCA	VAIHINGN	SWC
015	V	UUEB9CZH	A	K	CC	F	HA		LANGRKPF	SCA	VAIHINGN	SWC
016	V	*SPARE CHANNEL										
017	V	UUEB9CZM	A	F	CC	F	HA		LANGRKPF	SCA	VAIHINGN	SWC

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CHAN	CCSC	SA	CS	RP	OP	MR	VFC 1	FM-STA	ENR	TC-STA	ENR
018 V	RCYE9AXN	A	F	3A	F	HA		LANGRKPF	SCA	VAIHINGN	CSH
019 V	UUEE9CZG	A	I	CC	F	HA		LANGRKPF	SCA	VAIHINGN	SWC
020 V	RCYE9DCP	A	K	2C	M	HA		FELDBERG	SCA	VAIHINGN	CCC
021 V	RCYE9AXR	A	H	3A	F	HA		LANGRKPF	SCA	VAIHINGN	JH2
022 V	CTXX6FC9	A	T	2A	F	CD	44C XC1	RAMSTEIN	TCF	VAIHINGN	TCG
023 V	NCIC2597	A	C	2A	F	AT		RAMSTEIN	SSC	VAIHINGN	SSC
024 V	CUEE9ECX	A	D	CC	F	DA		LANGRKPF	SCA	VAIHINGN	DAC

CAPACITY - 024V CROSS REFERENCE -

FROM-STUTTGRT TCG

TO-VAIHINGN TCG

TRUNK-44UMJL

ACTIVE DATE - 75243

CHAN	CCSC	SA	CS	RP	OP	MR	VFC 1	FM-STA	ENR	TC-STA	ENR
001 V	*SPARE CHANNEL										
002 V	UUEE9CZJ	A	G	CC	F	HA		LANGRKPF	SCA	VAIHINGN	SWC
003 V	RCYVW536	A	K	1C	F	HA		SHAPE	SHB	VAIHINGN	SWC
004 V	UUEE9CZL	A	G	CC	F	HA		LANGRKPF	SCA	VAIHINGN	SWC
005 V	RCYVW1C6	A	G	2C	F	HA		LONDON	CCC	VAIHINGN	CCC
006 V	CTXX6CC4	A	T	1C	F	CD	44UX32	PIRMASNS	TCG	VAIHINGN	TCG
007 V	CTXX6C78	A	U	1C	F	CD	44C XC6	SHAPE	TCF	VAIHINGN	TCG
008 V	UUEE9CZN	A	H	CC	F	HA		LANGRKPF	SCA	VAIHINGN	SWC
009 V	CCJE24C6	A	C	2C	F	AR		LANGRKPF	SCA	VAIHINGN	JCC
010 V	RUEVW537	A	H	CC	F	HA		SHAPE	SBL	VAIHINGN	SBU
011 V	RCYRM235	A	A	1C	M	AC		VAIHINGN	CCC	MTFARNIS	RRC
012 V	RCYE9CPJ	A	F	1C	F	HA		LANGRKPF	SCA	VAIHINGN	EAC
013 V	RCYRM236	A	B	1C	M	AC		VAIHINGN	CCC	MTFARNIS	RRC
014 V	UUEE9AXC	A	E	2C	F	HA		LANGRKPF	SCA	VAIHINGN	SWC
015 V	UUEE9AXD	A	E	3A	F	HA		LANGRKPF	SCA	VAIHINGN	SWC
016 V	UUEE9AXE	A	F	3A	F	HA		LANGRKPF	SCA	VAIHINGN	SWC
017 V	UUEE9AWV	A	G	CC	F	HA		LANGRKPF	SCA	VAIHINGN	SWC
018 V	UUEE9AWW	A	G	CC	F	HA		LANGRKPF	SCA	VAIHINGN	SWC
019 V	UUEE9AWX	A	E	3C	F	HA		LANGRKPF	SCA	VAIHINGN	SWB
020 V	UUEE9AWY	A	E	3C	F	HA		LANGRKPF	SCA	VAIHINGN	SWB
021 V	UUEE9AWZ	A	G	3C	F	HA		LANGRKPF	SCA	VAIHINGN	SWB
022 V	CTYX6CB1	A	C	1C	F	CA	44UC C1	PIRMASNS	TCG	VAIHINGN	TCG
023 V	UUEE9ARV	A	G	CC	F	HA		LANGRKPF	SCA	VAIHINGN	SWB
024 V	UUEE9AXA	A	E	3C	F	HA		LANGRKPF	SCA	VAIHINGN	SWB

CAPACITY - 024V CROSS REFERENCE -

FROM-STUTTGRT TCG

TC-VAIHINGEN TCG

TRUNK-44UMJM

ACTIVE DATE - 76252

CHAN	CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TC-STA	ENR
001 V	*SPARE CHANNEL										
002 V	JUCHCARY	A	B	1C	F	FB		RAMSTEIN	SVR	VAIHINGN	SVR
003 V	BUCHCARZ	A	C	1C	F	FB		LONDON	SVR	VAIHINGN	SVR
004 V	CUCH22CZ	A	A	1C	F	FB		PENTAGON	SVT	VAIHINGN	SVC
005 V	CUCHCARV	A	B	1C	F	FB		SHAPE	SVS	VAIHINGN	SVR
006 V	*SPARE CHANNEL										
007 V	*SPARE CHANNEL										
008 V	CUCHCART	A	C	1C	F	FB		HEIDLBRG	SVR	VAIHINGN	SVR

CAPACITY - 008V CROSS REFERENCE -

FROM-STUTTGRT TCG

TC-VAIHINGEN TCG

TRUNK-44UML2

ACTIVE DATE - 73102

CHAN	CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TC-STA	ENR
001 V	UUEV9SSA	A	B	CC	F	HA		STUTTGRT	DTE	VAIHINGN	DTE
002 V	UUEV9SSB	A	B	CC	F	HA		STUTTGRT	DTE	VAIHINGN	DTE
003 V	UUEV9SSC	A	B	CC	F	HA		STUTTGRT	DTE	VAIHINGN	DTE
004 V	UUEV9SSD	A	B	CC	F	HA		STUTTGRT	DTE	VAIHINGN	DTE
005 V	UUEV9SSE	A	B	CC	F	HA		STUTTGRT	DTE	VAIHINGN	DTE
006 V	UUEV9SSF	A	B	CC	F	HA		STUTTGRT	DTE	VAIHINGN	DTE
007 V	UUEV9SSG	A	B	CC	F	HA		STUTTGRT	DTE	VAIHINGN	DTE
008 V	UUEV9SSH	A	B	CC	F	HA		STUTTGRT	DTE	VAIHINGN	DTE
009 V	UUEV9SSJ	A	B	CC	F	HA		STUTTGRT	DTE	VAIHINGN	DTE
010 V	UUEV9SSK	A	B	CC	F	HA		STUTTGRT	DTE	VAIHINGN	DTE
011 V	UUEV9SSL	A	C	CC	F	HA		STUTTGRT	DTE	VAIHINGN	DTE
012 V	UUEV9SSM	A	B	CC	F	HA		STUTTGRT	DTE	VAIHINGN	DTE

CAPACITY - 012V CROSS REFERENCE -

FROM-VAIHINGN DAC

TC-VAIHINGEN TCG

TRUNK-44U4E1

ACTIVE DATE - 76268

FACE 022 STATION MAKEUP 77173 S-8

CHAN		CCSC	SA	CS	RP	OP	MR	VECT	FR-STA	ENR	TO-STA	ENR
001	V	CCCEWCVG	A	C	1A	F	AL		WAIHINGN DAC		LANDSTHL	SYT
002	T	CCCAWERG	A	C	1A	F	AH		**WAIHINGN DAC		BERLIN	TCG
002	T	CCCAWERG	A	B	1A	F	AH		WAIHINGN DAC		BERLIN	TCG
003	T	CCCAWFNS	A	A	1A	F	AC		WAIHINGN DAC		KESTER	STC
004	T	CCCAWCKD	A	E	1A	M	AH		WAIHINGN DAC		LANDSTHL	SYT
005	V	CCCVWCCP	A	C	1A	R	HA		WAIHINGN DAC		KESTER	MCC
006	V	CCCA9CPA	A	C	1A	F	AF		WAIHINGN DAC		PIRMASNS	CRF
008	T	CCCAWAHM	A	K	1A	M	AH		WAIHINGN DAC		BERLIN	TCG
009	T	CCCAWAHR	A	E	1A	M	AG		WAIHINGN DAC		RHEINMAN	CMC
010	T	CCCAWA8D	A	E	1A	M	AG		FRANKFRT TCG		WCRMS	CCC
015	T	CCCAWEBV	A	E	1A	M	AH		WAIHINGN DAC		DIYARBKR	SYT
016	T	CCCAF520	A	A	1A	F	AG		WAIHINGN DAC		LAJES	STE
018	T	CCCA9GNZ	A	E	1A	F	AF		WAIHINGN DAC		CROUGHTN	MSU
020	T	CCCAWFYD	A	A	1A	F	AG		WAIHINGN DAC		TEHERAN	TCG
021	T	CCCAWACA	A	I	1A	P	AG		WAIHINGN DAC		KARAMRSL	CMC
022	T	CCCAWACB	A	I	1A	M	AG		WAIHINGN DAC		DIYARBKR	TCF
023	T	CCCAWA8E	A	G	1A	M	AG		WAIHINGN DAC		CCLTANC	TCL
024	T	CCCAWAHU	A	K	1A	M	AH		WAIHINGN DAC		CROUGHTN	DCR
025	T	CCCAWAHW	A	G	1A	M	AG		WAIHINGN DAC		AVIANO	TCF
026	T	CCCAWAH1	A	F	1A	M	AG		WAIHINGN DAC		NEAMAKRI	BFC
033	T	IZAAC2S4	A	D	3A	F	AC		WAIHINGN DAC		CAKHANGR	STE

**FUTURE ACTIVATION

FACITY - RRRR CROSS REFERENCE -

CIRCUIT SUMMARY BY RP /PACKAGE SYSTEMS NOT INCLUDED IN END TOTALS/

TYPE	NO. CHNLS		PRI 1		PRI 2		LC-PRI	
	SVC-A	OTHER	SVC-A	OTHER	SVC-A	OTHER	SVC-A	OTHER
VOICE	168	07	34	05	07	C1	147	01
VF-DATA	16	01	07	C1	05	C0	04	00
TTY	C2	CC	C2	CC	CC	C0	00	00
FAC	01	CC	CC	C0	01	C0	00	00
VFCT	14	CC	1C	C0	02	C0	02	00
TTY	86	06	42	04	2C	C0	24	02
DATA	12	02	C3	C0	03	02	06	00
SP PLUS	01	00	CC	C0	0C	C0	01	00
VOICE	C1	CC	CC	C0	CC	C0	01	00
TTY	C1	CC	CC	C0	CC	C0	01	00
DATA	C0	CC	CC	C0	CC	C0	00	00
OTHER	10	C0	CC	C0	CC	C0	10	00
TOTALS	317	16	88	10	36	C3	193	03

NETWORK SUMMARY

NETWORK	COUNT	NETWORK	COUNT

AP	1	BE	3
CW	2	CY	37
DA	4	DD	38
DI	14	DJ	5
DM	2	DN	19
DS	1	DW	1
EA	1	EC	7
FC	2	GA	1
GU	1	HB	1
KK	5	KX	2
LN	1	LO	1
LR	2	OC	1
CO	17	PP	1
QC	4	QJ	1
QM	1	QN	2
RS	1	TL	1
TP	1	TX	11
TY	2	UA	2
UB	124	UD	9
UE	2	UM	6
VP	1	WA	1
WC	1	YA	2
YM	1	ZA	1
ZG	2	ZN	2

APPENDIX VII

LINK MAKE-UP LIST

PAGE 001 LINK MAKEUP 77173 S-5

LINK NUMBER - S3844 BEGIN - NATOIIIA END - LAKEHRST

FROM-LAJES SYT

TO-LAKEHRST SYT

TRUNK-11CS02

ACTIVE DATE - 77087

CHAN	CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
001 V	JUBB7LBG	A	A	3A	H	HA		LAJES	SWB	POTTSTWN	SCA
002 V	JQMN7LCM	A	A	2E	H	AR		LAJES	OCA	CEDARBRK	SCA
003 V	DTXX6N76	A	G	1C	F	CD	11JX01	LAJES	TCF	ANDREWS	TCF
004 V	DTYX6N03	A	C	2C	F	AT	11BC03	LAJES	TOC	NORFOLK	CIC
005 V	JUBB7LDD	A	A	00	H	HA		LAJES	SWB	POTTSTWN	SCA
006 V	JUBB7LBE	A	A	00	H	HA		LAJES	SWB	POTTSTWN	SCA

CAPACITY - 006V CROSS REFERENCE -

FROM-LAJES TCF

TO-ANDREWS TCF

TRUNK-11JX01

ACTIVE DATE - 77087

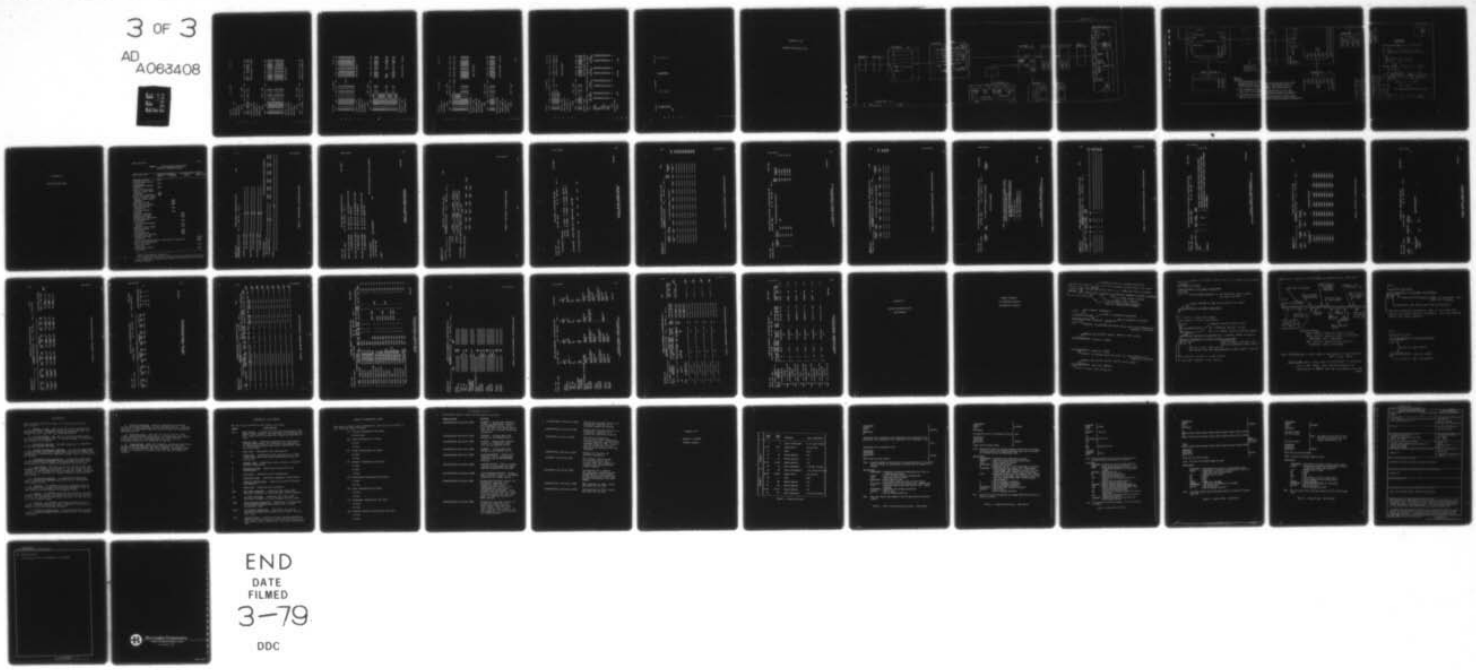
CHAN	CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
001 T	JOOA7LDV	A	A	1A	F	AF		LAJES	TCF	ANDREWS	TCF
002 T	*SPARE CHANNEL										
003 T	*SPARE CHANNEL										
004 T	*SPARE CHANNEL										
005 T	BWAA7LDN	A	A	2C	F	AG		LAJES	NAF	NORFOLK	CLA
006 T	BWAA7LDR	A	B	2C	F	AH		LAJES	PAG	NORFOLK	PAG
007 T	*SPARE CHANNEL										
008 T	NDNL115A	A	C	1C	F	AF		LAJES	NSM	ANDREWS	MSU
009 T	*SPARE CHANNEL										
010 T	JQAE7LDS	A	A	2E	F	AM		LAJES	DPC	ANDREWS	MSU
011 T	JQAE7LDS	A	A	2E	F	AM		LAJES	DPC	ANDREWS	MSU
012 T	JQAE7LDS	A	A	2E	F	AM		LAJES	DPC	ANDREWS	MSU
013 T	JQAE7LDS	A	A	2E	F	AM		LAJES	DPC	ANDREWS	MSU
014 T	BDFA7LDT	A	A	2A	N	AH		LAJES	DFS	SKAGGS I	SGD
015 T	*SPARE CHANNEL										
016 T	*SPARE CHANNEL										

CAPACITY - 016T CROSS REFERENCE - DTXX6N76

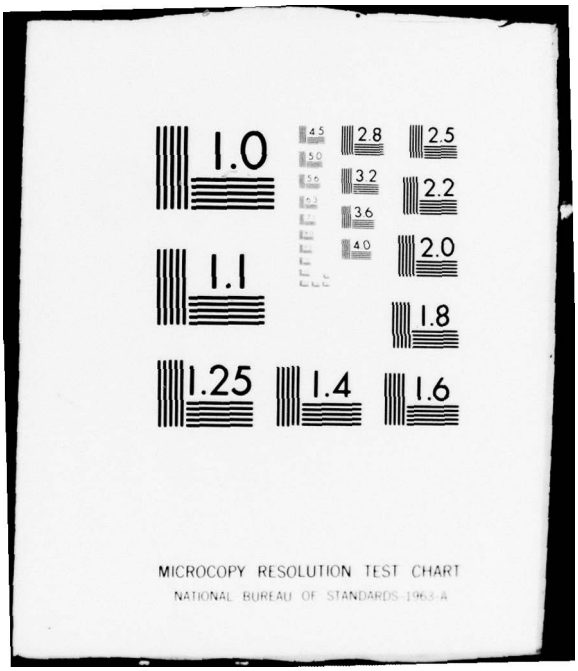
AD-A063 408 BURROUGHS CORP PAOLI PA FEDERAL AND SPECIAL SYSTEMS GROUP F/G 17/2
EXPLORATORY SYSTEM CONTROL MODEL DEVELOPMENT. VOLUME II. FILE D--ETC(U)
JAN 78 DCA100-76-C-0081

UNCLASSIFIED 64295-VOL-2-APP-A SBIE-AD-E100 143 NL

3 OF 3
AD A063408



END
DATE FILMED
3-79
DDC


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6
6.3
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

FROM-LAJES TOC

TO-NORFOLK CIC

TRUNK-11BC03

ACTIVE DATE - 77087

CHAN	CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
0A0 T	BWAD7LDP	A	A	2C	F	AR		LAJES	TOC	NORFOLK	BBX
0B0 T	BWAI7LDQ	A	A	00	F	AR		LAJES	TOC	NORFOLK	BBX

CAPACITY - 002T CROSS REFERENCE - DTYX6N03

FROM-FELDBERG TCF

TO-LAKEHRST SYT

TRUNK-41CS01

ACTIVE DATE - 76325

CHAN	CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
001 V	DUUCB192	A	B	3C	F	HA		FELDBERG	SCA	CEDARBRK	SCA
002 V	DUUCB193	A	B	3C	F	HA		FELDBERG	SCA	CEDARBRK	SCA
003 V	DUUCB194	A	B	3C	F	HA		FELDBERG	SCA	CEDARBRK	SCA
004 V	DUUCB195	A	B	3C	F	HA		FELDBERG	SCA	CEDARBRK	SCA
005 V	*SPARE CHANNEL										
006 V	JQMBA374	A	G	2E	F	HA		FELDBERG	SCA	SCOTT	CPA
007 V	DUUCB198	A	B	3C	F	HA		FELDBERG	SCA	POTTSTWN	SCA
008 V	DUUCB199	A	B	3C	F	HA		FELDBERG	SCA	POTTSTWN	SCA
009 V	DUUCB240	A	B	00	F	HA		FELDBERG	SCA	POTTSTWN	SCA
010 V	DUUCB196	A	B	3C	F	HA		FELDBERG	SCA	POTTSTWN	SCA
011 V	DUUCB197	A	B	3C	F	HA		FELDBERG	SCA	POTTSTWN	SCA
012 V	DUUCB241	A	B	00	F	HA		FELDBERG	SCA	POTTSTWN	SCA

CAPACITY - 012V CROSS REFERENCE -

FROM-CANRSBRG TCL

TO-LAKEHRST SYT

TRUNK-41US01

ACTIVE DATE - 76325

CHAN	CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
001 V	DUUCB244	A	C	00	F	HA		FELDBERG	SCA	CEDARBRK	SCA

CHAN		CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
002	V	DUUCB245	A	C	00	F	HA		FELDBERG	SCA	CEDARBRK	SCA
003	V	DUUCB242	A	B	00	F	HA		HILLNGDN	SCA	POTTSTWN	SCA
004	V	DUUCB243	A	B	00	F	HA		HILLNGDN	SCA	POTTSTWN	SCA
005	V	DUUCB246	A	B	00	F	HA		HILLNGDN	SCA	CEDARBRK	SCA
006	V	DUUCB247	A	B	00	F	HA		HILLNGDN	SCA	CEDARBRK	SCA
007	V	DTXX6N71	A	K	1A	F	CD	41UX02	PIRMASNS	TCG	FTDETRCK	TCG
008	V	CVPR21FU	A	B	1B	M	HA		VAIHINGN	SWC	WASHNGTN	OBA
009	V	DUUCB254	A	A	00	F	HA		FELDBERG	SCA	CEDARBRK	SCA
010	V	UKKVF912	A	B	3A	F	HA		HEIDLBRG	SWB	PENTAGON	OSS
011	V	CVQR210W	H	B	1B	F	HA		PIRMASNS	AER	ANDREWS	AER
011	V	DUUCB253	A	A	00	F	HA		FELDBERG	SCA	POTTSTWN	SCA
012	V	UKKVF913	A	B	3A	F	HA		HEIDLBRG	SWB	PENTAGON	OSS

CAPACITY - 012V CROSS REFERENCE -

FROM-PIRMASNS TCG

TO-FTDETRCK TCG

TRUNK-41UX02

ACTIVE DATE - 76222

CHAN		CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
001	T	*SPARE CHANNEL										
002	T	NDNA1N47	A	C	2A	F	AH		UNDTMNDL	CCO	FT MEADE	CCH
003	T	TQNAB717	A	A	1D	F	AD		CASTEAU	SPE	NORFOLK	SAQ
004	T	NDNA1N03	A	A	2A	F	AG		**LINDSEY	AFT	FT MEADE	NSA
005	T	*SPARE CHANNEL										
006	T	*SPARE CHANNEL										
007	T	*SPARE CHANNEL										
008	T	*SPARE CHANNEL										
009	T	*SPARE CHANNEL										
010	T	NDNA1J19	A	C	2A	F	AH		**HAHN	CCF	FT MEADE	CCF
010	T	NDNA1J19	A	B	2A	F	AH		HAHN	CCF	FT MEADE	CCF
011	T	*SPARE CHANNEL										
012	T	*SPARE CHANNEL										
013	T	*SPARE CHANNEL										
014	T	NDNA1U40	A	B	2A	F	AH		**UNDTMNDL	CCE	FT MEADE	CCO
014	T	NDNA1U40	A	A	2A	F	AH		UNDTMNDL	CCE	FT MEADE	CCO
015	T	*SPARE CHANNEL										
016	T	*SPARE CHANNEL										

**FUTURE ACTIVATION

CAPACITY - 016T CROSS REFERENCE - DTXX6N71

FROM-DNNRSBRG TCL

TO-LAKEHRST SYT

TRUNK-41US03

ACTIVE DATE - 77028

CHAN	CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
001 V	*RESVD CHANNEL										
002 V	DTYX6J75	A	A	00	F	DG	41UC03	VAIHINGN	WWN	FTRITCHI	WWM
003 V	*RESVD CHANNEL										
004 V	*RESVD CHANNEL										
005 V	*RESVD CHANNEL										
006 V	*RESVD CHANNEL										
007 V	DUUCB532	A	A	00	F	HA		**DNNRSBRG	SCA	DRANSVLL	SCA
008 V	DUUCB533	A	A	00	F	HA		**DNNRSBRG	SCA	DRANSVLL	SCA
009 V	DUUCB534	A	A	00	F	HA		**DNNRSBRG	SCA	DRANSVLL	SCA
010 V	DUUCB535	A	A	00	F	HA		**DNNRSBRG	SCA	DRANSVLL	SCA
011 V	DUUCB536	A	A	00	F	HA		**DNNRSBRG	SCA	DRANSVLL	SCA
012 V	DUUCB537	A	A	00	F	HA		**DNNRSBRG	SCA	DRANSVLL	SCA

**FUTURE ACTIVATION

CAPACITY - 012V CROSS REFERENCE -

FROM-VAIHINGN WWN

TO-FTRITCHI WWM

TRUNK-41UC03

ACTIVE DATE - 77126

CHAN	CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
0AQ T	CWCD24HJ	G	A	2A	F	DC		VAIHINGN	WWN	FTRITCHI	WWM
0BO T	CDJD24HK	G	A	2A	F	DC		VAIHINGN	WWN	FTRITCHI	WWM
0CO T	CWCD24HL	G	A	2A	F	DE		**VAIHINGN	WWN	FTRITCHI	WWM
0DO T	CWCD24HL	G	A	2A	F	DE		**VAIHINGN	WWN	FTRITCHI	WWM

**FUTURE ACTIVATION

CAPACITY - 004T CROSS REFERENCE - DTYX6J75

FROM-DIYARBKR SYT

TO-LAKEHRST SYT

TRUNK-61CS01

ACTIVE DATE - 76325

VII - 4

CHAN	CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
001 V	*SPARE CHANNEL										
002 V	DTPX6N10	A	B	1C	F	CM	61JI01	DIYARBKR	TCF	CHYNNMTN	TCF
003 V	*SPARE CHANNEL										
004 V	NDND1R44	A	D	3A	F	AR		KARAMRSL	CCF	FT MEADE	CCF
005 V	*SPARE CHANNEL										
006 V	*SPARE CHANNEL										

CAPACITY - 006V CROSS REFERENCE -

FROM-DIYARBKR TCF

TO-CHYNNMTN TCF

TRUNK-61JI01

ACTIVE DATE - 77084

CHAN	CCSD	SA	CS	RP	OP	MR	VFCT	FM-STA	ENR	TO-STA	ENR
001 V	JYEVF094	A	B	1C	F	HA		DIYARBKR	SPD	CHYNNMTN	SPD
002 V	JYEDF093	A	B	1C	F	AL		DIYARBKR	SPD	CHYNNMTN	SPD
003 V	JYEAF095	J	A	3A	F	AF		DIYARBKR	SPD	CHYNNMTN	COC

CAPACITY - 003V CROSS REFERENCE - DTPX6N68

CIRCUIT SUMMARY BY RP /PACKAGE SYSTEMS NOT INCLUDED IN END TOTALS/

TYPE	NO. CHNLS		PRI 1		PRI 2		LO-PRI	
	SVC-A	OTHER	SVC-A	OTHER	SVC-A	OTHER	SVC-A	OTHER
VOICE	26	00	01	00	02	00	23	00
VF-DATA	01	00	00	00	00	00	01	00
TTY	00	00	00	00	00	00	00	00
FAC	00	00	00	00	00	00	00	00
VFCT	04	00	02	00	01	00	01	00
TTY	08	00	02	00	06	00	00	00
DATA	03	02	01	00	02	02	00	00
SP PLUS	01	00	01	00	00	00	00	00
VOICE	01	00	01	00	00	00	00	00
TTY	00	01	00	00	00	00	00	01
DATA	01	00	01	00	00	00	00	00
OTHER	01	00	00	00	00	00	01	00
TOTALS	41	03	06	00	10	02	25	01

NETWORK SUMMARY

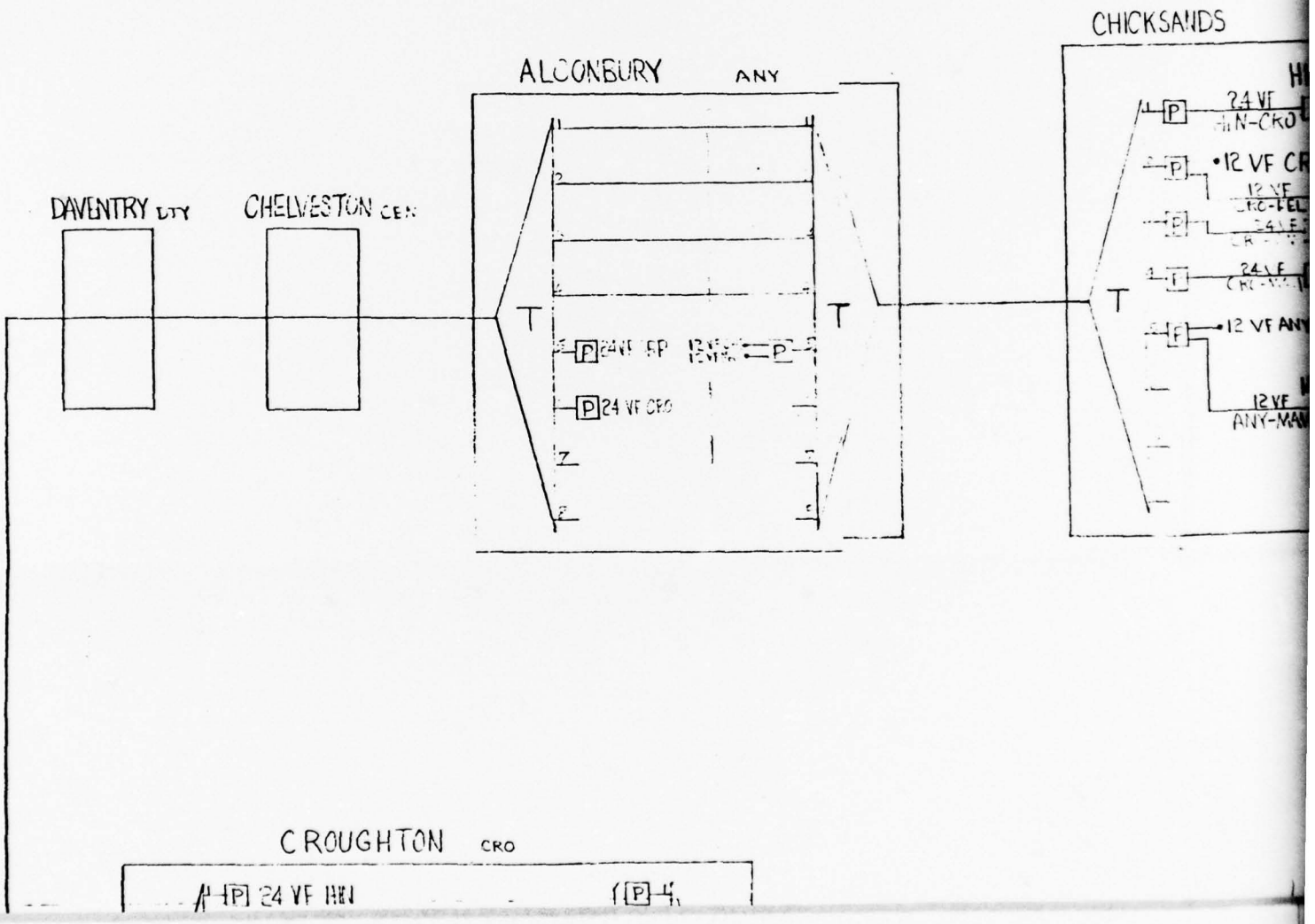
NETWORK	COUNT	NETWORK	COUNT

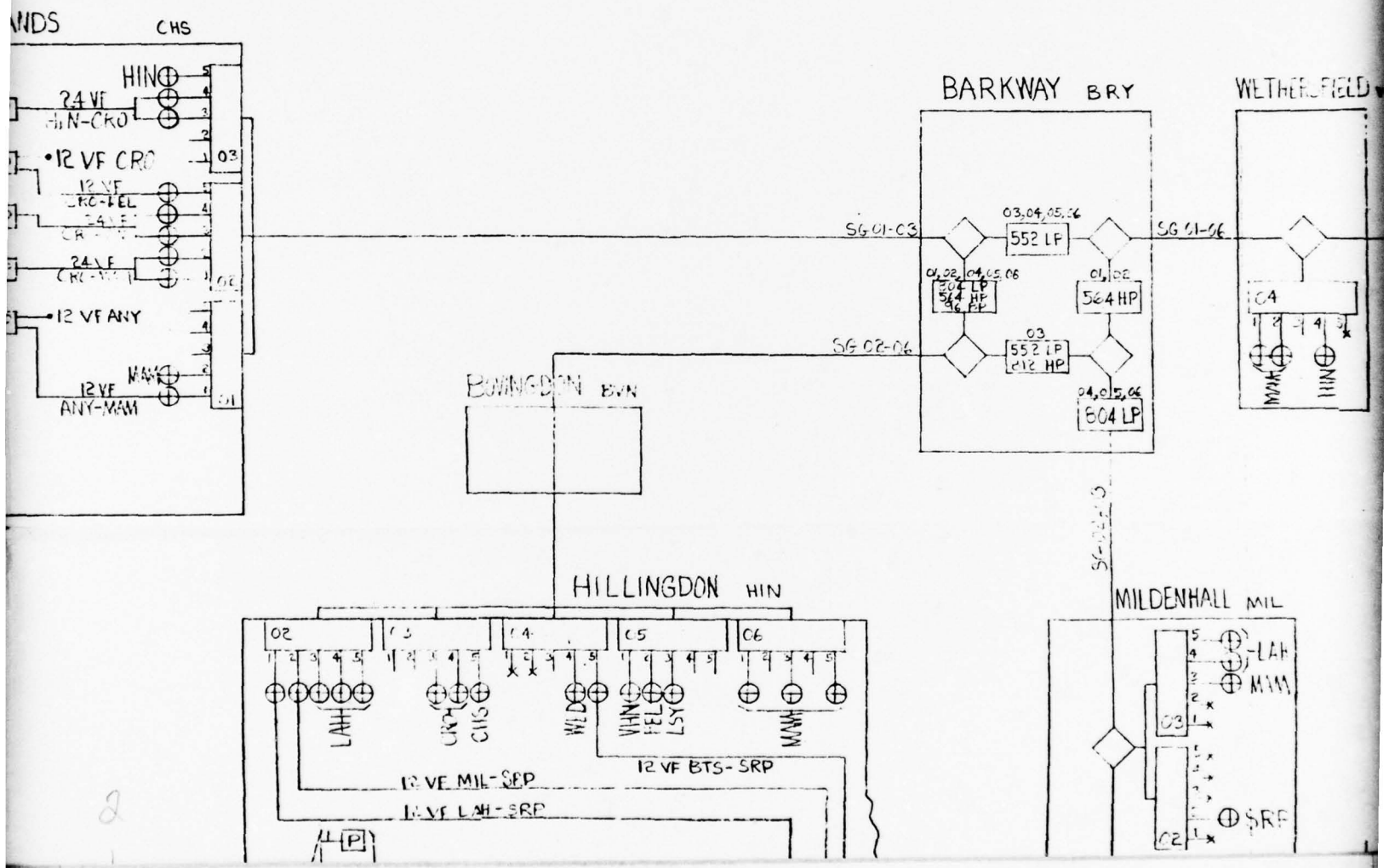
DF	1	DJ	1
DN	5	KK	2
DO	1	QA	1
QM	2	QN	1
TP	1	TX	2
TY	2	UB	3
UU	18	VP	1
WA	4	WC	1
YE	3		

END

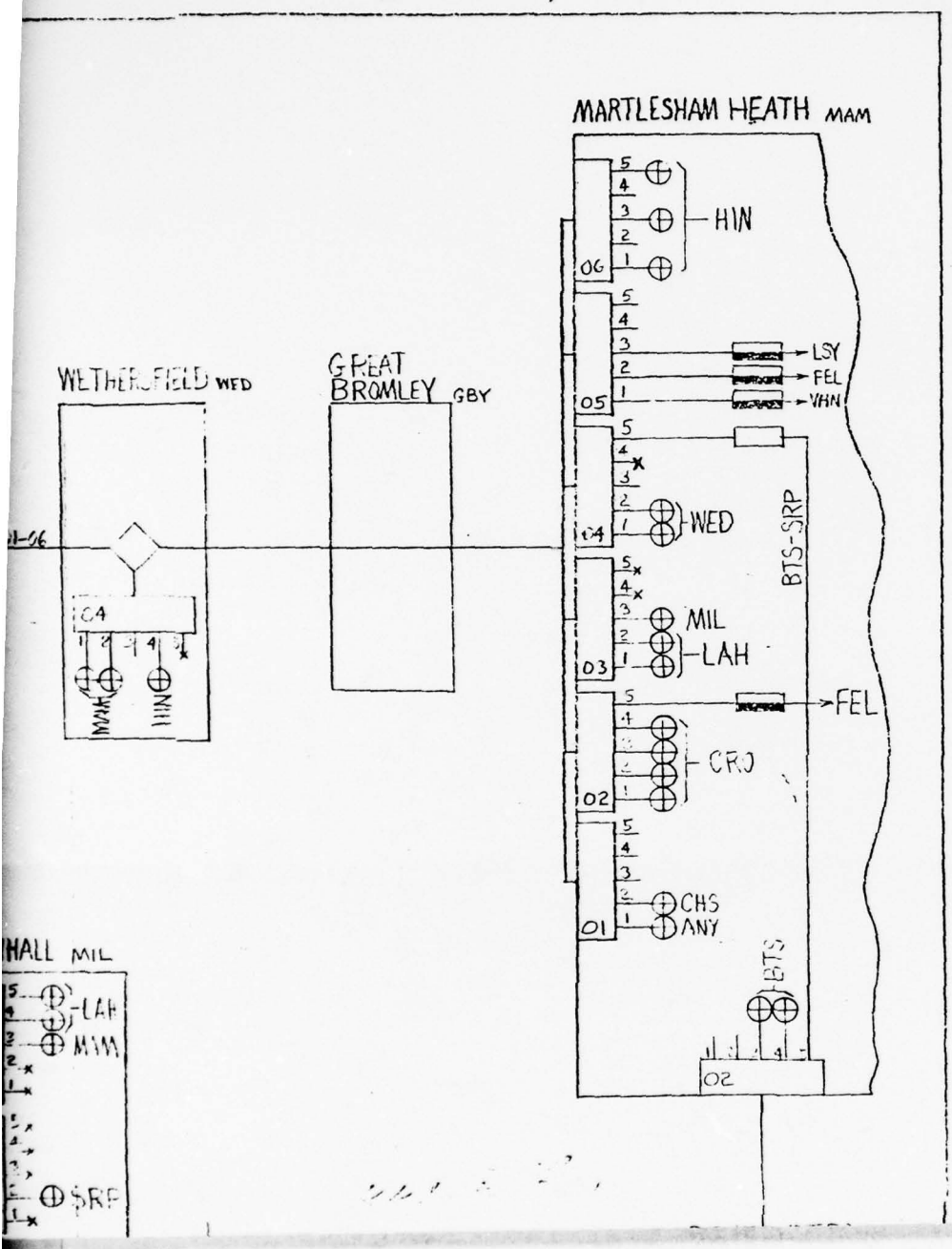
APPENDIX VIII

EXAMPLE MULTIPLEX PLAN

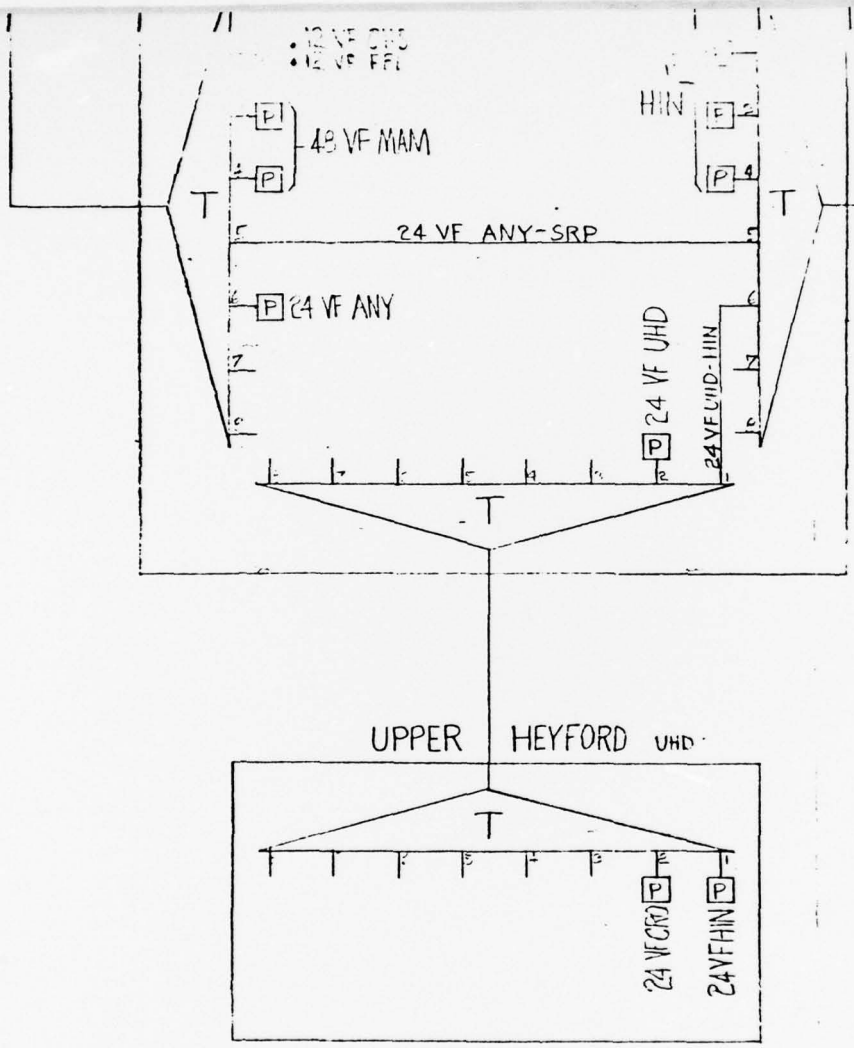

CHICKSANDS
ALCONBURY ANY
DAVENTRY DTY
CHELVESTON CEN
T
T
T
P 24 VF
P 24 VF CRO
P 24 VF
12 VF ANY
CROUGHTON CRO


NDS
CHS
HIN
24 VF
HIN-CRO
•12 VF CRO
12 VF
CRO-BEL
24 VF
12 VF ANY
MAN
12 VF
ANY-MAN
03
02
01
BARKWAY BRY
SG 01-03
SG 01-06
03,04,05,06
552 LP
01,02,04,05,06
564 LP
564 HP
96 PP
01,02
564 HP
03
552 LP
612 HP
04,05,06
604 LP
WETHERSFIELD
04
MAN
HIN
SG 02-06
BOVINGDON BVN
HILLINGDON HIN
02
03
04
05
06
LAH
CRO
CHS
MIL
VHA
BEL
LSY
MAN
12 VE MIL-SRP
12 VF LAH-SRP
12 VF BTS-SRP
P
MILDENHALL MIL
LAH
MAM
03
02
SRP

Unclassified.



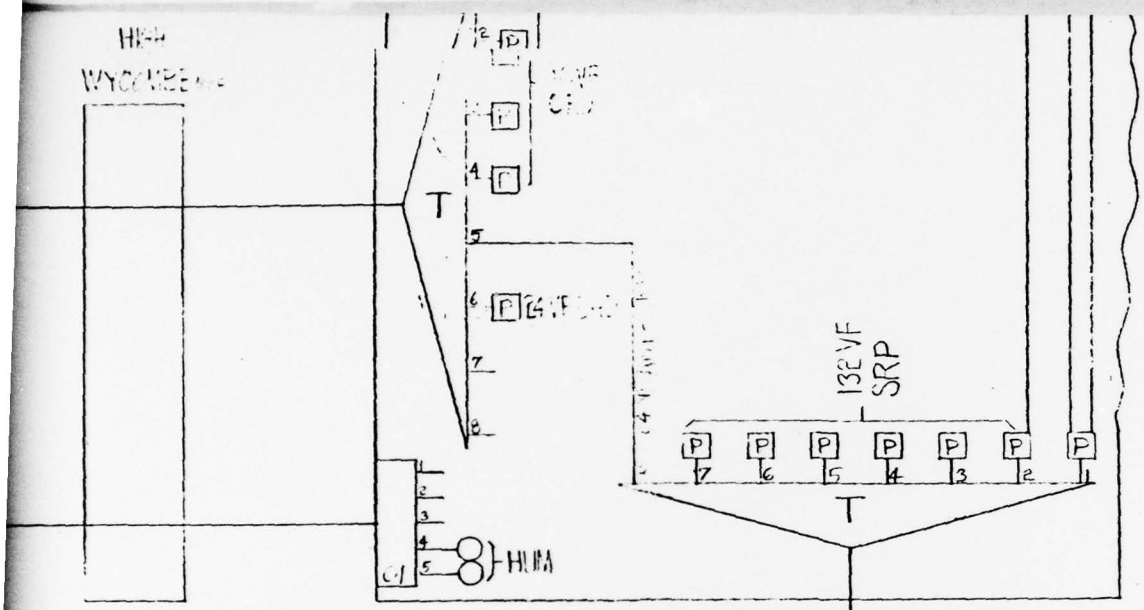
3

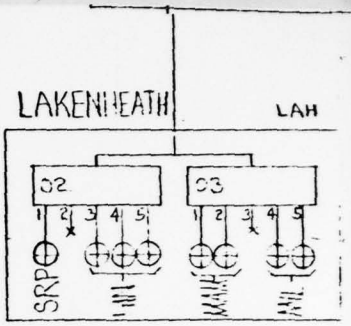


EXISTING SYSTEM
TO RINGSTEAD
(IF NOT DISCONTINUED)

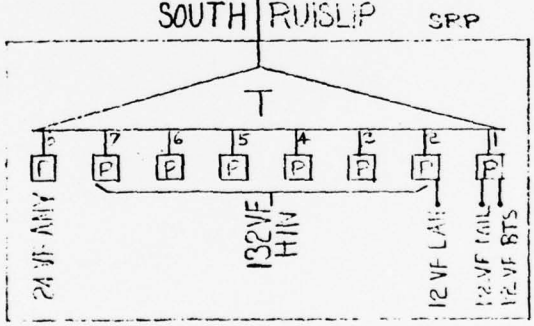
NOTES:

1. ALL FDM EQUIPMENT AT HIN, EQUIPMENT AT MAM EXCEPT TO BE INSTALLED UNDER
2. FDM EQUIPMENT ON LINK AND CHS IS TO BE INSTA
3. SUPERGROUP AND GROUP A MAY BE VARIED BY AFCS





M
D
TINUED)



AT HIN, WED AND LAH, AND ALL FDM
XCEPT THAT ON LINK TO BTS, IS
NDER SCOPE COMM TASK 21.

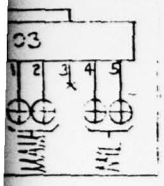
ON LINK MAM-BTS AND AT MIL
E INSTALLED UNDER THIS PROJECT.

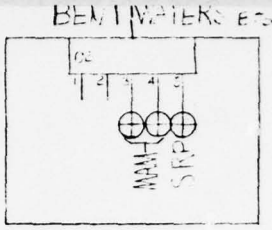
GROUP ALLOCATIONS IN FDM SECTOR
AFCS BASED ON EQUIPMENT AVAILABILITY.

DATE 11 MAY 17
EN INCEN
WORK
APPROVED:

5

LAH



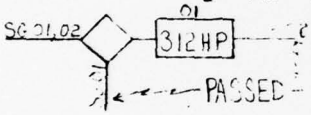


LEGEND

P PCM (24 VF CHANNELS) WITH ENCRYPTION DEVICE

TDM - 2 TO 8 CHANNELS, EACH 1.544 Mbps
(LINE RATE = N × 1.545 Mbps FOR N CHANNELS)

FDM SUPERGROUP, 5 GROUPS
12 VF CHANNELS PER GROUP



12 VF — P — VF INTERCONNECT, PCM TO PCM
GROUP INTERCONNECT — GROUP PILOT CONVERSION

DATE 11 MAY 171	DEFENSE COMMUNICATIONS ENGINEERING OFFICE
ON WEEKLY WORK	MULTIPLEX PLAN (PCM-TDM) UK WIDEBAND UPGRADE PROJECT
APPROVED: H7D	
	DCEC-SK-71-071

VLC-1

6

APPENDIX IX

FACILITY/LINK DATA

TABLE 1. FACILITY/LINK DATA BASE
FACILITY ABBREVIATIONS[1]

Type Facility	Traffic Switches		Transmission Media	Support Facilities
	Voice	Record		
AUTOVON Switch	SCA			
AUTOSEVOCOM Switch Automatic	SVS			
AUTOSEVOCOM Switch Manual	SVX			
Voice Switch,Automatic, Other than AUTOVON	TSB			
Voice Switch,Manual	TSM			
Digital Switch, Automatic, Other than AUTODIN		ADR		
AUTODIN Switch		DIN		
Data Relay, Manual		MDX		
Teletype Relay, Automatic		TAX		
Teletype Relay, Manual		TMX		
Coaxial Landline			CLX	
Submarine Cable			CSX	
HF Receiver Facility			HRX	
HF Transmitter Facility			HTX	
Line-of-Sight Radio (Land)			LSX	
Landline Wire Cable			LLC	
DCS SAT Earth Terminal			SYT	
DCS Satellite			SAT	
Tropospheric Scatter			TRX	
CRYPTO (online) Facility				BOR[2]
Voice & Telegraph Channel Derivation Equipment				MUX
DCS Electrical Power				PRX
Patch and Test Facility				PTF
Technical Control Facility				TCX

[1]See paragraph 6c, chapter 1.
[2]This type of facility is required to be reported only when it is supporting a separately identified DCS voice or record traffic switch.

SEQ NR _____ STATION PROFILE - FACILITY/LINK DATA BASE DATE

STATION NAME _____ S/C ___ AREA CODE ___ O&M ___

OPERATING UNIT MAILING ADDRESS _____ FAG

UNIT MESSAGE ADDRESS _____ FAI

NEXT HIGHER UNIT MAILING ADDRESS _____ FAO

UNIT MESSAGE ADDRESS _____ FAQ

2ND HIGHER UNIT MAILING ADDRESS _____ FAW

UNIT MESSAGE ADDRESS _____ FAY

CONTRACT MAINTENANCE

FIRST CONTRACTORS NAME _____ FBG

2ND CONTRACTORS NAME _____ FBO

FACILITIES MAINTAINED BY CONTRACT MAINTENANCE

FBH	FBI	FBJ	FBK	FBL	FBM
FBP	FBQ	FBR	FBS	FBT	FBU

REMARKS _____ FCI

1-10

DCAC 300-85-1

FIGURE 1a. STATION PROFILE - FACILITY/LINK DATA BASE

SER NR ZBZO STATION PROFILE - FACILITY/LINK DATA BASE DATE 750915

STATION NAME DUNLAP S/C KS AREA CODE 7 O&M U

OPERATING UNIT MAILING ADDRESS CDR 441ST SIG CO APO SAN FRANCISCO CALIF 96253
UNIT MESSAGE ADDRESS CDR 441ST SIG CO DUNLAP KOR

NEXT HIGHER UNIT MAILING ADDRESS CDR 50TH SIG BN APO SAN FRANCISCO CALIF 96254
UNIT MESSAGE ADDRESS CDR 50TH SIG BN CP ARTHUR KOR

2ND HIGHER UNIT MAILING ADDRESS CDR 7TH SIG GP APO SAN FRANCISCO CALIF 96255
UNIT MESSAGE ADDRESS CDR 7TH SIG GP HEPERSON KOR

CONTRACT MAINTENANCE FACILITIES MAINTAINED BY CONTRACT MAINTENANCE

FIRST CONTRACTORS NAME KOREA ENGINEERS CO PRX

2ND CONTRACTORS NAME -

REMARKS -

PAGE 0001

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FIGURE 1b. EXAMPLE: COMPUTER PRINTOUT OF
STATION PROFILE - FACILITY/LINK DATA BASE

SER NR

SITE PROFILE - FACILITY/LINK DATA BASE

DATE

STATION NAME _____ SITE NAME S/C ___ AREA CODE ___ O&M ___

SITE GEOGRAPHIC COORDINATES:

LATITUDE ___ DEGREES ___ MINUTES ___ SECONDS DIRECTION ___
GAH

LONGITUDE ___ DEGREES ___ MINUTES ___ SECONDS DIRECTION ___
GAH

SITE ELEVATION (ABOVE OR BELOW MSL AT CENTER OF SITE) _____ FEET
GAI

DCS FACILITIES AT THIS SITE:

GAJ GAK GAL GAM GAN GAO GAP

GAQ GAR GAS GAT GAU GAV

DCAC 300-85-1

FIGURE 2a. SITE PROFILE - FACILITY/LINK DATA BASE

SER NR ZBZO SITE PROFILE - FACILITY/LINK DATA BASE DATE 750915

STATION NAME DUNLAP SITE NAME DUNLAP S/C KS AREA CODE 7 O&M U

SITE GEOGRAPHIC COORDINATES

LATITUDE 36 DEGREES 17 MINUTES 23 SECONDS DIRECTION N

LONGITUDE 128 DEGREES 43 MINUTES 30 SECONDS DIRECTION E

SITE ELEVATION (ABOVE OR BELOW MSL AT CENTER OF SITE) 2134A FEET

DCS FACILITIES AT THIS SITE LSX SVX BOR PRX MUX TCX

PAGE 001A

DCAC 300-85-1

1-13

FIGURE 2b. EXAMPLE: COMPUTER PRINTOUT OF SITE PROFILE - FACILITY/LINK DATA BASE

SER NR | ROOMS HOUSING DCS FACILITIES - FACILITY/LINK DATA BASE | DATE

STATION NAME _____ SITE NAME S/C ___ AREA CODE ___ O&N ___

STRUCTURE NUMBER	ROOM OR WING NR	DCS FACILITIES CONTAINED IN THIS ROOM						ROOM SIZE (FT)	ATTENDANCE STATUS	
DAQ	DAR	DAT	DAU	DAV	DAW	DAX	DAY	DAZ	DBD	01
										02
										04
										03
										06
										07
										09
										10
										08

FIGURE 3a. ROOMS HOUSING DCS FACILITIES - FACILITY/LINK DATA BASE

SER NR ZBZO ROOMS HOUSING DCS FACILITIES - FACILITY/LINK DATA BASE DATE 750915

STATION NAME DUNLAP SITE NAME DUNLAP S/C KS AREA CODE 7 O&M U

STRUCTURE NUMBER	ROOM OR WING NR	DCS FACILITIES CONTAINED IN THIS ROOM		ROOM SIZE (FT)	ATTENDANCE STATUS	
2	W-1	TCX	MUX	1000	24 HOURS	02
4	R-1	PRX		600	ON CALL	03
2	W-2	LSX		1200	24 HOURS	01
3	R-1	SVX		300	24 HOURS	04
3	R-2	BOR		300	24 HOURS	06

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FIGURE 3b. EXAMPLE: COMPUTER PRINTOUT OF ROOMS HOUSING DCS FACILITIES - FACILITY/LINK DATA BASE

SER NR

VAN OR SHELTER HOUSING DCS FACILITIES - FACILITY/LINK DATA BASE

DATE

STATION NAME _____ SITE NAME _____ S/C ___ AREA CODE ___ O&M ___

STRUCTURE NUMBER	VAN NUMBER	DCS FACILITIES CONTAINED IN THIS STRUCTURE						ATTENDANCE STATUS	
DBE	DBF	DBH	DBI	DBJ	DBK	DBL	DBM	DBP	02
									04
									05
									03

FIGURE 4a. VAN OR SHELTER HOUSING DCS FACILITIES - FACILITY/LINK DATA BASE

SER NR Z9Z0 VAN OR SHELTER HOUSING DCS FACILITIES - FACILITY/LINK DATA BASE DATE 750915

STATION NAME DUNLAP SITE NAME DUNLAP S/C KS AREA CODE 7 O&M U

STRUCTURE NUMBER	VAN NUMBER	DCS FACILITIES CONTAINED IN THIS STRUCTURE	ATTENDANCE STATUS

NO DCS VAN OR SHELTER

(NOTE: The above statement "NO DCS VAN OR SHELTER" indicates a negative report from the site for data in this file. Negative reports may also appear for:

1. The ROOMS HOUSING DCS FACILITIES file provided data appears in the VAN OR SHELTER HOUSING DCS FACILITIES file.
2. The TCX/PTF DATA file.
3. The LINKS AND BB FREQUENCIES file.
4. The ANTENNAS AND REFLECTORS file.)

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FIGURE 4b. EXAMPLE: COMPUTER PRINTOUT OF VAN OR SHELTER HOUSING DCS FACILITES - FACILITY/LINK DATA BASE

SE&R NR | POWER SOURCES SUPPORTING DCS FACILITIES - FACILITY/LINK DATA BASE | DATE

STATION NAME _____ SITE NAME | S/C ___ AREA CODE ___ O&M ___

------ POWER SOURCE ------- LOCATION	NR	NR OF UNITS	TOTAL KW RATED	POWER CLASS		
EAA	EAB	EAC	EAI	EAN		
_____	—	—	____	—	_____	01
_____	—	—	____	—	_____	02
_____	—	—	____	—	_____	03
_____	—	—	____	—	_____	05
_____	—	—	____	—	_____	04

FIGURE 5a. POWER SOURCES SUPPORTING DCS FACILITIES - FACILITY/LINK DATA BASE

SER NR ZBZO POWER SOURCES SUPPORTING DCS FACILITIES - FACILITY/LINK DATA BASE DATE 750915

STATION NAME DUNLAP SITE NAME DUNLAP S/C KS AREA CODE 7 O&M U

------ POWER SOURCE ------ LOCATION	NR	NR OF UNITS	TOTAL KW RATED	POWER CLASS		
DUNLAP	2	-	-	B	AUXILIARY MILITARY TO BACKUP PRIME SOURCE FOR EXTENDED OUTAGES	02
4	3	2	200	C	AUXILIARY MILITARY TO BACKUP TECHNICAL BUS FOR SHORT TERM OUTAGES	03
4	4	1	11	D1	UNINTERRUPTIBLE SOURCE - FLOATING BATTERY (STATIC, RECTIFIER-INVERTER)	04
COMMERCIAL	1	-	-	X	PRIME COMMERCIAL	01

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FIGURE 5b. EXAMPLE: COMPUTER PRINTOUT OF
POWER SOURCES SUPPORTING DCS FACILITIES - FACILITY/LINK DATA BASE

SER NR

TCX/PTP DATA - FACILITY/LINK DATA BASE

DATE

STATION NAME _____ SITE NAME S/C ___ AREA CODE ___ O&M ___

TYPE FACILITY	STRUCTURE NUMBER	RESPONSIBLE TCX	ROOM OR VAN NUMBER
BAAA	BAAB	BAAF	BAAC

01

SUBORDINATE PTF LOCATIONS	ASSOCIATED FACILITIES 1	2	3	4	5	6
BAAG	BAAH	BAAI	BAAJ	BAAK	BAAL	BAAM
BAAN	BAAO	BAAP	BAAQ	BAAR	BAAS	BAAT
BAAU	BAAV	BAAW	BAAX	BAAY	BAAZ	BABA
BABB	BABC	BABD	BABE	BABF	BABG	BABH
BABI	BABJ	BABK	BABL	BABM	BABN	BABO
BABP	BABQ	BABR	BABS	BABT	BABU	BABV
BABW	BABX	BABY	BABZ	BACA	BACB	BACC
BACD	BACE	BACF	BACG	BACH	BACI	BACJ

FIGURE 6a. TCX/PTP DATA - FACILITY/LINK DATA BASE

SER NR ZBZO TCX/PTF DATA - FACILITY/LINK DATA BASE DATE 750915

STATION NAME DUNLAP SITE NAME DUNLAP S/C KS AREA CODE 7 O&M U

TYPE FACILITY	STRUCTURE NUMBER	RESPONSIBLE TCX	ROOM OR VAN NUMBER						
TCX	2	-	W-1						01
SUBORDINATE PTF LOCATIONS		1	2	ASSOCIATED FACILITIES 3	4	5	6		
BUTLER		LSX	HTX						

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FIGURE 6b. EXAMPLE: COMPUTER PRINTOUT OF TCX/PTF DATA - FACILITY/LINK DATA BASE

SER NR | TCX/PTF DATA - FACILITY/LINK DATA BASE | DATE

STATION NAME _____ | SITE NAME | S/C __ | AREA CODE __ | O&M __ | TYPE FACILITY

---------- TRANSMISSION LEVEL POINTS ----------

VOICE FREQ SEND DBM	VOICE FREQ REC DBM	CIRCUITS SEND DBM	CIRCUITS REC DBM	BASEBAND SEND DBM	BASEBAND REC DBM	BASEBAND OHM IMP	SUPERGROUP SEND DBM	SUPERGROUP REC DBM	SUPERGROUP OHM IMP	G R O U P SEND DBM	G R O U P REC DBM	G R O U P OHM IMP	DIRECT CURRENT STANDARDS VOLTS	MA	MARK	SPACE
BBAA		BBAD		BBAG			BBAJ			BBAM			BBAP			
BBAB		BBAE		BBAH			BBAK			BBAN			BBAQ			
BBAC		BBAF		BBAI			BBAL			BBAO			BBAR			

01

FIGURE 6a. TCX/PTF DATA - FACILITY/LINK DATA BASE (CON.)

SER NR ZBZO

TCX/PTF DATA - FACILITY/LINK DATA BASE

DATE 750915

STATION NAME DUNLAP SITE NAME DUNLAP S/C KS AREA CODE 7 O&M U TYPE FACILITY TCX

TRANSMISSION LEVEL POINTS

VOICE FREQ SEND DBM	VOICE FREQ REC DBM	CIRCUITS SEND DBM	CIRCUITS REC DBM	BASEBAND SEND DBM	BASEBAND REC DBM	BASEBAND OHM IMP	SUPERGROUP SEND DBM	SUPERGROUP REC DBM	SUPERGROUP OHM IMP	GROUP SEND DBM	GROUP REC DBM	GROUP OHM IMP
P7.0	N16.0	0.0	0.0	N45	N15	75B	N18	N28	135B	N34.5	N12	135B
		N2.0	N2.0									

DIRECT CURRENT STANDARDS

VOLTS	MA	MARK	SPACE
6	10	P	N
60	20	P	N
130	60	P	O

01

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FIGURE 6b. EXAMPLE: COMPUTER PRINTOUT OF TCX/PTF DATA - FACILITY/LINK DATA BASE (CON.)

SER NR — EQUIPMENT INVENTORY - FACILITY/LINK DATA BASE — DATE

STATION NAME _____ SITE NAME S/C ___ AREA CODE ___ O&M ___

G C	MERL NUMBER	IDENTIFICATION OF ITEM NOMENCLATURE	DESCRIPTION AND FEDERAL STOCK NUMBER	MANUF CODE	CAT CODE	TOTAL NR. GOVT OWNED	LEASED	QUANTITY AND STATUS W/LINK ID'S FOR RAD/MUX/ANT IN USE ONLINE	LINK ID'S		BACKUP SP-STDBY	LINK ID'S		INOP	PAC ABBRVN	
-	____	AAA		____	____	AAC	AAD	AAE	AAF		AAG	AAH		AAI	AAB	07
-	____	____	____	____	____	____	-	____	____	____	-	____	____	-	____	10
-	____	____	____	____	____	____	-	____	____	____	-	____	____	-	____	09
-	____	____	____	____	____	____	-	____	____	____	-	____	____	-	____	12
-	____	____	____	____	____	____	-	____	____	____	-	____	____	-	____	11
-	____	____	____	____	____	____	-	____	____	____	-	____	____	-	____	13
-	____	____	____	____	____	____	-	____	____	____	-	____	____	-	____	14
-	____	____	____	____	____	____	-	____	____	____	-	____	____	-	____	15
-	____	____	____	____	____	____	-	____	____	____	-	____	____	-	____	20

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FIGURE 7a. EQUIPMENT INVENTORY - FACILITY/LINK DATA BASE

SER NR ZBZO EQUIPMENT INVENTORY - FACILITY/LINK DATA BASE DATE 750915

STATION NAME DUNLAP SITE NAME DUNLAP S/C KS AREA CODE 7 O&M U

C	MERL NUMBER	NOMENCLATURE	IDENTIFICATION OF ITEM DESCRIPTION AND FEDERAL STOCK NUMBER	MANUF CODE	CAT CODE	TOTAL NR. GOVT OWNED	LEASED	QUANTITY AND STATUS W/LINK ID'S FOR RAD/MUX/ANT IN USE ONLINE	LINK ID'S	BACKUP SP-STDBY	LINK ID'S	INOP	FAC ABBRVN	
F	C03122	TSEC/HY-2A	SEE APPROP REF FOR LONG TITLE	98230		2	0	2	-	0	-	0	BOR	04
F	C03126	TSEC/KG-13	SEE APPROP REF FOR LONG TITLE	98230		2	0	2	-	0	-	0	BOR	03
F	C03129	TSEC/KG-3	SEE APPROP REF FOR LONG TITLE	98230		6	0	6	-	0	-	0	BOR	02
F	C03161	TSEC/KY-3A	SEE APPROP REF FOR LONG TITLE	98230		1	0	1	-	0	-	0	BOR	05
	88NMUX	VF MUX NOT USED	ON LINK(S) LISTED	THIS	LINE				M1055	M1056			LSX	15
A	008522	AN/FRC-109(V)	RADIO SET SMF 5820 192 2372	83744	RSTS	1	0	0	-	1	M1058	0	LSX	18
A	003752	AN/FRC-80(V)1	RADIO SET, SMF 5820 554 4239	80211	RSXC	1	0	1	M1059	0	-	0	LSX	07
A	004089	AN/FRC-80(V)2	RADIO SET MR-300 5820 351 2980	80211	RSXC	1	0	1	M1058	0	-	0	LSX	08
A	009367	AN/FRC-84	RADIO SET SMF 5820 917 3019	83744	TSRX	2	0	2	M1055	M1056	0 -	0	LSX	09
A	004172	AS-2489/E	ANT, SMROUDOME 12FT 5985 617 9030	15725	ATSH	2	0	1	M1058	1	SPARE	0	LSX	06
A	004174	AS-2492/F	ANT SMROUDOME 8FT 5985 617 9042	15725	ATSH	2	0	2	M1059	0	-	0	LSX	10
B	008010	P7024	ANTENNA PARA DISH 2FT 5930 052 4192	16335	ATXH	2	0	2	M1055	M1056	0 -	0	LSX	11
A	000054	AN/FCC-18(V)	MULTIPLEXER SYSTEM 5820 999 6296	03517	MXVC	2	0	2	M1058	M1059	0 -	0	MUX	13
M	003079	LGA 601-100	DSL GEN SET 100KW 6115 329 3584	15434	PUDG	2	0	0	-	2	-	0	PRX	12
M	008003	1YP-700A-25	BATTERY BANK	12859	PPBB	1	0	0	-	1	-	0	PRX	14
A	003757	SB-3259/G	SECORD SWBD MANUAL 5805 044 1929	46859	TPSM	1	0	1	-	0	-	0	SVX	17
	88NEQP	EQ NOT REPRTBLE	FOR FACILITY LISTED	THIS	LINE								TCX	19

FIGURE 7b. EXAMPLE: COMPUTER PRINTOUT OF EQUIPMENT INVENTORY - FACILITY/LINK DATA BASE

SER NR — LINKS AND BB FREQUENCIES - FACILITY/LINK DATA BASE — DATE

STATION NAME _____ SITE NAME — S/C ___ AREA CODE ___ O&M ___

	01		03
LINK ID		CBH	
ENR FAC		CBI	
PATH LENGTH		CBM	
CONNECT LOC			
S/C		CBJ	
AREA CODE			
O&M			
ENR FAC		CBK	
CHANNEL CAPACITY			
RADIO DESIGN		CBL	
VF MUX EQPD			
VF TERMINATED			
FREQUENCY ASSIGNMENTS (IN MHZ/POWER IN WATTS)			
SEND-1		CBN	
EMISSION		CBO	
AUTH PWR		CBP	
PWR IN USE			
AUTHORITY		CBQ	
SEND-2		CBS	
EMISSION		CBT	
AUTH PWR		CBU	
PWR IN USE			
AUTHORITY		CBV	
RECEIVE-1		CBX	
EMISSION		CBY	
RECEIVE-2		CBZ	
EMISSION		CCA	

FIGURE 8a. LINKS AND BB FREQUENCIES - FACILITY/LINK DATA BASE

SER NR ZBZO — LINKS AND BB FREQUENCIES - FACILITY/LINK DATA BASE — DATE 750915

STATION NAME DUNLAP — SITE NAME DUNLAP — S/C KS — AREA CODE 7 — O&M U

	01	03	04	02
LINK ID	M1056	M1058	M1059	M1055
ENR FAC	RRS	RRS	RRS	RRS
PATH LENGTH	14.	10	37	25
CONNECT LOC	DUNLAP -1	BUTLER	GRAGOS	HEPERSON
S/C	KS	KS	KS	KS
AREA CODE	7	7	7	7
O&M	U	U	U	U
ENR FAC	RSA	RSA	RSA	RRS
CHANNEL CAPACITY				
RADIO DESIGN	300	300	300	300
VF MUX EQPD	RF	132	240	RF
VF TERMINATED	000	120	192	000
FREQUENCY ASSIGNMENTS (IN MHZ/POWER IN WATTS)				
SEND-1	007167.5000	008307.7500	008366.0000	007135.0000
EMISSION	6000F9	10000F9	7000F9	6000F9
AUTH PWR	1	1	1	1
PWR IN USE	.5	1	1	1
AUTHORITY	EIGHT US ARMY DTG 231023Z AUG 73	EIGHT US ARMY DTG 231023Z AUG 73	EIGHT US ARMY DTG 231023Z AUG 73	EIGHT US ARMY DTG 231023Z AUG 73
SEND-2	007347.5000	008377.7500	-	007115.5000
EMISSION	6000F9	10000F9	-	6000F9
AUTH PWR	1	1	-	1
PWR IN USE	.5	1	-	1
AUTHORITY	EIGHT US ARMY DTG 231023Z AUG 73	EIGHT US ARMY DTG 021433Z DEC 73	-	EIGHT US ARMY DTG 021433Z DEC 73
RECEIVE-1	007482.5000	008146.7500	008235.0000	007310.0000
EMISSION	6000F9	10000F9	7000F9	6000F9
RECEIVE-2	007662.5000	008216.7500	-	007295.0000
EMISSION	6000F9	10000F9	-	6000F9

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FIGURE 8b. EXAMPLE: COMPUTER PRINTOUT OF LINKS AND BB FREQUENCIES - FACILITY/LINK DATA BASE

SER NR

ANTENNAS AND REFLECTORS - FACILITY/LINK DATA BASE

DATE

STATION NAME _____ SITE NAME _____ S/C ___ AREA CODE ___ O&M ___

ANTENNA / REFLECTOR																
NR TWR NR LINK ID	TYPE NOMENCLATURE COORDINATES		SIZE USE	HEIGHT LEG LTH (FT)	AZIMUTH FROM NORTH DEG MIN	TILT OR TAKEOFF ANGLE (MLRDNS)	FREQ RANGE (MHZ) GAIN (DB)	AXIS MAJOR MINOR	TRANSMISSION LINES LINE TYPE	OHM IMP	LGTH (FT)	CONNECTING LOCATION SITE NAME	S/C CODE	AREA CODE	
CAH	CAJ		CAL	CAN	CAO	CAQ	CAR	CAU	CAV			CAH			05
CAT	CAM		CAK	CAP			CAS		CAW						
CAI	CAZ								CAX						
															02
															01
															03
															04

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FIGURE 9a. ANTENNAS AND REFLECTORS - FACILITY/LINK DATA BASE

SER NR ZBZO — ANTENNAS AND REFLECTORS - FACILITY/LINK DATA BASE — DATE 750915

STATION NAME DUNLAP — SITE NAME DUNLAP — S/C KS — AREA CODE 7 — O&M U

ANTENNA / REFLECTOR NR TWR NR LINK ID	TYPE NOMENCLATURE COORDINATES	USE	SIZE HEIGHT LEG (FT)	LTH	AZIMUTH FROM NORTH DEG MIN	TILT OR TAKEOFF ANGLE (MLRDNS)	FREQ RANGE (MHZ) GAIN (DB)	AXIS MAJOR MINOR	TRANSMISSION LINES LINE TYPE	OHM IMP	LGTH (FT)	CONNECTING LOCATION SITE NAME	S/C CODE	AREA CODE
02	ANT SHROUDOME 8FT	8	75		255 50	-	7750.0-8400.0	-	WR 112 WG	50	133	GRAGOS	KS	7 02
01	AS-2492/F	B	-				44	-						
M1059	36 17 25N 128 43 31E													
01	ANT SHROUDOME 12FT	12	40		330 30	-	7750.0-8400.0	-	WR 112 WG	50	98	BUTLER	KS	7 01
01	AS-2489/E	B	-				47	-						
M1058	36 17 25N 128 43 31E													
03	ANTENNA PARA DISH 2FT	2	24		014 21	-	7000.0-8000.0	-	WAVEGUIDE	50	50	DUNLAP	KS	7 03
02	P7024	B	-				34	-						
M1056	36 17 24N 128 44 30E													
04	ANTENNA PARA DISH 2FT	2	52		182 06	-	7000.0-8000.0	-	WAVEGUIDE	50	78	HEPERSON	KS	7 04
02	P7024	B	-				35	-						
M1055	36 17 24N 128 44 30E													
05	ANT SHROUDOME 8FT	8	100		255 50	-	7750.0-8400.0	-	WR 112 WG	50	158	GRAGOS	KS	7 05
01	AS-2492/F	B	-				42	-						
M1059	36 17 25N 128 43 31E													
06	ANT SHROUDOME 12FT	12	125		167 21	-	7750.0-8400.0	-	WR 112 WG	50	185	-	-	- 06
01	AS-2489/E	B	-				46	-						
SPARE	36 17 25N 128 43 31E													

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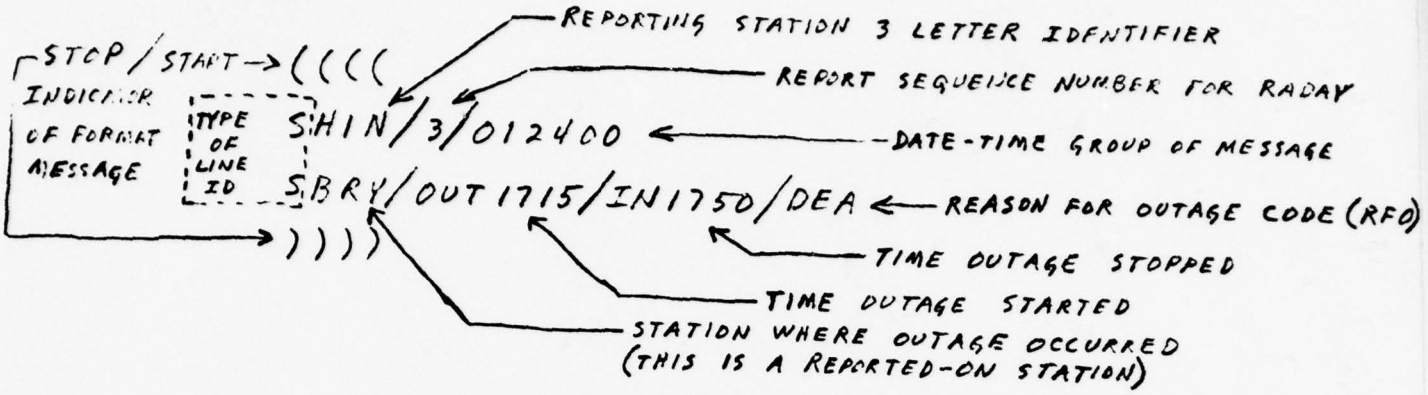
FIGURE 9b. EXAMPLE: COMPUTER PRINTOUT OF ANTENNAS AND REFLECTORS - FACILITY/LINK DATA BASE

APPENDIX X

STATUS REPORTING DATA

AND FORMATS

SAMPLE FORMATS
OF FORMATTED STATUS
INFORMATION REPORTS



((((DATA ELEMENT SEPARATORS

SIVN/1/192400

SIVNVNS/RMKS NARRATIVE XXXX START OF NARRATIVE INDICATOR, END OF NARRATIVE INDICATOR

))))

VONSPOT: AN AUTOVON AS-OCCURS REPORT ON OUTAGES/RESTORALS/HAZARDOUS CONDITIONS

VONDATA: AN AUTOVON SWITCH TRAFFIC DATA REPORT

SIVNVND/RMKS NARRATIVE XXXX

SCRDDNS/RMKS NARRATIVE XXXX

DINSPOT: AN AUTODIN AS-OCCURS REPORT ON OUTAGES/RESTORALS/HAZARDOUS CONDITIONS

DINDATA: AN AUTODIN SWITCH TRAFFIC DATA REPORT

SCRDDND/RMKS NARRATIVE XXXX

STATION WHERE DATA ORIGINATES

((((
SHIN/9/142400
LM1039/OUT1350/IN1440/RFO
))))

REPORTING STATION 3 CHARACTER IDENTIFIER (DCAC 310-55-1, VOL III)

LINK NUMBER ASSIGNED TO THE MICROWAVE PATH ON WHICH THE RFO OCCURRED

TRUNK NUMBER OF THE OUT-OF-SERVICE DCS TRUNK

K33UM01/OUT1410/IN1500/RFO

K INDICATES TRUNK LINE FORMAT

S INDICATES STATION LINE FORMAT

((((

SHIN/7/042400 ← REPORTING STATION S-LINE

K34EB01 ← TRUNK CARRYING AFFECTED CHANNEL

CHANNEL NUMBER WITHIN TRUNK

C004/OUT1600/IN1720/RFO ← CHANNEL OUTAGE & RESTORAL

ADSOV1987/OUT1610/IN1720/CCSDNNNN

CCSD OF CIRCUIT RESTORED BY ALLOCATION (PRE EMPTION) OF CHANNEL

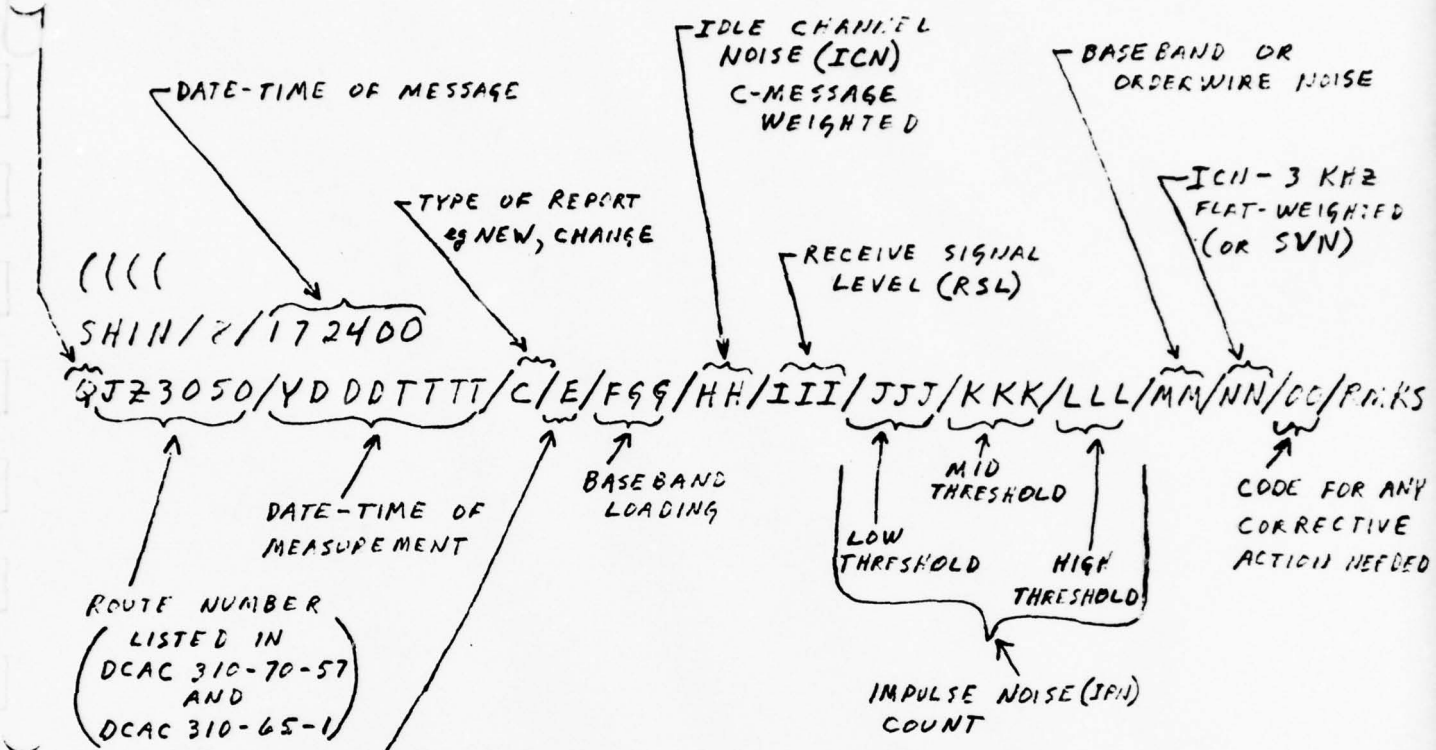
))))

CCSD OF CIRCUIT THAT WAS ON THE CHANNEL THAT WAS PREEMPTED (BY A HIGHER PRIORITY CIRCUIT)

A INDICATES ALLOCATION LINE FORMAT

C INDICADES CHANNEL LINE FORMAT

Q INDICATES PERFORMANCE MONITORING (QUALITY ASSURANCE) DATA LINE FORMAT



NOTES: YYY (OR YY) CODE IS USED WHEN A MEASUREMENT IS NOT REQUIRED AND IS NOT TAKEN.

ZZZ (OR ZZ) CODE IS USED WHEN A MEASUREMENT IS REQUIRED BUT IS NOT TAKEN. THIS CONDITION REQUIRES AN EXPLANATION IN RMKS WHY THE MEASUREMENT WAS NOT TAKEN.

((((

SIVN/4/162400

EYYYNNN/OUT1700/IN1800/RFO

))))

IDENDIFICATION (SERIAL) NUMBER OF EQUIPMENT THAT WAS OUT OF SERVICE

3 CHARACTER CODE SPECIFYING TYPE OF EQUIPMENT

E INDICATES EQUIPMENT LINE FORMAT. THIS IS ONLY USED FOR AUTOVON AND AUTODIN SWITCH EQUIPMENT. IT IS NOT USED FOR TRANSMISSION MEDIA EQUIPMENT.

((((

SHIN/5/172400

UCCSDNNNN/OUT1710/IN2040/RFO

))))

CCSD OF USER CIRCUIT

UCCSDNNNN/RMKS NARRATIVE XXXX

U INDICATES USER LINE FORMAT

DEFINITIONS

The following definitions apply for status reporting per DCAC 310-55-1

a. Channel Outage. Loss of service on a channel of a designated trunk. A channel outage is terminated when the channel can again provide the required service.

b. Circuit Outage. The loss of service between users in either or both directions. A circuit outage is terminated when service is restored.

c. DCS Access Station. The DCS reporting or reported-on station nearest the user.

d. Hazardous Condition (HAZCON). A condition applicable to DCS stations and links, under which the loss of additional equipment or transmission capability would result in disruption of the DCS.

e. Impaired Service Condition. A condition applicable to the DCS AUTODIN, AUTOVON, and AUTOSEVOCOM networks under which partial traffic handling capability has been lost.

f. Link Outage. The loss of service of all trunks and channels of transmission facilities. A link outage is considered terminated when the first channel or trunk, excluding orderwires, is returned to a usable condition and available for service.

g. Recoverable Subject. A standardized identifier used to categorize reported narrative status information into subject areas.

h. Recovery. An AUTODIN operating procedure used to reconstitute all messages transiting an AUTODIN switch at the time of a switch failure or program reload.

i. Reload. An AUTODIN operating procedure by which an AUTODIN switch program is replaced by the original version or by a new version and the table structure is initialized to a zero traffic state.

j. Restart. An AUTODIN operating procedure used to return to the beginning of, and to reperform, any cycle in which an error or interrupt occurred.

k. Special Interest Item. Any communications-related item or condition identified by a DOCC element for special reporting.

l. Station Isolation. Loss of connectivity with the DCS due to a cause external to the isolated station. Station isolation is terminated when the first circuit is restored to DCS connectivity.

m. Station Outage. The loss of service on all links, trunks, and circuits terminating at or transiting the station. A station outage is terminated when the first circuit, excluding orderwires, is returned to service.

n. Trunk Outage. When all channels, excluding orderwires, of the trunk are unusable and not available for service. Outage is terminated when the first channel, excluding orderwires, is returned to a usable condition and available for service.

INFORMATION LINE SYMBOLS

The following information Line Symbols are used;

Symbol	Description
((((	Open Parens. A series of four open parentheses indicates to the computer the beginning of formatted text. This symbol must be placed on a separate information line.
S	Station Line. Identifies reporting or reported-on station information, or identifies the reporting or reported-on station with which subordinate lines are associated.
L	Link Line. Identifies link information.
K	Trunk Line. Identifies trunk information or identifies the trunk with which subordinate lines are associated.
C	Channel Line. Identifies either analog or digital channel information.
A	Allocation Line. Identifies allocation line information.
U	User Line. Identifies user information.
E	Equipment Line. Identifies equipment information.
Q	Quality Control Line. Identifies quality control information.
/	Slant Bar. Separates data elements.
OUT	Out Time Indicator. Indicates the time a DCS facility, circuit, or user terminal failure begins.
IN	In Time Indicator. Indicates the time a DCS facility, circuit, or user terminal failure ends.
RMKS	Begin Remarks Indicator. Identifies the beginning of narrative remarks associated with a report information line.
XXXX	End Remarks Indicator. Identifies the end of narrative remarks associated with a report information line.
))))	Closed Parens. A series of four closed parentheses indicates to the computer the end of formatted text. This symbol must be placed on a separate information line.

ORDER OF INFORMATION LINES

The order in which report information lines will be included in the formatted report follows;

(1) Station Information (S-line):

S-line only

(2) Link Information (L-line):

S-line

L-line

(3) Trunk Information (K-line):

S-line

K-line

(4) Channel Information (C-line):

S-line

K-line

C-line

(5) Allocation Information (A-line):

S-line

A-line

(6) User Information (U-line):

S-line

U-line

(7) Equipment Information (E-line):

S-line

E-line

(8) Quality Control Information (Q-line):

S-line

Q-line

Recoverable subject codes are described as follows;

Abbreviation	Meaning
SZZZVNS/Rmks Narrative XXXX	VONSPOT - Outage and restoral status, or hazardous condition of an AUTOVON switch. Note that the ZZZ's are dummy characters for the switches reporting designator.
SZZZVND/Rmks Narrative XXXX	VONDATA - Traffic data submitted on an AUTOVON switch.
SZZZDNS/Rmks Narrative XXXX	DINSPOT - Outage and restoral status, or hazardous condition of an AUTODIN switch.
SZZZDND/Rmks Narrative XXXX	DINDATA - Traffic data submitted on an AUTODIN switch.
SZZZAVS/Rmks Narrative XXXX	AUTOSEVOCOMSPOT - Outage and restoral status or hazardous condition of an AUTOSEVOCOM station.
SZZZHAZ/Rmks Narrative XXXX	STATION HAZCON - Used to report hazardous conditions on reporting and reported-on stations.
SZZZJOSS/Rmks Narrative XXXX	JOINT OVERSEAS SWITCH - Outage and restoral status, or hazardous condition of a JOSS switch.
SSUBCBL/Rmks Narrative XXXX	Outage and restoral status, or hazardous condition of a submarine cable and its supporting facilities; i.e., cablehead and associated transmission equipment. This subject will be used when link or trunk numbers are not available, or when directed by a DOCC element.
SCABLES/Rmks Narrative XXXX	Outage and restoral status, or hazardous condition of a cable other than submarine. This subject will be used when link or trunk numbers are not available, or when directed by a DOCC element.

SEZZDSCS/Rmks Narrative XXXX	Outage and restoral status, or hazardous condition of a military satellite station.
SCOMSAT/Rmks Narrative XXXX	Outage and restoral status, or hazardous condition of a commercial satellite station.
SISOL/Rmks Narrative XXXX	DCS station isolation, isolation of CINC's embassies unified commands, and specified commands from the DCS. Isolation of facilities without reporting designators are also included.
SEQUIPT/Rmks Narrative XXXX	Outage and restoral of specific equipment.
STSO/Rmks Narrative XXXX	Activation, deactivation, or reconfiguration of a circuit when this subject is specifically designated by a DOCC element.
SSPOT/Rmks Narrative XXXX	Information on a subject not otherwise covered herein, submitted by a DOCC element or DCS reporting station and destined ultimately for NCS/ DCAOC.
SEURSPOT/Rmks Narrative XXXX	Same meaning as SPOT, except destined for DCA-EUR.
SPACSPOT/Rmks Narrative XXXX	Same meaning as SPOT, except destined for DCA-PAC.

APPENDIX XII

COMSPOT & COMSTAT

REPORT FORMATS

	CARD COL.	READ POS.	FUNCTION	LEGAL CHARACTERS
Message 1	1	1	Start of Message 1	@ (4 and 8 Punch)
	2-11	2-11	Memory Word	0-9 and A-F
	12	--	None	None
	13	12	Memory Address	1-8
	14	13	Memory Address	1-4
	15-17	14-16	Memory Address	1-6
	18	17	End of Message 1	/ (0 and 1 Punch)
Message 2	19	18	Start of Message 2	* (4, 8 and 11 Punch)
	20-29	19-28	Memory Word	0-9 and A-F
	30	—	None	None
	31	29	Memory Address	1-8
	32	30	Memory Address	1-4
	33-35	31-33	Memory Address	1-6
	36	34	End of Message 2	# (3 and 8 Punch)

Figure 1. Memory Card Data

```
VONSWMEMORY                                                          ┐
AAAAAA                                                               │
tttt                                                                 │ Heading
mm/dd/yyyy                                                           │
#                                                                    ┘

xxxxxxxxxx zzzzz xxxxxxxxxx zzzzz xxxxxxxxxx zzzzz xxxxxxxxxx zzzzz  ┐
xxxxxxxxxx zzzzz xxxxxxxxxx zzzzz xxxxxxxxxx zzzzz xxxxxxxxxx zzzzz  │
.                                                                    │ Data
.                                                                    │
.                                                                    │
xxxxxxxxxx zzzzz xxxxxxxxxx zzzzz                                    ┘

ENDVONTDCM                                                           ┐
mm/dd/yyyy                                                           │
nnnnnnntttt                                                          │ Ending
E                                                                    │
(ends with ten blank lines).                                         ┘
```

SIZE: Variable-depends on whether full or section printout is requested, whether printout is interrupted or aborted and the number of revisions

DEFINITIONS:

VONSWMEMORY	= Alphabetic characters identifying the output as a 490L Memory printout
AAAAAA	= Switch at which printout was generated
tttt	= Time printout is started
mm/dd/yyyy	= Month, day and year
#	= Part number, print in parts if interrupted
xxxxxxxxxx	= Positions two (2) thru eleven (11) - Memory data
zzzzz	= Positions twelve (12) thru sixteen (16) - Memory address
ENDVONTDCM	= Identifier for finish of printout
nnnnnnn	= Day of week
E	= End of message character

USE: Page copy output from magnetic tape of 490L Memory at Operator request

Figure 2. Full or Section Printout Format - 490L Memory

```
VONSWMEMORY                                          }
AAAAAA                                               } Heading
tttt                                                 }
mm/dd/yyyy                                           }

@ xxxxxxxxxx zzzzz /* xxxxxxxxxx zzzzz #             } Data

ENDVONTDCM                                           }
mm/dd/yyyy                                           }
nnnnnnntttt                                          } Ending
E                                                    }
(ends with ten blank lines)                          }
```

SIZE: Normally 27 lines of varying length as shown but if revisions have been made to the specified address they will be included in the data section as additional lines.

DEFINITIONS:

VONSWMEMORY	= Identifier for 490L Memory printout
AAAAAA	= Switch at which printout was generated
tttt	= Time printout is started
mm/dd/yyyy	= Month, day and year
@	= Position one (1) - start of message 1 character
xxxxxxxxxx	= Positions (2) thru eleven (11) - Memory data from message 1 and positions nineteen (19) thru twenty-eight (28) - Memory data from message 2
zzzzz	= Positions twelve (12) thru sixteen (16) - Memory address from message 1 and positions twenty-nine (29) thru thirty-three (33) - Memory address from message 2
/	= End of message 1 character
*	= Start of message 2 character
#	= End of message 2 character
ENDVONTDCM	= Identifier for finish of printout
nnnnnnn	= Day of week
E	= End of message character

USE: Print out stored information for single 490L Memory address at Operator request

Figure 3. Single-Word Printout - 490L Memory

VONSAREQCDC AAAAAA hhkkll	Heading
mm/dd/yyyy HH cc	Hour Entry
II oooo p r ddddddddd TTTT ssss	Initial Entry
RT nnnn qqqq	Release Time Entry
ENDASREQCD mm/dd/yyyy hhkkll E	Ending

SIZE: Variable-determined by number of hour, initial and release time entries between start and end or interruption.

DEFINITIONS:

VONASREQCDC	= Identifier for start of call data collection
AAAAAA	= Switch at which report was generated
hhkkll	= Numeric characters giving the time the heading or ending was recorded in hours, minutes and seconds.
mm/dd/yyyy	= Month, day and year
HH	= Identifier for hour entry
cc	= Numeric characters giving hour
II	= Identifier for initial entry
oooo	= Numeric characters giving originating trunk identity
p	= Numeric character giving precedence
r	= Numeric character giving route
ddddddddd	= Numeric characters giving dialed digits
TTTT	= Numeric characters giving terminating trunk
ssss	= Numeric characters giving final matrix connection time in minutes and seconds
RT	= Identifier for release time entry
nnnn	= Numeric characters giving release time in minutes and seconds
qqqq	= Numeric characters identifying line or trunk to which the entry applies
ENDASREQCD	= Identifier for end of call data collection
E	= End of message character

USE: Call Data Collection reports on magnetic tape and for printing on teletype.

Figure 4. Output Format - Call Data

```
VONSCHEDTDC                                                          ┐
AAAAAA                                                               │
tttt                                                                 ├ Heading
mm/dd/yyyy                                                           │
                                                                     ┘
(1)                                                                  ┐
xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx │
(2)                                                                  │
xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx │
.                                                                    ├ Data
.                                                                    │ 200 pairs
.                                                                    │ of lines
(200)                                                                │
xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx ┘
                                                                     ┐
ENDVONTDCM                                                           │
mm/dd/yyyy                                                           ├ Ending
nnnnnnntttt                                                          │
E                                                                    │
(ends with ten blank lines)                                          ┘
```

SIZE: 426 lines of varying length as shown

DEFINITIONS:

VONSCHEDTDC	= Identifies the output as a long-format report
AAAAAA	= Alphanumeric characters identifying the Switch at which the report was generated
tttt	= Ending time of report
mm	= Month
dd	= Day
yyyy	= Year
xxxxxx	= 2000 count readings
ENDVONTDCM	= Identifies the finish of the message
nnnnnnn	= Day of the week
E	= End-of-message character

USE: Scheduled traffic data collection reports on optional teletype page copy.

Figure 5. Output Format - Long Report

VONSPREQTDC AAAAAA tttt mm/dd/yyyy	Heading
(01 111c) xxxxxx (02 111c) xxxxxx . . . (20 111c) xxxxxx	Data - 20 lines (if less than 20 items specified for report, 111c and xxxxxx replaced with X's)
ENDVONTDCM mm/dd/yyyy nnnnnnntttt E (ends with ten blank lines)	Ending

SIZE: 65 lines of varying length as shown

DEFINITIONS:

VONSPREQTDC	= Identifies the output as short format report
AAAAAA	= Alphanumeric characters identifying the Switch at which the report was generated
tttt	= Ending time of report
mm	= Month
dd	= Day
yyyy	= Year
111	= Line number of item in long format
c	= Column number of item in long format
xxxxxx	= Count readings
ENDVONTDCM	= Identifies the finish of the message
nnnnnnn	= Day of the week
E	= End-of-message character

USE: Special-request data collection reports on the teletype page copy.

Figure 6. Output Format - Short Report

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER: 64295	2. GOVT ACCESSION NO.
3. RECIPIENT'S CATALOG NUMBER	
4. TITLE (and Subtitle): Final Report for the Exploratory Systems Control Model Development, Vol II	5. TYPE OF REPORT & PERIOD COVERED: Final Report July 77 - Jan 78
6. PERFORMING ORG. REPORT NUMBER	
7. AUTHOR(s)	8. CONTRACT OR GRANT NUMBER(s): DCA 100-76-C-0081
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Burroughs Corporation, Federal and Special Systems Group, Paoli, PA 19301	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: Task 15203, P.E. 33126
11. CONTROLLING OFFICE NAME AND ADDRESS: Defense Communications Engineering Center, 1860 Wiehle Avenue, Reston, VA 22090	12. REPORT DATE: Jan 78
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	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

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17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

Same as 16

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

loop, ring, system control, Defense Communications

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

UTEK Systems, Inc. completed Task 1 of the study for the Exploratory Systems Development Model. This study is based on the present day policies and procedures promulgated and published by DCA. The study has been accomplished in the perspective of the 1980 Defense Communication Systems (DCS).

It assumes that the reporting policies for the future would remain the same, however, the mechanisms for reporting and the information content of these reports may well vary. It also assumes that the basic purpose of the DCS

20. Abstract (Cont'd)

is to provide a level of performance to all customers.

Burroughs Corporation

Federal and Special Systems Group

Paoli, Pennsylvania 19301

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