DATA COMMUNICATIONS

GCOS 7

**DPS 7 Communications Processing facility
Volume 2 : Network Generation**

SOFTWARE

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USER'S GUIDE

DATA COMMUNICATIONS
GCOS 7

DPS 7 Communications Processing Facility
Volume 2 : Network Generation

Software

Subject : This manual describes the Communication Network Configurator through which the network is generated.

Special Instructions : This Revision 1 is valid for GCOS 7-V2 users. It replaces Revision 0 with its Addendum A which remains valid for GCOS 7-V1 users.
Change bars are provided to indicate technical modifications.

Software Supported : GCOS 7-LS Release V2
GCOS 7-MS Release V2
GCOS 7-ES Release V2

Date : June 1985

Suggestions and criticisms concerning the form, content, and presentation of this manual are invited. A form is provided at the end of this manual for this purpose.

PREFACE

This manual describes the Communications Network Configurator through which the communications network is generated.

The term "DPS7", used throughout this manual, also refers to "Level 64" and to "64/DPS", as applicable to the reader's host installation. Similarly, the term "GCOS" refers to GCOS-7 (reserved for DPS7 users, or GCOS-64, as relevant), and covers the system software as well as firmware, as opposed to the hardware for which GCOS has been realized.

TRANSPAC is relevant specifically to the French public network, and its use may be contracted for through a PTT subscription.

This manual is intended for the systems engineer and programmer/analyst, to set up and tailor the networking environment for DPS7 communications systems.

Section I deals with the general concepts of communications for DPS7 installations, and provides a partial synopsis of "Communications Architecture".

Section II introduces the DPS7 Systems Communications Network Configurator (i.e., CNC), develops the particular aspects of primary network and TRANSPAC configuration at greater length, and provides a brief introduction to Distributed Systems Access Control (i.e., DSAC) in the perspective of making provision for this in the user's network description.

Section III describes the CNC utility itself, including the optional environment, utility launching, and an overview of the CNC command language.

Section IV gives the GENCOM command, always presented before any other elements of the command language to CNC execution. Two other commands, COMM (for the insertion of comments) and IDSEQ, which may appear anywhere in the CNC command file, are also covered here.

All other CNC commands must be presented to CNC execution within certain command groups, of which there are two (apart from that of GENCOM itself). Section V describes the first of these command "groups", more specifically those commands which deal with the secondary network, with primary link exits, with the VCAM subsystem, and with queues.

Section VI covers those commands which would normally have appeared in Section V except that they are specific to the TRANSPAC French public data network. This section may be completely disregarded, therefore, by all users who are not interested in TRANSPAC.

Section VII deals with all CNC commands which belong in the third group, those relevant to objects in the DSA primary network as well as those relating to DSAC objects.

Finally, Section VIII discusses the subject of network tuning. This is divided into the three specific areas of BTNS/URP (i.e., Basic Terminal Network Support and Unit Record Processor), FNPS (i.e., Front-end Network Processing System), and MAM (i.e., Message Access Method).

Appendix A explains the various sysout reports in detail, which provides information on how to generate the network and later to tune it.

Appendix B covers the BTNS, FNPS and QMON sections of the Job Occurrence Report.

Appendix C lists all the CNC error messages possible, both for the Job Occurrence Report as well as for the CNC Sysout Report.

Appendix D identifies all keywords that are reserved for the CNC syntax, and also includes keywords both for future releases and for compatibility with previous releases.

Appendix E gives a summary of the terminals that may be supported for the URP's DCC (i.e., Data Communications Controller) for MAM and for the various VCAM subsystems, as well as of the way in which they may be used.

Appendix F compares DPS7's primary network commands with those of the other systems with which it may require to communicate within a DSA environment.

Appendix G presents the new CNC commands, as compared with the commands from previous releases which they replace.

Appendix H summarizes GCOS7-V2 CNC compatibility with previous releases.

Appendix I describes the H_SVSRST utility, which permits the SRST to be copied onto another file for security and testing purposes.

The following publications may be referred to for further details of topics mentioned in this manual:

● For DSA concepts and DPS 7 networking:

   ● 47 A2 0 IUC Communications Architecture

   ● 00 A2 8932 Network Configuration Guide

● For distributed system administration and control:

   ● 47 A2 I5UC DSAC User Guide

- For GCOS-7 user applications, communications services and utilities:

  - 47 A2 02UT TLS User Guide - for TDS applications

  - 47 A2 03UC MCS User Guide - for MCS applications and QMAINT

  - 47 A2 01UJ - 04UJ IOF Terminal User's Reference Manual

  - 46 A2 CQ15 Diskette and CARDLESS Facility User Guide

  - 47 A2 11UC Remote Facilities - for RBF6 and FTF6

  - 47 A2 12UC Remote Facilities - for LJP and UFT7

- For GCOS-7 front-end processor management, within a DSA environment:

  - 47 A2 06UC Network Administrative Supplement

- For GCOS-7 communications operator interface:

  - 47 A2 05UC Network Control Terminal Operations

  - 47 A2 04UC Terminal Operations

- For information on the DN7100 and DSA:

  - 15 A2 8023 DN7100 System Operations Manual (for DNS B2)
  - 39 A2 9799 DN7100 System Operations (for DNS C)

  - 15 A2 8024 DN7100 System Generation (for DNS B2)
  - 39 A2 9807 System Generation (for DNS C)

  - 15 A2 8026 DN7100 System Introduction (for DNS B2)
  - 39 A2 9805 DNS Concepts (for DNS C)

  - 39 A4 15DM DN7100 Overview

  - 15 A2 8028 DN7100 Terminal User Guide (for DNS B2)
  - 39 A2 9820 DN7100 Terminal Management Ref. Manual (for DNS C)

  - 39 A2 8025 Network Optimization Guide

  - 39 A2 8849 Network Administration Guide

  - 39 A2 8932 Network Configuration Guide

- For preliminary information on the DCU7010 adaptor:

  - 15 FI 7902 Manuel de Preparation de Site DCU7010/7011

- For information on TRANSPAC:

  - Specifications Techniques d'Utilisation du Reseau (STUR)

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- For information on DPS7 queue file preparation utilities:

  - 47 A2 05UF DMU User Guide

- For general information on DPS7 installations:

  - 47 A2 04UG System Overview

  - 47 A2 01US System Administrator's Guide

  - 47 A2 02US System Installation Configuration and Updating Guide

  - 47 A2 01UU System Operator's Guide

Suggestions and criticisms concerning the form, content and purpose of this manual, are invited. A Technical Publications Remarks Form is included at the end of the manual for this purpose.

CONVENTIONS USED IN THIS MANUAL

Headings/Titles

Each section of this document is structured according to the heading hierarchy shown below, each heading indicating the relative level of the text which follows it:

LEVEL	HEADING FORMAT
1 (highest)	ALL CAPITAL LETTERS, UNDERLINED
2	Initial Capital Letters, Underlined
3	ALL CAPITAL LETTERS, NOT UNDERLINED
4 (lowest)	Initial Capital Letters, Not Underlined

Command Names versus Parameter Keyword Names

All JCL code which must be submitted to the system "as-is", is shown in capital letters.

The number of synonyms between command names and parameters could lead to a certain amount of confusion on the part (at any rate) of the new user.

For this reason, the following convention is used:

- Parameter keywords and values are enclosed in inverted commas, in the text; e.g.:

      ... with the "NR = xxx" keyword.

- Command names, on the other hand, appear without any quotation marks; e.g.:

      ... must be defined with an NR command.

"Metalanguage" Conventions

In the pages dealing which each JCL command that may be issued to the CNC utility, metalanguage conventions are used to show the logical relationships between the various names and keywords, under the heading "Command Format".

OPTIONAL PARAMETERS

These are enclosed in "square parentheses"; e.g.:

      [, SC = (rsc-name-list)].

ALTERNATIVE PARAMETERS

These symbols are usually used to indicate keyword synonyms where available, e.g.:

      (PROFILE¦PF) = "pf-definition"

... where:

(precedes the first alternative

¦   is used to separate each of the alternatives from each other

)   follows the last of the alternatives shown.

Note that NONE of the above conventions should be included in code submitted to the system.

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Figures

TABLES/DETAILS OF TERMINALS

NETWORKING ENVIRONMENT

GCOS allows distributed processing over DSA networks. From an
external point of view, applications (or terminals) located on (or
connected to) a given system dialog with other applications on a
(potentially) different system.

Distributed applications may be either:

● Bull standard distributed functions like DJP (Distributed Job
  Processing), UFT7 (Unified File Transfer), etc.

● User applications (like MCS programs or transaction programs
  running under the control of TDS).

DPS7 systems may be connected physically to the network through
either:

● A specialized communications controller (DCC) integrated in the
  Unit Record Processor (URP)

● A specialized (front-end) communications processor, the Datanet
  DN7100 connected to the computer through a Peripheral Subsystem
  Interface (PSI).

COMMUNICATIONS SOFTWARE COMPONENTS

GCOS's communications software components may be classified in four categories:

- Network management components
- GCOS communications services
- User applications
- System utilities.

Figure 1-1. Schematic Example: DPS7 Networks
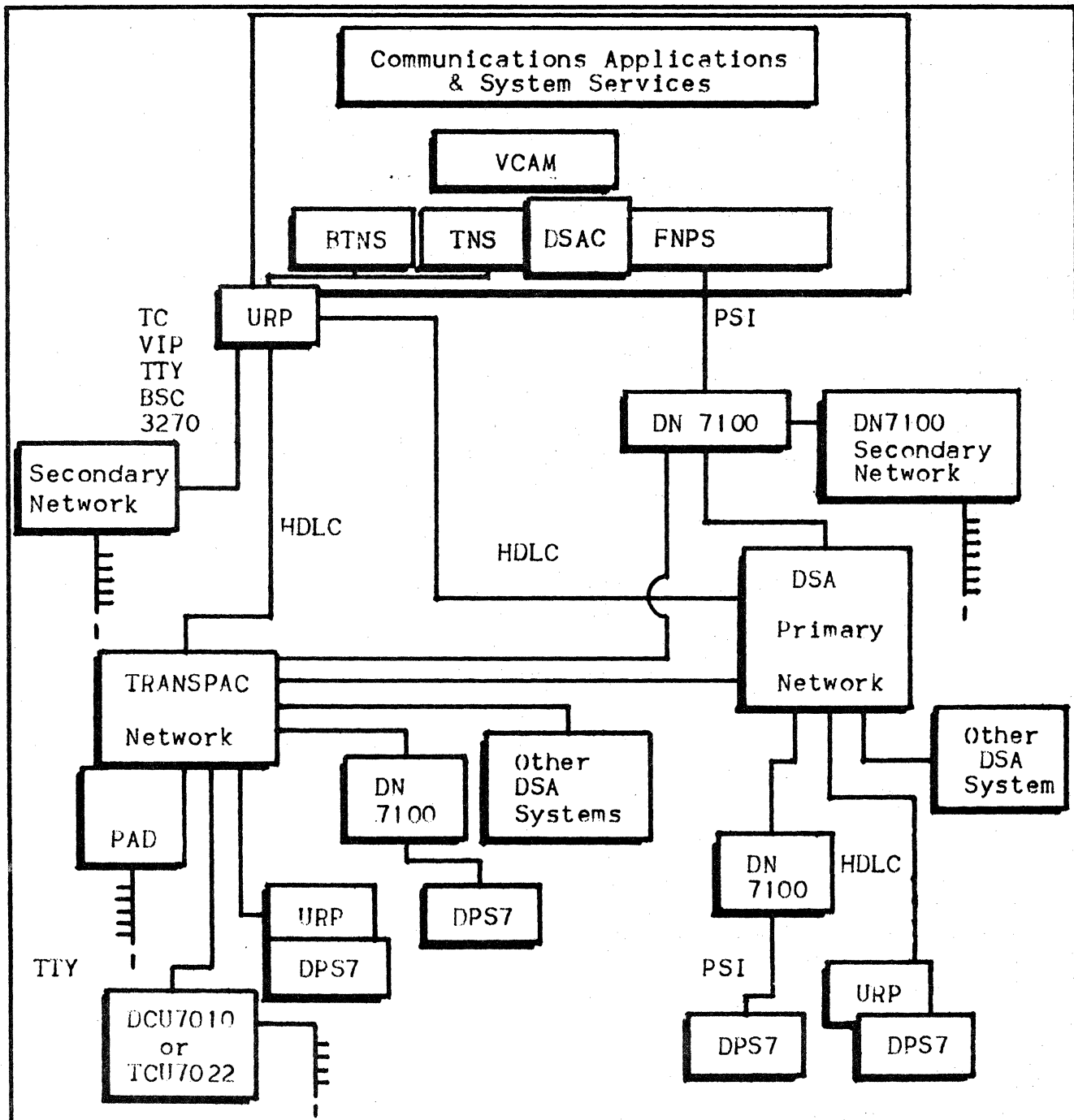
Network Management Components

The Network Management components handle the transport of information as well as providing an interface with the network for GCOS communications services and user applications programs.

These components comprise the following:

● Basic Terminal Network Support

● Transport and Network Support

● Front-end Network Processor Support

● Administrative Module

● Network Administrative Storage Facility

● Virtual Communications Access Method.

BASIC TERMINAL NETWORK SUPPORT (BTNS)

BTNS is a GCOS service job which handles communications through the data communications controller of the URP:

● Providing for data exchanges over URP/DCC lines

● Ensuring the network control operator interface

● Assuring the logical connection of terminals.

TRANSPORT AND NETWORK SUPPORT (TNS)

The functions of TNS provide support for the DSA primary network, over the URP of the DPS 7.

LISTRIBUTED SYSTEM ACCESS & CONTROL (DSAC)

Allows administration of the DSA primary network supported by TNS and FNPS.

FRONT-END NETWORK PROCESSOR SUPPORT (FNPS)

FNPS is the GCOS service job which handles communications through a
LN7100 functioning as a front-end processor.

The transport module manages I/O requests over the logical channels
of the PSI.

There are as many FNPS service jobs as there are DN7100 front-end
processors currently attached to the system.

ADMINISTRATIVE MODULE (ADM)

ADM is the GCOS service job which handles the loading, dumps and
generation for a DN7100 functioning as a front-end processor. There
are as many ADM service jobs as there are concurrently active load,
dump and generation functions.

NETWORK ADMINISTRATIVE STORAGE FACILITY (NASF)

NASF is a GCOS service job which supports:

● Network DSA logging

● The standard ASF (Administrative Storage Facility) function

● Support of the ADM service: i.e., DN7100 teleload and dump
  functions as well as DN7100 on-line test loading.

There are as many NASF service jobs as there are NASF activities
currently required on the system: refer to the Network Administrative
Supplement, for further information on FEP management.

VIRTUAL COMMUNICATIONS ACCESS METHOD (VCAM)

VCAM is a system distributed function which provides GCOS
communications services and user applications programs with a common
interface to access or be accessed by remote users through either the
URP/DCC or the DN7100.

This is accomplished without the user being aware of either the real
communications path used or the mechanism used for handling the
connection.

GCOS 7 Communications Services

GCOS communications services are software components which interface
directly between VCAM and either:

● Allow GCOS functions to be made available to remote users such as
  IOF, UFT7, etc.

● Are needed by user application programs in order to interface with
  VCAM, such as TDS, QMON/MAM, etc.

IOF

The Interactive Operation Facility is a general purpose time-sharing service which allows the user unrestricted interactive access to the system.

RBF6

These are remote batch facilities which allow the transfer and control of jobs and data between the system and remote DPS 6 stations.

CARDLESS

CARDLESS, known to the system by the reserved name READER, enables the user to dispense with the card reader by allowing jobs and data to be introduced from diskette.

DJP

Distributed Job Processing

UFT7

Unified File Transfer facility between two DPS7s

FTF6

File transfer between DPS7 and a remote DPS 6.

TDS

The Transaction Driven Subsystem constitutes an interface between user-provided transactions and VCAM, and is executed as a job step.

QMON/MAM

The Queue MONitor and the Message Access Method are services which ensure an interface between MCS applications and the network management component.

Usor Applications

The two main types of user applications are:

● Transaction programs written in COBOL or RPG

● MCS applications written in either MCS COBOL or GPL.

TRANSACTIONS

Transactions are linked into private sharable modules and, on TDS
execution, are dynamically linked to the TDS Executive.

The advantage of dynamic linking is that the TDS load module need not
be regenerated each time that the transaction is modified.

MCS APPLICATIONS

MCS applications communicate through MAM queues with terminals,
remote and local programs. Each MAM queue is user-defined.

One specific MCS application is QMAINT, a system utility which allows
the user to perform maintenance and simulation functions on his MAM
queues; see the MCS User Guide.

System Utilities

The system utilities concerned with transaction functions are:

● The Communications Network Configurator (CNC, dealt with in this
  manual)

● Queue Maintenance (QMAINT); see the MCS User Guide

● The DSA Log File Editor; see Network Administration Utilities

● The DNS Dump Editor; see Network Administration Utilities.

NETWORK GENERATION

GCOS network-related tables are configured by the CNC utility program.

The principal tables and buffers built by CNC are shown in Figure 1-2. These tables are built according to:

● The user's needs, as explicitly defined through CNC commands

● DPS7 hardware and firmware configuration, as defined at firmware generation and represented in the SRST (i.e., the System Resource and Status Table, which is not modifiable by the user but is readable by software: described below).

Figure 1-2. Schematic of Tables: DPS7 Communications Components

Figure 1-2. Schematic of Tables: DPS7 Communications Components
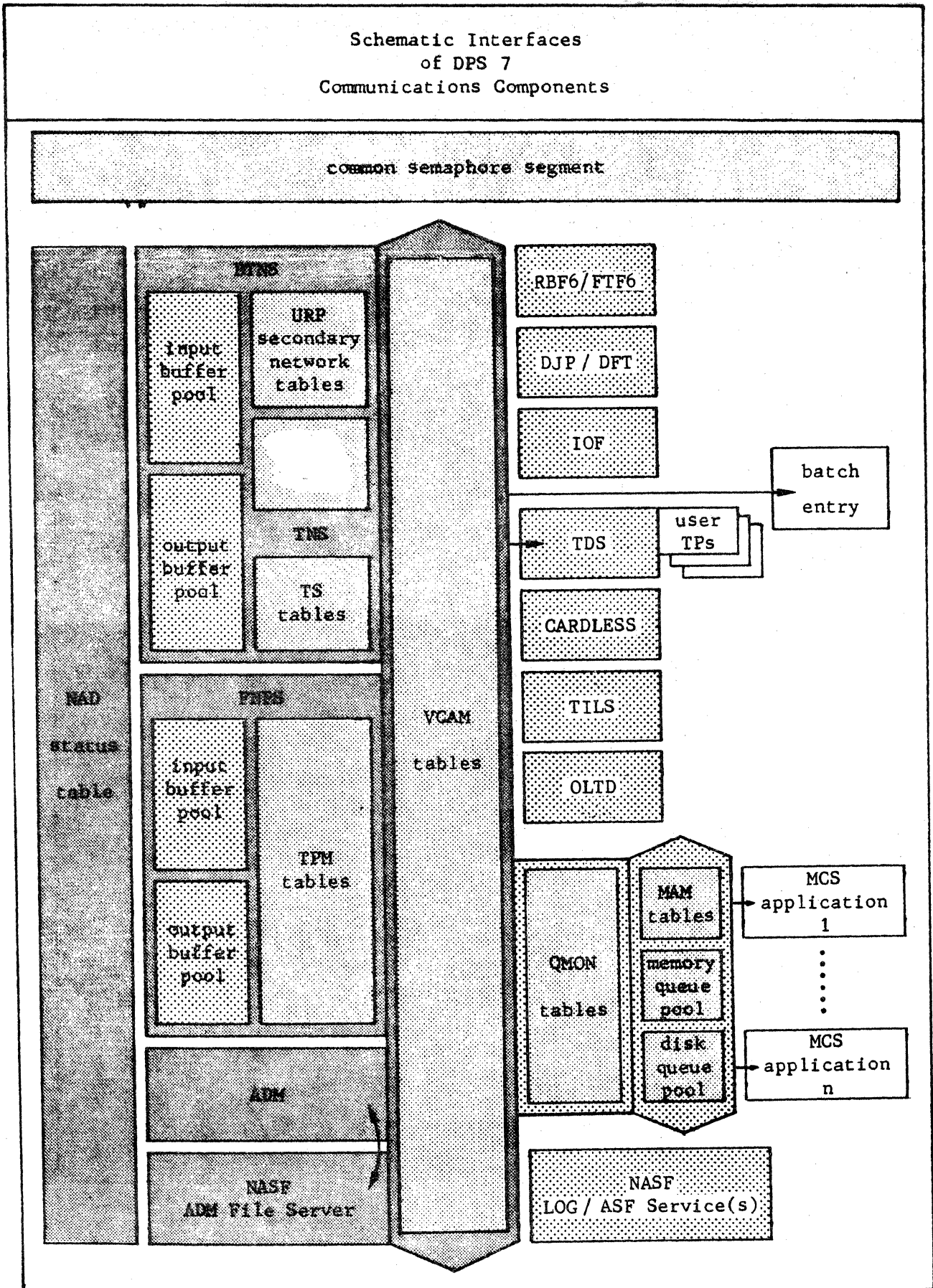
BTNS

URP/DCC network tables are shared by BTNS and TNS, and are generated from:

- The contents of the SRST

- The GENCOM, LINE, CLUSTER, STATN and TERMNL commands.

Transport station tables are used for supporting the TRANSPAC public data network and are generated from the LSUB, LLINE, RDTE and RDTN commands.

Input and output buffer pools are tailored from either:

- The GENCOM command parameters: NBDABF, DABFSZ, NBBTBF and BTBFSZ

- The CNC computation based on the URP/DCC network tables described above.

These tables are saved and initialized at BTNS start-up time.

TNS

Transport station tables are constructed from parameters supplied in the LTS and RTS commands.

FNPS

The transport module and administration module tables are generated from the:

- SRST contents

- FNP command.

The input and output buffer pools are used by TPM and are tailored from either:

- The FNP command parameters: INBFNB, INBFSZ, OUTBFNB and OUTBFSZ

- CNC computation based on the number of logical channels available for data exchanges.

These tables are saved and initialized at FNPS start-up time.

VCAM

VCAM tables are generated to an initial size computed by CNC and then
expanded or reduced dynamically at execution time, as determined by
the LINE and FNP commands.

The initial size of these tables is related to:

● Such factors as whether BTNS and/or FNPS are to be present

● Parameters provided in the DCTAP, LSC, FSC and RSC commands.

QMON/MAM

QMON and MAM tables are generated from:

● The QUEUE commands which specify memory queues

● The GENCOM command parameters: QCBLKSZ and QCPOOL.

The disk queue pool is generated from:

● The characteristics of the disk queue file: see the MCS User Guide |

● The QUEUE commands which specify disk queues

● The QDBLKSZ parameter of the GENCOM command.

Common Semaphore Segment

The common semaphore segment is a service segment generated
automatically by CNC and used by all the communications components.

NAD Status Table

The NAD Status Table is a list of entries for each communications
process group.

SECTION 2

NETWORK CONFIGURATION

INTRODUCTION

The various systems involved constitute the basic elements of a
network description. A system in this context is a set of hardware
and software resources under the control of an operating system. This
system is able to communicate with other systems and, to do this,
needs to support a minimum level of DSA functions. Such DSA-
compatible systems currently include:

● DPS7, Level 64 and 64/DPS

● DPS6

● DN7100, as either front-end processor or concentrator.

The network is not configured "centrally". An individual network
generation is performed for every system, each with its own
configuration language, to describe that system's "view" of the
network, including:

● Telecommunications software

● The terminals controlled

● The other systems with which it is to communicate, and how this is
  to be done.

It is crucial that all the different system configurations within a
network should be "coherent" with each other; see Appendix G.

Objectives of CNC

The goal of CNC is to describe the DPS7's "local" view of the
network. This network may consist only of a few terminals connected
to the URP/DCC; on the other hand, it might comprise a complex DSA
network of interconnected systems accessed via DN7100 front-end
processors.

CNC deals principally with the supervisory aspects of the network;
i.e., in DSA terminology, network and transport "layers", terminal
manager (BTNS).

In addition, CNC deals with some aspects of session control (VCAM)
and application control.

In the organization of a network, the two major considerations are:

1) The respective functional levels of application software on each of the systems involved; i.e., Application A at a given level on a given system may "talk" with Application B on another type of system. Such considerations should be independent of the actual physical means of conveying the data concerned between the two.

2) At a "lower" level, the physical and software "system connectibility" rules. A GCOS system is connectible to a network via two kinds of hardware:

   a) A front-end processor (DN7100), which is itself a DSA system. Connectibility in terms of terminals or other systems is limited by that of the DN7100 itself; see the DN7100 System Generation Manual. GCOS supports up to 6 PSI's connected to a maximum of 4 front-end systems; any given front-end processor may be connected via either:

   ● A single PSI; i.e., the most common case

   ● A twin PSI, which provides a fall-back PSI to avoid regenerating the network in the case of failure.

Figure 2-1. GCOS Connected via DN7100.

Host-to-front-end connection is made over the PSI.
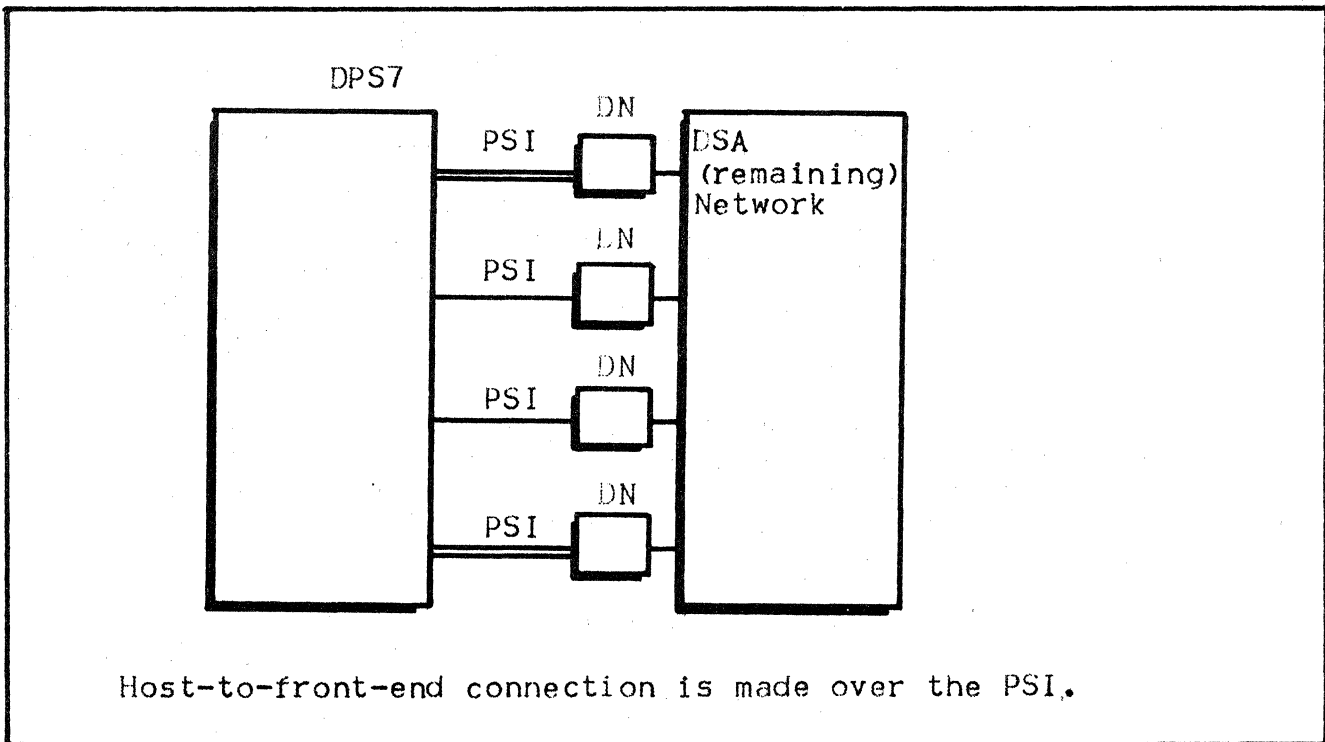
b) One or several Unit Record Processors; i.e., DCCs - or Data
   Communications Controllers - connected to the SURP and
   additional URPs. The connection is made via lines to terminals
   and/or other DSA systems. Generation of the URP/DCC(s) must be
   coherent with input to the CNC. The number of URP/DCCs is DPS7
   model-dependent and not limited by software, as is the number
   of lines connectible through them.

   (1) DCC connection through lines in VIP, TTY, TC, BSC2780 and
       BSC3270 protocol, to (stations and) terminals or to any
       hardware/software component simulating these devices; i.e.,
       mainly DPS6 systems emulating VIP stations, Polled VIP
       Emulator.

Figure 2-2.
DCC Connection via Lines in VIP/TTY/TC/BSC2780/BSC3270 Procedure.
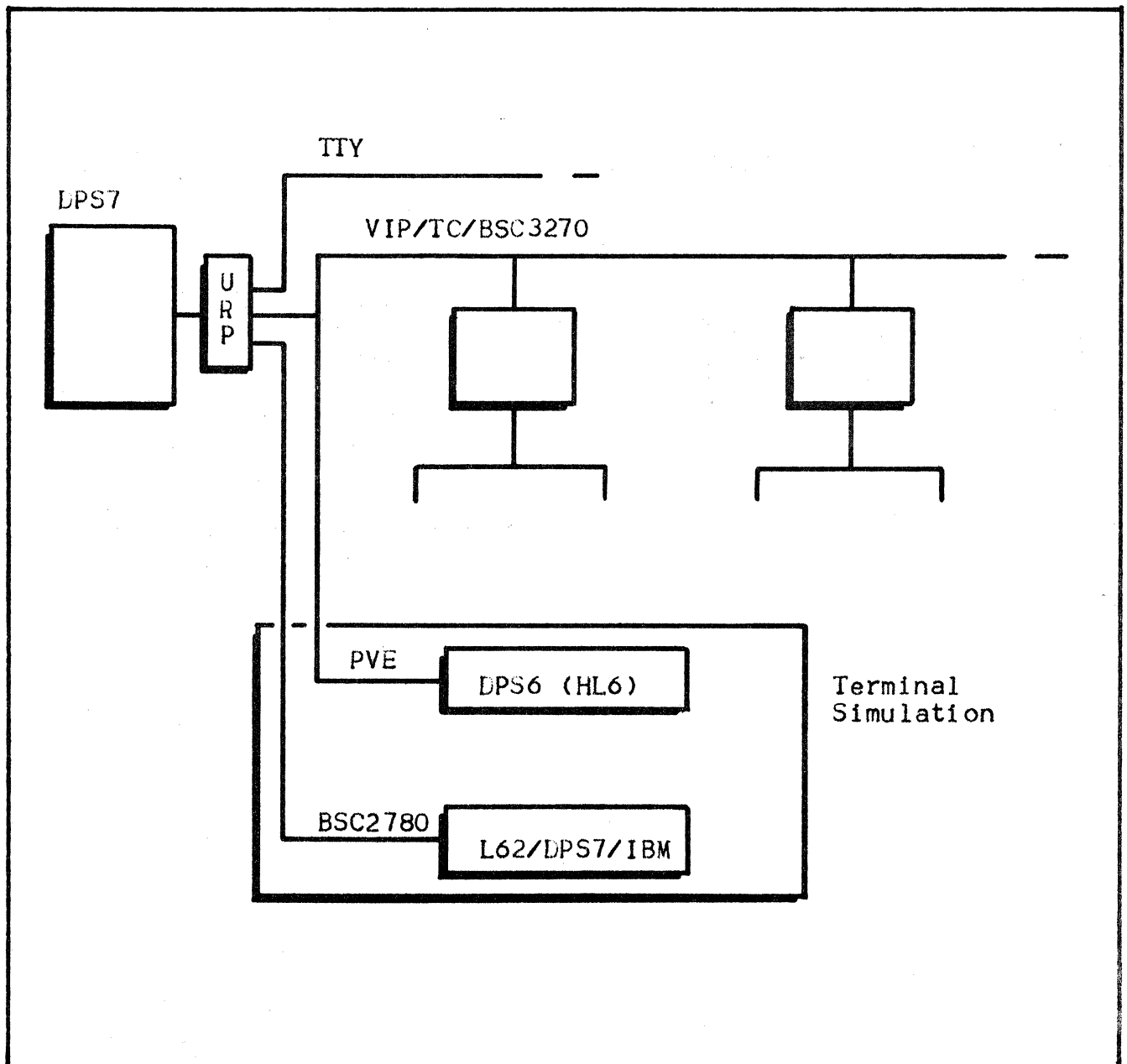
(2) DCC connections through HDLC lines to terminals via TRANSPAC.

Figure 2-3. DCC Connection via TRANSPAC.
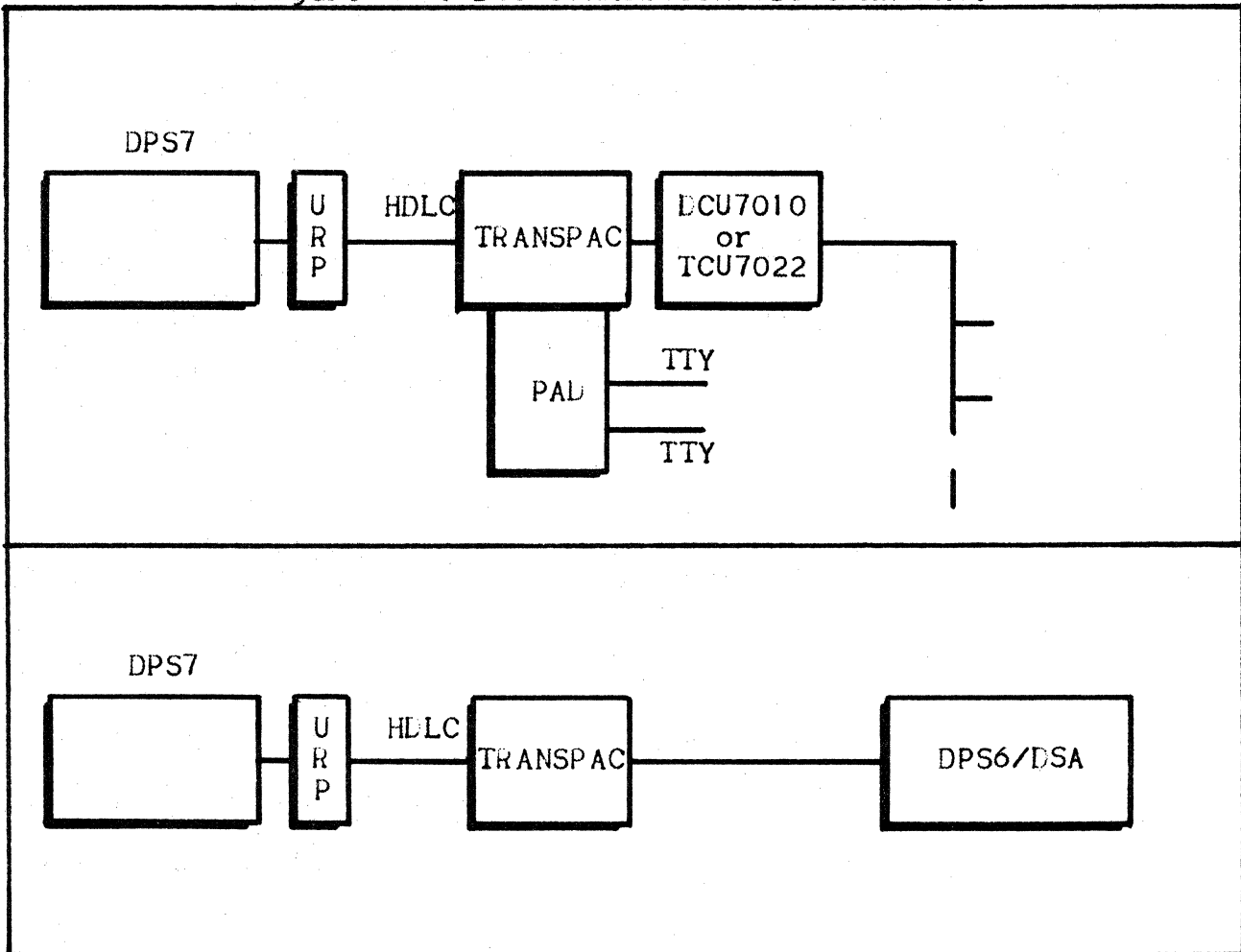
(3) DCC connections through HDLC lines to DSA systems. The
    configurations supported are depicted in Figure 2-4.

Figure 2-4. DCC Connection over a DSA Primary Network.
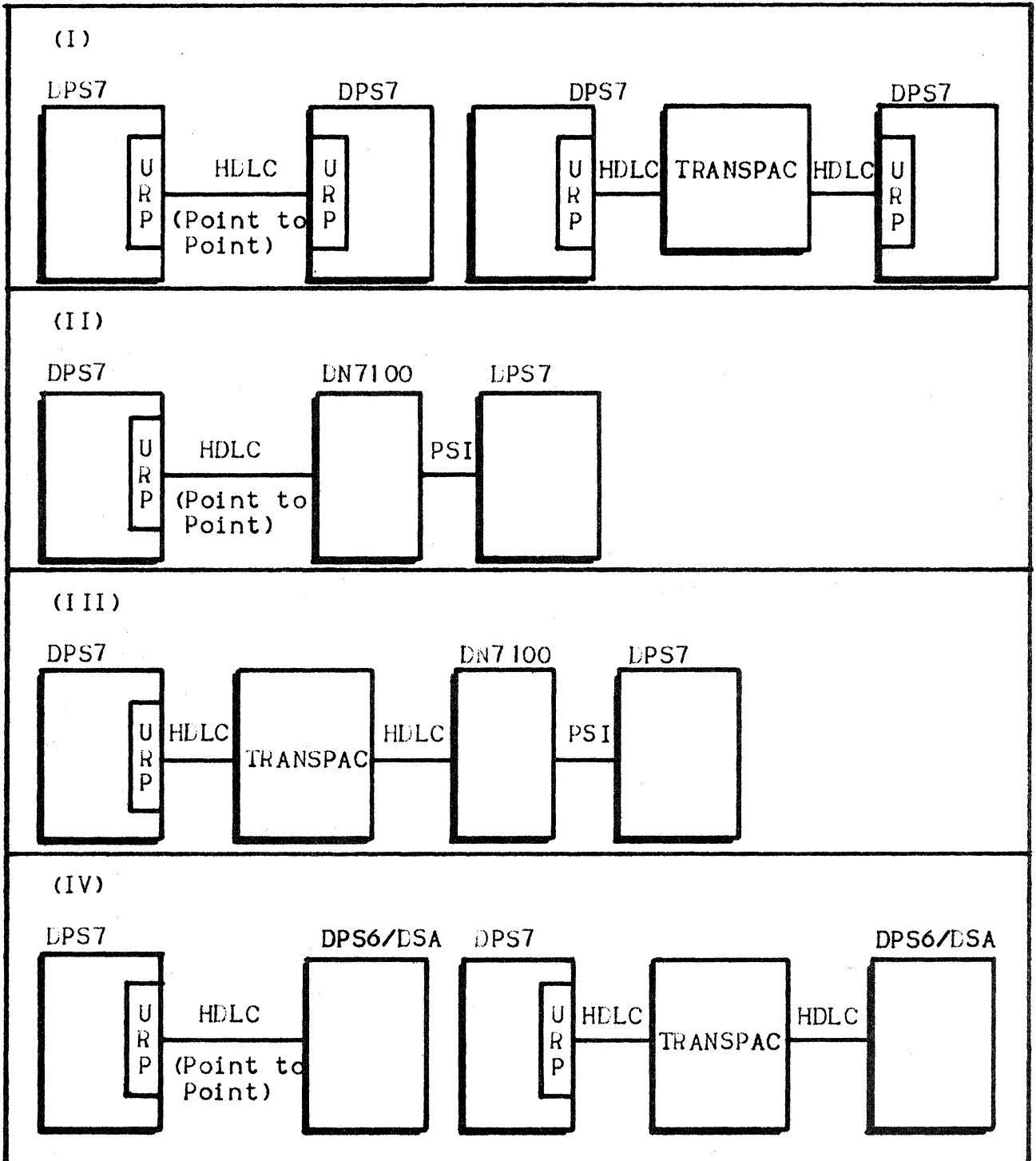
A DPS7 may simultaneously be connected physically to the network via both front-end processor and URP/DCCs. In this case, however, in order to reach a remote DSA system, it is necessary to specify statically at configuration (CNC) time, in an exclusive way, through which of the following the "local" exit is to be made, either:

● A specified front-end processor

● Any of the URP/DCCs.

The order in which the relevant RSC commands appear in the CNC utility's command file, implicitly defines the relative priority of these "local" exits. For example, configuring System A, it must be decided at configuration time whether System B is to be accessed by priority through one of:

● DN1

● DN2

● HDLC lines 3, 4, or 5; the system chooses the most appropriate link on each occasion. In order to modify access to System B, it is necessary either to rerun the configuration utility or use the MTP network operator command.

Figure 2-5. Multiple Connectibility.
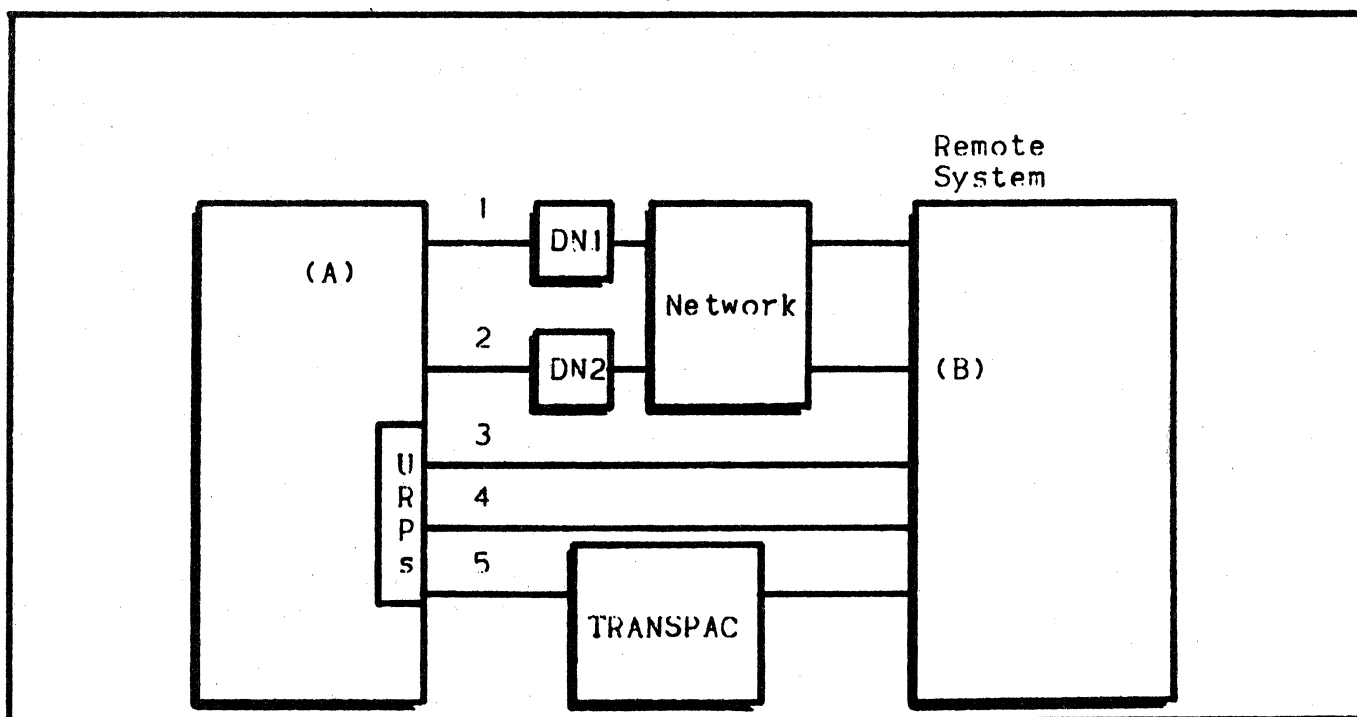
When DN1 is operational, outward connections towards (B) will be established through DN1. Should DN1 fail, the connection will be made through DN2. If DN1 then becomes operational again, subsequent connections will use this path; see the RSC command in Section 7, which includes an example of Figure 2-5.

PRIMARY NETWORK CONFIGURATION

From the point of view of the system being configured, a Primary Network may be defined here as being that part of the network which allows connection of the local system to remote systems.

For configuration of a primary network, the command set is:

LSYSTEM local system

FSYSTEM front-end system

RSYSTEM remote system

LSC   local session control

FSC   frontal session control

RSC   remote session control

LTS   local transport station

RTS   remote transport station

FNP   front-end processor

NR   network route

COMPATH communication path

XPRTC   transport protocol.

Some of these commands in fact refer to objects which have been declared by other commands; e.g., LSUB (GENNET), LINE, etc.

Certain network configuration commands applicable to earlier releases are still accepted; including:

● NODE a, LOCAL. b;

● FNP ...

● NODE c, FEP, d;

● NODE d, RMT, f;

Compatibility is conditional on there being no command set mix. It is strongly recommended that the new command set be used, for reasons of greater coherence with commands used for other DSA systems as well as the additional functionalities available; see Appendix H.

Configuration Methodology

The network should be built according to physical and logical connectibility (above).

a) Those systems of interest in the network should be represented:

- The "local" system; i.e., the system being configured

- The front-end system(s) connected to it

- The remote systems with which the local system wishes to dialog. These may be systems:

  - On which remote applications dialog with other applications on the local system

  - Requiring administrative functions from the local system, such as DSA logging.

The name of each system must be unique (within this object class) and comprises one to four alphanumeric characters. These system names are user-visible via the SITE = xxxx keyword in the command language. The following CNC commands are used for system configuration:

LSYSTEM: local system

FSYSTEM: front-end system(s)

RSYSTEM: remote system(s).

b) Represent the session controls associated with each of these systems.

The addressing entity of each application in the network comprises a session control name and a mailbox name. In the current implementation of DSA, all systems may support only one session control, the name of which is usually the same as that of the corresponding system. DPS7 systems respect this rule, to become mandatory for all systems in the future; for "multi-session control" systems, the rule applies at least to the first session control.

A session control comprises two elements:

- A name, of up to four alphanumeric characters, which must be unique in the system for this object class

- An identifier, of two bytes, which must also be unique in the network for this object class.

Session controls are defined with the CNC commands:

LSC, for "local" session control

FSC, for "front-end" session control

RSC, for "remote" session control.

For a front-end processor connected via twin PSI's, the FSC command must appear twice with the same name identifier, each related to a different FNP command.

Similarly, in the case of multiple exits towards a given remote system, an RSC command must appear (with the same name and identifier) as many times as there are local exits, where each RSC is related to a different FNP or RTS command (as appropriate).

c) Represent for (and between) each system the necessary transport elements: refer to the Communications Architecture Manual for a detailed explanation of transport mechanisms, as the following description constitutes only a "practical" user guide.

From the point of view of data transport, a remote session control (which, together with a mailbox, constitutes the application's "addressing entity") is accessible via "access paths". The two principal access path elements of interest to us here are:

● The "departure" transport station

● The "arrival" transport station.

These transport stations are currently located either:

● In front-end systems, attached either to the local system or to remote systems

● Within the local and/or remote systems themselves, in the case of URP/DCC usage.

The transport elements to be defined by the commands of CNC depend on the nature of these access paths:

(1) Transport stations include:

● The station attached to the local system, if the primary link is to be made through the URP/DCC

● The station(s) attached to the local system's front-end processor(s), if any

● "Arrival" stations located at remote systems (either on the URP/DCC or DN7100), only if these stations are implied by the access paths defined for the local system via its URP/DCC. If, on the other hand, the "departure" station(s) are attached to the local FEP, the corresponding emote stations are defined at FEP configuration time.

Transport stations are defined with the CNC commands:

> LTS, for a station located on the local system, attached to
> its URP/DCC
>
> FNP, for station(s) attached to the local system's DN7 100 (s)
>
> RTS, for relevant "arrival" stations located remotely.

(2) Access paths need be defined only if their "departure"
transport station is attached to the local system via the
URP/DCC.

Access paths represent:

- Network routes which comprise, with regard to the links
  currently supported:

  - The set of "exit physical line PLUS arrival transport
    station"

  - In the case of TRANSPAC, the potential virtual curcuits
    between the local system and the designated arrival
    transport station.

- The "communication paths PLUS local system exits" which
  comprise:

  - The exit physical lines concerned. Note that multiple
    links (i.e., the possibility for a COMPATH to be mapped
    over several physical links) are not supported

  - In the case of TRANSPAC, the local subscription.

Access paths are defined with the CNC commands:

> NR,   for the network route
>
> COMPATH,   for the communication path
>
> [XPRTC],   for the transport protocol, grouping all the
>   network route parameters.

Example

1) Definition of system, session control, and transport station:

Figure 2-6. Definition of System, Session Control and Station

System being   Network as seen from
Configured   Configured System

LSYSTEM   DPS7   HDLC Point to Point   DPS7 or DPS6/DSA
LSC   [ ]   RSYSTEM
LTS   RSC
                                                                       RTS

LSYSTEM   DPS7   DN7100   DPS7
LSC   [ ]   TRANSPAC   [ ]   PSI   [ ]   RSYSTEM
LTS   RTS   RSC

LSYSTEM   DPS7   PSI   DN7100   DSA   Any DSA System
LSC   [ ]   [ ]   Network [ ]   RSYSTEM
                                                                       RSC
                         FSYSTEM
                         FSC
                         FNP

LSYSTEM   DPS7   HDLC Point to Point   DPS7 or DPS6/DSA
LSC   [ ]   RSYSTEM
LTS   PSI   DN7100   RSC (access
                         [ ]   DSA   RTS)
                                    Network   RSC (access
                                                                       DN7100)
                         FSYSTEM   RTS
                         FSC
                         FNP

2) Configuration of a DPS7 connection to other DPS7 systems via
point-to-point lines, TRANSPAC and front-end processors:

Figure 2-7. System Configuration - Network Layout

Figure 2-8. System Configuration - Phase 1
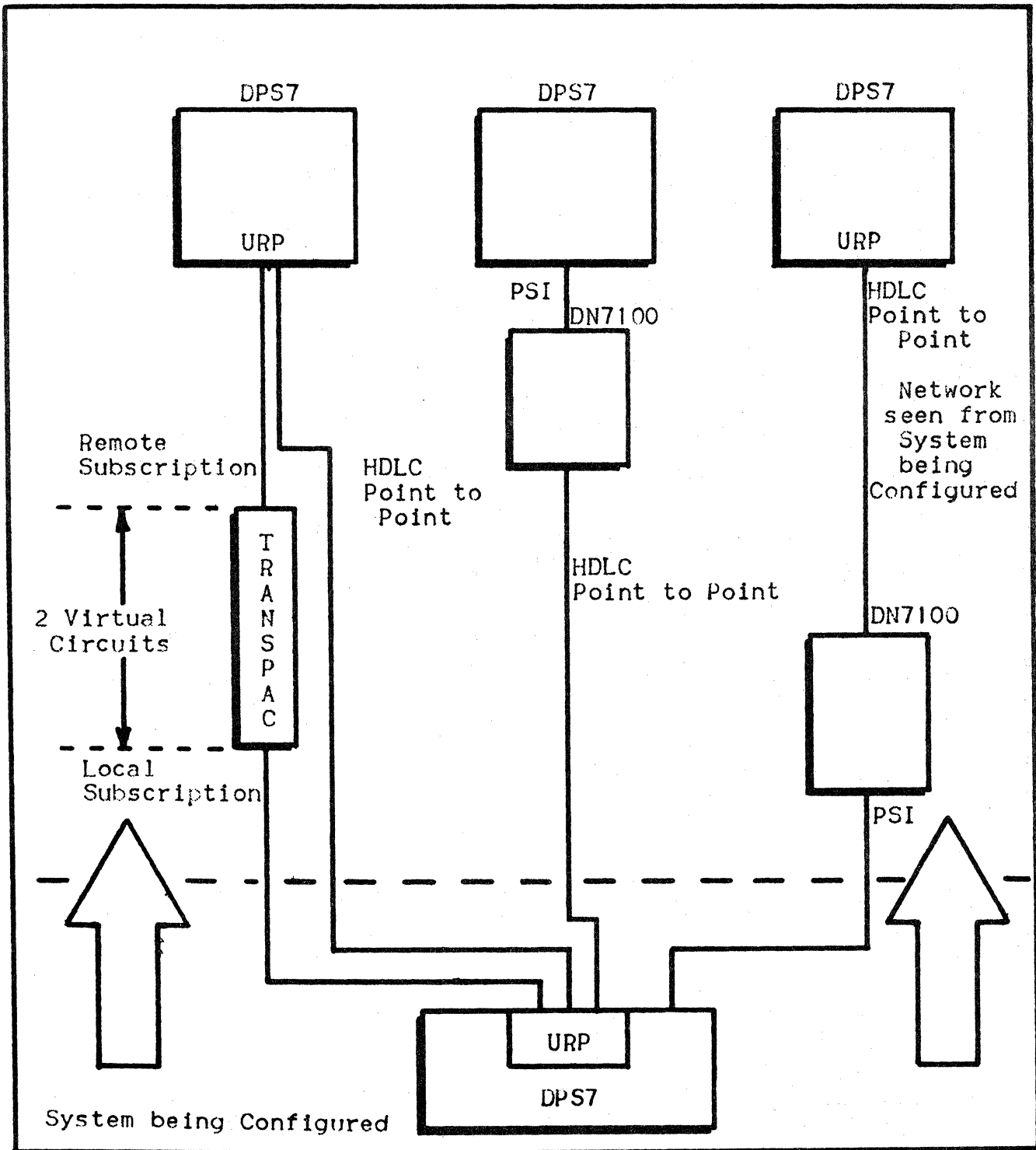
Figure 2-8. System Configuration - Phase 1
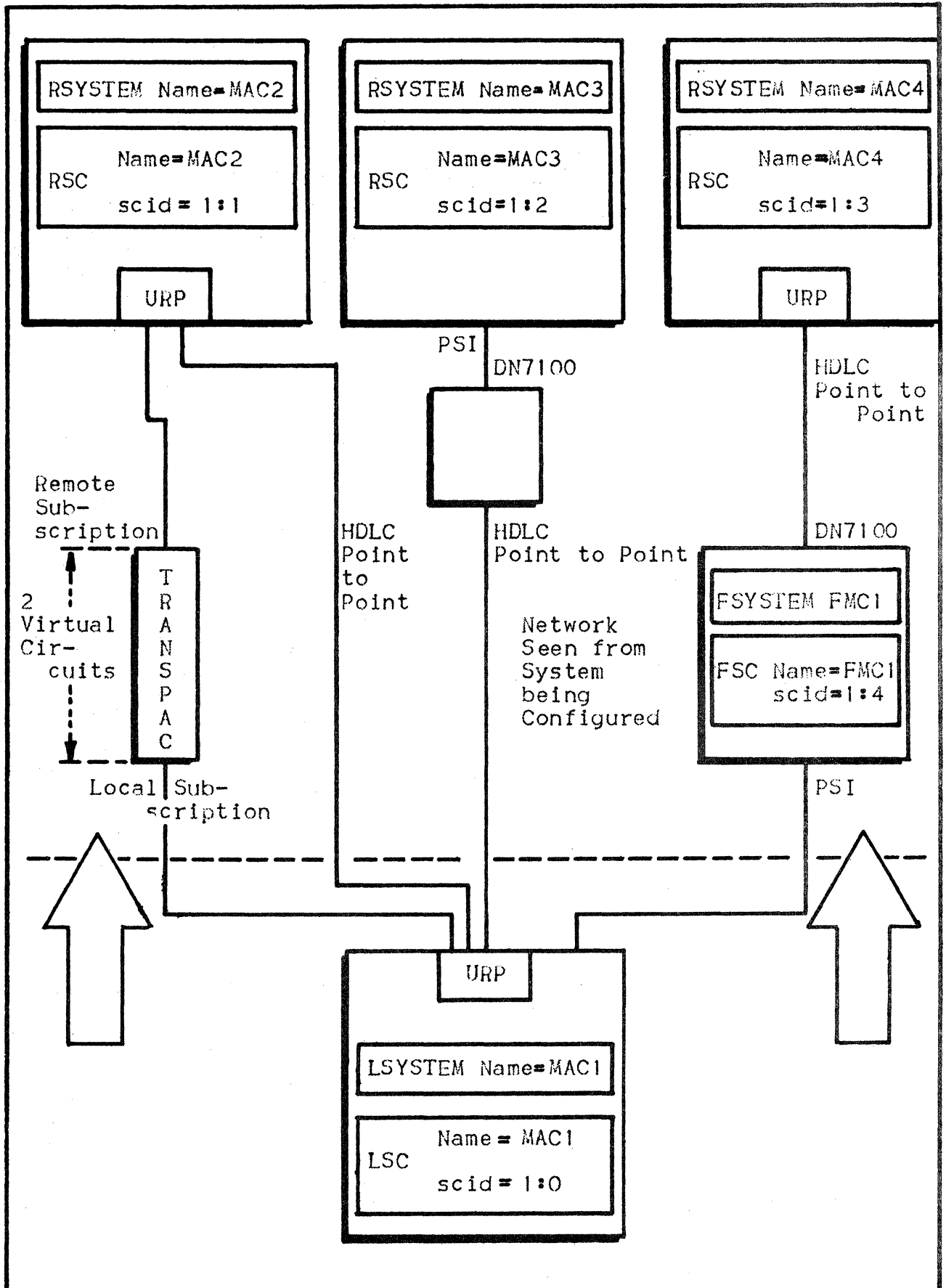
Figure 2-9. System Configuration - 2
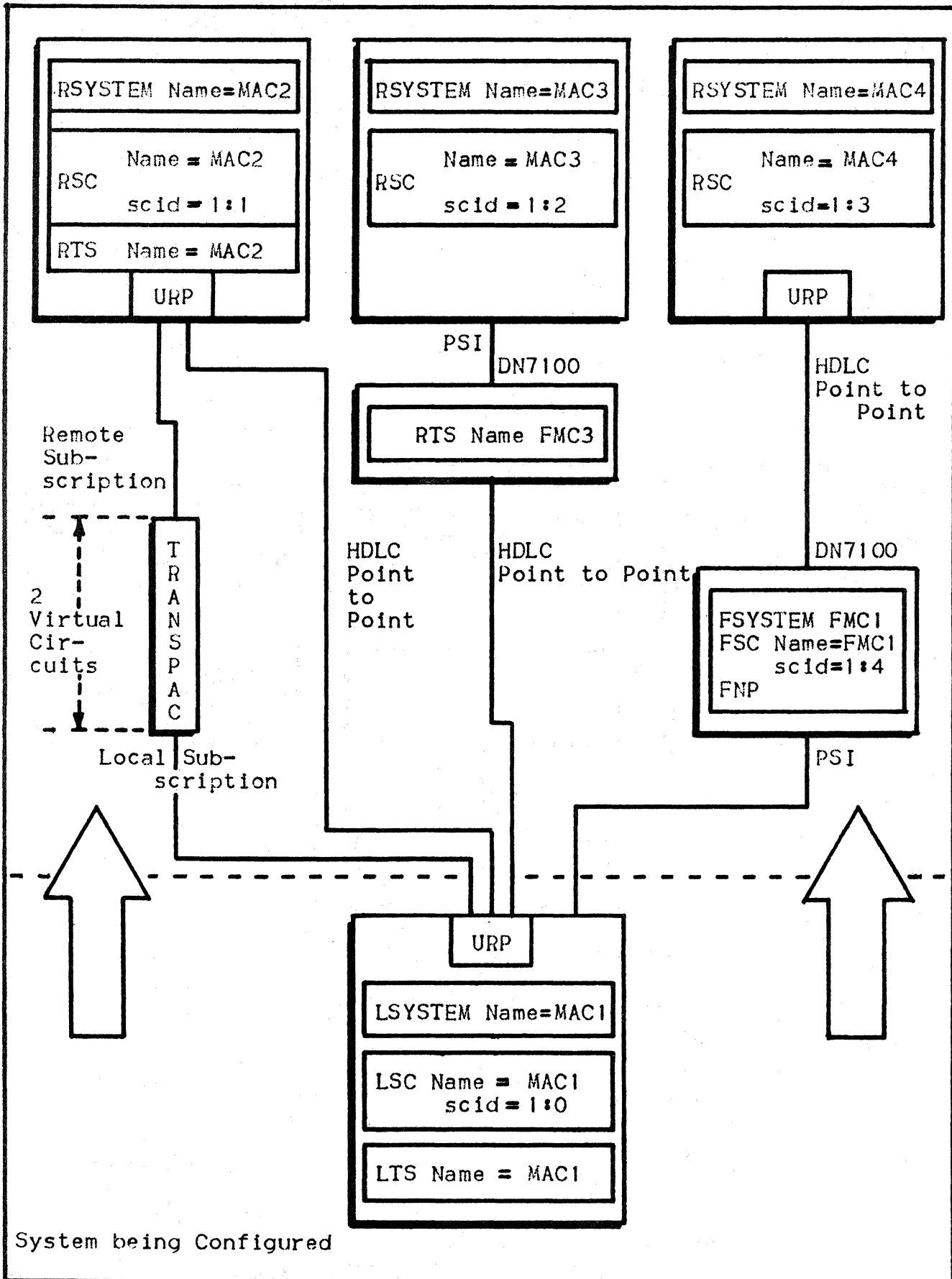
Figure 2-10. System Configuration - 3
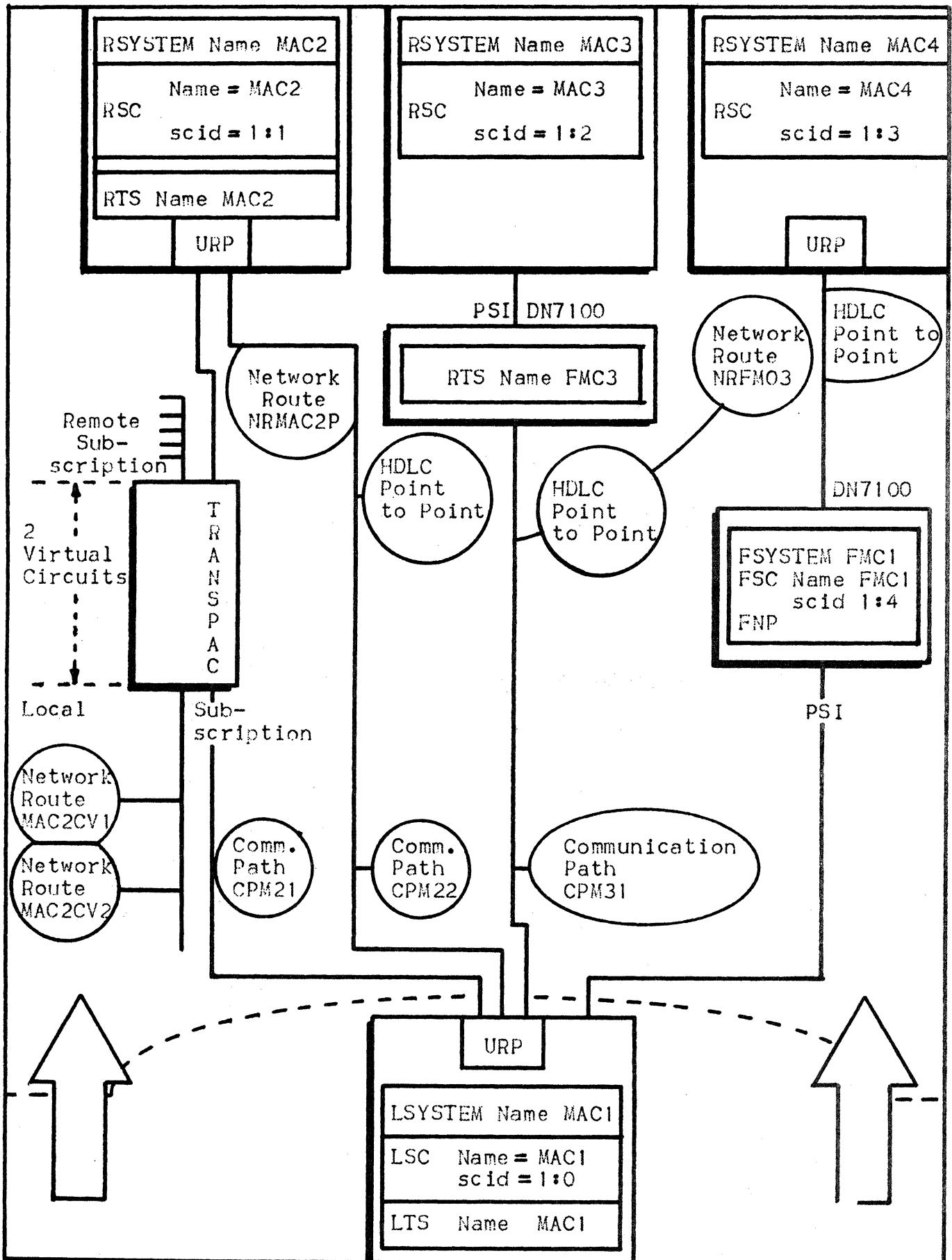
TRANSPAC CONFIGURATION

This needs to be performed for access to TRANSPAC via the local system's URP/DCC.

TRANSPAC Support

Up to two local subscriptions may be supported.

Permanent virtual circuits are not supported. Nevertheless, these must be declared if they are present in the local subscription.

The end points supported include:

- Asynchronous terminals through PADs

- Synchronous terminals through DCU7010 or TCU7022

- Remote DSA systems: i.e., DPS7, DPS6.

TRANSPAC-related Commands

Note that "xxxxxx" represents the number which identifies, as appropriate, the local or remote subscription:

LSUB   gnl, SUBNB = xxxxxx, VAN = TRANSPAC ...;

            - for the local TRANSPAC subscription.

COMPATH cpl, SUBSCRID = gnl, ...;

            - for the local system's exit via TRANSPAC to a remote DSA system.

RDTE   ratel, (CSX25), SUBNB = xxxxxx, VAN = TRANSPAC ...;

            - for the remote data equipment concerned.

RDTN   ...;

            - for the remote data terminal involved: i.e., behind RDTE.

RTS   rtsl, NETROUTE = nrl, ADDR = (TRANSPAC = xxxxxx) ...;

            - for the remote DSA system transport stations accessible via TRANSPAC.

NR   nrl, COMPATH = cpl

            - for a route between the local and remote systems via TRANSPAC, to be mapped dynamically over a virtual circuit.

Figure 2-11. TRANSPAC-related Commands - Layout

Figure 2-11. TRANSPAC-related Commands - Layout
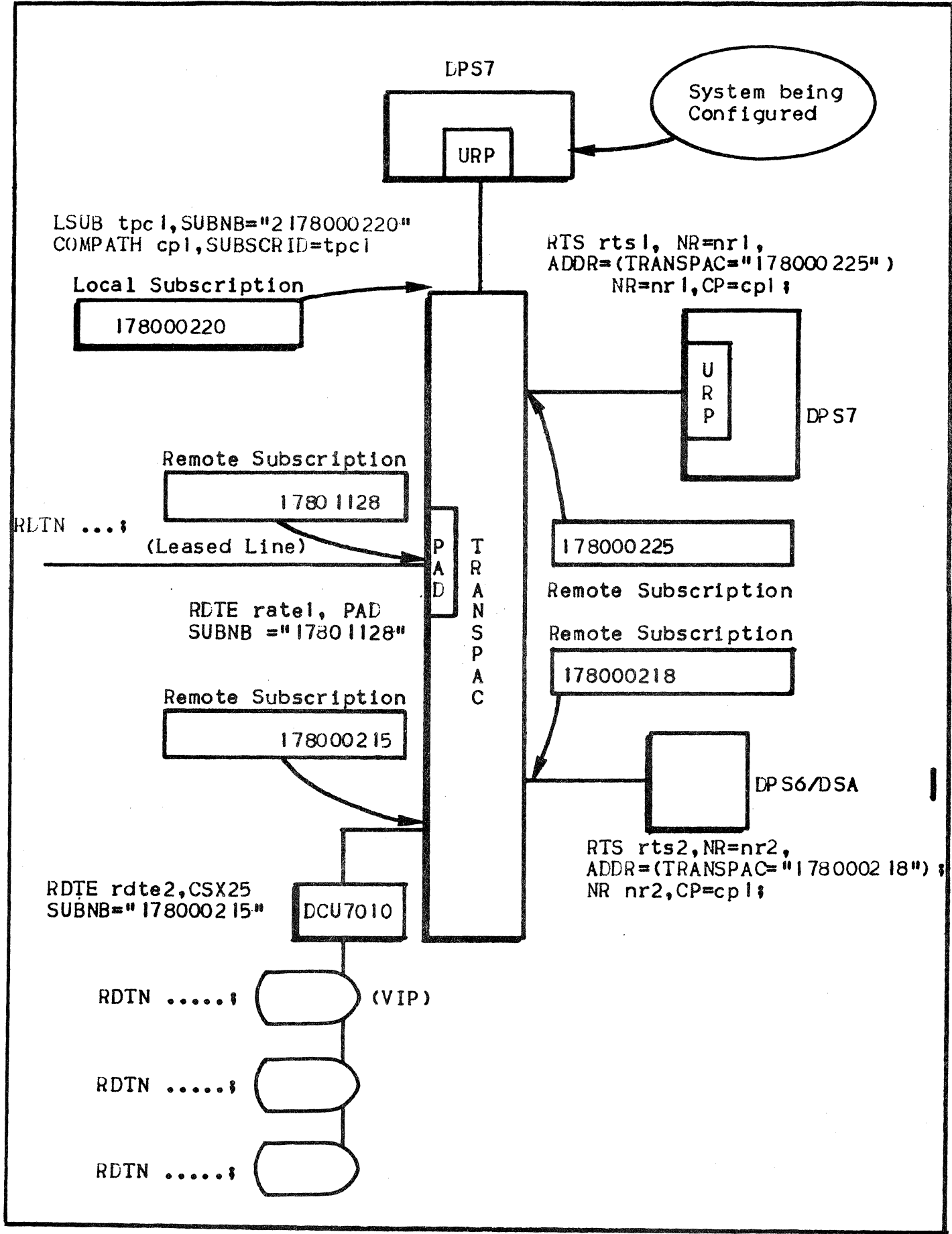
ADMINISTRATION CONFIGURATION

The remainder of this section comprises a brief introduction and description of the network generation aspects of the network administration mechanisms available with the current release of GCOS: including:

- The scope of network administration configuration

- An introduction to the network configuration commands relevant to network administration

- An explanation of the default configuration relative to network administration: this is fully compatible with the default (and unique) administration configuration applicable to earlier releases.

- A sample command layout for configuring network administration at CNC execution.

The Scope of Network Administration Configuration

Network administration configuration allows the definition of:

- Production by the local system of unsolicited events such as Open Session's and NAD errors

- The action to be taken with these events: i.e., one of:

  - Their storage in local logfiles

  - Their being sent to administrative correspondents throughout the network

  - Storage on the local system's logfiles of unsolicited events produced by remote systems in the network

  - Execution by the local system of commands issued by administrative correspondents throughout the network.

Network Administration Related Commands

AF   Administrative Function

AG   Administrative Group

AC   Administrative Correspondent

LG   Administrative LOG

FL   Administrative Filter.

Each of these commands is explained in detail, in Section VII.

Network Administrative Default Configuration

The default network administrative configuration enables the user to benefit from standard administrative features without being obliged to learn the administration configuration commands in detail.

Earlier releases did not allow explicit network administration configuration, while offering a limited range of administration functions. The current release's default administration configuration is a fully compatible superset of the administration configuration implicit in previous releases; in other words, there is complete compatibility with previous releases from this point of view.

This default configuration corresponds to a set of implicit administration configuration commands, of which any or all may be redefined explicitly.

These default functions are as follows:

● Unsolicited events sent by up to 10 remote systems, are stored in the local system's SYS.DSALOGi log files; the address of the local mailbox is $LOGFILE. This function was performed in earlier releases.

● The execution of AEP commands sent by up to 10 administrative correspondents located on any system in the network, including the local system; the local mailbox address is $NAD.

Figure 2-12. Default Network Administrative Features

Remote Correspondents (up to 10)
Located on any System *

Remote Systems

AEP
Command
Response

Event
to be
Logged

Network

$NAD
Mailbox

$LOGFILE
Mailbox

Local System
being
Configured

SYS.DSALOGi Files

* Including Local System

Figure 2-13. LSAC Objects

Legend :

CMD : Command
RSP : Response
UM : Unsolicited Message
IN : input, towards the AF
OU : output, towards the AC or LG
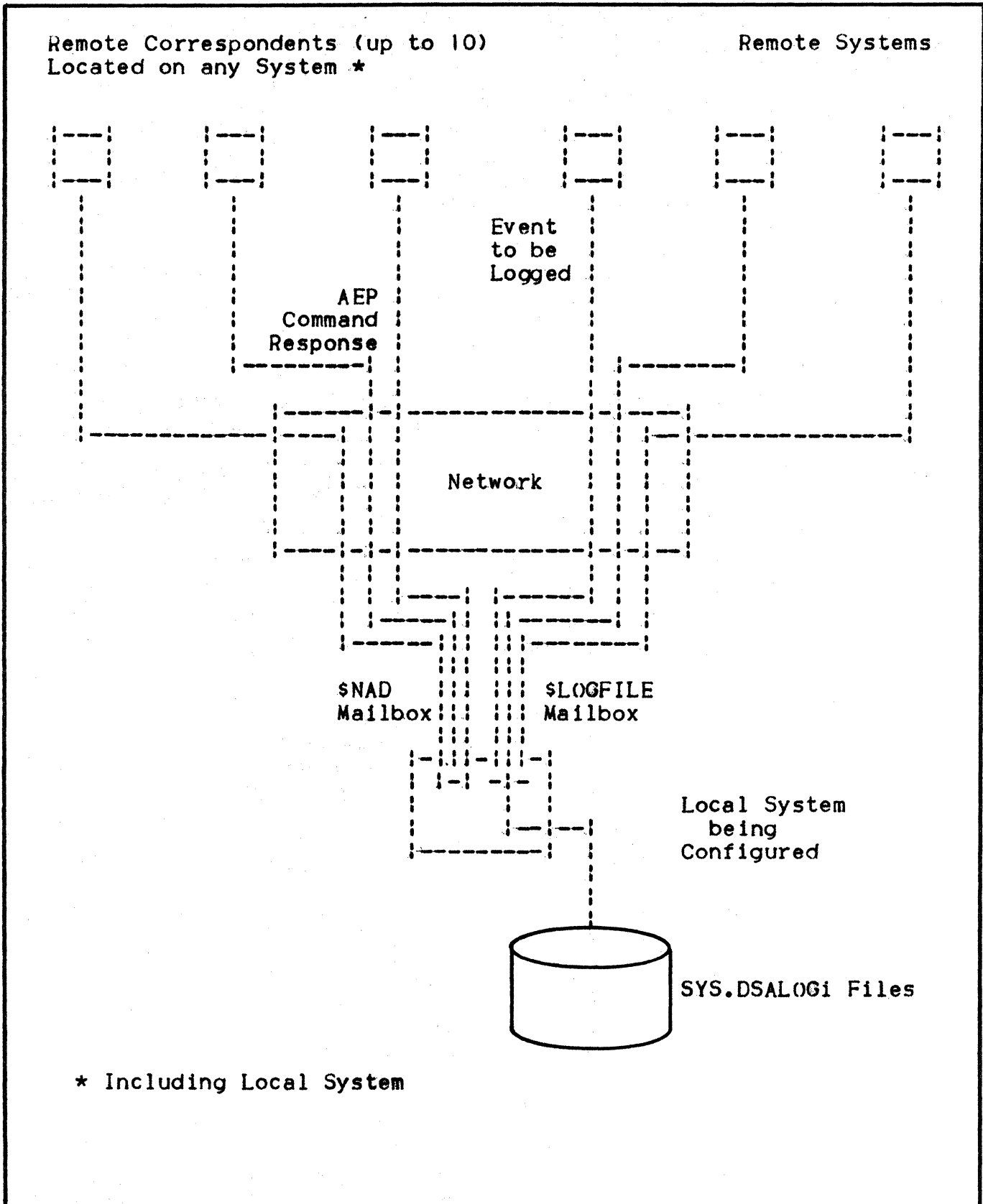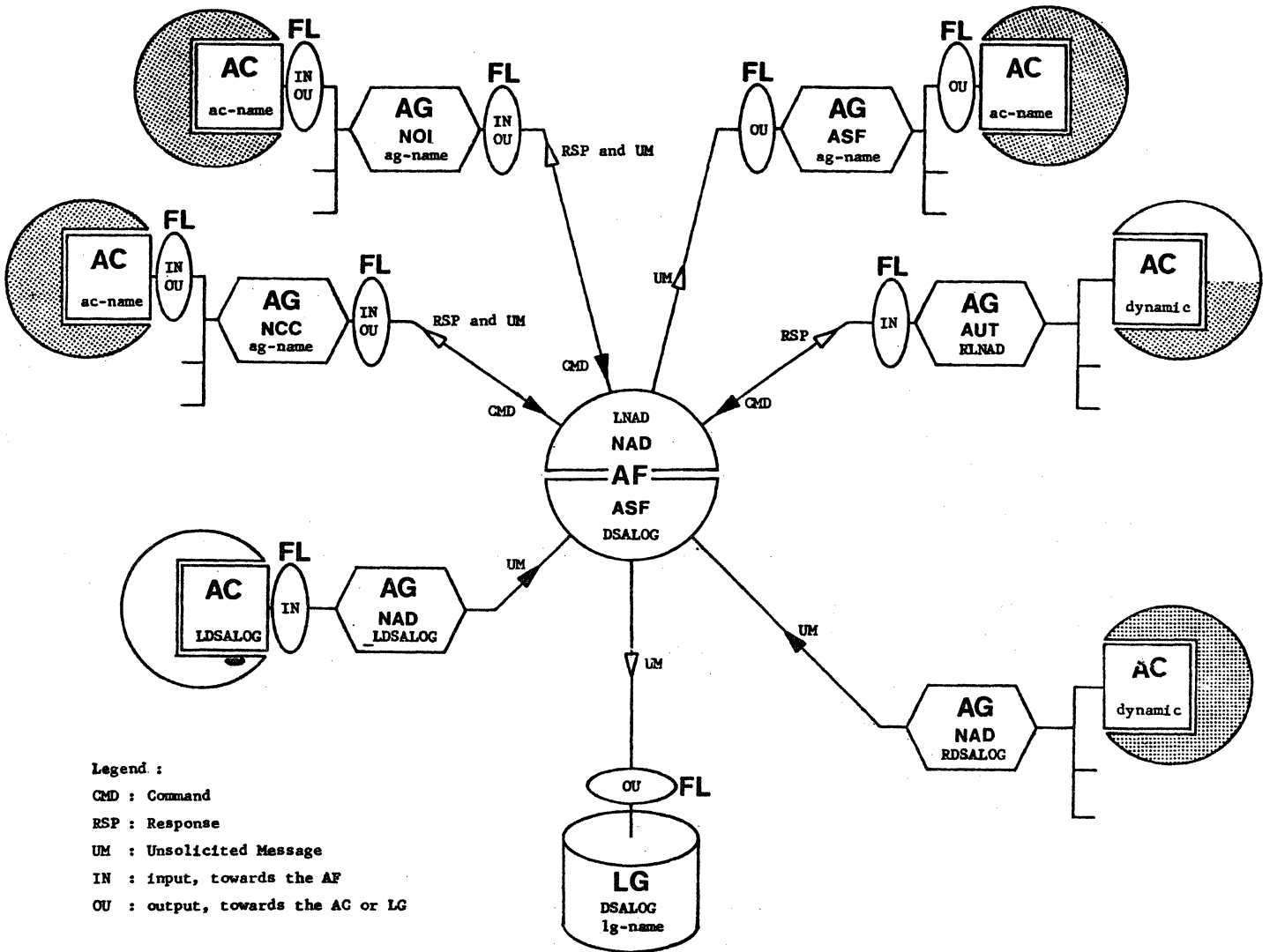
For a full explanation of the contents of the above, refer to the DSAC User Guide.

Leclaration of network administration objects in the user's network configuration description, is covered in subsection 1 of Section VII "Third Group Objects".

SECTION 3

COMMUNICATIONS NETWORK CONFIGURATOR (CNC)

OPERATIONAL ENVIRONMENT

The following prerequisites must all be met in order to execute a CNC step:

- No communications component may currently be active; i.e.:

  - BTNS, and/or TNS, or FNPS

  - MCS application(s)

  - Any VCAM subsystem such as TDS, IOF, or NASF

  - The QMAINT utility

  - Another CNC session

  - Execution of a DT command.

  Any attempt to execute the CNC utility without meeting this condition will result in a step abort with either of the SYSOUT messages, as appropriate:

      CN04 TELECOMMUNICATIONS SESSION IN PROGRESS

      CN70 CNC ALREADY IN PROGRESS.

- VCAM and/or MAM should not have been preloaded through the PMM "Preload Main Memory" OCL command; see the System Operation Operator Guide.

- If disk queues are specified in the CNC description, the relevant disk queue file must have been preallocated so that, at execution time, CNC may preformat the file.

  Upon initiation of CNC utility execution, volume premounting is requested through the standard device management interface, in the event of the volume containing the queue file not already being mounted.

- The following conditions must be met:

  - The URP/DCC lines declared in the CNC description must physically be present and connected in the system's SRST; furthermore, these lines must be "available" from a software point of view (i.e., "released" in terms of device management).

  - The STI (STation Index) values declared in the STATN commands must be consistent with the corresponding terminal or controller's values

    If an STI value does not correspond to an existing station, each time the "non-existent" station is polled, there will be:

    - An increase in response time for existing stations

    - The station for which the wrong value has been given, never to be polled.

  - The maximum number of stations on each line, is configured at firmware generation.

INPUT DATA

Data is input to the CNC step in the form of:

- CNC commands

- SRST information

- Preallocated disk queue files, for use by MCS applications.

CNC Commands

Commands may be introduced from either:

- Punched cards in an input enclosure contained in a job description

- A subfile retrieved from a source library.

SRST Information

The SRST (i.e., System Resource and Status Table) contains a description of all the hardware components and associated firmware elements within the installation, in terms of their:

- Hierarchical structure, including CPU, peripheral processors, peripherals and terminals

- Identifiers: e.g., MSnn for disk drives, LNnn for communications lines, CC for DN7100s functioning as front-end processors

- Status: e.g., "connected and available", or "failed".

For lines connected to the URP/DCC, execution of CNC checks:

- The hardware availability of the lines declared, as well as availability in terms of device management

- For the options declared, the correspondence between their CNC descriptions and their hardware capability: for instance:

  - Line procedure: e.g., TTY, TC, VIP, BSC or HDLC

  - Line type: i.e., leased, local or switched and, point-to-point or multipoint

  - The line speed allowed for each DCC (Data Communications Controller).

CNC execution does not, however, perform any checking for DN7100s declared in the network. This is done dynamically during use of the DN7100.

Preallocated Disk Queue files

If disk queues are to be generated for MCS applications, the disk
queue files concerned must first be preallocated.

The volume containing the disk queue file must be assigned to the CNC
step and mounted when requested at initiation of CNC step execution.

The disk queue file is then preformatted by the CNC step, on the
basis of the queue specifications specified in the network
description.

OUTPUT DATA

Data is output from the CNC step in the form of:

● Communications system tables

● A copy of the tables in a system file

● Preformatted disk queue file(s)

● CNC execution reports.

Communications System Tables

Upon successful completion of the CNC step, a set of communications tables is created.

These tables may be classified by communications component:

● BTNS tables, which contain all the information needed for managing that part of the network connected via the URP/DCC(s), such as:

  ● URP/DCC network description(s), in terms of its constituent lines, clusters, stations and terminals as well as their descriptions and respective relationships

  ● BTNS input/output buffer pool sizes, which are either computed by default or explicitly defined

  ● TRANSPAC transport station tables

  ● Transport tables for the primary network linked through the URP/DCC(s).

● FNPS tables, which contain all the information needed for managing that part of the DSA network connected through DN7100(s). This includes TPM, the transport module, the tables to enable I/O transfers between GCOS and DN7100(s) on one side and to provide an interface with VCAM on the other side.

● ADM (ADministrative Module) tables, which concern the system files to be referenced by service functions for the DN7100: e.g., loading, dumping, system generation and journalizing.

● VCAM tables, which contain the descriptions of communications service work stations essential to both BTNS and FNPS after network generation.

  The skeleton structure of these tables allows them to be managed dynamically by VCAM during communications sessions.

● MAM/QMON tables, which contain the queue descriptions, the generated disk and memory pools, and the related structures needed by QMON to enable the interface with VCAM.

Copy of tables in a System File

The whole set of communications system tables is copied to a system file located in backing store. Note that a system restart witn the CLEAN option will erase these tables. Should this occur, a new version of these tables may only be created by executing the CNC utility. A new network generation is only required if the CONFIG utility has been launched since the last exectution of CNC.

A fresh copy of the tables for FNPS, VCAM, MAM and QMON is loaded only at system initialization and never during communications session startup.

This file is used as follows:

● At system initialization, to restore all the tables into reserved system segments in memory without having to regenerate the network via the CNC utility.

● At BTNS startup, to restore the BTNS tables which might have been altered by a previous BTNS session.

    BTNS is started with the OCL command ST (Start Telecommunications).

Preformated Queue Files

The preallocated disk queue file is preformatted upon successful termination of the CNC step.

Control records are written at the beginning of the file, for the purpose of being able to restart the disk queues. The actual format of the control records depends on the queue specifications supplied with the network description commands.

Memory queues defined in the network description are preformatted in main memory.

Output Reports

Reports are printed out in the same way as for all other jobs run
under GCOS; i.e.:

- A SYSOUT report, which provides:

  - A list of the CNC commands used to generate the network

  - A summary of the network environment generated

  - An indication of any errors detected during CNC step execution.

- JOR (Job Occurrence Report).

Figure 3-I. CNC Utility: Main Flow

Figure 3-I. CNC Utility: Main Flow
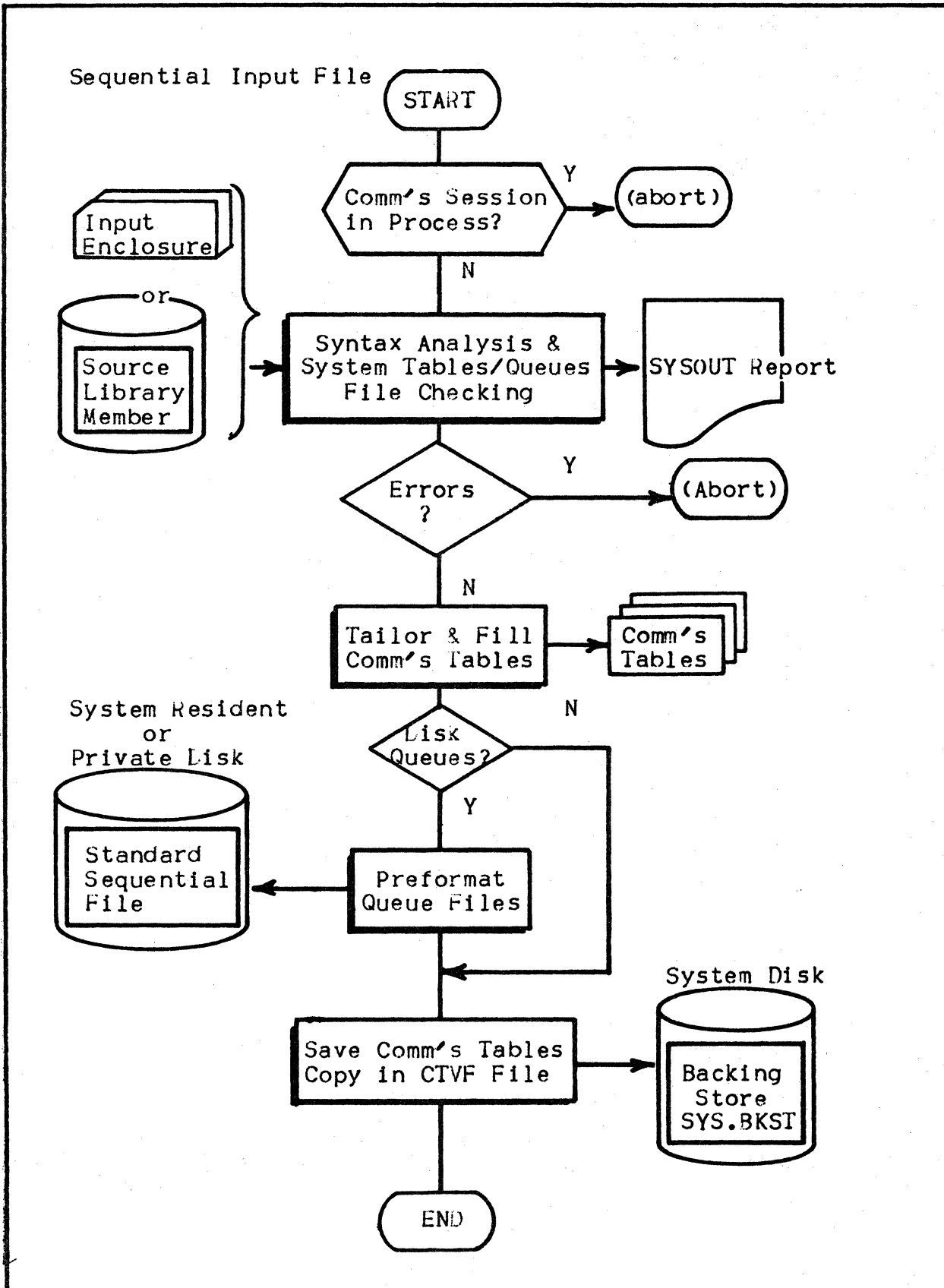
LAUNCHING THE UTILITY

CNC Utility JCL

```
$JOB    job-name, USER = user-name, PROJECT = project-name;

STEP    H_CNC, SYS.HLMLIB [, OPTIONS = ('SIMU'!'SIMUP')];

ASSIGN H_CR, (sequential-input-file!*input-enclosure-name);

ASSIGN H_QC_FMS, external-file-name, SHARE = FREE,
    (RESIDENT!(DEVCLASS = device-class-name, MEDIA = media-name));

ENDSTEP;

$INPUT input-enclosure-name;
       ...
       - CNC commands -
       ...
$ENDINPUT;

$ENDJOB;
```

Syntax

- STEP Statement:

    - H_CNC is the system LM (Load Module) in the system LM library
      named SYS.HLMLIB and must be specified as shown

    - OPTIONS = ('SIMU'!'SIMUP') specifies that the declared network
      is to be used only for simulation purposes; see below.

- ASSIGN Statement #1:

    H_CR is the system-reserved internal file name for the file
    containing the CNC commands (in the form either of an input
    enclosure or of a sequential file.

- ASSIGN Statement #2:

    - H_QC_FMS is the system-reserved internal file name for the
      preallocated file to accomodate disk queues; for preallocation,
      see below.

    - SHARE = FREE must be specified as shown, and denotes that the
      disk queue file is to be shared between BTNS, FNPS and active
      MCS applications.

    - RESIDENT must be specified if the disk queue file has been
      preallocated on a resident disk.

- $INPUT Statement:

  TYPE = DATASSF provides for punched cards in the input enclosure
  being in the form of DATA or SSF (System Standard Format).

Examples

- Network description in an input enclosure:

```
$JOB    NETGEN, USER = UNAME, PROJECT = DEPT;

STEP    H_CNC, SYS.HLMLIB;
ASSIGN  H_CR, *NETIN;
ASSIGN  H_QC_FMS, DQUEUE, DEVCLASS = MS/M400, MEDIA = VOL1,
        SHARE = FREE;

ENDSTEP;

$INPUT NETIN;
GENCOM SD2C;
QUEUE  V771, RESTART;
LINE   LN12;
STATN  STO9, 9;
TERMNL V771, VIP7700, KCT;
LINE   LN11, SPEED = H;
TERMNL ROSY, TTU8124, KPR;
LINE   LN05, SPEED = L;
TERMNL PAPR, DTU7171, KCT;
LINE   LN01;
STATN  S761, 1;
TERMNL VISL, VIP7760, KCT;
DCTAP  TDS1;
QUEUE  FROG, NUMBLK = 50;
$ENDINPUT;

$ENDJOB;
```

- Network description in a library member:

```
$JOB    TCOMMS, USER = UNAME, PROJECT = WAGE;

STEP    H_CNC, SYS.HLMLIB;
ASSIGN  H_CR, SOURCE, DEVCLASS = MS/M400, MEDIA = VOL2,
        SUBFILE = NETWK;
ENDSTEP;

$ENDJOB;
```

Disk Queue File Preallocation

If queues are to be held on disk, a file must be preallocated for this purpose. Unless otherwise stated in the QUEUE command, disk queuing is the default option (see page 5.30).

A disk file for queues is preallocated:

● With the file-level PREALLOC

● Before the CNC utility may be executed, since the disk queue file must be preformatted as a result of network generation.

If the file is to be modified, for example by altering its size, the following procedure must be followed:

1) The file is deallocated by either:

   ● Using the file-level utility DEALLOC

   ● Declaring MAM = NO at system generation.

2) The file may then be preallocated with PREALLOC.

3) The CNC utility must be run to update the system tables with the new file information.

However, the disk file may not be deallocated if either:

● It is already defined for a network currently in use

● MAM = (YES;REFORMAT) has been declared at system generation, thereby allocating the file to a system process group.

The utilities PREALLOC and DEALLOC may be found in the DMU User Guide.

```
$JOB      ALLOCDG USER = UNAME PROJECT = WAGE;

PREALLOC DQUEUE EXPDATE = 365 DVC = MS/M452
         GLOBAL = (MD = VOL1 SIZE = 5)
         BFAS = (SEQ = (BLKSIZE = 500 RECSIZE = 500) ;

$ENDJOB;
```

When using PREALLOC for this purpose, the following points of syntax should be respected:

- The external file name, for example DQUEUE, must be specified in an ASSIGN statement at CNC execution.

- The size of the file , specified as 5 cylinders, is subject to device class constraints: see "Defining Disk Queues" on page 8.21.

- The disk queue file must be mono-volume. Further, the file's starting cylinder may not be specified: so the GLOBAL keyword must be used.

- The parameter group BFAS = (SEQ = (BLKSIZE = 500 RECSIZE = 500)) must be specified as shown.

SIMULATION FACILITY

The simulator facility may be activated with the OPTIONS = ('SIMU'!'SIMUP') parameter in the STEP statement (above).

This allows the user to run a CNC step purely for syntax checking purposes, on a new or updated network description, without disturbing any programs running at the time.

Certain CNC step run-time prerequisites do NOT apply if the simulation facility is used, as follows:

● The CNC step may run concurrently with any combination of communications components and/or applications which interface with these.

● MAM and VCAM may be preinitialized.

● If disk queues are specified, the file normally needed for these may be absent.

SRST handling may be treated in either of two possible ways:

1) The SRST of the current site is selected for use with SIMU. In this case, values specified in CNC commands must be consistent with the SRST of the current site.

2) A "private" SRST, stored in a dedicated file, may be used. This option is selected with SIMUP.

   Values specified in CNC commands must be consistent with the "private" SRST, which is an image of another system. This image must have been built on the other system with the H_SVSRST utility.

   Such a private SRST file is assigned at CNC step run-time, as:

   ASSIGN H_SRST, private-file-name, FILESTAT = UNCAT, DVC = xx,
        MD = yy;

   Also, the CNC execution report banner indicates the name of the system from which the SRST originates; it further shows the date and time at which H_SVSRST was run.

   Refer to Appendix I for details of the H_SVSRST utility.

CNC COMMAND LANGUAGE

General Description

ALCOR   defines an administrative correspondent. Alias AC. Page 7.2.

ADFUNC   defines an administrative function of a group set. Alias AF.
         Page 7.5.

ADGROUP defines an administrative group of correspondents. Alias AG.
         Page 7.6.

CLUSTER defines a set of stations connected over a URP/DCC polled
         line, applicable to VIP, TC and BSC3270 line procedures. Page
         5.2.

COMM   defines a "comment". Page 4.5.

COMPATH defines a primary link "exit" through a URP/DCC
         communications path. Alias CP. Page 7.15.

DCTAP   defines a mailbox for a GCOS communications service, and must
         be present if any terminals are dedicated to the mailbox.
         Page 5.29.

FILTER   defines an administrative filter. Alias FL. Page 7.10.

FNP   describes how FNPS is to function for a given DN7100
         front-end processor. Page 7.16.

FSC   defines a front-end processor session control. Page 7.20.

FSYSTEM defines a front-end processing system. Alias FSYS. Page 7.21.

GENCOM   identifies a network generated by execution of the CNC
         utility, and defines all the common parameters for a given
         network. Page 4.1.

GENQMON defines parameters specific to QMON. Page 5.30.

IDSEQ   identifies the characteristics of a terminal connected to the
         URP/LCC through switched lines, and dynamically defines the
         parameters of a TERMNL or RDTN command. Page 4.7.

LINE   identifies each communications line to be supported within
         the network. Page 5.5.

LOG   defines an administrative LOG. Alias LG. Page 7.14.

LSC   defines the session control of the local system. Page 7.22.

LSUB   describes a local subscription for TRANSPAC, to allow access
         to GCOS via a URP/DCC HDLC link. Alias GENNET. Page 6.1.

LSYSTEM defines the local system. Alias LSYS. Page 7.23.

LTS   defines the transport station of the local system. Page 7.24.

NR   defines a route between the local system (exiting through a
            compath) and a remote station transport. Page 7.25.

NODE   for compatibility with earlier releases, identifies for a DSA
            system the system name and associated session control.

PVC   defines a TRANSPAC permanent virtual circuit connected to the
            URP/DCC. Alias LLINE. Page 6.5.

QUEUE   defines every disk or memory queue to be used by MCS
            applications. Page 5.31.

RDTE   describes a remote TRANSPAC subscription, accessed through
            the URP/DCC. Page 6.7.

RDTN   defines each remote terminal, associated with its
            corresponding RDTE. Page 6.10.

RSC   defines the session control of a remote system. Page 7.26.

RSYSTEM   defines a remote system. Alias RSYS. Page 7.28.

RTS   defines the transport control of a remote system. Page 7.30.

STATN   defines a station attached to a polled line, necessary for
            all line procedures except TTY. Page 5.17.

TERMNL   defines the characteristics of a terminal connected to a
            URP/DCC line. Page 5.19.

XPRTC   defines transport parameters attached to network routes. Page
            7.32.

Command Sequencing

GENERAL COMMAND LAYOUT

Certain constraints apply to the sequencing of CNC commands. An input file (to a CNC step) is composed of three consecutive command groups:

Group 1 GENCOM (unique in any single CNC command input file)

Group 2 CLUSTER
        DCTAP
        GENQMON
        LINE
        LSUB
        PVC
        QUEUE
        RDTE
        RDTN
        STATN
        TERMNL

Group 3 ADCOR
        ADFUNC
        ADGROUP
        COMPATH
        FILTER
        FNP
        FSC
        FSYSTEM
        LOG
        LSC
        LSYSTEM
        LTS
        NR
        RSC
        RSYSTEM
        RTS
        XPRTC

Note that COMM (comment) and IDSEQ may be inserted anywhere in the sequence; COMM may even be placed before the GENCOM command.

Figure 3-2. Acceptable CNC Command Sequences

TTY Procedure Lines

```
LINE      LNnn ...;
TERMNL    name terminal-type terminal-subtype ... ;

LINE      LNnn ... ;
          ...
```

HDLC and BSC2780 Procedure Lines

```
LINE      LNnn ... ;
STATN     name station-index ... ;
TERMNL    name terminal-type terminal-subtype ... ;
          ...
          ...
LINE      LNnn ... ;
          ...
```

VIP and BSC3270 Procedure Lines

```
LINE      LNnn ... ;
[CLUSTER  name ... ;]
STATN     name station-index ... ;
TERMNL    name terminal-type terminal-subtype ... ;
          ...
STATN     name station-index ... ;
          ...
[CLUSTER  name ... ;]
          ...
LINE      LNnn ... ;
          ...
```

TRANSPAC

```
LSUB      name TPCADD = "string" ... ;  (a maximum of 2 LSUB commands)
PVC       ASSIGN = rdte-name ... ;
          ...
RDTE      name rdte-type ... ;
RDTN      name rdtn-type rdtn-subtype ... ;
          ...
RDTE      name rdte-type ... ;
          ...
```

Command Syntax

Commands begin with the command's name, followed by a space, and must always end with a semi-colon (;). Commands may span over two or more consecutive records.

Individual parameters within a command may be separated by commas, spaces, or any combination of the two.

Outside any single command's "enclosure", blanks or records filled with blanks are skipped.

Certain symbols may not be used within user-defined terms, except for those explicitly described as having to be enclosed with double quotation marks. These excluded symbols include:

● Comma ","

● Slash "/"

● Open parenthesis "("

● Space " "

● Equals "="

● Close parenthesis ")"

● Semi-colon ";"

● Asterisk "*"

● Double quotation marks '"'.

Within a command, any user-defined names must be different from the command's reserved names, including:

● The command's name itself

● Keywords

● Self-identifying parameters

● Non-user defined positional parameters.

Symbolic Conventions

Command-reserved names and their aliases are written in capitals in the text. These include the command's name, keywords, and non-user-defined positionals.

Default values are underlined in the text.

Aliases (i.e., synonyms) for command-reserved names follow the "primary" term to which they refer.

The convention "object-list" may refer to any one of:

● "object

● "(object)"

● "(object, object, ...)".

SECTION 4

FIRST GROUP

GENCOM COMMAND

Definition

GENCOM is the only command that must appear in this group, preceding all other CNC commands (with the exception of COMM). GENCOM defines the start of network generation, irrespective of network type, of URP/DCC and/or DN7100 use, and of VCAM and/or MAM use. It also defines parameters for BTNS and MAM.

Command Format

```
GENCOM name [, BTBFSZ = (160|nnn)] [, DABFSZ = (144|nnn)]
             [, KEY = password] [, MAMNB = (1|n)]
             [, NBBTBF = nnn] [, NBDABF = nnn]
             [, PLGNB = nnn] [, QCBLKSZ = (16|nnnn)]
             [, QCPOOL = (Q|nnnn)] [, QDBLKSZ = (400|nnnn)]
             [, SIMBRK = (S*S|"xxx")] ;
```

Parameter Description

name   identifies the BTNS service, ranging from 1 through 4 alphanumeric characters long. If the GENCOM name is shorter than 4 characters, it is right-padded with underscores. TRACE, TRCT, DSAC, QMON and TRPT are reserved names and so may not be used as a GENCOM name. If no LSYSTEM name is provided, by default the local system name is the same as the GENCOM name, up to 4 characters long. Thus, the LSYSTEM name used in the network description will be that specified for GENCOM.

BTBFSZ   specifies the size in bytes of each unit in the BTNS input buffer pool. Size may range from "112" through "1056" bytes, in increments of 16. If the value supplied is not a multiple of 16, size is rounded up.

The default value is "160". The BTNS input buffer pool may be used for local secondary network processing in the same way as for primary network processing through URP/DCCs. Constraints and tuning recommendations applicable, may be referred to on pages 8.2 to 8.3.

DABFSZ   specifies the size of each unit of the BTNS output buffer pool, in bytes. Buffer unit size may range from "112" through "1056", in increments of 16. If the value supplied is not in multiples of 16, this size is rounded up. The default value for a TRANSPAC link is "160". For all other cases, the default value is "144", as shown. The BTNS output buffer pool is used for local secondary network processing in the same way as for primary network processing through the URP/DCC. Associated constraints and tuning recommendations may be found on pages 8.3 to 8.4, with regard to the DABFSZ and NBDABF parameters.

KEY   is an MCS-oriented parameter, to define the unique password used by MCS applications when executing ENABLE and DISABLE verbs, as specified with the KEY parameter of these verbs. If this parameter is not supplied to GENCOM, no checking is performed when the above verbs are executed. This password may range in length from 1 through 10 alphanumeric characters, and must NOT be specified if no QUEUEs are declared.

MAMNB   is an MCS-oriented parameter, to specify the maximum number of MCS processes that may execute concurrently. In a multi-process application, each constituent process should be counted individually. The default value is "1". This parameter should NOT be specified if no QUEUEs are declared.

NBBTBF   specifies the number of input buffer pool units to be used by BTNS for I/O transfers over the lines. The minimum is "8", and the maximum is defined by the algorithm:

$$(NBBTBF * BTBFSZ) \le 65488.$$

NBDABF   specifies the number of output buffer pool units to be used by BTNS, with a minimum of "8". The maximum is defined by the algorithm:

$$(NBDABF * DABFSZ) \le 65504.$$

For optimum values, refer to pages 8.3 through 8.4.

PLGNB   specifies the maximum number of terminals connectable simultaneously to the system via TRANSPAC, through either a PAD or a CSX25 RDTE, to allow the TRANSPAC table to be tuned. The default is computed by the CNC utility according to the parameter values supplied with the LSUB command, and must not be supplied if no LSUB is present.

QCBLKSZ is an MCS-oriented parameter, to specify the size in bytes of each block in the memory queue pool. Memory block size may range from "76" through "1024", with a default of "76". This parameter should NOT be specified if no QUEUEs are declared.

QCPOOL is an MCS-oriented parameter, to specify the number of memory queue pool blocks to be shared by all queues so qualified in their respective QUEUE commands, with a default of "0". The maximum number of memory blocks to be sharable is defined by the algorithm:

$$(QCPOOL + sigma \ (NUMBLK)) * QCBLKSZ \leq 65535.$$

For the NUMBLK parameter, refer to the QUEUE command (on page 5.31).

QDBLKSZ is an MCS-oriented parameter, to specify the block size in bytes for the disk queue file to be used for saving messages. The block size specified should be the size of the MAM buffer unit used for storing messages before rewriting to the file. This disk queue block size may range from "400" through "1024", with a default of "400" bytes, and should NOT be specified if no QUEUEs are declared.

SIMBRK supplies a character string for use as a break qualifier, prior to BTNS issuing the terminal operator identification command for network control purposes. Size may range from 1 through 3 alphanumeric characters, enclosed by double quotation marks, with a default of "$*$".

For terminal operations, refer to the Network Control Terminal Operations and Terminal Operations Manuals.

Example 1:

        GENCOM MCS1, BTBFSZ = 200, KEY = PASS, MAMNB = 2, NBBTBF = 20,
              QCBLKSZ = 205, QCPOOL = 50;

This command names a network "MCS1" and specifies:

● "BTBFSZ = 200, NBBTBF = 20" — for the BTNS buffer pool to be made
  up of 20 units each of 200 bytes.

● "KEY = PASS" - so that ENABLE and DISABLE verbs issued by MCS
  applications must specify the KEY option in order to be executed.

● "MAMNB = 2" - in order to allow concurrent execution of either:

  ● 2 single-process (i.e., monoprocess) applications

  ● 1 application with 2 processes (i.e., a multi-process
    application).

● "QCBLKSZ = 205" - so as to have a memory block size of 205 bytes,
  partitioned as:

  ● 5 bytes reserved for MAM control information

  ● 200 bytes for storing message text.

● "QCPOOL = 50" - to reserve a set of 50 memory blocks for sharing
  in the memory queue pool.

Example 2:

        GENCOM DAC1, BTBFSZ = 150, DABFSZ = 150, NBDABF = 30,
              SIMBRK = "%%";

This command names a network "DAC1", with the attributes:

● "BTBFSZ = 150" - to set the size of (BTNS) input buffer pool units
  at 150 bytes. The number of these buffer units will be determined
  automatically by the CNC utility, according to the network's
  components.

● "DABFSZ = 150, NBDABF = 30" - in order to have a BTNS output
  buffer pool with 30 units each of 150 bytes.

● 'SIMBRK = "%%"' - to define the break qualifier for network
  control commands and local dialog as "%%".

OTHER COMMANDS

These commands may appear anywhere in the command sequence.

COMM Command

DEFINITION

The COMM command defines a comment, and may appear anywhere in the
network description, even before the GENCOM command or within an
ordered sequence.

COMMAND FORMAT

COMM "string";

PARAMETER DESCRIPTION

"string" is a character string enclosed within double quotation marks
which must be opened and closed on the same record (i.e.,
card or line, as appropriate to the type of input used).

This comment string may not under any circumstances span two
or more records. If a comment is longer than the record's
maximum length, the excess number of characters must appear
on the next COMM command.

EXAMPLE

It is supposed that the following comment is to be inserted in the
CNC step description, on card input file:

NETWORK GENERATED EXCLUSIVELY WITH KEYBOARD/SCREEN VIP TERMINALS
FOR CUSTOMER ACCOUNT ENQUIRIES

In order to accomodate this comment, two consecutive COMM cards must
be used, as follows:

COMM "NETWORK GENERATED EXCLUSIVELY WITH KEYBOARD/SCREEN VIP
TERMINALS FOR";
COMM "CUSTOMER ACCOUNT ENQUIRIES";

IDSEQ Command

DEFINITION

Required for any terminal to be connected over a secondary switched network and "recognized" by BTNS in terms of its location and physical characteristics. IDSEQ may appear anywhere in the network description, provided that it does not disrupt either of the following sequences:

● LINE - CLUSTER - STATN - TERMNL

● RDTE - RDTN.

Although not mandatory, IDSEQ should be used for identifying the characteristics of any terminal connected to the URP/DCC over switched lines (either point-to-point or multipoint) or through the TRANSPAC French public data network.

At connection time, the terminal operator (or the terminal itself, through the "answer-back" function) may provide an identification sequence for BTNS to check terminal type and subtype(s) against those specified in the IDSEQ command. The terminal is then managed according to these physical characteristics with respect to such attributes as page and line length, password erasing sequence, automatic line feed capability, and device address.

If IDSEQ is not specified, the terminal will be managed strictly according to the default parameters defined with the TERMNL and/or RDTN commands.

Figure 4-1: IDSEQ Versus TERMNL/RDTN, Overriding Rules

"Yes" indicates parameters overridable by IDSEQ							
type	Yes	ASSIGN	No	IM	No	PAGE	Yes *
subtype	Yes	AUTO	No	LINELG	Yes *	SBLKG	No
ADD	Yes *	AUTOLF	No	NOBT	No	SYSHEAD	No
ANSWBCK	No	CLOSE	No	NSYSMES	No	TAB	No
* Denotes default values determined by type and subtype.							

Where IDSEQ specifies a string representing an "identification-sequence", log-on will only be allowed under the following conditions:

● If the ID matches the "identification-sequence" of a valid IDSEQ command

● If the terminal type specified in the IDSEQ command corresponds to the line procedure applicable to the line declared.

COMMAND FORMAT

IDSEQ "name", type, subtype1 [, subtype2 [, subtype3]] ;

PARAMETER DESCRIPTION

"name"   defines the name to be sent as terminal identification sequence at connection time, to be matched with either:

● The ID key-in by the terminal operator, as part of log-on dialog with the system, in the message:

CCO1 ID[,USER/PROJECT/BILLING] [, (APPL:$PASSWORD)]?

● The identification sequence sent automatically by the terminal, fulfilling both the conditions:

● That it has "answer-back" capability

● That the corresponding TERMNL command has been specified with the ANSWBCK option.

This name must be enclosed in double quotation marks and may range from 1 through 4 alphanumeric characters in length.

type   defines the type of standard terminal compatible with the line procedure used: see the TERMNL and RDTN commands. Under the current release, IDSEQ is applicable only to "standard" terminals.

subtype-n specifies attributes of the terminal concerned, such as:

● Ability to receive system messages

● I/O capability

● Default address.

Refer to the TERMNL command for the range of terminal subtypes available.

EXAMPLE 1

    IDSEQ "MCNS", AJ832, KPR↕

This command specifies an AJ832 terminal as "MCNS". The terminal's
input/output capability is defined as comprising a keyboard with
printer.

EXAMPLE 2

    IDSEQ "E552", MTS7508, KCT, PRT, DSK↕

A VIP terminal (such as TTS7800 or VIP7760), logging on and providing
the identification sequence "E552", will be managed as an MTS7508
terminal with the terminal subtypes validated as shown in the syntax
of this manual.

SECTION 5

SECOND GROUP

The following CNC commands should be presented in the CNC command sequence directly after the GENCOM command.

● Secondary network commands include CLUSTER, LINE (note that this command is also required for HDLC lines on a primary network), STATN, TERMNL and IDSEQ

● Primary link exit command: (secondary network command group) and LSUB

● VCAM subsystem command: DCTAP

● QMON commands include GENQMON and QUEUE

● Commands for terminals through TRANSPAC include LSUB, PVC, RDTE and RDTN.

All the above commands, with the exception of those associated with TRANSPAC, are covered in this section. Section 6 is reserved for commands exclusively used for access to TRANSPAC.

SECONDARY NETWORK

CLUSTER Command

DEFINITION

Applicable only to polled multipoint lines with BSC3270 and VIP procedures. CLUSTER is used to group several stations together as a single addressable entity.

This command must be followed immediately by the sequence STATN - TERMNL [- TERMNL ...] defining the cluster as having one or m7re stations. Until the next CLUSTER command in the sequence, all STATN commands refer to the current cluster.

CLUSTER may not be used for a TTY, HDLC or BSC2780 line.

Clusters facilitate network control in that a single "HT" or "RT" command addressed to the cluster replaces as many "HT" or "RT" commands as there are individual stations involved.

CLUSTER is also used to declare a DPS 6 system, connected to the DPS7 through a VIP line. The DPS 6 is described as a cluster of VIP terminals of type "HL6" and the cluster name is the same as that of the site on which the DPS 6 is to be known. Refer to the "Remote Facilities" Manual.

COMMAND FORMAT

    CLUSTER name [, CLOSE] ;

PARAMETER DESCRIPTION

name   ranges from 1 through 4 alphanumeric characters and identifies
        the cluster uniquely in the URP/DCC network.

CLOSE   specifies that BTNS must not poll the stations attached to the
        cluster, until an "RT cluster-name" network-control command is
        issued to start dialog with the stations declared.

EXAMPLE 1

The following CNC descriptions show two alternative possible ways of declaring the same stations:

```
LINE       LNO2;

STATN      STOO, 10;
TERMNL     vOO, VIP7700, KCT;

CLUSTER    CLOI;
STATN      STOI, I;
TERMNL     VOI, VIP 7001, KCT;
STATN      STO2, 2;
TERMNL     VO2, VIP7001, KCT;

CLUSTER    CLO2, CLOSE;
STATN      STO3, 3;
TERMNL     VO3, VIP7001, KCT;
STATN      STO4, 4;
TERMNL     VO4, VIP7700, KCT;

CLUSTER    CLO3;
STATN      STO5, 7;
TERMNL     VO5, VIP7700, KCT;
STATN      STO6, 8;
TERMNL     VO6, VIP7001, KCT;
```

This example defines a VIP line "LNO2" comprising 7 stations numbered from "STOO" through "STO6". Six of these stations have been declared under 3 clusters named "CLOI", "CLO2" and "CLO3".

Cluster "CLO2" will not be polled until an "RT CLO2" network control command is issued.

The 7 stations shown may alternatively be declared under 4 clusters, depending on the requirements of the network:

```
LINE       LNO2;

CLUSTER    CLOO;
STATN      STOO, 10;
TERMNL     VOO, VIP7700, KCT;

CLUSTER    CLOI;
           ...
           ...
           ...

CLUSTER    CLO2, CLOSE;
           ...
           ...
           ...

CLUSTER    CLO3;
           ...
           ...
           ...
```

EXAMPLE 2

This example declares a DPS 6 system connected through a VIP line. |

```
    CLUSTER REFI;
    STATN   S401,  I;
    TERMNL  V40 I, HL6, KCT;
    STATN   S402,  2;
    TERMNL  V402,  HL6, KCT;
    STATN   S403,  3;
    TERMNL  V403,  HL6, KCT;
```

LINE Command

DEFINITION

Required for each communications line in the network. LINE must be followed by all the CLUSTER, STATN and TERMNL commands pertaining to it.

LINE identifies the line and defines its characteristics.

Each communications line to be supported by the network, must be described by a separate LINE command.

COMMAND FORMAT

Secondary Network Lines

```
LINE LNnn [, RKMOD] [, BRKLG = (4!nn)] [, CCINS = nnn]
          [, CLV = n] [, CLOSE ] [, EPX] [, ERCAP]
          [, ININS = nnn] [, LINPLG] [, NAUCDE] [, NDISCNT]
          [, PADNB = nn] [, PARITY = n] [, PLCNT = nn]
          [, PLRGF = nnn] [, POLLIST = (nn [, nn ...])]
          [, RTCNT = nn] [, SPEED = x] [, SPN = (0!1)]
          [, SSR] [, TCTNM = (ASCII!SPTTY)] [, TILEN = nnn]
          [, TOLEN = nnn] ;
```

Primary Network HDLC Lines

```
LINE LNnn [, CLOSE] [, UHDLCW = (n1, n2)] ;
```

TLT PARAMETERS

The TLT is a URP/DCC table attached to each line. It contains all the parameter characterizing line functions.

Some of these parameters are not accessible to system software and must be initialized during URP/DCC firmware generation. For all lines, except those declared CLOSED, further parameters are initialized by BTNS during the start-up phase. An "RT" network control command must be issued, to activate line processing.

The TLT, loaded by BTNS, is built up by the CNC utility which reads hardware parameters from the URP/DCC and initializes parameters visible to the system software either with default values or with parameters explicitly specified in the appropriate CNC commands. Parameter default values are summarized below, after the Parameter Description.

Parameters may be classified in three categories:

1) TLT tuning parameters, which may be modified dynamically during the BTNS session with the "MTL" network control command

2) TLT system parameters, which depend on the requirements of the application program. These are either determined by the analyst/programmer or affected by manipulative procedures under the control of the terminal operator.

3) TLT hardware and procedure parameters, which depend mainly on the hardware characteristics of terminals, modems, and line procedure specifics.

PARAMETER DESCRIPTION

LNnn   defines the line uniquely within the network and is declared in the SRST at installation time. Values may range from "01" through "99".

          The CNC utility checks that the line declared is:

          ● Present in the SRST

          ● Connected and available from a software point of view (i.e., "released" in terms of device management)

          ● Not the system console line.

BKMOD   is a TLT system parameter which specifies the effect of a "break" during message output. BKMOD is applicable only to TTY terminals equipped with a BREAK key:

          ● If specified, output is immediately terminated

          ● If not specified, output continues until the end of the current message, before the BREAK condition is reported to BTNS.

BKKLG   is a TLT hardware/procedure parameter which specifies the length, in number of characters, of the BREAK signal over the reverse channel of TTY lines. Values may range between "4" and "15" inclusive, with a default of "4".

CCINS   is a TLT hardware/procedure parameter which defines the number of "fill" characters to be inserted after activation of a mechanical function by control code. Such functions include "carriage return" and "line feed". This is done in order to avoid losing subsequent data characters transmitted during execution of that function. The number of "fill" characters may range from "0" through "127", and depends on the type of terminal involved.

If "0" is specified, no "fill" characters are inserted. The
default value depends on the type of terminal applicable:

 3 TTY
10 TTY-R
 0 VIP-A or HDLC
 6 VIP-S
 2 BSC or TCV

CLOSE   specifies that BTNS must not initialize traffic over the line
concerned, until an "RT" network control command is issued to
start processing of the line. The TLT for the line is not
loaded during BTNS start-up. By default, the line is active.

CLV   is a TLT hardware/procedure parameter, to specify the level
of code used on the line, including the parity bit where
applicable. Values range from "0" through "3", with the
following meanings:

 0 8 bit code (the default value) |
 1 7 bit code
 2 6 bit code
 3 5 bit code (illegal for a synchronous line: i.e., VIP
    synchronous or BSC).

EPX   is a TLT parameter which specifies that echoplex is to be |
used over a TTY line: i.e., a character received by the |
URP/LCC is turned around to the transmitting terminal.
Echoplex may only be specified for fully-duplex lines, and
may be used for TTY37-type terminals with a printer and
keyboard disconnectable from each other.

ERCAP   is a TLT parameter which selects "erase" capability for TTY |
lines only. When specified, the operator may delete the last
character entered, by keying in a "back slash" (i.e.,
"reverse slant") character. Input message length, including
"erase" characters, must not exceed "128". Erase capability |
may alternatively be achieved using the $*$DC command. |

ININS   is a TLT hardware/procedure parameter which defines the
number of SYN control codes to be sent before each message,
to allow synchronization. This parameter is applicable only
to a synchronous line: i.e., VIP synchronous or BSC. The
number of SYN control codes may range from "0" through "127",
depending on terminal characteristics and performance.

The default is "4" SYN control codes.

LINPLG   is a TLT system parameter which specifies that polling of a
         multipoint line is to be linear; i.e., polling is to
         recommence from the top of the list after each successful
         polling. By default, "round-robin" polling is assumed; this
         means that subsequent polling starts with the line
         immediately following the last entry successfully polled.

NAUCLE   is a TLT hardware/procedure parameter applicable only to a
         switched line, to allow for manual connection. When
         specified, detection of the ring indicator on the line is
         inhibited, making the line unavailable to the network. In
         order to render such a line available again, this parameter
         must be omitted from the next network generation.

NDISCNT specifies that BTNS must not disconnect a switched line
         automatically, when the TOLEN time-out interval is exhausted.
         See TOLEN. NDISCNT is allowed only for switched lines and, in
         particular, should only be used for in-house switched lines
         where no common carrier billing considerations apply.

PADNB   is a TLT hardware/procedure parameter which defines the
         number of PAD control codes to be sent at the end of each
         output message. This is done in order to avoid losing the
         last character(s) in case of turn-around on reception. The
         number of PAD control codes ranges from "0" through "15",
         depending on modem characteristics, with a default of "4". |

PARITY   is a TLT hardware/procedure parameter used to check input
         parity, depending on the type of terminal connected. Values
         range from "0" through "3", with the following meanings:

         0   code without parity
         I   code with "pseudo-parity"; i.e., the parity bit is always
             set to I
         2   Code with even parity; i.e., the number of " I-bits" is
             even (the default value). |
         3   Code with odd parity; i.e., the number of "I-bits" is odd.

PLCNT   is a TLT system parameter for use in getting better response
         time over polled lines with a sizeable number of stations,
         arbitrarily set at more than 7. During the normal polling
         cycle, the URP/DCC firmware automatically polls each station
         specified in the (default or explicitly-defined) polling list
         for the line concerned; see POLLIST. If all stations are
         found to be idle (i.e., with nothing to send), the URP/DCC
         looks for a BTNS output request before starting a new polling
         cycle. PLCNT defines a maximum number of stations to be
         polled automatically before a BTNS output request may be
         taken into account. As a result, the maximum number of
         stations must not exceed the length of the polling list.

Minimum value is "0"; i.e., the whole polling list is scanned
before a BTNS output request may be serviced. The maximum
value is "15". Determination of default value depends on
whether the number of stations is:

- Less than or equal to 3, the default value is the same as
  the length of the polling list
- Greater than 3, the default value is "3".

PLRGF is a TLT system parameter which defines the PoLling
ReGulation Factor, in order to control the polling frequency
for stations in the OFF state. During the polling cycle, each
station which does not reply adds its TOLEN time to the total
inactivity time of the network, which may degrade network
performance.

The Polling Regulation Factor specifies the number of polling
cycles to be executed for ON stations, before executing a new
cycle for all stations; i.e., including the OFF stations. If
all stations are OFF, this value is ignored.

Minimum value: 0; i.e., no distinction is made between ON and
OFF stations

Maximum value: 255

Default value: 10.

POLLIST specifies the polling list to be used over the line, provided
that it has been declared as multipoint in the SRST; e.g., TC
and VIP. Stations to be polled are identified by their STIs
(STation Indexes), ranging in value from "1" through "32".
The number of stations on the list must not be greater than
the value declared with the SRST parameter POLISTLENGTH for
the line. STIs may be repeated in the list, in any order,
provided that they correspond to the STIs declared with STATN
commands after the LINE command concerned.

The polling list may be modified by the "MTP" network control
command, provided that the number of stations in the modified
polling list is not to exceed the total number originally
specified. A default polling list is established for the
line, according to the sequence of the various relevant STATN
commands, with 1 entry per station. See run-time
prerequisites on page 3-2.

RTCNT is a TLT hardware/procedure parameter which specifies the
number of retries to be attempted whenever an error occurs in
transmission. Values may range from "1" through "15", with a
default of "4".

SPEEL   is a TLT tuning parameter which defines the speed of an asynchronous line; i.e., TTY, TC, or VIP asynchronous. Values range from "A" through "T", representing the following speeds, in bits per second:

A = 50	E = 155	I = 600	M = 1800	Q = 4800
B = 75	F = 150	J = 900	N = 2000	R = 7200
C = 100	G = 200	K = 1050	O = 2400	S = 9600
D = 110	H = 300	L = 1200	P = 3600	T = 19200

A DCC (Data Communications Controller) is configured with 4 of the 20 speeds listed. The CNC utility checks that the value defined for the line is one of the four speeds configured for the DCC in question. A speed is selected for a given line from these four values and is specified at SRST generation time with the LINE resource command, to tailor the URP/DCC buffers for that line. In order to override the SRST value, the SPEEL parameter supplies the new value (which must be compatible with the URP buffers generated for that line).

SPN   is a TLT hardware/procedure parameter which defines the number of stop bits to be sent after each character, in asynchronous transmission; i.e., TTY, TC, or VIP asynchronous. This also depends on the type of terminal concerned. Values may be either:

    0 for 1 stop bit

    1 for 2 stop bits.

SSR   is a TLT hardware/procedure parameter which is specified according to modem and line speed type, as shown in Figure 5-1 below.

Figure 5-1: Line Speed and Modem Types

Modem Characteristics				Position of Modem	SSR
Bauds	Transmission	Selection Mode	Interface	terminal	specify
300	asynchronous	frequency emission	pin 11 CANNON	CPU	omit
600	asynchronous	debit binary	pin 23 CANNON	-any-	specify
1200	asynchronous	debit binary	pin 23 CANNON	-any-	specify
1200	synchronous	debit binary	pin 23 CANNON	-any-	omit
2400	synchronous	debit binary	pin 23 CANNON	-any-	specify
>2400	-any-	-any-	-any-	-any-	omit

TCTNM   is a TLT hardware/procedure parameter which allows selection of a translation table other than the standard one defined, for either of the options:

ASCII: If the line procedure is BSC2780 or BSC3270, transmission is in EBCDIC internal code. Depending on the type of terminal, ASCII-to-ASCII transmission may be forced by specifying TCTNM=ASCII.

SPTTY: If the line procedure is TC or TTY, the associated TCT may be patched by the user to obtain specific functions. These depend on the type of terminal and include, for example, an alteration to the "erase" character or "end-of-message" code. To indicate that the "special" user-patched TCT is to be loaded instead of the associated standard TCT, TCTNM=SPTTY must be specified.

This parameter is meaningless for the VIP line procedure. There is no default for the TCTNM parameter. In its absence, the standard TCT for the particular line procedure is loaded.

Note: Each line procedure, except HDLC, has its own Translation Code Table. In general, translation is from ASCII to EBCDIC on input and vice versa on output. The CNC utility identifies the TCT to be loaded into the URP, when the network is being generated. When the line is "opened" at run-time, its associated TCT will automatically be loaded, unless otherwise specified.

TILEN   is a TLT tuning parameter which defines the "time-out" value used by the URP/DCC to control initialization and disconnection of the modem. This value may range from "20" through "255" units, each unit representing 50 milliseconds. In Figure 5-2 below, the value specified must be greater than TI and T2, both of these depending on modem performance.
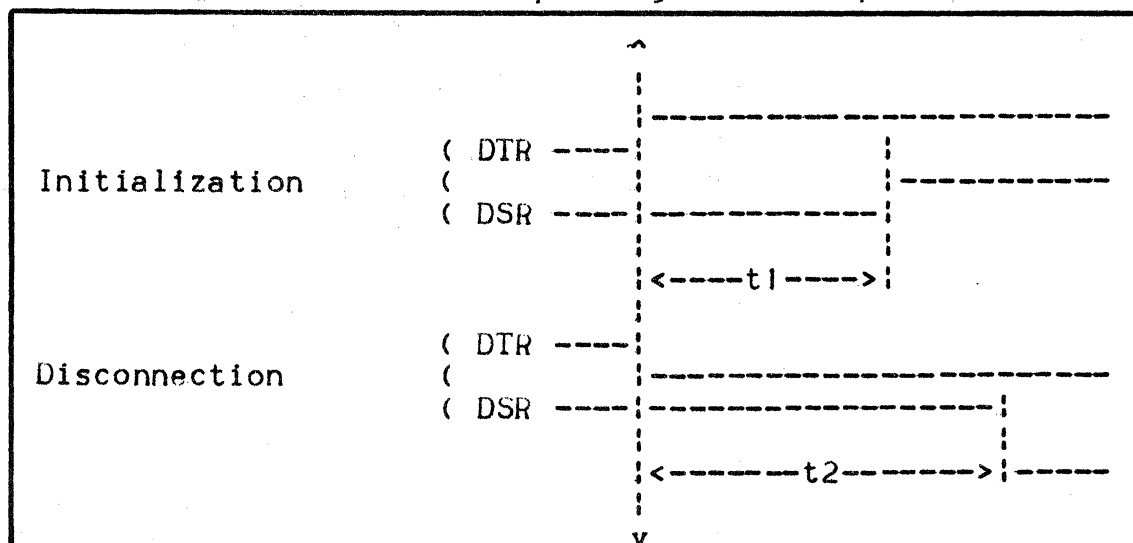
Figure 5-2: TILEN Values

If the "time-out" value is too small, BTNS will display the message:

- Upon initialization:

    CC11: LNnn CANNOT BE OPENED: ENABLE CP FAILED

- Upon disconnection:

    CC11 LNnn HELD BY SYSTEM: DISABLE ERROR.

TILEN may be modified with the network control command MTL.

TOLEN   is a TLT tuning parameter which defines the "time-out" value used by the URP/DCC when:

- Polling a buffered terminal

- Timing the interval between characters input from an unbuffered terminal.

For buffered terminals, "time-out" may range from "0" through "65535" units, each unit being 50 milliseconds. A "0" value gives a "time-out" of 50 * 65536 milliseconds.

For an unbuffered terminal, the "time-out" value may range from "0" through "255" units, each unit being 2 seconds. A "0" value gives a "time-out" of 2 * 256 seconds.

TOLEN may be modified with the MTL network control command, when time-out occurs under the following conditions:

- For synchronous terminals, BTNS reports the condition on the network console with the message:

    "CC13 station-name UNAVAILABLE"

- For asynchronous terminals, BTNS cancels that part of the text already input and initiates a new "read".

- For a switched line, BTNS disconnects the line

- For a BSC3270 multipoint line, time-out is controlled by the IBM3270 controller and not by the URP; this TOLEN parameter is therefore not applicable.

| Parameter | Line Transmission Procedure | | | | | | |
	TTY	TTY-R	TC	VIP (A)	VIP (S)	BSC *	HDLC
BRKLG	na	4	na	na	na	na	na
CCINS	3(DLE)	10(DLE)	2(NUL)	0(NUL)	6(DLE)	2(SYN)	na
CLV	0	0	0	0	0	0	na
ININS	na	na	na	na	4	4	na
PADNB	4	4	0	0	0	0	na
PARITY	2	2	2	2	3	0	na
PLCNT	na	na	(a)	(a)	(a)	(a,b)	na
PLRGF	na	na	10	10	10	10 (b)	na
RTCNT	0	0	4	4	4	4	3
SPEED	(c)	(c)	(c)	(c)	(c)	(c)	(c)
SPN	1	1	0	0	na	na	na
TILEN (d)	140	140	140	140	140	140	140
TOLEN (e)	64	64	16	16	16	416	na

Figure 5-3: TLT Parameter Default Values

Notes:

* BSC line procedure is applicable to both point-to-point and multipoint
(a) See detailed parameter description in text
(b) For multipoint BSC3270, only
(c) Values are defined by the SRST entry for the line
(d) Value of unit = 50 milliseconds
(e) Value of unit for:
 ● TTY and TTY-R line procedures = 2 seconds
 ● Other line procedures = 50 milliseconds.
na Denotes "not applicable".

The above table deals only with parameters for which values are to be defined by the user. For options specified by a self-identifying parameter, the default value is the absence of the parameter.

Parameter	TTY	TTY-R	TC	VIP (A)	VIP (S)	BSC 2780	BSC 3270	HDLC
BKMOL	yes	yes	no	no	no	no	no	no
BRKLG	no	yes	no	no	no	no	no	no
CCINS	yes	yes	yes	yes	yes	yes	yes	no
CLOSE	yes	yes	yes	yes	yes	yes	yes	yes
CLV	yes	yes	yes	yes	yes	yes	yes	no
EXP	yes	yes	no	no	no	no	no	no
ERCAP	yes	yes	no	no	no	no	no	no
ININS	no	no	no	no	yes	yes	yes	no
LINPLG	no	no	yes	yes	yes	yes	yes	no
NAUCLE (f)	yes	yes	yes	yes	yes	yes	yes	no
NLISCNT	yes	yes	no	no	no	no	no	no
PALNB	yes	yes	yes	yes	yes	yes	yes	no
PARITY	yes	yes	yes	yes	yes	yes	yes	no
PLCNT	no	no	yes	yes	yes	no	yes	no
PLRGF	no	no	yes	yes	yes	no	yes	no
POLLIST (g)	no	no	yes	yes	yes	no	yes	no
RTCNT	yes	yes	yes	yes	yes	yes	yes	yes
SPEED	yes	yes	yes	yes	no	no	no	no
SPN	yes	yes	yes	yes	no	no	no	no
SSR	yes	yes	yes	yes	yes	yes	yes	yes
TCTNM	yes	yes	no	no	no	yes	yes	no
TILEN	yes	yes	yes	yes	yes	yes	yes	yes
TOLEN	yes	yes	yes	yes	yes	yes	yes	no

Figure 5-4: LINE Parameter Options Allowed

Notes:

(f) Allowed only if the line is declared switched in the SRST
(g) Allowed only if the line is declared multiploint in the SRST.
● BSC2780 describes point-to-point
● BSC3270 describes multipoint
● TTY-R describes TTY line procedure with break on the reverse channel.

UHDLCW applies to HDLC lines:

n1 defines the maximum number of reads to be executed in one "shoot". Limited to " I" in the current release, the default is " I".

n2 defines the maximum number of writes to be executed in one "shoot". This is limited to "7" in the current release, with a default of "7".

The term "shoot" refers to the number of input or output CCEs in the phyical channel program executable at one time before "turn-around".

Although the LINE command must be followed by STATN and TERMNL commands, the mandatory parameters to be specified for these commands need only be syntactically correct for the CNC utility to accept.

Having described the line, the parameter LNnn must then appear; in the case of a:

● Point-to-point HLLC line, as the argument of the ACCESS parameter in the CP command

● TRANSPAC virtual circuit, as a parameter in the LSUB command (see Section VI "TRANSPAC Commands").

Refer to Section VIII "Tuning the Network", under "BTNS/URP ANL TNS/URP TUNING".

EXAMPLE 1

   LINE LN10;

This command defines a line named "LN10" in the SRST, to function with the default options assumed by the CNC utility according to the line procedure specified (also in the SRST).

EXAMPLE 2

   LINE LN04, LINPLG, POLLIST = (1, 1, 1, 2, 3), TOLEN = 4;

This command defines a multipoint line named "LN04", with the attributes:

● "LINPLG" for each polling cycle to start with the station identified by the station index "1" at the "head" of the polling list; see "POLLIST".

● "POLLIST"; the station indexes specified mean that:

   ● The length of the polling list declared for LN04 is at least "5", accounting for 5 STIs

   ● For each polling cycle, the station identified as "1" is to be polled more often than stations "2" and "3", because:

      ● STI "1" is specified 3 (consecutive) times more than STIs "2" and "3"

      ● The linear polling specified by LINPLG ensures that STI "1" has more chance of being polled since it heads the polling list and occurs repeatedly.

● "TOLEN" selects a "time-out" value, for use by URP/DCC firmware, of 4 * 50 = 200 milliseconds.

"Time-out" defines the lapse between the dispatch of a polling message and the corresponding station response.

If a TRANSPAC local subscription includes PVC, this must be defined in PVC, RDTE and RDTN commands, even though not used.

EXAMPLE 3

LINE LN15, CLOSE, EPX, ERCAP, SPEED = D;

This command defines a line named "LN15", with the attributes:

- "CLOSE" so that the line will not be initialized at BTNS start-up, but only with an "RT LN15" command issued at the network control terminal.

- "EPX" because the line declared is a TTY line for which "echoplex" is to be used. This option may only be used when the terminal's keyboard is disconnected from its printer.

- "ERCAP" to ensure that the character to be used is the "erase" character.

- "SPEED". This is a TTY line operating at a nominal speed, say, of 300 bits per second (value = H). The speed of transmission is to be altered to 110 bits per second; i.e., value = D. This is one of the four speeds configured for the line. This speed may be modified at run-time with the "MTL" network control command.

STATN Command

DEFINITION

Defines a station attached to a polled line, and must immediately be
followed by TERMNL commands defining the terminals composing the
station, before the next station on the line may be defined; see
Example 3, below.

STATN is applicable to all line procedures except TTY, and is
meaningful only for multipoint lines. More than one STATN command may
be associated with a given LINE command, and several STATN commands
may be grouped together under a single CLUSTER command.

For point-to-point lines, the station "concept" refers to the logic
needed to drive the line. For VIP lines, the station maps onto the
terminal object, and for BSC lines to a controller unit (as general
polling is performed for BSC3270 lines).

COMMAND FORMAT

    STATN name, station-index [, CLOSE] ;

PARAMETER DESCRIPTION

name   uniquely identifies the station in the URP/DCC network,
                    ranging from 1 through 4 alphanumeric characters in
                    length.

station-index   defines the STI by which the station is to be polled, a
                decimal integer value ranging from "1" through "32".
                The STI is the index of the station's hardware address
                and must be unique for each station on a given line:

                ● For VIP lines, this is the index in the ordered list
                  (0, 1, 2 ... 31) of the terminal address

                ● For BSC3270, it is the index in the ordered list
                  (40, C1, C2, ... 5E, 5F) of the controller unit
                  address

                ● For HDLC Point to Point as well as BSC2780 lines,
                  this value must be 1.

                The maximum number of stations is configured in the
                SRST.

CLOSE   specifies that BTNS must not poll the station until an
                    "RT station-name" network control command is issued in
                    order to start dialog with the station; see Example 2.

EXAMPLE 1

STATN STA1, 4;

This command defines a station named "STA1", with an STI of "4".

EXAMPLE 2

STATN STA2, 1, CLOSE;

This command defines a station which may not be polled until an "RT STA2" network control command has been issued.

EXAMPLE 3

The following sequence of commands shows the use and positioning of the STATN command.

LINE   LN12;

STATN   ST00, 1;
TERMNL T00, VIP7001, KCT;

STATN   ST01, 2, CLOSE;
TERMNL T01, VIP7700, KCT;
TERMNL T02, VIP7700, PRT;

STATN   ST02, 5;
TERMNL T03, VIP7001, KCT;

The polled line "LN12" has 3 stations attached to it; "ST00", "ST01", and "ST02".

Stations "ST00" and "ST02" are each composed of only 1 terminal, identified as "T00" and "T03", respectively.

Station "ST01" has 2 terminals, namely "T01" and "T02".

TERMNL Command

DEFINITION

Defines the terminal, as a uniquely addressable unit in the network, and specifies the characteristics with which it is to function.

Except for TTY line procedure, TERMNL commands (defining the terminals composing a station) must follow immediately after the associated STATN command (if present) or LINE command.

For TTY line procedure, to which the STATN command does not apply, the TERMNL command must immediately follow the relevant LINE command.

For switched lines, parameters defined at network generation in the TERMNL command, are default values which may be overridden at connection time.

COMMAND FORMAT

```
TERMNL name (terminal-type:SLAVE), terminal-subtype
        [ , ADD = "hh"] [ , ANSWBCK] [ , ASSIGN = name] [ , AUTO]
        [ , AUTOLF] [ , CLOSE] [ , IM = (NL:UN)] [ , LINELG = nnn]
        [ , NOBT] [ , NSYSMES] [ , PAGE = nnn] [ , SBKLG = (80:nnn)]
        [ , SYSHEAD = ("OD25":"hhhhhhhh")] [ , TAB]
        [ , USER = user-name] ;
```

PARAMETER DESCRIPTION

name   uniquely defines the terminal within the BTNS
                        network, with a value which may range from 1 through
                        4 alphanumeric characters in length. This name must
                        be identical to the name given for the corresponding
                        MAM queue, if the terminal is to be used by MCS
                        applications programs. See the QUEUE command.

terminal-type   defines the type of standard terminal specific to
                        the line procedure used, and therefore the
                        characteristics associated with a given terminal.
                        Terminal-type may be either:

                        ● Standard, featured in Figure 5-5; i.e., a
                          terminal supported by GCOS as "standard"

                        ● Non-standard. The user should contact his local
                          Bull technical support in the event of a
                          requirement for definition of a new or "foreign"
                          terminal-type's characteristics for support by
                          GCOS (with its features mapped onto
                          GCOS-supported features).

                        In the case of a terminal having several subtypes,

the subtype to act as "master" is declared with the
terminal type, and heads the list of TERMNL commands
declaring the other subtypes. The subtypes following
the "master" must be declared as "SLAVE". If "SLAVE"
is specified, ASSIGN and AUTO may not be present.

Figure 5-5: Types of Standard Terminals

TTY TTY-R	VIP asynchronous	VIP synchronous	BSC 2780	BSC 3270
AJ832	none	DKU7005	HL61	IBM3270
AJ833		DKU7007	HL62	IBM3278
DKU7001		DKU7105	HL64	IBM3741
DKU7002		DKU7107	HL66	
DTU7171		DKU7211	IBM370	
DTU7172		HL6		
PC7800		KDS7255		
PRT1220		KDS7275		
TK4105		MTS7508		
TN300		STS2840		
TN1200		TTS7800		
TTU8124		TTU8221		
TTU8126		TTX35		
TTU8128		VIP7001		
TTY33		VIP7700		
TTY35		VIP7760		
VIP7100		VIP7804		
VIP7200		VIP7805		
VIP7801		VIP7814		
VIP7801V				
VIP7802				

MINITEL and TELEX are only supported for use via TRANSPAC; refer to
Section VI.

terminal-subtype specifies the functional characteristics of the
terminal; e.g.:

CAS Cassette
CPU Central Processor
CRT Screen
DSK Disk or diskette
KB Keyboard
KCT Keyboard with screen
KPR Keyboard with printer
PRT Printer.

The terminal's I/O capability is overridden by its
subtype; i.e., if a keyboard printer is declared as
"PRT", its keyboard will be disabled.

Figure 5-6: Terminal Subtype Capability

Terminal Subtype	CAS	CPU	CRT	DSK	KB	KCT	KPR	PRT
I/O Capability	I/O	I/O	O	I/O	I	I/O	I/O	O
System Messages	no	no	yes	no	no	yes	yes	yes

Figure 5-7: Allowed Type/Subtype Combinations
With Corresponding Default Device Addresses

terminal type	line procedure	CAS	CPU	CRT	DSK	KB	KCT	KPR	PRT
AJ832	TTY					y		y	y
AJ833	TTY					y		y	y
DKU7001	TTY			79		79	79		
DKU7002	TTY			79		79	79		
DKU7005	VIP(S)			79		79	79		88
DKU7007	VIP(S)			79	97	79	79		88
DKU7105	VIP(S)			79		79	79		88
DKU7107	VIP(S)			79	97	79	79		88
DKU7211	VIP(S)			79	97	79	79		88
DTU7171	TTY/TTY-R			y		y	y		
DTU7172	TTY/TTY-R			y		y	y		
HL6	VIP(S)	y					y		
HL61	BSC	y							
HL62	BSC	y							
HL64	BSC/HDLC	y							
HL66	BSC	y							
IBM3270	BSC			y		y	y		y
IBM3278	BSC			y		y	y		y
IBM370	BSC	y							
IBM3741	BSC	y							
KDS7255	VIP(S)			79	97				
KDS7275	VIP(S)			79	97	79	79		88
MTS7508	VIP(S)			79	97	79	79		88
PC7800	TTY			y		y	y		
PRT1220	TTY					y		y	y
STS2840	VIP(S)			79	97	79	79		88
TK4105	TTY/TTY-R			y		y	y		
TN1200	TTY/TTY-R					y		y	y
TN300	TTY					y		y	y
TTS7800	VIP(S)			79	97	79	79		88
TTU8124	TTY					y		y	y
TTU8126	TTY/TTY-R					y		y	y
TTU8128	TTY/TTY-R					y		y	y
TTU8221	VIP(S)					79		79	79
TTX35	VIP(S)			79	97	79	79		88
TTY33	TTY					y		y	y
TTY35	TTY					y		y	y

terminal type	line procedure	CAS	CPU	CRT	DSK	KB	KCT	KPR	PRT
VIP7001	VIP(S)			79		79	79		88
VIP7100	TTY			y		y	y		
VIP7200	TTY			y		y	y		
VIP7700	VIP(S)	97		79		79	79		88
VIP7760	VIP(S)			79	97	79	79		88
VIP7801	TTY			y		y	y		
VIP7801V	TTY			y		y	y		
VIP7802	TTY			y		y	y		
VIP7804	VIP(S)			79		79	79		79
VIP7805	VIP(S)			79		79	79		79
VIP7814	VIP(S)			79		79	79		79

"Terminal-subtype" determines the I/O capability of the terminal (e.g., its ability to receive system messages) and defines its default access.

In Figure 5-7 "Allowed Type/Subtype Combinations", above, "y" indicates that a given combination is allowed. The default address, where applicable, is given as a 2-digit hexadecimal value.

ADL specifies the address of the terminal device within the station, with a 2-digit hexadecimal value enclosed in double quotes. Values are determined at installation time, obtainable from the Field Engineering Service. This (hardware address) parameter is mandatory for terminals connected with BSC3270 procedure, and must also be specified for VIP lines when the terminal device address should be different from the default generated by the CNC utility for the type/subtype combination applicable.

ANSWBCK

specifies that the terminal is to have "answer-back" capability, applicable only to terminals connected over switched lines.

The identification sequence is a string of up to 12 alphanumeric characters; see the IDSEQ command on pages 4.6 to 4.8.

ASSIGN

dedicates the terminal to a specific use, as identified by a name ranging from 1 through 8 alphanumeric characters in length. This name must be that of either:

● A program queue declared with the QUEUE command

● A communications service, otherwise known as a VCAM subsystem (such as IOF or TDS) as declared with the DCTAP command. Note that TDS is the only VCAM subsystem that does not have to be declared in a DCTAP command at network generation.

The assignment may be altered with the "MTT" network control command. If the terminal has been declared as "SLAVE", neither ASSIGN nor AUTO may be specified. However, if ASSIGN is specified for the "MASTER", it also applies implicitly to the "SLAVE".

AUTO

specifies that the terminal is to be submitted to automatic connection algorithms by BTNS.

If a terminal is declared without either AUTO or ASSIGN, it becomes a "general-purpose" terminal. The logical connection is initiated by the terminal operator before accessing the application program required.

If declared with "AUTO" alone, without ASSIGN, a terminal becomes "automatic". Once it has been powered-up, the BTNS Terminal Manager initiates the logical connection before directing the terminal to any application program which wants to "seize" it. If the output queue (associated with the terminal) is not empty, data is sent to the terminal. Note that terminals, declared only as "AUTO", are not asked for a "user id".

A terminal becomes "dedicated" if it is declared
with "ASSIGN" alone, without AUTO. The terminal's
logical connection is restricted to the application
specified in the ASSIGN option.

A terminal becomes "automatic-dedicated" if it is
declared with both "AUTO" and "ASSIGN". As soon as
the terminal is enabled, the BTNS Terminal Manager
initiates the logical connection of the terminal to
the application specified in the ASSIGN option.

AUTOLF
specifies that the KCT or KPR terminal concerned has
automatic line-feed capability; i.e., the line-feed
function is performed automatically every time that
"carriage return" or "transmit" is activated. At
log-on time, this parameter is passed on to the
relevant VCAM subsystem for editing purposes.

CLOSE
specifies that BTNS must not initiate traffic to the
terminal declared, until an "RT" network control
command is issued, before the terminal may accept a
connection request from an application.

IM
defines whether a transaction program activated from
the terminal needs to receive VIP function codes;
i.e.:

NL the default value, denotes "Normal Mode". VIP
function codes are not passed to the program.

UN denotes "Unedited Mode". VIP function codes are
passed to the transaction program in the mark
form "><U03".

LINELG
defines the number of characters in the physical
line length of the terminal, declared as a 3-digit
decimal value. See Figure 5-8 "Terminal
Characteristics" below. "LINELG" is used by IOF to
adapt its line length to that of the terminal
receiving a message.

Figure 5-8: Terminal Characteristics

terminal type	TAB	AUTOLF	LINELG default		PAGE default	
			hex	dec	hex	dec
AJ832	yes	no	9E	158		
AJ833	yes	no	9E	158		
DKU7001	no	no	50	80	18	24
DKU7002	software-visible as DKU7001					
DKU7005	yes	yes	50	80	18	24
DKU7007	yes	yes	50	80	18	24
DKU7105	yes	yes	50	80	18	24
DKU7107	yes	yes	50	80	18	24
DKU7211	yes	yes	50	80	18	24
DTU7171	no	no	50	80	18	24
DTU7172	no	no	50	80	18	24
HL6	no	no	50	80	18	24
HL61	yes	yes				
HL62						
HL64						
HL66					18	24
IBM370						
IBM3270	no	no	50	80	18	24
IBM3278	no	no	50	80	18	24
IBM3741	no	no				
KDS7255	no	no	80	128	1	
KDS7275	no	no	80	128	1	
MTS7508	no	yes	50	80	0C	12
PC7800	yes	no	50	80	18	24
PRT1220	yes	no	84	132	42	66
STS2840	no	no	50	80	18	24
TK4105	yes	no	50	80	1E	30
TN300	yes	yes	76	118		
TN1200	yes	yes	78	120		
TTS7800	yes	yes	50	80	18	24
TTU8124	yes	no	84	132		
TTU8126	yes	no	84	132		
TTU8128	yes	no	84	132		
TTU8221	yes	no	84	132		
TTX35	yes	yes	50	80	18	24
TTY33	no	no	48	72		
TTY35	no	no	48	72		

terminal type	TAB	AUTOLF	LINELG default		PAGE default	
			hex	dec	hex	dec
VIP7001	yes	yes	50	80	18	24
VIP7100	no	no	50	80	18	24
VIP7200	no	no	50	80	18	24
VIP7700	yes	yes	50	80	18	24
VIP7760	yes	yes	50	80	18	24
VIP7801	yes	no	50	80	18	24
VIP780 IV	yes	no	50	80	48	72
VIP7802	yes	no	50	80	18	24
VIP7804	yes	yes	50	80	48	72
VIP7805	yes	yes	50	80	48	72
VIP7814	yes	yes	50	80	48	72

NOBT
specifies that BTNS must not accept any "BT"command, whatever its origin, directed towards the terminal declared. NOBT is meaningless and redundant for terminals which cannot receive system messages in any case; i.e.:

- CAS, CPU, DSK, and KB terminal subtypes

- Any terminal specified with NSYSMES.

NSYSMES
specifies that BTNS must not send any system messages to the terminal declared. BTNS will not therefore initiate even the log-on dialog. The only way to connect a terminal defined with NSYSMES, is to declare it with both "AUTO" and "ASSIGN", thereby making the terminal "automatic/dedicated". Terminal connection is then notified to the network control operator. NSYSMES is particularly useful for TTY-compatible terminals that have no print (output) and/or manual input (keyboard) capability.

PAGE
specifies the number of lines on the terminal's screen, with a 3-digit decimal value. At log-on, this parameter is passed on to the VCAM subsystem concerned, for editing purposes.

USER
specifies a user name for automatic terminals, to be used for logon instead of the concatenation "1sys-name_terminal-name".

SBKLG   applicable only to BSC2780 line procedure, specifies |
                         the subblock size, in characters, to be generated by
                         BTNS when transmitting a character string. Subblocks
                         may be used in either:

                         ● "Normal" mode, in which checks are made for
                           transmission and device-control codes, so as to
                           distinguish them from data characters

                         ● "Transparent" mode, in which no distinction is
                           made between control codes and data characters.
                           Values may range from "50" through "512", with a
                           default of "80" characters.

SYSHEAD   specifies the character string to precede every
                         system service message sent by BTNS to the terminal
                         declared, expressed as a hexadecimal array enclosed
                         within double quotation marks. Values may range from
                         1 character (i.e., 2 hexadecimal digits) through 4
                         characters (i.e, 8 hexadecimal digits), with a
                         default value of "0D25" (which defines carriage
                         return and line-feed, respectively). An "FF" value
                         specifies that no character string is to be inserted
                         before system messages. For the format of network
                         messages, see the GCOS Terminal Operations manual.

                         This parameter is mandatory for BSC3270 terminals. |

TAB   specifies that tabulation is available on the
                         terminal declared. At log-on, this parameter is
                         passed on the VCAM subsystem concerned (e.g., IOF)
                         so that it may format the display layout
                         accordingly.

EXAMPLE 1

        LINE   LN12:
        STATN   KDSX, 1:
        TERMNL KDSC, KDS7275, KCT, ASSIGN = Q1, AUTO:
        TERMNL KDSD, SLAVE, DSK:

This set of commands specifies a "KDS7275" terminal to function under
the following conditions:

● The keyboard screen (i.e., "KCT"), named "KDSC", is "master"

● The diskette drive (i.e., "DSK"), named "KDSD", is "slave"

● Both the terminal's subtypes, "KCT" and "DSK", are to be logged on
  automatically to the MCS queue "Q1" whenever the station "KDSX"
  becomes available to BTNS, since they have been assigned to this
  queue.

EXAMPLE 2

    LINE   LNO I;
    TERMNL TTOI, TN300, KPR, ASSIGN = IOF, NOBT, ANSWBCK;

This set of commands specifies a "TN300" (i.e., TTY-type) terminal,
to function under the following conditions:

● The keyboard-printer (i.e., "KPR"), named "TTOI", is dedicated to
  the VCAM subsystem "IOF"

● The terminal is not to receive any messages sent with a "BT"
  command

● The terminal has:

    ● "Answer-back" capability

    ● Automatic line-feed, invoked by default

    ● A line length of 118 characters, also invoked by default.

● The STATN command is absent, since the TN300 is a TTY-type
  terminal.

VCAM SUBSYSTEM

DCTAP Command

DEFINITION

Required to define a communications "service" (otherwise known as a VCAM subsystem) whenever terminals or TRANSPAC RDTNs are assigned to it, by specifying a mailbox. DCTAP may appear anywhere in the second group of commands so long as it does not disrupt either of the following sequences:

● LINE – CLUSTER – STATN – TERMNL

● RDTE – RLTN.

Note that DCTAP commands are required for all communications services, with the exception of TDS. The mailbox so defined is left in IDLE state until used, during the current session. DCTAP is mandatory if any terminals are dedicated to the VCAM subsystem, declared with the ASSIGN option in their associated commands; i.e.:

● URP/LCC terminals declared through the TERMNL command

● TRANSPAC remote terminals declared with the RDTN command.

Declaring a mailbox with DCTAP enables VCAM to enqueue connection requests from the terminals, until the mailbox declared is activated by its associated VCAM subsystem.

The maximum number of connections enqueued by VCAM is 255. This maximum is redefined, however, by the relevant GCOS communications service as soon as that service's session begins. Connection requests arriving at an IDLE mailbox are mandatorily checked against the site catalog.

COMMAND FORMAT

     LCTAP name ;

PARAMETER DESCRIPTION

name ranges from 1 through 8 alphanumeric characters in length, and
     defines any communications service known to GCOS, such as IOF
     and READER.

<u>QMON COMMANDS</u>

<u>GENQMON Command</u>

(GENeration of QMON)

DEFINITION

Defines various MCS service parameters, for reactive launching of an application upon logon at a terminal associated with the input queue linked to the application.

COMMAND FORMAT

```
    GENQMON qmon-name, APPLIB = name
            [, APPABNUM = (20!nn)] ;
```


PARAMETER DESCRIPTION

qmon-name   indicates the relevant user-defined QMON Service name, of 1
            through 8 alphanumeric characters in length, to serve as
            internal identification within the system.

APPLIB   designates the catalogued application library name, of 1
            through 44 alphanumeric characters in length. A terminal
            QUEUE may reference a member of this library; see the
            "INIT" parameter of the QUEUE command.

APPABNUM   supplies an integer to specify the application's "abnormal
            launching maximum count", with a default value of "20".
            This counter is identical for all applications, and avoids
            the indefinite spawning of an incorrect job by the system.

QUEUE Command

DEFINITION

Required for each physical MAM queue to be defined in the network, QUEUE may appear anywhere in the network description provided that it does not disrupt either of the following sequences:

- LINE - CLUSTER - STATN - TERMNL

- RDTE - RDTN.

MAM physical queues may be terminal queues, program queues, or user-id queues. QUEUE defines the external queue name together with its functional attributes.

COMMAND FORMAT

```
QUEUE name [, BLOCKING] [, BREAK] [, CLOSE] [, (CTLRST¦RESTART)]
        [, ENQUEUE] [, IM = (NL¦MK¦UN)] [, INIT = appl_name]
        [, LLENGTH = (80¦nnnn)] [, MAXMG = (255¦nnn)]
        [, NBLOCKS = nnnn]
        [, (NUMBLK = nnn¦NUMREC = nnnnn¦QCPOOL)]
        [, OM = (NL¦UN)] [, SHARE] [, TWA] [, USERID] ;
```

PARAMETER DESCRIPTION

name   length and syntax depend on the characteristics and usage intended for the queue in question. These syntax rules ensure non-regression as compared with previous GCOS MAM releases and conform to DSA network protocols, COBOL ANSI 74 standards and DN7100 naming conventions. A MAM queue may be defined as one of:

- Program queue, when it is to be used by GCOS MCS applications for receiving messages. In this case, the queue-name's length may range from 1 through 8 alphanumeric characters.

- A user-id-queue, in which case its length may range from 1 through 12 alphanumeric characters. See the USERID parameter.

- BTNS terminal queue, when it is to be used for sending messages to a terminal managed by BTNS and connected through either the local network (i.e., a terminal defined with the TERMNL command) or the TRANSPAC French public network (i.e., as defined with the RDTN command). In this case, the queue-name must be identical to that of the terminal as specified in the appropriate commands, a terminal-name ranging from 1 through 4 alphanumeric characters in length.

• DSA terminal queue, when it is to be used for sending messages to either:

  • A terminal connected to a front-end or remote DN7100

  • An MCS application on a remote DPS7 in the network. |

  In this case, the queue's name must be in the format: "session-control-name.mailbox-name" - where:

  • "session-control-name" ranges from 1 through 4 alphanumeric characters in length, to define the session control of the DSA system to which the terminal is connected, as specified at network generation with either the "FSC" or the "RSC" command, as appropriate.

  • "mailbox-name" ranges from 1 through 8 alphanumeric characters in length, to define the name of the DSA mailbox attached to the application addressed. If this is a terminal, its name must be the same as the corresponding terminal name given in the DN7100 generation. For all other cases, this name corresponds to a local queue in the remote DPS7.

  • The string "session-control-name.mailbox-name" may not exceed 12 alphanumeric characters in length, including the "period" separator. This is so that it may fit the CD Declaration (i.e., Communications Description) which must be present for the RECEIVE statement.

  • The dollar sign (i.e., $) is allowed in both the session control name and the mailbox name, to conform with DN7100 naming conventions.

BLOCKING is applicable only to terminal queues, for editing messages sent by the application working behind the terminal queue in question. When this editing function is activated, MAM keeps a record of the logical terminal line length specified with LLENGTH in order to generate, automatically, a "new-line" or "carriage-return/line-feed" character string before the first line of each output message (or at the start of each new logical line).

BREAK is applicable only to program queues on which the MCS | application is to be notified of status concerning:

  • Asynchronous events, such as "BREAK" and "RVI"

  • Terminal status changes, such as connection and disconnection.

CLOSE — specifies that the queue is initially disabled. The first application to use this queue must start by "enabling" it; i.e., using the ENABLE verb in order to allow data transfer to take place between the queue and its associated terminal.

CTLRST — is applicable only to terminal disk queues, to allow controlled restart following a "step abort" or a "system crash".

ENQUEUE — is applicable only to program queues, to specify that new connection requests must be queued by VCAM, when the maximum number of connections allowed on the queue is reached (as defined with "MAXMG", or its default value), until a connection level is released by a terminal logging off.

IM — is applicable only to terminal queues, to specify the format of input data passed from a terminal to the MCS application:

NL denotes "Normal Mode", the default value, and specifies that:

- Headers and control characters are not passed to the application

- Encoding characters and repeat functions are performed

- Other characters, including standard marks, are passed without translation.

MK denotes "Mark Mode", to specify that:

- Headers are passed as marks, in the format "><u03abc"

- All hexadecimal control codes are translated into their corresponding mark formats

- Encoding characters and repeat functions are performed

- Other characters, including standard marks, are passed without translation.

UN denotes "Unedited Mode", to specify that:

- Headers are passed as marks, in the format "><u03abc"

- Other characters, including control characters and marks, are passed without translation.

INIT — defines the application name in relation to the terminal, or program, queue as applicable. QMON retrieves the JCL subfile specified in the GENQMON command. The "appl-name" may range from 1 through 12 alphanumeric characters in length. For use

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of "INIT", refer to the MCS User Guide.

LLENGTH   applies only to terminal queues, to specify the number of
           characters in the logical terminal line size to be used for
           automatic editing, when the BLOCKING option is specified.
           Values may range from "5" through "9999", with a default of
           "80".

MAXMG   applies only to program queues, to specify the maximum
           number of users that may be connected simultaneously to the
           program queue concerned. Once this maximum number has been
           reached, new connections are either:

           ● Enqueued at VCAM level, to await disconnection of an
             existing user, if ENQUEUE has been specified

           ● Rejected with the message:

             CCO4 LOGON DENIED: MAILBOX SATURATED.

           A "DT" command may be used at any time, to display the
           maximum number of users authorized as well as the current
           number of active and waiting connections (in the queue). The
           maximum value is "255", which is also the default.

NBLOCKS   is applicable only to terminal queues, to specify the number
           of logical lines that may be accepted in each message sent
           to the terminal declared. The number of characters in each
           logical line is determined with "LLENGTH". The length of the
           message transmitted is defined by the algorithm:

           (NBLOCKS * LLENGTH) = maximum length.

           Any part of the message in excess of this limit, is
           truncated. The number of logical lines may range from "1"
           through "9999", with a default of "20".

NUMBLK   sets the number of memory blocks for exclusive use of the
           queue declared. The size of the memory block is defined in
           bytes by the "QCBLKSZ" parameter of the GENCOM command (see
           pages 4.1 to 4.4). The usable size of the memory block is
           (QCBLKSZ - 5). The number of memory blocks is defined by the
           algorithm:

           (sigma NUMBLK + QCPOOL) * QCBLKSZ $\leq$ 65535.

NUMREC   defines the number of disk queue file blocks for the
           exclusive use of the queue declared. For block size, see the
           "QDBLKSZ" parameter of the GENCOM command (pages 4.1 to
           4.4). The usable size of each disk block is (QDBLKSZ - 5).

The number of blocks is defined by the algorithm:

NUMREC $\leq$ 32767.

OM is applicable only to terminal queues, to specify the format
of data to be output from the MCS application to the
terminal:

NL denotes "Normal Mode", the default value, to specify that
the user may provide a header for the VIP line procedure
in the mark format "><U03abc":

● Character encoding and repeat functions are performed

● Hexadecimal control codes are translated into
character encoding marks in the format "><Cab"

● Standard marks specified to the terminal, are
translated into hexadecimal characters

● All other characters are passed without translation.

UN denotes "Unedited Mode", to specify that:

● The user may provide a header for the VIP line
procedure in the mark form "><U03abc"

● Other characters, including control characters and
marks, are passed without translation.

QCPOOL defines the queue as a memory queue, to share the memory
queue pool reserved with the "QCPOOL" parameter of the
GENCOM command. All queues qualified by the "QCPOOL" option
(each in its respective QUEUE command) will share the same
common memory pool.

This option allows a saving to be made in memory, especially
for interactive applications with traffic not heavy enough
to fill all queues at the same time. "QCPOOL" allows the
same memory space to be used for more than one queue, at
least. The user should note that there is no protection, for
queues sharing the common memory pool, against an
application exhausting the pool with excessive output,
thereby blocking other queues. Such an application should
use a mix of pool queues and queues defined with "NUMBLK".

RESTART applies only to disk queues, (i.e., program or terminal
queues) to allow recovery from a "step abort" or a "system
crash" with a queue "roll back".

SHARE   is applicable only to program queues, to allow 2 or more MCS |
         applications to share the same queue, defined with either
         input or input/output capability in their QASSIGN
         statements. This option is useful for establishing interjob
         communication, and must not be used if the program queue
         concerned is to be ASSIGNed as a subqueue (in the
         appropriate QASSIGN statement).

TWA   "two-way-alternate" protocol, is applicable only to program
         queues, to allow dialog between application and terminal, as
         determined by the following procedure when either is to have
         the right to transmit. For the application, either:

         ● 1 or more SEND WITH EMIs may be executed, whereby the
           application retains the right to transmit

         ● A SEND WITH EGI is executed, whereby the application
           surrenders this right to the terminal.

         Even when the terminal has the right of transmission, the
         application remains "master" and may override this right:

         ● At the end of a message transmitted by the terminal, the
           right to transmit passes automatically to the application
           and may not be retained by the terminal

         ● At log-on time, the terminal has the initial right to
           transmit.

USERID   defines the queue as a "user id" queue. When a terminal
         requests connection to a program queue, QMON looks first for
         a "user id" queue defined with the user name specified to
         the "USERID" entry in the log-on sequence. If such a user-id
         queue exists, it will be used as an output queue for the
         duration of the connection. If it does not exist, however,
         QMON will use the terminal queue designated for the terminal
         concerned. This feature is particularly useful in a
         switched-network environment, where the terminal name has no
         real meaning and does not guarantee connection.

EXAMPLE I

    QUEUE LSK1, BREAK, RESTART, TWA;

This command declares a disk queue with the name "DSK1", to allow:

- "BREAK", for the application to be notified of every asynchronous event coming from terminals associated with the queue

- "RESTART", to enable rollback for recovery and restart, even in the case of a BTNS abort

- "TWA", to enable dialog between the application and the terminals to which it is connected.

EXAMPLE 2

    QUEUE TER1, QCPOOL;

This command declares a terminal memory queue as "TER1", to share the memory queue pool reserved via the GENCOM command with other queues qualified by the "QCPOOL" option in their respective QUEUE commands.

EXAMPLE 3

    QUEUE CATLG, NUMREC = 200, USERID;

This command defines a disk queue of "200" blocks, as output queue dedicated to the user known in the GCOS system catalog under the user-id name "CATLG".

EXAMPLE 4

    QUEUE ND1.$VIPTER1;

This command defines a DSA disk terminal queue, to contain messages dispatched to the terminal associated with the mailbox "$VIPTER1" under the LSA system with the session control "ND1".

A command "(FSC;RSC) ND1 ... ;" must be present in the network generation.

SECTION 6

TRANSPAC COMMANDS

(LSUB:GENNET) COMMAND

(Local SUBscription)

Definition

Describes a local subscription for a private/public data network, to allow access to GCOS via a URP/DCC HDLC link.

LSUB defines parameters common to both switched and permanent virtual circuits, to be established over this subscription. The only network currently supported is TRANSPAC, the French public data network. LSUB therefore only applies to TRANSPAC users. LSUB must come after (but not necessarily directly following) the LINE command which defines the relevant HDLC X25 line supporting the subscription. LSUB may not, however, appear anywhere within either of the following sequences:

● LINE – STATN – TERMNL – IDSEQ

● RDTE – RDTN.

Each LSUB command must immediately be followed by the appropriate PVC commands, to define the relevant Permanent Virtual Circuits, if any (even though Permanent Virtual Circuits are not as yet supported). Any remote equipment able to access GCOS via TRANSPAC must be defined through its respective RDTE and RDTN commands, and may be common to two different subscriptions.

Note that:

1) All subscription parameters must be consistent with the TRANSPAC specification provided by the PTT. The TRANSPAC network does not, however, provide any means of checking these parameters' validity or accuracy.

2) Appendix B of the Network Control Terminal Operations manual provides a fuller explanation of TRANSPAC subscriptions.

Command Format

```
LSUB name, LNnn, (SUBNB!TPCADD) = "string" [, ITC]
     [, MUXPRM = (n1, n2)] [, PCV = xxx]
     [, PKSIZE = (128!nnn)] [, SLINE = nnn]
     [, WINDOW = (3!n)] [, SILIN = (Q!nnn)] [, SOLIN = (Q!nnn)] ;
```

Parameter Description

name
: uniquely identifies a TRANSPAC subscription handled through the BTNS/URP/DCC interface, ranging from 1 through 4 alphanumeric characters in length. This name is used to:

  ● Reference the subscription via network control commands; e.g., to display the subscription's status

  ● Automatically generate the names of the virtual circuits used by the subscription; see the PVC command.

  Note that the first character of an LSUB name must be unique; i.e., two LSUB names may not begin with the same character.

LNnn
: defines an SRST identifier for the HDLC X25 line connecting the DCC (on the URP) with the TRANSPAC switch. This line must previously have been defined with a LINE - STATN - TERMNL sequence before it may be referenced in an LSUB command. Note that the same line-name may not be used in two different LSUB commands.

(SUBNB!TPCADD)
: defines the DPS7's TRANSPAC subscription number, provided in the PTT subscription contract. This number must be enclosed in double quotation marks, and may range from 1 through 15 numeric characters in length.

SILIN
: specifies the number of switched virtual circuits that may be opened with incoming calls, as defined in the PTT subscription contract. Possible values range from "1" through "32".

SOLIN
: specifies the number of switched virtual circuits that may be opened with outgoing calls. Possible values range from "1" through "32".

SLINE   specifies the number of switched virtual circuits that may be opened with inward or outward calls. This figure is defined in the PTT subscription contract. Values may range from "1" through "32", although the theoretical maximum allowed by TRANSPAC is "4096":

SLINE ≥ (SILIN + SOLIN)

- where SLINE is equal to the sum of the values of SILIN and SOLIN, when there are no mixed switched virtual circuits.

ITC   specifies that "Indication of Throughput Class" has been subscribed for. When present, all incoming calls will contain the input/output throughput class used over the virtual circuit established.

MUXPRM   specifies multiplexing parameters, as follows:

n1 defines the maximum number of multiplexed virtual circuits: i.e., the number of type CSX25 RDTEs (DCU7010 and/or TCU7022) attached to this LSUB

n2 defines the maximum number of VIP terminals connected over any one of the "n1" virtual circuits.

PCV   defines the password to be used when a charged call is received from a PAD. Length is 4 alphanumeric characters. For any given TRANSPAC subscription, this password is common to all the virtual circuits established over the LSUBs concerned, and must be used when logon is requested by an asynchronous terminal connected through a PAD.

PKSIZE   defines the maximum packet size to be used over all the virtual circuits of the TRANSPAC subscription concerned. This value is defined in the PTT subscription contract, and must be consistent with the values given for "BTBFSZ" and "DABFSZ". Possible values include "32", "64", "128" (default), and "256".

WINDOW   defines the "window" size common to all the virtual circuits of the subscription. Values may range from 1 through 3 characters in length, and must be identical to the value defined in the TRANSPAC contract.

Example

LSUB TPC1. LN08, PVC = D002, SLINE = 15, TPCADD = "175000039";

This command defines a TRANSPAC subscription named "TPC1", to be
accessed through the URP/DCC line "LN08" (which must be an HDLC line,
model HDLC in the SRST).

Charged call packages from PAD terminals must be identified by the
password "D002".

"15" switched virtual circuits have been subscribed for.

The subscription number is defined by "TPCADD", which will appear in
any "DI" command issued for the network.

(PVC!LLINE) COMMAND

(Permanent Virtual Circuit)

Definition

Required for each permanent virtual circuit pertaining to a TRANSPAC subscription via a BTNS/URP/DCC interface, PVC must appear immediately after the LSUB command defining its TRANSPAC subscription.

Permanent virtual circuits are not supported by GCOS currently. If, however, the TRANSPAC local subscription includes "PVC", each permanent virtual circuit must be defined with a PVC comman even though it is not used; the same must also be done with the corresponding RDTE and RDTN commands.

Command Format

    PVC ASSIGN = rdte-name [, MASTER] ;

Parameter Description

ASSIGN   specifies the name of the Remote Data Terminal Equipment, as defined by an RDTE command, to which the permanent virtual circuit is connected. Length may range from 1 through 4 alphanumeric characters, and the corresponding RDTE command may be declared either before or after each relevant PVC command.

Since permanent virtual circuits are not currently supported, the RDTE command need only be syntactically correct although it may not reference a subscription number actually in use. The same applies to the corresponding RDTN command (which follows RDTE).

MASTER   specifies that the subscriber has the right to use the virtual circuit, for which he is chargeable. This value is supplied in the PTT subscription contract.

Example

    LSUB TPCI, LN08, TPCADD = "175000040";

    PVC   ASSIGN = RD02;

These commands relate to the TRANSPAC network, and refer to a
permanent virtual circuit belonging to the subscription "TPCI".

Since the PVC command directly follows LSUB, this permanent virtual
circuit is to be referenced as "T000".

The virtual circuit will be used for communicating with a remote
piece of equipment named "RD02", which will be declared later on with
a corresponding RDTE command.

RDTE COMMAND

(Remote Data Terminal Equipment)

Definition

Required for each "remote data terminal equipment" set to be connected via the TRANSPAC network through a BTNS/URP/DCC interface, RDTE defines the name and characteristics of a remote subscription to a private or public data network. The only network currently supported is the French public network TRANSPAC.

RDTE describes the type of equipment and the virtual circuit management mode to be established between the user and the DPS 7. RDTE must be followed by the RDTN command(s) pertaining to it.

If 2 local subscriptions are declared (i.e., when 2 LSUB commands are present), the RDTE/RDTN set(s) is/are valid for both of them. A set of remote equipment may call via any subscriber number specified in the PTT subscription contract.

All equipment connected via the URP/DCC interface, must be declared with RDTE/RDTN command sets, in order to be known to BTNS for the purpose of line management consistency control.

Command Format

```
RDTE name (PADICSX25), (SUBNBITPCADD) = "string" [, CHARGED]
     [, CSG = n] [, NOCALL] ;
```

Parameter Description

name   identifies the remote data equipment within GCOS, and may range from 2 through 4 alphanumeric characters in length.

(SUBNBITPCADD)   defines the RDTE subscription number, enclosed with double quotation marks with values ranging from 1 through 15 numeric characters in length, as specified in the PTT subscription contract for the RDTE (except for numbers beginning with "9", for which see the "PAD" parameter). This parameter is mandatory, required for use by BTNS in order to:

● Build the call packet for an outward call

● Check an incoming call's packet and determine the RDTE description in its table

● Allocate RDTEs for PAD switched calls; see the "PAD" parameter.

The number is also used for information purposes, when the subscription of an RDTE is to be displayed with the "DT" command.

PAD   identifies the equipment as a PAD for connecting an asynchronous teletype terminal to the network. This terminal is described with the RDTN command directly following this RDTE:

- For terminals connected through leased lines, there must be as many RDTE commands as terminals. "SUBNB" specifies the subscription number for TRANSPAC character mode.

- For terminals connected through switched lines (or telex networks, if not explicitly configured), there must be as many RDTE commands as there are terminals concurrently connectable. The "SUBNB" parameter specifies a user-defined conventional subscription number beginning with "9", which must be unique in the set. Should any RDTEs be lacking, connection will be refused with a specific "reason code", documented in the Network Control Terminal Operations and Terminal Operations Manuals. For this type of connection, each RDTE must specify "CSG = 0".

CSX25   identifies the equipment as either the DCU7010 convertor or the TCU7022/7043 terminal concentrator.

CHARGED   specifies that the RDTE will be charged to the DPS7 user, when called, according to its TRANSPAC terms of reference.

CSG   corresponds to the "GFA" entry of a TRANSPAC subscription and defines the "closed-subscriber-group" number pertaining corresponding RDTE. This is a 2-digit decimal value, ranging from 00 through 99. The default value of 00 denotes a "common" CSG for PAD terminals connected over switched telephone lines as well as over telex networks. The CSG is used as follows:

- For an outward call (i.e., the DPS7 calling a terminal), the CSG is used by GCOS to build the call packet, and by TRANSPAC to verify the DPS7's access rights to the public network

- For an incoming call (i.e., a terminal calling the DPS7), the CSG is used by the host to verify the terminal's access rights to GCOS.

Note: For TRANSPAC, CSG may have any one of 32
possible values, ranging from 00 through 31.

NOCALL   specifies that the RDTE may not be called from the
DPS7, applicable only where the RDTE has a
subscription specifying a specialized "outgoing"
virtual circuit.

Example 1

```
COMM "PAD ASYNCHRONOUS TERMINAL ";
COMM " - THROUGH A LEASED LINE ";
COMM "----------------------------------------";
RDTE  RDTE2, PAD, TPCADD = "178010128", CSG = 0;
RDTN  T1, TTU8126, KPR;
```

Example 2

```
COMM "----------------------------------------";
COMM " PAD ASYNCHRONOUS TERMINALS ";
COMM " THROUGH PUBLIC SWITCHED LINE ";
COMM "----------------------------------------";
RDTE  RDT4, PAD, TPCADD = "90000000", CSG = 0;
RDTN  T6, TTU8126, KPR;
```

Example 3

```
COMM "----------------------------------------";
COMM "DCU7010 CONNECTING VIP TERMINALS";
COMM "----------------------------------------";
RDTE RV11, CSX25, TPCADD = "178000215";
RDTN P1, VIP7001, KCT;
RDTN P2, VIP7700, KCT;
RDTN P3, VIP7760, KCT;
```

This command declares a "CSX25" station, being the DCU7010,
controlling a group of VIP terminals declared by RDTN commands.

RDTN COMMAND

(Remote Data TermiNal)

Definition

Required to describe a "remote data terminal" attached to an RDTE and must follow the RDTE command to which it pertains. This description includes the terminal's type, its physical characteristics, and whether it is assigned to a specific MCS application or VCAM subsystem. RDTE relates only to connection with TRANSPAC, the only suitable network currently supported. As such, this command is the TRANSPAC equivalent of the TERMNL command (for which certain parameters are specific to secondary network management). Note that it is recommended that RDTNs be defined AFTER all TERMNLs in the network generation description.

Some RDTN parameters may be overridden by the IDSEQ command.

Command Format

```
RDTN name rdtn-type rdtn-subtype [ , ADD = "hh"]
     [ , ASSIGN = name] [ , AUTO] [ , AUTOLF] [ , LINELG = nnn]
     [ , NOBT] [ , NSYSMES] [ , PAGE = nnn] [ , STI = nn]
     [ , SYSHEAD = ("QD25!"hhhhhhhh")] [ , TAB] ;
```

Parameter Description

name   uniquely identifies the RDTN within the BTNS/TRANSPAC network, with values ranging from 1 through 4 alphanumeric characters in length. This name must be identical to that specified for the corresponding MAM queue, if the RDTN is to be used by an MCS application; see the QUEUE command.

rdtn-type   defines the type of standard RDTN used to:

- ● Link up with an MCS application, or VCAM subsystem, upon a connection request being initiated either from the terminal or from the user

- ● Check the consistency of the RDTN with the RDTE for which it has been declared

- ● Check the consistency of the RDTN's type and subtype

- ● Define default values for the physical capabilities of the RDTN.

Figure 6-1: Terminal Connectibility

rdte type		
PAD		CSX25
		DCU7010 : TCU7022
TTY-like		VIP7001 : DKU7007
MINITEL		VIP7700 : DKU7107
TELEX		VIP7760 : DKU7211
		TTS7800 :
		TTU8221 :

rdtn-subtype specifies functional characteristics of the RDTN, as one
of the following:

CAS Cassette

CRT Screen

DSK Disk or diskette

KB Keyboard

KCT Keyboard with screen

KPR Keyboard with printer

PRT Printer.

The RDTN's I/O capability is overriden by its subtype;
i.e., if a keyboard printer is declared as PRT, its
keyboard will not be accessible to BTNS. The RDTN's I/O
capability determines its ability to receive messages,
and also defines its default access.

Figure 6-2: RDTN Subtype Capability

rdtn subtype	CAS	CRT	DSK	KB	KCT	KPR	PRT
I/O Capability	I/O	0	I/O	I	I/O	I/O	0
System Messages	no	yes	no	no	yes	yes	yes

Figure 6-3: Type/Subtype Combinations Allowed

("-" denotes "not applicable")

rdtn-type	rdte	CAS	CRT	DSK	KB	KCT	KPR	PRT
TTY-like	PAD	-	-	-	yes	-	yes	yes
TTU822	CSX25	-	-	-	-	-	79	-
VIP700	CSX25	-	79	-	79	79	-	88
VIP7700	CSX25	97	79	-	79	79	-	88
VIP7760	CSX25	-	79	97	79	79	-	88
TTS7800	CSX25	-	79	97	79	79	-	88
DKU7007	CSX25	-	79	-	79	79	-	88
DKU7107	CSX25	-	79	-	79	79	-	88
DKU7211	CSX25	-	79	-	79	79	-	88
MINITEL	PAD	-	yes	-	yes	yes	-	-
TELEX	PAD	-	-	-	yes	-	yes	yes

ADD specifies the hardware address of a standard or compatible RDTN, as a 2 digit hexadecimal value enclosed in double quotation marks. Values are determined at installation time by the Field Engineering Service. ADD must be specified whenever the terminal address is other than the default address generated by CNC from the type/subtype combination.

ASSIGN dedicates the RDTN to a specific use, as identified by a name, ranging from 1 through 8 alphanumeric characters in length, which must be either:

● A program queue declared with the QUEUE command

● A communications service (otherwise known as a VCAM subsystem) as declared with the DCTAP command.

If the ASSIGN option is used without AUTO at log-on, the question sent by the site controller will not include "APPL?". Instead, the format will be:

CCO I USER/PROJECT/BILLING?

AUTO specifies that the RDTN is to be submitted by BTNS to automatic connection algorithms.

If the terminal is declared without either AUTO or ASSIGN, it becomes a "general-purpose" terminal. This means that the logical connection is initiated by the operator, before accessing whichever application he chooses.

If the terminal is declared with "AUTO" alone, without ASSIGN, it becomes an "automatic" terminal. Once the terminal is powered up, this means that the logical connection is initiated by the BTNS terminal manager and directed to any application program which wants to "seize" the terminal.

If the terminal is declared with "ASSIGN" alone, without AUTO, it becomes a "dedicated" terminal. Once the logical connection has been initiated by the operator, this means that it is directed to the application program specified to the ASSIGN keyword.

AUTOLF   specifies that the KCT, or KPR, RDTN concerned is to have automatic line-feed capability; i.e., the line-feed function is automatically performed whenever "carriage-return" or "transmit" is activated. At log-on, this parameter is passed on to the VCAM subsystem concerned, and may be used for editing.

LINELG   defines the number of characters in the length of each physical line for the RDTN declared, as a 3 digit decimal value. See Figure 5-8 "Terminal Characteristics", under the command TERMNL, above. If specified, this parameter is used by IOF to adapt the length of its messages to the line length of the receiving RDTN.

NOBT   specifies that BTNS is not to accept any "BT" command, whatever its origin, directed to the RDTN declared. This parameter is meaningless and redundant, for any RDTN that cannot receive system messages; e.g., "KB". The same applies to any RDTN specified with "NSYSMES".

NSYSMES   specifies that BTNS must not send any system messages to the RDTN declared. As a result, BTNS will not even initiate the log-on dialog. The only way to connect such an RDTN is to define it with both "AUTO" and "ASSIGN", in which case connection is notified to the network control operator. This option is particularly useful for TTY-compatible RDTNs which have no print (output) and/or manual input (i.e., keyboard) capability.

PAGE   specifies the number of lines on the RDTN's screen, as a 3 digit decimal value. At log-on, this parameter is passed on to the VCAM subsystem(s) concerned to enable editing functions to be performed.

STI   defines the address of the VIP station to which the RDTN is attached. Values range from "0" through "32" and must be obtained from the corresponding DCU7010/TCU7022 generation. This parameter is mandatory for an RDTN with VIP line procedure, attached to an RDTE of type "CSX25".

SYSHEAD   specifies a character string to precede any system message sent by BTNS to the RDTN declared, expressed as a hexadecimal array enclosed in double quotation marks, ranging from 1 character (i.e., 2 hexadecimal digits) through 4 characters (i.e., 8 hexadecimal digits) in length. The default value is "0D25", defining carriage return and line feed. An "FF" value specifies that no character string is to be inserted before system messages. For the format of network messages, see the GCOS Terminal Operations Manual.

TAB   specifies that tabulation is to be available on the RDTN declared. At log-on, this parameter is passed to the VCAM subsystem(s) concerned; e.g., IOF, in order to format display layout.

Example 1

    RDTN R125, DTU7171, KCT, AUTO, ASSIGN = IOF;

This command declares a "DTU7171" RDTN with input/output capability (i.e., "KCT") and must be preceded by an RDTE command specifying the "PAD" type. In addition, this RDTN is connected automatically to "IOF" whenever it becomes available.

Example 2

    RDTN R211, TTU8124, KPR;

This command defines a "TTU8124" RDTN, declared with input/output capability (i.e., "KPR"), which must be attached to an RDTE of "PAD" type.

Example 3

```
RDTE  RVI1, CSX25, TPCADD = "178000215";
RLTN  TV10, VIP7700, KCT, STI = 00;
RLTN  TV11, VIP7700, KCT, STI = 01;
RDTN  TV12, VIP7001, KCT, STI = 02;
RLTN  TV13, VIP7001, KCT, STI = 03;
RLTN  TV17, VIP7001, KCT, STI = 07;
RDTN  TV18, VIP7001, KCT, STI = 08;
RLTN  TV19, VIP7001, KCT, STI = 09;
```

A number of VIP RDTNs are declared, controlled by a DCU7010
controller which in its turn has been declared with an RDTE command
type "CSX25".

SECTION 7

THIRD GROUP COMMANDS

There are no sequencing constraints as regards these commands belonging in the third group, which fall into two functional categories each dealt with in its own subsection, namely:

- Primary object commands:

  - (LSYSTEM:LSYS)

  - (FSYSTEM:FSYS)

  - (RSYSTEM:RSYS)

  - LSC

  - FSC

  - RSC

  - LTS

  - RTS

  - FNP

  - (COMPATH:CP)

  - NR

  - XPRTC

- Network administration commands:

  - ADCOR

  - ADFUNC

  - ADGROU

  - FILTER

  - LOG.

NETWORK ADMINISTRATION COMMANDS

(ADCOR¦AC) Command

(ADministrative CORrespondent)

DEFINITION

Defines an administrative correspondent located either on the local system or on a remote system in the DSA network.

An AC object is always related to one AF object with which the administrative connection is to be established. Each AC belongs to an administrative group (i.e., an AG object).

COMMAND FORMAT

Form 1

```
(ADCOR¦AC) ac-name, (ADGROUP¦AG) = ag-name,
            SC = session-control-name,
            (MAILBOX¦MB) = "mailbox-name"
            [, IMP = ((PRIMARY¦PRIM)¦(BACKUP¦BACK))]
            [, (EXTENSION¦EXT) = (mailbox-extension-name¦"       ")]
            [, RECSIZE = (nnn¦200)] [, STATE = (ENBL¦LOCK)]
            [, MAXLG = maximum-enqueued-log-events]
            [, MAXCD = maximum-concurrent-commands]
            [, (CHAR_CODE¦CODE) = (ASCII¦EBCDIC)] ;
```

Form 2

```
(ADCOR¦AC) LDSALOG [, NBREC = (record-number¦25)]
            [, STATE = (ENBL¦LOCK)] ;
```

DESCRIPTION OF PARAMETERS

ac-name   is the 1-to-8 alphanumeric character-long administrative correspondent name, which may not belong to the LDSALOG reserved ac-name list. This name may not either:

   ● Be the same as any log name (defined using the LOG command), as these are visible as individual local administrative correspondents

   ● Begin with an underscore (i.e., "_") character, which is reserved for administrative objects created dynamically by the system.

ag-name   is the 1-to-8 alphanumeric character-long administrative
                group name to which the AC belongs; this AG must have
                been defined with an ADDGROUP command and may not be the
                same as either of the AGs RDSALOG or RLNAD (which do not
                own any predefined ACs).

IMP   is the "primary" or "backup" importance, valid only for
                ACs belonging to an AG with the attribute "INIT = AF".
                Inside any given AG of this type, there may be only one
                primary AC, but there may optionally be a number of
                "backup" ACs.

SC   is the 4 alphanumeric character-long session control
                name of the system on which the AC "resides", and must
                have been declared with, as appropriate, an LSC, FSC, or
                RSC command.

(MAILBOX¦MB)   is the 1-to-8 alphanumeric character-long name of the
                mailbox to be associated with the AC. It should be noted
                that, if this name comprises a dollar (i.e., "$")
                character, it must be enclosed within double quotation
                marks; e.g., "$LOGFILE".

EXT   is the 1-to-4 alphanumeric character-long name of the
                mailbox extension to be associated with the AC. Default
                value is 4 spaces; e.g., "$LOGFILE   ".

RECSIZE   is the maximum record length for AEP records during one
                administrative session, where:

                    50 < RECSIZE <= 200

                ... with a default value of 200.

STATE   is the state of the AC after configuration has been
                completed, "enabled" by default.

MAXLG   is the maximum allowable number of enqueued log events
                destined for this AC, applicable only to ACs of type
                NOI, NCC or ASF. This value must be in the range:

                    0 < MAXLG <= 64.

MAXCD   is the maximum number of concurrent commands allowable
                during the administrative session, applicable only to
                ACs of type NOI, AUT, or NCC.

NBREC   is the mean mesure of the maximum enqueued local
               journalization requests, with an impact on the DSAC
               working set:

                   25 <= record-number <= 200

               ... with a default value of "25". An overflow situation
               will lead to temporary LDSALOG AC suspension; for
               further details, see the DSAC User Guide.

NOTES

ACs related to RDSALOG and RLNAD AGs, are not declared statically at
CNC execution time; they are created dynamically (and named by the
NAD) upon each incoming connection request. By convention, the name
of such an AC must be one of:

● "_RNADnnn", for AG RDSALOG

● "_RAUTnnn", for AG RLNAD

... with "nnn" ranging from "0" through "999", allocated on the basis
of an internal algorithm.

There are default filters associated with RDSALOG and RLNAD AGs, but
no default filters associated with ACs created dynamically by the
system.

(ADFUNC!AF) Command

(ADministrative FUNCtion)

DEFINITION

Defines a standard DSAC function to allow an administrative connection between the local system and administrative correspondents located at either:

● The local system

● A remote system in the DSA network.

Two administrative function objects exist:

● The LNAD function, which accepts execution of AEP commands sent by any recognized administrative correspondent to the local system

● The DSALOG function, which accepts unsolicited events sent by remote systems to the local system's LOG file.

COMMAND FORMAT

Form 1

    (ADFUNC!AF) LNAD ;

Form 2

    (ADFUNC!AF) DSALOG [, (STATE!ST) = (ENBL!LOCK)] ;

NOTE

Both of these administrative function objects are always present and included in the default network administrative configuration dynamically created by the system.

(ADGROUP¦AG) Command

(ADministrative GROUP)

DEFINITION

Defines a set of administrative correspondents (i.e., ACs) which have some common attributes, to be related to a single administrative function (i.e., AF).

The AC objects constituting one AG object, may reside on different systems in the DSA network. At any given time, any given AC may belong to only one administrative group.

COMMAND FORMAT

Form 1

```
(ADGROUP¦AG) ag-name, (ADFUNC¦AF) = LNAD [, TYPE = (ASF¦NOI¦NCC) ]
             [, INIT = (AF [, MAXRETRY = (nnn¦0)]
             [, RETRYTIME = (nnn¦300)] ¦AC)]
             [, MAX_SESS = (nnn¦10)] [, STATE = (ENBL¦LOCK)] ¦
```

Form 2

```
(ADGROUP¦AG) RDSALOG [, MAX_SESS = (nnn¦10)] ¦
```

Form 3

```
(ADGROUP¦AG) RLNAD [, MAX_SESS = (nnn¦10)] ¦
```

PARAMETER DESCRIPTION

Form 1

ag-name   is the 1-to-8 alphanumeric character-long administrative
           group name, which may not belong to the reserved name list
           (RDSALOG, RLNAD) or begin with "_" (i.e., underscore), as
           this convention is reserved for administrative objects
           created dynamically by the system.

ADFUNC   is the 1-to-8 alphanumeric character-long name of the
             administrative function to which this administrative group
             is to be related; either:

             ● LNAD

             ● DSALOG.

TYPE   is the type of administrative group, as well as that of the
             administrative correspondents to which it is related.

INIT   specifies the initiator of connections to the ACs belonging
             to this AG; either the AF (i.e., "INIT = AF") or the AC
             (i.e., "INIT = AG"). If "INIT = AF", the ACs concerned must
             conform to the following criteria:

             ● Only one AC may have the attribute "IMP = PRIM"

             ● Several ACs may optionally have the attribute "IMP =
               BACKUP".

MAX_SESS   is the maximum number of active sessions to be allowed to
             this AG at any one time. This value must be less than or
             equal to the number of ACs belonging to the AG, as there
             can be only one possible administrative session between an
             AF and a given AC; i.e.:

             $0 < max\_sess <= 256$.

MAXRETRY   is the maximum number of attempts, successful or
             unsuccessful, to open a connection with one of the ACs in
             the group:

             $0 <= nnn <= 10000$.

             By convention, "0" signifies an infinite count and is the
             default value. This parameter is meaningful only when the
             connection is initiated by the AF (i.e., AG with the
             attribute "INIT = AF").

RETRYTIME   defines the delay between retries of outwards connections
             to an external AC (and, potentially, its backups),
             expressed in seconds:

             $0 < nnn <= 3600$.

             With a default of 300 seconds, this parameter is meaningful
             only when the connection is initiated by the AF (i.e., AG
             with the attribute "INIT = AF").

Form 2

AF
TYPE
INIT
STATE   parameters may be specified but must be equal,
               respectively, to "DSALOG", "NAD", "AC" and "ENBL".

MAX_SESS   is the maximum number of sessions that may be initiated
           towards the local ASF handler on the $LOGFILE mailbox. All
           incoming connections to the mailbox $LOGFILE, are
           considered as belonging to this AG:

               0 < max_sess <= 256

           ... with a default of "10". There is no default filter
           associated with this AG.

Form 3

AF
TYPE
INIT
STATE   parameters may be specified but must be equal to,
               respectively, "LNAD", "AUT", "YES" and "ENBL".

MAX_SESS   defines the maximum number of sessions that may be
           initiated towards the local NAD on $NAD mailbox. All
           incoming connections to $NAD which have not been configured
           as ACs of type "NOI" or "NCC", are considered as belonging
           to this AG:

               0 < max_sess <= 256

           ... with a default of "10". By default also, one filter is
           associated with this AG. An input filter which rejects any
           command other than an information command, with the
           following attributes, is associated with this AG:

               Type = INPUT
               Logic = INCL
               LOW_POWER = 1
               HIGH_POWER = 1.

NOTES

Default filters associated with AGs:

AG Type	nbfilters	Filter1	Filter2	Filter3	Remarks
AUT	2	INPUT INCL POW1 = 1 POW2 = 1	OUTPUT EXCL POW1 = 0 POW2 = 3	– –	Information commands accepted. No message sent.
ASF	1	OUTPUT INCL POW1 = 0 POW2 = 3 LVL1 = 12	–	–	Important unsolicited messages are sent.
NAD	0	–	–	–	No filter.
NCC	3	INPUT INCL POW1 = 0 POW2 = 3	OUTPUT INCL POW1 = 0 POW2 = 3 LVL1 = 12	OUTPUT INCL POW1 = 2 POW2 = 3	All commands are accepted. Important events are reported.
NOI	3	INPUT INCL POW1 = 0 POW2 = 3	OUTPUT INCL POW1 = 0 POW2 = 3 LVL1 = 12	OUTPUT INCL POW1 = 2 POW2 = 3	All commands are accepted. Important events are reported.

A default filter generated by the system, is named as follows:

    _FL::agtype::nn

... where:

- "agtype" is one of the keywords:
  "(AUT:ASF:NAD:NCC:NOI)"

- "nn" is a number used for building an unique identifier.

Example: "_FLNOI07".

(FILTER:FL) Command

<u>(FILTER:FL) Command</u>

(administrative FILTER)

DEFINITION

Defines an object for use in controlling the flow of administrative traffic between administrative functions and correspondents.

FILTER is always related to a LOG, an administrative correspondent, or an administrative group. In the case of the last of these three alternatives, the FILTER is considered as an attribute common to all the AG's dependent ACs.

There are two possible types of filter:

● Input filters, which are used for data sent by an AC to the AF

● Output filters, which are used on data sent by the AF to an AC.

COMMAND FORMAT

```
(FILTER:FL)  filter-name,
             (AC = ac-name:AG = ag-name:(LOG:LG) = log-name),
             TYPE = (INPUT:OUTPUT)
             [, LOGIC = (INCL:EXCL:OBLI)]  [, STATE = (ENBL:LOCK)]
             [, (LOW_DOMAIN:DOM1) = domain-1
             , (HIGH_DOMAIN:DOM2) = domain-2]
             [, (LOW_POWER:POW1) = power-1
             , (HIGH_POWER:POW2) = power-2]
             [, (LOW_CLASS:CLASS1) = class-1
             , (HIGH_CLASS:CLASS2) = class-2]
             [, (LOW_CODE:CODE1) = code-1
             , (HIGH_CODE:CODE2)= code-2]
             [, (LOW_LEVEL:LVL1) = level-1
             , (HIGH_LEVEL:LVL2) = level-2]
             [, SYSTEM1 = system-1, SYSTEM2 = system-2]  ;
```

PARAMETER DESCRIPTION

Mandatory Parameters

filter-name   is the 1-to-8 alphanumeric character-long name of
                           the administrative filter.

AC
AG
LOG   designates the name of the entity with which this
                           filter is to be associated, as defined by an AC,
                           AG, or LOG command, respectively.

TYPE

specifies if the filter is to apply to data received by the AF (i.e., with "TYPE = INPUT") or sent by the AF (i.e., with "TYPE = OUTPUT"). This attribute must be consistant with the data exchange directions possible between AC, AG, LOG and the AF to which they are related: depending on:

- The "type" attribute of the AG, for AG-related filters

- The "type" attribute of the AG "owning" the specified AC, for AC-related filters

- The fact that the filter applies to a LOG; i.e.:

Figure 7-1: Filter Rules

Filter Type	Filter Owner	AC or AG of NAD Type	AG of ASF Type	AC or AG of NOI,NCC, or AUT Type	LOG
Input		yes	no	yes	no
Output		no	yes	yes	yes

Note that mandatory parameters must be declared before any optional ones.

Optional Parameters

LOGIC

INCL = inclusive filter, the default value;
EXCL = exclusive filter;
OBLI = obligatory filter.

STATE

an "enabled" filter is taken into account in the filter-matching algorithm, while a "locked" filter is skipped by this algorithm. The filter's state may subsequently be modified by using the appropriate commands.

DOMAIN
POWER
CLASS
CODE
LEVEL
SYSTEM

designate the various filtering criteria which
may be set; at least one of these criteria must
be applied (supplying at least one of the two
values defining the range). If any criterion is
absent (i.e., neither of the two values defining
its range, has been specified), it is ignored by
the filter's matching strategy.

Criteria must be consistant with the filter's
type as well as with object type:

Figure 7-2: Input Filters

Criteria	AC/AG Type	NOI/NCC/AUT	NAD (ACLDSALOG)
DOMAIN		yes	yes
POWER		yes	yes
CLASS		yes	yes
CODE		yes	yes
LEVEL		yes	yes
SYSTEM		yes	no (1)

Figure 7-3: Output Filters

Criteria	Filter Owner of ASF Type	AC or AG of ASF Type	AC or AG of NOI, NCC, or AUT Type	LOG
DOMAIN		yes	yes	yes
POWER		yes	yes	yes
CLASS		yes	yes	yes
CODE		yes	yes	yes
LEVEL		yes	yes	yes
SYSTEM		no (1)	no (1)	yes

(1) The local system's name is used for filtering. Thus, use of any
system name for a filter OTHER THAN that of the LSYS, will lead
to the rejection of all records; i.e., the AC will never receive
a single record.

(LOW_DOMAIN:DOM1)   is the lowest value for the domain, which must be less than or equal to the value of DOM2, with a default value of 0

(HIGH_DOMAIN:DOM2)   is the highest value for the domain, which must be equal to or greater than the value of DOM1, with a default value of 4

(LOW_POWER:POW1)   is the lowest value for the power, which must be less than or equal to the value of POW2, with a default value of 0

(HIGH_POWER:POW2)   is the highest value for the power, which must be equal to or greater than the value of POW1, with a default value of 4

(LOW_CLASS:CLASS1)   is the lowest value for the class, which must be less than or equal to the value of CLASS2, with a default value of 1

(HIGH_CLASS:CLASS2)   is the highest value for the class, which must be equal to or greater than the value of CLASS1, with a default value of 255

(LOW_LEVEL:LVL1)   is the lowest value for the level, which must be less than or equal to the value of LVL2, with a default value of 0

(HIGH_LEVEL:LVL2)   is the highest value for the level, which must be equal to or greater than the value of LVL1, with a default value of 255

SYSTEM1
SYSTEM2   if specified, these must both designate the same system-name, which must have been defined by, as appropriate, an FSYS or RSYS command.

(LOG¦LG) Command

(administrative LOG)

DEFINITION

An administrative LOG is a set of files on which administrative
records are to be logged, and may be considered as equivalent to a
special type of administrative correspondent with respect to the AF
(type ASF). The LOG object may be associated with filters, in order
to determine which records are to be logged on the set of files
concerned.

COMMAND FORMAT

(LOG¦LG) log-name [, AUPI_AREA = nnn] [, STATE = (ENBL¦LOCK)] ;

PARAMETER DESCRIPTION

log-name   is the 1-to-8 alphanumeric character-long name of the log.
             The associated files are SYS.log-name1, SYS.log-name2, etc.
             The maximum number of files which may be associated with
             one log is 9. Characteristics associated with the log, are
             built dynamically at LOG utilization time, including:

             ● The number of files

             ● The number of records in each file.

             The log function supports two different LOGs:

             ● One is named DSALOG and is mandatory when two LOGs are
               described

             ● The other name is free.

             It should be noted that "LOG DSALOG STATE = ENBL;" is the
             default configuration command for LOG objects.

AUPI_AREA   defines the AUPI memory window size for this log, expressed
             as a number of AEP records:

             10 <= nnn <= 100.

             By default, there is no AUPI memory window; i.e., "0". When
             defined, this permits optimization of log access, for AUTs
             working in real time who access the corresponding LOG.

             The overhead for the (permanent) LOG ASF Handler, in terms
             of memory, is approximately:

             (nnn * 350) bytes.

PRIMARY OBJECT COMMANDS

(COMPATH:CP) Command

(COMmunication PATH)

DEFINITION

COMPATH defines a communication path as the local system "exit".
COMPATHs may be mapped over HDLC lines or TRANSPAC local
subscriptions. Section 2 (above) explains under what circumstances
COMPATHs need to be defined.

COMMAND FORMAT

```
(COMPATH:CP) compath-name,
        (ACCESS = line-name:(SUB:SUBSCRID) = lsub-name);
```

PARAMETER DESCRIPTION

compath-name   defines the communication path's name, containing 1 to
                   8 alphanumeric characters. This name is "local"; i.e.,
                   it is known only within the local system.

ACCESS   specifies an HDLC line name, containing 4 alphanumeric
                   characters, as defined with a LINE command. "ACCESS"
                   is used when the COMPATH defines an "exit" over a
                   point-to-point HDLC line.

(SUB:SUBSCRID)   gives a TRANSPAC local subscription name, containing 1
                   to 4 alphanumeric characters, as defined with an LSUB
                   command. "SUB" is used when the COMPATH defines the
                   "exit" over a TRANSPAC local subscription.

FNP Command
===========

DEFINITION

Applies when a DN7100 is configured in the DPS7 network as a
front-end processor.

FNP describes how the FNPS Message Management component is to
function, by:

● Referencing the name and address of the DN7100 in the SRST, to
  obtain access to its hardware characteristics

● Defining the FNPS environment needed to manage and service the
  DN7100.

Each DN7100 to be managed by FNPS must be described by a separate FNP
command. A maximum of 4 DN7100 front-end processors may currently be
supported, connected via a maximum of 6 PSI's. In the case of a
front-end processor connected via a twin PSI, there must be one FNP
command for each PSI (but both related to the the same FSC).

DPS7 is connected to the DN7100 via a PSI, which multiplexes data
exchanges over logical channels. A maximum of 16 logical channels may
be allocated over the PSI, of which 13 are available for user data.

Except for specialized usage of DN7100 where traffic in one direction
is much higher than in the other, the input versus output division of
these logical data channels is usually "half-and-half"; i.e.:

● 7 channels for output (i.e., rounded up)

● 6 channels for input (i.e., rounded down).

From the point of view of the DPS7, channel numbering is as follows:

Figure 7-4: DPS7 FEP Channel Numbering

Channel Number		Channel Type
0	DN7100 status control command channel	Command Channels
1	Control command channel for data input channels	
2	Control command channel for data output channels	
3 to x	Data exchanges controlled by command channel 1	Data Input Channels
x+1 to 15	Data exchanges controlled by command channel 2	Data Output Channels

COMMAND FORMAT

```
FNP name, CCnn [, INBFNB = nnnn] [, INBFSZ = (32!nnnn)]
               [, INLCNB = nn] [, (NLOAD [, OUTBFNB = nnnn]
               [, OUTBFSZ = (32!nnnn)]!RMTLOAD)]
               [, MODE = nn] [, TIMER = (32!nnn)] ;
```

PARAMETER DESCRIPTION

name   uniquely identifies an FNPS service as a GCOS communications
support. Length may range from 1 to 8 alphanumeric
characters. TRACE, TRCT, DSAC, QMON and TRPT are reserved
names and so may not be used as an FNP name.

CCnn   is the external identifier of the DN7100 held in the SRST, to
identify the DN7100 as a hardware component of DPS7.

INBFNB   specifies the number of input buffer pool units to be used by
FNPS for I/O transfers with the associated DN7100. This
number may range from 4 to 30720 units, with a default of 64
units. For optimum values, refer to Network Control Terminal
Operations in Appendix G.

INBFSZ   specifies the size in bytes of each unit forming the input
buffer pool for use by FNPS during I/O transfers with the
associated DN7100. This size may range from "16" through
"2048" bytes, in increments of 16 bytes. If the value
supplied is not a multiple of 16, the size is rounded up to
the next multiple. The default value is "32" bytes. "(INBFNB
* INBFSZ)" must be less than or equal to "480" K bytes.

INLCNB   specifies the number of logical channels to be used by FNPS
for receiving messages from the DN7100. If "x" is the number
of logical channels available on the PSI in question, as
specified in the SRST entry defining the DN7100 controller,
values for INLCNB may be defined as follows:

        Minimum value: "1"
        Maximum value: "x-4
        Default value: "(x-3)/2"

        - where "x" must be both greater than or equal to "5", and
less than or equal to "16". If the default value calculated
is not an integer:

      ● The number of input channels is rounded down to the
        nearest integer; e.g., 6.5 means 6 channels

      ● The number of output channels is rounded up.

MODE   specifies the total number of input and output channels to be
          reserved for connection to SIRIS3 or SIRIS8. The maximum
          number of channels that may be declared is "11".

NLOAD   specifies that the host may not issue a command to load the
          DN7100; i.e., "MTF fsys-name". Should such a command be
          issued, it will be refused. This option is particularly
          useful in a configuration where one DN7100 is shared by 2
          hosts and only one has the right to load the DN7100. "NLOAD"
          may not be specified concurrently with "RMTLOAD".

OUTBFNB   specifies the number of units of output buffer pool to be
          used by FNPS during I/O transfers with the DN7100 concerned.
          This number ranges from "4" to "30720" units, with a default
          of "64". For optimum values, see page 8.10.

OUTBFSZ   specifies the size in bytes of each unit forming the output
          buffer pool for use by FNPS for I/O transfers with the
          associated DN7100. Size ranges from "16" through "2048"
          bytes, in increments of 16. If the value specified is not a
          multiple of 16, the size is rounded up to the nearest
          multiple. The default value is "32" bytes. "(OUTBFNB *
          OUTBFSZ)" must be less than or equal to "480" K bytes.

RMTLOAD   specifies that the host has the access right to load the
          DN7100, to be done from the DN7100's own diskette. When the
          network control operator issues an "MTF fsys-name" command,
          where "fsys-name" is the DN7100 system's name, the DN7100 is
          requested to load its software from its own diskette. If
          neither "RMTLOAD" nor "NLOAD" are specified, ADM loads the
          DN7100 from a subfile of the GCOS system library SYS.FPCORE
          which contains the necessary DN7100 memory images. "RMTLOAD"
          may not be specified at the same time as "NLOAD". See the
          GCOS Network Administrative Supplement.

TIMER   refers to the "watch-dog" timer and specifies, in seconds,
          the maximum time to be allowed by FNPS. FNPS sends a STATUS
          at each "TIMER" value (in seconds) to the DN7100. On the
          other hand, the DN7100, sends a STATUS at each declared "T3"
          value (in deciseconds) to FNPS. The "T3" parameter value is
          defined in the DN7100 generation command TS, the default
          value being 200 deciseconds; see the DATANET 7100 System
          Generation Manual.

          "TIMER = 0" suppresses the survey mechanism; in this case,
          the corresponding DN7100 "T3" must also be equal to "0".

          Receipt of a STATUS does not trigger a responding STATUS. The
          DN7100 will be declared as "failed" by FNPS as soon as no
          STATUS has been received during "2 * timer" seconds.

Minimum: 20 seconds
Maximum: 300 seconds
Default: 32 seconds.

The optimal value for "T3" = "10 * timer".

The time out value must be equal to or greater than half the survey time declared for the DN7100; i.e., if the survey time is declared as 300 deciseconds, the value given to "TIMER" must be either "15" seconds or "(15 + x)" seconds.

EXAMPLE

    FNP DN01, CC01;

This command defines an FNPS service for a DN7100 identified in the SRST as the controller "CC01".

Buffer pools are generated for FNPS, with default values as indicated in Command Format above.

FSC Command
_____

(Frontal Session Control)

DEFINITION

Defines the session control for the local system's front-end
processor, as specified by the FSYSTEM command. A front-end session
control is similar to other types of session control in that it has
two network-wide representations unique in the network (for this
object class):

● A 1 to 4 character name identical to that of the front-end system
  itself

● A 2 byte identifier, as specified by "SCID" keywork.

Only the first of these two names will be taken into account in
future releases.

In the case of a twin-PSI front-end processor, the FSC command (with
the same name and identification) must appear twice, each one
referring to one of the PSI's through its FNP command. E.g.:

      FSC DNO4, SCID = 3:12, FNP = FNP1;
      FSC DNO4, SCID = 3:12, FNP = FNP2;

COMMAND FORMAT

    FSC fsc-name, SCID = scid, FNP = fnp-name ;

PARAMETER DESCRIPTION

fsc-name is the network-wide session control name for the front-end
          processor, comprising from 1 through 4 alphanumeric
          characters.

scid   is the network-wide front-end system session control
          identifier. This parameter is presented in the form "a: b",
          where "a" and "b" are integers, and "0" is less than or
          equal to "a" while "b" is less than or equal to "255".
          Assignment of different "SCID" values in the network is
          arbitrary.

fnp-name identifies the transport service to be associated with the
          front-end system, as defined with the corresponding FNP
          command. There must be as many FNP services defined as there
          are FSYSTEM and FSC command pairs. Length may range from 1
          to 8 alphanumeric characters.

7.20

(FSYSTEM!FSYS) Command

(Frontal SYSTEM)

DEFINITION

Defines a DN7100 to be used as front-end processor to the local
system. There must be as many FSYSTEM (and associated FSC) commands
as there are local front-end processors, up to a maximum of 4.

COMMAND FORMAT

    (FSYSTEM!FSYS) fsys-name [, (PROFILE!PF) = "pf-definition"] ;

PARAMETER DESCRIPTION

fsys-name   is a network-wide name unique in its object class, from
                 1 through 4 alphanumeric characters long. This name is
                 used as argument for the MTF load, dump and SYSGEN
                 commands. The front-end system session control name, as
                 defined with the FSC command, must be identical to its
                 system name.

pf-definition defines the front-end system's hardware and software
                 characteristics. Enclosed in double quotation marks,
                 length may be of up to 22 characters. Profile Syntax:
                 "system-name/software-id/software-level". Defined
                 profiles:

                 DN7100/(DN-B/(V2.5!V2.6)
                    !DN-C/V3.0).

                 This information is used to identify the front-end
                 system, and may be displayed with the "DT (system)" OCL
                 command.

LSC Command

(Local Session Control)

DEFINITION

Defines the local session control, which must be unique on GCOS
systems. Note that DSA allows for several session controls on a
single system. LSC is mandatory if the local system is to communicate
with other systems (front-end or remote systems, as defined by
FSYSTEM and RSYSTEM commands, respectively). Otherwise, LSC is
optional. When present, this command must be unique.

Local session control has two network-wide representations, like any
session control, unique in the network for the object class and
comprising:

- A 1 to 4 character name, identical on GCOS-7 systems to the local
  system's name: see the LSYSTEM command

- A 2-byte identifier as specified by the "SCID" keyword.

In the future, only the first name will be taken into account.

COMMAND FORMAT

    LSC SCID = scid [, TS = ts-name] ;

PARAMETER DESCRIPTION

scid   is in the form "a: b", where "a" and "b" are integers, "a" is
        greater than or equal to "0", and "b" is less than or equal
        to "255", as the network-wide local system session control
        identifier. Assignment of the various "SCID" values in the
        system is arbitrary.

ts-name is the 1 to 4 alphanumeric character local transport name, as
        defined in an LTS command. The "TS =" keyword is mandatory
        for primary network use through a URP/DCC.

7.22

(LSYSTEM:LSYS) Command

(Local SYSTEM)

DEFINITION

Defines the local system: i.e., the system which is currently being configured. LSYSTEM is mandatory if the local system is to communicate with other systems (either front-end or remote systems, defined by the FSYSTEM and RSYSTEM commands, respectively); if not, this command is optional. When present, LSYSTEM must be unique.

COMMAND FORMAT

     (LSYSTEM:LSYS) lsys-name [, (PROFILE:PF) = "pf-definition"] ;

PARAMETER DESCRIPTION

lsys-name   is the network-wide name for the local system, unique
                 in its network system object class and from 1 through 4
                 alphanumeric characters in length. This name is also
                 the name of the local session control, as defined by
                 the LSC command, and the default name of the local
                 transport station, defined by the LTS command. This
                 name is required to be identical to the LSYS name
                 specified in CONFIG.

pf-definition defines the local system's hardware and software
               characteristics, enclosed in double quotation marks and
               of up to 22 characters in length. This information is
               used by distributed application software to identify
               the capabilities of the local system, and may be
               displayed with the "DT (system)" OCL command.

               This definition in no way replaces normal unbundling
               procedures. Syntax of the profile is:

               "system name/software identification/software level"

               The profiles currently defined include:

               ● "L64"

               ● "64DPS/GCOS-64/1E.5"

               ● "DPS7"

               ● "DPS7/GCOS-7/(V1:V2:V3)".

LTS Command

(Local Transport Station)

DEFINITION

Defines the local system transport station, mandatory when using a primary network through the URP/DCC. The default local transport station is identical to the names of the local system and session control. Refer to Appendix A of the Network Control Terminal Operations manual for a detailed description of transport mechanisms and recommendations for tuning LTS parameters with regard to other transport commands such as RTS, XPRTC, NR and COMPATH.

When present, this command must be unique.

COMMAND FORMAT

```
LTS lts-name [, (FLOWTH!TI) = (10!nnn)] [, (SILENT!T2) = (60!nnn)]
      [, RETRY = (3!nnn)] [, TPUSZ = (256!nnn)] ;
```

PARAMETER DESCRIPTION

lts-name   is the local transport name, to be known to the local
               system only, with length ranging from 1 to 8 alphanumeric
               characters. It is nevertheless recommended that this name
               be identical to that of the local system. in which case
               length may range from 1 to only 4 alphanumeric
               characters.

(FLOWTH!TI)   defines the flow command timer, expressed in seconds.
               This value must be greater than zero and identical on all
               transport stations in the network. Authorized values
               start at "10" seconds, and proceed by increments of 10
               seconds up to a maximum of "250". The default is "10".

(SILENT!T2)   defines the silence timer, expressed in seconds. This
               value must be greater than zero and identical for all
               transport stations in the network. Authorized values
               start from "10" seconds, and proceed by increments of 10
               seconds up to a maximum of "250". The default is "60".

RETRY   sets the "retransmission maximum count". This value must
               be greater than "0" and less than "255", with a default
               of "3".

TPUSZ   defines the "transport unit minimum size", expressed in
               bytes. This value must be less than or equal to "256",
               with a default of "256".

(Network Route)

DEFINITION

Defines a network route associated to a local system "exit" (as defined with a COMPATH command) and an arrival transport station (as defined with an RTS command). Refer to Section 2 for an explanation of network route definition.

COMMAND FORMAT

   NR nr=name, (COMPATH;CP) = compath-name [, XPRTC = xprtc-name] ;

PARAMETER DESCRIPTION

nr-name   defines a name for the network route, to be known only
                   to the local system, and ranging from 1 through 8
                   alphanumeric characters in length.

(COMPATH;CP)   identifies the communication path to be associated with
                   the network route, as defined with a COMPATH command.
                   Several network routes may reference the same COMPATH
                   when these routes are mapped over TRANSPAC virtual
                   circuits belonging to the same local subscription.
                   Length may range from 1 through 8 alphanumeric
                   characters.

XPRTC   identifies the transport protocol name to be associated
                   with this network route. Several network routes may
                   reference the same transport protocol. The default
                   protocol is described by the XPRTC command. Length may
                   range from 1 to 8 alphanumeric characters.

RSC Command
_____

(Remote Session Control)

DEFINITION

Defines a remote session control; i.e., a session control of a remote
system declared with the RSYSTEM command. Some DSA systems may have
several session controls.

Like any other type of session control, a remote session control has
2 network-wide representations, unique in the network for this object
class:

● A 1 to 4 character long name, identical on GCOS6 and GCOS7
  systems, to the corresponding remote system name. It is strongly
  recommended that this rule be applied for all other systems (and
  to the first session control, in the case of multi-session control
  systems).

● A 2-byte identifier, as specified with the "SCID" keyword.

In the future, only the first name will be taken into account.

Exclusive use of the "TS" or "FNP" keyword depends on the type of
physical access applicable to the remote system; see Section 2,
"Primary Network Configuration".

Remote session controls may be accessed through several local system
(FEP or URP/DCC) "exits". In this case, the RSC command must be
repeated, with the same name and "SCID" representations. When
initiating an outward connection toward a remote session control, the
system performs a circular search dynamically, for an exit in the
states ACCESS = ENBL and telecoms LM = RUNNING. For instance, the
example on page 2.2 in Figure 2-1 might be configured as follows,
where the Remote Session Control name is LYON:

     RSC LYON, FNP = FNP1, SCID = 2:20;
     RSC LYON, FNP = FNP2, SCID = 2:20;
     RSC LYON, TS = TSLY, SCID = 2:20;

For a twin-PSI exit to a front-end processor, it is not necessary for
the RSC command to take account of "both" the corresponding FNP
commands. It is sufficient to declare the RSC as associated with the
first FNP, and the system will perform the appropriate
reconfiguration as and when necessary (i.e., in the case of switching
between enabled PSI's).

COMMAND FORMAT

     RSC rsc-name, SCID = rsc-identifier,
         (TS = (rts-list);FNP = fnp-name);

PARAMETER DESCRIPTION

rsc-name   defines the network-wide remote system session
                  control, a 4 character alphanumeric name.

rsc-identifier   specifies the network-wide remote system session
                  control identifier, in the form "a:b" where "a" and
                  "b" are integers, "0" is less than or equal to "a",
                  and "b" is less than or equal to "255". The assignment
                  of different "SCID" values in the system is arbitrary.

rts   specifies the name of a remote transport station
                  "serving" the corresponding remote session control, as
                  defined with an RTS command, ranging from 1 to 4
                  alphanumeric characters in length.

fnp-name   specifies the name of the transport service of a
                  local-system FEP through which the remote session
                  control is to be accessed, as defined with an FNP
                  command.

(RSYSTEM:RSYS) Command

(Remote SYSTEM)

DEFINITION

Defines a remote system with which the local system requires to be able to communicate.

COMMAND FORMAT

```
(RSYSTEM:RSYS) rsys-name [, SC = (rsc-list)]
               [, (PROFILE:PF) = "pf-definition"] ;
```

PARAMETER DESCRIPTION

rsys-name   specifies the network-wide name for the remote system, unique in its object class, of l to 4 alphanumeric characters in length. This is the name used by the local system's command language (i.e., the "SITE = xxxx" keyword), even if the remote system has several session controls.

rsc-list   lists the name(s) of the relevant remote system session control. It is mandatory for GCOS systems for the corresponding system and session control names to be identical. Similarly, the "SC" identifier should not be used as a default session control name associated with a remote system. Session control names, implicit or explicit, must be defined with the RSC (i.e., Remote Session Control) command.

pf-definition defines the remote system's hardware and software characteristics. Enclosed in double quotation marks, this value may be of up to 22 alphanumeric characters in length. This information is used by distributed application software for identification of remote systems, and may be displayed with the "DT (system)" OCL command. Profile definition does not in any way replace normal unbundling procedures.

Profile syntax is:

system-name/software-identification/software-level".

The following profiles have been defined, so far:

```
(L64
!64DPS/GCOS-64/( lE.5! lE.6)
!DPS7
!DPS7/GCOS-7/(V1!V2!V3)
!L6/MFS/(2.10!2.20!3.00)
!DPS6/DSS/(1.1!2.0!2.2!2.3!3.0!3.1!3.2)
!DN7100/(DN-B/(V2.5!V2.6)
          !DN-C/V3.0)
!DPS8/GCOS-8/(SR2300!SR2500!SR3000)
!DPS4/GCOS-4/(NCT1!NCT2)
!MINI6/DSA/(3.0!3.1!3.2)).
```

RTS Command

(Remote Transport Station)

DEFINITION

Defines a remote transport station; i.e., a transport station located on a remote system. For remote transport station choice and definition, as well as recommendations on RTS parameter tuning with regard to other transport commands (such as LTS, XPRTC, NR, COMPATH), refer to Section 2 "Configuration Methodology", and to Appendix A of the Network Control Terminal Operations manual.

COMMAND FORMAT

```
RTS rts-name, (NETROUTE¦NR) = (nr-list), XCNT = nnn
    [, ADDR = (TRANSPAC = (subscription-number-list))]
    [, VERSION = dsa_version-number];
```

PARAMETER DESCRIPTION

rts-name

specifies the 1-to-8 alphanumeric character remote transport station name, which is not required to be unique for its object class throughout the network. It is, however, strongly recommended that transport station name be identical to the corresponding system name, in which case the rts-name must be no longer than 4 characters.

(NETROUTE¦NR)

supplies a list of network route names, each of 1 through 8 alphanumeric characters in length. Each network route name referenced must be defined with a NR command. No network route may be named more than once in any single RTS command.

XCNT

defines the maximum number of transport connections. In the current release, there is no session multiplexing over any single transport connection; a single IOF or TDS connection counts as one session and as one transport connection. The total number of transport connections may not in any case exceed "416".

subscription-number-list

supplies the list of TRANSPAC remote subscription numbers, in the form of "xxxx" (where xxxx represents from 1 through 15 numeric characters).

VERSION   specifies the transport station version
number, in the form "release-id:version-id",
as either:

- "0:00" for DSA200 (the default)

- "1:00" for DSA300.

<u>XPRTC Command</u>

(Transport PRoToCol)

DEFINITION

Defines a transport protocol: i.e., a set of transport parameters to be associated with a given network route. Several different network routes may have the same protocol. Any network route for which no transport protocol has been specified explicitly, is given a default protocol consisting of a set of constants and system-computed values. Refer to Appendix A of the Network Control Terminal Operations manual, for a detailed description of transport mechanisms, as well as recommendations for tuning the parameters of this XPRTC command with regard to other transport commands (i.e., RTS, NR, and COMPATH).

COMMAND FORMAT

```
XPRTC xprtc-name [, WINDOW = credit-description]
      [, UNITSZ = transport-unit-size] [, LEVEL =
      (SLAVE:BASIC:FLOW-CONTROL:RQST_RECOVERY:FULL_RECOVERY)] :
```

PARAMETER DESCRIPTION

xprtc-name   defines a "local" name (i.e., known only to the "local" system), of from 1 through 8 alphanumeric characters in length.

LEVEL   defines the transport station's "transport protocol option". This includes such options as negociation rules, throttling and error recovery techniques. The level selected by TNS, when starting a transport connection, depends on the configuration concerned:

   ● If only one network route has been configured between the LTS and RTS, the level found in the configured table is selected.

   ● If there is a large number of network routes, "FULL_RECOVERY" is selected.

WINDOW   defines the maximum credit to be allowed for any transport route mapped over network routes controlled by this protocol, in either of the forms:

- "(input-credit, output-credit)" - where "input-credit" must be equal to "output-credit" (in the current release).

- "(credit)" - where "credit" represents both input and output credits.

"Credit" must be both greater than "0" and less than " 15 ", with a default value of "3".

UNITSZ   defines the maximum transport unit size for any transport route mapped over routes with this protocol. The default is individually computed by the system for each route as a function of such parameters as those of the corresponding COMPATH command.

SECTION 8

TUNING THE NETWORK

Tuning the network enables optimal use to be made of the communications system, in terms of reducing response time and optimizing memory occupancy.

The four principle aspects of improving network performance are:

- BTNS/URP and TNS/URP Tuning

- FNPS Tuning

- MAM Tuning

- Optimization of MCS Applications.

For the last of these, see the MCS User Guide.

BTNS/URP AND TNS/URP TUNING

This aspect of network tuning involves the following:

- Network Definition

- BTNS Buffers

  - BTNS Input Buffer Pool Size

  - BTNS Output Buffer Pool Size

  - Factors Affecting Buffer Pool Size

- TNS Buffers

  - Sizing the Buffer Units

  - Configuring the Line

- Use of Polling Algorithms

- Factors Affecting Station Declaration.

Network Definition

The following points should be taken into consideration when defining the network.

The user may write several network descriptions, such that each description has a specific use and function corresponding to a specific communication session.

The CNC step takes an average of one minute to generate a given network, which allows switching from one network operation to another. The only constraint on changing the network, is the need to stop BTNS momentarily together with any executing communications programs: i.e., VCAM subsystems and/or MCS applications and FNPS. After a RESTART CLEAN, the execution of CNC takes a little longer because of the reconstruction of system tables.

Once the network has been generated, however, BTNS takes about thirty seconds to be initialized.

BTNS Buffers

BTNS INPUT BUFFER POOL SIZE

When specifying the BTNS input buffer pool size, the following points should be taken into consideration:

- On input, units of the BTNS input buffer pool are linked dynamically, to receive data from the terminals connected to VCAM subsystems and MCS applications.

  An overload situation will occur, during a peak in traffic, if a buffer pool is too small to cope with the load. In this case, BTNS automatically retries communication but, by doing so, decreases throughput performance.

- The BTNS input buffer pool occupies a segment of up to 64K bytes, created at BTNS startup and deleted upon termination of the communications session.

  The size of this buffer pool is defined with the "BTBFSZ" and "NBBTBF" parameters of the GENCOM command, and should provide the space required to contain one message per transmission line, as BTNS must be able if necessary to service ALL transmission lines concurrently.

- When specifying the "BTBFSZ" parameter, the unit size is determined by the "average" message length sent to the terminal. Other constraints are based on:

  - Line speed; i.e., 19200 bps requires a minimum unit size of 160 bytes

  - Link type: one packet must fit into one buffer unit. The unit size must be consistent with the TRANSPAC subscription and firmware generation of the HDLC line. Note that an excessively large value for "BTBFSZ" will result in under-occupancy of the buffer pool.

- When specifying the "NBBTBF" parameter, the minima of units necessary for transmission are:

  - Two units for each VIP transmission line

  - 1 unit for every two transmission lines.

  This minimum number should be increased if message length exceeds BP unit size (or packet length, in the case of an HDLC line).

BTNS OUTPUT BUFFER POOL SIZE

When specifying the size of the BTNS output buffer pool, the following points should be taken into account:

- This output buffer pool is used for storing messages to be sent to the appropriate terminals, and must be large enough to handle all

the messages generated dynamically by the application(s).

- The BTNS output buffer pool occupies a segment of up to 64K bytes, created at BTNS startup and deleted upon termination of the communications session.

  The size of this pool is determined by the "DABFSZ" and "NBDABF" parameters of the GENCOM command, and should provide the space required to handle data output to as many terminals as may be active at any one time.

  An overload situation will occur, during a peak in traffic, if a buffer pool is too small to cope with the load. In this case, BTNS automatically retries communication but, by doing so, decreases throughput performance.

- When specifying the "DABFSZ" parameter, the unit size is determined by the "average" message length, as well as by other constraints:

  - The fastest line speed available

  - Link type: the unit size must be consistent with both the TNS configuration and the firmware generation of the HDLC line.

- When specifying the "NBDABF" parameter, the factors which determine the "optimum" number of units for the whole output buffer pool, include:

  - The type of application: i.e., interactive, file transfer, etc.

  - The number of terminals. All terminals share the same output buffer pool resource.

  - The use of TNS, which involves an additional load on the system.

FACTORS AFFECTING BUFFER POOL SIZE

If the buffer size parameters are not specified explicitly, CNC will generate pools of equal length.

Optimum values for these buffer size parameters may be adjusted dynamically. By using the results of several communications sessions, obtained from the relevant BTNS JORs, buffer pool sizes may be "tuned" for subsequent sessions.

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Factors influencing the choice made of optimum values, include:

● Transmission lines are not generally all active simultaneously.

● Functional characteristics of the network:

    ● Line speed. The faster the speed of transmission, the greater
      the throughput of the buffer pool. Consequently, the smaller
      the buffer pool, the quicker must be the turnaround.

    ● Total network traffic. The greater the traffic, the larger the
      buffer pool. An increase in overall traffic is caused by:

        ● An increase in the number of terminals active in the network

        ● The type of application; e.g., remote batch applications
          impose a heavier workload - implying a heavier traffic - on
          the network, than interactive applications.

    ● Message length. Buffer unit size must range from "N/4" through
      "N", where "N" is the average message length.

TNS Buffers

SIZING THE BUFFER UNITS

In the current release, TNS and BTNS share the same buffer pools: a
trade-off should therefore be taken into account with the
optimization of BTNS buffers. The line is configured at URP firmware
generation, with its hardware and "software-visible" attributes, the
responsibility of the DPS7 installation engineer.

In the firmware generation for the line, the sizes of the input and
output frames are specified. These frame lengths determine the sizes
of the input and output buffer units, "BTBFSZ" and "DABFSZ"
parameters of the GENCOM command, used by TNS. They may be specified
by the user, if the default values of 160 bytes are deemed
unsuitable.

The algorithms for sizing the buffer units, are as follows:

● For a TRANSPAC virtual circuit, the buffer unit must be large
  enough to fit the subscription packet size. In particular, the
  input buffer must be large enough also to accomodate the packet
  and buffer management headers.

    (BTBFSZ¦DABFSZ) = (PKSIZE + 32)

    ... where "PKSIZE" is a parameter of the LSUB command.

● For a point-to-point HDLC line, the buffer unit must be large
  enough for the "fragment" directly negociated by TNS. However, the
  network administrator may specify the maximum size required:

    (BTBFSZ¦DABFSZ) = (UNITSZ + 32)

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... where "UNITSZ" is a parameter of the XPRTC command.

The fragment size proposed by TNS to the "remote" transport station (i.e., RTS) is determined by the following algorithmic procedures:

1) For a given network route, the initial sizing depends on the type of "access":

    a) Over a point-to-point HDLC line, the fragment size selected is the LEAST of the following parametric values:

        ● The "data part" of the "frame length" specified in the URP firmware generation; i.e., ("frame-length" - 2), see "Configuring the Line"

        ● The "data part" of the buffer unit size, "BTBFSZ" and "DABFSZ" in the GENCOM command; i.e.:

            ((BTBFSZ:DABFSZ) - 32)

        ● The "UNITSZ" parameter of the XPRTC command.

        fragment/pt-to-pt = Min (frame/fw - 2, ((BTBFSZ:DABFSZ) - 32), UNITSZ/xprtc)

    b) Over a TRANSPAC virtual circuit, the fragment size is selected according to the following consecutive criteria; if the XPRTC command is specified:

        ● With its "UNITSZ" parameter, the fragment size selected is equal to the value of "UNITSZ"

        ● Without its "UNITSZ" parameter, or if the command is not specified at all, the fragment size selected is calculated as the product of the "WINDOW" and "PKSIZE" parameters of the LSUB command.

        fragment/tpac-vc = (UNITSZ/xprtc:(WINDOW/lsub * PKSIZE/lsub))

2) Where there are several network routes linking the "local" transport station (i.e., LTS) to the RTS, the fragment size chosen is the LOWEST COMMON MINIMUM of all the fragment sizes determined for each network route concerned, according to whichever is applicable of 1a and 1b above:

    fragment/lcm = Min (fragment/nr/1, fragment/nr/2, ... , fragment/nr/n).

3) Once the connection between LTS and RTS on a mutual exchange has been confirmed, either transport station then selects the SMALLER of their "input" and "output" fragments for transmitting data:

    fragment/on-line = Min (fragment/send, fragment/receive).

4) Once the fragment size has been selected, TNS will calculate the letter size as the product of the fragment size and the "output" credit. The "output" credit proposed to the RTS, is one of:

- Equal to the non-zero value specified by the "WINDOW" parameter of the XPRTC command

- If "WINLOW = 0" is specified in the XPRTC command, equal to twice the number of network routes declared

- If the XPRTC command is not specified at all, or is specified without "WINDOW", equal to the default value of "3".

letter = (fragment * credit -> {WINDOW/xprtc!2 sigma x=1, x=n nr/x!3})

The Network Administrator must check the BTNS Job Occurrence Report for "overloading" of the buffer pool due to its being "undersized". "Overloading", for each transport connection, may be caused by TNS demanding more buffer units than currently declared in the CNC; e.g.:

- For a point-to-point HDLC line, as many as, or more than, twice the value specified by the "WINDOW" parameter of the XPRTC command

- For a TRANSPAC virtual circuit, as many as, or more than, twice the value specified by the "WINDOW" parameter of the LSUB command.

To resolve this problem, the Network Administrator may perform any or all of the following:

- Increase the number of output buffer units, with the "NBDABF" parameter of the GENCOM command

- Decrease the credit value of the XPRTC parameter "WINDOW"

- In the case of a TRANSPAC virtual circuit, reduce the fragment size specified in the "UNITSZ" parameter of the XPRTC command.

CONFIGURING THE LINE

An example of an URP firmware configuration, for 2 HDLC lines,
follows:

```
RES   LNO1    HDLCA,SVA="L TOOP3.0909"
                   |                      |  |
                   |                      |  |-> maximum lengths of input and
                   |                      |  |   output frames:
                   |                      |  |
                   |                      |  |      09 * 16 = 144 bytes
                   |                      |  |
                   |                      |  ---> HDLC frame-window, defined as
                   |                      |        "TFNAK"
                   |-> LAP-A (unbalanced mode); for LAP-B (balanced mode),
                                                 specify "HDLCB"
ULNK  LNO1    CA02, DLIN=00, LCN=15

RES   LNO4    HDLCA, SVA="L TOOP3.0909"
ULNK  LNO4    CA02, DLIN=03, LCN=21

LNO1
      TERML  1
           |
           |-> defines the Data Terminal Equipment: DTE
               (a line configured to TRANSPAC must be declared as a DTE)
ENLLN

LNO4
      TERMND=0
           |
           |-> defines the Data Communications Equipment: DCE
ENDLN
```

An example of the TLT printout for one of the lines configured,
follows:

```
LINE: LNO4
      TYPE: HDLCA    SVA: ' L TOOP3.0909 '
                                  |
                                  |---> HDLC frame-window, defined as
                                  |      "TFNAK"
      TLT:   06430011  77A001FF  110409FF  090 1.10.10  00000000 00000000
                                      |      |
                                      |      |-> 09 * 16 = 144 bytes:
                                      |          maximum input frame
                                      |
                                      |-> 09 * 16 = 144 bytes:
                                          maximum output frame
      CONNECTED TO:
        URP : UCO1 SVA: ' IS2D21060513 '
        UCLA: CA02 SVA: ' HFDL...3.... '
```

The frame length specified in the URP firmware generation determines
the MAXIMUM value that may be specified for "PKSIZE" or "UNITSZ"; and
must be greater than or equal to the value specified for "-TUL" in
the TS SYSGEN command of the DN7100.

There will be no I/O difficulties if the value specified for either "PKSIZE" or "UNITSZ" is less than the configured value at the same time as being at least equal to the packet or fragment size required.

Configured values must be increased, if a new maximum is required. In this case, the network administrator must ask the field engineer to rerun the URP firmware generation.

Since the GENCOM command is unique for any given CNC version, the buffer sizes declared in "BTBFSZ" and "DABFSZ" apply for all the lines in that DPS7's network. The generated firmware values are likewise identical.

Use of Polling Algorithms

When BTNS is initialized through the console command ST, the polling list is loaded into the URP; the firmware handles polling.

Setting up and modifying the polling list is done through algorithms, for which the following points should be considered:

● Setting the polling list up. For stations on a multipoint line, the polling list is determined by two LINE command parameters:

   ● "POLLIST", which lists stations according to their STIs, as defined in the STATN commands following LINE

   ● "LINPLG", which defines the restart of polling, for after successful data entry from a given station, as follows:

      ● If specified, polling resumes at the beginning of the polling list; i.e., "linear"

      ● If not specified, polling resumes at the next station consecutive to the station just polled; i.e., "round-robin".

● Modifying the polling list may be done with any one of the following network control commands:

   HT   to inhibit a station which is known to be:

      ● Logically closed down; i.e., not used to send or receive

      ● Unavailable due to "time out" having occurred, as specified with the value given to TOLEN.

   RT   to restore a station to the polling list, if either:

      ● HT has been issued previously, to avoid polling an inactive station

      ● The STATN command has been specified with the "CLOSE" option at network generation, and has remained in this closed state at BTNS start-up time.

   MTP to modify part or the whole of the polling list.

EXAMPLES OF USING POLLIST AND LINPLG PARAMETERS

Example 1:

Equal frequency, round-robin polling, where all stations (1, 2, 3, 4, 5) are polled at the same frequency:

POLLIST = (1, 2, 3, 4, 5)

Example 2:

Biased frequency, round-robin polling, where station 1 is polled four times as frequently as stations 2, 3, 4 and 5:

POLLIST = (1, 2, 1, 3, 1, 4, 1, 5)

Example 3:

Descending frequency, round-robin polling, where stations are to be polled in order of descending frequency: i.e., station 1 is polled most frequently, while station 5 is the least polled:

POLLIST = (1, 2, 3, 4, 5), LINPLG

Example 4:

Biased frequency, linear polling, where the polling bias is heavily in favor of station 1:

POLLIST = (1, 1, 1, 2, 3, 4, 5), LINPLG

Factors Affecting Station Declaration

When declaring stations, the following points should be taken into account:

● The effects of declaring one station per line are:

  ● A larger number of lines used

  ● The "load per line" not used to its optimum capacity

  ● Installation costs increased:

    ● For equipment already installed, as running and maintenance costs will be greater than necessary due to the use of more lines than needed

    ● At the stage of planning the installation, as more equipment will be ordered than needed for the network to function.

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- When using the multipoint facility (i.e., declaring more than one station per line), the gain in reducing the number of lines needed must be weighed against:

- Degradation in response time caused by:

  - The "overhead" of the polling mechanism, through polling inactive stations

  - The sharing of line throughput by multiple stations. The time for message transmission, which in turn depends on message length and, for the duration of which, the line is used "exclusively" by the station active.

- The type of application; i.e., "interactive" applications are generally more suitable for a multipoint network than are "remote batch" applications.

Figure 8-1: Maximum Terminal Message Length

Terminal Type	Line Procedure	Message Length (bytes)	Terminal Type	Line Procedure	Message Length (bytes)
AJ832	TTY	128	PRT1220	TTY	6144
AJ833	TTY	128	STS2840	VIP(S)	(b)
DKU7001	TTY	2048	TK4105	TTY/TTY-R	2048
DKU7002	TTY	2048	TN300	TTY	128
LKU7005	VIP(S)	6144	TN1200	TTY/TTY-R	256
LKU7007	VIP(S)	6144	TTS7800	VIP(S)	(c)
LKU7105	VIP(S)	6144	TTU8124	TTY	256
LKU7107	VIP(S)	6144	TTU8126	TTY/TTY-R	256
DKU7211	VIP(S)	6144	TTU8128	TTY/TTY-R	6144
DTU7171	TTY/TTY-R	128	TTU8221	VIP(S)	1024
DTU7172	TTY/TTY-R	128	TTX35	VIP(S)	6144
HL6	VIP(S)	2048	TTY33	TTY	128
HL61	BSC	2048	TTY35	TTY	128
HL62	BSC	2048	VIP7001	VIP(S)	2048
HL64	BSC/HDLC	2048	VIP7100	TTY	1024
HL66	BSC	2048	VIP7200	TTY	1024
IBM370	BSC	2048	VIP7700	VIP(S)	2048
IBM3270	BSC	(a)	VIP7760	VIP(S)	2048
IBM3278	BSC	6144	VIP7801	TTY	2048
IBM3741	BSC	1024	VIP7801V	TTY	2048
KDS7255	VIP(S)	1024	VIP7802	TTY	2048
KLS7275	VIP(S)	1024	VIP7804	VIP(S)	2048
MTS7508	VIP(S)	1024	VIP7805	VIP(S)	2048
PC7800	TTY	2048	VIP7814	VIP(S)	2048

(a) Model 1, 480 bytes
   Model 2, 1920 bytes
(b) 1280 or 1920 bytes
(c) Panel display, 256 or 480 bytes; CRT, 960 or 1920 bytes.

FNPS TUNING

The information treated here relates to the FNPS service job, running in the GCOS system environment. Each FNPS manages one DN7100 Front-end Processor. For Release GCOS7/V2, there may be up to four FNPSs together managing four active input buffer pools and four active output buffer pools each with differing functional characteristics, according to the specification of the respective FNP commands.

Information on the optimization of DN7100 software, in terms of memory occupancy and performance/throughput, is dealt with in the DN7100 Performance Guide.

FNPS tuning involves:

● FNPS Tables

● FNPS Input Buffer Pool Size

● FNPS Output Buffer Pool Size

● Specifying FNPS Buffer Pool Sizes

● Allocating FNPS Buffer Pools

● PSI Logical Channels.

FNPS Tables

These basic tables are created as a result of network generation, from parameters supplied in the FNP command, and are held in Type 0 segments. Other tables are managed dynamically by FNPS and, as such, are optimized whenever necessary: these are held in Type 2 segments.

Furthermore, the basic table is small and so memory occupancy is negligible: i.e., 78 bytes.

FNPS Input Buffer Pool Size

When specifying each FNPS input buffer pool's size, the following points should be taken into account:

● One FNPS input buffer pool exists for each DN7100 known to the system. Each input buffer pool is made up of units all of equal length. The unit length for one input buffer pool need not necessarily be the same as for the others.

Each time a connection is made, FNPS knows the maximum message length applicable to the corresponding session, from the exchange protocol with the DN7100 over the PSI channel. FNPS allocates buffer pool space as a function of this maximum message length. As FNPS receives successive connections and messages, it attempts to allocate a sufficient number of contiguous units to accomodate the new messages.

- If one segment of 32K is insufficient (as a function of the sum of the maximum message lengths applicable to all current connections), FNPS may create a second segment if possible, even if the length of data actually received is less than the maximum length possible. If "INBFNB * INBFSZ" does not allow creation of a second segment, FNPS uses space allocated at connection time.

- When specifying the "INBFNB" parameter, the number of units must allow for the "average" traffic rate without risking an overload situation which would decrease the throughput of messages from the DN7100. In the report produced by FNPS (see Appendix A), "MAXIMUM UNIT NUMBER" indicates if buffer saturation has been reached:

  - Saturation is indicated when the value of MAXIMUM UNIT NUMBER is close to that of UNIT NUMBER

  - If MAXIMUM UNIT NUMBER is much smaller than UNIT NUMBER and a second buffer has had to be created, "INBFNB * INBFSZ" has been calculated too generously.

FNPS Output Buffer Pool Size

When specifying the size of each output buffer pool, the following points should be taken into consideration:

- One FNPS output buffer pool exists for each DN7100 known to the system. Each buffer pool is made up of units all with a given length. The unit length for one buffer pool may possibly differ from that of the others.

  Each time a connection is made, FNPS knows the maximum message length applicable to the corresponding session, from the exchange protocol with the DN7100 over the PSI channel. FNPS allocates buffer pool space as a function of this maximum message length. Each time VCAM wants to send a message, FNPS attempts to allocate a sufficient number of contiguous units to accomodate it.

- If one segment of 32K is insufficient (as a function of the sum of the maximum message lengths applicable to all current connections), FNPS may create a second segment if possible, even if the length of data actually received is less than the maximum length possible. If "OUTBFNB * OUTBFSZ" does not allow creation of a second segment, FNPS uses space allocated in anticipation at connection time.

- When specifying the "OUTBFNB" parameter, the number of units must allow for the "average" traffic rate without risking an overload situation which would decrease the throughput of messages from the DN7100. In the report produced by FNPS (see Appendix A), "MAXIMUM UNIT NUMBER" indicates if buffer saturation has been reached:

  - Saturation is indicated when the value of MAXIMUM UNIT NUMBER is close to that of UNIT NUMBER

  - If MAXIMUM UNIT NUMBER is much smaller than UNIT NUMBER and a second buffer has had to be created, "OUTBFNB * OUTBFSZ" has been calculated too generously.

Specifying FNPS Buffer Pool Sizes

The size of INBFSZ and OUTBFSZ depends on the "average" message length, which in turn is determined by a combination of the:

● Maximum amount of data transmitted before the "turn" is handed over to the correspondent

● Public data network's cumulative:

  ● Transit time

  ● Transmission speed.

Allocating FNPS Buffer Pools

The sizes of FNPS input and output buffer pools, are determined at CNC generation by the values specified for the following FNP command parameters:

● On input, by the product of INBFNB * INBFSZ

● On output, by the product of OUTBFNB * OUTBFSZ.

For both input and output buffer pools, the maximum value that may be specified by the user is 480K bytes – which is requested by GCOS in 15 segments of 32K bytes each.

At run time, the amount of memory "locked" by FNPS to serve as buffer pools may not exceed what has been specified at CNC generation. For example, if the user has specified 128K bytes, FNPS will only "lock" as much memory, up to the user maximum of 128K bytes, as necessary – to the nearest IK bytes (with a minimum of 32K). Once the total amount of memory specified by the user has been "locked", no further allocation of memory may take place and FNPS must then operate within that maximum of memory available no matter what constraints are imposed on the system.

If FNPS's memory requirements exceed what the user has specified, performance will be degraded. The user must therefore increase the buffer pools' sizes up to FNPS's maximum requirements at the next CNC generation and rerun the communications session.

A lack of available "locked" memory is caused by the following conditions:

● More users log on than provided for, thereby creating a "saturation" peak period

● Data throughputs than foreseen, generated by the user and from the system.

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PSI Logical Channels

A maximum of 16 logical channels is allocated over the PSI, the total number of channels available for user data being 13. The reasons for this are that:

- Cost, in terms of memory space, is negligible; see "FNPS Tables"

- Better overlapping of I/O activities is permitted at FNPS level.

Except in the case of highly specialized use of the DN7100, where traffic in one direction is much higher than in the other, the default division between input and output is:

- 6 input data logical channels

- 7 output data logical channels.

Should the user need to adjust the division of channels between input and output, this may be done with the "INLCNB" parameter of the FNP command.

From the point of view of the DPS7, the conventional channel numbering is as follows:

Channel Number		Channel Type
0	DN7100 status control command channel	Command Channels
1	Control command channel for data input channels	
2	Control command channel for data output channels	
3 ⋮ x	Data exchanges controlled by command channel 1	Data Input Channels
x+1 ⋮ n	Data exchanges controlled by command channel 2	Data Output Channels

The value of "n" is normally "15"; unless the FNP keyword "MODE = m" has been specified, in which case the number of channels reserved for:

- Data output is "(15-m) = x"

- SIRIS is "m".

For further information on the sharing of channels between GCOS and SIRIS, refer to the DN7100 System Generation Manual.

MAM TUNING

This aspect of network tuning involves the following items:

● Choosing between Disk Queues and Memory Queues

● Queued Message Structure

● Calculating the Number of Blocks

● Specifying the "QCBLKSZ" and "QDBLKSZ" Parameters

● Defining Memory Queue Space

● Defining Disk Queues

● Preallocating Disk Files.

Choosing between Disk Queues and Memory Queues

The following conditions determine the choice to be made between disk and memory queues:

● Disk queues are used for:

  ● Invoking the checkpoint/restart facility, in the event of "step abort" or "system crash"

  ● File transfer and data collection, where the data obtained is to be used for input to applications normally run after the communications session has been terminated.

● Memory queues are used for:

  ● When response time is critical in reducing turnaround

  ● Interactive or conversational dialog.

● Both disk and memory queues are used for:

  ● Heavy traffic loads over a large network

  ● File transmission.

  In this case, queues are allocated as follows:

  ● Memory queues for receiving data

  ● Disk queues for storing data.

EXAMPLE OF USING BOTH TYPES OF QUEUES

The installation environment and application usage are as follows:

● Twenty VIP7700 keyboard-screen terminals are used in
  conversational mode to enter invoices, on the basis of one enquiry
  (i.e., input) to one response (i.e., output)

● Four printers produce hard-copy, in the form of invoices keyed in
  on the VIPs, and therefore many output messages may be generated
  for printing.

The choice of queues most suitable for the requirements of this
application, is made as follows:

● Memory queues to be used for the VIP terminals as well as the
  application, for rapid turnaround

● Disk queues to be used for the printers, since hard copy is slower
  to produce than screen displays.

Structure of the Queued Message

The internal structure of a message enqueued by MAM, is the same in
memory as it is on disk.

The message is assembled in fixed-length blocks, as specified by the
user. The two types of block are the "TCB" (i.e., Text Control Block)
and the "HCB" (i.e., Header Control Block).

Each TCB is structured as follows:

● Five bytes are used to provide a link with the relevant HCB

● The remaining bytes contain the data part of the message.

Each HCB occupies a block of the same size as a TCB, structured as
follows:

HCB1 where 50 bytes are used for control information and provide the
     link to HCB2; the remaining bytes are used to link the related
     TCBs, each link comprising 4 bytes.

HCB2 where 4 bytes provide the link between HCB2 and HCB3; the
     remaining bytes hold the link with the relevant TCBs, each link
     comprising 4 bytes.

HCB3 where, since there is no succeeding HCB to be linked with HCB3,
     the first 4 bytes are lost. The remaining bytes provide the link
     with the relevant TCBs, each link comprising 4 bytes.

The number of blocks needed to enqueue a given message, must depend
on the:

● Length of the message

● Size of the block, in bytes, as defined in the GENCOM command,
  with:

  ● "QLBLKSZ" for disk queues

  ● "QCBLKSZ" for memory queues.

Figure 8-2: Optimizing Queue Size - 1

Case 1

message of
9n bytes in
working area
of program

9n

TCB1	n
TCB2	n
TCB3	n
TCB4	n
TCB5	n
TCB6	n
TCB7	n
TCB8	n
TCB9	n

HCB1	n
TCB1	n
TCB2	n
TCB3	n

HCB2	n
TCB4	n
TCB5	n
TCB6	n

HCB3	n
TCB7	n
TCB8	n
TCB9	n

Message of 9n bytes is structured into 9 TCBs
of n bytes each, every 3 TCBs headed by 1 HCB.
In Case 1, the message is unduly split owing
to the small size of the blocks declared. The
number of links required slows down storage &
retrieval, and hence increases response time.

Figure 8-3: Optimizing Queue Size - 2

Case 2

message of 9n bytes in working area of program

9n

TCBa	3n
TCBb	3n
TCBc	3n

HCB I	3n
TCBa	3n
TCBb	3n
TCBc	3n

Message of 9n bytes is structured into 3 TCBs of 3n bytes each, all TCBs headed by one HCB.

In Case 2, the blocks are larger in size. The number of links is fewer, compared with Case I. Storage and retrieval are more rapid, thereby decreasing the response time.
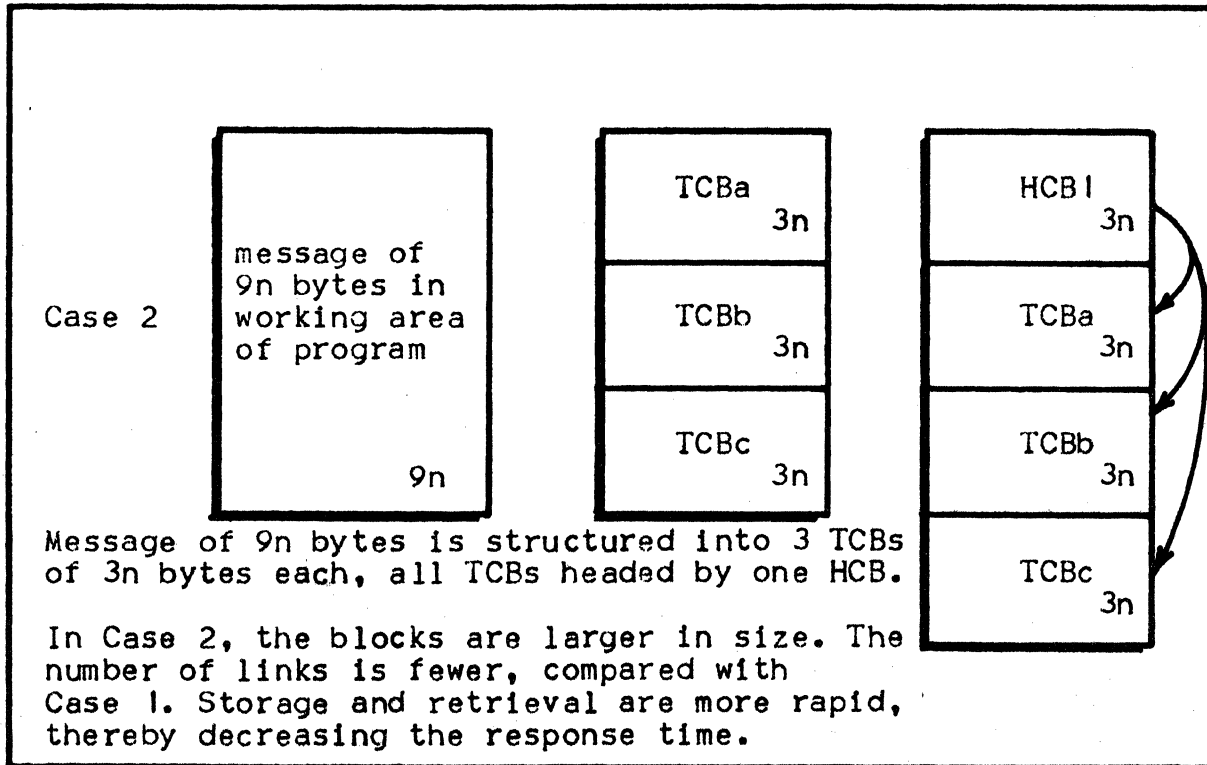
Calculating the Number of Blocks

● In the following algorithms, symbols used for the variables are:

N = the number of TCBs

B = the block size, in bytes.

● The number of TCBs is given by the algorithm:

N = (message-length)/$(B - 5)$ (+ 1, for any remainder).

● The number of HCBs is given by the following algorithms:

● For 1 HCB: i.e., only HCBI is used:

$(N * 4) \leq (B - 50)$

● For 2 HCBs: i.e., HCBI and HCB2 are used:

$(N * 4) \leq (2B - 54)$

● For 3 HCBs: i.e., HCBI, HCB2 and HCB3 are all used:

$(N * 4) \leq (3B - 58)$

Specifying the "QCBLKSZ" and "QDBLKSZ" Parameters

When specifying values for these parameters, the following compromise must be considered:

- Economy of space, involving:

  - A reduction in the number of blocks needed to enqueue the average message

  - Minimization of the amount of "lost" space.

- Performance, involving a reduction of the "overhead" imposed on BTNS and on the application by MAM, in terms of:

  - Avoiding unnecessary "splitting" of messages, which is costly in CPU time

  - Reducing the number of I/O operations needed to access TCBs and HCBs, on a disk queue file.

EXAMPLE OF OPTIMIZING QUEUE SIZE

Consider an average message length of 980 bytes:

- Solution 1. If 3 TCBs are used, the:

  - Block size must be no less than $(327 + 5) = 332$ bytes

  - "Loss" in TCB3 will be $(327 * 3) - 980 = 1$ byte

  - "Loss" in HCB1 will be $(332 - (50 + (3 * 4))) = 270$ bytes

  - Total "loss" will be $1 + 270 = 271$ bytes.

- Solution 2. If 4 TCBs are used, the:

  - Block size must be no less than $(245 + 5) = 250$ bytes

  - "Loss" in TCB4 will be $(245 * 4) - 980$ bytes $= 0$ bytes

  - "Loss" in HCB1 will be $(250 - (50 + (4 * 4))) = 184$ bytes

  - Total "loss" will be $0 + 184 = 184$ bytes.

- Solution 3. If 5 TCBs are used, the:

  - Block size must be no less than $(196 + 5) = 201$ bytes

  - "Loss" in TCB5 will be $(196 * 5) - 980 = 0$ bytes

  - "Loss" in HCB1 will be $(201 - (50 + (5 * 4))) = 131$ bytes

  - Total "loss" will be $0 + 131 = 131$ bytes.

The greater the number of TCBs used, the less the amount of "lost" space BUT the greater the access time.

A reasonable compromise would be Solution 2, where the block size is equivalent to 25% of the message length; see "BTNS/URP Tuning: Factors Affecting Buffer Pool Size", in the Network Control Terminal Operations manual.

EXAMPLE OF OPTIMIZING THE NUMBER OF BLOCKS

Consider a message text to fill a screen of 24 lines, each line having 80 characters. A block size of 85 bytes has been chosen to contain the text and 5 bytes to provide for the link.

- Solution A proposes to reduce response time, which will be achieved if BTNS can start delivery of the first lines of text before the entire message is enqueued. In order to do this:

    - Each line must be sent as a separate message; i.e., SEND WITH EMI

    - The structure of the message must therefore be:

        - One TCB to contain each line of text

        - Each TCB to be headed by one HCB I

        - 24 TCBs and 24 HCB Is are needed to contain the entire message

        - The total space required will be (48 * 85) = 4080 bytes.

- Solution B proposes to save space, which will be achieved if the entire message can be enqueued before it is transmitted. In order to do this:

    - Each line is sent as a portion of the message; i.e., SEND without an indicator being specified, until line 24

    - The last line, 24, is transmitted as SEND WITH EMI, thereby terminating the message

    - The message's structure must therefore be:

        - 24 TCBs to contain the entire message

        - One HCB I to link the first 8 TCBs; i.e., TCBI through TCB8

        - One HCB2 to link the remaining 16 TCBs; i.e., TCB9 through TCB24

        - One HCBI, one HCB2 and 24 TCBs are needed to contain the entire message

        - The total space required will be (26 * 85) = 2210 bytes.

In Solution A, the advantage of so structuring the message is security, since each TCB is controlled by its own HCB; as opposed to Solution B where 8 TCBs are controlled by a single HCB. The risk of losing text is restricted to one TCB, as opposed to 8 TCBs, respectively.

The saving of 1870 bytes in Solution B is made at the expense of minimizing response time since, unlike Solution A, transmission does not start until the entire message has been enqueued.

Defining Memory Queue Space.

The space for memory queues is restricted to a single segment of 64K bytes. In the following algorithms, the parameters specified are to be found in the corresponding CNC commands:

- "NUMBLK" parameter in the QUEUE command

- "QCBLKSZ" parameter in the GENCOM command

- "QCPOOL" parameter in the GENCOM command.

The number of memory blocks is given by the algorithm:

$$N = sigma \ (NUMBLK) + QCPOOL$$

The restriction on memory queue space is given by the algorithm:

$$(N * QCBLKSZ) \leq 65535$$

The total memory queue space declared, must include both the:

- Pool independently reserved for the exclusive use of individual queues, as declared with "NUMBLK" in the respective QUEUEs

- Pool, as declared with "QCPOOL" in GENCOM, to be shared by all queues qualified by "QCPOOL" in their respective QUEUEs.

Violating this restriction on memory queue space will cause an error during network generation, with the message:

ERROR CN0020 SEVERITY 4 SEGMENT TOO LARGE : segment-name

For further details, see Appendix A.

The actual size of the segment generated for memory queues, is provided by the CNC SYSOUT report; see Appendix A.

Estimating the size of the memory buffer pool, must depend on:

● Message length, already dealt with above

● Traffic load, which comprises:

  ● Time taken to compose the message text to be input

  ● Time taken to enter the composed message text

  ● BTNS transfer time

  ● Processing time of the executing application

  ● Response time for outputting a message to the terminal.

Typically, in the case of interactive applications, up to 30% of the memory buffer pool is used on average during peak periods.

If the "maximum" has not been exceeded over a period of several "typical" communications sessions, the CNC parameters determining the memory buffer pool's size may be reduced when a new network description is generated.

Tailoring the buffer pool's size may be based on the following information:

● At the end of each session, the BTNS JOR listing, which gives an account of the memory queue segment; see Appendix A

● During the session, the network control command DT QUEUE may be issued from time to time, to take random samples of queue occupancy.

● Number of queues sharing the buffer pool, as related to queue type:

  ● Terminal queues are better suited to share a buffer pool

  ● Program queues are better suited to individually reserved pools, in order to be able to receive several messages in a stream.

The "QCPOOL" parameter of the GENCOM command, enables all or part of the memory buffer pool to be shared by several queues, if all or some of the queues are defined with "QCPOOL" in their respecitive QUEUE commands.

The disadvantage of shared buffer pools is the possibility of overloading.

Defining Disk Queues

In order to be able to use disk queues:

- The disk queue file must first be preallocated

- A buffer segment must be generated by CNC, to contain:

  - A "bit map", to reflect the status of each block in the file whether used or not

  - Buffers for reading/writing HCBs and TCBs from/to the disk file.

The size of this buffer segment is given in the CNC SYSOUT Report; see Appendix A.

Calculating the size of the queue file depends on:

- The block size, as defined by "QDBLKSZ" in the GENCOM command. A block size of between 400 and 1000 bytes should satisfy the requirements of most applications. Any size smaller than 400 bytes will increase unacceptably the overhead for disk I/O transfers. The greater the capacity of the disk, the larger "QDBLKSZ" may be.

- The maximum number of blocks permitted in the file, is defined by the following algorithm: where "NUMREC" is a parameter in the QUEUE command:

    Sigma (NUMREC) $\leq$ 32767

  If the total number of blocks exceeds the maximum defined above, an error message will be flagged at network generation:

    ERROR CN0020 SEVERITY 4 SEGMENT TOO LARGE : segment-name

  For further details, see Appendix A.

- Characteristics of the disk to be used: i.e., the number of:

  - Blocks per track

  - Tracks per cylinder.

The number of blocks per track for all disk drives, excluding MSU0310 is given by the algorithm:

    13165/(135 + QDBLKSZ)

In order to optimize file allocation for disk I/Os and missing segments, the user may obtain statistics from the JOR listings of both BTNS and the MCS application(s) concerned. For details of the BTNS JOR listing, see Appendix A.

The number of blocks per track for MSU0310, is given by the algorithm:

    1 + ((7294 - QDBLKSZ)/(101 + ((2137 * QDBLKSZ)/2048)))

Preallocating Disk Files

File access contention should be avoided in order to optimize performance and reduce response times. For this reason, files used during the communications session should be allocated on different disks, wherever possible.

The files most frequently used, in a communications system, are:

- System backing store (i.e., SYS.BKST1), for swapping code and data segments belonging to both system and applications, during execution. This file is accessed by the VMM (i.e., Virtual Memory Management) component of GCOS.

  A "bottleneck" will occur, in accessing the SYS.BKST1 file, if memory is overloaded by too many jobs executing concurrently.

- The queue file accessed through MAM by both BTNS and MCS applications

- User files accessed only by the MCS applications.

File contention generally arises if:

- User files are allocated on the same disk as the queue file, resulting in a great number of I/O operations having to be performed by the system in processing messages, thereby slowing throughput down. Contention arises between:

  - BTNS, in trying to enqueue and dequeue messages

  - The MCS application(s), in trying to access both types of file.

- The queue file is allocated on the system disk, and if the load imposed on the system is such as to increase the rate of segment swapping, contention being caused among:

  - VMM, in swapping and loading code as well as data segments

  - BTNS, in trying to enqueue and dequeue messages

  - The MCS application, in trying to access the queue file.

APPENDIX A

CNC SYSOUT REPORT

The information in the CNC SYSOUT report comprises:

- The network description input to the CNC utility; i.e., the commands specified for generating the network

- Output from CNC execution, including:

  - Any CNC error messages that may have been generated; see Appendix C

  - Hardware and firmware parameters relating to the components declared for the network

  - The sizes of the tables and buffers specified for the network.

The purpose of the CNC Report is to enable the user to optimize his network and tune its performance. The structure of this report is as follows:

1) The Header Banner

2) The network definition, containing a listing of the CNC commands provided by the user, as well as any error messages resulting from execution of the CNC utility; see examples in Appendix C

3) An error summary report, specifying the severity of each error

4) The relevant firmware parameters

5) The BTNS environment, with a summary of the network handled through BTNS and the URP/DCC

6) The FNPS environment, with a summary of information related to DN7100(s) declared with FNP command(s)

7) The VCAM environment, displaying the initial sizes of the VCAM tables generated by the CNC utility

8) The MAM environment, summarizing information related to both MAM and QMON

9) Tables common to all communications components, together with their sizes, generally referred to as the "Common Semaphore Segment".

HEADER BANNER

Figure A.1: Header Banner

```
                                    :----> CNC version number
****** ****** ****** ****** ****** *:***** ****** ****** ****
****** ****** ****** ****** ****** *:***** ****** ****** ****
**** GCOS L64                       :                    ****
****                C N C           :                    ****
****                  VERSION: 4C.05  DATED: SEP 10, 1982****
****CNC_EXECUTION_REPORT*********13   -:***** ****** ****** ****
****** ****** ****** ****** ****** *:***** ****** ****** ****
                                    :
                                    V
ADDITIONAL INFO:    8  --------------> CNC technical level


SRST OF THE MACHINE 60D00020 SAVED AT 09:38:38 OCT 07, 1982
OPTIONS : SIMU    :                      PRIVATE SRST
          :       :------------------------:
          V       V
If "SIMU" or "SIMUP" option            If "SIMUP" option
```

A.2

Figure A.2: List of Commands and Errors

```
LISTING OF DIRECTIVES AND ERROR MESSAGES        (title)

0        XXXXXX
1        XXXXXX
2                    (see examples in Appendix F)  (commands)
3        ----
4
5
6
 ...
```

Notes:

● Input records are sequentially numbered

● Errors detected during the first pass are interspersed, but not
  among the input records.

Example:

15   GENQMON QMAM,APPLIB=DSAC_APPL_D ,APPLABNUM=30:
   .01   1
   .02*** ERROR   ON00 SEVERITY 03 - ILLEGAL SYNTAX

   - Shows an error detected after the first pass, following the
   listing of commands.

ERROR SUMMARY

If no error is detected, the message produced is:

NO ERROR DETECTED

Any errors detected, even severity 2 warnings, will generate an error summary in the form:

SEVERITY 2 WARNINGS: xxx

SEVERITY 3 ERRORS: xxx

SEVERITY 4 ERRORS: xxx

Errors of SEVERITY 3 or 4 will of course lead to an abort of the CNC utility. In this case, an additional message is produced to indicate whether the previous configuration has been lost or not; i.e., either:

● PREVIOUS CNC (IF ANY) PRESERVED

● PREVIOUS CNC (IF ANY) LOST.

FIRMWARE PARAMETERS

Figure A.3: URP Attributes
Format of Information for Each Line Declared

LINE : LN02

(where LN02 is the SRST name of the telecommunications line, declared with the LINE command).

TYPE : TTY   SVA :⁄ L HOO OO II ⁄
      ¦   ¦
      ¦   ¦
      +--> Line procedure defined in RESOURCE   V
         card at SRST generation, namely   Software Visible Attributes
         BSC   : BSC   defined in resource card at
         HDLC-A : HDLC-X25   SRST generation, giving the
         TCV   : TC Olivetti   hexadecimal TLT image for
         TTY   : Teletype   the line concerned
         TTY-R   : Teletype (reverse channel)
         VIP-A   : VIP Asynchronous
         VIP-S   : VIP Synchronous

TLT : IA000000 00804200 59370403 0003088A (is the TLT hexadecimal
                                          image for the line).

CONNECTED TO :

URP : UCO I   SVA : ⁄ _S251Y0602 ⁄
    ¦   ¦
    +> External name of SRST/URP to which   V
       the line is connected, defined in Software Visible Attributes
       RESOURCE card at SRST generation   for the SURP/URP concerned

UCLA : CAO I   SVA : ⁄ HFDL...3.. ⁄
     ¦   ¦
     +> External name of UCLA/DCC to which   V
        the line is connected, defined in Software Visible Attributes
        RESOURCE card at SRST generation   for the UCLA/DCC concerned

---

BTNS ENVIRONMENT

Local Network

    GENCOM NAME=D20- <--- Is the name of the BTNS workstation, as
                          defined with the GENCOM command.

DECLARED LINES=4
| DECLARED CLUSTER(S)=2
| | DECLARED STATION(S)=10
| | | DECLARED TERMINAL(S)=15 -> Total number of terminals
| | | declared with TERMNL commands
| | +--> Total number of stations declared with STATN commands
| +--> Total number of clusters declared with CLUSTER commands
+--> Total number of lines declared with LINE commands

TRANSPAC Network

SUBSCRIBER # 1
| GENNET NAME : TC1
| | ASSIGNED TO : LN12
| | | TRANSPAC ADDRESS- 01234 -> TRANSPAC address specified
| | | with SUBNB parameter of the
| | | LSUB command
| | +--> URP HDLC line as declared in SRST
| +--> Name of subscription defined with the LSUB command
+--> Sequence number of the LSUB command

NB OF PERMANENT V.C. =3 ASSIGNED FROM : T000 TO : T002
|
+-> Total number of permanent virtual circuits declared by PVC
    commands, with names automatically assigned

NB OF SWITCHED V.C. = 15 ASSIGNED FROM : T003 TO : T017
|
+-> Total number of switched virtual circuits specified by the
    SLINE parameters of the LSUB command, with names
    automatically assigned

NB OF MULTIPLEXED ENTRIES = 20.

Segment Size

BTNS TABLES = 6475 BYTES (indicates the size of the tables dedicated to secondary network management).

OUTPUT B.P. = 4080 (28 UNITS OF 144 BYTES) (indicates the size of the output buffer pool).

INPUT B.P. = 4080 (28 UNITS OF 144 BYTES) (indicates the size of the input buffer pool).

TRANSPAC TRANSPORT TABLES = 9315 BYTES (indicate the sizes of the TRANSPAC and transport station tables, respectively).

Figure A.4: FNPS Environment

Format of Information for each FNPS Buffer Pool 32K Segment

OUBFNB: 0
    BUF SZ: 32768
            UNIT SZ:000072
                UNIT NB:000450
                    MAX UNIT NB:000016
                        MAX USER NB:000306

                            Maximum number of VCAM
                            connections for this
                            buffer pool segment

                        Maximum number of units in
                        this buffer pool segment
                        used in session

                    Number of buffer pool units
                    defined by INBFNB or OUTBFNB
                    parameters of related FNP

            Size of buffer unit defined by INBFSZ
            or OUTBFSZ parameters of related FNP

    Size of buffer pool segment in bytes

The number of units used for the buffer pool, at the moment of
termination:

● A value of "0" indicates "normal" termination

● This parameter becomes INBFNB, for input buffer pools.

6 lines appear for each input and output buffer pool segment of 32K.

Note that suppressed segments do not appear.

VCAM ENVIRONMENT

Table Sizes

- The initial size of VCAM Table 1 is shown as:
  VCAM TABLES 1= 307 BYTES.

- The initial size of VCAM Table 2 is shown as:
  VCAM TABLES 2= 269 BYTES.

Figure A.5: MAM Environment

DECLARED CORE QUEUE(S)=6 ¦ +--> Total number of memory queues declared by QUEUE commands specifying NUMBLK or QCPOOL	CORE QUEUE POOL=1420 BYTES ¦ +> Total size reserved in memory queue segment as declared by QCPOOL of the GENCOM command
DECLARED DISK QUEUE(S)=14 ¦ +--> Total number of disk queues declared by QUEUE commands specifying NUMREC or no option	DISK QUEUE POOL=10218 BYTES ¦ +> Total size reserved for disk queue pool segment automatically computed by CNC

```
QUEUES FILE IS :
EFN=MS_QUEUE
  ¦     MEDIA=K187
  ¦     ¦   SIZE=5 CYL--> Size in cylinders of disk queue file
  ¦     +--> Name of disk containing disk queue file
  +--> External-file-name of the disk queue file
```

MAM TABLES SIZE =1860 BYTES <-- Size of MAM tables

Q.M. TABLES SIZE =1834 BYTES <-- Size of QMON tables

Figure A.6: Common Tables

```
COMMON TABLES SIZE
     SEMAPHORE SEGMENT = 3432 BYTES                                    |
 :    DICTIONARY SEGMENT=2400 BYTES
 :    :    IDSEQ SEGMENT=192 BYTES --> Size of identification
 :    :                               sequence segment (generated
 :    :                               by CNC from IDSEQ commands)
 :    +--> Dictionary of communications names (built by CNC from
 :         generation names)
 +--> Size of common semaphore segment
```

Note that, after a RESTART CLEAN, the CNC report shows the terminal
features description as just regenerated by the system.

APPENDIX B

BTNS, FNPS AND QMON
JOB OCCURRENCE REPORTS

During the communications session over the network, statistics are gathered by BTNS, FNPS and QMON in order to enable the user to:

● Tune the network; see Section 8

● Control the traffic over each line in the BTNS/URP secondary network

● Regulate the resource requirements of MCS applications.

BTNS statistics give information concerning:

● Buffer pool sizes and maximum occupancy

● The number of messages exchanged per line and per terminal

● The number of errors that have occurred during transmission.

FNPS statistics give information concerning:

● Buffer pool sizes

● The maximum occupancy of these pools for each of the 4 (maximum) DN7100s supported.

QMON statistics give information concerning:

● Disk and memory buffer pool sizes

● The stream processor work area, for character conversion

● The maximum number of disk blocks used by QMON and MCS applications

● The number of connections between QMON and VCAM

● The peak number of input and output CDs used by MCS applications

● The maximum length of the 'resource waiting queue' used by QMON for messages.

BTNS
Job Occurrence Report

* * * * * * * * * * * * * * STATISTICS * * * * * * * * * * * * * * * *

IE.5 00

   BTNS version

Format of Information for each Terminal Declared

TRML:TT02

      INPUT MESS.: 000040

              OUTPUT MESS.: 000028

                             OUTPUT ERRORS:000000

                            Total number of retries attempted
                            by BTNS to send data to terminal

                 Total number of messages, including
                 system messages, sent to terminal

        Total number of messages received from terminal

"Terminal-name" specified in TERMNL command at CNC generation

Format of Information for each Line Declared

LINK:LN02

      INPUT MESS.: 000040
        OUTPUT MESS.:000028

                  OUTPUT ERRORS:000000

                          INPUT ERRORS:000000

                        Total number of retries attempted
                        by BTNS to receive data over line

                  Total number of retries attempted
                  by BTNS to send data over line

           Total number of messages sent over line

     Total number of messages received over line

"Line-name" specified in LINE command at CNC generation.

BTNS JOR
(continued)

Format of Information for BTNS Buffer Pools

BP NAME:buffer-pool-name
    BP SEG SIZE:002272
        UNIT SIZE:000112
           UNIT NB:000020
             MAX UNIT NB:000003

Maximum number of units in
buffer pool used in session

Number of buffer pool units
defined by NBRTBF or NBDABF
parameters of GENCOM command

Size of buffer unit defined by BTBFSZ
or DABFSZ parameters of GENCOM command

Size of buffer pool in bytes

3 lines of information are displayed, one line for each buffer
pool:

- SC: Buffer pool internal to BTNS, automatically sized by BTNS
to contain messages sent and received by the secondary
network controller

- INP.: Information relates to BTNS input buffer pool

- OUT.: Information relates to BTNS output buffer pool.

Information Applicable Specifically to MAM

PEAK NB OF (CORE QUEUE:DISK BUFFER) BLOCKS IS: 000006

Maximum number of blocks used during the session in the:

- Memory (core) queue segment

- Disk buffer pool used to access the disk queue file,
automatically sized by CNC according to the number of lines and
MCS applications to be executed concurrently; see the "MAM"
parameter of GENCOM.

* * * * * * * * * * * * * END OF STATISTICS * * * * * * * * * * * * * *

B.3

```
                              FNPS
                    Job Occurrence Report

 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 * * * * * * * * * * * * * STATISTICS ** * * * * * * * * * * * *
 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

     Format of Information for each FNPS Buffer Pool 32K Segment

OUBFNB: 0
          BUF SZ: 32768
                       UNIT SZ:000072
                               UNIT NB:000450
                                      MAX UNIT NB:000016
                                             MAX USER NB:000306

                                          Maximum number of VCAM
                                          connections for this
                                          buffer pool segment

                                    Maximum number of units in
                                    this buffer pool segment
                                    used in session

                               Number of buffer pool units
                               defined by INBFNB or OUTBFNB
                               parameters of related FNP

                        Size of buffer unit defined by INBFSZ
                        or OUTBFSZ parameters of related FNP

           Size of buffer pool segment in bytes

The number of units used for the buffer pool, at the moment of
termination:

● A value of "0" indicates "normal" termination

● This parameter becomes INBFNB, for input buffer pools.

6 lines appear for each input and output buffer pool segment of 32K.

Note that suppressed segments do not appear.

 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 * * * * * * * * * * * * * END OF STATISTICS * * * * * * * * * *
 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```
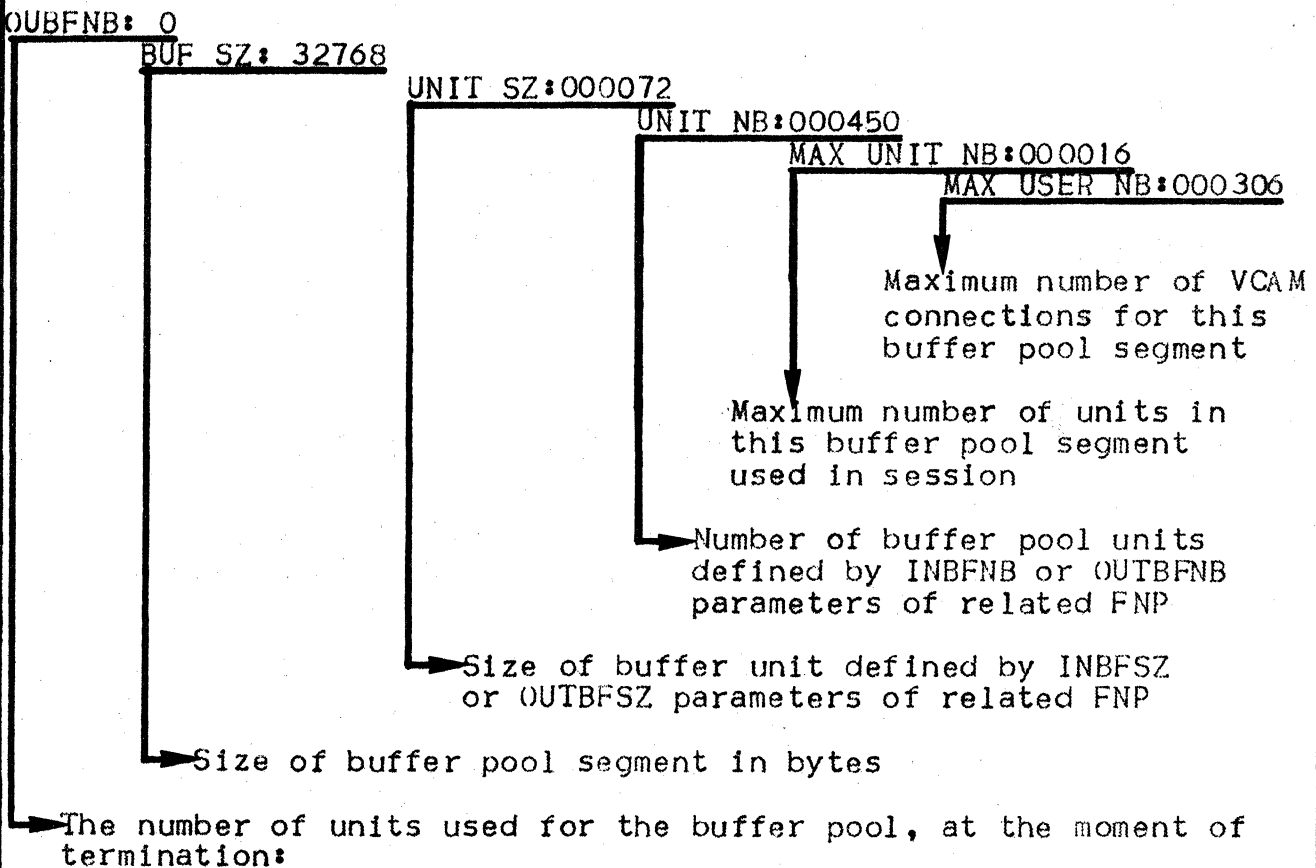
```
┌──────────────────────────────────────────────────────────────────┐
│                            QMON                                    │
│                    Job Occurrence Report                           │
└──────────────────────────────────────────────────────────────────┘
```

* * * * * * * * * * * * QMON STATISTICS * * * * * * * * * * * * *

<u>1E.4 00</u>
┌
└──►QMON version and patch status

```
┌──────────────────────────────────────────────┐
│ BMAM.      EXTAB SEG SIZE:          4320       │
│ BMAM.      DBUF POOL SEG SIZE:     15840   │ DB SIZE:              400
│                                            │ Declared in QDBLKSZ of GENCOM◄──┐
│ BMAM.      CBUF POOL SEG SIZE:     25600   │ CB SIZE:              256
│                                            │ Declared in QCBLKSZ of GENCOM◄──┐
│ QMON.      QMTAB SEG SIZE:          3162   │
└──────────────────────────────────────────────┘
```
┌
└──►Sizes of tables and buffer pools are also treated in "MAM
    Environment" of "CNC Sysout Report", page A.10.

QMON.   SP WORK AREAS SIZE: 7215
┌
└──►Size of the stream processor work area for handling character
    conversion according to the mode: NL, UN or MK

BMAM.   PEAK NUMBER OF CB USED: 6
┌
└──►Maximum number of memory blocks used during the session

BMAM.   PEAK NUMBER OF DB USED: 3
┌
└──►Maximum number of disk blocks used during the session

BMAM USERS.   PEAK NUMBER OF DB USED: 3
┌
└──►Maximum number of disk blocks used by applications during the
    session

QMON.   PEAK NUMBER OF DB USED: 3
┌
└──►Maximum number of disk blocks used by QMON during the session

QMON.   PEAK NUMBER OF OMGE USED: 1   QMGETAB SIZE: 52
┌
└──►Maximum number of connections between QMON and VCAM
                              Size of message group table◄──┘

QMON.   PEAK NUMBER OF CICD USED: 1   CICDTAB SIZE: 5
┌
└──►Maximum number of input CDs used by QMON
                              Size of input CD table◄──┘

QMON.   PEAK NUMBER OF COCD USED: 1   COCDTAB SIZE: 48
┌
└──►Maximum number of output CDs used by QMON
                              Size of output CD table◄──┘

QMON.   PEAK LENGTH OF RESWQ: 2   RESWQTAB SIZE: 10
┌
└──►Maximum length of the resource waiting queue used by QMON for
    messages.

APPENDIX C

CNC ERROR MESSAGES

The error messages output from execution of the CNC utility, appear in:

- The SYSOUT file

- The JOR (i.e., Job Occurrence Report), in the case of an abnormal condition occurring during writing to the SYSOUT file.

ERROR MESSAGE FORMAT

- The format of error messages in SYSOUT is:

  ERROR CN nnnn SEVERITY (s) error-message-text

- In the JOR, the format of error messages is:

  CNnn error-message-text

- Where:

  - CN denotes that the source of the message is the CNC utility

  - "nnnn" and "nn" indicate the message's number

  - "s" indicates the degree of severity of the error message concerned, as follows:

    2 Warning; i.e., the network generated may still be usable

    3 Fatal; this leads to an abort of CNC execution but triggers a complete syntax analysis of the network

    4 Fatal; this leads to an abort of CNC execution and may also stop syntax analysis.

  - "error-message-text" gives the error condition and may be accompanied by the corresponding return code, in the format:

    RC = xxxxxxxx-yyyyyyyy,zzzzzzzz

    - where:

    - "xxxxxxxx" is the hexadecimal contents of the RC Register

    - "yyyyyyyy" is the name of the SIU (i.e., System Integration Unit) procedure concerned

    - "zzzzzzzz" is the Return Code.

_____

CN01 ERROR DURING $\begin{Bmatrix} \text{CLOSE} \\ \text{OPEN} \\ \text{PUT} \end{Bmatrix}$ SYSOUT RC =xxxxxxxx-yyyyyyyy,zzzzzzzz

Syntax: The contents of the RC (i.e., Return Code) specifies the error.

Cause: CNC execution has been aborted due to the error, indicated as appropriate, while accessing the SYSOUT file.

Action: Retry.

CNC SYSOUT ERROR MESSAGES
_____

ERROR CN 0000 SEVERITY (4) ILLEGAL SYNTAX

        Syntax: Denotes the element in error.

        Cause: One or a combination of the following:

            ● Wrong command name, keyword or argument

            ● Missing or duplicated positional parameter:
              e.g., name, LNnn, station-index, "type",
              "subtype", etc.

        Action: Correct the command(s) and rerun the CNC
               utility.

ERROR CN 0001 SEVERITY (3) COMMAND SEQUENCING ERROR

        Syntax: As in text.

        Cause: A restriction in sequencing commands (e.g.,
              LINE - STATN - TERMNL) has not been observed.

        Action: Correct the command sequence and rerun the CNC
               utility.

ERROR CN 0002 SEVERITY (3) SEVERAL TERMNL FOR A TTY LINE

        Syntax: As in text.

        Cause: Only 1 terminal is allowed on any single TTY
              line.

        Action: Ensure that only 1 TERMNL command is present
               for the TTY line and rerun the CNC utility.

ERROR CN 0003 SEVERITY (3) DUPLICATED : name

        Syntax: "name" identifies any element defined by any
              CNC command except the COMM command.

        Cause: The only duplication allowed is the
              "terminal-name" or "rdtn-name" and its
              associated "terminal-queue": otherwise, names
              must be unique for the network

        Action: Use a "name" other than the one indicated in
              the appropriate command and rerun the CNC
              utility.

ERROR CN 0004 SEVERITY (3) INVALID NAME LENGTH : name

    Syntax: "name" identifies any element defined by any
           CNC command except the COMM command.

    Cause: The number of characters identifying the
           element has been exceeded.

    Action: Correct the "name" in the appropriate command
           and rerun the CNC utility.

ERROR CN 0005 SEVERITY (3) QCPOOL NOT DEFINED BY GENCOM

    Syntax: As in text.

    Cause: A queue has been declared with the "QCPOOL"
           option in the appropriate QUEUE command while
           this option has not been specified in the
           GENCOM command.

    Action: Insert the "QCPOOL" option in the GENCOM
           command and rerun the CNC utility.

ERROR CN 0006 SEVERITY (3) CLUSTER/STATN NOT ALLOWED ON A TTY LINE

    Syntax: As in text.

    Cause: As in text.

    Action: Remove the STATN and/or CLUSTER commands
           following all TTY LINE commands and rerun the
           CNC utility.

ERROR CN 0007 SEVERITY (3) USELESS KEYWORD IN GENCOM : keyword

    Syntax: "keyword" identifies the option specified in
           GENCOM which is irrelevant according to the
           requirements of the network to be generated and
           may lead to a waste of memory space, such as
           the generation of useless tables.

    Cause: See syntax.

    Action: Remove the option from the GENCOM command and
           rerun the CNC utility.

ERROR CN 0008 SEVERITY (3) INVALID VALUE : value

        Syntax: "value" appears against the parameter of the
        command in error.

        Cause: "value" is outside the range allowed for the
        appropriate parameter.

        Action: Correct the parameter in the appropriate
        command and rerun the CNC utility.

ERROR CN 0009 SEVERITY (3) MISSING STATN OR TERMNL

        Syntax: As in text.

        Cause: A LINE command must be followed by one of
        either:

            ● STATN if it describes a multipoint or polled
              line

            ● TERMNL if it describes a TTY line.

        Action: Insert the appropriate command and rerun the
        CNC utility.

ERROR CN 0010 SEVERITY (2) INVALID TERMINAL : (TYPE:STYPE)

        Syntax: As in text.

        Cause: Either:

            ● The "terminal-type" in a TERMNL or RDTN
              command is not allowed according to the LINE
              or RDTE, respectively, previously defined

            ● The "terminal-subtype" in a TERMNL, RDTN, or
              IDSEQ command is incorrect according to the
              "terminal-type" specified in the same
              command.

        Action: Correct as appropriate, and rerun the CNC
        utility.

ERROR CN 0011 SEVERITY (3) MISSING LINE OR STATN

>Syntax: As in text.

>Cause: A TERMNL command must immediately follow
either:

>>● A TTY LINE command

>>● A STATN command, for other line procedures.

>Action: Insert the appropriate command and rerun the
CNC utility.

ERROR CN 0012 SEVERITY (3) DUPLICATED KEYWORD

>Syntax: As in text.

>Cause: A keyword has occurred more than once in a
command.

>Action: Correct the command and rerun the CNC utility.

ERROR CN 0013 SEVERITY (4) UNABLE TO CREATE : name
RC=xxxxxxxx->yyyyyyyy,zzzzzzzz

>Syntax: "name" may be that of a table, a buffer, or of
a work segment.

>Cause: A system malfunction has prevented the CNC
utility from creating the table, buffer or work
segment identified.

>Action: Call the Field Engineering Service.

ERROR CN 0014 SEVERITY (3) MISSING GENCOM

>Syntax: As in text.

>Cause: The GENCOM command must be present and must
head the list of CNC commands.

>Action: Insert the GENCOM command or, if the GENCOM
command is present, correct the sequence of CNC
commands, and rerun the CNC utility.

ERROR CN 0015 SEVERITY (3) NOT CONNECTED IN SRST : name

    Syntax: "name" is an "LNnn" identifying a LINE.

    Cause: The referenced element has been declared in the
           firmware generation but is flagged as
           unavailable.

    Action: Call the Field Engineering Service.

ERROR CN 0016 SEVERITY (4) INVALID LINE MODEL : model

    Syntax: "model" defines the DCC line model, as declared
           in the SRST during firmware generation.

    Cause: The generated SRST has allowed for such a DCC
           line, a model which is not known to the
           software.

    Action: Call the Field Engineering Service.

ERROR CN 0017 SEVERITY (3) NO MASTER TERMINAL DECLARED

    Syntax: As in text.

    Cause: A TERMNL command specified as SLAVE follows
           immediately a LINE or STATN command, as
           appropriate.

    Action: Insert a TERMNL command for a "master" terminal
           in front of the "slave" terminal command(s) and
           rerun the CNC utility.

ERROR CN 0018 SEVERITY (3) NOT A QUEUE OR TAP NAME : name

    Syntax: "name" is the argument specified for the ASSIGN
           parameter of a TERMNL command.

    Cause: The argument does not match, either:

         ● The program queue declared by a QUEUE
           command

         ● A VCAM subsystem as declared by a DCTAP
           command.

    Action: Correct the command and rerun the CNC utility.

ERROR CN 0019 SEVERITY (3) POLLIST GREATER THAN DECLARED IN SRST

    Syntax: As in text.

    Cause: The value declared for the POLLIST parameter of
           a LINE command defines more station index
           entries than have been reserved in the URP for
           that line: refer to the POLLISTLENGTH parameter
           of the SRST entry.

    Action: Reduce the number of entries in the appropriate
           LINE command and rerun the CNC utility.

ERROR CN 0020 SEVERITY (4) SEGMENT TOO LARGE : name

    Syntax: "name" identifies one of:

             ● The BTNS input or output buffer pool

             ● The FNPS input or output buffer pool

             ● Memory queues.

    Cause: The value(s) declared for one of the above
           elements, has exceeded the limit allowed.

    Action: Adjust the value(s) in the GENCOM, QUEUE, or
           FNP command (as appropriate), and rerun the CNC
           utility.

ERROR CN 0021 SEVERITY (4) UNABLE TO (OPEN¦READ¦CLOSE) INPUT FILE
RC = xxxxxxxx->yyyyyyyy, zzzz zzzz

    Syntax: The contents of RC specify the reason for the
           abort.

    Cause: System error.

    Action: Check the JCL statements and retry the job. If
           this same condition recurs, call the Field
           Engineering Service.

ERROR CN 0022 SEVERITY (2) NOT DECLARED IN SRST : name

Syntax: "name" identifies a LINE.

Cause: Either:

- "name" is not in the form "LNnn" for the LINE

- "name" is in the correct form but the referenced LINE has not been declared at firmware generation.

Action: 1) Check the name for the appropriate LINE command and, if this is wrong, correct it and then rerun the CNC utility

2) If the CNC generation is correct, the wrong firmware generation has been used to initialize the system. In this case, call the Field Engineering Service.

ERROR CN 0023 SEVERITY (4) QUEUES FILE ACCESS ERROR
RC = xxxxxxxx->yyyyyyyy, zzzzzzzz

Syntax: The contents of the RC specify the error as well as the system primitive involved.

Cause: The error, when accessing queue files, may be either:

- A user error, when the file has not been preallocated

- A system error, if "IOFAIL"

Action: If:

- The file has not been preallocated, correct the JCL statements and retry the job

- "IOFAIL" has occurred, retry the job. If this same condition recurs, call the Field Engineering Service.

ERROR CN 0024 SEVERITY (4) NON STANDARD DISK

Syntax: As in text.

Cause: The disk queue file has been preallocated on a disk whose type is other than MS/M300, MS/M350, MS/M400, MS/M402, MS/M450, or MS/M500.

Action: Correct the appropriate JCL statement and retry the job.

ERROR CN 0025 SEVERITY (4) QUEUES FILE TOO LARGE

    Syntax: As in text.

    Cause: The size of the preallocated disk queue file is in excess of the limit allowed.

    Action: Adjust the file size in the appropriate QUEUE command and rerun the CNC utility.

ERROR CN 0026 SEVERITY (3) PARAMETERS CONFLICT : text

    Syntax: "text" defines conflicts between parameters in the same or in different commands.

    "text" = BKMOD/LINE TYPE

    Cause: The BKMOD parameter of the LINE command pertains to TTY terminals equipped with "break" keys

    Action: Correct the appropriate LINE command and rerun the CNC utility.

    "text" = BRKLG/LINE TYPE

    Cause: The BRKLG parameter of the LINE command may only be specified for a TTY line with "break" on the reverse channel, model "TTY-R" in the SRST.

    Action: Correct the appropriate LINE command, and rerun the CNC utility.

    "text" = CCINS/LINE TYPE

    Cause: The CCINS parameter of the LINE command may not be defined for HDLC line procedure.

    Action: Delete this parameter from the appropriate LINE command, and rerun the CNC utility.

    "text" = CLV/LINE TYPE

    Cause: The value "3", representing 5-bit code, has not been specified for "CLV" with synchronous line procedure.

    Action: Correct the appropriate LINE command and rerun the CNC utility.

"text" = CORE QUEUE/RESTART

Cause: The "RESTART" parameter of the QUEUE command
has been specified for memory queues declared
for the network, by either:

- The "QCBLKSZ" and "QCPOOL" parameters of the
GENCOM command

- The "NUMBLK" parameter of the QUEUE command.

Action: Correct, and rerun the CNC utility.

"text" = AG INITIATOR/AC PARAM % IMP: acname

Cause: The AG initiator may not have a set of ACs
declared as either backup or primary. The "IMP"
parameter in the AC command is not significant.

Action: Correct, and rerun the CNC utility.

"text" = AG ACCEPT/SEVERAL PRIMARY AC: ac-name

Cause: Several ACs have been declared as "PRIMARY";
this is not allowed for a single AG.

Action: Correct, and rerun the CNC utility.

"text" = COUPLE (SESSION, MBX) DECLARED: ac-name

Cause: A session name and mailbox name have already
been declared.

Action: Correct, and rerun the CNC utility.

"text" = EPX/LINE TYPE

Cause: The "EPX" parameter of the LINE command
pertains only to TTY37-type terminals (which
allow for echoplex).

Action: Correct, and rerun the CNC utility.

"text" = ERCAP/LINE TYPE

Cause: The "ERCAP" parameter of the LINE command
pertains only to TTY terminals which have
"erase" capability.

Action: Correct, and rerun the CNC utility.

"text" = ININS/LINE TYPE

Cause: The "ININS" parameter of the LINE command
pertains only to synchronous line procedure
requiring "synchronization".

Action: Correct the appropriate LINE command and rerun
the CNC utility.

"text" = LINPLG/LINE TYPE

Cause: The "LINPLG" parameter of the LINE command has
not been specified for a TTY line.

Action: Correct the appropriate LINE command and rerun
the CNC utility.

"text" = NAUCDE/LINE TYPE

Cause: The "NAUCDE" parameter of the LINE command
pertains only to a "switched" line and may not
be applied to a line with a 108/2 CCITT
interface.

Action: Correct the appropriate LINE command and rerun
the CNC utility.

"text" = NDISCNT/LINE TYPE

Cause: The "NDISCNT" parameter of the LINE command may
only be specified for a "switched" line.

Action: Correct the appropriate LINE command and rerun
the CNC utility.

"text" = (PADNB!PARITY)/LINE TYPE

Cause: The "PADNB" and/or "PARITY" parameters of the
LINE command may not be defined for a line with
HDLC procedure.

Action: Correct the appropriate LINE command and rerun
the CNC utility.

"text" = {PLCNT:PLRGF}/LINE TYPE

Cause: The "PLCNT" and/or "PLRGF" parameters of the
LINE command may not be defined for a line with
either TTY or HDLC procedure.

Action: Delete the parameter(s) from the appropriate
LINE command and rerun the CNC utility.

"text" = POLLIST/LINE TYPE

Cause: The "POLLIST" parameter of the LINE command
pertains only to a "multipoint" line and may
not be applied to a line with TTY procedure.

Action: Correct the appropriate LINE command and rerun
the CNC utility.

"text" = PROG. QUEUE/BLOCKING

Cause: The "BLOCKING" parameter of the QUEUE command
must not be specified for a program queue.

Action: Delete this parameter from the appropriate
QUEUE command and rerun the CNC utility.

"text" = PROG. QUEUE/CTLRST

Cause: The "CTLRST" parameter of the QUEUE command
only pertains to disk queues.

Action: Correct the appropriate QUEUE command and rerun
the CNC utility.

"text" = PROG. QUEUE/(LLENGTH:NBLOCKS)

Cause: The "LLENGTH" and/or "NBLOCKS" parameters of
the QUEUE command must not be specified for a
program queue.

Action: Delete the parameter(s) concerned from the
appropriate QUEUE command and rerun the CNC
utility.

"text" = RESTART/CTLRST

Cause: A disk queue may not be declared with both the
options "CTLRST" and "RESTART".

Action: Correct the appropriate QUEUE command and rerun
the CNC utility.

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"text" = RMTLOAD/NLOAD

Cause: Either "RMTLOAD" or "NLOAD" may be specified
for any given FEP; the presence of both is
contradictory.

Action: Delete whichever of these options is not
required, from the FNP command, and rerun the
CNC utility.

"text" = SLAVE/ASSIGN

Cause: A terminal declared as "SLAVE" in the TERMNL
command must immediately follow a "master"
terminal.

Action: Correct the relevant TERMNL command by, as
appropriate:

● Inserting a "master" TERMNL command before
the command in question

● Rearranging the command sequence

- and rerun the CNC utility.

"text" = SLAVE/AUTO

Cause: The "AUTO" parameter of the TERMNL command may
only be applied to either a "receive-only" or a
"master" terminal; it may not be specified for
a terminal declared as "SLAVE".

Action: Delete this parameter from the appropriate
TERMNL command and rerun the CNC utility.

"text" = SPEED/LINE TYPE

Cause: The "SPEED" parameter of the LINE command may
not be specified for a line with synchronous
procedure.

Action: Delete this parameter from the appropriate LINE
command and rerun the CNC utility.

"text" = SPN/LINE TYPE

Cause: The "SPN" parameter of the LINE command
pertains only to a line with asynchronous
procedure.

Action: Delete this parameter from the appropriate LINE
command and rerun the CNC utility.

"text" = TCTNM/LINE TYPE

Cause: The "TCTNM" parameter of the LINE command may
not be defined for a line with HDLC procedure.

Action: Delete this parameter from the appropriate LINE
command and rerun the CNC utility.

"text" =
TERM_QUEUE/(ACCEPT!BREAK!ENQUEUE!MAXMG!SHARE!TWA!TWS)

Cause: All the QUEUE command parameters listed above,
pertain only to program queues and may not be
specified for terminal queues.

Action: Delete the appropriate parameter(s) from the
relevant QUEUE command and rerun the CNC
utility.

"text" = TERM. QUEUE/USERID

Cause: The QUEUE command associated with the relevant
TERMNL command, contains an illegal "USERID"
keyword.

Action: Delete this parameter from the relevant QUEUE
command, and rerun the CNC utility.

"text" = TOLEN/LINE TYPE

Cause: The "TOLEN" parameter of the LINE command may
not be defined for a line with HDLC procedure.

Action: Delete this parameter from the appropriate LINE
command and rerun the CNC utility.

"text" = TYPE/ADD

Cause: The 2-digit hexadecimal value defining the
address of a "compatible" terminal for the
"ADD" parameter of the TERMNL command, does not
correspond to a value which exists in the
configuration.

Action: Correct the appropriate TERMNL command and
rerun the CNC utility.

"text" = TYPE/LINE TYPE

Cause: The "terminal-type" specified in the relevant
TERMNL command, does not correspond to a
terminal supported by the line procedure
concerned.

Action: Correct the appropriate TERMNL command and
rerun the CNC utility.

"text" = TYPE/RDTE TYPE

Cause: The "terminal-type" defined in the relevant
RDTN command, does not correspond to that
specified in the associated RDTE command.

Action: Modify either the RDTN or the RDTE command, as
appropriate, and rerun the CNC utility.

"text" = TYPE/STI

Cause: An RDTN command has been specified with the
"STI" option, while the associated RDTE command
defines "PAD" parameters.

Action: Delete the "STI" parameter from the RDTN
command, or modify the "terminal-type" of the
relevant RDTE command, as required, and rerun
the CNC utility.

"text" = TYPE/STYPE

Cause: The "terminal-subtype" specified for the TERMNL
command concerned, is not allowed for the
"terminal-type" defined in the same command.

Action: Correct the corresponding TERMNL command as
appropriate, and rerun the CNC utility.

ERROR CN 0027 SEVERITY (3) DUPLICATED STI

>Syntax: As in text.

>Cause: The same "station-index" has been used in more than one "STATN" command for the same line.

>Action: Correct the appropriate STATN command, and rerun the CNC utility.

ERROR CN 0028 SEVERITY (2) STI NOT SPECIFIED IN POLLING LIST (LINE COMMAND)

>Syntax: As in text.

>Cause: The "station-index" declared in a STATN command, has not been included in the values defined by the "POLLIST" parameter of the preceding LINE command.

>Action: In order to resume polling for the station affected, the network control operator may use the MTF command; otherwise no action may be taken.

ERROR CN 0029 SEVERITY (4) ERRONEOUS POLLIST IN PREVIOUS LINE COMMAND

>Syntax: As in text.

>Cause: The values defined by the "POLLIST" parameter of the relevant LINE command include a "station-index" for which no subsequent STATN command has been declared.

>Action: Either:

>- Amend the "polling-list" of the appropriate LINE command

>- Include a STATN command with the missing "station-index"

>- and rerun the CNC utility.

ERROR CN 0030 SEVERITY (3) MORE THAN 3 SUBTYPES DECLARED

        Syntax: As in text.

        Cause: An IDSEQ command has declared more than 3
               "terminal-subtypes"

        Action: Correct the appropriate IDSEQ command, and
               rerun the CNC utility.

ERROR CN 0031 SEVERITY (3) DECLARED SPEED DOES NOT EXIST ON THE UCLA
(SRST)

        Syntax: As in text.

        Cause: The value specified for the "SPEED" parameter
               of the LINE command, defines a line speed for
               which the DCC has not been configured.

        Action: Correct the appropriate LINE command, and rerun
               the CNC utility.

ERROR CN 0032 SEVERITY (3) NOT A HEXADECIMAL STRING

        Syntax: As in text.

        Cause: A value given for "ADD" in a TERMNL command, is
               not hexadecimal.

        Action: Correct the appropriate TERMNL command, and
               rerun the CNC utility.

ERROR CN 0034 SEVERITY (3) UNABLE TO GET LDN
RC= xxxxxxxx->yyyyyyyy, zzzzzzzz

        Syntax: The contents of RC defines the system error.

        Cause: System error.

        Action: Call the Field Engineering Service.

ERROR CN 0035 SEVERITY (3) PROCEDURE NOT SUPPORTED BY URP IMAGE
(NROFTCTTOTAL)

        Syntax: "NROFTCTTOTAL" is an SRST entry to the URP.

        Cause: The value specified for the "TCTNM" parameter
               of the LINE command, must be greater than the
               value specified for "NROFTCTTOTAL".

        Action: Call the Field Engineering Service.

ERROR CN 0036 SEVERITY (4) UNABLE TO GET SEMAPHORE
RC= xxxxxxxx->yyyyyyyy, zzzzzzzz

    Syntax: The contents of the RC defines the system
            error.

    Cause: System error.

    Action: Call the Field Engineering Service.

ERROR CN 0037 SEVERITY (3) UNABLE TO READ LINE TLT
RC= xxxxxxxx->yyyyyyyy, zzzzzzzz

    Syntax: The contents of the RC defines the system
            error.

    Cause: System error.

    Action: Call the Field Engineering Service.

ERROR CN 0038 SEVERITY (2) USELESS OPTION : option

    Syntax: "option" defines a parameter used in the
            previous release, but redundant in the current
            release.

    Cause: See syntax.

    Action: Delete this parameter from the appropriate
            command, and rerun the CNC utility.

ERROR CN 0039 SEVERITY (3) NOT A LINE OR FNP NAME : name

    Syntax: "name" may identify either a LINE or an FNP.

    Cause: A "name" is not in the form of, either "LNnn"
           for LINE, or "CCnn" for FNP.

    Action: Correct the erroneous "name" in the appropriate
            LINE or FNP command, and rerun the CNC utility.

ERROR CN 0040 SEVERITY (3) DUPLICATE (GENCOM:LSYSTEM)

    Syntax: As in text.

    Cause: The GENCOM or LSYSTEM command has appeared more
           than once in the CNC generation description.

    Action: Ensure that only one GENCOM, and only one
            LSYSTEM, are present, and rerun the CNC
            utility.

ERROR CN 0041   SEVERITY (3) MORE THAN (4 : FNP!2 : LSUB)

        Syntax: As in text.

        Cause: TRANSPAC local subscription numbers are limited
               to 2, and the number of DN7100 front-end
               processors is limited to 4.

        Action: Ensure that there are no more than:

               ● 4 FNP commands (or 6, in the case of
                 twin-PSIs)

               ● 2 LSUB commands

               - present in the generation description, and
               rerun the CNC utility.

ERROR CN 0042   SEVERITY (4) UNABLE TO CORRECT OR RETRIEVE: object name

        Syntax: As in text.

        Cause: The named object declared in CNC, may not be
               introduced into the Dictionary or retrieved
               from it, during session control processing.

        Action: Call the field engineering service.

ERROR CN 0043   SEVERITY (3) BUFFER UNIT SIZE INCOMPATIBLE WITH LINE
                  SPEED

        Syntax: As in text.

        Cause: The buffer unit size declared with the "BTBFSZ"
               and/or "DABFSZ" parameters, must be greater
               than "128" for lines with a speed in excess of
               9600 bauds.

        Action: Correct the relevant parameter value in the
               GENCOM command by increasing the buffer size
               appropriately, and rerun the CNC utility.

ERROR CN 0044 SEVERITY (2) MIN NUMBER OF BUFFER UNITS FORCED BY
GENERATOR

        Syntax: As in text.

        Cause: The number of buffer units declared with the
               "NBBTBF" and/or "NBDABF" parameters, is less
               than the minimum required by BTNS for the
               number and type of lines defined.

        Action: Correct the relevant parameter value in the
               GENCOM command to increase the number of buffer
               units, and rerun the CNC utility.

ERROR CN 0045 SEVERITY (3) WRONG LINE NAME : LNnn

        Syntax: As in text.

        Cause: An LSUB command has declared a name for a DCC
               line which is:

               ● Not a DCC line

               ● Already declared by a previous LSUB command

               ● Not declared by any LINE command, preceding
                 the LSUB command.

        Action: As appropriate, correct the command sequence or
               modify the line name, and rerun the CNC
               utility.

ERROR CN 0046 SEVERITY (3) NO LOGICAL LINE DECLARED

        Syntax: As in text.

        Cause: A TRANSPAC subscription has been defined
               without any virtual circuit declaration,
               either:

               ● Through the "SLINE" option of the LSUB
                 command

               ● With the PVC command, following the LSUB
                 command concerned.

        Action: Define the virtual circuits required, by either
               of the above methods, and rerun the CNC
               utility.

ERROR CN 0047 SEVERITY (3) NOT A SYSTEM NAME : name

        Syntax: "name" is the first half of a queue-name,
               represented in the format xxx,yyyy, defined by
               a QUEUE command.

        Cause: "name", represented by xxx must be the same as
               that of a system defined by a LSYSTEM, FSYSTEM,
               or RSYSTEM command.

        Action: As appropriate, either correct the "name" in
               the relevant QUEUE command, or insert the
               missing LSYSTEM, FSYSTEM, or RSYSTEM command;
               and rerun the CNC utility.

ERROR CN 0049 SEVERITY (3) STRING MUST BE NUMERIC (SUBSCRIPTION
NUMBER:TPC ADDRESS)

        Syntax: As in text.

        Cause: An LSUB or RDTN command defines a TRANSPAC
               subscription number with a "SUBNB" parameter
               whose value is non-numeric.

        Action: Correct the TRANSPAC subscription number in the
               appropriate command, and rerun the CNC utility.

ERROR CN 0050 SEVERITY (4) UNABLE TO CREATE NETWORK FILE
RC= xxxxxxxx->yyyyyyyy, zzzzzzzz

        Syntax: The contents of RC defines the error and the
               system primitive.

        Cause: Execution of CNC has been aborted, due to an
               abnormal condition occurring during the copying
               of communication tables into a file.

        Action: Retry. If repeatedly unsuccessful:

               1) Perform ISL with the "RESTART CLEAN" option

               2) Rerun the CNC utility.

ERROR CN 0051 SEVERITY (4) UNABLE TO EXPAND A SEGMENT SIZE
RC= xxxxxxxx->yyyyyyyy,zzzzzzzz

        Syntax: The contents of the RC defines the system
               error.

        Cause: A system error.

        Action: Call the Field Engineering Service.

ERROR CN 0052 SEVERITY (4) SAME NETWORK ROUTE : NETWORK ROUTE NAME MAPPED OVER SEVERAL RTS

        Syntax: As in text.

        Cause: Incorrect network definition. Any given network route may be allocated to a maximum of only one Remote Transport Station.

        Action: Correct the configuration description accordingly, and rerun the CNC utility.

ERROR CN 0053 SEVERITY (3) COMMAND NOT DECLARED : command_name

        Syntax: As in text.

        Cause: A command makes a reference to an object which must be defined by another command which is absent (e.g., a NR command referencing an "unknown" communications path).

        Action: Correct the configuration description by inserting the missing command, and rerun the CNC utility.

ERROR CN 0054 SEVERITY (4) NETWORK CONFIGURATION OVERFLOW

        Syntax: As in text.

        Cause: Description of primary network too large.

        Action: Correct the configuration description with special regard to configurability limits, and rerun the CNC utility.

ERROR CN 0055 SEVERITY (3) MISSING MANDATORY PARAMETER

        Syntax: As in text.

        Cause: A mandatory parameter has been omitted from the configuration description.

        Action: Insert the missing command in the configuration description, and rerun the CNC utility.

ERROR CN 0056 SEVERITY (2) COMMAND NOT REFERENCED : command-name

        Syntax: As in text.

        Cause: An object has been defined but not referenced by any other command.

        Action: Check that the command in question is not an error.

ERROR CN 0057 SEVERITY (4) ERROR DURING OPEN WORK FILE
              RC= xxxxxxxx->yyyyyyyy, zzzzzzzz

        Syntax: The contents of the RC defines the system error.

        Cause: A system error.

        Action: Call the Field Engineering Service.

ERROR CN 0058 SEVERITY (4) ERROR DURING PUT WORK FILE
              RC= xxxxxxxx->yyyyyyyy, zzzzzzzz

        Syntax: The contents of the RC defines the system error.

        Cause: A system error.

        Action: Call the Field Engineering Service.

ERROR CN 0059 SEVERITY (4) ERROR DURING GET WORK FILE
              RC= xxxxxxxx->yyyyyyyy,zzzzzzzz

        Syntax: The contents of the RC defines the system error.

        Cause: A system error.

        Action: Call the Field Engineering Service.

ERROR CN 0060 SEVERITY (4) ERROR DURING CLOSE WORK FILE
              RC= xxxxxxxx->yyyyyyyy, zzzzzzzz

        Syntax: The contents of the RC defines the system error.

        Cause: System error.

        Action: Call the Field Engineering Service.

ERROR CN 0061 SEVERITY (4) CNC INTERNAL ERROR (GAG ERROR)

        Syntax: As in text.

        Cause: This is a CNC internal error, caused by the
        command for which this error appears.

        Action: Call the Field Engineering Service. A temporary
        solution is to suppress the corresponding
        command.

ERROR CN 0062 SEVERITY (4) CNC INTERNAL ERROR (GRAMMAR ERROR)

        Syntax: As in text.

        Cause: This is a CNC internal error, caused by the
        command for which the error appears.

        Action: Call the Field Engineering Service. A temporary
        solution is to suppress the command concerned.

ERROR CN 0063 SEVERITY (4) CNC INTERNAL ERROR

        Syntax: As in text.

        Cause: An internal error in the CNC utility.

        Action: Call the Field Engineering Service.

ERROR CN 0064 SEVERITY (4) INVALID OPTION STRING

        Syntax: As in text.

        Cause: The option in the STEP statement of the CNC
        utility, is other than "OPTIONS =
        ('SIMU'|'SIMUP')".

        Action: Check and correct the STEP statement, and rerun
        the CNC utility.

ERROR CN 0065 SEVERITY (4) TELECOMMUNICATION SESSION IN PROGRESS

        Syntax: As in text.

        Cause: An attempt has been made to run the CNC utility while any of the following are also running:

- BTNS

- FNPS

- ADM

- NASF

- Any application using MAM or VCAM

- Any telecommunications-related command; e.g., DT.

        Action: Wait for completion of all of the above jobs applicable, and rerun CNC.

ERROR CN 0066 SEVERITY (4) UNABLE TO CREATE A NAME IN DICTIONARY
RC= xxxxxxxx->yyyyyyyy, zzzzzzzz

        Syntax: As in text.

        Cause: CNC internal error.

        Action: Call the Field Engineering Service.

ERROR CN 0067 SEVERITY (4) UNABLE TO FORMAT QUEUE FILE
RC= xxxxxxxx->yyyyyyyy, zzzzzzzz

        Syntax: The contents of the RC specifies the error and the system primitive.

        Cause: CNC generation has been aborted due to the occurrence of a disk error while formatting the disk queue file.

        Action: Retry CNC execution. If the same failure recurs, reallocate the file on either:

- A different area of the same disk

- Another disk.

ERROR CN 0068 SEVERITY (4) ERROR DURING SRST FILE OPEN
RC= xxxxxxxx->yyyyyyyy, zzzzzzzz

Syntax: The contents of the RC specifies the error.

Cause: In simulation mode with a private SRST, it has
been impossible to access the private SRST
file.

Action: Check the presence and availability of the
private SRST file, as specified in the CNC
JCL's corresponding ASSIGN statement.

ERROR CN 0069 SEVERITY (4) ERROR WHEN ACCESSING SRST FILE
RC= xxxxxxxx->yyyyyyyy, zzzzzzzz

Syntax: The contents of the RC specifies the error and
the system primitive.

Cause: In simulation mode with a private SRST, it has
been impossible to access the private SRST
file.

Action: Retry the CNC utility. If the same failure
recurs, reallocate and rebuild the private SRST
file on either:

● A different area of the same disk

● On another disk.

ERROR CN 0070 SEVERITY (4) CNC ALREADY IN PROGRESS

Syntax: As in text.

Cause: This is an attempt to run the CNC utility
(other than in simulation mode), while another
CNC step (not in simulation mode, either) is
already in execution.

Action: Wait for completion of the existing CNC step,
before resubmitting this CNC execution.

ERROR CN 0071 SEVERITY (4) UNABLE TO GET OPTION STRING
RC= xxxxxxxx->yyyyyyyy,zzzzzzzz

Syntax: As in text.

Cause: System error.

Action: Call the Field Engineering Service.

ERROR CN 0072 SEVERITY (2) UNKNOWN SYSTEM PROFILE DEFAULT VALUE
ASSUMED

Syntax: As in text.

Cause: LSYSTEM, FSYSTEM, or RSYSTEM specifies an
unknown profile.

Action: Correct the corresponding "PROFILE" parameter,
and rerun the CNC utility.

ERROR CN 0073 SEVERITY (4) LOCAL OBJECT COMMANDS OMITTED

Syntax: As in text.

Cause: An attempt has been made to define a primary
network through the URP/DCC while omitting one
of the required commands LSYSTEM, LSC, or LTS.

Action: Insert the missing command(s) into the CNC
generation description, and then rerun the CNC
utility.

ERROR CN 0074 SEVERITY (4) SEVERAL NETWORK ROUTES MAPPED OVER A SAME
LINE COMPATH : compath_name_NOT SUPPORTED

Syntax: As in text.

Cause: The primary network configurability currently
supported via the URP/DCC, forbids multiple
network routes mapped over the same COMPATH on
a given line.

Action: Correct the configuration description, and
rerun the CNC utility.

ERROR CN 0075 SEVERITY (4) FOREIGN NETWORK ADDRESS MUST BE DECLARED
IN RTS COMMAND : rts_name

Syntax: As in text.

Cause: This results from an attempt to map a network
route over a virtual circuit, to arrive in a
remote transport station for which no foreign
network address has been defined.

Action: Complete the appropriate RTS command, and rerun
the CNC utility.

ERROR CN 0076 SEVERITY (3) CONFLICT BETWEEN CONFIG HOSTID NAME/LOCAL SYSTEM NAME

> Syntax: As in text.
>
> Cause: Incompatibility exists between the CONFIG HOSTID parameter value and the name defined for the local system.
>
> Action: Correct, as appropriate, either:
>
> - The CONFIG command concerned, and rerun the CONFIG job
>
> - The CNC generation description, and rerun the CNC utility.

ERROR CN 0077 SEVERITY (4) MIXED PRIMARY NETWORK CONFIGURATION LANGUAGE

> Syntax: As in text.
>
> Cause: The configuration description contains a mixture of both:
>
> - Old primary network commands; e.g., NODE
>
> - New commands; e.g., LSYSTEM, FSYSTEM, LSC, FSC, RSC, LTS, RTS, XPRTC, COMPATH, NR.
>
> Action: Replace all the NODE commands with the corresponding new ones; refer to Appendix H.

ERROR CN 0078 SEVERITY (2) NODE COMMAND NOT SUPPORTED IN FUTURE RELEASES

> Syntax: As in text.
>
> Cause: NODE commands have been used to define the primary network.
>
> Action: It is recommended that all NODE commands be replaced with the new set of primary network commands; see Appendix H.

ERROR CN 0080 SEVERITY (3) NO REFERENCED OBJECT

Syntax: As in text.

Cause: Either:

- An HDLC line has been defined with a LINE command, without a corresponding reference by an LSUB or COMPATH command

- An FNP command has been defined without a corresponding reference by an FSC command.

Action: Correct the network description appropriately, and then rerun the CNC utility.

ERROR CN 0081 SEVERITY (3) FRAME SIZE GREATER THAN BUF UNIT SIZE

Syntax: As in text.

Cause: For an HDLC line, the SRST frame size is greater than the buffer size declared, as appropriate, either of the GENCOM command parameters:

- DABFSZ

- BTBFSZ.

Action: Correct the network description appropriately, and then rerun the CNC utility.

ERROR CN 0090 SEVERITY (2) AG MAXIMUM SESSIONS REDUCED TO NUMBER OF AC: ag-name

Syntax: As in text.

Cause: The "maximum-session" value explicitly declared in the AG command, exceeds the real number of ACs.

Action: Correct the parameter value.

APPENDIX D

CNC RESERVED SYNTAX

Within any CNC command, user-defined names are required to be different from command-reserved names and their aliases. Such command-reserved names include:

- The name of the command itself

- Command keywords

- Command self-identifying values

- Non-user definable positional parameters within commands.

Certain command-reserved names do not appear in the Command Descriptions (in Sections 4, 5, 6 and 7). This is because they, either:

- Still exist only for reasons of compatibility with previous releases

- Correspond to features reserved for future releases, but already supported by the CNC utility.

Figure D.1: CNC Reserved Syntax

AC ADFUNC &AJ833 ASSIGN	ACCESS ALGROUP ANSWBCK AUTO	ALCOR AF APPABNUM AUTOLF	ADD AG APPLIB	ADDR &AJ832 ASCII
BASIC BREAK	*BATCHNB BRKLG	'BCC BTBFSZ	BKMOD *BTT7300	BLOCKING
&CAS CLUSTER CP CTLRST	CCINS CLV &CPU	CCnn COMM &CRT	CHARGED COMPATH CSG	CLOSE *CONTROL CSX25
DABFSZ &DKU7007 'DTC	DCTAP &DKU7105 &DTU7171	&DKU7001 &DKU7107 &DTU7172	&DKU7002 &DKU7211	&DKU7005 &DSK
ENQUEUE	EPX	ERCAP		
FEP FNP	FILTER FSC	FL FSYS	FLOW_CONTROL FSYSTEM	FLOWTH FULL_RECOVERY
GENCOM	*GENNET	GENQMON		
&HL6 HOST	&HL61	&HL62	&HL64	&HL66
&IBM370 IM 'INIT	&IBM3270 *IN INLCNB	&IBM3278 INBFNB IOF	&IBM3741 INBFSZ ITC	IDSEQ ININS
&KB &KPR	&KCT	&KDS7255	&KDS7275	KEY
LEVEL LLENGTH LSUB	LG LLINE LSYS	LINE LNnn LSYSTEM	LINELG LOG LTS	LINPLG LSC
MAMNB MK MUX	MASTER MODE MUXPRM	'MAXDUSZ *MTS7500	MAXMG &MTS7508	&MINITEL &MT281
NAUCLE NETROUTE *NODE	NBBTBF NL NR	NBDABF NLOAD NSYSMES	NBLOCKS NOBT NUMBLK	NDISCNT NOCALL NUMREC
OM	*OPER	*OU	OUTBFNB	OUTBFSZ
'PACKETSZ 'PCNT PKSIZE 'PRIORITY	PAD PCV PLCNT *PRIRA	PALNB &PC7800 PLGNB PROFILE	PAGE PF PLRGF &PRT	PARITY 'PFA POLLIST &PRT1220

PVC	⁄PVCNUM			
QCBLKSZ ★QRRO	QCPOOL	QDBLKSZ	★QLIN	QUEUE
RDTE ★RMODE RSYS	RLTN RMT RSYSTEM	READER RMTLOAD RTCNT	RESTART RQST_RECOVERY RTS	RETRY RSC
SBKLG SILIN SOLIN STATN SUBNB ★SYSLOG	SC SIMBRK SPEED STI SUBSCRID	SCID ★SIMU SPN &STS2840 ★SWITCH	SHARE SLAVE SPTTY ★STYPE ⁄SWTHTEC	SILENT SLINE SSR SUB SYSHEAD
TAB &TELEX TILEN &TN1200 TRANSPAC &TTU8126 &TTY35 T1	TCTNM TERMNL TIMER TOLEN TS &TTU8128 ★TTY37 T2	★TCV260 ★TE318 &TK4105 TPCADL ⁄TSID &TTU8221 &TTY38	★TC349 ⁄THRCLAS &TN300 TPUSZ &TTS7800 &TTX35 TWA	★TC380 ⁄THRUPUT ★TN340 ⁄TRAFFIC &TTU8124 &TTY33 ★TYPE
UHDLCW	UN	UNITSZ	USERID	
VAN &VIP7001 &VIP7801 &VIP7814	VERSION &VIP7100 &VIP7801V ★VTE2820	★VIP765 &VIP7200 &VIP7802	★VIP775 &VIP7700 &VIP7804	★VIP785 &VIP7760 &VIP7805
⁄WHEN	WINDOW	⁄WINDOWSZ		
XCNT	XPRTC	⁄X25		

Notes:

● Unmarked symbols must not be employed as user-defined names, in the statements of commands for which they are used as reserved identifiers.

● "⁄" denotes symbols reserved for later releases, to be used for functions not supported in the current release.

● "★" denotes keywords retained for reasons of compatibility with the previous version of CNC supported by earlier releases.

● "&" denotes keywords which, for release GCOS-7/V2, are no longer reserved, but which nevertheless should not be employed as user-defined names.

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EXPLANATION OF SYMBOLS

AC   alias for the ADCOR command name.

ACCESS   optional keyword of the COMPATH command, specifying the
                   name of the line over which the COMPATH is to be
                   mapped.

ADCOR   CNC command name introducing the ADCOR command, to
                   define an administrative correspondent located either
                   on the local system or on a remote system in the DSA
                   network.

ADD   optional keyword in the RDTN and TERMNL commands,
                   specifying the hardware address of a compatible "rdtn"
                   or terminal respectively, in the form of a 2-digit
                   hexadecimal value enclosed within double quotation
                   marks.

ADDR   optional keyword in the RTS command, specifying the
                   VAN's subscription served by the RTS.

ADFUNC   CNC command name introducing the ADFUNC command, to
                   define a standard DSAC function allowing connection
                   between the local system and administrative
                   correspondents located at either:

                   ● The local system

                   ● A remote system in the DSA network.

ADGROUP   CNC command name introducing the ADGROUP command, to
                   define a set of administrative correspondents to be
                   related to a single administrative function (i.e., AF).

AF   alias for the ADFUNC command name.

AG   alias for the ADGROUP command name.

AJ832   argument in the TERMNL command, defining the mandatory
                   "terminal-type"; applicable to TTY line procedure.

AJ833   argument in the TERMNL command, defining the mandatory
                   "terminal-type"; applicable to TTY line procedure.

ANSWBCK   optional keyword in the TERMNL command, specifying that
                   the terminal has "answer-back" capability; only
                   applicable to terminals connected over switched lines.

APPABNUM   optional keyword in the GENQMON command, defining the
                   maximum count allowable for unsuccessful application
                   spawning.

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APLIB mandatory keyword in the GENQMON command, defining the library containing the JCL necessary to launch applications associated with a given terminal queue.

ASCII argument of the "TCTNM" keyword, in the LINE command, specifying the ASCII translation table for BSC transmissions.

ASSIGN optional keyword in the PVC, RDTN and TERMNL commands, used as follows:

- For PVC, specifies the "rdtn" to which the permanent circuit is to be connected

- For RDTN and TERMNL, specifies the dedicated use to which the "rdtn" or terminal, respectively, is to be put.

AUTO optional keyword in the RDTN and TERMNL commands, specifying that the "rdtn" or terminal, respectively, is to be submitted to automatic connection algorithms by BTNS.

AUTOLF optional keyword in the RDTN and TERMNL commands, specifying that the KCT or KPR "subtypes" of the "rdtn" or terminal, respectively, have automatic line-feed capability.

BASIC argument of the "LEVEL" keyword in the XPRTC command.

BATCHNB keyword retained for compatibility with Release 1.D and no longer in use. This optional keyword in the GENCOM command specified the maximum number of batch-entry processes that could be connected at any one time to TDS.

BCC self-identifying value reserved for future releases, to be used as an optional parameter in the XPRTC command.

BKMOD optional keyword in the LINE command, specifying the effect of a "break" during output of a message; only applicable to TTY terminals equipped with a BREAK key.

BLOCKING optional keyword in the QUEUE command, applicable only to terminal queues for editing messages sent by the application working "behind" the queue.

BREAK optional keyword in the QUEUE command, applicable only to program queues on which the MCS application receives control messages about events and changes in terminal status.

BRKLG optional keyword in the LINE command, specifying the length (in number of characters) of the "break" signal; applicable only to TTY lines with reverse channel.

APPLIB   mandatory keyword in the GENQMON command, defining the
             library containing the JCL necessary to launch
             applications associated with a given terminal queue.

ASCII   argument of the "TCTNM" keyword, in the LINE command,
             specifying the ASCII translation table for BSC
             transmissions.

ASSIGN   optional keyword in the PVC, RLTN and TERMNL commands,
             used as follows:

             ● For PVC, specifies the "rdtn" to which the permanent
               circuit is to be connected

             ● For RLTN and TERMNL, specifies the dedicated use to
               which the "rdtn" or terminal, respectively, is to be
               put.

AUTO   optional keyword in the RLTN and TERMNL commands,
             specifying that the "rdtn" or terminal, respectively,
             is to be submitted to automatic connection algorithms
             by BTNS.

AUTOLF   optional keyword in the RLTN and TERMNL commands,
             specifying that the KCT or KPR "subtypes" of the "rdtn"
             or terminal, respectively, have automatic line-feed
             capability.

BASIC   argument of the "LEVEL" keyword in the XPRTC command.

BATCHNB   keyword retained for compatibility with Release 1.D and
             no longer in use. This optional keyword in the GENCOM
             command specified the maximum number of batch-entry
             processes that could be connected at any one time to
             TDS.

BCC   self-identifying value reserved for future releases, to
             be used as an optional parameter in the XPRTC command.

BKMOD   optional keyword in the LINE command, specifying the
             effect of a "break" during output of a message; only
             applicable to TTY terminals equipped with a BREAK key.

BLOCKING   optional keyword in the QUEUE command, applicable only
             to terminal queues for editing messages sent by the
             application working "behind" the queue.

BREAK   optional keyword in the QUEUE command, applicable only
             to program queues on which the MCS application receives |
             control messages about events and changes in terminal
             status.

BRKLG   optional keyword in the LINE command, specifying the
             length (in number of characters) of the "break" signal;
             applicable only to TTY lines with reverse channel.

CPU	argument of the TERMNL command, defining the mandatory "terminal-subtype"; i.e., processor. "CPU" is also a keyword reserved for future releases, to be used as an argument of the RDTE command to define the mandatory "rdte-type".
CRT	argument in the RLTN and TERMNL commands, specifying the mandatory "rdtn-subtype", or "terminal-subtype", respectively; indicates a screen (i.e., Cathode Ray Tube).
CSG	optional keyword in the RDTE command, defining the "closed-subscriber-group" number of the "rdte", as specified in the "rdte" subscription contract.
CSX25	argument of the RDTE command, defining the mandatory "rdte-type".
CTLRST	optional keyword in the QUEUE command, applicable only to terminal disk queues, in order to allow controlled restart from step aborts and system crashes.
LABFSZ	optional keyword in the GENCOM command, specifying the size (in bytes) of each unit of the BTNS output buffer pool used for I/O transfers.
DCTAP	CNC command name introducing the DCTAP command.
DKU7001	argument of the TERMNL command, defining the mandatory "terminal-type"; applicable to TTY line procedure.
DKU7002	Similar to DKU7001.
DKU7005	Similar to DKU7007.
DKU7007	argument of the TERMNL command, defining the mandatory "terminal-type"; applicable to VIP(S) line procedure. "DKU7007" is also an argument of the RDTN command, defining the mandatory "rdtn-type", to be specified in conjunction with "CSX25" in the RDTE command.
DKU7105	Similar to DKU7107.
DKU7107	argument of the TERMNL command, defining the mandatory "terminal-type"; similar to DKU7007.
DKU7211	argument of the TERMNL command, defining the mandatory "terminal-type"; applicable to VIP(S) line procedure. "DKU7211" is also an argument of the RDTN command, defining the mandatory "rdtn-type", to be specified in conjunction with "CSX25" in the RDTE command.

LSK	argument in the RLTN and TERMNL commands, defining the mandatory "rdtn-subtype", or "terminal-subtype", respectively; specifies disk (i.e., DISK).
LTC	keyword reserved for future releases, to be used as an optional keyword in the LSUB command for specifying that the "default-throughput-class" facility has been subscribed for.
LTU7171	argument in the RDTN and TERMNL commands, defining the mandatory "rdtn-type", or "terminal-type", respectively; applicable to the TTY and TTY-R line procedures.
DTU7172	Similar to DTU7171.
ENQUEUE	optional keyword in the QUEUE command, applicable only to program queues, specifying that when the maximum number of connections allowed for the queue has been reached, new connection requests are to be enqueued until a connection level is released.
EPX	optional keyword in the LINE command, specifying that echoplex is to be used over a TTY line.
ERCAP	optional keyword in the LINE command, specifying the "erase" capability for TTY lines.
FEP	argument of the Release 1E NODE command, defining the mandatory "node-type"; specifies a DN7100 functioning as an FEP in a DSA environment.
FILTER	CNC command name introducing the FILTER command, to define an object for use in controlling the flow of traffic between administrative functions and correspondents.
FL	alias for the FILTER command name.
FLOW_CONTROL	argument of the "LEVEL" keyword in the XPRTC command.
FLOWTH	optional keyword in the LTS command, specifying the flow command time (i.e., "TI").
FNP	CNC command name introducing the FNP command. "FNP" is also a mandatory keyword in the FSC command, defining the transport service to be associated with the session control in question. "FNP" is furthermore an optional keyword in the RSC command, defining the exit transport service related to the remote session control in question.
FSC	CNC command name introducing the FSC command.
FSYS	alias of FSYSTEM.

FSYSTEM   CNC command name introducing the FSYSTEM command.

FULL_RECOVERY argument of the "LEVEL" keyword in the XPRTC command.

GENCOM   CNC command name introducing the GENCOM command.

GENNET   alias of LSUB.

GENQMON   CNC command name introducing the GENQMON command.

HL6   argument of the TERMNL command, defining the mandatory
                    "terminal-type"; applicable to VIP(S) line procedure.

HL61   argument of the TERMNL command, defining the mandatory
                    "terminal-type"; applicable to BSC line procedure.

HL62   argument of the TERMNL command, defining the mandatory
                    "terminal-type"; applicable to BSC line procedure.

HL64   argument of the TERMNL command, defining the mandatory
                    "terminal-type"; applicable to the line procedures BSC
                    and HDLC. "HL64" is also a keyword reserved for future
                    releases, for use as an argument in the RDTN command to
                    define the mandatory "rdtn-type".

HL66   argument of the TERMNL command, defining the mandatory
                    "terminal-type".

HOST   argument of the Release IE NODE command, defining the
                    mandatory "node-type"; specifies DPS7 as a DSA node.

IBM370   argument of the TERMNL command, defining the mandatory
                    "terminal-type"; applicable to BSC line procedure.

IBM3270   argument of the TERMNL command, defining the mandatory
                    "terminal-type"; applicable to BSC line procedure.

IBM3278   argument of the TERMNL command, defining the mandatory
                    "terminal-type"; applicable to BSC line procedure.

IBM3741   argument of the TERMNL command, defining the mandatory
                    "terminal-type"; applicable to BSC line procedure.

ILSEQ   CNC command name introducing the ILSEQ command.

IM   optional keyword in the QUEUE and TERMNL commands, used
                    as follows:

                    ● For QUEUE, applicable only to program queues,
                      specifying the format of input data passed from the
                      terminal to the MCS application

                    ● For TERMNL, specifies whether the transaction
                      program, running under TDS, needs to receive VIP
                      function codes.

IN	keyword retained for compatibility with Release 1.L and no longer in use. This was an argument of the LINE command, defining the number of actions to have input priority over the line, for the optional keyword "PRIRA".
INBFNB	optional keyword in the FNP command, specifying the number of units for the input buffer pool, for use by FNPS during I/O transfers with the associated LN7100.
INBFSZ	optional keyword in the FNP command, specifying the size (in bytes) of each unit of the FNPS input buffer pool used for I/O transfers with the associated LN7100.
ININS	optional keyword in the LINE command, defining the number of "SYN" control codes to be sent prior to each message, for synchronization purposes; applicable only to a synchronous line with either VIP(S) or BSC procedure.
INIT	keyword in the QUEUE command, to define the application name in relation to the terminal; for future use.
INLCNB	optional keyword in the FNP command, specifying the number of logical channels to be used by FNPS for receiving messages from the associated DN7100.
IOF	argument in the LCTAP command, defining the mandatory mailbox name; specifies Interactive Operation Facility.
ITC	optional keyword in the LSUB command, specifying that all incoming calls must contain the I/O throughput class used over the virtual circuit established.
KB	argument of the RDTN and TERMNL commands, defining the mandatory "rdtn-subtype", or "terminal-subtype", respectively; specifies KeyBoard.
KCT	argument in the RDTN and TERMNL commands, defining the mandatory "rdtn-subtype", or "terminal-subtype", respectively; specifies a keyboard with screen (i.e., Keyboard with Cathode Tube).
KDS7255	argument of the TERMNL command, defining the mandatory "terminal-type"; applicable to VIP(S) line procedure. "KLS7255" is also a keyword reserved for future releases, to be used as an argument in the RLTN command for defining the mandatory "rdtn-type", in conjunction with "CXS25" in the RLTE command.

KDS7275	argument of the TERMNL command, defining the mandatory "terminal-type"; applicable to VIP(S) line procedure. "KDS7275" is also a keyword reserved for future releases, to be used as an argument in the RDTN command for defining the mandatory "rdtn-type", in conjunction with "CXS25" in the RLTE command.
KEY	optional keyword in the GENCOM command, introducing the "password" used by MCS applications for access verification.
KPR	argument in the RLTN and TERMNL commands, defining the mandatory "rdtn-subtype", or "terminal-subtype", respectively; specifies Keyboard with PRinter.
LEVEL	optional keyword in the XPRTC command, providing transport options.
LG	alias for the LOG command name.
LINE	CNC command name introducing the LINE command.
LINELG	optional keyword in the RDTN and TERMNL commands, defining the (number of characters in the) physical line length of the "rdtn", or terminal, respectively.
LINPLG	optional keyword in the LINE command, specifying that the polling for a multipoint line is to be linear.
LLENGTH	optional keyword in the QUEUE command, applicable only to terminal queues, specifying the (number of characters in the) logical line length to be used for automatic editing.
LLINE	alias of PVC.
LNnn	where "nn" is a 2-digit decimal value, mandatory parameter in the LINE and LSUB commands, identifying the (HDLC) line in the SRST.
LOG	CNC command name introducing the LOG command, to define a set of files on which administrative records are to be logged.
LSC	CNC command name introducing the LSC command.
LSUB	CNC command name introducing the LSUB command.
LSYS	alias of LSYSTEM.
LSYSTEM	CNC command name introducing the LSYSTEM command.
LTS	CNC command name introducing the LTS command.

MAMNB	optional keyword in the GENCOM command, specifying the maximum number of MCS processes executable concurrently.
MASTER	optional keyword in the PVC command, specifying that the subscriber has the right to use the virtual circuit for which he will be charged.
MAXDUSZ	keyword reserved for future releases, to be used as an optional parameter in the RTS command.
MAXMG	optional keyword in the QUEUE command, applicable only to program queues, specifying the maximum number of users simultaneously connectable to the queue.
MINITEL	argument of the RDTN command, defining the mandatory "rdtn-type"; to be used in conjunction with PAD in the corresponding RDTE.
MK	argument of the QUEUE command, introduced by the optional keyword "IM", denoting Mark mode.
MODE	optional keyword in the FNP command, for specifying the total number of input and output channels to be reserved for connection to SIRIS3 or SIRIS8.
MTS7500	argument of the TERMNL command used in previous releases, not to be used for reasons of inter-release compatibility.
MTS7508	argument of the TERMNL command, defining the mandatory "terminal-type"; applicable to VIP(S) line procedure.
MT28 I	argument of the TERMNL command, defining the mandatory "terminal-type"; applicable to TTY line procedure.
MUX	keyword reserved for future releases, to be used as an argument in the RLTE command and introduced by the optional keyword "RMODE".
MUXPRM	optional keyword in the LSUB command, specifying multiplexing characteristics.
NAUCLE	optional keyword in the LINE command, applicable only to a switched line in order to allow for manual connection.
NBBTBF	optional keyword in the GENCOM command, specifying the number of units in the input buffer pool to be used by BTNS for I/O transfers over the lines.
NBDABF	optional keyword in the GENCOM command, specifying the number of units for the output buffer pool to be used by BTNS for I/O transfers over the lines.

NBLOCKS   optional keyword in the QUEUE command, applicable only
                 to terminal queues, defining the number of logical
                 lines acceptable in each message sent to the terminal.

NDISCNT   optional keyword in the LINE command, specifying that
                 BTNS must not automatically disconnect a switched line
                 when "time-out" is reached.

NETROUTE   mandatory keyword in the RTS command, defining the
                 network routes to the RTS concerned.

NL   argument in the QUEUE and TERMNL commands, denoting
                 NormaL mode, and used as follows:

                 ● For QUEUE, introduced by the optional keywords "IM"
                   and "CM".

                 ● For TERMNL, introduced by the "IM" optional keyword.

NLOAD   optional keyword in the FNP command, specifying that
                 the associated DN7100 is not to be loaded automatically
                 by FNPS whenever loading is requested by the DN7100
                 after shutdown of its software.

NOBT   optional keyword in the RDTN and TERMNL commands,
                 specifying that BTNS is not to accept any BT command -
                 whatever its origin - directed towards the "rdtn"'s
                 terminal.

NOCALL   optional keyword in the RDTE command, specifying that
                 the "rdte" may not be called from the DPS7.

NODE   CNC command name introducing the Release IE NODE
                 command, which will no longer be supported in future
                 releases.

NR   CNC command name introducing the NR command. NR is also
                 an alias of the NETROUTE keyword.

NSYSMES   optional keyword in the RDTN and TERMNL commands,
                 specifying that BTNS must not send any messages to the
                 "rdtn", or terminal, respectively.

NUMBLK   optional keyword in the QUEUE command, specifying the
                 number of memory blocks to be used exclusively by the
                 queue.

NUMREC   optional keyword in the QUEUE command, specifying the
                 number of disk queue file blocks to be used exclusively
                 by the queue.

OM   optional keyword in the QUEUE command, applicable only
                 to terminal queues, specifying the data format to be
                 output from the MCS application to the terminal.

OPER
keyword retained for compatibility with Release 1.D and no longer in use, specifying the network control terminal in the TERMNL command.

OU
keyword retained for compatibility with Release 1.D and no longer in use, defining, in the LINE command, the number of actions to have output priority over the line, for the optional keyword "PRIRA".

OUTBFNB
optional keyword in the FNP command, specifying the number of units for the output buffer pool used by FNPS for I/O transfers with the associated DN7100.

OUTBFSZ
optional keyword in the FNP command, specifying the size (in bytes) of each unit of the FNPS output buffer pool used for I/O transfers with the associated DN7100.

PACKETSZ
keyword reserved for future releases, for optional use in the NR command.

PAL
argument of the RLTE command, defining the mandatory "rdte-type"; identifies the equipment used for connecting asynchronous TTY terminals to TRANSPAC.

PALNB
optional keyword in the LINE command, specifying the number of PAL control codes to be sent at the end of each output message (in order to avoid truncation).

PAGE
optional keyword in the RDTN and TERMNL commands, specifying the number of lines on the screen of the "rdtn", or terminal, respectively.

PARITY
optional keyword in the LINE command, specifying the type of checking to be performed on the parity of input data.

PCNT
keyword reserved for future releases, to be used optionally in the RTS command.

PCV
optional keyword in the LSUB command, introducing the password to be used when logon is requested by an asynchronous terminal through the PAD.

PC7800
argument of the TERMNL command, defining the mandatory "terminal-type"; applicable to TTY line procedure.

PF
alias of PROFILE.

PFA
keyword reserved for future releases, for optional use in the LSUB command for defining an array of profiles to be associated with the parameters "THRCLAS", "PKSIZE", and "WINDOW" in the same command.

PKSIZE
optional keyword in the LSUB command, defining the packet size to be used over all the virtual circuits of a particular TRANSPAC subscription.

PLCNT   optional keyword in the LINE command, defining the
                 maximum number of station to be polled automatically
                 before a BTNS output request may be considered.

PLGNB   optional keyword in the GENCOM command, specifying the
                 number of multiplex plugs to be used by the BTNS
                 transport station for managing terminals connected to
                 TRANSPAC through LCU7010 and/or TCU7022.

PLRGF   optional keyword in the LINE keyword, for controlling
                 the polling frequency for stations that are in the
                 "off" state.

POLLIST   optional keyword in the LINE command, specifying the
                 polling list for use over the line concerned (which
                 must be "multipoint" in the SRST); applicable to the
                 line procedures TC and VIP.

PRIORITY   keyword reserved for future releases, for optional use
                 in the NR command.

PRIRA   keyword retained for compatibility with Release 1.D and
                 no longer in use; optionally specified input/output
                 priority in the LINE command.

PROFILE   optional keyword in the LSYSTEM, FSYSTEM, and RSYSTEM
                 commands, defining system hardware and software.

PRT   argument in the RDTN and TERMNL commands, defining the
                 mandatory "rdtn-subtype", or "terminal-subtype",
                 respectively; specifies PRinTer.

PRT1220   argument of the TERMNL command, defining the mandatory
                 "terminal-type"; applicable to TTY line procedure.

PVC   CNC command name introducing the PVC command.

PVCNUM   keyword reserved for future releases, for optional use
                 in the NR command.

QCBLKSZ   optional keyword in the GENCOM command, specifying the
                 size (in bytes) of each memory block in the memory
                 queue pool.

QCPOOL   optional keyword in the GENCOM and QUEUE commands, used
                 as follows:

                 ● For GENCOM, specifies the number of blocks in the
                   memory queue pool, to be shared by all queues
                   qualified by the "QCPOOL" option in their respective
                   QUEUE commands

                 ● For QUEUE, indicates that this memory queue is to
                   share the memory queue pool reserved by the "QCPOOL"
                   option in the GENCOM command.

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QDBLKSZ optional keyword in the GENCOM command, specifying the block size (in bytes) of the disk queue file to be used for saving messages.

QLIN keyword retained for compatibility with Release 1.D and no longer in use; an argument of the LINE command, this option defined linear scanning of output queues for the optional keyword "PRIRA".

QUEUE CNC command name introducing the QUEUE command.

QRRO keyword retained for compatibility with Release 1.D and no longer in use; this argument of the LINE command defined "round-robin" scanning of output queues for the optional keyword "PRIRA".

RDTE CNC command name introducing the RDTE command.

RDTN CNC command name introducing the RDTN command.

READER argument of the DCTAP command, defining the mandatory mailbox name; specifies "cardless".

RESTART optional keyword in the QUEUE command, applicable only to disk queues (i.e., either terminal queues or program queues, on disk), to allow recovery from either a step abort or a system crash.

RETRY optional keyword in the LTS command, defining the maximum retry count for the transport station.

RMODE keyword reserved for future releases, for optional use in the RDTE command, specifying the management mode for the virtual circuit established between the "rdte" and the DPS7.

RMT argument of the Release IE NODE command, defining the mandatory "node-type"; specifies a DN7100, a DPS7, or a DPS6/DSS as a DSA system.

RMTLOAD optional keyword in the FNP command, specifying that the DN7100 concerned is to be loaded from its own diskette.

RQST_RECOVERY argument of the "LEVEL" keyword in the XPRTC command.

RSC CNC command name introducing the RSC command.

RSYS alias of RSYSTEM.

RSYSTEM CNC command name introducing the RSYSTEM command.

RTCNT optional keyword in the LINE command, specifying the number of retries to be attempted whenever an error occurs in transmission.

RTS	CNC command name introducing the RTS command.
SBKLG	optional keyword in the TERMNL command, applicable only to BSC line procedure, specifying the sub-block size (in characters) to be generated by BTNS when transmitting a character string.
SC	optional keyword in the RSYSTEM command, identifying the associated session control.
SCID	keyword mandatory in the LSC, FSC and RSC commands, defining the session control identifier.
SHARE	optional keyword in the QUEUE command, applicable only to program queues, allowing two or more MCS applications to share the same queue (defined with either input, or input/output, capability in their respective QASSIGN statements).
SILENT	optional keyword in the LTS command, defining the silence timer.
SILIN	optional keyword in the LSUB command, specifying the number of switched virtual circuits that may be opened by incoming calls.
SIMBRK	optional keyword in the GENCOM command, specifying the "break qualifier" (in the form of up to three alphanumeric characters, enclosed in double quotation marks).
SIMU	keyword retained for compatibility with Release 1.D and no longer in use; optionally specified, in the DCTAP command, either the number of simultaneities for TDS or the maximum number of terminals simultaneously connectable to IOF.
SLAVE	argument of the TERMNL command, defining the mandatory "terminal-subtype"; applicable to terminals with several subtypes.
SLINE	optional keyword in the LSUB command, specifying the total number of switched virtual circuits that may be opened by either incoming or outgoing calls.
SOLIN	optional keyword in the LSUB command, specifying the number of switched virtual circuits that may be opened by outgoing calls.
SPEED	optional keyword in the LINE command, defining the speed of an asynchronous line; applicable to the line procedures TTY, TC and VIP(A).

SPN	optional keyword in the LINE command, defining the number of "stop bits" to be sent after a character in asynchronous transmission; applicable to the line procedures TTY, TC and VIP(A).
SPTTY	argument of the LINE command, defining the special TTY translation table and introduced by the optional "TCTNM" keyword.
SSR	optional keyword in the LINE command, specified according to the type of modem and line speed applicable.
STATN	CNC command name introducing the STATN command.
STI	mandatory keyword in the RDTN command for an "rdtn" using VIP line procedure and attached to a type-CSX25 "rdte", defining the "station-index" applicable.
STS2840	argument of the TERMNL command, defining the mandatory "terminal-type"; applicable to VIP(S) line procedure.
STYPE	keyword retained for compatibility with Release 1.D and no longer in use; introduced the mandatory "terminal-subtype" in the TERMNL command.
SUB	optional keyword in the COMPATH command, defining the local TRANSPAC subscription over which the "compath" is to be mapped.
SUBNB	mandatory keyword (alias TPCADD) in the LSUB and RDTE commands, used as follows: ● For LSUB, defines the DPS7 TRANSPAC subscription number ● For RDTE, defines the remote subscription telephone number of the "rdte".
SUBSCRID	alias of SUB.
SWITCH	argument of the TERMNL command used in previous releases, not to be used for reasons of inter-release compatibility.
SWIHTEC	keyword reserved for future releases, for optional use in the COMPATH command.
SYSHEAD	optional keyword in the RDTN and TERMNL commands, specifying the character string to precede each message sent by BTNS to the "rdtn", or terminal, respectively.
SYSLOG	keyword retained for compatibility with Release 1.D and no longer in use; in the GENCOM command, optionally specified that every system message sent by BTNS was to be logged.

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TAB	optional keyword in the RDTN and TERMNL commands, specifying that tabulation is available on the "rdtn", or terminal, respectively for use by IOF in display formatting.
TCTNM	optional keyword in the LINE command, to allow selection of a translation table other than the standard one defined for the line procedure applicable.
TCV260	argument of the TERMNL command used in previous releases, not to be used for reasons of inter-release compatibility.
TC349	argument of the TERMNL command used in previous releases, not to be used for reasons of inter-release compatibility.
TC380	argument of the TERMNL command used in previous releases, not to be used for reasons of inter-release compatibility.
TELEX	argument of the RDTN command, defining the mandatory "rdtn-type"; to be used in conjunction with PAD in the corresponding RDTE.
TERMNL	CNC command name introducing the TERMNL command.
TE318	argument of the TERMNL command used in previous releases, not to be used for reasons of inter-release compatibility.
THRCLAS	keyword reserved for future releases, for optional use in the LSUB and PVC commands, as follows:

• For LSUB, defines the default in- and out-throughput classes for use when the "DTC" option (in the same command) has been selected

• For PVC, defines the in- and out- throughput classes to be used over the virtual circuit for referencing profiles declared with the "PFA" list in the corresponding LSUB command. |
THRUPUT	keyword reserved for future releases, as an optional parameter in the NR command.
TILEN	optional keyword in the LINE command, defining the "time-out" value to the URP for controlling modem initialization and disconnection.
TIMER	optional keyword in the FNP command, specifying (in seconds) the maximum time to be allowed by FNPS to elapse before declaring the corresponding DN7100 as "failed".

TN300	argument in the TERMNL command, defining the mandatory "terminal-type"; applicable to TTY line procedure.
TN340	argument of the TERMNL command used in previous releases, not to be used for reasons of inter-release compatibility.
TNI200	argument in the TERMNL command, defining the mandatory "terminal-type"; applicable to TTY line procedure.
TOLEN	optional keyword in the LINE command, specifying the "time-out" value to be used by the URP either, to pool a buffered terminal or, to time the interval between characters input from an unbuffered terminal.
TPCADD	alias of "SUBNB".
TPUSZ	optional keyword in the LTS command, defining the transport unit minimum size.
TRAFFIC	keyword reserved for future releases to be used optionally in the NR command.
TRANSPAC	argument in the RDTE and RTS commands, used as follows:
	● In RDTE, introduced by the "VAN" keyword
	● In RTS, introduced by the "ADDR" keyword.
TS	optional keyword in the LSC and RSC commands, defining the transport station relevant to each of these session controls.
TSID	keyword reserved for future releases to be used optionally in the LTS and RTS commands.
TTS7800	argument in the RDTN and TERMNL commands, defining the mandatory "rdtn-type", or "terminal-type", respectively; applicable to CSX25 in the corresponding RDTE, or VIP(S) line procedure.
TTU8124	argument in the RLTN and TERMNL commands, defining the mandatory "rdtn-type", or "terminal-type", respectively; applicable to TTY line procedure.
TTU8126	argument in the RLTN and TERMNL commands, defining the mandatory "rdtn-type", or "terminal-type", respectively; applicable to TTY and TTY-R line procedure.
TTU8128	argument in the RLTN and TERMNL commands, defining the mandatory "rdtn-type", or "terminal-type", respectively; applicable to TTY and TTY-R line procedure.

TTU8221	argument in the RDTN and TERMNL commands, defining, respectively, the mandatory:
	● "rdtn-type": specified in conjunction with "CSX25" in the corresponding RDTE
	● "terminal-type": applicable to VIP(S) line procedure.
TTX35	argument of the TERMNL command, defining the mandatory "terminal-type": applicable to VIP(S) line procedure.
TTY33	argument in the TERMNL command, defining the mandatory "terminal-type": applicable to TTY line procedure.
TTY35	argument in the TERMNL command, defining the mandatory "terminal-type": applicable to TTY line procedure.
TTY37	argument of the TERMNL command used in previous releases, not to be used for reasons of inter-release compatibility.
TTY38	argument of the TERMNL command used in previous releases, not to be used for reasons of inter-release compatibility.
TWA	optional keyword in the QUEUE command, applicable only to program queues for allowing dialog between application and terminal: specifies "two-way alternate".
TYPE	keyword retained for compatibility with Release I.D and no longer in use: introduced the mandatory "terminal-type" in the TERMNL command.
T1	alias of "FLOWTH".
T2	alias of "SILENT".
UHDLCW	optional keyword in the LINE command, to specify the maximum number of reads and/or writes that may be executed at a time for an HDLC line.
UN	argument of the QUEUE and TERMNL commands, denoting "unedited mode", and used as follows:
	● For QUEUE, introduced by the optional keywords "IM" and "OM"
	● For TERMNL, introduced by the optional keyword "IM".
UNITSZ	optional keyword in the XPRTC command, defining the maximum transport unit size.

USERID	optional keyword in the QUEUE command, specifying a "userid-queue" (useful in a switched network environment).
VAN	optional keyword in the LSUB and RDTE commands, introducing a "Value Added Network" name.
VERSION	optional keyword in the LTS and RTS commands, defining the "level" of the transport station.
VIP765	argument of the TERMNL command used in previous releases, not to be used for reasons of inter-release compatibility.
VIP775	argument of the TERMNL command used in previous releases, not to be used for reasons of inter-release compatibility.
VIP785	argument of the TERMNL command used in previous releases, not to be used for reasons of inter-release compatibility.
VIP7001	argument in the RDTN and TERMNL commands, defining, respectively, the mandatory:

- "rdtn-type", in conjunction with "CSX25" in the corresponding RDTE

- "terminal-type"; applicable to VIP(S) line procedure.

VIP7100	argument in the TERMNL command, defining the mandatory "terminal-type"; applicable to TTY line procedure.
VIP7200	argument in the TERMNL command, defining the mandatory "terminal-type"; applicable to TTY line procedure.
VIP7700	argument in the RDTN and TERMNL commands, defining, respectively, the mandatory:

- "rdtn-type", in conjunction with "CSX25" in the corresponding RDTE

- "terminal-type"; applicable to VIP(S) line procedure.

VIP7760	argument in the RDTN and TERMNL commands, defining, respectively, the mandatory:

- "rdtn-type", in conjunction with "CSX25" in the corresponding RDTE

- "terminal-type"; applicable to VIP(S) line procedure.

VIP7801	argument in the TERMNL command, defining the mandatory "terminal-type"; applicable to TTY line procedure.
VIP7801V	argument of the TERMNL command, defining the mandatory "terminal-type"; applicable to TTY line procedure.
VIP7802	argument in the TERMNL command, defining the mandatory "terminal-type"; applicable to TTY line procedure.
VIP7804	argument in the TERMNL command, defining the mandatory "terminal-type"; applicable to VIP(S) line procedure.
VIP7805	argument in the TERMNL command, defining the mandatory "terminal-type"; applicable to VIP(S) line procedure.
VIP7814	argument of the TERMNL command, defining the mandatory "terminal-type"; applicable to VIP(S) line procedure.
VTE2820	keyword retained for compatibility with Release 1.D and no longer in use; argument of the TERMNL command, introduced by the mandatory keyword "TYPE".
WHEN	keyword reserved for future releases, to be used optionally in the NR command.
WINDOW	optional keyword in the LSUB and XPRTC commands, defining, respectively: • In LSUB, the "window size" to be common to all the TRANSPAC subscription's virtual circuits • In XPRTC, defining the maximum credit for any transport route mapped over the NR.
WINDOWSZ	keyword reserved for future releases to be used optionally in the NR command.
XCNT	mandatory keyword in the RTS command, defining the "transport connection maximum count".
XPRTC	CNC command name introducing the XPRTC command. "XPRTC" is also an optional keyword in the NR command, defining the transport protocol to be attached to the "netroute".
X25	keyword reserved for future releases, to be used as an argument of the RLTE command and introduced by the optional keyword "RMODE".

APPENDIX E

TERMINAL CONFIGURABILITY

This subject concerns the connection of terminals to the Data Communications Controller (i.e., DCC) of the URP.

The various tables below provide the user with information concerning the terminal types supported by GCOS, in terms of:

- The access methods and subsystems which support each terminal; i.e.:

  - MAM, for user-provided applications in MCS COBOL and/or GPL

  - VCAM, for communications services such as TDS, IOF, RBF and CARDLESS.

- The types of "links" supported; i.e.:

  - Point-to-point

  - Multipoint

  - TRANSPAC non-multiplexed and multiplexed virtual circuits, through PAD and CSX25.

For further information on the auxiliary devices supported for standard terminals, see Figures 5-7 and 6-3 in the TERMNL and RDTN command descriptions on pages 5.21 and 6.12, respectively.

It should further be noted that:

- IOF does not support auxiliary devices - such as cassette, disk, or diskette - and the printer option is not supported whenever a screen is present

- Such terminals require the "direct timing source" option for transmission over the link.

Terminal Connectibility		MAM	VCAM					
			TLS		IOF		RBF	CARD
Type	Model		F	U	U	F		-LESS
AJ832	AJ832 Anderson-Jacobson	Y	-	Y	Y	-	-	-
AJ833	AJ833 Anderson-Jacobson	Y	-	Y	Y	-	-	-
DKU7001	DKU7001	Y	-	Y	Y	-	-	-
DKU7002	DKU7002	Y	-	Y	Y	-	-	-
DKU7005	DKU7005 & TTX35	Y	Y	Y	Y	Y	-	-
DKU7007	DKU7007	Y	Y	Y	Y	Y	-	-
DKU7105	see DKU7107 below	Y	Y	Y	Y	Y	-	-
DKU7107	DKU7105 & DKU7107	Y	Y	Y	Y	Y	-	-
DKU7211	DKU7211	Y	Y	Y	Y	Y	-	-
DTU7171	DTU7171 & DTU7172	Y	-	Y	Y	-	-	-
DTU7172	see DTU7171 above	Y	-	Y	Y	-	-	-
HL6	Bull DPS6	Y	-	-	-	-	Y	-
HL61	61-40 & 61-60	Y	-	-	-	-	-	-
HL62	62 (any model)	Y	-	-	-	-	-	-
HL64	64/DPS or DPS7	Y	-	-	-	-	-	-
HL66	DPS8	Y	-	-	-	-	-	-
IBM370	IBM 360 & 370	Y	-	-	-	-	-	-
IBM3270	IBM3270	Y	Y	-	Y	Y	-	-
IBM3278	IBM3278	Y	Y	-	Y	Y	-	-
IBM3741	IBM3741	Y	-	-	-	-	-	-
KDS7255	KDS7255/7256	Y	-	Y	-	-	-	Y
KDS7275	KDS7265/7266/7275/7276	Y	-	Y	-	-	-	Y
MINITEL	Minitel	Y	Y	-	-	Y	-	-
MTS7508	MTS7508	Y	-	Y	Y	-	-	-
PC7800	PC7800	Y	Y	Y	Y	Y	-	-
PRT1220	MT281/PRT1220/PRU7220	Y	-	Y	Y	-	-	-
STS2840	STS2840/VIP/V240	Y	-	Y	Y	-	-	-
TELEX	Telex	Y	-	Y	Y	-	-	-
TK4105	TK4105	Y	-	Y	Y	-	-	-
TN300	Terminet 300	Y	-	Y	Y	-	-	-
TN1200	Terminet 1200	Y	-	Y	Y	-	-	-
TTS7800	TTS7800/V211	Y	-	Y	-	-	-	-
TTU8124	TTU8124 & 8125	Y	-	Y	Y	-	-	-
TTU8126	TTU8126	Y	-	Y	Y	-	-	-
TTU8128	TTU8128	Y	-	Y	Y	-	-	-
TTU8221	TTU8221, 8223 & 8229	Y	-	Y	Y	-	-	-
TTX35	see DKU7005, above	Y	Y	Y	Y	Y	-	-
TTY33	Teletype 33	Y	-	Y	Y	-	-	-
TTY35	Teletype 35	Y	-	Y	Y	-	-	-
VIP7001	VIP7001 & VIP7002	Y	Y	Y	Y	Y	-	-
VIP7100	VIP7100	Y	-	Y	Y	-	-	-
VIP7200	VIP7200 & DKU7201	Y	-	Y	Y	-	-	-
VIP7700	VIP7700/7705/7750	Y	Y	Y	Y	Y	-	-
VIP7760	VIP7760	Y	Y	Y	Y	Y	-	-
VIP7801	VIP7801/7801V/7802	Y	Y	Y	Y	Y	-	-
VIP7804	VIP7804/7805/7814	Y	Y	Y	Y	Y	-	-
VIP7805	see VIP7804 above	Y	Y	Y	Y	Y	-	-
VIP7814	see VIP7804 above	Y	Y	Y	Y	Y	-	-

Note that, on page E.2:

"F" = formatted

"U" = unformatted

"Y" = yes.

Type	Point-to-Point			Multipoint			TRANSPAC		
	Local W8	Leased (Modem)	Switched Lines	Through Modems	Through MIU	Switched Lines	Non-mux VC	Mux VC DC	TC
AJ832	Y	Y	Y	–	–	–	Y	–	–
AJ833	Y	Y	Y	–	–	–	Y	–	–
LKU7001	Y	Y	Y	–	–	–	Y	–	–
LKU7002	Y	Y	Y	–	–	–	Y	–	–
DKU7005	Y	Y	Y	Y	Y	–	–	–	–
DKU7007	Y	Y	Y	Y(1)	Y	–	–	–	Y
LKU7105	Y	Y	Y	Y(1)	Y	–	–	–	Y
DKU7107	Y	Y	Y	Y(1)	Y	–	–	–	Y
DKU7211	Y	Y	Y	Y(1)	Y	–	–	–	Y
LTU7171	Y	Y	Y	–	–	–	Y	–	–
LTU7172	Y	Y	Y	–	–	–	Y	–	–
HL6	Y	Y	Y	–	–	–	–	–	–
HL61	–	Y	Y	–	–	–	–	–	–
HL62	–	Y	Y	–	–	–	–	–	–
HL64	–	Y	Y	–	–	–	–	–	–
HL66	–	Y	Y	–	–	–	–	–	–
IBM370	–	Y	Y	–	–	–	–	–	–
IBM3270	Y	Y	Y	Y(1)	Y	–	–	–	–
IBM3278	Y	Y	Y	Y(1)	Y	–	–	–	–
IBM3741	–	Y	Y	–	–	–	–	–	–
KLS7255	Y	Y	Y	Y	Y	–	–	–	–
KDS7275	Y	Y	Y	Y	Y	–	–	–	–
MINITEL	–	–	–	–	–	–	Y	–	–
MTS7508	Y	Y	Y	Y	Y	–	–	–	–
PC7800	Y	Y	Y	–	–	–	–	–	–
PRT1220	Y	Y	Y	–	–	–	–	–	–
STS2840	Y	Y	Y	Y	Y	–	–	–	–
TELEX	–	–	–	–	–	–	Y	–	–
TK4105	Y	Y	Y	–	–	–	Y	–	–
TN300	Y	Y	Y	–	–	–	Y	–	–
TN1200	Y	Y	Y	–	–	–	–	–	–
TTS7800	Y	Y	Y	Y	Y	–	–	Y	–
TTU8124	Y	Y	Y	–	–	–	Y	–	–
TTU8126	Y	Y	Y	–	–	–	Y	–	–
TTU8128	Y	Y	Y	–	–	–	Y	–	–
TTU8221	Y	Y	Y	Y	Y	–	–	Y	–
TTX35	Y	Y	Y	Y	Y	–	–	–	–
TTY33	Y	Y	Y	–	–	–	Y	–	–
TTY35	Y	Y	Y	–	–	–	Y	–	–

Type	Point-to-Point			Multipoint			TRANSPAC		
	Local W8	Leased (Modem)	Switch-ed Lines	Through Modems	Through MIU	Switch-ed Lines	Non-mux VC	Mux VC DC	TC
VIP700 I	Y	Y	Y	Y	Y	–	–	Y	–
VIP7100	Y	Y	Y	–	–	–	Y	–	–
VIP7200	Y	Y	Y	–	–	–	Y	–	–
VIP7700	Y	Y	Y	Y	Y	–	–	Y	–
VIP7760	Y	Y	Y	Y	Y	–	–	Y	–
VIP7801	Y	Y	Y	–	–	–	–	–	–
VIP780 IV	Y	Y	Y	–	–	–	–	–	–
VIP7802	Y	Y	Y	–	–	–	–	–	–
VIP7804	Y	Y	Y	Y	Y	–	–	–	–
VIP7805	Y	Y	Y	Y	Y	–	–	–	–
VIP7814	Y	Y	Y	Y	Y	–	–	–	–

Note that, for the previous page and above:

(I) These types consist of screens connected to separate controllers. The controllers are:

- Treated as "multipoint"

- Not described by software, for which "terminal-name" physically represents the controller and screen.

LC = DCU7010

TC = TCU7022/7043

Y   = Yes.

- VIP-line procedure terminals and IBM3270 may function under "point-to-point" BUT still preserve their respective line-procedure characteristics (i.e., multipoint).

APPENDIX F

CNC INPUT EXAMPLES

EXAMPLE 1

- Secondary network through URP/DCC

- Queues

- TRANSPAC through URP/DCC

- Primary network through front-end processor.

Figure F-1. Example 1 Configuration

Secondary Network

D09

VIP Terminals

TTY Terminals

CC01   CC02

LN13

DG64   DG65

LN10

TRANSPAC

D20

D21

D22

PAD Terminals

Questar Terminals

Other Systems Accessible thru FEPs:

- Thru DG64 and DG65:
  DP78, HG78, DG66 and HG66

- Thru DG64 only:
  HGTA and DGTA

- Thru DG65 only:
  DPHX, HPHX, HTOR and DTOR
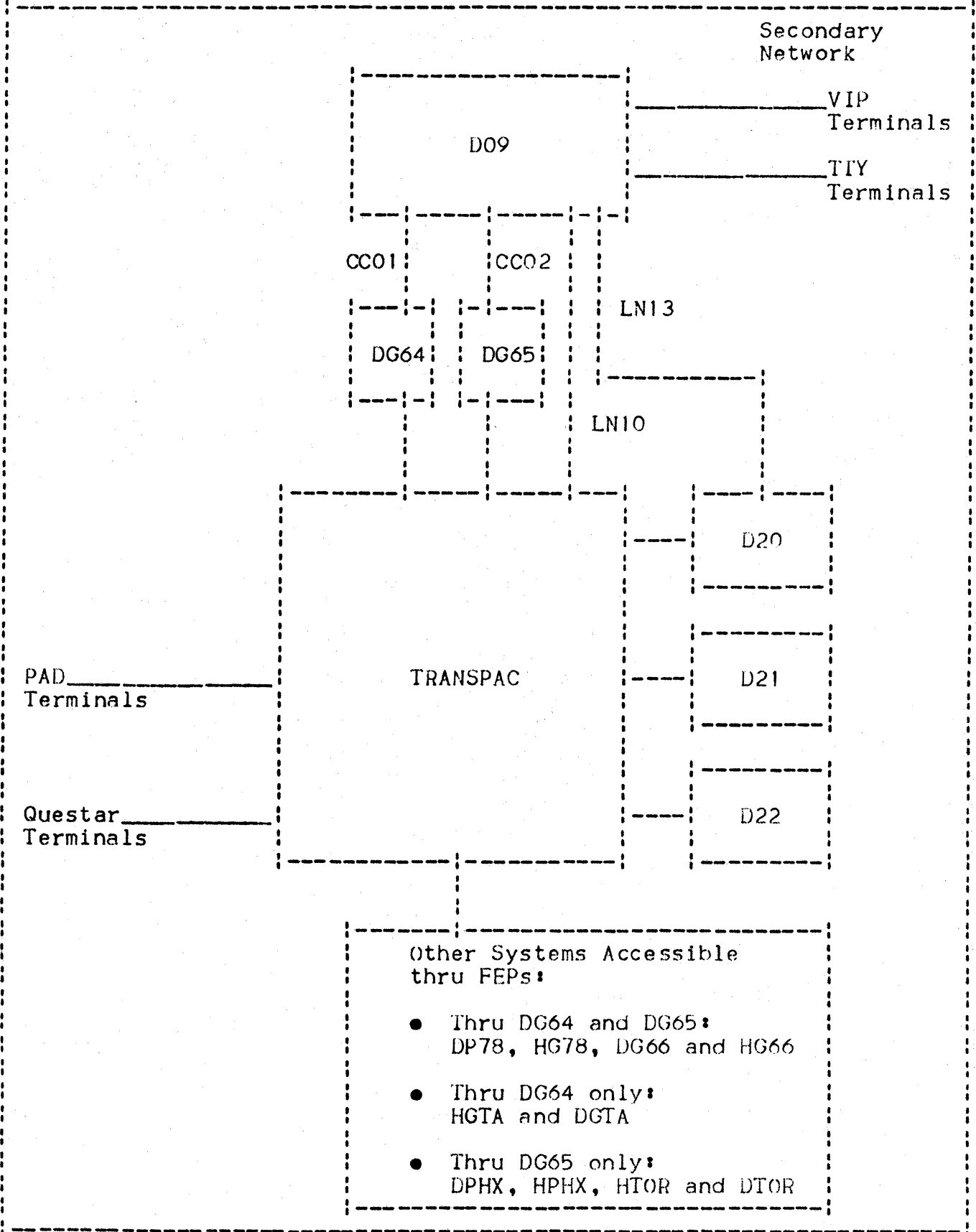
```
COMM  "****************************************************************";
COMM  "*******                                                  *******";
COMM  "******************* DESCRIPTION SYSTEM DO9 *******************";
COMM  "*******                                                  *******";
COMM  "****************************************************************";

GENCOM   RESO NBBTBF=100 BTBFSZ=512 DABFSZ=512 NBDABF=100 QCPOOL=100
         QCBLKSZ=256 QDBLKSZ=512 MAMNB=5 PLGNB=10;

COMM  "****************************************************************";
COMM  "*******                                                  *******";
COMM  "************** SECONDARY NETWORK DECLARATION **************";
COMM  "*******                                                  *******";
COMM  "****************************************************************";

COMM  "******************* REMOTE MAINTENANCE TTY *******************";

LINE     LN02 BKMOD ERCAP CLOSE;
TERMNL   TO21 TTY33 KPR AUTOLF;

COMM     "**************** DKU7107 AND DKU7211 LINE ****************";

LINE     LN11 PLRGF=100 PLCNT=1 SSR CLOSE;

STATN    S111 1;
TERMNL   T111 DKU7211 KCT;

STATN    S112 2;
TERMNL   T112 DKU7107 KCT;

STATN    S113 3;
TERMNL   T113 DKU7107 KCT;

STATN    S114 4;
TERMNL   T114 DKU7107 KCT;

STATN    S115 5;
TERMNL   T115 DKU7107 KCT;

STATN    S116 6;
TERMNL   T116 DKU7211 KCT;

COMM     "*************** PRIVATE VIP LINE: QUESTAR ***************";

LINE     LN14 PLRGF=100 PLCNT=1 SSR;

STATN    S141 1;
TERMNL   T141 DKU7211 KCT;
TERMNL   R141 SLAVE PRT;

STATN    S142 2;
TERMNL   T142 DKU7107 KCT;

STATN    S143 3;
TERMNL   T143 DKU7107 KCT;
TERMNL   P143 DKU7107 PRT AUTO;
```

F.3

```
STATN    S144 4;
TERMNL   T144 DKU7007 KCT;

COMM     "****************** SWITCHED VIP LINE *******************";

LINE     LN17 PLRGF=100 PLCNT=1 SSR;

STATN    S171 1;
TERMNL   T171 VIP7700 KCT;
TERMNL   P171 VIP7700 PRT AUTO;

STATN    S172 2;
TERMNL   T172 VIP7700 KCT;
TERMNL   P172 SLAVE PRT;

STATN    S173 3;
TERMNL   T173 VIP7700 KCT;

STATN    S174 4;
TERMNL   T174 VIP7700 KCT;

STATN    S175 5;
TERMNL   T175 VIP7700 KCT;

STATN    S176 6;
TERMNL   T176 VIP7700 KCT;

COMM     "****************** SWITCHED VIP LINE *******************";

LINE     LN18 PLRGF=100 PLCNT=1 SSR;

STATN    S181 1;
TERMNL   T181 KDS7255 CRT;
TERMNL   P181 SLAVE DSK;

STATN    S182 2 CLOSE;
TERMNL   T182 MTS7508 KCT;
TERMNL   P182 SLAVE PRT;
TERMNL   C182 SLAVE DSK;

STATN    S183 3 CLOSE;
TERMNL   T183 VIP7001 KCT;

STATN    S184 4 CLOSE;
TERMNL   T184 VIP7700 KCT;
TERMNL   P184 SLAVE PRT;
TERMNL   C184 SLAVE CAS;

STATN    S185 5 CLOSE;
TERMNL   T185 VIP7760 KCT;
TERMNL   P186 SLAVE PRT;
TERMNL   C186 SLAVE DSK;
```

```
COMM       "******************** SWITCHED TTY LINE *********************";

LINE       LN23 SPEED=H ERCAP;
TERMNL     T231 TTU8124 KPR;

COMM       "******************** SWITCHED TTY LINE *********************";

LINE       LN24 SPEED=H ERCAP;
TERMNL     T241 TTU8124 KPR;

COMM       "******************** IDSEQ DECLARATION *********************";

IDSEQ      "J832" AJ832 KPR;
IDSEQ      "7211" DKU7211 KCT;
IDSEQ      "7700" VIP7700 KCT;
IDSEQ      "7760" VIP7760 KCT;
IDSEQ      "7007" DKU7007 KCT;

COMM  "*****************************************************************";
COMM  "*******                                                  *******";
COMM  "*******               HDLC LINES                         *******";
COMM  "*******                                                  *******";
COMM  "*******          LN10 = TRANSPAC HDLC LINE               *******";
COMM  "*******                                                  *******";
COMM  "*******          LN13 = PT-TO-PT HDLC LINE               *******";
COMM  "*******                                                  *******";
COMM  "*****************************************************************";

COMM  "******************** HDLC PT-TO-PT LINE ********************";

LINE       LN13 UHDLCW=(7,7) CLOSE;
STATN      ST01 1;
TERMNL     HL01 HL64 CPU;

COMM       "******************** HDLC LINE THRU TRANSPAC *******************";

LINE       LN10 CLOSE UHDLCW=(7,7);
STATN      ST03 1;
TERMNL     TT03 SWITCH CPU;

COMM       "*****************************************************************";
COMM       "*****************************************************************";
COMM       "******************** LOCAL SUBSCRIPTION *********************";
COMM       "*****************************************************************";
COMM       "*****************************************************************";

LSUB       TF01 LN10 SUBNB="175001426" SLINE=8 SILIN=2 SOLIN=2
           PKSIZE=128 WINDOW=3 MUXPRM=(2,5) PCV=ABCD;

COMM       "************** PAD TERMINALS ON SWITCHED LINE **************";

RDTE       PA01 PAD SUBNB="900000001" CSG=0;
RDTN       TA01 TTU8124 KPR;

RDTE       PA02 PAD SUBNB="900000002" CSG=0;
RDTN       TA02 TTU8124 KPR;
```

```
RDTE        PA03 PAD SUBNB="900000003" CSG=0;
RDTN        TA03 TTU8126 KPR;

RDTE        PA04 PAD SUBNB="900000004" CSG=0;
RDTN        TA04 TTU8126 KPR;

COMM        "*************** PAD TERMINALS LEASED LINE ***************";

RDTE        PA05 PAD SUBNB="175010041" CSG=0;
RDTN        TA05 TTU8126 KPR;

COMM        "*************** TCU CONTROLLER THRU TRANSPAC ***************";

RDTE        TC01 CSX25 SUBNB="1750000669";

RDTN        TV01 VIP7700 KCT STI=00;
RDTN        TV02 VIP7700 KCT STI=01;
RDTN        TV03 VIP7700 KCT STI=02;
RDTN        TV04 VIP7700 KCT STI=03;
RDTN        TV05 VIP7700 KCT STI=04;

COMM        "****************************************************************";
COMM        "****************************************************************";
COMM        "******************** PRIMARY NETWORK ********************";
COMM        "****************************************************************";
COMM        "****************************************************************";

COMM        "****************************************************************";
COMM        "**************** LOCAL SYSTEM DECLARATION ****************";
COMM        "****************************************************************";

LSYSTEM HG64;
LSC         SCID=01:31 TS=HG65_TS;
LTS         HG64_TS FLOWTH=10 SILENT=20 RETRY=3 TPUSZ=256;

COMM        "****************************************************************";
COMM        "************ FNPS AND FRONT-END DECLARATIONS ************";
COMM        "****************************************************************";

COMM        "******************** FNPS DECLARATIONS ********************";

FNP         UNCP1 CC01 TIMER=36 INBFSZ=80 INBFNB=64 OUTBFSZ=80
            OUTBFNB=64;

FNP         UNCP2 CC02 TIMER=36 INBFSZ=80 INBFNB=64 OUTBFSZ=80
            OUTBFNB=64;

COMM        "**************** FRONT-END DECLARATIONS ****************";

FSYSTEM DG64;
FSC         DG64 SCID=1:34 FNP=UNCP1;

FSYSTEM DG65;
FSC         DG65 SCID=1:35 FNP=UNCP2;
```

```
COMM      "********************************************************";
COMM      "***************** D20 DECLARATION:  *********************";
COMM      "*************** THIS SYSTEM IS ACCESSIBLE ***************";
COMM      "*************** THRU LN13 OR THRU TRANSPAC **************";
COMM      "*************** VIA LN10 OR FRONT-ENDS *****************";
COMM      "********************************************************";

RSYSTEM  D20;

RSC       D20 SCID=70:44 TS=D20_TS;
RSC       D20 SCID=70:44 FNP=UNCP1;
RSC       D20 SCID=70:44 FNP=UNCP2;

RTS       D20_TS NETROUTE=(NR20,NR21) XCNT=64
          ADDR=(TRANSPAC="175001425");

NR        NR20 COMPATH=CP20 XPRTC=PTPT;
XPRTC     PTPT WINDOW=(14,14);
CP        CP20 ACCESS=LN13;
NR        NR21 COMPATH=CP1 XPRTC=TPC_PRTC;

COMM      "********************************************************";
COMM      "**************** D21 AND D22 DECLARATION: **************";
COMM      "************** THESE SYSTEMS ARE ACCESSIBLE ************";
COMM      "************** THRU TRANSPAC EITHER VIA DCC ***********";
COMM      "***************** OR VIA THE FRONT-ENDS ***************";
COMM      "********************************************************";

COMM      "**************** D21 SYSTEM = DPS6/DSS ****************";

RSYS      D21;

RSC       D21 SCID=70:34 TS=L6_TS;
RSC       D21 SCID=70:34 FNP=UNCP1;
RSC       D21 SCID=70:34 FNP=UNCP2;

RTS       L6_TS NETROUTE=(NR01) XCNT=64 ADDR=(TRANSPAC="175000667");

NR        NR01 COMPATH=CP1 XPRTC=TPC_L6;
XPRTC     TPC_L6 WINDOW=(7,7) LEVEL=FULL_RECOVERY;

COMM      "************** D22 SYSTEM IS ANOTHER DPS7 *************";

RSYS      D22;

RSC       D22 SCID=70:33 TS=D22_TS;
RSC       D22 SCID~70:33 FNP=UNCP2;
RSC       D22 SCID=70:33 FNP=UNCP1;

RTS       D22_TS NETROUTE=(NR02) XCNT=20 ADDR=(TRANSPAC="175000668");

NR        NR02 COMPATH=CP1 XPRTC=TPC_PRTC;
```

```
COMM       "*** COMPATH AND XPRTC TO ACCESS D20 D22 THRU TRANSPAC ***";

CP         CP1 SUBSCRID=TPC1;
XPRTC      TPC_PRTC WINDOW=(5,5);

COMM       "*****************************************************************";
COMM       "*****************************************************************";
COMM       "*** SYSTEMS ACCESSIBLE THRU BOTH FIRST AND SECOND DN'S ***";
COMM       "*****************************************************************";
COMM       "*****************************************************************";

RSYSTEM DP78;
RSC        DP78 SCID=01:37 FNP=UNCP1;
RSC        DP78 SCID=01:37 FNP=UNCP2;

RSYSTEM HG78;
RSC        HG78 SCID=01:33 FNP=UNCP1;
RSC        HG78 SCID=01:33 FNP=UNCP2;

RSYSTEM DG66;
RSC        DG66 SCID=01:03 FNP=UNCP1;
RSC        DG66 SCID=01:03 FNP=UNCP2;

RSYSTEM HG66;
RSC        HG66 SCID=01:04 FNP=UNCP1;
RSC        HG66 SCID=01:04 FNP=UNCP2;

COMM       "*****************************************************************";
COMM       "*****************************************************************";
COMM       "************ SYSTEMS ACCESSIBLE THRU FIRST FEP ************";
COMM       "*****************************************************************";
COMM       "*****************************************************************";

RSYSTEM HGTA;
RSC        HGTA SCID=01:32 FNP=UNCP1;

RSYSTEM DGTA;
RSC        DGTA SCID=01:36 FNP=UNCP1;

COMM       "*****************************************************************";
COMM       "*****************************************************************";
COMM       "*********** SYSTEMS ACCESSIBLE THRU SECOND FEP **********";
COMM       "*****************************************************************";
COMM       "*****************************************************************";

RSYSTEM DPHX;
RSC        DPHX SCID=15:255 FNP=UNCP2;

RSYSTEM HPHX;
RSC        HPHX SCID=15:01 FNP=UNCP2;

RSYSTEM DTOR;
RSC        DTOR SCID=12:10 FNP=UNCP2;

RSYSTEM HTOR;
RSC        HTOR SCID=12:01 FNP=UNCP2;
```

```
COMM        "***********************************************************";
COMM        "***********************************************************";
COMM        "****************** MCS QUEUES: DECLARATION ****************";
COMM        "***********************************************************";
COMM        "***********************************************************";

GENQMON  COMQ APPLIB=PER.LIB APPABNUM=3;
QUEUE       DG64 V903 QCPOOL;
QUEUE       DE01 QCPOOL USERID;
QUEUE       DE02 QCPOOL USERID;
QUEUE       QIN QCPOOL INIT=PROGMCS;
QUEUE       QIN1 QCPOOL;
QUEUE       QIN2 QCPOOL;
QUEUE       T111 QCPOOL;
QUEUE       T112 QCPOOL;
QUEUE       T113 QCPOOL;
QUEUE       T141 OM=UN QCPOOL;
QUEUE       T142 QCPOOL;
QUEUE       T143 QCPOOL;
QUEUE       T144 QCPOOL;
QUEUE       T192 OM=UN;
QUEUE       T201 QCPOOL;
QUEUE       T211 QCPOOL;
QUEUE       T221 QCPOOL;
QUEUE       T231 QCPOOL;
QUEUE       T241 QCPOOL;
QUEUE       QSOR NUMREC=15000;
QUEUE       GENT NUMREC=15000;
```

****************** BTNS ENVIRONMENT ******************

LOCAL NETWORK

GENCOM NAME = RESO
DECLARED LINES = 9
DECLARED CLUSTER(S) = 0
DECLARED STATION(S) = 23
DECLARED TERMINAL(S) = 37

TRANSPAC NETWORK

SUBSCRIPTOR # 0
GENNET NAME :
ASSIGNED TC :
TRANSPAC ADDRESS =

SUBSCRIPTOR # 0
GENNET NAME :
ASSIGNED TC :
TRANSPAC ADDRESS =

SEGMENTS SIZE

BTNS TABLES = 9789 BYTES
OUTPUT B.P. = 51248 (100 UNITS OF 512 BYTES)
INPUT B.P. = 51248 (100 UNITS OF 512 BYTES)
TRANSPAC TABLES = 27088 BYTES

****************** FNPS ENVIRONMENT ******************

FEP # 1
SITE NAME : UNCP1
OUTPUT B.P. = 5120 (64 UNITS OF 80 BYTES)
INPUT B.P. = 5120 (64 UNITS OF 80 BYTES)

FEP # 2
SITE NAME : UNCP2
OUTPUT B.P. = 5120 (64 UNITS OF 80 BYTES)
INPUT B.P. = 5120 (64 UNITS OF 80 BYTES)

FNPS TABLES SIZE
TPM TABLES = 168 BYTES

****************** VCAM ENVIRONMENT *********************

TABLES SIZE

VCAM TABLES 1 = 4256 BYTES
VCAM TABLES 2 = 2858 BYTES

****************** MAM ENVIRONMENT *********************

DECLARED CORE QUEUE(S) = 18
CORE QUEUE POOL = 25600 BYTES

DECLARED DISK QUEUE(S) = 3
DISK QUEUE POOL = 0 BYTES

QUEUES FILE IS :
EFN =
MEDIA =
SIZE = 0 CYL.

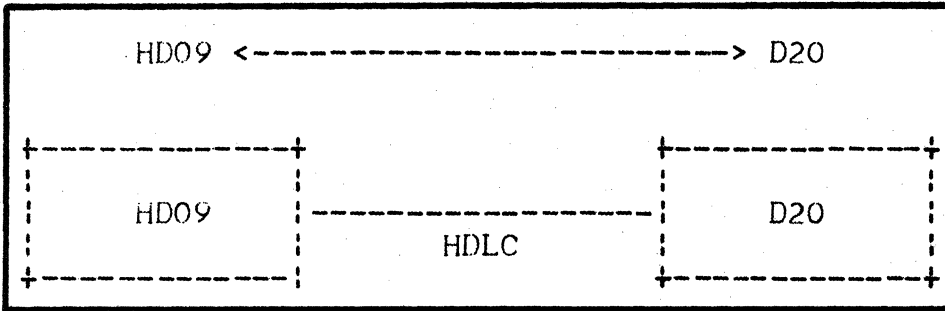MAM TABLES SIZE = 2439 BYTES
Q.M. TABLES SIZE = 3893 BYTES

****************** COMMON TABLES *********************

COMMON TABLES SIZE

SEMAPHORES SEGMENT = 7488 BYTES
DICTIONNARY SEGMENT = 3000 BYTES
IDSEQ SEGMENT = 165 BYTES

****

EXAMPLE 2:

● Primary network between 2 systems

● URP/DCC use.

Figure F-2. Primary Network via URPs between Two Systems


```
COMM     "========================================================";
COMM     "================== CNC HD09 ============================";
COMM     "========================================================";

GENCOM   ESS1, NBBTBF=65, BTBFSZ=256, NBDABF=65, DABFSZ=256;

COMM     "***************** HDLC LINE *******************";

LINE     LN01, UHDLCW=(7,7);
STATN    ST01, 1;
TERMNL   TT01, SWITCH, CPU;

LSYSTEM  HD09;
LSC      SCID=70:42, TS=D09_TS;
LTS      D09_TS, FLOWTH=60, SILENT=60, RETRY=3, TPUSZ=256,
         VERSION=00:00;

RSYSTEM  D20;
RSC      D20, SCID=70:44, TS=D20_TS;
RTS      D20_TS, NETROUTE=(NR_01), XCNT=20;

NR       NR_01, COMPATH=CP_01, XPRTC=PTPT;
COMPATH  CP_01, ACCESS=LN01, NETWORK=NATIVE_PT_TO_PT;
XPRTC    PTPT, UNITSZ=128, WINDOW=(14,14), LEVEL=FLOW_CONTROL;

COMM     "*************** END OF DESCRIPTION **************";
```

```
COMM      "**************************************************";
COMM      "*************** PRIVATE CNC D20 ****************";
COMM      "****** TEST BETWEEN D20 - D09 THRU URC'S *******";
COMM      "**************** BTNS <--> BTNS *****************";
COMM      "**************************************************";

GENCOM    ESS1, BTBFSZ=256, NBBTBF=65, DABFSZ=256, NBDABF=65;

COMM      "************** HDLC LINE TO HD09 ***************";

LINE      LN03, UHDLCW=(7,7), CLOSE;
STATN     S301, 1;
TERMNL    H301, HL64, CPU;

COMM      "*********** LINE TO SYNCHRONOUS VIP ************";

LINE      LN12;
STATN     SC10, 1;
TERMNL    VC10, VIP7001, KCT;

COMM      "*************** DECLARATION D20 ****************";

LSYSTEM   D20;
LSC       SCID=70:44, TS=LOOP;
LTS       LOOP, FLOWTH=10, SILENT=60, RETRY=3, TPUSZ=256;

COMM      "*************** DECLARATION HD09 ***************";

RSYSTEM   HD09, SC=HD09;
RSC       HD09, SCID=70:42, TS=HD09;
RTS       HD09, NR=HD09, XCNT=200;
NR        HD09, COMPATH=HD09;
COMPATH   HD09, ACCESS=LN03;
```
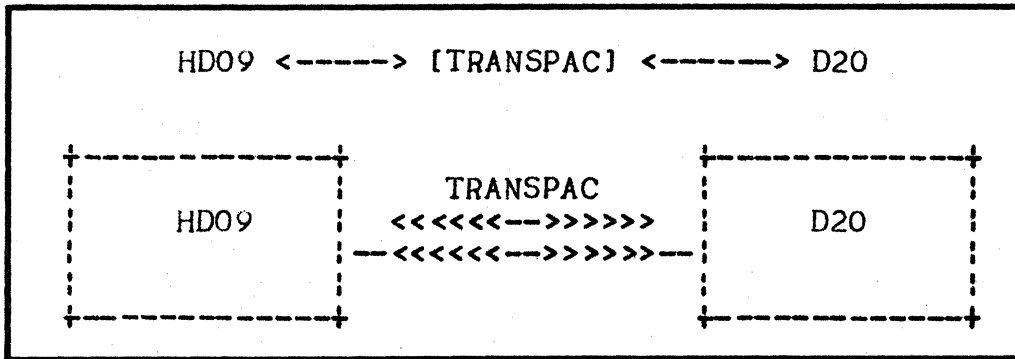
EXAMPLE 3

- Primary network between two systems

- Use of URPs

- Link via TRANSPAC.

Figure F-3. Primary Network between 2 Systems + URPs + TRANSPAC |

```
 ┌─────────────────────────────────────────────────────────────┐
 │                                                               │
 │      HDO9 <──────> [TRANSPAC] <──────> D20                     │
 │                                                               │
 │   +─────────────+          TRANSPAC      +─────────────+       │
 │   !             !      <<<<<<──>>>>>>     !             !       │
 │   !    HDO9     !    ──<<<<<<──>>>>>>──   !     D20     !       │
 │   !             !                         !             !       │
 │   +─────────────+                         +─────────────+       │
 │                                                               │
 └─────────────────────────────────────────────────────────────┘
```

```
COMM     " ===== ====== ====== ====== === ==== ===== === === ===";
COMM     " ====== ===== ===== === CNC HDO9 ===== ===== ===== ===";
COMM     " = ===== === === ===== ===== === == ===== ===== === ===";

GENCOM   ESSI, NBBTBF=65, BTBFSZ=256, NBDABF=65, DABFSZ=256;

COMM     "************** LINE HDLC TO HDO9 ***************";

LINE     LNOI, CLOSE, UHDLCW=(7,7);
STATN    STOI, I;
TERMNL   TTOI, SWITCH, CPU;

COMM     "****** DESCRIPTION TRANSPAC SUBSCRIPTION ********";

LSUB     ATPC, LNOI, TPCADD="175000039", SLINE=6, PCV=ABAB, PKSIZE=32,
         WINDOW=I;
```

```
COMM     "*** ** ** ** ** ** ** ** ** *** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **";
COMM     "** ** ** ** ** PRIMARY NETWORK DECLARATION ** ** ** ** ** ** **";
COMM     "** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** **";

LSYSTEM  HD09;
LSC      SCID=70:42, TS=D09_TS;
LTS      D09_TS, FLOWTH=10, SILENT=60, RETRY=3, TPUSZ=256,
         VERSION=00:00;

RSYSTEM  D20;
RSC      D20, SCID=70:44, TS=D20_TS;
RTS      D20_TS, NETROUTE=(NR-CV1), XCNT=200,
         ADDR=(TRANSPAC="175000040");
NR       NR-CV1, COMPATH=CP_01, XPRTC=PRTCA;
COMPATH  CP_01, SUBSCRID=ATPC, NETWORK=TRANSPAC;
XPRTC    PRTCA, UNITSZ=1024, WINDOW=(7,7), LEVEL=FLOW_CONTROL;

COMM     "** ** ** ** ** ** ** ** END OF DESCRIPTION ** ** ** ** ** ** ** ** **";
```

```
COMM      "****************************************";
COMM      "**************** PRIVATE CNC D20 ****************";
COMM      "**** TEST BETWEEN HD09 - D20 THROUGH TRANSPAC ****";
COMM      "**************** BTNS <---> BTNS ****************";
COMM      "****************************************";

GENCOM    HDLC, BTBFSZ=256, NBBTBF=65, DABFSZ=256, NBDABF=65;

COMM      "************* LINE HDLC TO HD09 ***************";

LINE      LN08, UHDLCW=(7,7), CLOSE;
STATN     S801, 1;
TERMNL    H801, HL64, CPU;

COMM      "************ LINE TO SWITCHED NETWORK ************";

LINE      LN11, SPEED=H, TOLEN=255, ERCAP;
TERMNL    TT11, TN300, KPR;

COMM      "************* LINE TO SYNCHRONOUS VIP ************";

LINE      LN12;
STATN     SC10, 1;
TERMNL    VC10, VIP7001, KCT;

COMM      "******* DESCRIPTION TRANSPAC SUBSCRIPTION ********";

LSUB      ATFC, LN08, TPCADD="175000040", SLINE=6, PCV=AABB,
          PKSIZE=128, WINDOW=3;

COMM      "**************** DECLARATION D20 ***************";

LSYSTEM   D20;
LSC       SCID=70:44, TS=D20_TS;
LTS       D20_TS, FLOWTH=10, SILENT=60, RETRY=3, TPUSZ=256;

COMM      "*************** DECLARATION HD09 ****************";

RSYSTEM   HD09, SC=HD09;
RSC       HD09, SCID=70:42, TS=HD09_TS;
RTS       HD09_TS, NR=NR_CV1, ADDR=(TRANSPAC="175000039"), XCNT=200;
NR        NR_CV1, COMPATH=CP_01, XPRTC=PRTCA;
COMPATH   CP_01, SUBSCRID=ATPC, NETWORK=TRANSPAC;
XPRTC     PRTCA, UNITSZ=1024, WINDOW=(7,7), LEVEL=FLOW_CONTROL;
```

F.16

APPENDIX G

PRIMARY NETWORK COMMANDS
RELATIONSHIPS BETWEEN DPS7 AND OTHER SYSTEMS

A DSA network is never configured "globally", but separately for each system to form a part of the network.

Network configuration on the DPS7 describes both the:

- DPS7, itself

- DPS7's "local" view of those remote systems in the network with which it requires to communicate.

The possibility exists, therefore, that problems could arise from discrepancies between the various systems comprising the overall network. This is all the more likely in that DSA allows a wide range of different possible systems to be connected - e.g., DPS8, DPS7, DPS6, DN7100 - each of which has its own set of configuration commands.

This appendix provides the relationships between DPS7 commands and those of other systems to which it may be connected via DSA.

Figure G-1: DPS7 Host to Remote DPS6/DSA Link (Example)
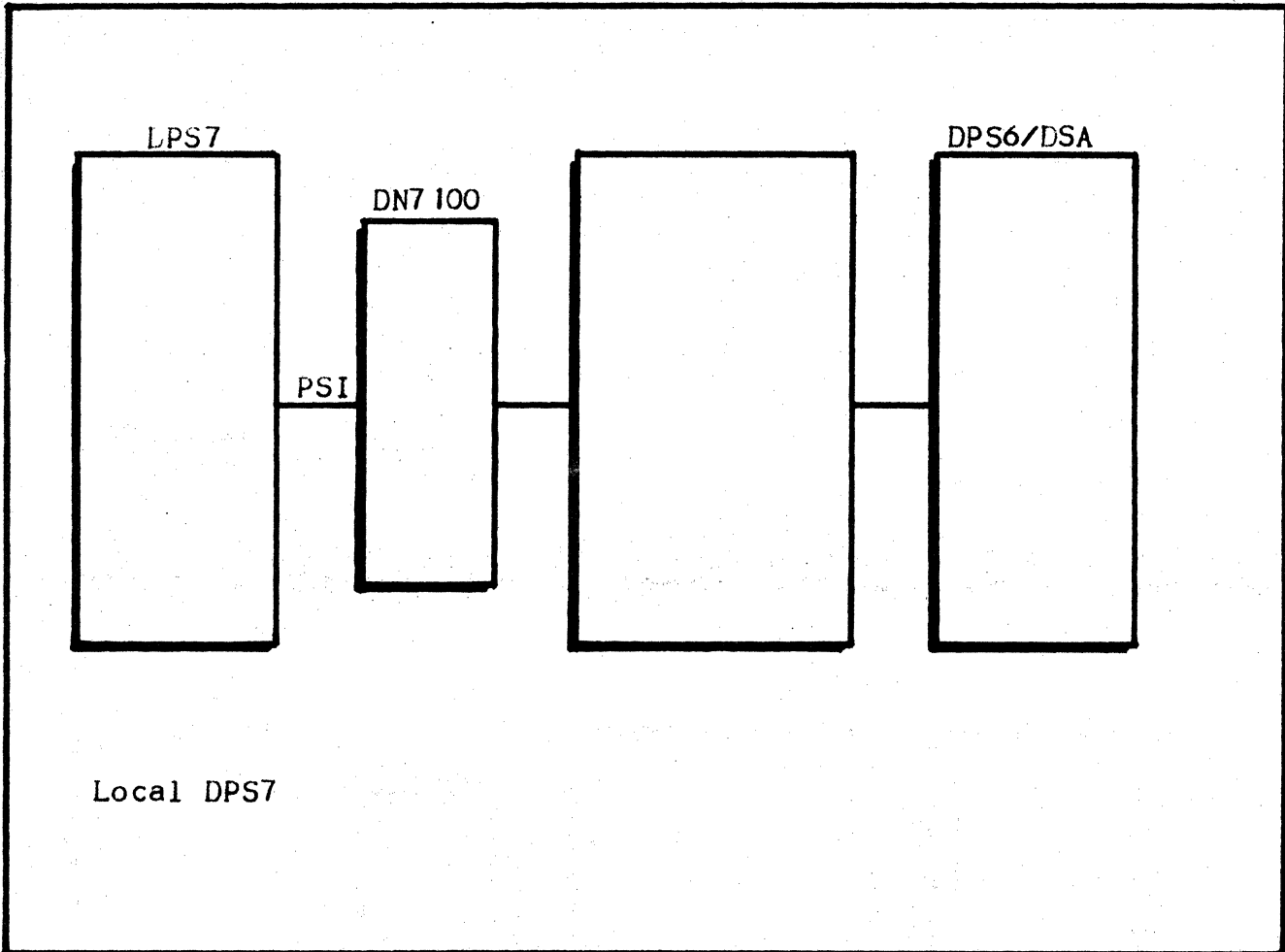
DPS7 to Local DN7100 FEP Link

Figure G-2: DPS7 to Local DN7100 FEP

Local DPS7		Corresponding Object Description on Front-End DN7100			Relationship
Command	Argument	Directive	Type	Argument	
LSYSTEM	lsys-name	–	–		Must be identical to DN7100 ND RMT name
LSC	SCID=a:b	ND	RMT	-ADDRa:b name	Must be the same Must be the same as local DPS7's lsc-name (which is identical to local lsys-name)
FSYSTEM	fsys-name	EX	–		Must be identical to ND LOC name
FSC	fsc-name SCID=a:b	ND "	loc "	name -ADDRa:b	Must be the same Must be the same
FNP	INLCNB=n0 MODE=n1				Definition of logical channels; these parameters
		-->CT " TS	PSI " L64	-LMCH v1 -MXMH v2 -RCH v3	must be coherent with each other: see reference manuals
	TIMER=t	TS	L64	-T3 v	t and v must be compatible; t in seconds, v in tenths of seconds. Same convention (0) to suppress watch dog

Figure G-3: DPS7 Link to Remote DPS6/DSA

Local DPS7		Corresponding Object Description on Remote DPS6		Relationship
Command	Argument	Directive	Argument	
LSYSTEM	lsys-name	-	-	Must be identical to remote DPS6 rsc-name
LSC	SCID=a:b	RSC	scid rsc-name	Must be the same Must be the same as local DPS7 lsc-name which is identical to local DPS7 lsys-name
RSYSTEM	rsys-name	NODE		
RSC	rsc-name SCID=a:b	SC	sc-name scid	Must be the same Must be the same

DPS7 Linked to a Remote DPS7 Via a Point-to-point HDLC Link

Figure G-4: DPS7 Linked to Remote DPS7 (Point-to-point HDLC)
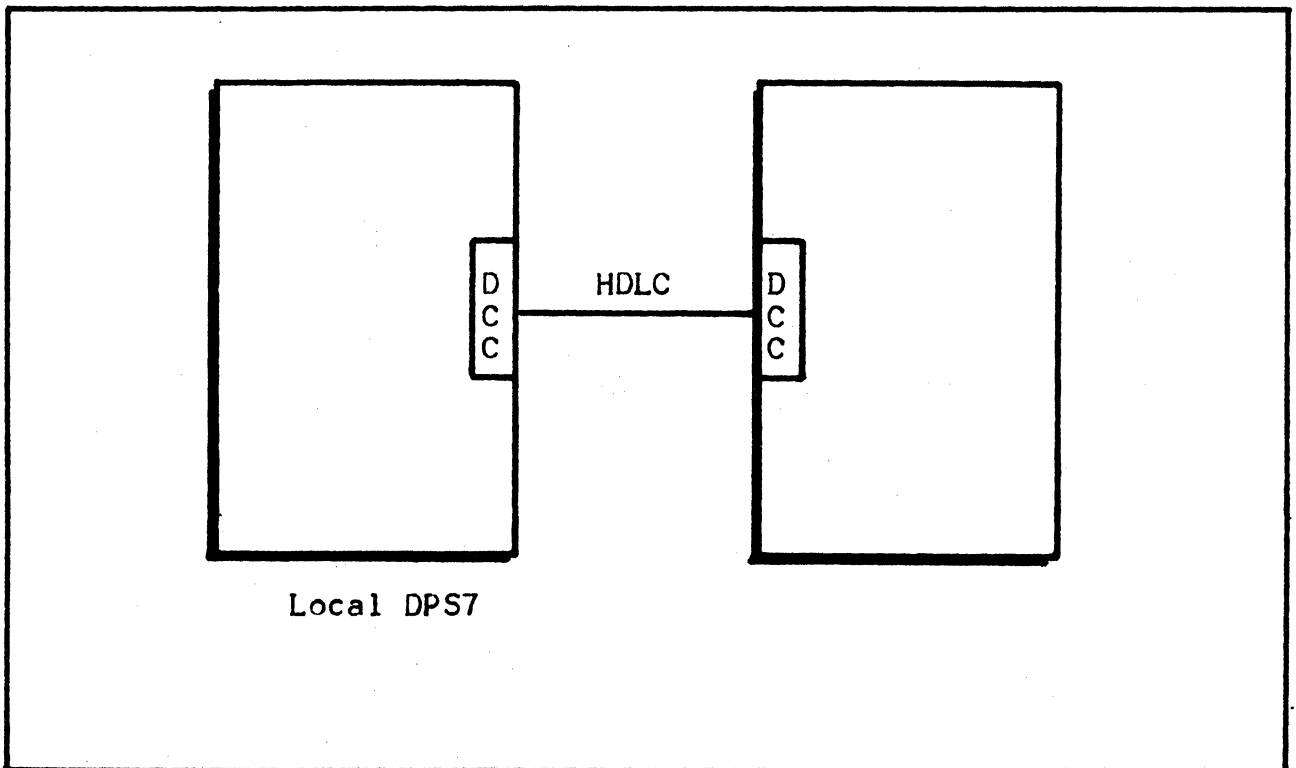
Local DPS7

Figure G-5: DPS7 - DPS7 Relationships

Local DPS7		Corresponding Object Description on Remote DPS7		Relationship
Command	Argument	Command	Argument	
LSYSTEM	lsys-name PROFILE=pf	RSYSTEM	rsys-name PROFILE=pf	Must be the same Must be the same
LSC		RSC	rsc-name	Must be identical to rsys-name
	SCID=a:b TS=lts-name		SCID=a:b TS=rts-name	Must be the same No name relationship; TS name is local
LTS	lts-name	RTS	rts-name	No name relationship; TS name is local
	FLOWTH=v1			Must be equal to remote DPS7's LTS FLOWTH parameter value
	SILENT=v2			Must be equal to remote DPS7's LTS SILENT parameter value
RSYSTEM	rsys-name PROFILE=pf	LSYSTEM	lsys-name PROFILE=pf	Must be the same Must be the same
RSC	rsc-name SCID=a:b TS=rts-name	LSC	lsc-name SCID=a:b TS=lts-name	Must be the same Must be the same No name relationship; TS name is local
RTS	rts-name	LTS	lts-name	No name relationship; TS name is local
			FLOWTH=v1	Must be equal to local DPS7 LTS FLOWTH parameter value
			SILENT=v2	Must be equal to local DPS7 LTS SILENT parameter value

Figure G-6:
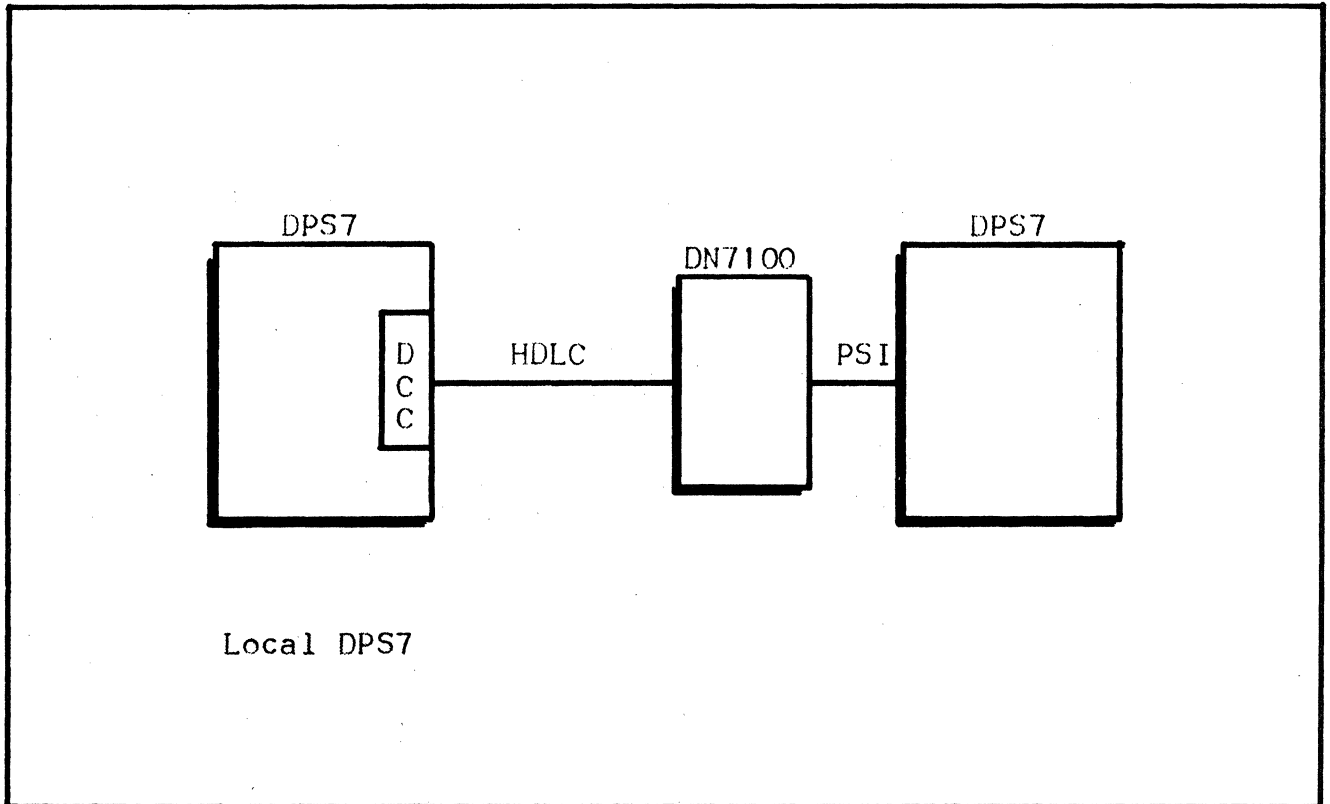DPS7 Linked to Remote DPS7 via DN7100 (Point-to-point HDLC)

Local DPS7

Figure G-7: DPS7 - DN7100 - DPS7 Relationships

Local DPS7		Corresponding Object Description on Remote DPS7		Relationship
Command	Argument	Command	Argument	
LSYSTEM	lsys-name PROFILE=pf	RSYSTEM	rsys-name PROFILE=pf	Must be the same Must be the same
LSC		RSC	rsc-name	Must be the same as local DPS7 lsc-name which is identical to local DPS7's lsys-name
	SCID=a:b		SCID=a:b	Must be the same

Local DPS7		Corresponding Object Description on Remote DN7100			Relationship
		Direc-tive	Type		
LSC	TS=lts-name				TS corresponds to Remote DN7100 TS (DSA) object
LTS	lts-name	TS	DSA	name	No name relationship; ts-name is local
	FLOWTH=v1 SILENT=v2 RETRY=r			-t1 v1 -t2 v2 -RTRY r	Must be the same * Must be the same * Must be the same *
RTS	rts-name XCNT	EX		-TSCNX	XCNT $\leq$ TSCNX
LINE	name speed	LL PL	HDLC HDLC	llname plname -SPD	Must be equal

Note that:

● GCOS NR object --> DNS PA HDLC object

● GCOS COMPATH object has no DNS equivalent.

● Where Relationship is marked with "*": same default value but different units; i.e.:

  ● Seconds for DPS7

  ● Tenths of seconds for DNS.

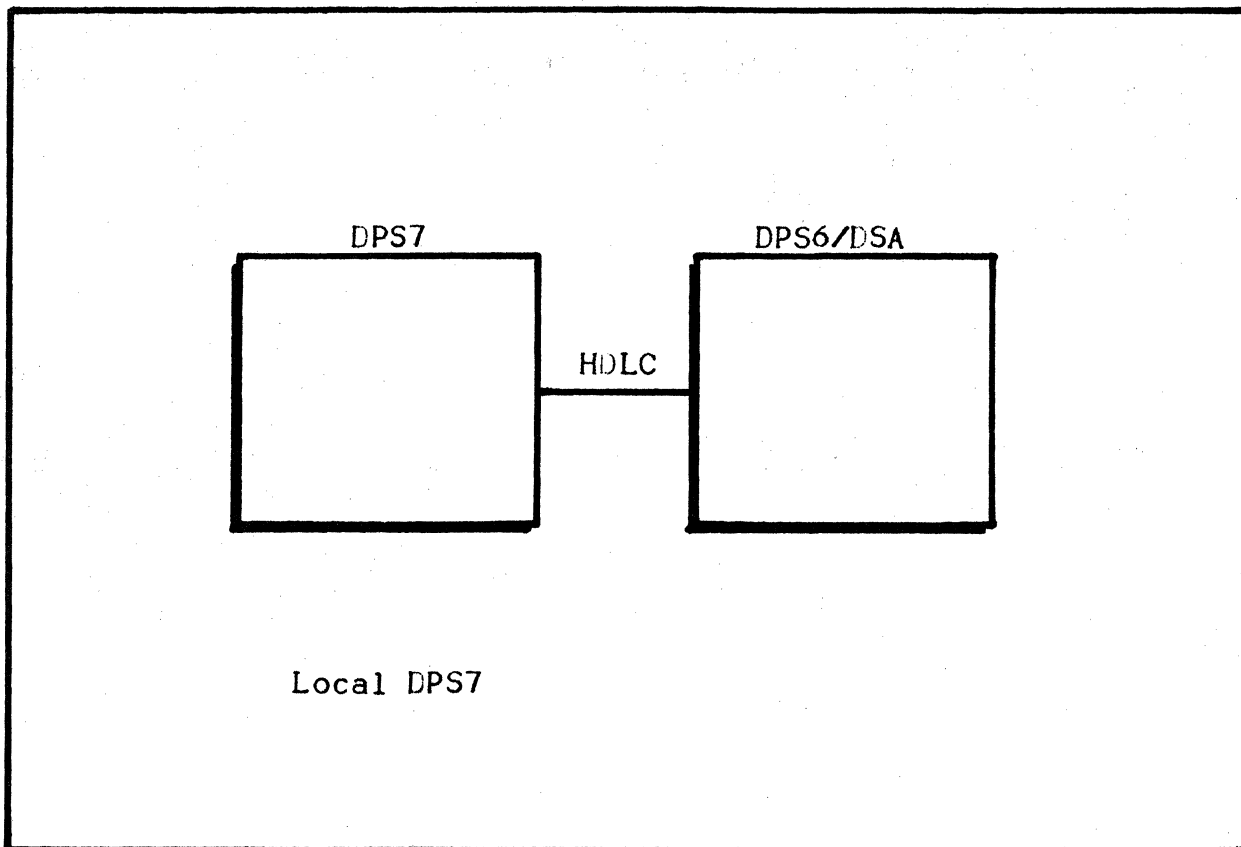Figure G-8: DPS7 Linked to DPS6/DSA (Point-to-point HDLC)

Figure G-9: DPS7 - DPS6/DSA Relationships

Local DPS7		Corresponding Object Description on Remote DPS6		Relationship
Command	Argument	Directive	Argument	
LSYSTEM	lsys-name	-	-	Must be identical to remote DPS6's rsc-name
LSC	SCID=a≡b	RSC	scid rsc-name ts-name	Must be the same Must be the same as local DPS7 lsc-name which is identical to local DPS7's lsys-name Corresponds to local DPS7's LTS
LTS	lts-name FLOWTH=v1 SILENT=v2 RETRY=r	RTS	rts-name t1 t2	No name relationship; TS name is local FLOWTH=t1 (same default=10s) SILENT=t2 (same default=60s) Must be the same as remote DPS6's TS retry parameter
RSYSTEM	rsys-name	NODE		-
RSC	rsc-name SCID=a≡b TS=rts-name	SC	sc-name scid	Must be the same Must be the same Corresponds to remote DPS6's ts-name
RTS	rts-name XCNT=x	TS	ts-name lc-lim retry	No name relationship; ts-name is local lc-lim > x Must be the same as local DPS7's LTS RETRY parameter
LINE	name SPEED=s	LLHB	 llspeed	 Must be equal

Notes:

- GCOS NR object --> DPS6/DSA PALL object

- GCOS COMPATH object has no DPS6/DSA equivalent; line
  identification is specified directly in the PALL definition.

APPENDIX H

CNC PRIMARY NETWORK COMMANDS

COMPATIBILITY WITH PREVIOUS RELEASES

The NODE command, from previous releases, is still supported. It is nevertheless strongly recommended that the user replace all occurrences of NODE in his job descriptions, at the earliest opportunity, with the appropriate new commands; i.e., LSYSTEM, RSYSTEM, LSC, FSC and RSC.

Each occurrence of NODE is flagged with a warning; see error CN78. Any mix of NODE with the new commands:

● Is flagged

● Leads to an abort, with error CN77.

Figure H-1: Inter-release Equivalents

Previous Release Commands	Current Release Commands
NODE a, LOCAL, b;	LSYSTEM a; LSC SCID = b;
FNP f1, ... ; (0)	FNP f1, ... ; (same command)
NODE c, FNP, c ; (1)	FSYSTEM c; FSC c, SCID = c, FNP = f1;
NODE e, RMT, f; (2)	RSYSTEM e, SC = e; RSC e, SCID = f, FNP = f1;

Notes:

(1) had to follow (0), and (2) had to follow (1). In the current release, there are no sequencing constraints between the commands LSYSTEM, FSYSTEM, RSYSTEM, LSC, FSC and RSC.

- SCID is expressed differently, between old and new commands; e.g., "0D1F" becomes "13:31".

APPENDIX I

THE H_SVSRST UTILITY

FUNCTIONALITY

This utility saves an image of the GCOS site's SRST, onto a UFAS disk
sequential file.

This file may be used as input to execution of the CNC utility
running in simulation mode, optionally on another system if required:
refer to page 3-8.

INVOKING H_SVSRST

    RUN SAVE_SRST (library-name, DVC=devclass, MD=volume-name)
        VL = (efn, DVC=devclass, MD=volume-name), FORCE = (Y!N) ;

efn   external file name of the file to be created

DVC   definition of the volume on which the "efn" resides
MD

FORCE "Y" means that the first step deallocates the file, if it
        already exists, before preallocating it.

SAVE_SRST JCL

```
VALUES     SRST_FILE, MD=K183, DVC=MS/M452, FORCE=Y;
JUMP       FORCE&FORCE;
FORCEY:
FORCEYES:
DEALLOC    &1, DVC=&DVC, MD=&MD;
FORCEN:
FORCENO:
PREALLOC   &1, FILESTAT=UNCAT, UFAS=(SEQ=(CISIZE=2100, RECSIZE=512,
           RECFORM=V)), DVC=&DVC, GLOBAL=(MEDIA=&MD), SIZE=1);
STEP       H_SVSRST (SYS.HLMLIB), DUMP=DATA;
ASSIGN     H_SRST, &1, FILESTAT=UNCAT, DVC=&DVC, MD=&MD;
ENDSTEP;
```

UTILITY REPORT

The report carries a standard SYSOUT banner, which indicates either:

- Successful (i.e., error-free) execution

- Any errors that may have been found, together with the appropriate message(s).

Figure I-1: Example H_SVSRST Banner

```
*******************************************************************
*******************************************************************
**** GCOS L64
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