CNBS 7-A1 NGL

Reference Manual

DPS7000/XTA
NOVASCALE 7000

Communications: CNS

REFERENCE
39 A2 40DM 01

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Trademarks and Acknowledgements

Preface

This manual describes how to configure and generate the Communications Network Software (CNS7), independently of an associated Bull DPS7000 host.

In normal operation, generation uses the CNS7 automatic generation facility, FPG7. However, this manual also provides an in depth description of the startup and generation procedures for more complex systems than can be generated by the automatic generation facility.

This manual is for Data Processing Managers, System Engineers, Network Designers and Network Administrators with experience in configuring and managing systems operating in the Bull Distributed Systems Architecture (DSA) environment. It is assumed that any reader is familiar with DSA "objects" used for configuration and the systems operation in a DSA network.

The following manual directory contains a list of publications which may also be helpful in understanding the functions of configuration and generation described in this manual.

The manual has the following structure:

Section 1	A general introduction to DSA and CNS7.
Section 2	Describes the conceptual aspects of the Distributed Systems Architecture and introduces DSA "Objects".
Section 3	Describes the configuration file and the methods of declaring the basic directives required to configure CNS. A configuration example is shown.
Section 4	Describes the configuration of administrative functions.
Section 5	Describes the Node Generation Language (NGL) and each configuration and generation directive constituting NGL.
Section 6	Describes the startup and generation procedures.
Appendix A	Describes the Dynamic Network Extension facility.
Appendix B	The SYSGEN IMA File.

MANUAL DIRECTORY

The Bull publications listed below constitute the reference manual set for CNS7.

BULL software reference manuals are periodically updated to support enhancements and improvements to the software.

Contact the BULL representative for information concerning the availability of software and the supporting documentation, as these provide specialized services.

Reference Number ..... Manual Title

39 A2 40DM ..... CNS7 A1 NGL Reference Manual
39 A2 41DM ..... CNS7 A1 Operator Guide
39 A2 42DM ..... CNS7 A1 Documentation Directory
39 A2 43DM ..... CNS7 A1 Terminal Management Reference Guide
39 A2 44DM ..... CNS7 A1 In- & On- Line Tests Operator Guide
39 A2 46DM ..... FPG7 User's Guide

The following publications provide additional information:

39 A2 8849 ..... DSA Network Administration Guide
39 A2 8932 ..... DSA Network Configuration Guide
39 A4 9725 ..... DSA Concepts
39 A2 9922 ..... DSA Network Operator's Handbook
39 A2 9925 ..... ISO/DSA Specification 1.0
39 A2 9693 ..... DSA Log File Messages
39 A2 26DM ..... OSI/DSA Network Systems Messages & Return Codes
47 A2 30UC ..... GCOS 7 Network Overview and Generation
47 A2 31UC ..... GCOS 7 Network Operations

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1. Overview

1.1 INTRODUCTION

This manual provides an overview of CNS7 and presents the procedures and directives required for the startup and generation, covering:

- architecture
- configuration
- node generation language
- startup and generation.

1.2 ARCHITECTURE

CNS7 provides communications over many types of link, for example, dedicated lines, switched telephone networks or X.25 public networks. It allows Bull DPS7000 systems to access applications in other host processors and allows terminals to access applications running on the Bull DPS7000 system running CNS7.

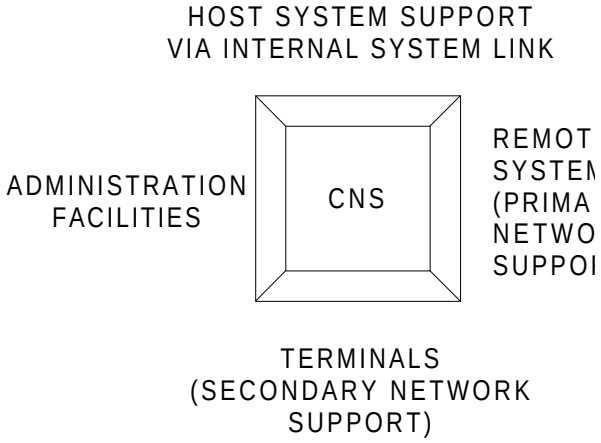


Figure 1-1. The Elements That Communicate Via CNS7

The functions of CNS7 are as follows:

- as a front-end processor, CNS7 provides the interface between a Bull DPS7000 host and a primary and/or secondary network
- as a switch, CNS7 routes messages in the primary network.

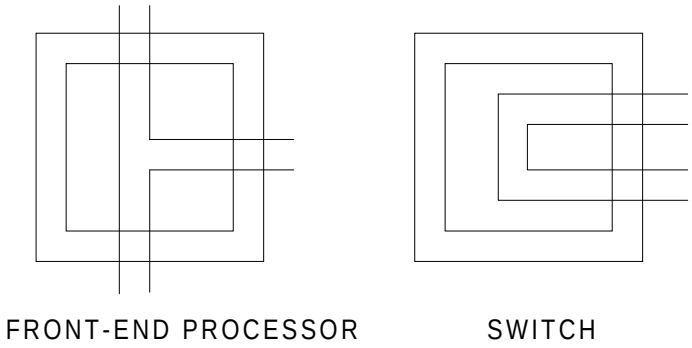


Figure 1-2. The Functions of CNS7

Also, CNS7 contains administration facilities which support, monitor and control network operations.

1.2.1 The Primary Network

A primary network is a group of one or more systems interconnected by an ISO/DSA network. This part of the network supports data transfers between remote systems. CNS7 also supports local area networks based on ISO 8802.3 protocols.

1.2.2 The Secondary Network

A secondary network is a group of terminals connected to a system and supported by the Terminal Manager. Information is exchanged across a secondary network by means of physical links and between processes located in the same system. Terminals may access the primary network via the Terminal Manager.

1.2.3 D.S.A.C. Distributed Systems Administration and Control

Distributed Systems Administration and Control is the collective name for all components, languages, data formats and protocols which provide control and administration support for the network, for systems within the network and for distributed applications.

The administrative functions are distributed among the network components and cover:

- loading network systems
- dumping of systems locally from the host or remotely via an HDLC line or Bull Establishment Network cable
- monitoring the network
- matching system parameters to network characteristics
- logging information for statistical, accounting and maintenance purposes
- in-line tests
- software generation.

NOTE: The TELELOAD function is supported by any system running under DNS (Bull Datanet, Bull CpNet) but not CNS7.

The Network Control and Administrative facilities for CNS7 are provided by:

- NGL Node Generation Language (see section 5 of this manual)
- NCL Network Control Language (see the Bull Publication, CNS7 System Operations)
- NOI Network Operator Interface (see section 4 of this manual)
- NAD Node Administrator (see section 4 of this manual)
- ASF Administrative Storage Facility (see section 4 of this manual).

2. Architecture

2.1 GENERAL

A network is a set of components connected together by communication links. The components can be hardware or software. Computer processors, communications processors and telephone lines are examples of hardware components. Routing and operating systems are examples of software components. A system requires data about the hardware and software components with which it communicates. This data is subject to a set of protocols defined by DSA.

To describe the network, a hardware or software component **(described as objects)** are **mapped** to another component. Mapping can be:

- on a **one to one** basis, one object is related to one other object
- on a **one to many** basis, several objects are related to one object.

2.1.1 Objects

Objects are described in the Bull Publication, The DSA Network Configuration Guide, which is recommended as prerequisite reading. This section lists the objects which may be declared in CNS7, and shows how they relate one to another.

The following tables show the full set of types of objects existing for each family (or class) of object.

Table 2-1. CNS OBJECTS (1/3)

FAMILY/CLASS	MNEMONIC	OBJECT TYPE DESCRIPTION	OBJECT TYPE NAME	COMPONENT CATEGORY
Administrative Correspondent	AC	Administ. Storage Facility Node Administrator Network Control Center Network Operator Interface	ASF NAD NCC NOI	Administrative Image
Administrative Function	AF	Node Administrator Network Operator InterfaceSystem Generator	NAD NOI SYSG	Administrative Proper
Administrative Group	AG	Administ. Storage Facility Node Administrator Network Control Center Network Operator Interface Operator	ASF NAD NCC NOI OP	Administrative Image
Cable	CB	Local area network	LAN 1	Routing
Connection Descriptor	CD	Terminal Management	TMG	Descriptor
Cluster	CL	X25 VIP X25 3270	TGX VIP X25 3270	Administrative Proper
Correspondent	CO	Terminal Management	TMG	Addressing
Controller	CT	Communications Communications Communications Communications E-LAN or ISL	DCA DCBE DCE MLNA RLNA	Proper " " " "
Device Pool	DP	Terminal Management	TMG	Addressing
Device	DV	Asynchronous Minitel/Videotex Packet Assembly-Desass TGX VIP 2780 3270	ASY MNTL PAD TGX VIP 2780 3270	Addressing " " " " " "
Device Connection	DX	Mapped onto a DV of the same type	ASY MNTL PAD TGX VIP 2780 3270	Connection object " " " " " "
Filter	FL	Input Output	IN OUT	Administrative Proper
Logical Connection	LC	Mapped onto SC/SR same type	DSA ISO LOC	Connection object " "
Logical Device	LD	Terminal Management	TMG	Addressing Proper

Table 2-1. CNS OBJECTS (2/3)

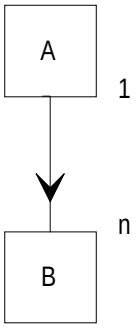
FAMILY/CLASS	MNEMONIC	OBJECT TYPE DESCRIPTION	OBJECT TYPE NAME	COMPONENT CATEGORY
Link Connection	LK	Mapped onto an LL or DV of same type	ASY ASYV BDL MTPT SLV VIP 2780 3270	Connection object " " " "
Logical Line	LL	Asynchronous Videotex HDLC Multipoint HDLC Proper Multipoint HDLC Image VIP BSC 2780 BSC 3270	ASY ASYV BDL MTPT SLV VIP 2780 3270	Addressing " " " " " " "
Login Descripto	LN	Terminal Management	TMG	Descriptor
Logical Device Connection	LX	Mapped onto an LD of the same type	TMG	Connection object
Mailbox	MB	Debug Station Terminal Management User	DBG STAT TMG USER	Addressing Proper " "
Model	MD	Asynchronous Videotex/mintel TGX VIP BSC 2780	ASY MNTL TGX VIP 2780	Descriptor " " " "
Network Connection	NC	Mapped between TS of LOC type and other TS (or CL) whose type it takes	DSA DIWS TGX X25	Connection object " " "
Network Route	NR	HDLC Local Area Network PAD over E-LAN PAD Permament X25 PAD for LAN (gateway) Switched X25 Private Switch	HDLC LAN 1 LPAD PAD PER SLAN SW SX25	Routing " " " " " " "
Network Subscription	NS	HDLC Remote X25	HDLC RMT X25	ProperImage Proper
Network User	NU	Local X25 network	LOC X25	Proper Image
Operator	OP	Operator	OP	Administrative Proper

Table 2-1. CNS OBJECTS (3/3)

FAMILY/CLASS	MNEMONIC	OBJECT TYPE DESCRIPTION	OBJECT TYPE NAME	COMPONENT CATEGORY
Physical Connection	PC	Mapped onto the PL of the same type	ASY HDLC SYN CSMA	Connection object " "
Physical Line	PL	Asynchronus Local area network proper Local area network image HDLC Synchronous X.21	ASY CSMA CSM1 HDLC SYN X21	Addressing " " " "
Statistic Block	SB	All Controllers All Session Controls All Logical lines except 3270, VIP3270, VIP logical lines DSA transport stations All other transport stations All physical lines except SYN SYN physical lines All session routes All Network Subscriptions	SBCT SBCL SBLH SBLS SBN1 SBN2 SBPH SBPS SBPR SBV1	Administrative Proper
Session Control	SC	"Banalized" equiment Local Remote	EQU LOC RMT	Image ProperImage
Terminal Station	SN	Terminal Management	TMG	Addressing Proper
Session Route	SR	"Banalized" DSA ISO	BAN DSA ISO	Routing " "
Station Connection	SX	Mapped onto SN of the same type	TMG	Connection object
System	SY			
Transport Connection	TC	Mapped onto TS, of the same type (DSA, DIWS, TGX, X25)	TC object	Connection
IN-line test	TL	Tests	TL	Maint.
Transport Station	TS	DSA/ISO Workstation DSA Local Private Switch	DIWS DSA LOC SX25	Image Image Proper Image
Terminal Unit	TU	Asynchronous PAD TGX VIP	ASY PAD TGX VIP	Addressing Proper
Mailbox Extension	TX	Terminal Management	TMG	Addressing
User Descriptor	UD	Terminal Management	TMG	Descriptor
Virtual Circuit	VC	Mapped onto NS same type	X25	Connections object

2.2 MAPPING DIAGRAMS

The rest of this section shows the relationship between objects and how one is "mapped" to another. The following symbols are used:



This represents the principle that when an object A is declared, one of its parameters will be the map to B. A is therefore mapped onto B, and B is mapped from A. In this case a list of Bs may be declared in one A.

An image object is always shown in lower case.

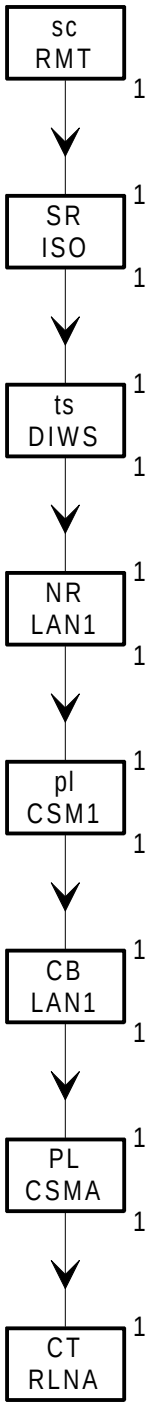


Figure 2-1. Declaration of ISL to Local DPS7000 Host

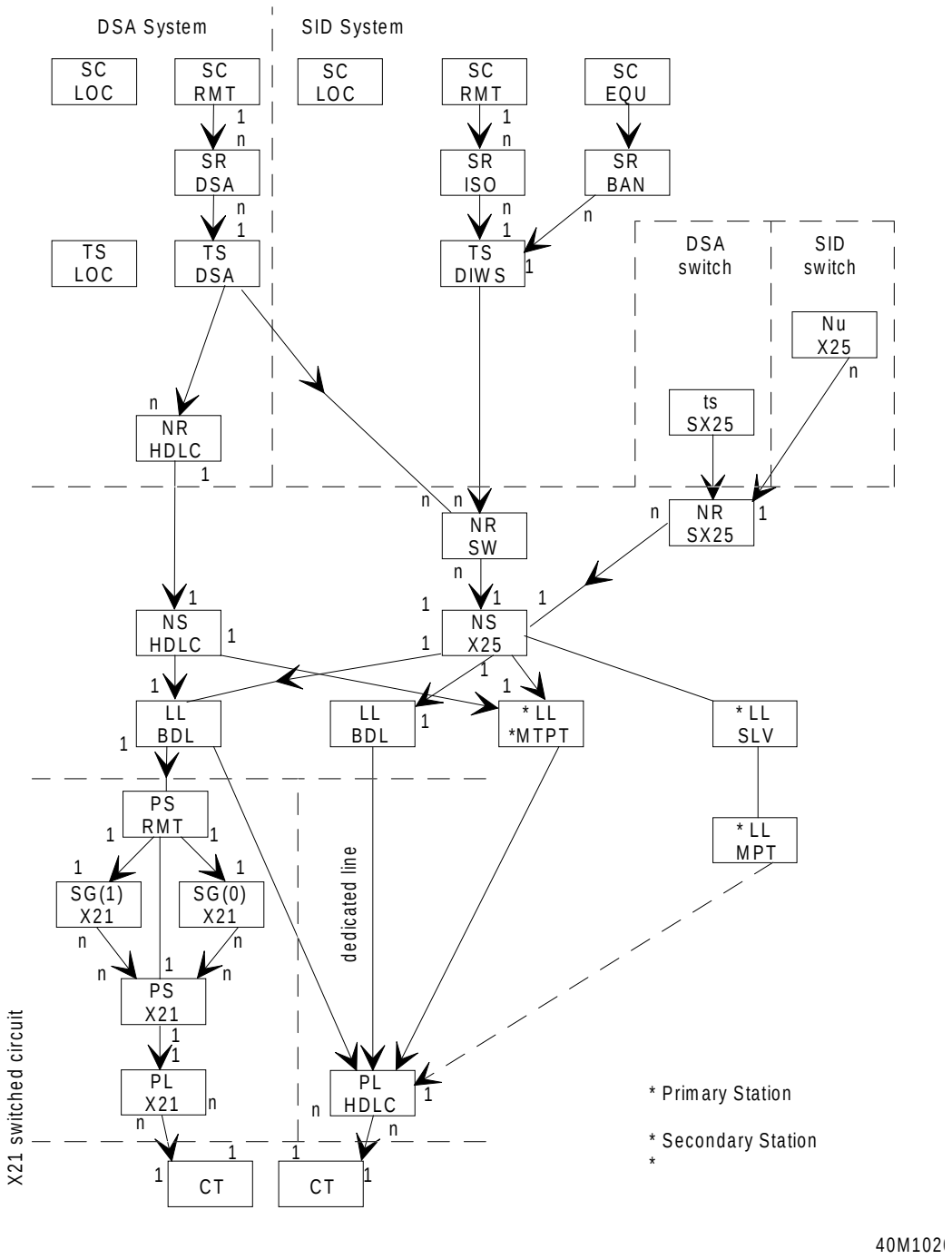


Figure 2-2. Object Mappings In A Primary Network Wide Area Network Connections

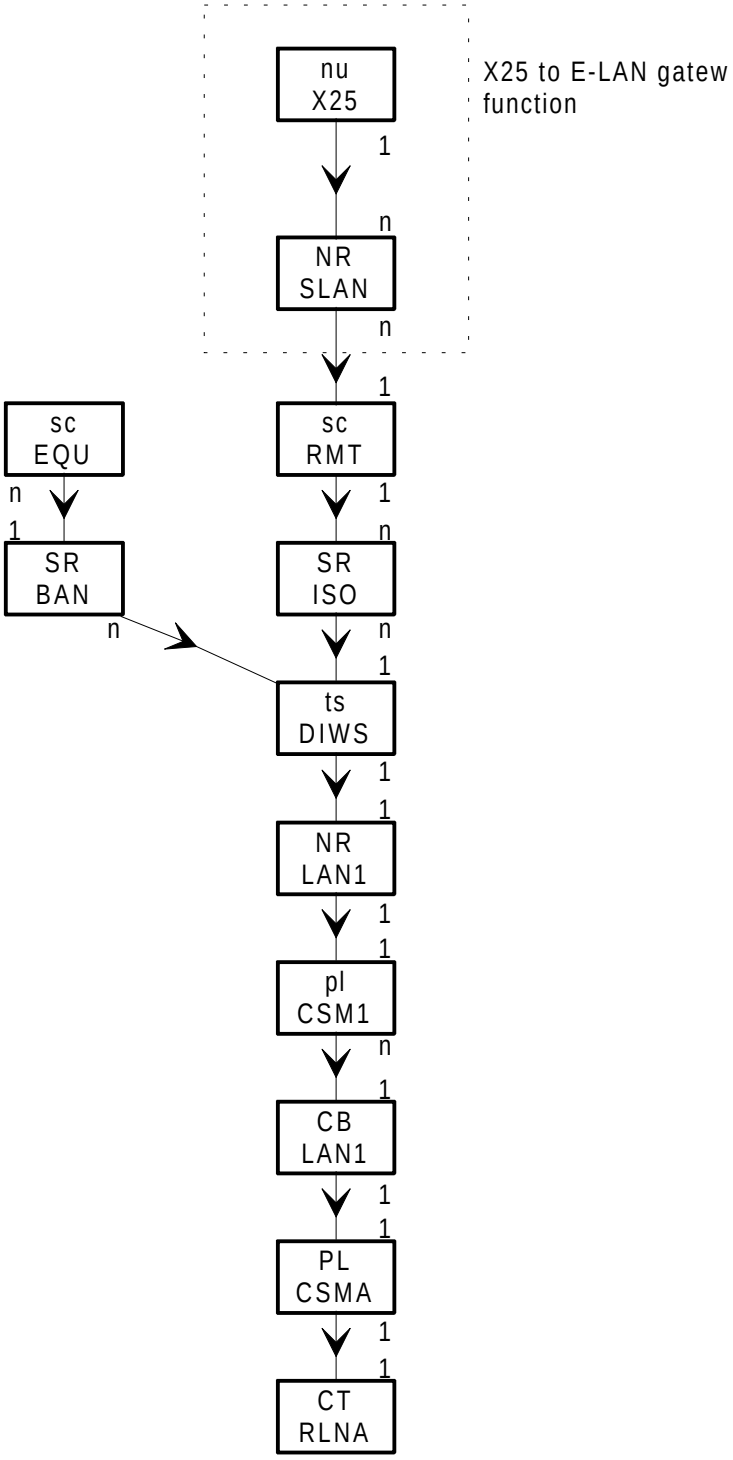


Figure 2-3. Object Mappings In A Primary Network Bull Establishement Network Connections

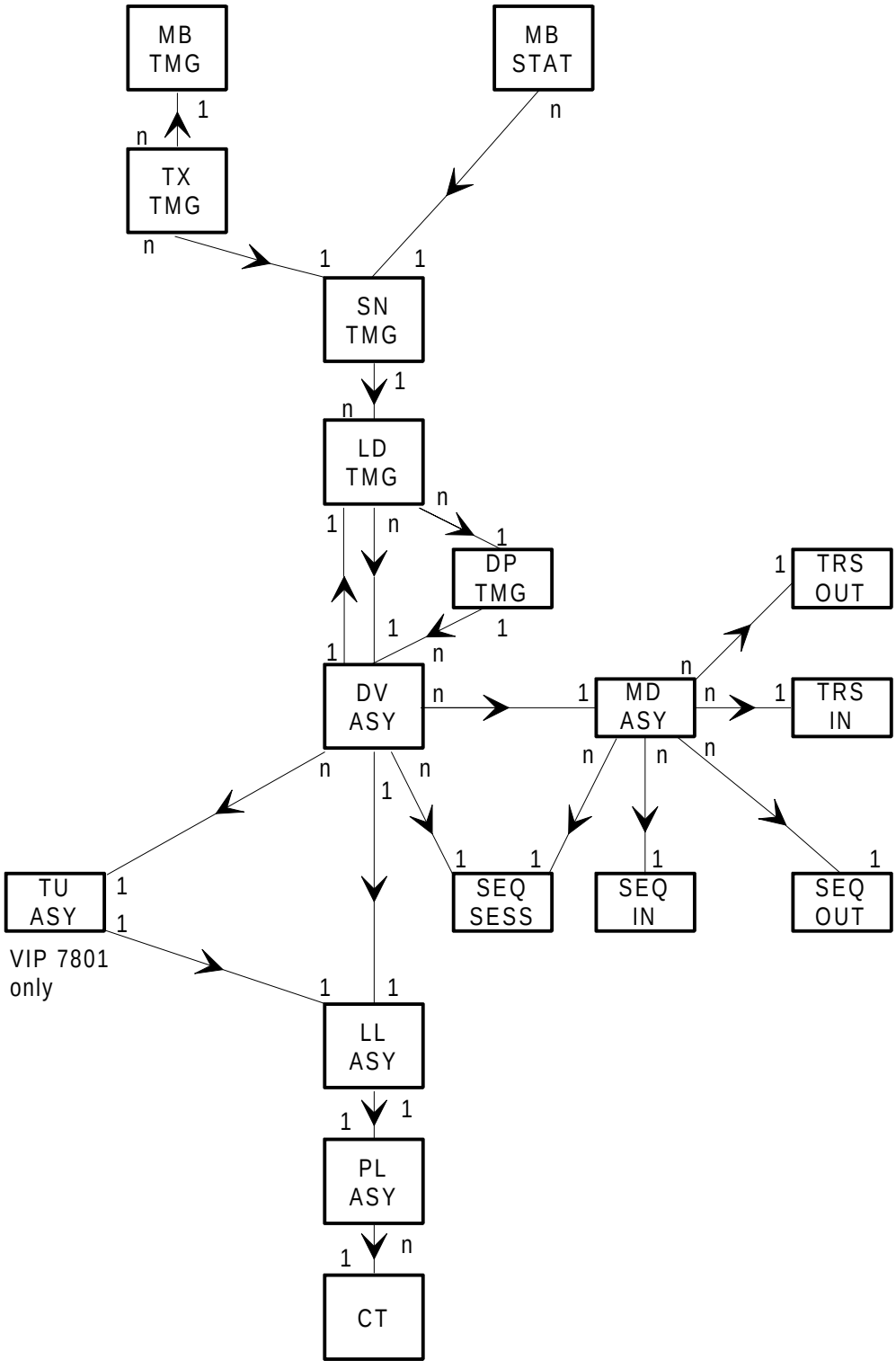


Figure 2-4. Object Mapping for Asynchronous Devices

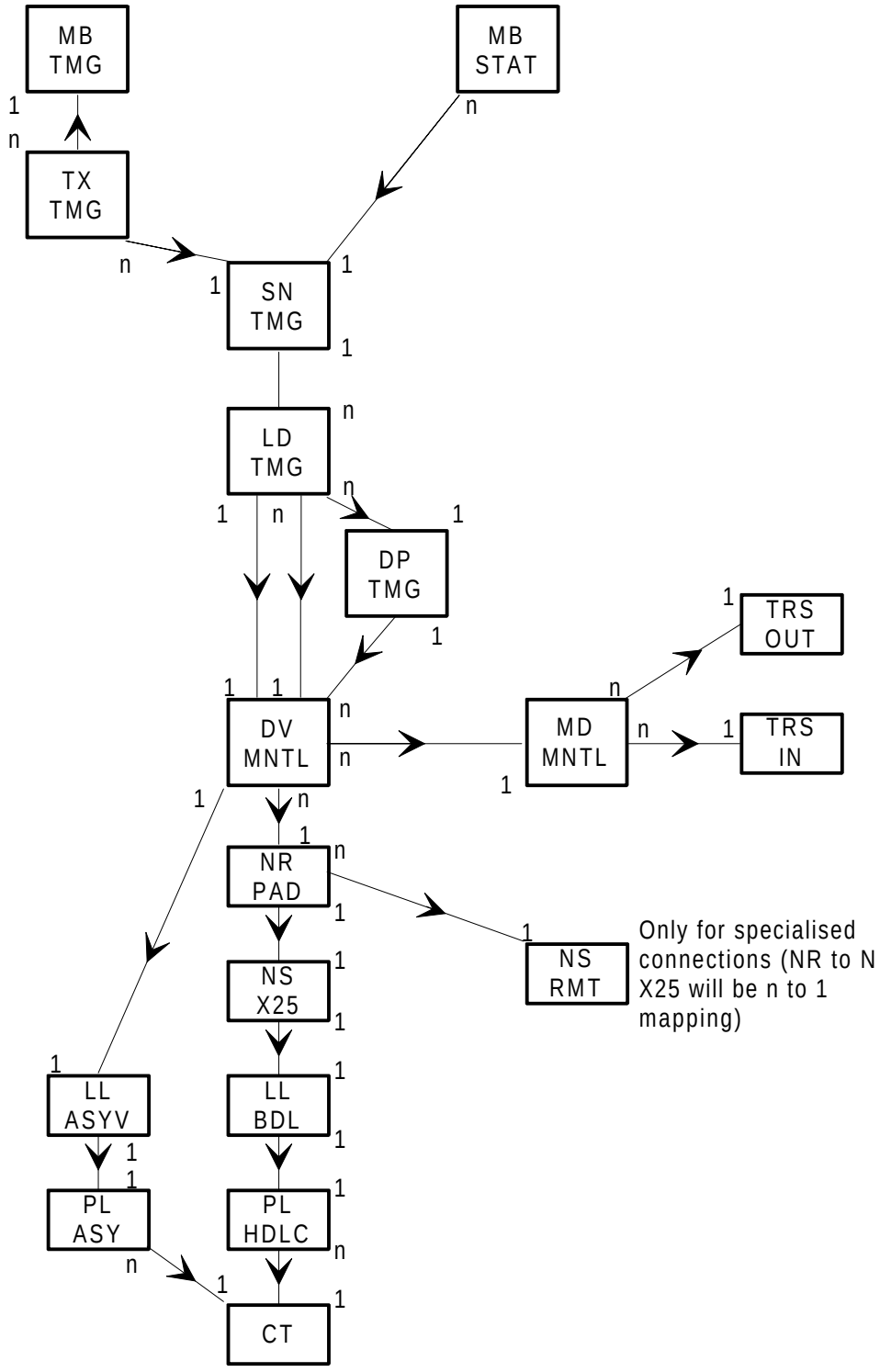


Figure 2-5. Object Mapping For MNTL Devices.

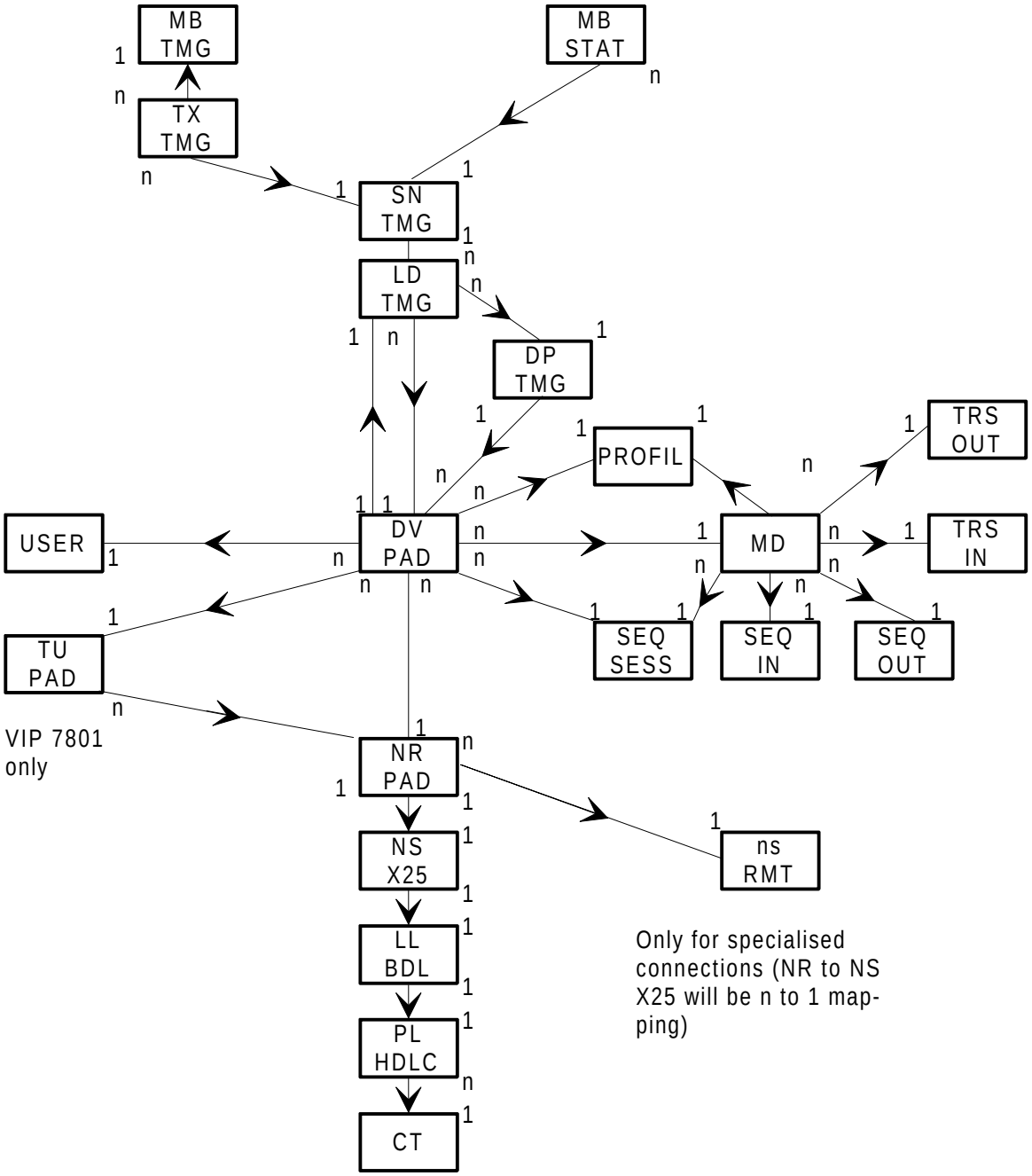


Figure 2-6. Object Mapping For PAD Devices.

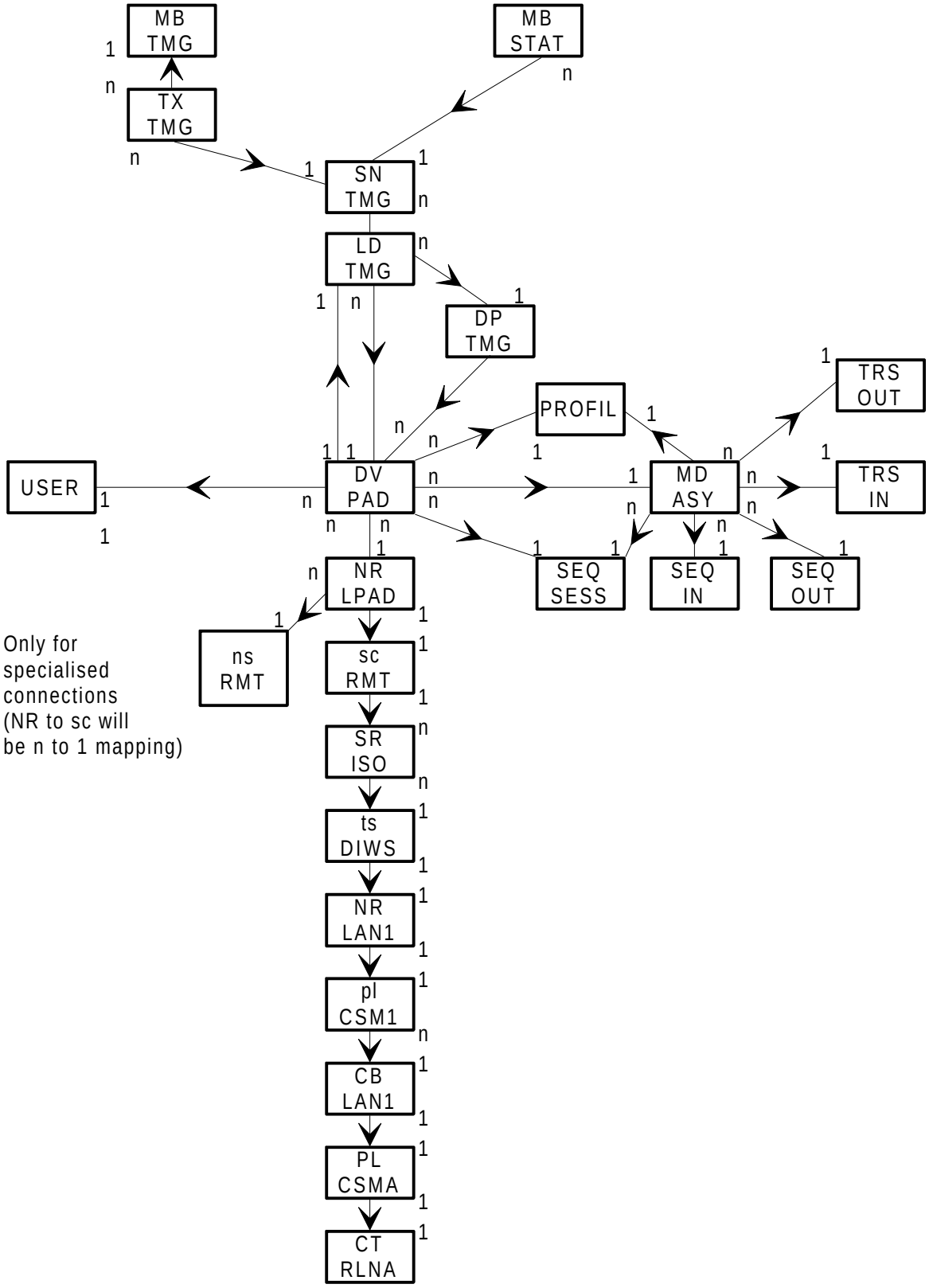


Figure 2-7. Object Mapping For PAD Device Handler On LAN

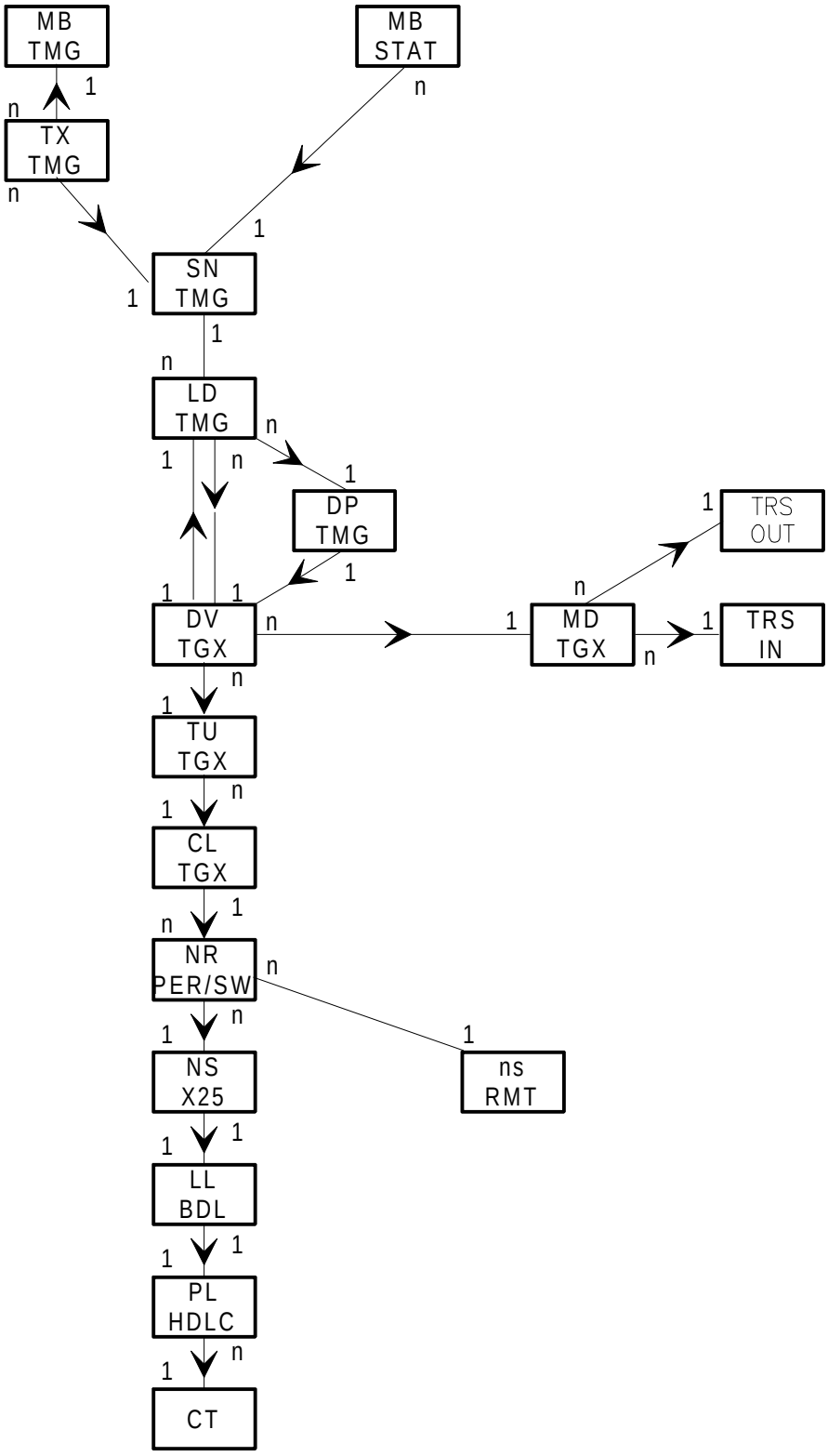


Figure 2-8. Object Mapping For TGX Devices.

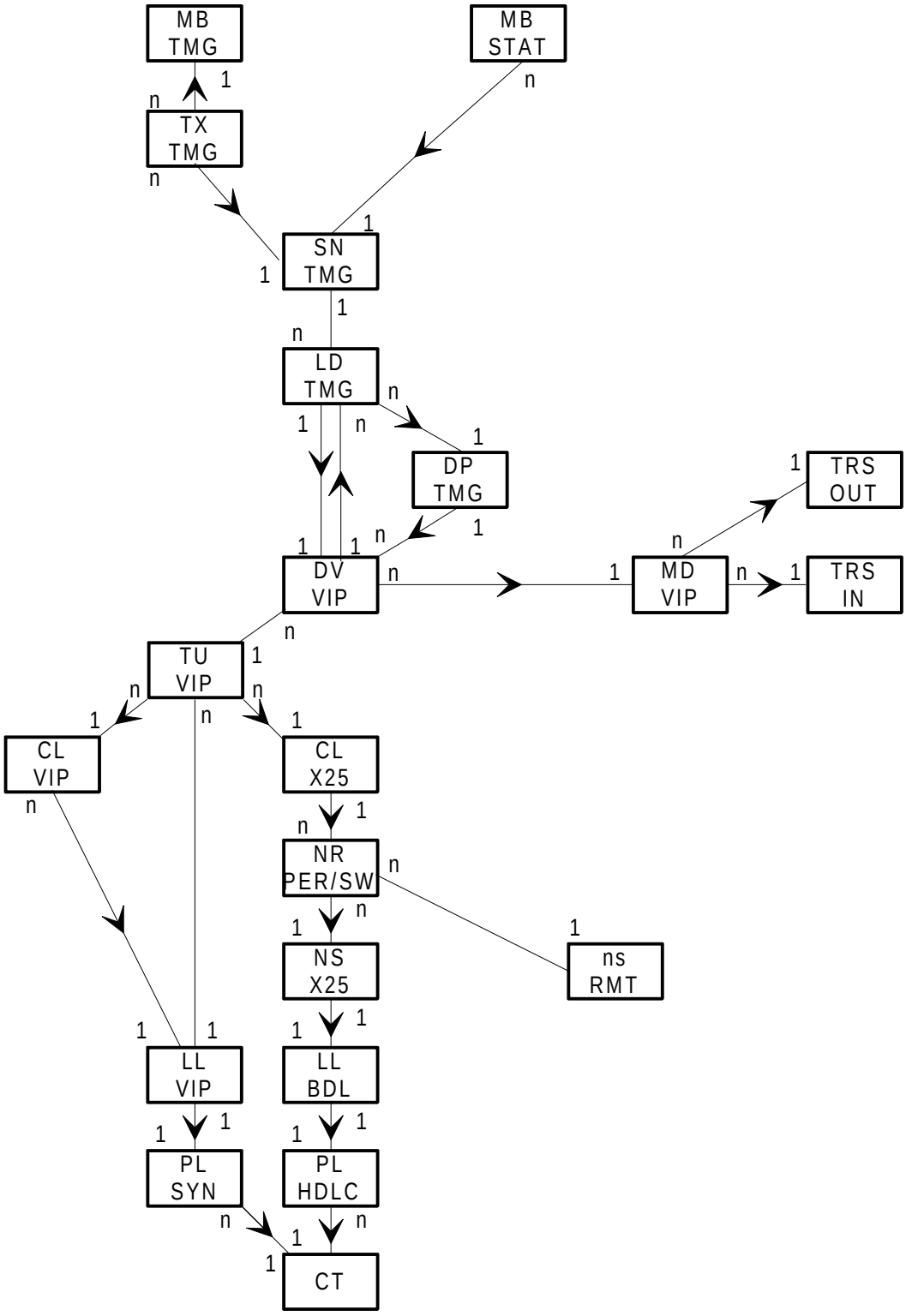


Figure 2-9. Object Mapping For VIP Devices.

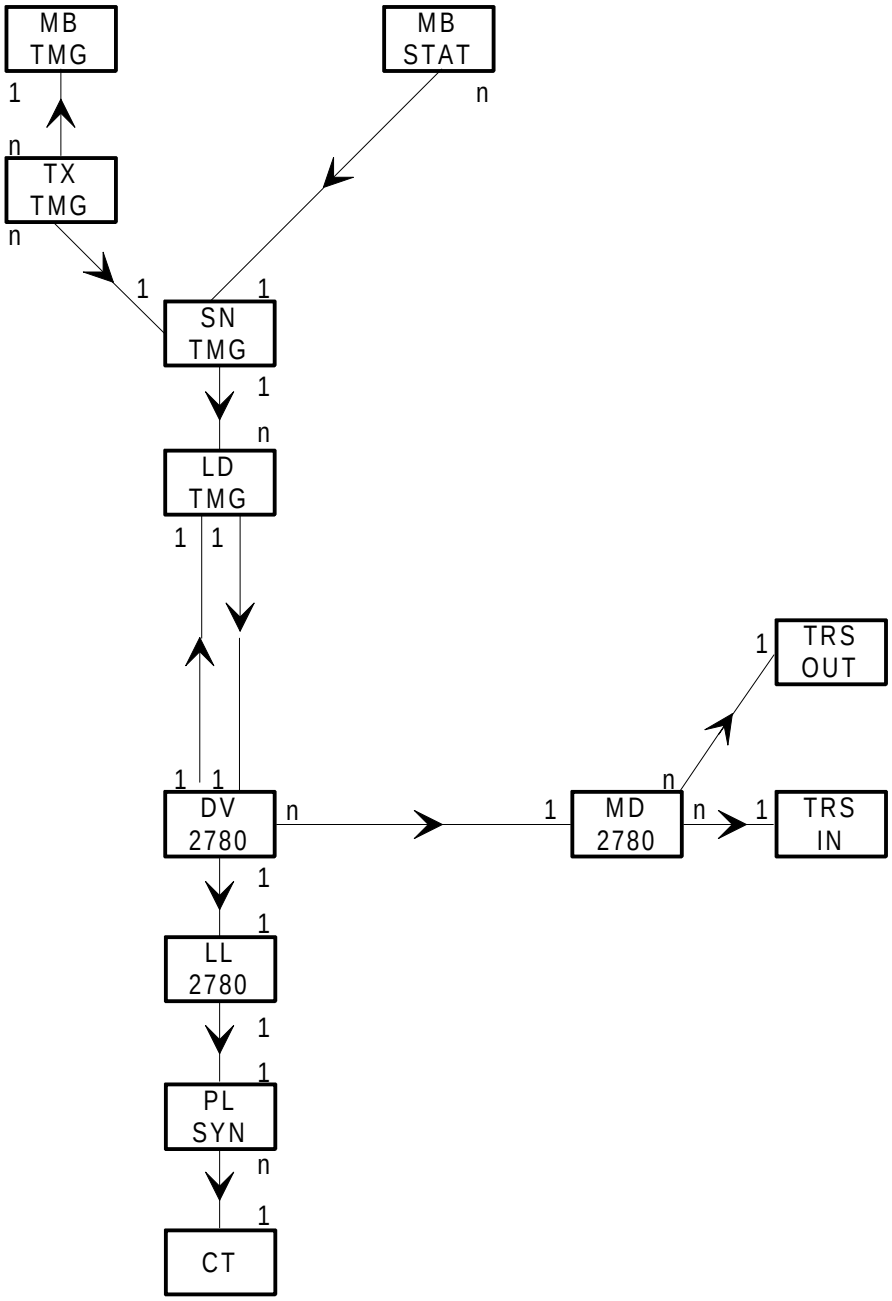


Figure 2-10. Object Mapping For 2700/3700 Devices.

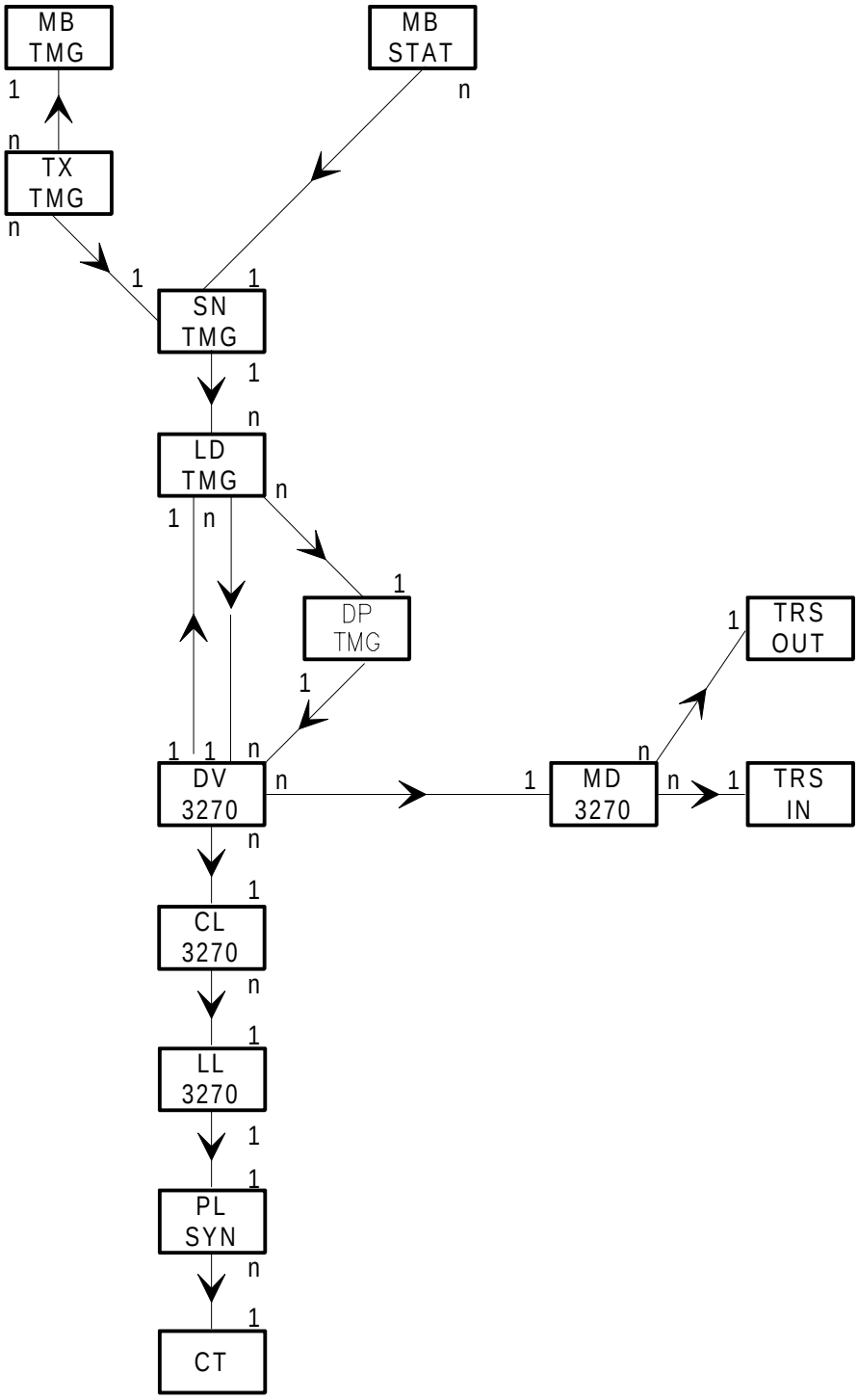
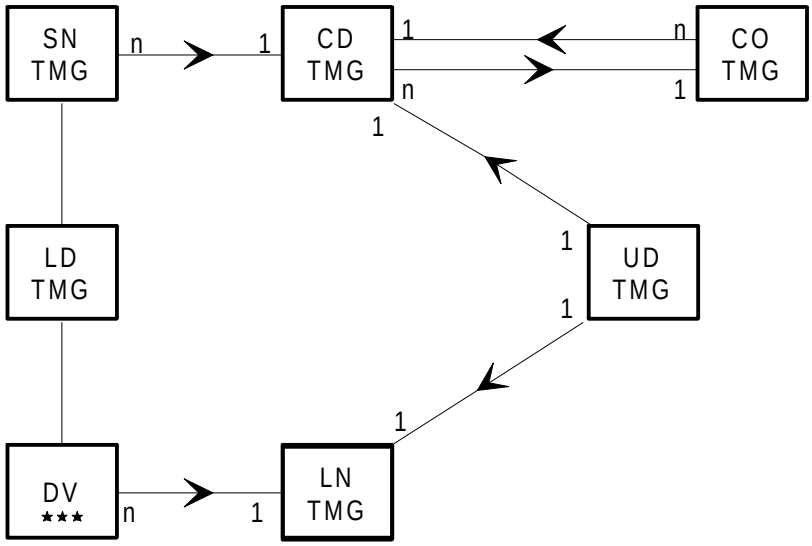


Figure 2-11. Object Mapping For 2780/3780



*** the value depends on the type of device

Figure 2-12. Object mappings For Security Parameters

NOTE: This is the general case for this mapping.

3. The Generation File Basic Requirements And Methodology

3.1 INTRODUCTION

This section gives general guidelines about what to do before a system builder generates the system software and network configuration.

The preliminary actions are described in stages aimed at helping the system builder to:

- organise the network;
- create the generation file;
- describe the hardware configuration and the user-available functions using NGL directives in the generation file.

Finally, to show the method, a real example of a network configuration and corresponding generation is provided

3.2 GENERATION

The generation is performed using a generation file. This file will contain generation directives which describe the networking environment (the systems and their interconnections) and the permitted resources. The directives represent static logical and physical DSA objects and their mappings (the relationships between objects).

3.3 METHODOLOGY

To simplify the generation, it is suggested that the following steps be carried out:

1. Define at which level a remote system interfaces, with your own. For further information, see the *DSA Network Configuration Guide.*

2. For the connection and use of terminals with CNS, see the *CNS* Terminal *Management Reference manual.*

3. Document all details about your system's physical configuration. For example, the physical links, line speeds and terminal characteristics.

4. Draw the network (or possible variants) illustrating the network systems, the various intersystem links and terminals connected. This is useful when a mixture of communication line types is used (e.g., X.25 public data network connections, private X.25 network connections, local area network connections, etc.).

5. Define your system's visibility of the network in terms of computers, terminals and applications and their interconnections. Administrative facilities must also be taken into account.

6. Create the generation file on the Bull DPS 7000 host. This is done using the FPG7 generation facility (see *FPG7 User's Guide*).

   For information on the directory name and the files used for generation from the Bull DPS7000, see "Generation File Structure" later in this Section. For further details see the GCOS 7 Network Operations manual.

7. To modify or add to the file which FPG7 has created, you can use either:

   - FSE (Full Screen Editor)

     or

   - EDIT

     to declare directives as described by the present manual. The use of either depends on the software in use. For example, modifications may be required for:

   - non standard device models ;

   - administrative filters (FL);

   - backup possibilities ;

   - use of some non-default values ;

   - non-standard LANG or other files.

3.4 CNS GENERATION FILE STRUCTURE

The generation file must have the following structure:

- CNS <sysgen_identif> -EOS <unbundling string> (note that the <unbundling string> is supplied with the software).

  The CNS directive is mandatory. It must be the first directive declared in the generation file.

- FILE DECLARATIONS must be done if the files required have names which are different from the default.

  Default names are :

```
DIR     BLIB
LKFL    SLIBCHXMOD
TBFL    BLIBYTABLE
PATCH1  SLIBPATCH1
PATCH2  SLIBPATCH2
TMP     TEMP
```

- LANG <language name> -MESFIL <messages file name> -KEYFIL <keywords file name>

- Object declaration

  For further details on how to arrange the objects for the network organization, see Declaring the Objects, below.

- END <options>

  The END directive is mandatory. It is the last directive of any generation file and is used to define where the generation is to be saved.

For information regarding where to find the file in which the absolute memory image will be stored, refer to the *GCOS 7 Network* Operations manual.

3.5 NODE GENERATION LANGUAGE

The Node Generation Language (NGL) of CNS consists of a set of directives. Each directive is used to define one object and to assign explicit or default values to their attributes. The general syntax of a directive is:

```
<directive-name> <object-name> <object-type> <list-of-attributes>
```

Directive names are identical to the family names of the objects which they configure. Each directive starts with two mandatory positional parameters (i.e., name and type of object). These are followed by other attribute values, introduced by keywords. The keywords can be entered in any order. The attribute list depends on the object type.

In addition to the directives defining each object, there is also a set of directives which define the configuration.

General configuration directives and object generation directives are summarized and shown in detail in the following paragraph. Configuration examples are also shown.

Two objects of the same family must have different names. Also, CB, LL and PL objects must not have the same names.

3.5.1 Symbols Used

The following symbols are used in the commands:

UPPER CASE CHARACTERS	Reserved word or symbol
lower case characters	Symbolic name or value
Brackets [ ]	Optional parameter
Braces {}	An enclosed entry must be selected.
Brackets and braces [{}]	None or one parameter is entered (separated by |), the default parameter is underlined.
Parentheses	(min,max) default. Indicate minimum, maximum and default values. If no values are specified, values between 0 and 32767 are assumed.
Underlining ___	Indicates the default parameter
Vertical bar |	Separates a list of parameters for choice

3.5.2 Parameter Values

For the commands, the parameter values are as follows:

v	Decimal or hexadecimal values will be accepted. Hexadecimal is represented by X'v' (e.g., X'2F'). If there is no specific indication, a value can be between 0 and 32767 or X'7FFF'.
addr	The physical address. It may be entered either as a decimal or a hexadecimal value. If hexadecimal, the format X'addr' is used. Leading zeroes are accepted.
id-code	A hardware identifier which is entered as a string of 4 characters.
name	A user-defined alphanumeric string (including _ and $) of 1 to 4 characters. If less than 4 characters are entered, trailing blanks are added by the system. This string may be from 1 to 8 characters for the following: - Connection Descriptor (CD) - Correspondent (CO) - Logon Descriptor (LN) - Mailbox (MB) - Model (MD) - User Descriptor (UD)
string	A user-defined alphanumeric string (including _ and $). If less than the maximum number of characters are entered, trailing blanks are added by the system.
v1 : v2	A network address which entered as decimal or hexadecimal values.

3.5.3 Multiline Directives

Directives can be continued across multiple lines or records. To indicate continuation, enter the ampersand (&) as the last character of the line. The end of the directive is indicated by the absence of the ampersand.

3.5.4 Multi-Directive Line

It is possible to have more than one directive per line provided each directive is separated by a semi-colon (;).

3.5.5 Mapping

Mapping is a relation which exists between two objects. In some directives the name of an object to which another object is mapped is introduced by a keyword. When this keyword and the associated object names are optional, the described object will be generated with the status ENBL if no mapping is given.

MAP1 indicates the first mapping (or first mapped object),
MAP2 refers to the second mapping (or second mapped object).

3.5.6 Comment Lines

Comments may be introduced into a generation file by initiating a record with the characters '&*' (ampersand asterisk) or '&b' (ampersand space). A record initiated with '&' and not followed by '*' or 'b' (space) will result in a syntax error message.

Table 3-1. General Directives

Directive	Function
CNS	Provides a description of the system.
DIR	Defines directories used during system generation.
LKFT	Defines the name of a separate file containing LINK directives.
TBFL	Defines the table file.
PATCH1	Describes the first patch file.
TMP	Defines directories of temporary used during system generation.
LANG	Defines the language used.
LINK	Defines the list of modules and conditions under which they are to be incorporated during system generation.
END	Ends the configuration file.

Table 3-2. Object Generation Directives

Directive	Function
AC	Defines an Administrative Correspondent.
AF	Defines an Administrative Function.
AG	Defines an Administrative Group.
CB	Defines a Cable
CD	Defines a Connection Descriptor.
CL	Defines a Cluster.
CO	Defines a Correspondent.
CT	Defines a Controller.
DEVICE	Defines a Device
DP	Defines a device pool
DV	Defines a Device.
EX	Defines the parameters of the executive.
FL	Defines a Filter.
LD	Defines a Logical Device.
LL	Defines a Logical Line.
LN	Defines a Login Descriptor.
MB	Defines a Mailbox.
MD	Defines a Model.
NR	Defines a Network Route.
NS	Defines a Network Subscription.
NU	Defines a Network User.
OP	Defines an Operator.
PL	Defines a Physical Line.
PROFIL	Defines a PAD profile.
SB	Defines a Statistic Block.
SC	Defines a Session Control.
SEQ	Defines special TM associated with characters processed from/to an asynchronous terminal.
SN	Defines a Terminal Station.
SR	Defines a Session Route.
TS	Defines a Transport Station.
TRS	Defines Trascoding tables for a device model.
TU	Defines a Terminal Unit.
TX	Defines a Mailbox Extension.
UD	Defines a User Descriptor.
USER	Defines data of the call packet (PAD)

3.6 DECLARING THE OBJECTS

A CNS7 directive must be declared in the generation file. Subsequently other directives must also be declared describing the following:

- the particular hardware configuration
- the different network elements
- the functions that will be available.

In order to build a coherent image of the network it is recommended that you declare the directives in the following order.

3.6.1 Declare The Local System

To declare the local system:

Session Control: SC name LOC -ADDR v1:v2

the name and the values of v1:v2 must be unique throughout the network.

If the primary DSA network function is to be in the system, you must describe the local transport station as follows:

TS name LOC -ADDR v1:v2

the values of v1:v2 must be unique throughout the network.

If the non-DSA X.25 network function is to be available in the system, you must describe the local network user as follows:

NU name LOC -CALL string

the name given to the digit string must be unique throughout the private network.

3.6.2 Define the Controllers

For example:

CT name RLNA -PHAD addr
CT name DCBE -PHAD addr
CT name DCA -PHAD addr
CT name DCE -PHAD addr

3.6.3 Declare the Lines for the Primary Network and Associated Functions

Example for a leased line used as a point-to-point link:

NS name HDLC -LL name
LL name BDL -PL name
PL name HDLC -PHAD addr -CT name

Example for a leased line used as an X.25 link:

NS name X25 -NBVC v -LL name [-NTW string]
LL name BDL -PL name
PL name HDLC -PHAD addr -CT name

Example for a leased line used as a multi-point link, the local system being the master station (-PRIM):

LL name MTPT -LAPN -PL name -PRIM
PL name HDLC -PHAD addr -CT name

Example for a leased line used upon a multi-point link, the local system being the secondary station (-SECD):

LL name MTPT -LAPN -PL name -SECD v
PL name HDLC -PHAD addr -CT name

Example for a local area network:

CB name1 LAN1 -PL name
PL name CSMA -ETHAD v -CT name

NOTE: CB, LL and PL names must not be identical.

3.6.4 Declare the Configuration to Access Host System, and Associated Functions

For example:

SC name RMT -ADDR v1:v2 -SR name
SR name ISO -TS name
TS name DIWS -NR name
NR name LAN1 -PL name1
PL name1 CSM1 -ETHAD v1 -CB name
CB name LAN1 -PL name2
PL name2 CSMA -ETHAD v2 -CT name
CT name RLNA -PHAD addr

3.6.5 Declare the Other DSA Remote Systems and the Way to Access Them

The name and the values of v1:v2 in the SC directive and the values of v1:v2 in the TS directive must be unique throughout the network and correspond respectively to the name, v1:v2 of the SC LOC and TS LOC directives in the remote system.

a) X.25 point-to-point

SC name RMT -ADDR v1:v2 -SR name
SR name DSA -TS name
TS name DSA -ADDR v1:v2 -NR name
Also for a switched virtual circuit (SVC) on a public data network you must declare:

NR name SW -NS name -RMT name1
NS name1 RMT -CALL String
Or, for an X.25 permanent virtual circuit (PVC):

NR name PER - LCN v -NS name

b) HDLC multipoint

SC name RMT -ADDR v1:v2 -SR name
SR name DSA -TS name
TS name DSA -ADDR v1:v2 -NR name
NR name HDLC -NS name
NS name HDLC -LL name
LL name SLV -SECD v -LL name1

where name1 is the name of LL MTPT with parameter -PRIM of the primary station.

c) X.25 multipoint

```
SC name RMT -ADDR v1:v2 -SR name
SR name DSA -TS name
TS name DSA -ADDR v1:v2 -NR name
NR name SW -NS name
NS name X25 -DCE -NTW DSA -NBVC v -LL name
LL name SLV -SECD v -LL name1
```

d) X.25 switch

If CNS also has the X.25 switch function to route X.25 calls between DSA systems, the access to it should be described as follows:

```
TS name SX25 -ADDR v1:v2 -NR name
NR name SX25 -NS name
```

The value of v1:v2 is the same as in the target system's TS DSA directive.

3.6.6 Declare Any ISO/DSA Workstations

First configure the remote ISO systems.

a) Connection via X.25

```
SC name RMT -NAT ISO -SR name
SR name ISO -TS name
TS name DIWS -NR name
NR name SW -NS name1 -RMT name2
NS name2 RMT -CALL String
```

If over a Public Data Network, name1 defines the local PDN network subscription, and name2 the NS of the remote ISO station.This may also be done for private X.25.

b) Connection via E-LAN

```
SC name RMT -NAT ISO  -SR name
SR name ISO -TS name
TS name DIWS -NR name
NR name LAN1 -PL name
PL name CSM1 -ETHAD v -CB name1
```

In both cases, the local system must have the -ISOPLG parameter declared in the SC LOC directive.

3.6.7 Non-DSA Remote Systems Using the local System as a switch

If remote non-DSA systems (ISO) are using the local system as an X.25 switch, the following should be used:

NU name X25 -CALL String -NR name
NR name X25 -NS name (on X.25)
NR name SLAN -SC name (on LAN)

String is the complete X.25 address (complementary address included, if any) for the remote system. Zeroes are significant in the X.25 address.

3.6.8 Declare the Statistics Blocks

See Section 4, and Section 5 as this is a part of the administration.

3.6.9 Declare the Terminal Model Types To Be Used

This is done using the MD directive. This introduces the parameters of a device model, for example:

MD DKU7001 ASY

All models (standard and non-standard) must be declared.

For further details see the description of the MD directive in Section 5.

3.6.10 Declare the Secondary Network

Declare the Synchronous terminals, for example:

DEVICE name VIP -MD name [-ENTMD] -TU name .....
TU name VIP -PHAD addr -LL name .....
LL name VIP -PL name ....
PL name SYN -PHAD addr -CT name

Declare the asynchronous terminals, for example:

DEVICE name ASY -MD name [-ENTMD] -LL name .....
LL name ASY -PL name .....
PL name -CT name -SPD

Declare any X.25 PAD terminals which are connected, for example:

DEVICE name PAD -MD name [-ENTMD] -NR name .....
NR name PAD -NS name .....

Declare any PAD terminals connected via a LAN:

DEVICE name PAD -MD name [-ENTMD] -NR name .....
NR name LPAD -SC name1 .....

where the -SC name1 is the already defined gateway (X.25/LAN). The local SC (SC LOC) must have the -PADPLG parameter defined.

3.6.11 Declare Terminal Clusters

Example of X.25 VIP clusters:

DV name VIP -TU name
TU name VIP -CL name
CL name X25 -NR name
NR name SW -NS name1 -RMT name2
NS name2 RMT -CALL string

3.6.12 Declare The Administrative Functions

This includes the operators, filters and the log file.

See Section 4 of this manual for details on configuring the administrative functions.

3.6.13 Declare The Possible Connections To Remote Applications

Applications running in computers accessible from the Terminal Manager must be declared, for example:

CO string TMG -DMB string -SCID string -CD name
CD name TMG .....

3.6.14 Declare The Physical Subscription

This gives directives for the local and remote X.21 physical subscriptions.

NOTE: The generation file must close with the END directive.

3.7 DYNAMIC NETWORK EXTENSION

The system can only call a remote system if the remote system's site name (SC-id) is "known" to CNS. This name is generally declared in an SC RMT object in the generation file.

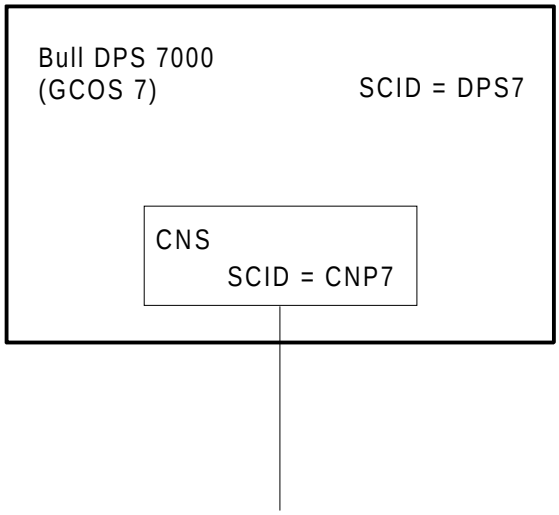
The system can accept calls from a remote system, even if its name is not known to CNS, if it calls using the TS object of a system and this TS and route to it are declared in your generation.

This is available for both DSA and ISO systems.

The Dynamic Network Externsion (DNE) facility allows non declared users to call your system via a local X.25 PDN subscription or via a LAN cable. The non declared user is either an ISO computer system or a terminal using a PAD. For further details on this facility, see Appendix A.

3.8 EXAMPLE OF GENERATION

On the next few pages, the generation file and drawings showing the topology of the primary DSA network, the terminals which may be connected to the terminal manager, and the administrative functions are given. The example shows most, but not all, of the available functions.



For GCOS7 :

SCID = DPS7
SC-address = 02:00
TS name = TS00
Cable address =
080038500200

For CNS7 :

SCID = CNP7
SC-address = 01:00
TS name = CNP7
Cable address =
08003500100

Figure 3-1. The Local System

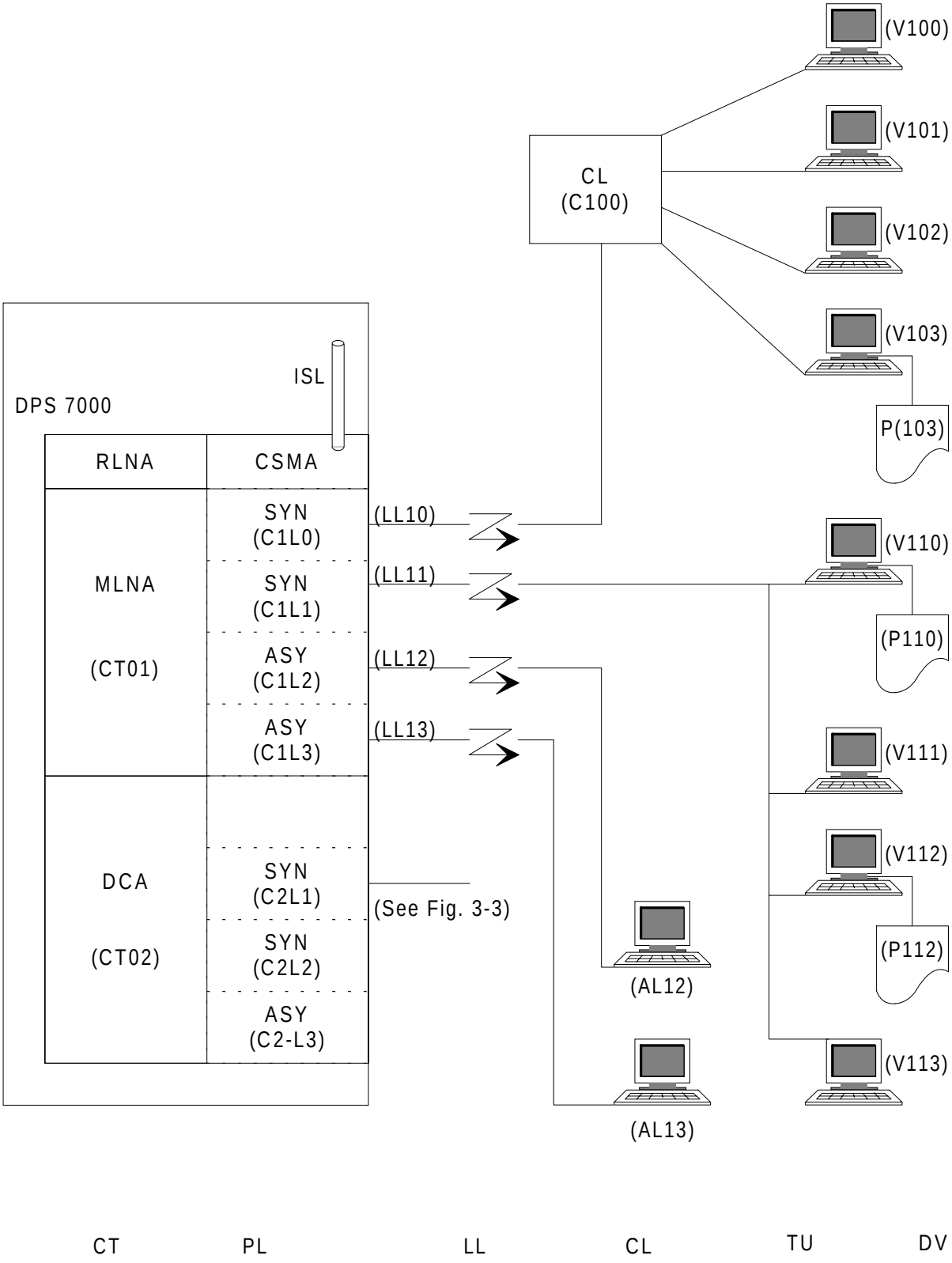


Figure 3-2. Terminals Connections (1/2)

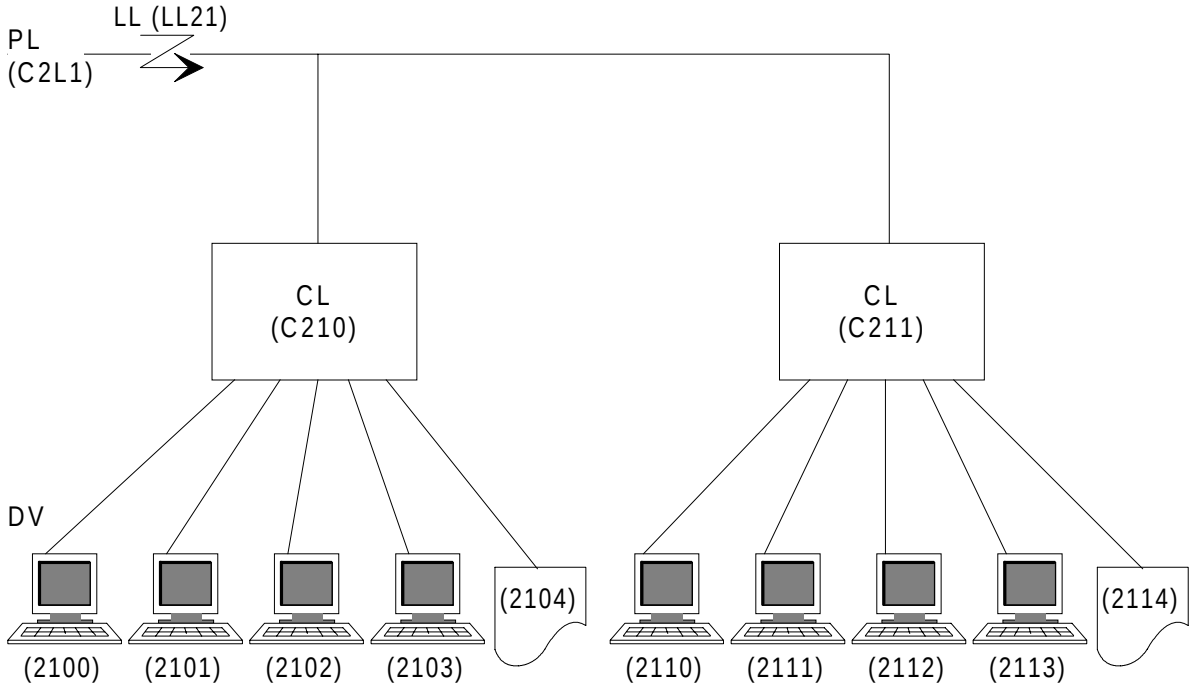


Figure 3-2. Terminals Connections (2/2)

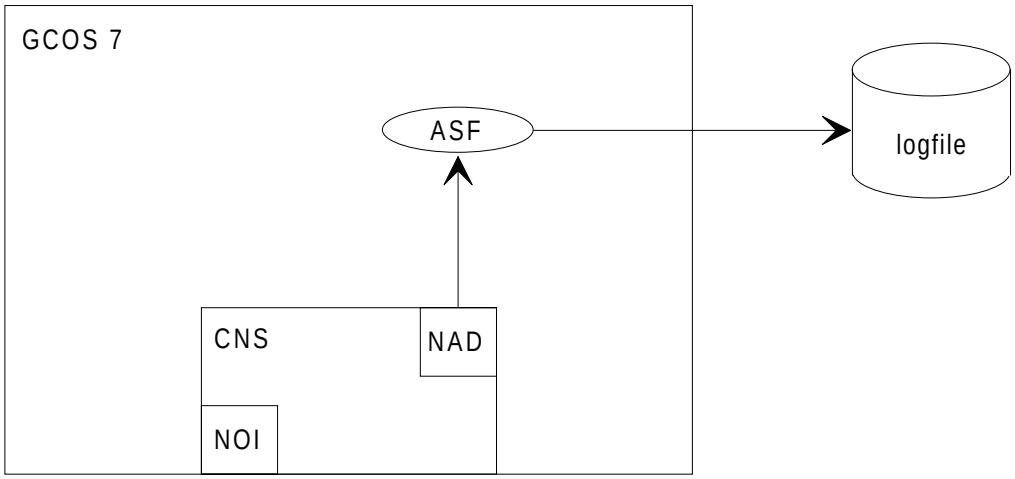


Figure 3-3. Connections Between Admisnistrative Functions

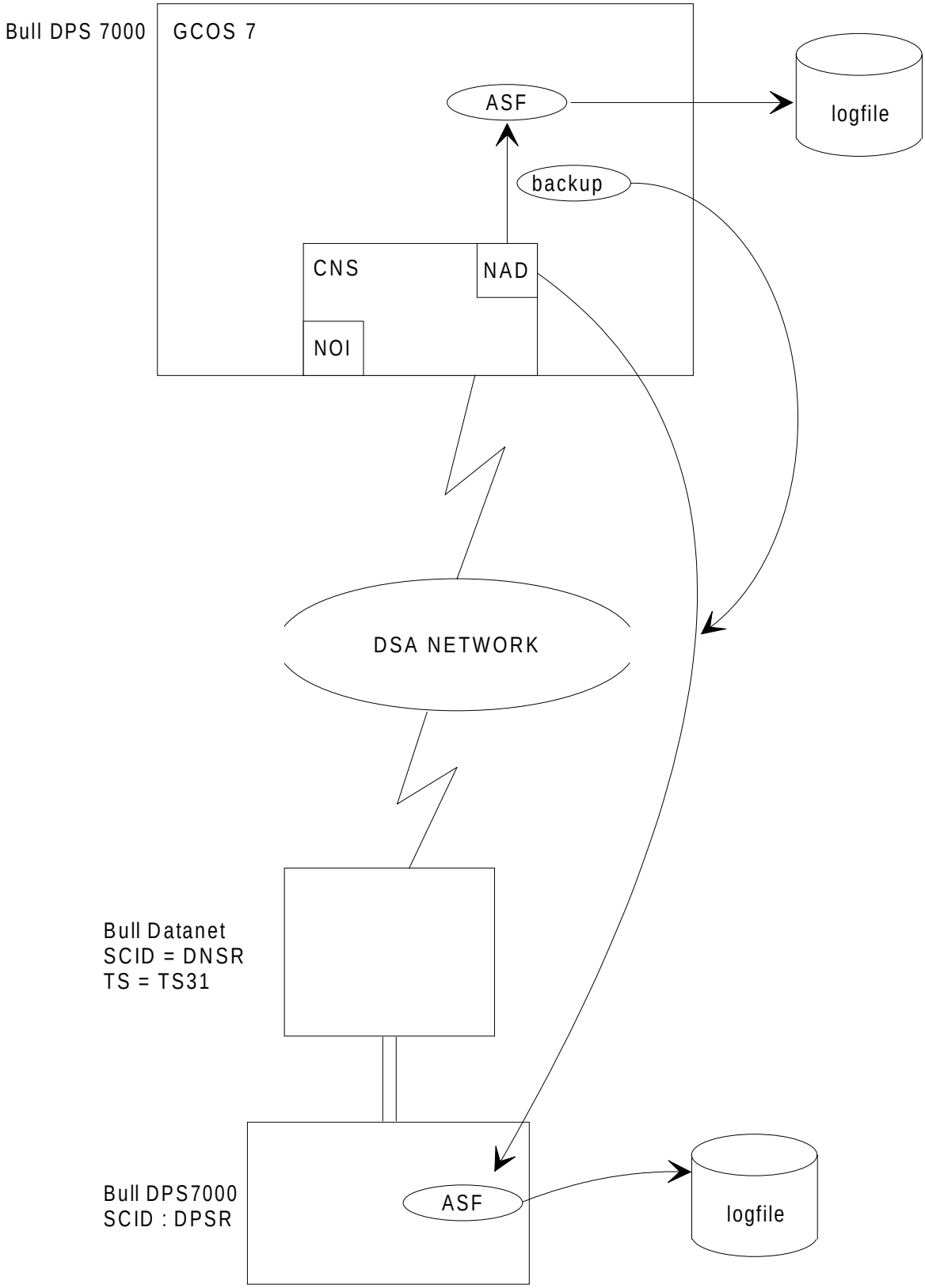


Figure 3-4. Primary Network Connection To Remote Bull DPS7000 With Bull Datanet

&

```
&****************************************
&*                                      *
&*         MANDATORY DIRECTIVES         *
&*                                      *
&****************************************
&
CNS    MFEP     -EOS A
& RELEASE DIRECTORY ON THE DPS7000
DIR    BLIB
TMP    TEMP
& FILES FOR GENERATION
LKFL   SLIBCHXMOD
TBFL   BLIBYTABLE
& PATCH FILES
PATCH1 SLIBPATCH1
PATCH2 SLIBPATCH2
& TERMINAL MANAGER FILES FOR MESSAGES AND KEYWORDS
& IN ENGLISH
LANG   ENGLISH  -MESFIL SLIBDLCMSG -KEYFIL SLIBDLCKW
& IN FRENCH
LANG   FRANCAIS -MESFIL SLIBDLCMSF -KEYFIL SLIBDLCKW
&
&****************************************
&*                                      *
&*         LOCAL CNP7 GENERATION        *
&*                                      *
&****************************************
&
EX  CNP7   -MEM 60
&
& CNP7 SESSION CONTROL DECLARATION
SC  CNP7  LOC     -ADDR X'02':X'00'
& CNP7 LOCAL TRANSPORT STATION
TS  CNP7  LOC     -ADDR X'02':X'00'
&
&****************************************
&*                                      *
&*       LOCAL NETWORK CONTROLLER       *
&*                                      *
&****************************************
&
& LINK TO DPS7000 CPU
&
& INTER SYSTEM LINK (ISL) CONTROLLER
CT  RLN1  RLNA       -PHAD 1
& CONTAIN THE CNP7 ADDRESS
PL  RLN1  CSMA       -CT RLN1 -ETHAD 0800385F0200
& CABLE USAGE DECLARATION: TYPE LAN1 (ISO 8802.2 CLASS 1)
CB  CB01  LAN1       -PL RLN1
&
& COMMUNICATION LINES
```

```
&
& COMMUNICATION CONTROLLER (COMMON HARDWARE WITH ISL CONTROLLER)
CT  CT01  MLNA      -PHAD 1
& PHYSICAL LINES
PL  C1L0  SYN       -PHAD 0 -CT CT01 -SPD 9600
PL  C1L1  SYN       -PHAD 1 -CT CT01 -SPD 4800
PL  C1L2  ASY       -PHAD 2 -CT CT01 -SPD 1200
PL  C1L3  ASY       -PHAD 3 -CT CT01 -SPD 1200 -HALF
&
&****************************************
&*                                      *
&*    DATA COMMUNICATION CONTROLLERS    *
&*                                      *
&****************************************
&
& FIRST DCA ONLY THREE LINES USED (V24/V28 INTERFACE)
&
CT  CT02  DCA       -PHAD 2
& PHYSICAL LINES (ONLY THREE ARE DECLARED)
PL  C2L1  SYN       -PHAD 1 -CT CT02 -SPD 9600
PL  C2L2  SYN       -PHAD 2 -CT CT02 -SPD 9600
PL  C2L3  ASY       -PHAD 3 -CT CT02 -SPD 1200 -HALF
&
&****************************************
&*                                      *
&*       NETWORK ROUTES ON ISL          *
&*                                      *
&****************************************
&
& ROUTE TO DPS7000 CPU
&
& CONTAIN THE ADDRESS OF DPS7000 ON THE ISL
PL  PL00  CSM1      -ETHAD 0800385F0100 -CB CB01
& NETWORK ROUTE
NR  NR00  LAN1       -PL PL00
&
&****************************************
&*                                      *
&*     TRANSPORT STATION TO DPS7000     *
&*                                      *
&****************************************
&
TS  TS00  DIWS       -NR NR00
&
&****************************************
&*                                      *
&*  SESSION ROUTE AND SESSION CONTROL   *
&*            TO DPS7000                *
&*                                      *
&****************************************
&
SR  SR00  ISO       -TS TS00
& SESSION CONTROL DECLARATION
SC  DPS7  RMT       -NAT DSA -ADDR X'01':X'00' -SR SR00
&
```

```
&*************************************
&*                                   *
&*       VIP TERMINALS DECLARATION   *
&*                                   *
&*************************************
&
& FIRST LINE: VIP COMMUNICATION PROTOCOL, 9600 BPS
LL  LL10  VIP       -PL C1L0 -NBSYN 6
& CLUSTER CONTROLLER (TCU OR TCS) TYPE VIP WITH GROUP POLLING
CL  C100  VIP       -LL LL10 -PHAD 0
& TERMINAL UNIT TYPE VIP AT ADDRESS 00
TU  D100  VIP       -CL C100 -PHAD 00
& TERMINAL SCREEN AND KEYBOARD TYPE VIP, MODEL DKU7007
& CONNECTION DESCRIPTOR USED IS SERCD
& ASKING FOR TERMINAL MANAGER LANGUAGE
DEVICE V100 VIP      -TU D100 -MD DKU7007 -CD SERCD -ENTLAN
& TERMINAL PRINTER TYPE VIP, MODEL TTU8126, RECEIVE ONLY
DEVICE P100 VIP      -TU D100 -MD TTU8126V -ROP -DLALL
TU  D101  VIP       -CL C100 -PHAD 01
DEVICE V101 VIP     -TU D101 -MD DKU7007 -CD SERCD -ENTLAN
DEVICE P101 VIP     -TU D101 -MD TTU8126V -ROP -DLALL
TU  D102  VIP       -CL C100 -PHAD 02
DEVICE V102 VIP     -TU D102 -MD DKU7007 -CD SERCD
DEVICE P102 VIP     -TU D102 -MD TTU8126V -ROP -DLALL
TU  D103  VIP       -CL C100 -PHAD 03
DEVICE V103 VIP     -TU D103 -MD DKU7007 -CD SERCD
DEVICE P103 VIP     -TU D103 -MD TTU8126V -ROP -DLALL
&
&
& SECOND LINE: VIP COMMUNICATION PROTOCOL, 4800 BPS
LL  LL11  VIP       -PL C1L1
& TERMINALS WITHOUT CLUSTER CONTROLLER
& TERMINAL UNIT TYPE VIP AT ADDRESS 00
TU  D110  VIP       -LL LL11 -PHAD 00
& TERMINAL SCREEN AND KEYBOARD TYPE VIP, MODEL DKU7105
& CONNECTION DESCRIPTOR USED IS SERCD
DEVICE V110 VIP     -TU D110 -MD DKU7105 -CD SERCD
& TERMINAL PRINTER TYPE VIP, MODEL TTU8124, RECEIVE ONLY
DEVICE P110 VIP     -TU D110 -MD TTU8124V -ROP -DLALL
TU  D111  VIP       -LL LL11 -PHAD 01
DEVICE V111 VIP     -TU D111 -MD DKU7105 -CD SERCD
TU  D112  VIP       -LL LL11 -PHAD 02
DEVICE V112 VIP     -TU D112 -MD DKU7105 -CD SERCD
DEVICE P112 VIP     -TU D112 -MD TTU8126V -ROP -DLALL
TU  D113  VIP       -LL LL11 -PHAD 03
DEVICE V113 VIP     -TU D113 -MD DKU7105 -CD SERCD
&
```

```
&****************************************
&*                                      *
&*  ASYNCHRONOUS TERMINAL DECLARATION   *
&*                                      *
&****************************************
&
& FIRST ASYNCHRONOUS LINE
LL LL12  ASY       -PL C1L2
& TERMINAL MODEL DKU7102
& CONNECTION DESCRIPTOR USED IS SERCD
DEVICE AL12  ASY   -LL LL12 -MD DKU7102 -CD SERCD
&
& SECOND ASYNCHRONOUS LINE
LL LL13  ASY       -PL C1L3
& TERMINAL MODEL TTU8126
DEVICE AL13  ASY   -LL LL13 -MD TTU8126 -CD SERCD
&
&****************************************
&*                                      *
&*  CORRESPONDENTS AND CONNECTIONS      *
&*                                      *
&****************************************
&
& DPS7000 PROGRAMS
&
CO IOFDPS7       TMG       -SCID DPS7 -DMB IOF        -CD SERCD
CO TDS1DPS7      TMG       -SCID DPS7 -DMB TDS1       -CD SERCD
CO TDS2DPS7      TMG       -SCID DPS7 -DMB TDS2       -CD SERCD
&
& CNP7 APPLICATIONS
&
& NETWORK OPERATOR INTERFACE
CO NOI           TMG       -SCID CNP7 -DMB $NOI        -CD SERCD
&
& CNP7 EDITOR AND DEBUGGER (MAINTENANCE PURPOSE)
CO EDIT          TMG       -SCID CNP7 -DMB EDIT       -CD PASSW
CO DEBUG         TMG       -SCID CNP7 -DMB $DEBUG     -CD PASSW
&
& CONNECTION DESCRIPTORS
&
& WITH SECURITY PARAMETER COLLECTION (PROMPTING)
CD SERCD         TMG       -BILLAM PR -PROJAM PR -USERAM PR -
PSSWAM PR
& WITH PASSWORD SECURITY PARAMETER COLLECTION ONLY
CD PASSW         TMG       -PSSWAM PR
&
```

```
&****************************************
&*                                      *
&*        NETWORK ADMINISTRATION        *
&*                                      *
&****************************************
&
& NETWORK OPERATOR INTERFACE
AF  NOI  NOI
& NETWORK ADMINISTRATION
AF  NAD  NAD
&
& ADMINISTRATIVE GROUP FOR ASF
AG  ASF  ASF       -AF NAD
& ADMINISTRATIVE CORRESPONDENTS
& FOR THE NAD
& (THIS IS FOR CONNECTION WITH THE LOGFILE)
AC  ASF  ASF       -AG ASF -MBL CNP7 -MBR DPS7
& (THIS IS FOR CONNECTION WITH THE NOI)
AG  NOI  NOI       -AF NAD -CNX INIT
AC  NOI  NOI       -AG NOI -MBL CNP7 -MBR CNP7
& FOR THE NOI
& (THIS IS FOR CONNECTION WITH THE NAD)
AG  NAD  NAD       -AF NOI -CNX ACCEPT
AC  NAD  NAD       -AG NAD -MBL CNP7 -MBR CNP7
&
& FILTERS DECLARATION FOR THE ADMINISTRATION
&
& FILTERS FOR DISPLAY FUNCTIONS AND ERROR MESSAGES
FL  MINO  OUT      -LO INCL -IML 12
& INCLUDE COMMANDS FOR DISPLAY
FL  MINI  IN       -LO INCL -POU 1
&
& FILTERS FOR DISPLAY COMMANDS AND TEST CONTROL
&
& SECURITY AND ADMINISTRATION NOT AUTHORISED
& TEST COMMANDS AUTHORISED
FL  TSTO  IN       -LO INCL -POU 2
& UP COMMANDS AUTHORISED (NEEDED FOR STATUS MODIFICATION)
FL  TST1  IN       -LO INCL -COU 5 -COL 5 -DOU 2
&
& OPERATORS DECLARATION FOR USE WITH NETWORK OPERATOR INTERFACE
AG  OPER  OP       -AF NOI
OP  ALL   OP       -MBL CNP7 -MBR CNP7 -AG OPER -PSSW ALL
OP  DISP  OP       -MBL CNP7 -MBR CNP7 -AG OPER -PSSW DISP &
                   -FL MINI MINO
OP  TST   OP       -MBL CNP7 -MBR CNP7 -AG OPER -PSSW TST &
                   -FL TST0 TST1 MINO
&
&
```

```
&****************************************
&*                                      *
&*      MAIL BOXES FOR SPECIAL USAGE    *
&*                                      *
&****************************************
&
& DEBUGGER (MAINTENANCE USAGE)
MB $DEBUG       -PSSW DEBU
&
& EDITOR (MAINTENANCE USAGE)
MB EDIT    USER     -CNX NEY
&
& IN/ON LINE SPECIFIC MAILBOXES:
MB $NSE    USER    -CNX VSEQY  -NO_SES
MB $NSF    USER    -CNX VSEQX  -NO_SES
MB $ECHO   USER    -CNX VSEQO
&****************************************
&*                                      *
&*       GENERATION MANAGEMENT          *
&*                                      *
&* (RENAME AND CONFIG WITH NEW PATCH'S) *
&*                                      *
&****************************************
&
& DECLARATIONS FOR CONNECTION FROM A CNP7 TERMINAL
CO SYSG TMG       -DMB SYSGEN -CD SYSG -SCID CNP7
CD SYSG TMG       -CO SYSG
& MAILBOX
MB SYSGEN  USER   -CNX I_SYSGEN
& ADMINISTRATIVE DECLARATION
AF GENE SYSG      -SC DPS7
&
&
&****************************************
&*                                      *
&*       MODELS DEFINITIONS             *
&*                                      *
&****************************************
&
MD  DKU7102       ASY
MD  TTU8126       ASY
MD  DKU7007       VIP
MD  DKU7105       VIP
MD  TTU8126V      VIP
MD  TTU8124V      VIP
&
END -SAVE CORECNSI
```

If you wish to declare 3270 terminals (see Figures for details),the following lines should also be declared in your generation file:

```
&
& SUPPLEMENT FOR 3270 TERMINALS
&
&
&*************************************
&*                                    *
&*    3270 TERMINALS DECLARATION      *
&*                                    *
&*************************************
&
& FIRST LINE DECLARED ON FIRST DCA CONTROLLER
LL  LL21  3270   -PL C2L1
& CLUSTER AT ADDRESS 00
CL  C210  3270   -LL LL21 -PHAD 00
& TERMINAL MODEL 3278 TYPE 2 (E FOR EBCDIC) ADDRESS 00
DEVICE 2100 3270 -CL C210 -MD 3278-2E -CD SERCD -ENTLAN -PHAD 00
DEVICE 2101 3270 -CL C210 -MD 3278-2E -CD SERCD -ENTLAN -PHAD 01
DEVICE 2102 3270 -CL C210 -MD 3278-2E -CD SERCD -ENTLAN -PHAD 02
DEVICE 2103 3270 -CL C210 -MD 3278-2E -CD SERCD -ENTLAN -PHAD 03
& PRINTER TERMINAL MODEL 3287E ADDRESS 04
DEVICE 2104 3270 -CL C210 -MD 3287-2E -CD SERCD -ENTLAN -PHAD 04
& CLUSTER AT ADDRESS 01
CL  C211  3270   -LL LL21 -PHAD 01
& TERMINAL MODEL 3278 TYPE 2 (E FOR EBCDIC) ADDRESS 00
DEVICE 2110 3270 -CL C211 -MD 3278-2E -CD SERCD -PHAD 00
DEVICE 2111 3270 -CL C211 -MD 3278-2E -CD SERCD -PHAD 01
DEVICE 2112 3270 -CL C211 -MD 3278-2E -CD SERCD -PHAD 02
DEVICE 2113 3270 -CL C211 -MD 3278-2E -CD SERCD -PHAD 03
& PRINTER TERMINAL MODEL 3287E ADDRESS 04
DEVICE 2114 3270 -CL C211 -MD 3287-2E -CD SERCD -PHAD 04
&
&
& ADDITION TO MODEL LIST
&
MD 3278-2E    3270
MD 3287-2E    3270
&
```

If you wish to declare a remote Bull DPS7 (with Bull Datanet front-end processor), you should declare the following lines in your generation file (see Figures):

```
&
& ADDITION FOR A REMOTE DPS7 CONNECTION (THROUGH DATANET)
&
&
&*****************************************
&*                                       *
&*    DATA COMMUNICATION CONTROLLERS     *
&*                                       *
&*****************************************
&
&
& SECOND DCA ONLY THREE LINES DECLARED (V24/V28 INTERFACE)
&
CT  CT03  DCA       -PHAD 3
& PHYSICAL LINES (ONLY THREE ARE DECLARED)
PL  C3L1  HDLC      -PHAD 1 -CT CT03 -SPD 9600
PL  C3L2  SYN       -PHAD 2 -CT CT03 -SPD 9600 -HALF
PL  C3L3  ASY       -PHAD 3 -CT CT03 -SPD 1200 -HALF
&
&*****************************************
&*                                       *
&*         HDLC NETWORK ROUTES           *
&*                                       *
&*****************************************
&
& ROUTE TO DPS7 AND DATANET
&
& HDLC LINE WITH DATANET
&
LL  LL31  BDL    -LAPB  -PL C3L1 -PRIM 3
& NETWORK SUBSCRIPTION
NS  NS31  HDLC   -LL LL31
& NETWORK ROUTE
NR  NR31  HDLC   -NS NS31
&
&*****************************************
&*                                       *
&*     TRANSPORT STATION TO DATANET      *
&*                                       *
&*****************************************
&
TS TS31  DSA   -ADDR X'03':X'00' -NR NR31
&
```

```
&*************************************
&*                                    *
&*  SESSION ROUTE AND SESSION CONTROL   *
&*       TO DATANET AND DPS7           *
&*                                    *
&*************************************
&
& SESSION ROUTE FOR DATANET
SR  SR31  DSA       -TS TS31
& SESSION CONTROL DECLARATION FOR DATANET
SC  DNSR  RMT       -ADDR X'03':X'00' -SR SR31
& SESSION ROUTE FOR REMOTE DPS7
SR  SR32  DSA       -TS TS31
& SESSION CONTROL DECLARATION FOR REMOTE DPS7
SC  DPSR  RMT       -ADDR X'04':X'00' -SR SR32
&
&
& IF YOU WANT THAT THE LOGFILE IS ALSO SENT TO THE REMOTE DPS7
& ADD THE FOLLOWING COMMANDS:
&
AC ASFR  ASF -AG ASF -MBL CNP7 -MBR DPSR
&
&
```

4. Configuration Of Administration Functions

4.1 INTRODUCTION

This section of the manual provides a descriptive guide of the administrative functions, NAD, NOI, ASF, and In/On-Line Tests and of the administrative directives AC, AF, AG, FL and OP. Configuration examples of the administrative functions are shown in section 3 of this manual. For the syntax for each directive, see section 5 of this manual.

4.1.1 NAD Node Administrator

The NAD is present in each system within the network. It builds the unsolicited messages and command responses into an internal format (administrative record) and sends them to all the administrative correspondents. The NAD must be declared in the AF directive of the NAD type (see Figure 4-1 of this manual).

4.1.1.1 MAPPING

The NAD is mapped from Administrative Groups (AGs) of the NOI, NCC or ASF type. Each Administrative Group of the NOI, NCC or ASF type is mapped from Administrative Correspondents (AC) of the same type and onto Filters (FL). Filters mapped from an AG relate to all ACs mapped onto this AG.

4.1.1.2 CONNECTION

The NAD connects with an Administrative Correspondent if the AG mapped from this AC is declared as an acceptor (-CNX ACCEPT) in the AG directive.

The global mailbox names used to connect are given by the -MBL and -MBR in the AC directive:

- BL gives the global mailbox name of the local NAD
- BR gives the correspondent or remote (NOI, ASF, NCC) global mailbox name.

NOTE: The global mailbox name consists of the session control identifier (SC id) + the mailbox name + optionally, the mailbox extension.

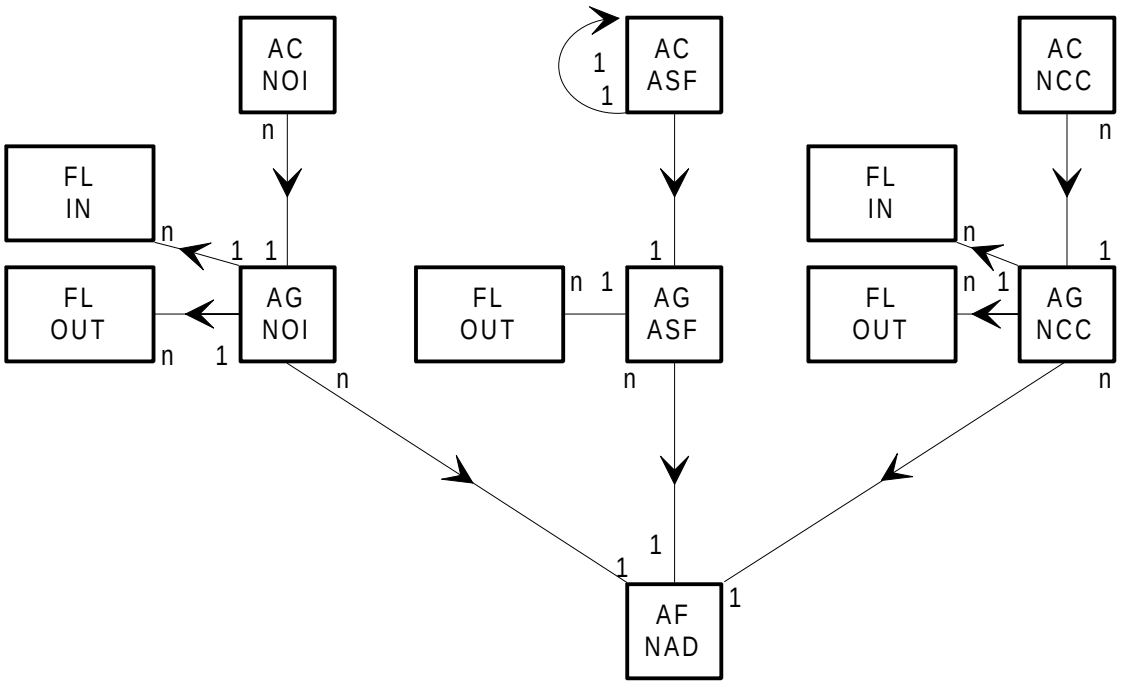


Figure 4-1. NAD Administrative Object Relationships

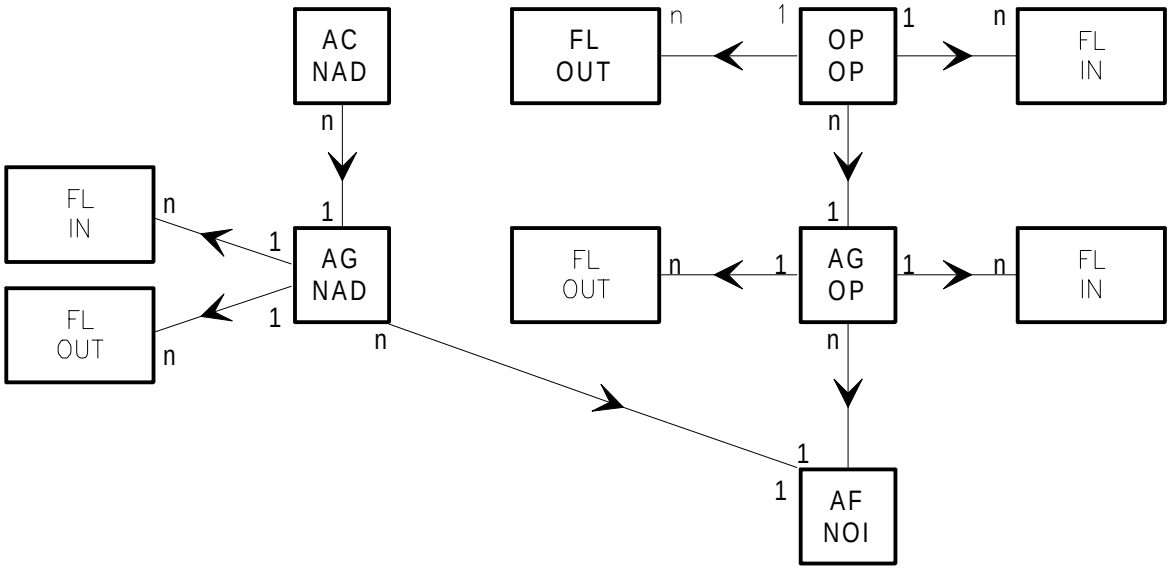


Figure 4-2. NOI Administrative Object Relationships

NOTE: A filter of the IN type, mapped from the OP has priority over a filter of the IN type mapped from the AG.

Figure 4-3. In/On Line Test Object Relationships

4.1.2 NOI Network Operator Interface

The NOI is not always present in a system. It is present if the AF directive of the NOI type is declared at generation (see figure 4-2). The network operator uses Network Control Language at the NOI to input commands and display logged items and statistics. The NOI also formats unsolicited messages that are output on the operator's console.

4.1.2.1 MAPPING

The NOI is mapped from Administrative Groups (AGs) of the NAD or OP type. An Administrative Group (AG) of the NOI type is mapped from Administrative Correspondents (ACs) of the same type and onto filters of the IN or OUT type. Filters mapped from an AG relate to all ACs that are mapped onto this AG. An Administrative Group (AG) of the OP type is mapped from Operators (OPs) of the same type and onto filters of the IN or OUT type. Filters of the IN or OUT type can be mapped directly from an Operator (OP). A filter of the IN type mapped from an AG of type OP is only activated when there is no filter of the IN type mapped from the OP belonging to this AG, or when the filter mapped from the OP accepts the command. A filter of the type OUT, mapped from an OP, is only activated when there is no filter of type OUT mapped from the AG (of type OP), or when the filter mapped from the AG accepts the response.

4.1.2.2 NAD CONNECTION

The NOI only connects with its Administrative Correspondents (ACs) of the NAD type if the AG mapped from the AC is declared as an acceptor (-CNX ACCEPT) in the AG directive. In this case (the NOI as the initiator), connection will only be made if an operator is connected to the NOI. The global mailbox names used for connection are given by -MBL and -MBR in the AC directive:

- MBL gives the global mailbox name of the local NOI
- MBR gives the global mailbox name of the local or remote correspondent of the NAD type.

4.1.2.3 TERMINAL MANAGER CONNECTION

The NOI receives a connection request from the Terminal Manager and searches for an Operator (OP) object, which is not in use, representing an operator who is not yet connected, with both the valid password and the valid remote global mailbox name. These attributes are declared in the OP directive.

4.1.2.4 BACK-UP NOI

An NOI is declared as the principal NOI by using -PR in the AC directive. A back-up AC of NOI can be mapped onto it by means of the keyword -ACBKP. If the connection to the principal NOI fails, connection to the back-up will be tried.

4.1.3 ASF Administrative Storage Facility

The ASF contains the log file, which is always present in a network, and therefore the AC ASF must always be declared in the generation.

4.1.3.1 MAPPING

The NAD is mapped from Administrative Groups (AGs) of the ASF type. An Administrative Group (AG) of the ASF type is mapped from Administrative Correspondents (ACs) of the same type and onto filters of the OUT type. Filters mapped from an AG relate to all ACs that are mapped onto this AG.

4.1.3.2 NAD CONNECTION

The ASF only accepts connections with its Administrative Correspondents (ACs) of the NAD type. The global mailbox names used to establish the connection are introduced by the keywords -MBL and -MBR of the AC directive.

4.1.3.3 BACK-UP ASF

An ASF is declared as the principal ASF by using -PR in the AC directive. A back-up AC of ASF can be mapped onto it by means of the keyword -ACBKP. If the connection to the principal ASF fails, connection to the back-up will be tried.

4.1.4 In/On-Line Tests

The nucleus of the in/on-line tests is always in a system. In/on-line tests are initiated by the NAD after an operator command. For the in/on-line tests, some USER type mailboxes must be declared. See the MB (mailbox) directive in Section 5 for details.

4.2 EXAMPLES

Section 3 contains an example of a generation file which shows the generation of administrative utilities.

5. Configuration And Generation Directives

5.1 INTRODUCTION

CNS7 generation adapts selected software modules to the hardware configuration and the required user-available functions.

Normally, a generation file can be composed by the use of FPG7 supplied with the system. However, in some cases, it may be considered useful to create or modify the generation file by hand. This section is a compendium of the configuration and generation directives available.

5.2 CONFIGURATION AND GENERATION DIRECTIVES

The configuration and generation directives which are described in this section appear in alphabetical order. General generation rules are described in Section 3.

> It is recommended that default values be adopted throughout, unless there is a good reason for changing them. Where there is no default value, you will be obliged to declare a value of your choice.

5.2.1 AC - ADMINISTRATIVE CORRESPONDENT

5.2.1.1 Description

An ADMINISTRATIVE CORRESPONDENT is the image of an Administrative Function (AF) with which sessions may be established. The AC may either be situated in a different system or may be resident in the same system as the AF proper.

An Administrative Correspondent may be indirectly associated (via the Administrative Group) with Filters (FL), which control the flow of administrative records between the functions.

5.2.1.2 Syntax for AC -ASF/NCC/NOI

```
AC name {ASF|NCC|NOI}

     -MBL name1 [name 2]
     -MBR name1 [name 2]
     [-ACBKP name]
     [-AG name]
     [{-PR|-BK}]
     [-THR v]           (0,32767) 10 for NCC or NOI.
                        20 for ASF.
```

Example:

```
AC  COI1  NOI  -MBL  L6BA  -MBR  L6BA  -AG  GOI1
```

5.2.1.3 Syntax for AC -NAD

```
AC name  NAD

     -MBL name 1 [name 2]

     -MBR name 1 [name 2]

     [-AG name ]
```

5.2.1.4 Description of Parameters

Name	Ranges from 1 to 4 alphanumeric characters.
ACBKP	Name of the back-up AC if this AC only is relevant to the principal system. This parameter must not be used if -BK is present.
AG	Name of the Administrative Group onto which this Administrative Correspondent is mapped. For ASF, NAD, NCC and NOI this AG type is respectively ASF, NAD, NCC and NOI.
BK	This AC is the back-up system.
MBL	Name 1 is the local Session Control (sc-id of your system) and name 2 the local mailbox. (See note).
MBR	Name 1 identifies the remote Session Control and name 2 the remote mailbox. (See note).
PR	This AC is the principal system.
THR	The maximum number of administrative messages waiting for this AC.

NOTE: The default names are as follows:

	ASF	NAD	NCC	NOI
-MBL	$NAD	$NOIAEP	$NAD	$NAD
-MBR	$LOGFILE	$NAD		$NOIAEP

5.2.2 AF - ADMINISTRATIVE FUNCTION

5.2.2.1 Description

An ADMINISTRATIVE FUNCTION describes a local administrative component of the local system. It is addressed via a mailbox through which sessions may be established to other Administrative Correspondents.

Interconnections between AFs are described by associating the set of "Administrative Correspondents" which are the image of and represent other AFs with which sessions may be established.

5.2.2.2 Syntax for AF -NAD/NOI

```
AF name {NAD|NOI}
```

Example:

```
AF FOI1 NOI
```

5.2.2.3 Syntax for AF -SYSG

This administrative function should be declared when the possibility of modifying a generated image (application of new patches or changing the name) is required. See Section 6 for details.

AF name SYSG -SC name

Example :

```
AF SYSG SYSG -SC DPS7
```

5.2.2.4 Description of Parameters

SC	identifies the session control identifier (sc-id) of the host DPS7000.

5.2.3 AG - ADMINISTRATIVE GROUP

5.2.3.1 Description

An ADMINISTRATIVE GROUP groups a set of similar Administrative correspondents (AC or CP) and to provide a mapping between AC and AF. The AG type is the same as the correspondent type.

5.2.3.2 Syntax for AG -ASF

```
AG name ASF [-AF name]
```

5.2.3.3 Syntax for AG -NAD/NCC/NOI

```
AG name {NAD|NCC|NOI}
    [-CNX {INIT|ACCEPT}]
    [-AF name]
    [-FL name1 [ name2 [ name3...]]]
```

Example:

```
AG GAD1 NAD       -AF FOI1
AG GOI1 NOI       -AF FAD1  -FL FL01
```

5.2.3.4 Syntax for AG -OP

```
AG name OP
   [-AF name]
   [-FL name1 [ name2 [ name3...]]]
```

Example:

```
AG GOP1 OP        -AF FOI1
```

5.2.3.5 Description of Parameters

AF	The name of the Administrative Function onto which this administrative group is mapped. For an Administrative Group of the NAD or OP type, the Administrative function is of the NOI type. For an Administrative Group of the ASF, NOI or NCC type, the Administrative Function is of the NAD type.
CNX	INIT if this AG is initiator, ACCEPT if this AG is acceptor. INIT (for NOI or NCC) and ACCEPT (for NAD) are the default values.
FL	The name(s) of the filter(s) associated with this AG, except for AG of type NAD.

5.2.4 CB - CABLE

5.2.4.1 Description

Defines an Inter System Link (ISL) or local area network cable (E-LAN or STARLAN). An ISL is a local area cable used to connect system components.

5.2.4.2 Syntax for CB

```
CB name LAN1

   -PL name

   [-ACSISO name]
```

Examples:

```
CB CBE1 LAN1 -PL PLE1
CB CBE2 LAN1 -PL PLE2
```

5.2.4.3 Description of Parameters

ACSISO	Defines a chain of SR BAN, TS DIWS, NR LAN1, and PL CSM1 objects, which will be used for connections with systems declared in the configuration extension file (EQU file of the GO function). All these objects will have the name introduced as the name of the ACSISO parameter. This name should not be the same as the name of the CB object, nor any other PL, NR, TS or SR objects. This parameter should not be used in declaring the ISL (InterSystem Link).
PL	The name of the physical line object (CSMA type) onto which this cable object is mapped.

NOTE: The name of the CB object must be different from the PL and LL objects.

5.2.5 CD - CONNECTION DESCRIPTOR

5.2.5.1 Description

A CONNECTION DESCRIPTOR defines all major aspects of the connection phase including:

- security parameters (manual or automatic)
- default correspondent (CO) for the connection
- billing/project parameters
- terminal handling for the phase, case conversion

It may be mapped from one or to several terminal stations (SN).

The Connection Descriptor to be used during the connect process may be retrieved in many ways:

- From the Correspondent (CO) object, when this information is entered in the connect command and the CO maps to a CD;
- From the User Descriptor (UD) object and the UD maps to the CD;
- From the Terminal Station object SN.

When no Connection Descriptor is defined, a default one is used. It contains the following information:

- Acquisition modes (BILLAM, PROJAM, PSSWAM, STRGAM, USERAM) are set to DEF;
- Acquisition mode COAM is set to PR;
- The option AUTACK (Automatic Acknowledgement) is selected.

5.2.5.2 Syntax for CD

```
CD name TMG

[-BILL string]          (12 char. max) 12 spaces

[-BILLAM {CN|LI} {DEF|PR|PRDEF} {LCOFF|LCON} {OV|NOOV}]

[-BRK {AT|ATPGLT|ATPGWR|PGWR}]

[-CO name]

[-COAM {DEF|PR|PRDEF} {OV|NOOV}]

[-PROJ string]          (12 char. max) 12 spaces

[-PROJAM {CN|LI} {DEF|PR|PRDEF} {LCOFF|LCON} {OV|NOOV}]

[-PSSW string]          (12 char.max) 12 spaces

[-PSSWAM {CN|LI} {DEF|PR|PRDEF} {LCOFF|LCON} {OV|NOOV}]

[-STRG string]          (32 char. max)

[-STRGAM {DEF|PR|PRDEF} {LCOFF|LCON} {OV|NOOV}]

[-USERAM {CN|LI} {DEF|PR|PRDEF} {LCOFF|LCON} {OV|NOOV}]

[-USERID string]        (12 char.max) 12 spaces

[{-AUTACK|-MANACK}]
```

Example:

```
CD USER TMG  -BILL AGENCY1     -BILLAM PRDEF  -BRK AT       &

             -CO TDS                -PROJ TICKET    &
             -PROJAM PRDEF LCON
             -PSSW WXYZ    -PSSWAM PR NOOV
             -STRG DSANET  -STRGAM DEF NOOV
             -USERAM LI
```

5.2.5.3 Description of Parameters

Name	Up to 8 alphanumeric characters.
AT	(ATtention): Sends an attention message to a DSA correspondent when a break is received from the device.
ATPGLT	Purges all letters received from a DSA correspondent and sends an attention message when a break is received from the device.
ATPGWR	Purges the current output and sends an attention message to a DSA correspondent when a break is received from the device.
AUTACK	A connection received from the correspondent has to be acknowledged by the Terminal Manager (TM) with no action on the part of the terminal operator.

BILL	The default billing account.
BILLAM	The way the terminal operator has to enter this parameter during the connect process.
BRK	Action to be done when a break signal is received from a device. This parameter is overridden when this option is defined in the Correspondent object (CO). No default value is provided. When the parameter is not defined, the one defined in the Session Control object is used. The recommended value of the parameter is AT.
CN	The security parameter is specific to the connect process and does not have to be retrieved from the Log-in phase.
CO	The name of the default correspondent.
COAM	The way the terminal operator has to enter the CO parameter during the connect process. DEF is used as a default option if CO is specified and PR is used as a default option if CO is not specified.
DEF	(DEFault): use the default if the parameter is not redefined in the connect command.
LCOFF	Lower case characters are not allowed in the parameter and are translated to upper case.
LCON	Lower case characters are allowed in the parameter.
LI	The parameter value must be taken from the login phase (the parameter given in the LN object).
MANACK	When a connection request is received from the correspondent, the terminal operator is asked whether or not to accept the connection.
NOOV	The terminal operator is not allowed to enter a security parameter different from the default value.
OV	The terminal operator is allowed to enter a security parameter different from the default value.
PGWR	Purges the current output when a break signal is received from the device.
PR	The security parameter will be requested from the terminal operator if not present in the connect command. The terminal operator is prompted up to three times until the parameter is entered.
PRDEF	The terminal operator will be prompted for the security parameter if not present in the connect command. If there is no response, the default value is used.

PROJ	Default value for the project id.
PROJAM	The way the terminal operator has to enter the PROJ parameter during the connect process.
PSSW	The default password to be used. This parameter should not be used if the security requirements do not allow a password to be present in main memory. Instead declare PSSW as follows: `PSSWAM PR 0V`
PSSWAM	The way the terminal operator has to enter this parameter during the connect process.
STRG	The default user string to be passed to the correspondent when the terminal is connected.
STRGAM	The way the terminal operator has to enter the STRG parameter during the connect process.
USERAM	The way the terminal operator has to enter the USERID parameter during the connection process.
USERID	The default user-id.

5.2.6 CL - CLUSTER

5.2.6.1 Description

The CLUSTER object may be used in one of two ways:

- **CL-X25 and CL-TGX:**

These objects represent a DSA transport layer. They indicate parameters for flow control, retries, etc. and are used only for synchronous terminals communicating across an X.25 network.

- **CL-3270 and CL-VIP:**

These objects represent terminal cluster controllers. They indicate the physical address of the cluster. For VIP devices, the CL-VIP is used only if you require group polling of several TUs on a line. For 3270 devices, CL-3270 is always used.

5.2.6.2 Syntax for CL -TGX/X25

```
An X25 CL type is used to declare TCUxxxx and TCSxxxx cluster
controllers.

CL name {TGX|X25}

     -NR name
```

```
     [-CRDT v]            (1, 15)    3

     [-RTRY v]            (1, 9)     3

     [-T1 v]              (40, 1000) 100  (in 1/10s)

     [-T2 v]              (10, 1800) 600  (in 1/10s)

     [{-RECV|-FLCT|-SLAVE}]
```

```
Example:
CL CL01 TGX  -NR NR01
5.2.6.3 Syntax for CL -VIP
CL name VIP

    -PHAD addr     (0,7)

    [-LL name]

    [-NREC v]      (1, 255) 15
```

5.2.6.3 Syntax for CL -3270

```
CL name 3270

     -PHAD addr      (0, 31)

     [-LL name]

     [-NREC v]       (1, 255) 15
```

5.2.6.4 Description of Parameters

CRDT	Maximum credit allowed for the DSA transport protocol. This credit value is the number of fragments sent in anticipation of an acknowledgement. Memory cost increases with credit allowed but data traffic (for acknowledgments) decreases.
FLCT	The DSA transport protocol provides flow control in addition to the basic service. No error recovery is provided at transport protocol level (see RECV option for error recovery). Any error on a terminal causes that terminal to be disconnected.
LL	Name of the logical line mapped from this cluster.
NR	Name of the Network Route onto which this cluster is mapped.
NREC	Maximum number of successive blocks received in the cluster.
PHAD	Physical address of the cluster on the line. For more details about this parameter for VIP, see the PHAD option of the TU Directive.

RECV	The DSA transport protocol provides error recovery and flow control. Any error on a terminal causes the last (unacknowledged) fragment to be re-sent to that terminal.
RTRY	Maximum number of retries that may be attempted after a T1 time-out.
SLAVE	The DSA transport protocol will provide the functions required by the remote transport station which can be: - Flow Control (FLCT); - Error Recovery (RECV).
T1	For DSA Transport protocol, introduces the acknowledgment time-out. The timer is started by transport upon the transmission of each new fragment. Transport must receive an acknowledgement, otherwise the last fragment transmitted by it will be assumed to be lost and re-transmission will be initiated.
T2	For DSA Transport protocol, introduces the remote transport activity time-out. This is the maximum time lapse between two exchanges of fragment (data or acknowledgement). When T2 runs out, the transport connection is automatically closed.

5.2.7 CNS - CNS

5.2.7.1 Description

This directive permits the definition of parameters for the configuration and verifies that users are entitled to use the various options of the product. This directive must be the first in the configuration file.

5.2.7.2 Syntax

```
CNS string1

    -EOS string2
```

5.2.7.3 Description of Parameters

string1	User defined string of up to 8 characters naming the generated memory image for this configuration. This string will be in the welcome banner.
string2	String of 44 characters giving the valid options of the system. This string is in the software delivery.

5.2.8 CO - CORRESPONDENT

5.2.8.1 Description

The CORRESPONDENT object is used to convert the external symbolic name obtained from the terminal operator into the Standard Global Name (DSA name) of the correspondent.

5.2.8.2 Syntax

```
CO name TMG
        -DMB string             (8 chars. max.)
        [-BRK {AT|ATPGLT|ATPGWR|PGWR}]
        [-CD name]
        [-EXT string]           (4 chars. max.) 4 spaces
        [-SCID string]          (4 chars. max.)
        [{-CDOV|-NOCDOV}]
```

Example:

```
CO PAYROLL TMG  -DMB TDS3REV6  -BRK AT  -CD USER  -SCID 6X08
```

5.2.8.3 Description of Parameters

Name	Ranges from 1 to 8 alphanumeric characters.
AT	Send an attention message to a DSA correspondent when a break is received from the device.
ATPGLT	Purge all letters received from a DSA correspondent and to send an attention message when a break is received from the device.
ATPGWR	Purge the current output and to send an attention message to a DSA correspondent when a break is received from the device.
BRK	(BReaK): gives the processing to be done when a break signal is received from a device connected to a DSA correspondent. When the parameter is not defined and no default is provided, the parameter defined in the Connection Descriptor (CD) is used.
CD	Name of the Connection Descriptor to be used when this correspondent is referenced by the terminal operator.
CDOV	If present, the terminal operator can select another connection descriptor object by using the connection command (CN).
DMB	Destination mailbox name of the correspondent to be connected.
EXT	Mailbox extension of the correspondent to be connected.
NOCDOV	The terminal operator cannot connect to this correspondent with another connection descriptor (CD).
PGWR	Purges the current output when a break signal is received from the device.
SCID	Session control identity of the correspondent to be connected. The default value is the SC which has the -DFLT option declared in its directive.

5.2.9 CT - CONTROLLER

5.2.9.1 Description

A CONTROLLER object represents hardware component supporting a communications link, or local area network (E-LAN or ISL) controller. It gives the address of a hardware component.

5.2.9.2 Syntax

```
CT name {DCA|DCBE|DCE|RLNA|MLNA}

    -PHAD addr.
```

5.2.9.3 Description of Parameters

DCA	Communications line controller for lines of type A: - 1 V35/V28 interface, only available for HDLC procedures - 3 V24/V28 interfaces
DCBE	Communications line controller for lines of type B: - 4 V11 interfaces
DCE	Communications line controller for lines of type E: - 4 V24/V28 interfaces
MLNA	Communications line part of LNA board, having 4 V24/V28 interfaces.
RLNA	RLE/RLD (Establishment network or Departmental network)or ISL controller part of the LNA board. Only one physical line (of type CSMA) is allowed.
PHAD	Physical address of the controller (mandatory).

5.2.10 DEVICE - DEVICE

5.2.10.1 Description

This is a macro-command which generates the chain of directives MB (STAT-type), SN (TMG-type), LD (TMG-type), and the DV of the type specified in the macro-command (see the descriptions of DV directives).

5.2.10.2 Syntax

```
DEVICE name type       DV options for the type declared

     [ -CD name ]

     [{-CDOV|-NOCDOV}]
```

5.2.10.3 Description of Parameters

name	Maximum 4 characters.
type	Specifies one of the DV types (refer to the descriptions of DV directives for further details).
DV options	Refer to the DV directive for further details.
CD, CDOV, NOCDOV	Refer to the descriptions in the SN directive for further details.

5.2.11 DIR - DIR

5.2.11.1 Description

This directive contains a pointer to the location (library) of the software modules that are required on generation.

5.2.11.2 Syntax

```
DIR name
```

5.2.11.3 Description of Parameters

Name	Character string to locate the software modules in the SYS.DSA name library.

NOTE: This directive is optional, the default value of name is BLIB.

5.2.12 DP - DEVICE POOL

5.2.12.1 Description

A Device Pool represents a set of devices (DV) from which one will be selected at session establishment time (once), or during the session (n times); depending on an availability algorithm. The choice between the devices may be different for each allocation unit (EOR, EOQ, EOI or ECS enclosures) at session establishment time.

A Device Pool may be shared by many Logical Devices among multiple sessions. This type of pooling only applies to the output flow from the Terminal Manager to the terminal device. The attributes of the pool must be supported by all the devices (DV) mapped to it, either directly or through emulation.

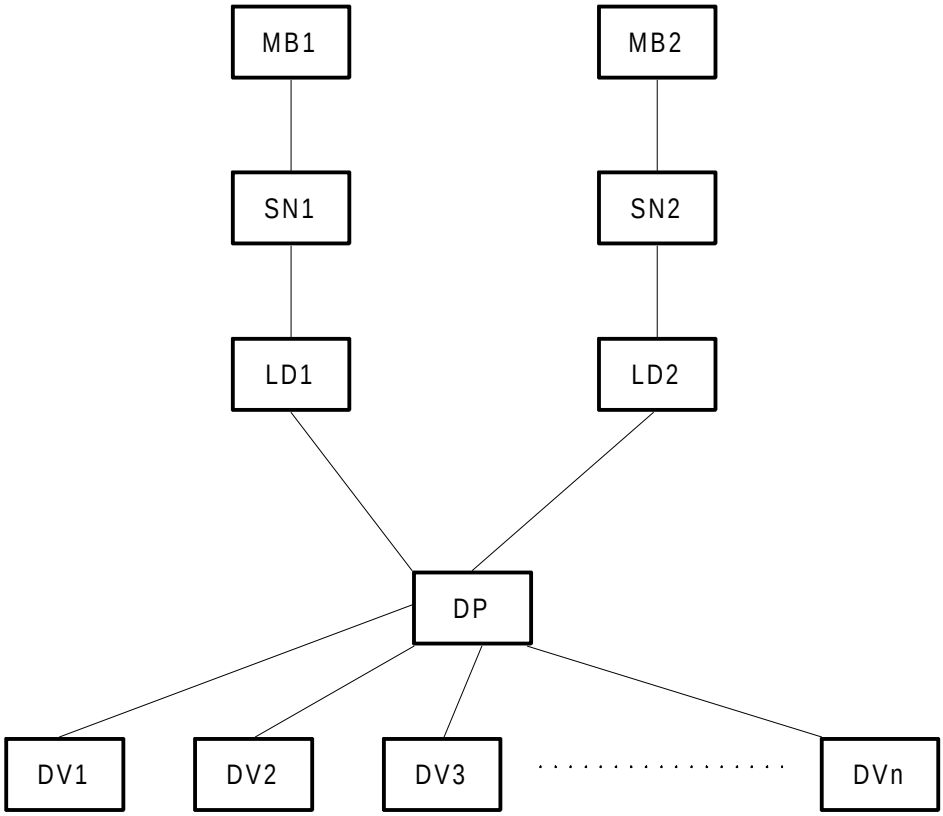
5.2.12.2 Syntax

```
DP name TMG

     -DV name1 [name2 [name3.....]]
```

5.2.12.3 Description of Parameters

DV	Name(s) of the device object(s) mapped from this device pool. Several devices may be allocated to the pool by the DP object inserted between LD and the DV.



This configuration possibility is used in two cases:

- in the establishment of a printer pool. When a correspondent opens the session, the TM selects the first available printer,
- in the configuration of a single logic station for a POOL of PAD DEVICES.

5.2.13 DV - DEVICE

5.2.13.1 Description

The DEVICE (DV) object describes a physical device (display terminal, printer etc.) in the secondary network. The parameters include a physical description and some parameters defining the behaviour of the TM (Terminal Manager).

Some parameters may also be defined in the Model (MD) directive mapped to this device. Parameters not described in this DV will then take default values from the MD.

The DV object may be mapped onto one or several Logical Devices (LD) (for example, a printer may be shared by several workstations).

5.2.13.2 Syntax for DV -ASY

```
DV name ASY
```

```
-MD name
[-BUFF v]                    (0, 32767)
[-EEACK]
[-ENTLAN]
[-ENTMD]
[-HCON]
[-HC name]
[-LANG name]
[-LD name]
[-LINE v]                      (0, 255)
[{-LL name|-TU name}]
[-LN name]
[-PAGE v]             (0, 255)
[-NBSESS v]           (1, 10) 2
[-ROP]
[-SPEED v]            (0, 32767)
[-SEQSES name]
[-TODISC v]           (0, 32767)
[-TYAHD v1 v2 v3]     v1 = (1,4)
                      v2 = (0, 255) 0
                      v3 = (0, 255) 0
[-TYXOFF v1:v2]
[-TYXON v1:v2  ]
[{-MANCN|-AUTOCN}]
[{-AUTLGO|-MANLGO}]
[{-BANN|-NOBANN}]
[{-SHR|-DED|-ESHR}]
[-DLALL]
[-DLBRM]
[-DLCXM]
[-DLLOC]
[{-ECHON|ECHOFF}]
[{-EPOFF |-EPON|-EPDLY[v]}]  (100, 2550) 100 (in 1/10 s)
```

```
[{-IMPLOG|-EXPLOG}]
[{-LCOFF|-LCON}]
[{-LNOV|-NOLNOV}]
[{-LOWCAS|-UPCAS}]
[{-SDIN|NOSDIN}]
[{-S64|S96}]
[{-EXITLI|NOEXLI}]
[{-EXITCN|-NOEXCN}]
[{-NOEXSD|-EXITSD}]
[-EXARG v]                      (1,32767)
[-SDLD name]
[{-PRON|-PROFF}]
```

5.2.13.3 Syntax for DV -PAD

```
DV name PAD
       -MD name
       [-BUFF v]          (0, 32767)
       [-EEACK]
       [-ENTLAN]
       [-ENTMD]
       [-HC name]
       [-HCON  ]
       [-LANG name ]
       [-LD name]
       [-LINE v]          (0, 255)
       [-LN name]
       [-NBSESS v]        (1,10) 2
       [{-REGUL|-NOREG}]
       [-NOX29]
       [-NOX29S]
       [{-NR name|-TU name}]
       [-PAGE v]          (0, 255)
       [-PROFIL name]
       [-ROP]
       [-SPEED v]         (0, 32767)
       [-TODISC v]        (0, 32767)
```

```
[-USER name]
[{-AUTGLO|MANGLO}]
[{-SHR|-DED|-ESHR}]
[{-BANN|-NOBANN}]
[-DLALL]
[-DLBRM]
[-DLCXM]
[-DLLOC]
[{-ECHON|-ECHOFF}]
[{-EPOFF|-EPON|-EPDLY [v]}]    (100,2550) 100 (in 1/10s)
[{-IMPLOG|-EXPLOG}]
[{-LCOFF|-LCON}]
[{-LNOV|-NOLNOV}]
[{-LOWCAS|-UPCAS}]
[{-MANCN|-AUTOCN}]
[{-SDIN|-NOSDIN}]
[{-S64|-S96}]
[{-EXITLI|-NOEXLI}]
[{-EXITCN|-NOEXCN}]
[{-NOEXSD|-EXITSD}]
[-EXARG  v]                          (1, 32767)
[-SDLD name]
[-T1]                                (0,120) 60 (1/10 seconds)
[{-PROF F|-PRON}]
```

5.2.13.4 Syntax for DV -MNTL

```
DV name MNTL              -MD name
        [-BUFF v]                (0, 32767)
        [-EEACK]
        [-ENTLAN]
        [-ENTMD]
        [-HC name]
        [-HCON]
        [-LD name]
        [-LANG name]
        [-LINE v]               (40 or 80)
        [{-LL name|-NR name}]
        [-LN name]
        [-TODISC v]
        [{-MANCN|-AUTOCN}]
        [{-AUTLGO|-MANLGO}]
        [{-BANN|-NOBANN}]
        [{-SHR|-DED|-ESHR}]
        [-DLALL]
        [-DLBRM]
        [-DLCXM]
        [-DLLOC]
        [{-EPOFF|-EPON|-EPDLY [v]}]   (100,2550) 100 (in 1/10s)
        [{-IMPLOG|-EXPLOG}]
        [{-LCOF F|-LCON}]
        [-SDLD name]
        [{-LNOV|-NOLNOV}]
        [{-LOWCAS|-UPCAS}]
        [{-SDIN |-NOSDIN}]
        [{-S64|-S96}]
        [-JAM string]                                  (1 char.)
        [{-MINITL|-VDOPAD}]
```

```
[{-EXITLI|-NOEXLI}]
[{-EXITCN|-NOEXCN}]
[{-NOEXSD|-EXITSD}]
[-EXARG v]                                          (1,32767)
[-RACK]
```

5.2.13.5 Syntax for -VIP/TGX

```
DV name {VIP|TGX}
        -MD name
        -TU name
        [-BUFF v]            (0, 32767)
        [-CPT]
        [-EEACK]
        [-ENTLAN]
        [-ENTMD]
        [-HC name]
        [-HCON]
        [-LD name]
        [-LANG name]
        [-LINE v]            (0, 255)
        [-LN name]
        [-NBSESS v]          (1, 10) 2
        [-PAGE v]            (0, 255)
        [-ROP]
        [-RTRY1 v1:v2]       (0, 255) v1= 5
                             v2= 20 (in 1/10s)
        [-RTRY2 v1:v2]       (0, 255) v1= 4
                             v2= 100 (in 1/10s)
        [-SEGOUT]
        [-SPEED v]          (0, 32767)
        [-TODISC v]         (0, 32767)
        [{-MANCN|-AUTOCN}]
```

```
[{-AUTLGO|-MANLGO}]

[{-BANN|-NOBANN}]

[{-SHR|-DED|-ESHR}]

[-DLALL ]

[-DLBRM ]

[-DLCXM ]

[-DLLOC]

[{-EPOFF|-EPON|-EPDLY [v]}]   (100,2550) 100 (in 1/10s)

[{-IMPLOG|-EXPLOG}]

[{-LCOFF|-LCON}]

[{-LNOV|-NOLNOV}]

[{-LOWCAS|-UPCAS}]

[{-SDIN|-NOSDIN}]

[{-S64|-S96}]

[{-EXIT LI|-NOEXLI}]

[{-EXITCN|-NOEXCN}]

[{-NOEXSD|-EXITSD}]

[-EXARG v]                    (1,32767)

[-SDLD name]
```

Example:

```
DV DV01 VIP  -BUFF 960     -ENTMD    -LD LDAS     -MD VIP7760 &
             -PAGE 12                 -TODISC 3000 -AUTOCN   &
             -DLLOC        -TU TU01   -EXPLOG      -S64
```

5.2.13.6 Syntax for DV -2780

```
DV name              2780 -LN name
       -MD name
       -DLALL
       -NOBANN
       [-LD name]
       [-LANG name]
       [-LL name]
       [-TODISC v]          (0, 32767)
       [{-AUTLGO|-MANLGO}]
       [{-MANCN|-AUTOCN}]
       [-EEACK]
       [{-EXITLI|-NOEXLI}]
       [{-EXITCN|-NOEXCN}]
       [{-NOEXSD|-EXITSD}]
       [{-SDIN|-NOSDIN}]
       [-EXARG v]          (1,32767)
       [-SDLD name]
       [-BUFF v]          (1,32767) 80
```

5.2.13.7 Syntax for DV -3270

```
DV name 3270          -CL name
       -MD name
       -PHAD v               (0, 31)
       [-BUFF v]             (0, 32767)
       [-EEACK]
       [-ENTLAN]
       [-ENTMD]
       [-HC name]
       [-HCON]
       [-LD name]
       [-LANG name]
```

```
[-LINE v]              (0, 255)
[-LN name]
[-NBSESS v]            (1, 10) 2
[-PAGE v]              (0, 255)
[-RTRY1 v]             (1, 32767) 600 (in 1/10 s)
[-RTRY2 v1:v2]         v1 (1, 10) 3
                      v2 (1, 32767) 300 (in 1/10 s)
[-TODISC v]           (0, 32767)
[-TOSURV v]           (0, 32767) 600 (in 1/10 s)
[{-MANCN|-AUTOCN}]
[{-AUTLGO|-MANLGO}]
[{-BANN|-NOBANN}]
[{-SHR|-DED|-ESHR}]
[-DLALL]
[-DLBRM]
[-DLCXM]
[-DLLOC]
[{-EPOFF|-EPON|-EPDLY [v]}]      (100,2550) 100 (in 1/10s)
[{-IMPLOG|-EXPLOG}]
[{-LCOFF|-LCON}]
[{-LNOV|-NOLNOV}]
[{-LOWCAS|-UPCAS}]
[{-SDIN|-NOSDIN}]
[{-S64|-S96}]
[{-EXITLI|-NOEXLI}]
[{-EXITCN|-NOEXCN}]
[{-NOEXSD|-EXITSD}]
[-EXARG v]                            (1,32767)
[-SDLD name]
```

5.2.13.8 Description of Parameters

AUTOCN	Connection from the secondary network is accepted as soon as the device is connected (i.e. carrier detect signal or ACK response to polling). Then TM enters the login phase or waits for a login command. This is incompatible with the -AUTSPD parameter of the PL ASY directive.
AUTLGO	Log out will be done after session disconnection.
BANN	Banner is displayed at physical connection. This is the default option.
BSBLOC	The delete character can act on the previous input (Terminal Manager edition buffer).
BSLINE	The delete character only acts on the last line (since last input delimiter).
BUFF	Maximum size of the data that can be sent to the terminal. The maximum size is in relation to the size of the physical buffer of the terminal. For a 2780 connected to a host operating under GCOS 7, it is the sub-block size in bytes, (for which the default value is 80). For VIP and TGX, the default values are included in the model. See also the SEGOUT parameter.
CL	Name of the cluster onto which the device is mapped.
CPT	Data transfer to/from the KDS diskette uses the block numbering option (the diskette terminal is seen by the VIP protocol as a cassette).
DED	The device is not sharable.
DLALL	Sets the initial defer message option to delete expedited messages (broadcast and secondary dialog) from the correspondent. The default is no defer. This parameter must be present with 2780 for connection to a host operating under GCOS 7.
DLBRM	Sets the initial defer message option to delete the broadcast messages entered by a network operator. The default is no defer.
DLCXM	Sets the initial defer message option to delete the correspondent expedited messages. The default is no defer.
DLLOC	Sets the initial defer message option to delete the secondary dialog message (generated locally). The default is no defer.
ECHOFF	Non-echoplex mode (alternate mode).
ECHON	Echoplex mode. This is the default parameter.
EEACK	End-to-end ACK for session.

ENTLAN — The Terminal Manager (TM) will prompt for the language of the secondary dialog.

ENTMD — TM will prompt for the model name when the device is connected to the secondary network. If absent or if the terminal operator presses <C/R> without having specified a model name, the model declared in DV is taken by default.

EPDLY — The device needs a delay when an end of page or page overflow occurs. The delay value is in tenths of a second and should give a time delay greater than the default of 10 seconds. See Table 5-1.

EPOFF — The device needs no delay when an end of page or page overflow occurs. The following data is immediately sent to the device at the top of the screen (wrap around). This is the default. See Table 5-1.

EPON — When an end of page or page overflow occurs, TM must wait for data from the device before processing the next page. See Table 5-1.

The parameters EPDLY, EPOFF, EPON are effective only in certain cases, given by the table below.

Table 5-1. End of Page Parameter Validity

	ASY	**PAD**	**MNTL**	**VIP**	**TGX/VIP X25**	**3270**
SPD (**)	X	X	X	X	X	X
Real	X	X		X		

**Note: This is used in connection to the NOI, the mailboxes $DEBURG and $EDIT, and interterminal sessions.

ESHR — The device is exclusively sharable.

EXARG — Used with user exit routines (if they exist). The values will be supplied on installation.

EXITCN — User exit routine (if it exists) is entered on connection request.

EXITLI — User exit routine (if it exists) is entered on login request.

EXITSD — User exit routine (if it exists) is entered on each secondary dialogue command.

EXPLOG — A login command must be entered by the terminal operator.

HC — Hard Copy model name.

HCON — The device is connected to a hard copy device, the name of which is described in the HC option.

IMPLOG	The login process has to be started according to the Login Descriptor (LN) object as soon as the connection from the secondary network layer is accepted.
JAM	The character echoed instead of the character received when read and jam. Only valid for direct connection.
LANG	Name of the language used on the device for the secondary dialogue commands and messages. This language must be defined by a LANG directive. The default language is the one described in the first LANG directive.
LCOFF	Initial value of the lower case option to OFF. In such a case, all lower case characters are translated to upper case before being transmitted to the correspondent. This is the default. See Table 5-2.
LCON	Initial value of the lower case option to ON. If present, no translation to upper case characters is operated. See Table 5-2.
LD	Name of the Logical Device object which is to be used to retrieve the appropriate mailbox to be used. The terminal operator can enter a connect command using the keyword LMB (Local MailBox). When this is not used, the mailbox is retrieved via this logical device. The Logical Device object must be one of those referencing this Device object with the keyword DV. The default for this parameter is the first logical device having referenced the device.
LINE	Line length of the device in characters. This parameter is optional and the default value is retrieved from the model object. The value ranges from 0 (undefined) to 255. For MNTL device, the recommended values are 40 or 80.
LL	Name of the logical line onto which this device is mapped.
LN	Name of the Login Descriptor object to be used.
LNOV	The terminal operator is allowed to specify a login descriptor object name in the login command. The login phase is then further processed according to this new login descriptor. This is the default.
LOWCAS	The device accepts lowercase characters. The characters may be displayed by the device as lower or upper case. The default is defined in the model. See Table 5-2.
MANCN	Connection from the secondary network is accepted when the terminal operator enters data. Then TM enters the login phase or waits for a login command. This is the default.
MANLGO	Logout must be done by the terminal operator.

MD	Up to eight-character model name defining the device. The model type must be the same as the device. This model object may be either a standard model (see the list of standard models following this description of parameters), or it may be defined within the generation.
MINITL	In Videotex mode, the function Key is transmitted to the DSA correspondent as if it were coming from a Minitel terminal itself (i.e., X'13', Key code).
NBSESS	Maximum number of simultaneous sessions (for multi-session printer sharing).
NOBANN	No login Banner is sent to the device.
NOEXCN	The Connect exit is not entered at connection.
NOEXLI	The login exit is not entered at login.
NOEXSD	The secondary dialogue exit is not entered on secondary dialogue command.
NOLNOV	The terminal operator is not allowed to specify a login descriptor (LN) object name in the login command.
NOREG	Flow regulation is not used.
NOSDIN	Texts received from the device do not contain secondary dialog commands.
NOX29	Transmission of X29 messages towards the PAD is not supported.
NOX29S	Transmission of X29 messages which may modify the PAD profile are not supported.
NR	Name of the network route associated with this device.
PAGE	Page length of the device expressed in lines. The default for this parameter is defined in the model. The value ranges from 0 (undefined) to 255. Zero is not supported by GCOS7 IOF applications.
PHAD	Device address. ALL DVs mapped onto the same CL must have different addresses.
PROFIL	Name of the PROFIL directive associated with this device. (See PROFIL directive for further details).
PROFF	The paper tape reader function is not supported for this device.
PRON	Supporting the paper tape reader function (use with PR-ON, PR-OFF in the local dialogue).
REGUL	Flow regulation is performed by the terminal manager.
ROP	Receive Only Printer.

RACK	If this parameter is present in a DV MNTL directive, the status of the minitel device is sent to the application.
RTRY1	For VIP and TGX, specifies the number of retries (v1) and the time-out value (v2) for each retry when a BUSY or NA status occurs (level 1). For 3270, v specifies the time-out when a BUSY STATUS occurs.
RTRY2	For VIP and TGX, specifies the number of retries (v1) and the time-out value (v2) for each retry when the maximum number of retries (RTRY) is reached (level 2). For 3270, v specifies the number of retries (v1) and the time between retries (v2).
SDIN	Texts received from the device may be considered as secondary dialog commands if the text starts with the secondary dialog sequence. This is the default.
SDLD	Logical device name used to enter local dialog from another device.
SEGOUT	Length of the text sent to the device is limited by the buffer length. The text is cut into several blocks. The buffer length is given by the -BUFF parameter.
SEQSES	SEQ SESS directive used to specify the character sequence to send to the application in the place of the terminal operator input.
SHR	Device is sharable.
SPEED	Device speed in characters per second. This value used to count the number of filling characters or the delay before the next select. The default for this parameter is defined in the model. The value ranges from 0 to 32767.
S64	The device uses the 64 symbols subset. The default is defined in the model. See Table 5-2.
S96	The device uses the 96 symbols set. The default is defined in the model. See Table 5-2.
TODISC	Value in tenths of seconds of the no session timer. This is the time after which the device is logged out and disconnected from the secondary network when no session is established. The default for this parameter is 0 (i.e. no timer). The value ranges from 0 to 32767.
TOSURV	Time out suppression of a faulty device in tenths of a second
TU	Name of the associated terminal unit (TU).
TYAHD	Type ahead. It is followed by 3 values which define the type ahead buffer size (v1), the XON threshold (v2) and the XOFF threshold (v3). Value v1 between 1 (128 bytes) and 4 (512 bytes). Buffer size = v1 x 128 bytes.

TYXOFF — Defines the XOFF sequence with 2 characters. When the number of free bytes in the type ahead buffer is lower than v3 of -TYAHD, the XOFF sequence is sent to the terminal. To specify a one character sequence, the second character must be X'00'.

TYXON — Defines the XON sequence with 2 characters. When the number of free bytes in the type ahead buffer is greater than v2 of -TYAHD, the XON sequence is sent to the terminal. To specify a one character sequence, the second character must be X'00'.

T1 — Idle time-out delay. If the time between the sending of two characters from the device exceeds this value, the PAD sends the characters already held to the TM.

UPCAS — The device only accepts upper case characters. A translation may be done by TM. The default is defined in the model. See Table 5-2.

USER — Name of the USER directive which defines the call packet data.

VDOPAD — In Videotex mode, the function Key is transmitted to the DSA correspondent as if it were coming from VIDEOPAD (i.e., Key code X'OD'). (as in the Teletel access point).

Table 5-2. Relationship between LCON/LCOFF, S64/S96 and LOWCAS/UPCAS parameters

	LCON	**LCOFF**		**LOWCAS**	**UPCAS**
S64	Upper (1)	Upper (1)	S64	Upper (3)	Upper (2)
S96	Lower/Upper (1)	Upper (2)	S96	Lower/Upper (4)	Upper (2)
Terminal-<> Terminal Manager (input)			**Terminal Manager-<> Terminal (output)**		
(1) Terminal Manager does not perform translation (2) Terminal manager performs translation (3) Terminal performs translation (4) Terminal does not perform translation					

LIST OF STANDARD MODELS

More than one model identification may be used for a single device in the case where different configurations or uses are possible (e.g; half/full duplex, ...). Also, some synonyms are provided. In the table on the next few pages, the following information is provided:

- the marketing identifier of the terminal;
- the model name;
- the reference model name;
- the functional type of the terminal;
  - LP for line printers;
  - TTY for teleprinters;
  - DIS for visual displays;
  - DIS + DS for visual displays with diskette units;
  - K7 for cassette units;
  - DSK for diskette units;
  - TELEX for telex-type terminals;
  - ROP for Receive-Only Printer;
- the connection mode:
  - PAD for a terminal connected through the PAD facility of an X.25 network;
  - ASY for asynchronous;
  - SYN for synchronous;
  - CSX for cluster terminal;
  - TGX for Transpac cluster terminal.
  - VIDEOPAD for a terminal connected through the VIDEOPAD facility of an X.25 network.

Table 5-3. Asynchronous Terminals

Marketing identifier	Model name	Synonyms	TYPE	DSA Connection	Comment	IDNB Code
AJ832 AJ832	AJ832 832APL64		TTY TTY	ASY/PAD ASY/PAD	 APL mode for GCOS 7	15 15
DKU7001 DKU7002 DKU7102	DKU7001 DKU7002 DKU7102		DIS DIS DIS	ASY/PAD ASY/PAD ASY/PAD		19 1A 1B
MINITEL	MINITEL MINITELX MINITEL2		DIS	ASY/PAD	TTY/SDP Mode videotex Mode videotex Mode	24 24 24
PRT1220 PRU1003 PRU1005	A2	 TTU8124 TTU8126	LP TTY TTY	ASY/PAD ASY/PAD ASY/PAD		5C 0A 0B
TELEX TN300 TN1200	T ELEX TN300 TN1200		TELEX TTY TTY	PAD only ASY/PAD ASY/PAD		21 05 11
TTU8125 TTU8127 TTX35 TTX33	TTU8124 TTU8124A TTU8126 TTU8126A TTX35 TTX33		TTY TTY TTY TTY DIS TTY	ASY/PAD ASY/PAD ASY/PAD ASY/PAD ASY/PAD ASY/PAD	QWERTY keyboard AZERTY keyboard QWERTY AZERTY	0A 0A 0B 0B 17 01
TWU1003 TWU1005		TTU8124 TTU8126	TTY TTY	ASY/PAD ASY/PAD		0A 0B
VIP7100 VIP7200 VIP7201 VIP7301 VIP7305 VIP7801 VIP7801 VIP7802	VIP7100 VIP7200 VIP7201 VIP7301 VIP7801 TXT7801	 VIP7301 VIP7801	DIS DIS DIS DIS DIS DIS DIS DIS	ASY/PAD ASY/PAD ASY/PAD ASY/PAD ASY/PAD ASY/PAD ASY/PAD ASY/PAD	 character mode character mode block mode character mode	0D 0E 48 48 17 17

Table 5-4. VIP Terminals (1/2)

Marketing identifier	Model name	Synonyms	TYPE	DSA Connection	Comment	IDNB Code
	A2V		LP	SYN		5C
ASPI10	ASPI10V		LP	SYN		75
ASPI30	ASPI30V		LP	SYN		7A
ASPI32	ASPI32V		LP	SYN		76
ASPI34	ASPI34V		LP	SYN		7B
ASPI38	ASPI38V		LP	SYN		77
DKU7005	DKU7005		DIS	SYN		3D
DKU7007	DKU7007		DIS	SYN+CSX	with diskette	3D
DKU7007	DKU7007D		DIS+DSU	SYN+CSX		40
DKU7105	DKU7105		DIS	SYN	with diskette	41
DKU7107	DKU7107		DIS	SYN		41
DKU7107	DKU7107D	DKU71X7	DIS+DSU	SYN+CSX	colour terminal	42
DKU7211			DIS	SYN		42
DKU7211	DKU7211		DIS	SYN		45
DY311	DY311	PRU7101V	LP	SYN		78
K7200	K7200		K7	SYN+CSX	used with KDS7265 used with VIP7200	38
K7700	K7700		K7	SYN+CSX		38
KDS7265	KDS7265		DIS	SYN+CSX		38
KDS7275	KDS7275		DIS	SYN+CSX		38
KDT			DIS	SYN		
PRU1901	PRU1901V	TTU8221	TTY	SYN		39
PRU7003	PRU7003V	TTU8124V	LP	SYN		0A
PRU7005	PRU7005V	TTU8126V	LP	SYN		0B
PRU7070	PRU7070V	ASPI10V	LP	SYN		75
PRU7075	PRU7075V	ASPI30V	LP	SYN		7A
PRU7101	PRU7101V	PRU7101V	LP	SYN		78
PRU7102	PRU7102V	ASPI32V	LP	SYN		78
PRU7170	PRU7170V	ASPI38V	LP	SYN		76
PRU7270	PRU7270V	ASPI34V	LP	SYN		77
PRU7370	PRU7370V		LP	SYN		7B
	PVE		DIS	SYN	polled VIP emulation	34
	ROPV		LP	SYN+CSX	Receive only device	
PRU7080	SARA10V		LP	SYN+CSX		72
TCU *			K7	SYN+CSX		
TDU *			DSK	SYN+CSX		
TG *	TGT		DIS	TGX		
TGLP *			LP	TGX		
TGT *			DIS	TGX	Transpac use	

Table 5-4. VIP Terminals (2/2)

Marketing identifier	Model name	Synonyms	TYPE	DSA Connection	Comment	IDNB Code
TN300	TN300V		LP	SYN+CSX		05
TN340	TN340V		LP	SYN+CSX		73
TN1200	TN1200V		LP	SYN+CSX		11
TTU8125	TTU8124V		LP	SYN+CSX		0A
TTU8127	TTU8126V		LP	SYN+CSX		0B
TTU8221	TTU8221	VROP	TTY	SYN+CSX	Receive only printer	39
TTU8221	TTU8221R	TTU8221	TTY-ROP	SYN		39
TTU8223	TTU8223		TTY	SYN		39
TTX35	TTX35V2		DIS	SYN		23
TWU1003	TTU8124V		LP	SYN		0A
TWU1005	TTU8126V		LP	SYN		0B
TWU1901	TTU8221V		TTY	SYN		39
VIP0000				SYN	for model LIKE	3C
VIP7001	VIP7001		DIS	SYN+CSX		33
VIP7700	VIP7700		DIS	SYN+CSX		3A
VIP7760	VIP7760		DIS	SYN+CSX		3E
VIP7804	VIP7804		DIS	SYN		3E
VIP7804	VIP7804V		DIS	SYN	VDF options	3E
VIP7805	VIP7805	VIP7804	DIS	SYN		3E
VIP7805	VIP7805V	VIP7804V	DIS	SYN	VDF options	47
VIP7814	VIP7814			DIS	SYN	
VROP*			TTY	SYN	Receive only device	
VTS7778	VIP7700		DIS	SYN		33

*These specifications enable the user to undertake the developments necessary in order to connect terminals other than those included in the present lists to a Bull network. For futher details, see your local Bull representative.

Table 5-5. 3270 Terminals

Marketing identifier	Model name	TYPE	DSA Connection		Comments	IDNB Code
3275-1	3275-1A	DIS	SYN		ASCII	61
3275-1E		DIS	SYN		EBCDIC	61
3275-2	3275-2A	DIS	SYN		ASCII	61
3275-2E		DIS	SYN		EBCDIC	61
3276-1	3276-1A	DIS	SYN		ASCII	64
3276-1E		DIS	SYN		EBCDIC	64
3276-2	3276-2A	DIS	SYN		ASCII	64
3276-2E		DIS	SYN		EBCDIC	64
3276-3	3276-3A	DIS	SYN		ASCII	64
3276-3E		DIS	SYN		EBCDIC	64
3276-4	3276-4A	DIS	SYN		ASCII	64
3276-4E		DIS	SYN		EBCDIC	64
3277-1	3277-1A	DIS	SYN		ASCII	61
3277-1E		DIS	SYN		EBCDIC	61
3277-2	3277-2A	DIS	SYN		ASCII	61
3277-2E		DIS	SYN		EBCDIC	61
3278-1	3278-1A	DIS	SYN		ASCII	64
3278-1E		DIS	SYN		EBCDIC	64
3278-2	3278-2A	DIS	SYN		ASCII	64
3278-2E		DIS	SYN		EBCDIC	64
3278-3	3278-3A	DIS	SYN		ASCII	64
3278-3E		DIS	SYN		EBCDIC	64
3278-4	3278-4A	DIS	SYN		ASCII	64
3278-4E		DIS	SYN		EBCDIC	64
3278-5	3278-5A	DIS	SYN		ASCII	64
3278-5E		DIS	SYN		EBCDIC	64
3279	3279E	DIS	SYN		EBCDIC	69
3284-1	3284-1A	LP	SYN		ASCII	66
3284-1E		LP	SYN		EBCDIC	66
3284-2	3284-2A	LP	SYN		ASCII	66
3284-2E		LP	SYN		EBCDIC	66
3284-3	3284-3A	LP	SYN		ASCII	66
3284-3E		LP	SYN		EBCDIC	66
3286-1	3286-1A	LP	SYN		ASCII	66
3286-1E		LP	SYN		EBCDIC	66
3286-2A		LP	SYN		ASCII	66
3286-2E		LP	SYN		EBCDIC	66
3287	3287	LP	SYN		EBCDIC	66
3287-1	3287-1A	LP	SYN		ASCII	66
3287-1E		LP	SYN		EBCDIC	66
3287-2	3287-2A	LP	SYN		ASCII	66
3287-2E		LP	SYN		EBCDIC	66
3288-2	3288-2A	LP	SYN		ASCII	66
3288-3E		LP	SYN		EBCDIC	66
3289-1	3289-1A	LP	SYN		ASCII	66
3289-1E		LP	SYN		EBCDIC	66
3289-2	3289-2A	LP	SYN		ASCII	66
3289-2E		LP	SYN		EBCDIC	66

Table 5-6. 2780 Terminals

Marketing identifier	Model name	Synonyms	TYPE	Connection	Comments.	DSA Code Hex
BULL DPS 6						
/Mini 6	2780		RB	SYN		62
(MOD400+WS2780)	2780E	2780	RB	SYN	EBCDIC	62

5.2.14 END - END

5.2.14.1 Description

This directive is the last directive of any configuration file and is used to give the name of the file containing the memory image resulting from this generation.

5.2.14.2 Syntax

```
END        -SAVE    string
```

5.2.14.3 Description of Parameters

SAVE — Name of the file where the absolute memory image will be stored after the generation has been successfully completed.

Example

```
END        -SAVE    CORECNP7I
```

5.2.15 EX - EXECUTIVE

5.2.15.1 Description

An EXECUTIVE object defines some basic operating system parameters.

This directive may be omitted if ALL default parameters are acceptable.

5.2.15.2 Syntax

```
EX name
     [-BUFSZ v]              (70,     ) 200
     [-MEM v]                (10, 90) 30
     [-NBCREQ v]
```

5.2.15.3 Description of Parameters

BUFSZ — Size of the buffers in bytes. Buffer size is a compromise between the total number of buffers (less, if the buffer size is bigger) and the time taken for the system to handle a text (faster when the buffer is bigger). Default value is 200. Minimum value is 70.

MEM — Percentage of main memory to be allocated to both dynamic and buffer memory. The percentage value for buffer memory is found by subtracting, 'v' from the total memory available. If 'v' is not specified, the system will allocate 33% of memory to dynamic memory and the remainder (i.e. 67%) to buffer memory.

This ratio is not necessarily desirable in all cases. In some instances, it is advisable to allocate more memory to dynamic activities, thereby reducing the amount of memory available for buffer memory. Evaluation of the optimum values depends on the type of network that is supported and the number of terminals expected to be simultaneously active.

To estimate the critical values, the following formulae may be applied:

User memory size = Total memory - (coding + Tables)

User memory size x V% ---> Dynamic area

Since approximately 700 bytes are required for each active terminal, the number of possible terminals, T, is thus found:

$$T = \frac{\text{Dynamic Area}}{700}$$

Memory size is expressed as kilobyte units.

NBCREQ — Maximum number of SC -EQU objects which can be declared in the EQU file This parameter is used with the DNE facility (see Appendix A).

5.2.16 FL - FILTER

5.2.16.1 Description

A FILTER determines whether a particular administrative record is allowed to, or must, be sent to the administrative entity with which the Filter is associated.

Filters are mapped from AG and OP objects (refer to these objects for further details).

To filter given message, the "Domain", "Power", "Class", "Code", "Responding System" and "Importance Level" fields of the administrative record are examined. If the value of these fields (including the limiting values, ranges, not exclusive) matches the filter, it is passed to the corresponding administrative component.

The record is passed to the associated administrative component if it matches all obligatory filters, at least one inclusive filter and does not match any exclusive filter.

NOTE: If no filters are declared, all AEP records will be allowed.

A filter with all default values is equivalent to no filter.

If an NCL command is allowed (with an IN filter mapped to OP-OP), the response to this command is always allowed, whatever OUT filters are declared.

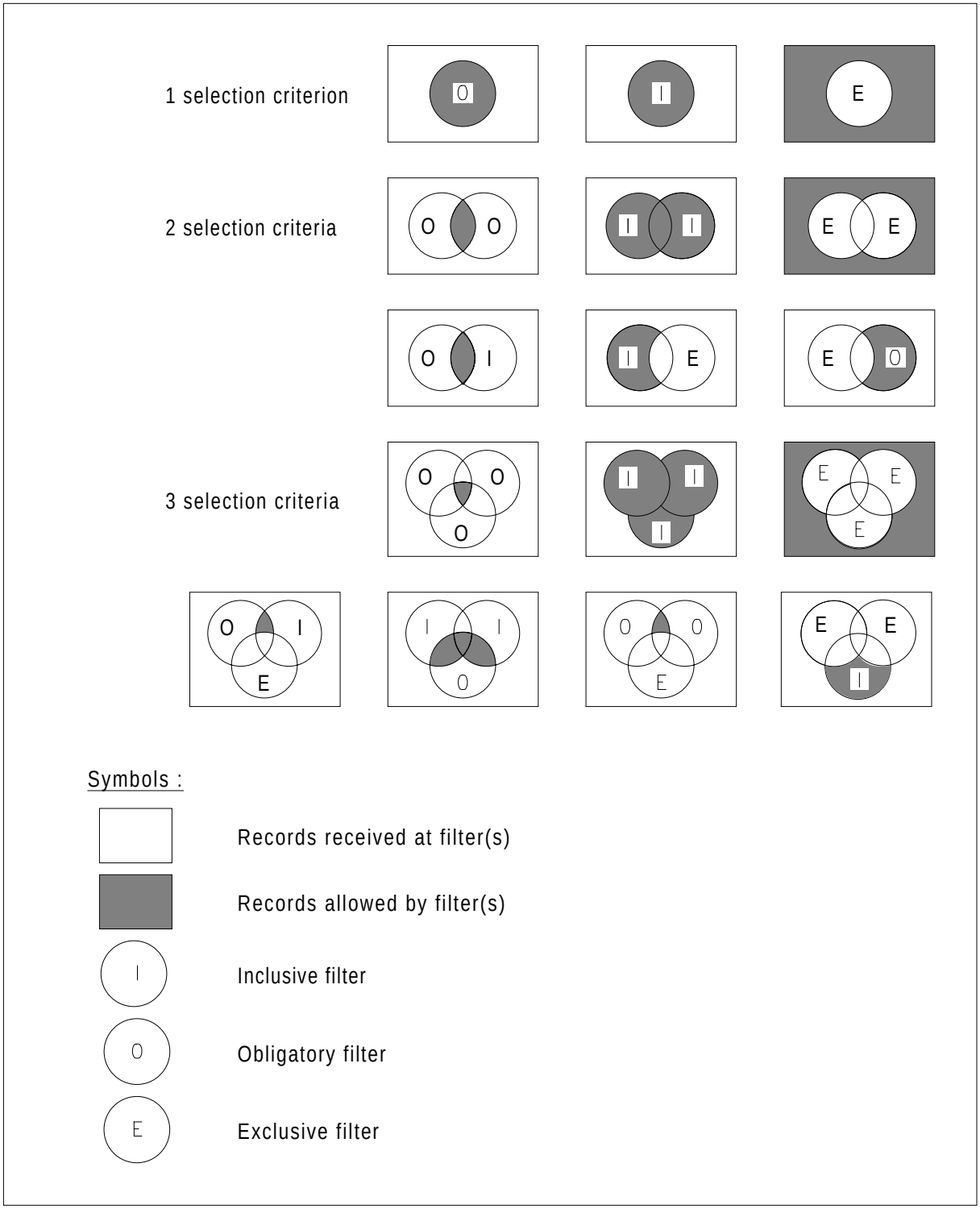


Figure 5-1. Filter Logic

5.2.16.2 Syntax for FL -IN/OUT

Note that IN implies the following direction of filtering of administrative records:

```
OP --> AG --> AF
```

or AC

and OUT implies the following direction of filtering of administrative records:

```
AF --> AG --> OP.
```

or AC

```
FL name {IN|OUT}
-LO {EXCL|INCL|OBLG}
                        Values for          Values for
                        LO{INCL|OBLG}       LO EXCL


    [-CLL v]            (1, 255) 1              256
    [-CLU v]            (CLL v, 255) 255        256
    [-COL v]            (1, 255) 1              256
    [-COU v]            (COL v, 255) 255        256
    [-DOL v]            (0, 4) 0                256
    [-DOU v]            (DOL v, 4) 4            256
    [-IML v]            (0, 30) 0               256
    [-IMU v]            (IML v, 30) 30          256
    [-POL v]            (0, 3) 0                256
    [-POU v]            (POL v, 3) 3            256
    [-SYS name]
```

5.2.16.3 Description of Parameters

CLL	Lower value of the class (see Note 1 for a list of CLASS values). This parameter allows execution of the process associated with the record (in the NAD) as well as sorting log and filtering responses.
CLU	Upper value of the class (See Note 1 for a list of CLASS values).
COL	Lower value of the code (See Note 2 for a list of CODE values). This parameter determines the particular action to be taken by the class processor or the specific message when unsolicited.
COU	Upper value of the code (See Note 2 for a list of CODE values).
DOL	Lower value of the domain (See Note 3 for a list of DOMAIN values). This parameter indicates the administrative area with which the command deals.
DOU	Upper value of the domain (See Note 3 for a list of DOMAIN values).

IML	Lower value of the importance level (See Note 4 for a list of IMPORTANCE LEVEL values). This parameter defines filtering and log analysis. It is inoperative in filters of the IN type.
IMU	Upper value of the importance level (See Note4 for a list of IMPORTANCE values). This parameter is inoperative in filters of the IN type.
LO	Defines the logical operand (exclusive filter, inclusive filter or obligatory filter). An exclusive filter (EXCL) rejects all records that match it. An inclusive (INCL) filter selects all records that match it. An obligatory (OBLG) filter rejects all records that do not match it.
POL	Lower value of the power (See Note 5 for a list of POWER values). This parameter indicates the level of operation being reported.
POU	Upper value of the power (See Note 5 for a list of POWER values).
SYS	Specifies the sc -id for the record. For obligatory or inclusive filters, it indicates the authorized destination, records will only be accepted for that system.

Note 1:

List of CLASS values

1 = Cross-network monitoring
2 = Cross-network transfers
3 = System start-up control
4 = [PL] Physical Line (line adapter)
5 = [LL] Logical Line
6 = [NS] Network subscription
7 = [NR] Network route (path)
8 = [VC] Virtual circuit
9 = [TS] Transport station
10 = [MB] Mailbox
11 = [SS] Session
12 = [LC] Logical connection
13 = [CT] Communications controller
14 = [DV] Terminal device
15 = [AF] Administrative functions
16 = Software debug control
17 = Data storage management
18 = Reserved for future use
19 = [EX] Executive (local OS)
20 = [SY] System (node)
21 = [TC] Transport connection
22 = [MO/WS] Mailbox owner (workstation)
23 = [NC] Network connection
24 = [SD] Session descriptor
25 = [CH] Inter-system channel
26 = [SN] Station (Terminal)
27 = [CL] Terminal cluster
28 = [LK] Link connection
29 = [PC] Physical connection
30 = [SC] Session Control
31 = [CC] Channel connection
32 = Periodic response management (in NAD)
33 = Auto-event management (in NAD)
34 = [FL] Output filter management (in NAD)
35 = [SB] Statistics Block
36 = Additional control of NAD itself
37 = Control of system
38 = [MU] Mailbox User
40 = Reserved for future use
41 = Threshold violation
42 = Maintenance control
43 = [AC] Administrative Correspondent
44 = [SR] Session Route
45 = [LD] Logical terminal Device
46 = Reserved for future use
47 = ASF Library
48 = [OP] Operator and administrator control
49 = [LG] LOG (ASF) control
50 = AUTs control
51 = [TL] Diagnostic application control
52 = Packaged application control
53 = User application control
54 = [FT] File Transfer
56 = [AG] Administrative Group
57 = [CO] Correspondent

60 = [SX] Station Connection
61 = [LX] Logical Device Connection
62 = [DX] Device Connection
63 = [UD] User Descriptor
64 = [LN] Login Descriptor
65 = [CD] Connection Descriptor
66 = [TX] Terminal Mailbox Extension
67 = Reserved for future use
68 = [DP] Device Pool
69 = [WM] Welcome Message
70 = [TU] Terminal Unit
71 = [MD] Terminal Model
74 = [SW] Software "module"
75 = [NU] Network User
90 = [CB] CaBle
100 = Vehicle (system type-specific)
200 - 255 = Reserved for customized objects.

Note 2:

List of CODE values

1 = (NB) Report NUMBER of objects.
2 = (LS) LIST objects.
3 = (DA) DISPLAY common ATTRIBUTES of objects.
4 = (GH) Report HISTORY (statistics) of object.
5 = (UP) UPDATE object state or attributes.
6 = (MP) Alter MAPPING of object to other objects.
7 = CREATE object or object OPEN report.
8 = DELETE object or object CLOSE report.
9 =Reserved for future use
10 =Reserved for future use
11 =Reserved for future use
12 = (GA) GET all ATTRIBUTES of an object.
13 = Reserved for future use
14 = ERROR events report.
15 = THRESHOLD violation report.
16 = RESET event report.
17 = OPEN FAILURE event report.
18 = 49 Reserved for additional general commands and events.
50 = (TX) Text broadcast.
51 = 149 Reserved for class-specific events and error reports.
150 = 255 Reserved for implementation-specific events and error reports.

Note 3:

List of DOMAIN values

0 = DSA communications.
1 = Administration of local System.
2 = Application administration.
3 = Control of Administration itself.
4 = Security administration.

Note 4:

List of IMPORTANCE LEVEL values

0 = Response to Number (NB) or List (LS) commands.
2 = Response to attribute or history reporting commands (DA, GA, GH commands).
4 = Unimportant errors ordinarily masked to anybody.
6 = Answer to modification commands (UP, MP commands).
8 = Impossible answer by NAD (command rejected).
10 = Standard events and probe points.
12 = Important events.
14 = In-line tests messages to operator.
16 and above = Important errors.
22 and above = Operator intervention suggested.
24 and above = Operator intervention required.
26 and above = Portion of distributed system failed or shutdown.
30 and above = Fatal error.

Note 5:

List of POWER values

0 = Messages reporting events (unsolicited messages).
1 = Information display commands (DA, GA, GH commands).
2 = Test and maintenance commands (TL command).
3 = Control and modification commands (MP, UP commands).

5.2.17 LANG - LANGUAGE

5.2.17.1 Description

This directive introduces the name of files which contain messages and keywords used by the Terminal Manager for secondary dialog commands and messages.

Several LANG directives can be present. The first language directive defines the default one (See -LANG parameter of DV directive). If no LANG directive is declared, the default language-name is NATIONAL; the predefined filenames are used by default.

LANG directives must be declared at the beginning of the generation file. At physical connection the terminal operator may change language, if ENTLAN is present in the DV for the terminal.

5.2.17.2 Syntax

```
LANG {NATIONAL|language-name}   (8 chars. max.)
    -KEYFIL string    (64 chars. max.)
    -MESFIL string    (64 chars. max.)
```

5.2.17.3 Description of Parameters

language-name	Name of the language defined by KEYFIL and MESFIL. (this is NATIONAL if this directive is absent).
KEYFIL	Directory name followed by keyword file name. The default name is SLIBDLCKW.
MESFIL	Directory name by the message file name. The default name is SLIBDLCMSG.

Example

```
LANG ENGLISH -KEYFIL SLIBDLCKW  -MESFIL SLIBDLCMSG
```

5.2.18 LD - LOGICAL DEVICE

5.2.18.1 Description

The LOGICAL DEVICE defines an element of the virtual terminal station which is to be connected to the correspondent.

One SN object may be mapped to several LDs (for example if the terminal station comprises several devices) and several LD objects may be mapped to a single DV or DP (for example if several terminal stations share the same device or pool).

5.2.18.2 Syntax for LD -TMG

```
LD name TMG
     -DV name
     [-DP name {-MAIN|-AUX}]
```

Example:

```
LD LD01 TMG -DV DV01
```

5.2.18.3 Description of Parameters

AUX	Declares this LD as NOT being the principal LD in a device pool (DP).
DP	Device Pool object mapped from this LD.
DV	Device object used when the correspondent addresses the logical device.
MAIN	Logical device is the principal LD in a device pool (DP).

5.2.19 LINK - LINK

5.2.19.1 Description

This directive introduces a list of modules that will be incorporated during system generation.

These LINK directives are not included directly in the generation description file but in a separate file, the name of which is mentioned in a LKFL directive. This directive is only used in the link command file at the generation phase. Used only on a file created by Bull.

5.2.19.2 Syntax

```
LINK   <condition>
```

5.2.19.3 Description of Parameters

Condition:	defines a link condition, declared in the file introduced by the LKFL directive, which will be used by the LINKER to build the system.

5.2.20 LKFL - LINK FILE

5.2.20.1 Description

This directive is required as the generation is carried out via a host computer. It contains a pointer to a separate file containing LINKER directives.

5.2.20.2 Syntax

```
LKFL string
```

5.2.20.3 Description of Parameters

string	is the character string required to locate the link command file. The default name is SLIBCHXMOD which is in the SYS.DSASLIB library.

Example

```
LKFL SLIBCHXMOD
```

5.2.21 LL - LOGICAL LINE

5.2.21.1 Description

A LOGICAL LINE object represents the link control entity in the local system. It is the end point of a link connection. The object type indicates the line protocol used.

5.2.21.2 Syntax for LL-ASY

Used for asynchronous devices which are not connected to a PAD.

```
LL name ASY
    -PL name
    [{-ASC2|-ASCI|-ASC1|-BCD|-BCD1|-BCD2|-EBCD}]
    [-T2 v]            (0,32767) 1000
```

Example:

```
LL LLA1 ASY -PL PLA1
```

5.2.21.3 Syntax for LL -ASYV

Gives the logical line for directly connected MINITEL devices.

```
LL name ASYV
    -PL name
    [-T2 v]   (0,32767) 1000
```

5.2.21.4 Syntax for LL-BDL

Used for HDLC lines using the LAPB protocol

```
LL name BDL
    -LAPB
    {-PL name [-TTD] | -PS name}
    [{-PRIM v | -DYN}]          (1 or 3) 3
    [-FRL v]                    (2, 32767) 2048
    [-W v]                      (1, 7) 4 or (1, 127) 4 with EXT
option
    [-EXT]
    [-N2 v]                     (2, 50) 10
    [-T1 v]                     (1, 1200)  16
    [-T2 v]                     (2, 32767) 40
    [-T3 v]                     (0, 600) 0
    [-DISC]
    [{-DFSB | -SB name}]
```

Example: (for TRANSPAC X.25 PDN)

```
LL LLTP BDL -FRL 133 -LAPB -PL PLTP -T1 16 -T3 3 - W   4    N2  10
```

5.2.21.5 Syntax for LL-MTPT

Primary station

Used for HDLC lines using the NRM protocol, on a primary station. It represents the link control entity in the local system.

```
LL name MTPT
    -LAPN
    -PRIM
    -PL name
    [{-TWA | -TWS}]
    [{-PTP | -MPT}]
    [-DYN]
    [-FRL v]          (2, 32767) 2048
    [-EXT]
    [-N2 v]           (2, 50) 10
    [-T1 v]           (2, 30) 5
    [-T2 v]           (0, 32767) 40
```

Secondary Station

Used for HDLC lines using the NRM protocol, on a secondary station. It represents the link control entity in the local system.

```
LL name MTPT
    -LAPN
    -SECD v           (1, 254)
    -PL name
    [{-TWA | -TWS}]
    [-EXT]
    [-FRL v]          (2, 32767) 2048
    [-W v]            (1, 7) 4
    [-N2 v]           (2, 50) 10
    [-T1 v]           (1, 1200) 16
    [-T2 v]           (0, 32767) 40
    [{-DFSB|-SB name}]
```

Example:

```
LL LLS1 MTPT -LAPN -SECD 2 -TWA -PL PLS1 -FRL 300   &
-N2 6 -W 5 -T1 100
```

5.2.21.6 Syntax for LL-SLV

Used for HDLC lines using the NRM protocol, on a primary station. It represents the link control entity in the remote system.

```
LL name SLV

    -SECD v          (1, 254)

    {-LL name | -SWITCH}

    [{-TWA | -TWS}]

    [-W v]           (1, 7) 4

    [-FRL v]         (2, 32767) 2048

    [-EXT]

    [-N2 v]          (2, 50) 10

    [-T1 v]          (1, 1200) 16

    [-T6 v]          (0, 600) 50

    [{-DFSB | -SB name}]
```

5.2.21.7 Syntax for LL-VIP

Used for devices using the VIP procedure.

```
LL name VIP

   -PL name
```

Invariable parameters:

```
[-SYN v]            X'16'

[-NBSYN v]          (2, 20) 4

[-FILL v]           X'FF'

[{-ASCI  -ASC1  -ASC2}]

[{-CRC | -NCRC}]
```

Speed dependent parameters:

```
[-T2 v]          (0, 32767) 120

[-T3 v]          (0, 32767) 40
```

```
[-T7 v]          (0, T3 v) 4
```

Configuration dependent parameters:

```
[-NSEL v]        (1, 10) 5
[-RR v]          (1, 15) 3
[-RS v]          (1, 15) 3
[-T4 v]          (0, 32767) 30
[-T5 v]          (0, 32767) 300
[-T6 v]          (0, 32767) 3000
[{-DFSB | -SB name}]
```

5.2.21.8 Syntax for LL-2780

Used for devices using the 2780 procedure.

```
LL name 2780
-PL name

[-SYN v]            X'16'

[-NBSYN v]          (2, 20) 4

[{-ADDSYN | -NADSYN}]

[{-ASCI
  -ASC1
  -ASC2
  -EBCD}]

[-RR v]             (1, 255) 10

[-RS v]             (1, 255) 100

[-SECO]

[-T2 v]             (0, 32767)  120

[-T3 v]             (1, 32767) 50

[-T8 v]             (100, 18000) 300

[{-CRC | -NCRC}]

[-AUTOCN]           valid only for 2780 connected under GGCOS 7

[-HANGUP]           valid only for 2780 connected under GGCOS 7

[-RVI ]

[-TTD]              Invalid for GCOS 7

[{-DFSB | -SB name}]
```

5.2.21.9 Syntax for LL-3270

Used for devices using the 3270 procedure.

```
LL name 3270

   -PL name
```

Invariable parameters:

```
[-SYN v]            X'32'

[-NBSYN v]          (2, 20 ) 4

[{-ADDSYN | -NADSYN}]

[-FILL v]           X'FF'

[{-ASCI
   -ASC1
   -ASC2
   -EBCD}]

[{-CRC | -NCRC}]
```

Speed dependent parameters:

```
[-T2 v]          (0, 32767) 120

[-T3 v]          (0, 32767) 40

[-T7 v]          (0, T3 v) 4
```

Configuration dependent parameters:

```
[-NSEL v]        (1, 10) 5

[-RR v]          (1, 15) 3

[-RS v]          (1, 15) 3

[-T4 v]          (0, 32767) 30

[-T5 v]          (0, 32767) 300

[-T6 v]          (0, 32767) 3000

[{-DFSB | -SB name}]
```

5.2.21.10 Description of Parameters

ADDSYN	Synchronization characters will be added inside long messages to enable transmission.
AUTOCN	(AUTOmatic CoNnection). Automatic connection to the device is initiated by CNS as soon as the modem is ready, or on reception of ENQ. An automatic connection to an application may then be initiated if a correct SN-CD-CO mapping is provided and if AUTOCN is declared in the DV object. This parameter is valid only for 2780 devices connected to a host operating under GCOS 7.
ASCI	**For LL-ASY or 2780:** Code used is ASCII without parity. In the case of asynchronous lines, this option is replaced by the result of automatic speed recognition (if used) which also provides the code. **For LL-3270:** Code used is ASCII with ODD parity (equivalent to ASC1).
ASC1	Code used is ASCII with odd parity. In the case of asynchronous lines, this option is superseded by the result of automatic speed recognition (if used) which also provides the code.
ASC2	Code used is ASCII with even parity. In the case of asynchronous lines, this option is replaced by the result of automatic speed recognition (if used) which also provides the code.
BCD	Code used is BCD without parity.
BCD1	Code used is BCD with odd parity.
BCD2	Code used is BCD with even parity.
CRC	**For LL-VIP, 2780:** A Cyclic Redundancy Check is used.
DFSB	An implicit Statistic Block (SB) is applied to this logical line. For VIP, and 3270 logical lines, the SB type is SBLS and the SAMIN value is 300 seconds. For other types of line, , the type of SB is SBLH and the SAMIN value is 60 seconds.

DISC — The link set-up begins with a DISC frame (clean up sequence) preceding the SABM frame in order to resynchronise the upper layers. The use of this parameter is highly recommended.

DYN — **For LL-BDL:**

Dynamic addressing facility (see CCITT X.21 and S70). The local address will be 1 in the case of an incoming call and 3 in the case of an outgoing call.

This parameter may only be used for X.21 switched links.

For LL-MTPT:

In the case of a point to point switched line, the secondary station address is resolved after polling with the global address (X'FF').

EBCD — The code used is EBCDIC.

EXT — Extended numbering mode (modulo 128) is used (with LAPB or LAPN procedure). Normal numbering (default value) uses modulo 8.

FILL — Hexadecimal value of PAD characters.

FRL — Maximum frame length in bytes (see paragraph "HDLC logical lines").

For X.25 networks:

FRL >= packet size + 7 (see SIZE parameter on NS-X25)

For non-X.25 networks:

FRL >= max. fragment size + 15 (see FRL parameter on TS-DSA)

For LL-MTPT in a primary station:

FRL >= max. FRL value of all LL-SLV mapped to this LL-MTPT.

HANGUP — Forces physical disconnection of a switched line after logout. This option applies only to 2780 connected to a host operating under GCOS 7. Default is no physical disconnection.

LAPA — LAP procedure with asynchronous response mode will be used.

LAPB — LAPB procedure (asynchronous balanced mode) will be used.

LAPN — LAP procedure with NRM will be used (Normal Response Mode).

MPT — Multipoint configuration.

NADSYN	Synchronisation characters are not to be added to long messages.
NBSYN	Number of successive synchronization characters which will be put into the synchronisation message header or inserted in long messages. The default value is sufficient for most configurations but certain terminals or controllers require a different value (for example, some Bull VIP controllers require NBSYN=6). Refer to the terminal documentation.
NCRC	Cyclic Redundancy Check is not used.
NSEL	Number of successive selections made during the selection phase. See paragraph "The NSEL parameter".
N2	Maximum number of retries of a command frame following the timeout of timer T1. For LL-MTPT: Maximum number of retries of an information frame. When the maximum value is reached the higher layer is avoided and the LAPN automatically goes in Disconnect State.
PL	Name of the physical line object mapped from this LL.
PRIM	For LL-BDL: HDLC local address. It may be 1 or 3 and must be different at the two ends of a line. If the local system is connected to an X.25 PDN, the default value (PRIM 3) is correct; the PDN takes address 1. For LL-MTPT: Identifies this system as the primary station. There may be only one primary station on a link.
PS	Name of the physical subscription object of the RMT type mapped from this LL.
PTP	Point to point configuration. This configuration may be a leased or a switched line. PTP permits the optimization of polling/selecting management.
RR	Maximum number of retries during reception. For LL-VIP, and 3270: Maximum number of retries in the case of no response. The default value of 3 is sufficient for normal transmission conditions, but it should be increased to around 7 if the physical line quality is poor. For LL-2780:

Maximum number of retries in the case of no response and also in the case of a NAK of a text (GCOS 7/8) or of an ENQ (ENQuiry) bid for the line (GCOS 8).

RS — Maximum number of retries during transmission.

For LL-VIP and 3270:

Maximum number of retries for NAKs received following a transmitted text message. The default value of 3 is sufficient for normal transmission conditions, but it should be increased to around 7 if the physical line quality is poor.

For LL-2780:

Maximum number of WACK or TTD sent, WACK received or NACK received before sending a text (line bid sequence) (GCOS 7/8) and the maximum number of ENQ sent (GCOS 7). When there is an overflow, the TU (VIP) or the device (2780, 3780) is disconnected. There is no checking for the 2780.

RVI — CNS can send the RVI sequence if it is receiving data and has data to transmit. If this option is selected, ensure that the terminal correctly handles RVIs. In all cases, CNS can always receive them.

SB — Name of the Statistic Block mapped from this LL.

For VIP, and 3270 logical lines, the SB is of type SBLS.

For other types of line, the SB is of type SBLH.

SECO — CNS is considered as the secondary station in the case of contention. If this parameter is not declared, CNS is considered as the primary station.

If both stations bid for the line at the same time, the primary station will have priority (the contention timeout is 1 sec. for a primary station and 3 secs. for a secondary station).

For a connection from CNS to a terminal, declare SECO on the LL (the terminal is the primary station).

For a connection from CNS to CNS, one system must be secondary (declare SECO) and the other must be primary (do not declare SECO).

SECD — Secondary station address. All addresses must be different on a line.

SWITCH — Switched line access. If you use this parameter, do not map the LL-SLV to any LL-MTPT. The mapping will be dynamically performed by CNS during operation when the secondary station is identified.

SYN — Hexadecimal value of the synchronisation character. This character must be allocated taking the parity expressed by ASCI, ASC1 or ASC2 into account.

TTD — CNS can send TTD when it has no more data to transmit. It should be used for those terminals which are not fully compatible and for those which have problems receiving EOT (e.g., physical disconnection). If this parameter is not declared, CNS sends TTD only if the last data sent ended with ETB (if ETX, CNS clears the transmission by sending EOT).

TWA — Two way alternate mode. A station may only send or receive data at a given time.

If a secondary station operates in TWA mode, the primary station may be TWA or TWS. If the primary station is TWS the secondary station may only send or receive frames at a given time, and the REJ frame is never used by the primary station.

TWS — Two way simultaneous mode.

If a secondary station is in TWS mode, the primary station must be in the same mode. In this case, the secondary may send and receive frames simultaneously. The secondary station must be able to receive a REJ command frame and may transmit a REJ response frame.

For point to point:

A station may send and receive data simultaneously.

For multipoint:

Any station may send while any other (or the same) receives.

T1 — **For LL-BDL:**

HDLC LAPB protocol timeout, expressed in 1/10 sec. See paragraph "HDLC logical lines".

$$T1 >= \frac{6 \times \text{max. frame size (in bytes)} \times 8 \times 10}{\text{line speed (in bps)}}$$

For LL-MTPT (primary station):

Mode setting time-out, expressed in 1/10th seconds. It is used to supervise the acknowledgement of SNRM command frame. If no response is received after T1, the timer T6 defined on LL-SLV is started. When T6 runs out a SNRM is retransmitted. After N2 retries upper layer connection is released. T1 is also used to supervise the acknowledgement of a DISC command frame; when it runs out, another DISC frame is immediately sent. After N2 retries, the upper layer connection is released and in case of switched line, the level 1 connection is also released.

For LL-SLV:

Response time out to a poll bit set to 1, expressed in tenths of a second. This time out must cover the transmission time of at least the two biggest information frames. This time out is restarted each time a frame is received with its final bit set to zero, and is stopped when a frame with final bit set to one is received.

For LL-MTPT (secondary station):

Polling activity supervision delay. Value to be given in 1/10th seconds. Each time an information frame is waiting for transmission, and the polling is inactive, then the timer T1 is started to monitor the expected polling. When the timer T1 runs out, it is restarted. After N2 retries the higher layer is disconnected and the LAPN automatically goes in Disconnect State.

T2

Input/output survey time-out, expressed in 1/10 sec.

$$T2 >= \frac{10 \times \text{buffer-size} \times \text{no. of buffers} \times 8}{\text{line-speed}}$$

Where buffer-size is in bytes, and line-speed is in bits/sec. The standard buffer size is 200 bytes.

See also paragraph "HDLC logical lines"

T3

For LL-VIP, 3270, 2780:

Acknowledgement timer for text, expressed in 1/10 sec. (see paragraph "VIP and 3270 logical lines"). An optimum value may be calculated with the formula:

$$T3 = \frac{8 \times \text{max. frame size (in bytes)} \times 10}{\text{line speed (in bps)}} + T7$$

For LL-BDL:

Acknowledgment delay timer used to defer the acknowledgment of a command frame received. It must be smaller than T1. The default value of 0 allows no delay for acknowledgement (see paragraph "HDLC logical lines").

T4

Activity timeout (see paragraph "VIP and 3270 logical lines").

T5

Fast survey time-out (see paragraph "VIP and 3270 logical lines").

T6

For LL-VIP and 3270:

Slow survey time-out (see paragraph "VIP and 3270 logical lines").

For LL-SLV:

	Long supervision time out. It defines polling frequency for secondary stations which do not answer to a SNRM command frame with poll bit set to 1. Values to be given in tenths of a second.
T7	Response time-out for a polling sequence or a text message (see paragraph "VIP and 3270 logical lines").
T8	Non-traffic time-out (in 1/10 sec) on the line when CNS is in receive mode. It is not used when CNS is outputting. If the time-out occurs, CNS sends an EOT sequence on private lines and DLE-EOT on switched lines. The default value is sufficient for most configurations.
W	HDLC frame window size which is the maximum number of outstanding Information frames (named K parameter in the LAP/LAPB protocol) to be sent consecutively. If the average frame length transmitted is small, increase the value of W to its maximum value (see paragraph "HDLC logical lines").
WAIT	Maximum number of retries (v1) and the time-out value (v2) to wait for physical intervention following the reception of 9 printer error status.

HDLC logical lines

When a connection is established between two systems on an HDLC line, the protocol does not allow for negociation of parameters. These are fixed on the subscription form (in the case of X.25 PDN) and at system generation.

Frame length

The relationship between frames and packets is one-to-one, so the frame size (parameter FRL on LL) must be large enough to include the maximum packet size which will be transmitted. In CNS the default frame size is 2048 (except for LL-SLCC which is 4096). If the default value is not used, it is recommended to use a frame size of:

- either the maximum packet size + 7 (for an X.25 network),
- or the maximum fragment size + 15 (for a non-X25 network).

The fragment size is specified with the FRL parameter on TS-DSA.

Acknowledgement mechanism

When a frame is transmitted, the transmitting system starts timer T1 (parameter T1 on LL) which monitors the acknowledgement of this frame by the receiving system. The transmitting system resets T1 each time it receives an ACK from the receiving system. This process is symetric for both systems.

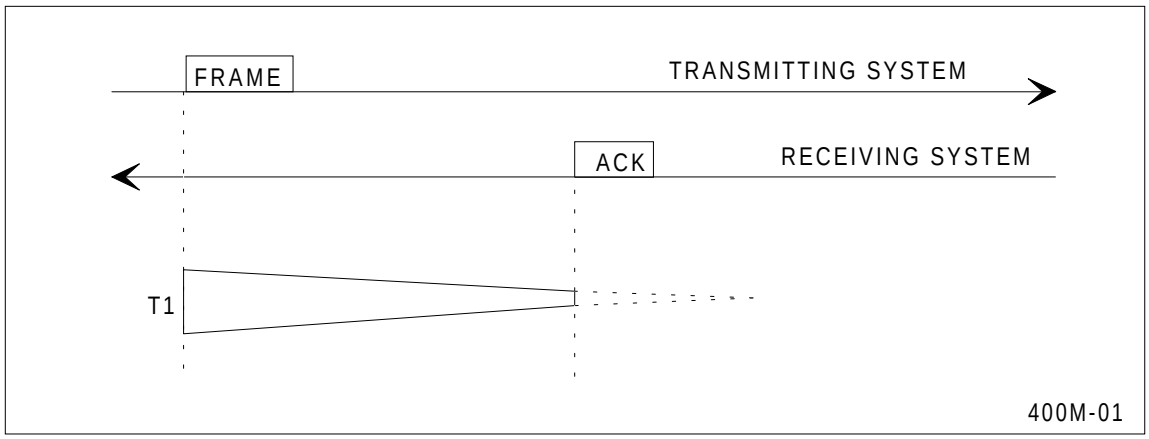


Figure 5-2. Acknowledfment Mecanism

If the ACK is not received before the end of T1, the transmitting system will retransmit the first unacknowledged frame with bit p=1 and will restart T1. The receiving system must then acknowledge receipt of this frame as soon as possible with bit f=1.

This mechanism of retransmission can be repeated up to n times as defined by parameter N2 on LL (e.g. for Transpac, the French X.25 PDN, n=10). If no reply is received after N2 retries or if several acknowledgements are received with bit f=1 for the same frame retransmitted with bit p=1, the transmitting system reinitializes the transmission. If there is still no response, the link is disconnected.

Instead of using Supervisor frames (S) to acknowledge received Information frames (I), the receiving system tries to use its own transmitted I frames. To do this, CNS delays the transmission of S frames in order to use the first I frame which it will send to the transmitting system. Therefore the time necessary for CNS to acknowledge received frames is slightly increased.

This increase must be taken into account when calculating the value of T1, in order to avoid unnecessary retransmission. CNS employs two methods to optimise this mechanism by using a window at frame level (W parameter on LL):

- Acknowledgement on frame count

  The receiving system sends an ACK for every Ka - 2 received frames. Ka is the window for frames.

  If the frame window at the receiving system is less than 3, the receiving system will send ACK immediately after each received frame.

- Acknowledgement on delay

  When a frame is received, CNS starts timer T3 in the receiving system (parameter T3 on LL). If the number of received frames is less than Ka - 2, the receiving system will send ACK at the end of T3 since the number of frames received will never reach Ka - 2.

  Thus, to avoid retransmission:

  T3 (receiving + transmission time for maximum frame < T1 (transmitting system) at transmitting system system)

  T1 at the transmitting system must be equal to T1 at the receiving system in order to avoid retransmission.

NOTES:

1. Parameter T3 on LL corresponds to parameter T2 of the HDLC standard.

2. In CNS, the clock which controls these timers operates at 100 ms, so the maximum precision for these timers is 1/10 sec.

Calculating timer T1

When an I frame is sent, the transmitting system starts timer T1. The receiving system can theoretically acknowledge after the transmission of two frames, at the latest (in the case where the receiving system is busy transmitting an I frame). So T1 must be greater than the transmission time for three maximum size frames (minimum T1). This is the value suggested by Transpac as the minimum.

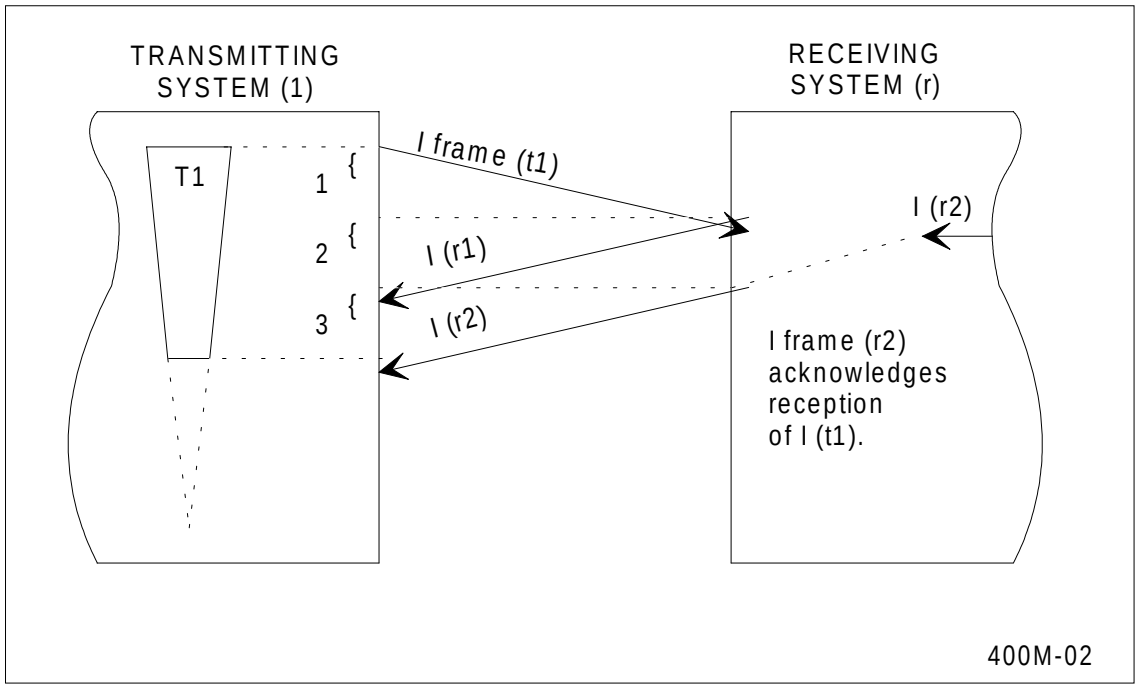


Figure 5-3. Timer Mechanism

However this is correct only if there are no queues in the receiving system. In fact, CNS allows for two queues for each line which is transmitting:

- one in the communications controller (MLCP or MLC-16). This queue allows a credit of 1 frame.
- one between the TSV and the DCS (link layer). This queue allows a credit of 2 frames.

In this case the theoretical situation is as shown below.

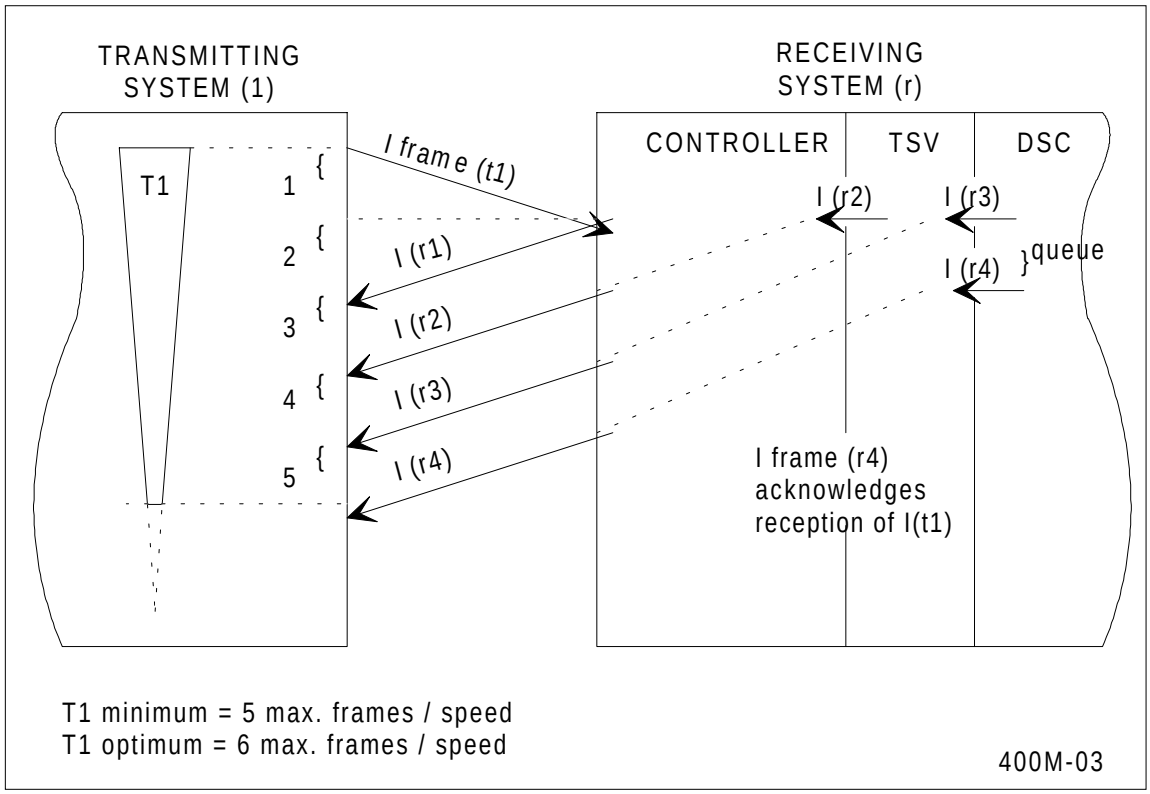


Figure 5-4. Calculating Timer T1

As a result, T1 in the transmitting system must cover the time necessary to empty the queues in the receiving system so as to be sure of receiving the ACK before T1 times out.

T1 > transmission time for 5 maximum frames.

Since it does not matter if T1 is too large, an optimum value for T1 is found by allowing the transmission time for 6 maximum frames.

$$T1 = \frac{6 \times \text{max. frame size (in bytes)} \times 8 \times 10}{\text{line speed (in bps)}}$$

Calculating timer T2

T2 is the input/output survey timer. It is used to detect whether or not the last transmit request was completed. This time-out must allow the time to send 8 buffers for NMLC. (The standard buffer size is 200 bytes). Values should be given in tenths of a second. The value is calculated by the formula:

$$T2 > \frac{10 \times \text{buffer-size} \times \text{no. of buffers} \times 8}{\text{line-speed}}$$

Where buffer-size is in bytes, and line-speed is in bits/sec.

Calculating timer T3

$$T3 < T1 - \frac{\text{maximum frame size (in bytes)} \times 8}{\text{line speed (in bps)}}$$

Timer equivalence

Timers T1, T2 and T3 must be identical for both systems on a line.

Calculating W

If the transmitted frames are short and if ACK is sent after each packet, on a high speed link, the processing time for these frames becomes important with respect to their transmission time. This produces an extra load for CNS which is proportional to the number of frames transmitted.

If the frame window is too small, the transmission of short frames (such as I frames which only acknowledge packets or S frames) will not be optimal. It is therefore recommended to use the largest possible window size.

VIP and 3270 logical lines

Summary

The declaration of LL-VIP and LL-3270 are very similar. In the syntax descriptions shown earlier the parameters on these objects are split into three groups:

- Invariable. You have no choice when declaring them. If you omit them, the default value is correct;
- Speed dependant. The value is related to the speed of the line;
- Configuration dependant. The value depends mainly on the configuration and the use made of the terminals.

Retry counters RR and RS

Parameters RR and RS are retry counters mainly used on transmission errors. Their default value, 3, is sufficient for normal transmission conditions, but the value should be increased to around 7 if the physical link quality is poor.

Survey timers (T2, T3, T7)

Figure 5-5 illustrates the basic mechanisms of these timers with a timing diagram showing the events which start and stop the timers.

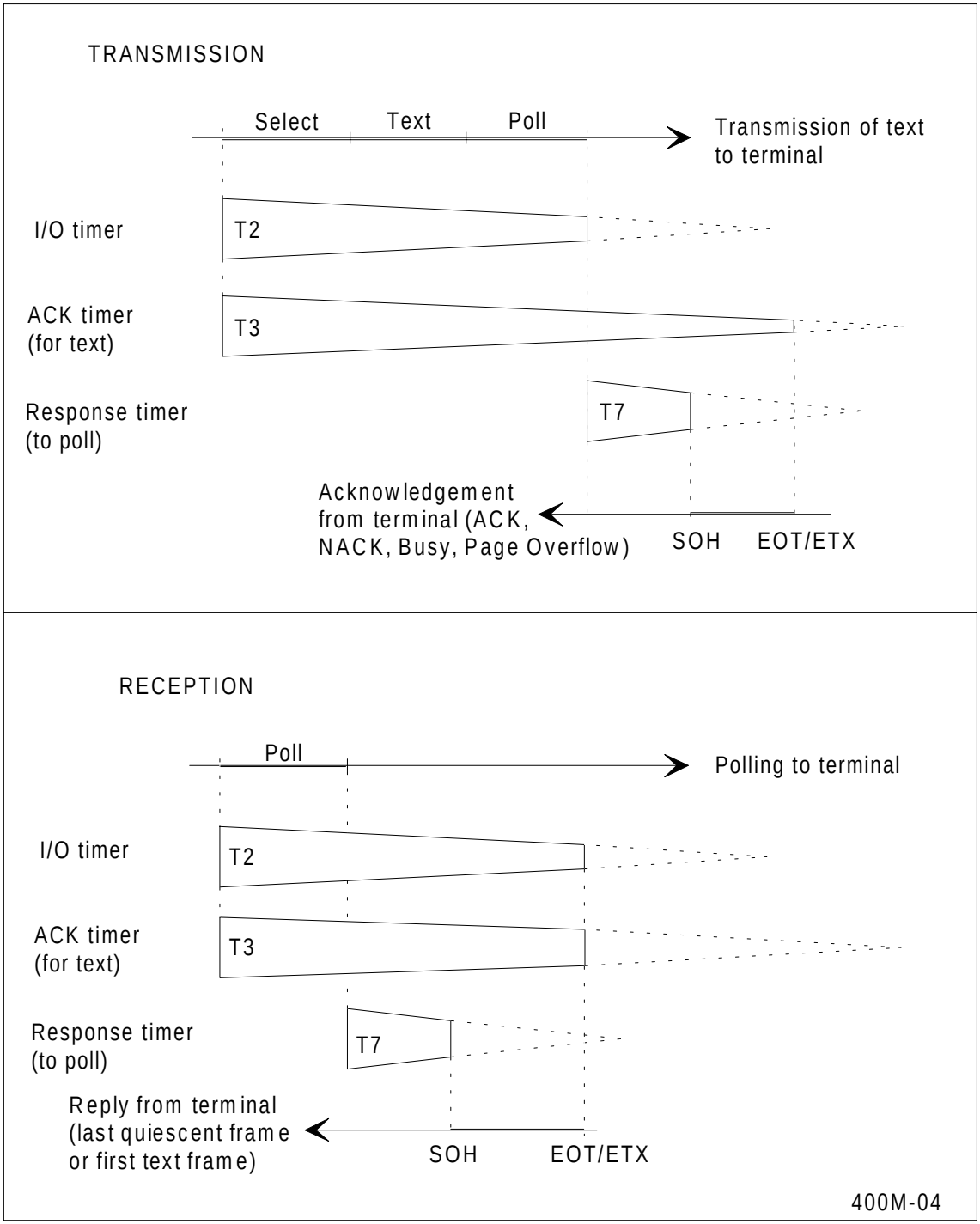


Figure 5-5. VIP and 3270 timers

Timer T2

T2 is the input-output survey timer. It is used to check whether or not the last transmission request was completed and so detects hardware errors in your system. An optimum value can be calculated using the following formula:

$$T2 \text{ (in 1/10 sec)} >= \frac{8 \times \text{buffer size} \times \text{no. of buffers} \times 10}{\text{line speed (in bps)}}$$

where: buffer size is in bytes (8 bits),
standard buffer size = 200,

The default value for T2 is 120 which is sufficient for a line speed of 1200 bps. It is not important if T2 is too long, errors will simply be detected after a long delay. However, if T2 is too short, the timer may time out and a false error will be signalled before the last transmission request has been completed.

For lower line speeds, increase T2 proportionally.

Timer T3

T3 is the acknowledgement timer for text. It detects procedure errors on the line.

For transmission, it is the time required to select a terminal, transmit the longest expected message, poll the terminal and receive its response. It begins with the SOH (Start of Heading) of the transmitted message, and ends with the ACK, NACK, BUSY or PAGE OVERFLOW received from the terminal.

For reception, it is the time required to poll a terminal and receive the longest expected message. It begins with the SOH (Start of Heading) and ends with the EOT (End of Text) of the message being received.

An optimum value can be calculated using the following formula:

$$T3 \text{ (in 1/10 sec)} = \frac{8 \times \text{max. frame size} \times 10}{\text{line speed (in bps)}} + T7$$

The default value for T3 is 40 which is sufficient for a line speed of 4800 bps and for a frame size of 2048 bytes.

For larger frame sizes, T3 must be increased (and possibly T2 also).

Timer T7

T7 is the response timer for a polling sequence. It is used to detect hardware errors on the line or in the terminal. The response to a polling sequence may be sent alone (in a Quiescent Frame) or at the end of the first text message. After N unsuccessful retries (defined with the RR parameter), the terminal is treated as shown in figure 3-??.

T7 is the time required (in 1/10 sec) for a terminal to start replying to any transmission which requires a response. The default value for T7 is 4 which is generally sufficient for a line speed of 4800 bps. For lower line speeds, increase T7 proportionally.

However, for slow terminal screens (address 60, status 00), this value may be too small. This problem is resolved by declaring the ACKDL parameter on TU-VIP. This parameter allows CNS to wait for a maximum of 1 minute for the ACK before retransmitting the message.

NOTE:

1. For devices other than screens, do not declare -ACKDL. CNS assumes this parameter by default and automatically calculates the wait time according to the message size.

2. The ACKDL parameter may also be used on the TU-TGX object, used for TGX terminal clusters on an X.25 network (see paragraph on this subject).

Polling timers (T4, T5, T6)

The frequency of polling is determined by three parameters on LL-VIP and LL-3270:

- T4 : activity timeout (connected),
- T5 : fast survey timeout (available),
- T6 : slow survey timeout (not available).

These parameters give respectively the time (in 1/10 sec) between successive polling of a terminal if it is:

- connected to the CNS terminal manager,
- not connected but it answers the polling,
- not connected and it does not answer the polling (for example, the terminal is switched off).

The passage between these different groups is represented in figure 5-4.

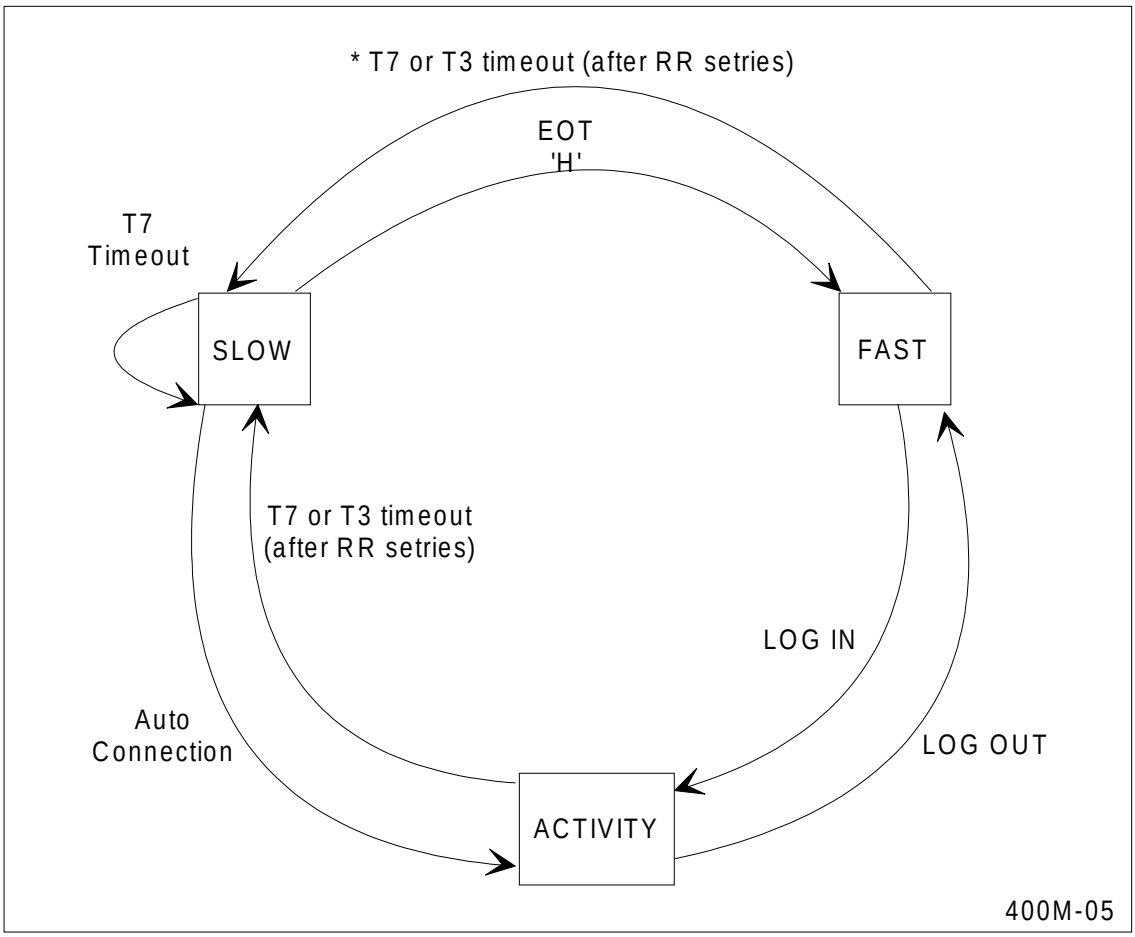


Figure 5-6. Pollings groups

For T4 and T5, all TUs or CLs connected to a line are polled each time the timer runs out. The default values of these parameters are respectively 3 seconds and 30 seconds.

NOTES:

1. For VIP terminals, if you declare CL-VIP, the terminal units mapped to this CL are group polled (i.e. the CL is polled).

   If you don't declare CL-VIP, the terminal units are individually polled.

2. For 3270 terminals, the terminals connected to a given cluster controller are always group polled (there is always a CL-3270 object)

A terminal switched off is always in the slow survey group. When it is switched on, it remains in the slow survey group until the next time it is polled and answers the polling. It then passes into the fast survey group.

For T6, one TU or CL on a line is polled once during the timer period, so each TU or CL is polled once every T6 x N secs (N= number of terminals in the slow survey group). The default value for T6 is 5 minutes.

For all timers, the polling frequency may be affected by the NSEL parameter on LL (see later) and by the NREC parameter on CL (see CL object).

The default values for T4, T5 and T6 are generally too large. The following formulae are recommended to calculate these timers:

```
T4  >  M x T7
T5  =  2 x T4
T6  >  2 x T5
```

where:

```
T4, T5, T6 values are in 1/10 sec,
M = number of TUs and/or CLs on the line,
T7 default value is 4.
```

The NSEL parameter

The NSEL parameter on LL-VIP and LL-3270 is independent of the polling timers (T4, T5, T6) but has an important effect on the delay experienced by users at their terminals. It specifies the number of successive selections which will be made during the selection phase.

NOTE: During this time, no other terminals will be selected or polled. It is therefore important that the total selection time should not be too long, so that the other users do not think that they have been dropped by the system.

The value is mainly dependent on the average size of messages which will be transmitted to the terminal and therefore on the type of application to which the terminal user connects. If, for instance, on a 4800bd line, you connect to an application which issues large messages of the size of the whole screen (1920 bytes), the selection of one such message will last more than 3 seconds. If you declare NSEL=5, the selection time for this terminal may be 16 seconds, during which time other terminals will not be selected or polled. On the other hand, if your application is of the question/answer type with output messages averaging one line, even NSEL=10 will not cause a long selection time.

Try to ensure that the average length of the selection time does not exceed 5 seconds. In other words:

$$\frac{\text{NSEL} \times \text{average message size (in bytes)} \times 8}{\text{line speed (in bps)}} < 5$$

The default value for NSEL is 5, which is correct for a line speed of 4800 bps and an average message size of 600 bytes.

Polling versus Selecting

The total transmission time on a line is used partly for selecting (and transmitting messages) and partly for polling (and receiving messages). The NSEL parameter regulates the selection time on the line. The NREC parameter on CL-VIP and CL-3270 regulates the polling phase (see the CL object).

You must adjust these two parameters so that neither the selection nor the polling phase monopolizes the line. Figure 5-7 shows a secondary network configuration and the corresponding timing diagram for polling/selecting.

It is assumed in this example that all terminals are connected to the terminal manager, so they are all in the activity group and are polled every T4.

At the beginning of the polling phase, T4 is reset. Cluster CL01 is polled twice (NREC = 2) and TU03 and TU04 are polled once each.

At the end of the polling phase, the selection phase is started and two successive selections are made (NSEL = 2).

Note that the NREC parameter applies to a cluster. The cluster controller manages the transmission of messages from all of the terminals connected to it. It may send one message from each terminal or two messages from the same terminal.

NSEL, on the other hand, applies to the line. CNS manages the transmission of messages to the terminals. It may send one message to two different terminals or two messages to the same terminal, depending on the order in which they were received from the correspondent(s).

In the example, T4 times out after the end of the selection phase so the next polling phase starts at this time. If T4 times out before the end of the selection phase, the next polling phase starts immediately after the end of the selection phase.

A similar process occurs for terminals in the fast survey (T5) and slow survey (T6) groups. In the case of conflict where more than one of the timers time out together, T4 has priority over T5 which has priority over T6.

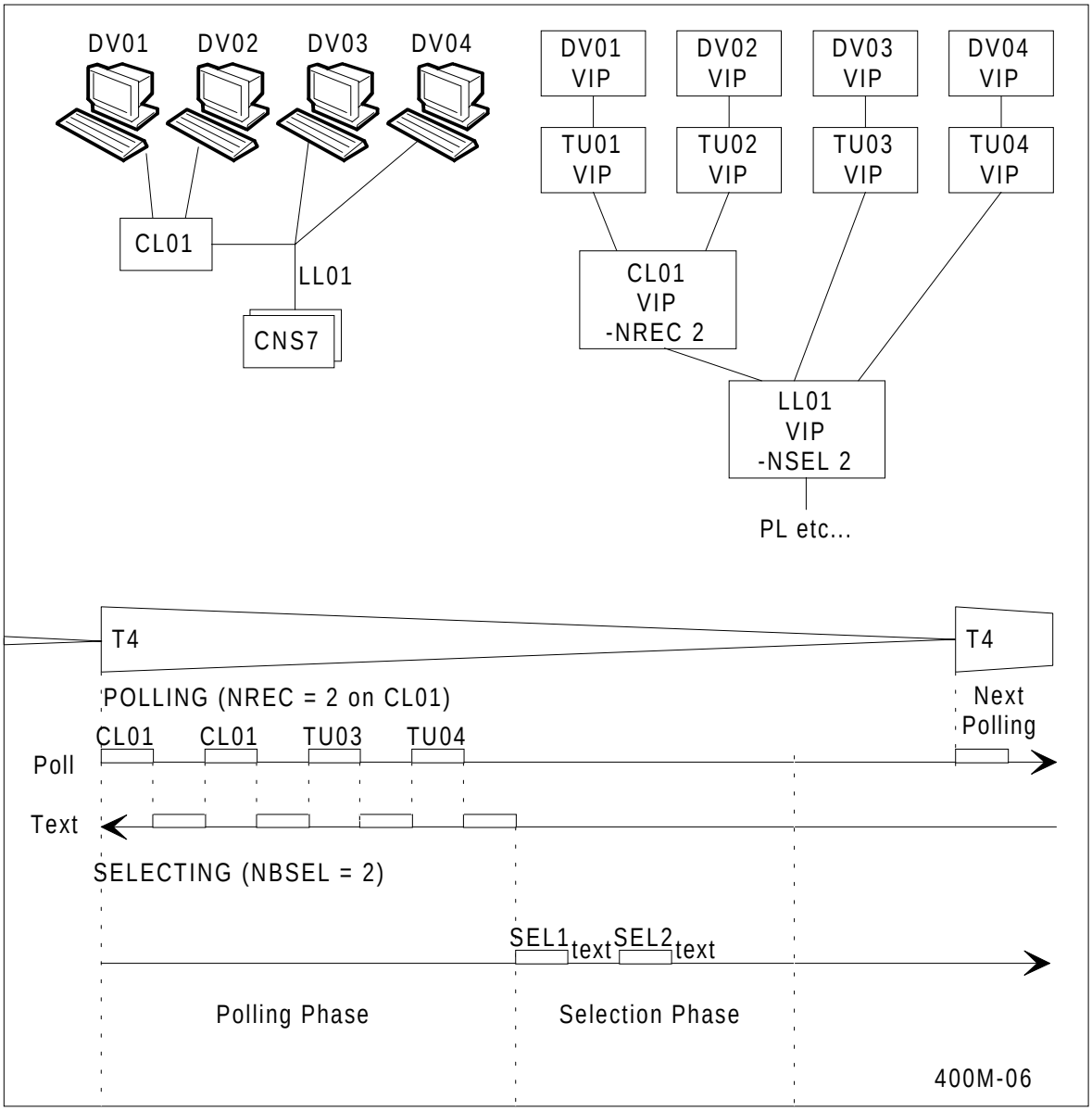


Figure 5-7. Polling versus selecting

2780 Transmission code support

EBCDIC and ASCII are supported in non-transparent mode. Leading graphics are not supported. Frames are ended with ETB or ETX and can be blocked in Intermediate Text Blocks by ITB. There can be up to 7 blocks per frame, so the terminals must be able to accept up to 6 ITBs.

Since no rules currently exist on how the BCC (Block Check Character) is calculated after ITB, below is an explanation of how it is supported by CNS. It conforms to IBM practice (IBM System Journal 1967, vol. 6, no. 4). Please check that your terminal or emulator has the same BCC calculation after ITB.

In a frame:

- The FIRST STX:
  - resets the BCC calculation to 0;
  - is NOT included in it.
- ITB:
  - causes the generation/verification of BCC;
  - is included in it;
  - resets the BCC counter to 0.
- A block following ITB:
  - may or may not begin with STX;
  - has BCC (Block Check Character) calculated from the first character (STX if applicable).

This is summarized by the following diagram.

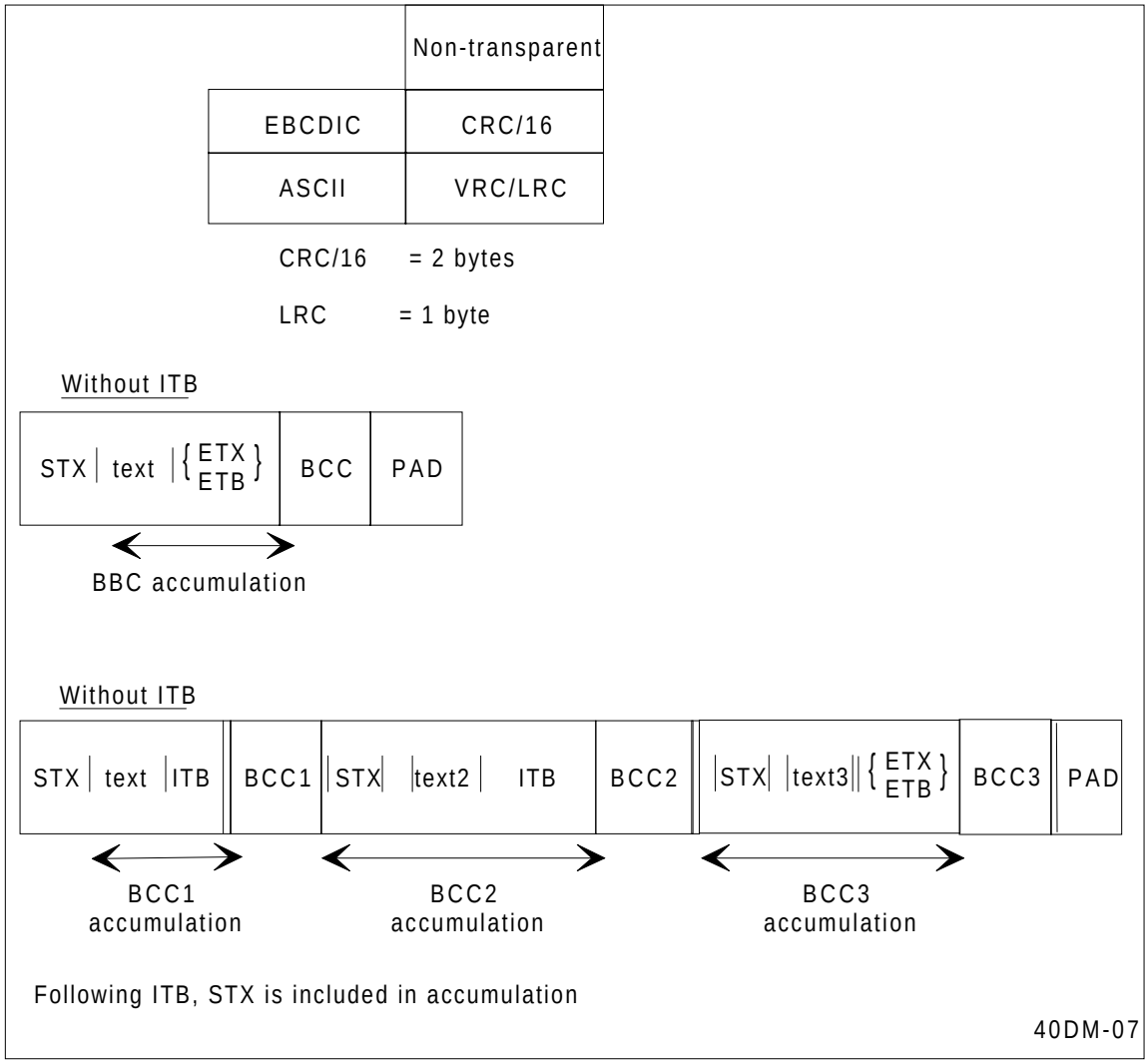


Figure 5-8. BCC calculation for 2700/3700 terminals

```
  Primary station

& POINT TO POINT LEASED (FULL DUPLEX- TWS)
&
&
PL PL01 HDLC -DFSB -PHAD 1 -CT CT02 -FULL
LL LL01 MTPT -LAPN -PRIM -TWS -PTP -PL PL01 -FRL 200 -N2 6 -T1 6 -
T2 12
LL LI01 SLV -SECD 3 -LL LL01 -SB SB01 -TWS -FRL 200 -T1 12 -T6 25
-W 3 -N2 9
&
& POINT TO POINT LEASED (HALF DUPLEX- TWA) (2 WIRES)
&
&
PL PL00 HDLC -DFSB -PHAD 0 -CT CT02 -HALF -HALF2
LL LL00 MTPT -LAPN -PRIM -TWA -PTP -PL PL00 -FRL 300 -N2 3 -T1 4 -
T2 10
LL LI00 SLV -SECD 2 -LL LL00 -SB SB01 -TWA -FRL 300 -T1 10 -T6 20
-W 5 -N2 8
&
& MULTIPOINT LEASED (FULL DUPLEX- TWA)
&
&
PL PL06 HDLC -DFSB -PHAD 1 -CT CT05 -FULL
LL LL06 MTPT -LAPN -PRIM -TWA -MPT -PL PL06 -FRL 261 -N2 6 -T1 2
LL LI22 SLV -SECD 1 -LL LL06 -TWA -FRL 261 -T1 4 -T6 30 -W 7 -N2 8
LL LI23 SLV -SECD 2 -LL LL06 -TWA -FRL 261 -T1 4 -T6 30 -W 7 -N2 8
LL LI24 SLV -SECD 3 -LL LL06 -TWA -FRL 261 -T1 4 -T6 30 -W 7 -N2 8
LL LI25 SLV -SECD 4 -LL LL06 -TWA -FRL 261 -T1 4 -T6 30 -W 7 -N2 8
&
& MULTIPOINT LEASED (HALF DUPLEX- TWA)
&
&
&
PL PL04 HDLC -DFSB -PHAD 0 -HALF -108 2 -CT CT05
LL LL04 MTPT -LAPN -PRIM -TWA -MPT -PL PL04 -FRL 400 -N2 3 -TI 4
LL LI11 SLV -SECD 1 -LL LL04 -SB SB01 -TWA -FRL 200 -T1 12 -T6 80
LL LI12 SLV -SECD 1 -LL LL04 -SB SB01 -TWA -FRL 250 -T1 14 -T6 80
LL LI13 SLV -SECD 1 -LL LL04 -SB SB01 -TWA -FRL 400 -T1 20 -T6 120
&
& MULTIPOINT LEASED (FULL DUPLEX -TWS, TWA MIXED)
&

&
PL PL07 HDLC  -PHAD -PHAD 1 -FULL -SB2 SB01 -CT CT06
LL LL07 MTPT -LAPN -PRIM -TWS -MPT -PL PL07 -FRL 300 -N2 4 -T1 4
LL LI26 SLV  -SECD 1 -LL LL07 -TWS -FRL 261 -T1 4 -T6 40 -SB SB01
LL LI27 SLV  -SECD 2 -LL LL07 -TWS -FRL 133 -T1 3 -T6 60 -SB SB01
LL LI28 SLV  -SECD 3 -LL LL07 -TWS -FRL 300 -T1 5 -T6 40
LL LI29 SLV  -SECD 4 -LL LL07 -TWS -FRL 200 -T1 4 -T6 50
LL LI30 SLV  -SECD 5 -LL LL07 -TWS -FRL 133 -T1 3 -T6 50 -SB SB01
&
& MULTIPOINT LEASED (FULL DUPLEX -TWS)
&
&
PL PL05 HDLC   -PHAD 0  -FULL -SB SB01 -CT CT06
LL LL05 MTPT  -LAPN -PRIM -TWS -MPT -PL PL05 -FRL 133 -N2 4 -T1 2
LL LI14 SLV  -SECD 1 -LL LL05 -TWS -FRL 133 -T1 3 -T6 40 -N2 6
LL LI15 SLV  -SECD 2 -LL LL05 -TWS -FRL 133 -T1 3 -T6 40 -N2 6
LL LI16 SLV  -SECD 3 -LL LL05 -TWS -FRL 133 -T1 3 -T6 40 -N2 6
LL LI17 SLV  -SECD 4 -LL LL05 -TWS -FRL 133 -T1 3 -T6 40 -N2 6
LL LI18 SLV  -SECD 5 -LL LL05 -TWS -FRL 133 -T1 3 -T6 40 -N2 6
LL LI19 SLV  -SECD 6 -LL LL05 -TWS -FRL 133 -T1 3 -T6 40 -N2 6
```

```
LL LI20 SLV  -SECD 7 -LL LL05 -TWS -FRL 133 -T1 3 -T6 40 -N2 6
&
& POINT TO POINT SWITCHED (FULL DUPLEX -TWS) (4 WIRES)
&
&
PL PL03 HDLC -DFSB -PHAD 1 -HALF -HALF4 -SWITCH 500 -CT CT04
LL LL03 MTPT -LAPN -PRIM -TWS -PTP -PL PL03 -DYN -T1 4 -N2 7
LL LI07 SLV -SECD 6 -SWITCH -TWS
LL LI08 SLV -SECD 7 -SWITCH -TWS
LL LI09 SLV -SECD 8 -SWITCH -TWS
LL LI10 SLV -SECD 9 -SWITCH -TWS
&
&
& POINT TO POINT SWITCHED (HALF DUPLEX -TWA) (2 WIRES)
&
&
PL PL02 HDLC -DFSB -PHAD 0 -HALF -HALF2 -SWITCH 600 -CT CT04
LL LL02 MTPT -LAPN -PRIM -TWA -PTP -PL PL02 -DYN -T1 3 -N2 5
LL LI02 SLV -SECD 1 -SWITCH -TWA -T1 13 -T6 26 -W 7 -N2 11

LL LI03 SLV -SECD 2 -SWITCH -TWA
LL LI04 SLV -SECD 2 -SWITCH -TWA
LL LI05 SLV -SECD 4 -SWITCH -TWA
LL LI06 SLV -SECD 5 -SWITCH -TWA
```

Secondary station

```
&
&   L A P N   S E C O N D A R Y   S T A T I O N
&
&
& (1) LEASED LINE (FULL DUPLEX -TWS), PTP CONFIGURATION ONLY
&
&
PL PLS0 HDLC -PHAD 0 -HALF -HALF4 -CT CT05 -DFSB
LL LLS0 MTPT -LAPN -SECD 1 -TWS -PL PLS0 -DFSB -FRL 200 -N2 5 -W 4
-T1 120
&
&
& (2) LEASED LINE (FULL DUPLEX -TWS), FOR MTPT CONFIGURATION
&
&
PL PLS5 HDLC -PHAD 0 -CT CT06 -HALF -DFSB
LL LLS5 MTPT -LAPN -SECD 3 -TWS -PL PLS5 -DFSB -FRL 200 -N2 4 -W 7
-T1 120
&
&
&
& (3) LEASED LINE (FULL DUPLEX -TWS), PTP AND MTPT CONFIGURATION
ONLY
&
&
PL PLS1 HDLC -PHAD 1 -CT CT05 -HALF -HALF2 -DFSB
LL LLS1 MTPT -LAPN -SECD 2 -TWS -PL PLS1 -c
DFSB -FRL 300 -N2 6 -W 5 -T1 100
&
&
```

```
& (4) SWITCHED LINE (FULL DUPLEX -TWS)
&
&
PL PLS2 HDLC -PHAD 2 -CT CT05 -HALF -HALF4 -SWITCH 120 -DFS
LL LLS2 MTPT -LAPN -SECD 8 -TWS -PL PLS2 -DFSB -N2 7 -W 7 -T1 100
&
&
& (5) SWITCHED LINE (HALF DUPLEX -TWA)
&
&
PL PLS3 HDLC -PHAD 3 -CT CT05 -HALF -HALF2 -SWITCH 200 -DFSB
LL LLS3 MTPT -LAPN -SECD 4 -TWA -PL PLS3 -DFSB -N2 8 -W 3 -T1 90
&
```

Table 5-7. Summary of the parameters of LI declaration

	NRM						
	ASY ASYV	**MTPT (P)**	**MTPT (S)**	**SLV**	**BDL**	**2780**	**3270V IP**
T1							
Default value **Maximum value** **Minimum value**		5302	16 1200 1	16 1200 1	16 1200 1		
T2							
Default value **Maximum value** **Minimum value**	1000 32767 20	40 32767 0	40 32767 0	32767	40 0	120 32767 0	120 32767 0
T3							
Default value **Maximum value** **Minimum value**					0 600 0	40	
T4							
Default value						30	
T5							
Default value						300	
T6							
Default value **Maximum value** **Minimum value**				50 600 0		3000	
T7							
Default value **Maximum value** **Minimum value**						8 T3 0	
FRL							
Default value **Maximum value** **Minimum value**		2048 32767 2	2048 32767 2	2048 32767 2	2048 32767 2		
N2							
Default value **Maximum value** **Minimum value**		10 50 2	10 50 2	10 50 2	10 50 2		
SECD							
Default value **Maximum value** **Minimum value**			- 254 1	- 254 1			
W							
Default value **Maximum value** **Minimum value**			4 7 1	4 7 1	4 7 1	 (127 with -EXT)	
PRIM							
Default valuePermitted value					3 3 or 1		

Default values are appropriate to line speeds of 4800 bps (the BDL case is of a frame length of 133 bytes), except for NRM (MTPT and SLV types. Default time values for NRM (MTPT and SLV) lines are appropriate to a frame length of 133 bytes at 1200 bps (point-to-point).

5.2.22 LN - LOGIN DESCRIPTION

5.2.22.1 Description

A LOGIN DESCRIPTOR defines the login phase. It specifies default values for the security parameters which must be provided at login and specifies whether the security parameters must be entered manually by the operator or automatically by DNS (acquisition mode).

The same LN may be mapped from several DV objects in order to define the same login procedure for several devices.

The Login Descriptor which will be used during a particular login phase may be retrieved in one of several ways. They are listed below in order of decreasing priority:

- an LN may be entered explicitly in the login command,
- from the User Descriptor (UD) object, if a UD is entered in the login command and if the UD is mapped to an LD,
- from the Device (DV) object which represents the device, if an LN is mapped from this DV.

If no Login Descriptor is defined, a default one is used. It contains the following information:

- acquisition modes are set to DEF
- default security parameters are provided (blank)

5.2.22.2 Syntax

```
LN name TMG

     [-BILL string]          (12 chars. max) 12 spaces

     [-BILLAM {DEF|PR|PRDEF} {LCOFF|LCON} {OV|NOOV}]

     [-PROJ string]          (12 chars. max) 12 spaces

     [-PROJAM {DEF|PR|PRDEF} {LCOFF|LCON} {OV|NOOV}]

     [-PSSW string]          (12 chars. max) 12 spaces

     [-PSSWAM {DEF|PR|PRDEF} {LCOFF|LCON} {OV|NOOV}]

     [-USERAM {DEF|PR|PRDEF} {LCOFF|LCON} {OV|NOOV}]

     [-USERID string]        (12 chars. max) 12 spaces

     [{-IMPCN|-EXPCN}]*
```

* See the description of the MANCN/AUTOCN parameter for a DV object of the 2780 type.

Example:

```
LN DV01 TMG      -BILL AGENCY1        -BILLAM DEF NOOV  &
                 -PROJ TICKET         -PROJAM DEF NOOV  &
                 -PSSWAM PR LCOFF     -USERAM PRDEF OV  &
                 -USERID ANONYMOUS
```

5.2.22.3 Description of Parameters

Name	Ranges from 1 to 8 alphanumeric characters.
BILL	Default value for the billing account to be used.
BILLAM	The way the terminal operator enters this parameter during login.
DEF	CNS uses the default in this CD if the operator does not enter a new parameter in the login command.
EXPCN	The terminal operator must enter a connect command once the login process is terminated.
IMPCN	The connect phase is automatic once the login phase is terminated. The connect process is then done according to the CD description (see CD).
LCOFF	Lower case characters are converted to upper case. The security parameter is then not case sensitive.
LCON	Lower case characters are allowed in the parameter. The security parameter is then **case sensitive** and must input **exactly** as declared on the LD.
NOOV	The terminal operator is not allowed to enter a security parameter different from the default value.
OV	The terminal operator is allowed to enter a security parameter different from the default value.
PR	Prompt to the terminal operator to for the security parameter, if it is not present in the login command. The terminal operator is prompted until the parameter is entered.
PRDEF	The terminal operator will be prompted for the security parameter if it is not present in the login command. If the reply is empty, the default value is used.
PROJ	Alphanumeric string, which is the default project id to be used.
PROJAM	The way the terminal operator has to enter this parameter during the login process.
PSSW	Default password. This parameter should not be used, if a password is not allowed in main memory.

PSSWAM	The way the terminal operator has to enter this parameter during the login process.
USERAM	The way the terminal operator has to enter this parameter during the login process.
USERID	Default user-id.

5.2.23 MB - MAILBOX

5.2.23.1 Description

A MAILBOX object identifies a correspondent uniquely on a particular system. The correspondent is either a terminal or an application. It is one end-point of the logical connection between two correspondents.

The mailbox name is part of the correspondent's Standard Global Mailbox Name. The Standard Global mailbox name identifies the correspondent uniquely in a network.

For a terminal:

Std. Global Mailbox Name = sc-id of system + Mailbox name [+ Mailbox extension]

For an application:

Std. Global Mailbox Name = sc-id of system + Mailbox name

For native DSA applications, a mailbox does not need to be declared. For other applications, a mailbox must be declared.

5.2.23.2 Syntax for MB -$DEBUG

(Used for accessing the local interactive debug application. For further details refer to the Note later in this section).

```
MB $DEBUG -PSSW  password  (8 chars. max.) spaces
```

5.2.23.3 Syntax for MB -STAT

The 'STAT'ion mailbox introduces a Terminal Manager mailbox when the extension is not used. The STAT mailbox name must be a maximum of 8 characters. Note that a TMG mailbox with an extension (TX) and a STAT mailbox cannot be mixed on the same terminal station (SN). The Standard Global Mailbox Name contains a Session Control name (4 chars.), MB STAT name (8 chars.) and blanks (4 chars.).

```
MB name STAT -SN name
```

5.2.23.4 Syntax for MB -TMG

The 'TMG' mailbox introduces a Terminal Manager Mailbox when the extension is used. Note that when you declare a TMG mailbox, you are obliged to declare a mailbox extension (TX). The TMG mailbox name must be a maximum of 8 characters. The mailbox extension (TX) name must be four characters in length. The global mailbox name contains the Session Control name (4 chars.), MB TMG name (8 chars.) and TX TMG name (4 chars.).

```
MB name TMG
```

5.2.23.5 Syntax for MB -USER

This mailbox is used for accessing the local test tasks, or to read a file situated in a host system.

```
MB name USER

[-CNX string]

[-INIT string]

[-PSSW string]     (8 chars. max) spaces

[-NO_SES]
```

For In-Line Tests, the following USER mailboxes must be declared:

```
MB $NSE USER -CNX VSEQY  -NO_SES
MB $NSF USER -CNX VSEQX  -NO_SES
MB $ECHO USER -CNX VSEQO
```

MB $NSE	are user mailboxes used for performing the BNSE (Basic Network Session Exerciser) In-Line test.
MB $NSF	between systems.
MB $ECHO	is a user mailbox used for device testing. Connections are established with this mailbox from a device in order to use the echo function.

5.2.23.6 Syntax for MB -$SYSGEN

In order to create the $SYSGEN Mailbox for the interactive application of patches or for renaming the generation file, you should declare the following directive:

```
MB $SYSGEN USER  -CNX I_SYSGEN
```

This directive does not permit the execution of a generation, and is only given here for information. It is in the SYSGEN file (see appendix B of this manual) delivered with the software release.

5.2.23.7 Description of Parameters

CNX Open a session on a mailbox. For example, when a session connection request is received, this parameter gives the connection immediate sequence address.

INIT Initialization routine address.

PSSW Eight-character password to be given to this mailbox at connection time.

NO_SES The task does not use the SES interface service.

NOTE: The interactive debug task is generated by means of the following directive in the system configuration file:

```
MB  $DEBUG   -PSSW  password
```

5.2.23.8 System Operator Considerations

The mailbox $DEBUG is generated with the status LOCK. Before connecting to it, the system operator must enable the mailbox with the following command:

```
UP MB $DEBUG -ST ENBL
```

Each time the interactive debug task disconnects, the mailbox returns to the status LOCK.

The system operator can change the password at any time by entering:

```
UP MB $DEBUG -PSSW password
```

CAUTION

The use of this command may be restricted to certain operators through the use of administrative filters.

Every command addressed to the interactive debug task will be sent to the LOGFILE and to the operator.

The interactive debug task will notify the LOGFILE and the operator of any connection attempts and will also prevent disconnections.

The system operator can survey all tasks performed by the interactive debug operator and can also disconnect the interactive debug operator by using the following command:

```
UP MB $DEBUG -ST LOCK
```

5.2.24 MD - MODEL

This directive gives the parameters of a device. The parameters will be shared by all DVs mapped to this model. Some model parameters are also present in the device. These parameters give defaults for the device. There must be an MD directive for every different -MD parameter in the DV declarations, inlcuding standard models.

If the -SEQIN, SEQOUT, or SEQSES parameters are used in the MD directive, SEQ tables must be declared to re-define entries in the predefined tables.

The default values are in the standard model, referenced by the -LIKE option. See the *Terminal Management Reference* manual for more details.

5.2.24.1 Syntax for MD -ASY

```
MD name ASY
    [-LIKE name]
    [-BUF v]                                (0,  32767)
    [-FILL v]
    [-FILLBS v0 [:v1[:v2[:v3]]]]
    [-FILLDL v0 [:v1[:....[:v7]...]]]
    [-FILLFF v0 [:v1[....[:v5]...]]]
    [-FILLNL v0 [:v1[....[:v7]...]]]
    [-HC name]
    [-IDNB v]
    [-LINE v]                                (0, 255)
    [-MOTOR v]
    [-NWNAME]
    [-PAGE v]                                    (0,255)
    [-PROFIL name]
```

```
[-ROP]
[-SEQIN name]
[-SEQOUT name]
[-SEQSES name]
[-SEEPD v]
[-STOP {1|}]
[-TEXT]
[-TRSIN name]
[-SPEED v]                                        (0,32767)
[-STOP {1|2}]
[-TEXT]
[-TRSIN name]
[-TRSOUT name]
[{-ASCII|-BCD|-BIN|-EBCD}]
[{-AUTCR|-NAUTCR}]
[{-AUTLF|-NAUTLF}]
[{-AUTLF||NAUTLF}]
[{-BRK {BRK|ATTo|ATT1|ATT2|IGN}[LG]|-NBK}]
[{-COLOR|-NCOLOR}]
[{-LOWCAS|-UCAS}]
[{-S64|-S96}]
[-OVSZ]
```

Example:

```
MD GLASS12 ASY       -LIKE DKU7001       -PAGE 12
```

For further details refer to the Bull Publication, CNS7 Terminal Management.

5.2.24.2 Syntax for MD -MNTL

The Minitel device can be connected as follows:

- Direct connection via an asynchronous line. In your generation, for example, the DV object will be mapped directly onto an LL object.
- Via VIDEOPAD. In this case, in your generation, your DV object (MNTL type) will be mapped directly onto an NR (PAD).

```
MD name MNTL
    [-LIKE name]
    [-BUF v]           (0, 32767)
    [-IDNB v]
    [-LINE v]          (40 or 80)
    [-NWNAME]
    [{-LOWCAS|-UPCAS}]
    [{-S64|-S96}]
    [-RETOUR {ATT0|ATT1|ATT2|EOI|EOI1|EOI2}]
    [-REPET {ATT0|ATT1|ATT2|EOI|EOI1|EOI2}]
    [-GUIDE {ATT0|ATT1|ATT2|EOI|EOI1|EOI2}]
    [-ANNUL {ATT0|ATT1|ATT2|EOI|EOI1|EOI2}]
    [-SOMR {ATT0|ATT1|ATT2|EOI|EOI1|EOI2}]
    [-CORCT {ATT0|ATT1|ATT2|EOI|EOI1|EOI2}]
    [-SUITE {ATT0|ATT1|ATT2|EOI|EOI1|EOI2}]
    [-CNXFIN {ATT0|ATT1|ATT2|EOI|EOI1|EOI2}]
    [-RACK]
    [-TRSIN name]
    [-TRSOUT name]
```

5.2.24.3 Syntax for MD -VIP/TGX

```
MD name {VIP|TGX}
     [-BREAK V1[:v2]]
     [-LIKE name]
     [-BS v1[:v2 ...[:v7]]]
     [-BUF v]          (0, 32767)
     [-CR v1[:v2 ...[:v7]]]
     [-FF v1[:v2 ...[:v7]]]
     [-FILL v]
     [-FILLBS v0 [:v1[:v2]]]
     [-FILLDL v0 [:v1[:v2[:v3]]]]
     [-FILLFF v0 [:v1[:v2]]]
     [-FILLHT v0 [:v1[:v2 ...[:v5]]]]
     [-FILLNL v0 [:v1 ...[:v5]]]
     [-FILLVT v0 [:v1[:v2]]]
     [-IDNB v]
     [-HT v1[:v2 ...[:v7]]]
     [-LF v1[:v2 ...[:v7]]]
     [-LINE v]          ( 0, 255)
     [-NL v1[:v2 ...[:v7]]]
     [-NOSTAT]
     [-NWANAME]
     [-PAGE v]                        (0,255)
     [-ROP]
     [-SECR v1[:v2 ...[:v7]]]
     [-SNM vo[:v1 ...[:6]]]
     [-SPEED v]                       (0,32767)
     [-TRSIN name]
     [-TROUT name]
     [-VT v& [:v2 ...[:v7]]]
     [{-AUTLF-NAULTF}]
     [{-CTRLF|-NKYPAP}]
```

```
[{-KYPAP|-NKAPAP}]

[{-LOWCAS|-UP"CAS}]

[{-SGOUT|-NSGOUT}]

[{-S64|-S96}]
```

Examples:

```
MD VIP1 VIP      -LIKE VIP7760
MD GCX1 VIP      -LIKE VIP7760
MD TGX1 TGX      -LIKE TTU8221     -CONFIG   TGX
```

5.2.24.4 Syntax for MD -3270

```
MD name 3270

    [-LIKE name]

    [-BUF v]           (0, 32767)

    [-IDNB v]

    [-LINE v]          (0, 255)

    [-NWNAME]

    [-PAGE v]          (0, 255)

    [-SPEED v]         (0, 32767)

    [{-LOWCAS|-UPCAS}]

    [{-S64|-S96}]

    [-SFAP]

    [-TRSIN name]

    [-TRSOUT name]
```

5.2.24.5 Syntax for MD -2780

```
MD name 2780
    [-LIKE name]
    [-IDNB name]
    [-NWNAME]
    [-TRSIN name]
    [-TRSOUT name]
```

5.2.24.6 Description of Parameters

ANNUL	Action to be taken when the "ANNULATION" key of minitel terminals is received in SDP or TTY modes.
ASCII	Terminal code is ASCII.
ATT0	Action (ATT0) to be taken when ATT0 is received in SDP or TTY modes.
ATT1	Action to be take when ATT1 is received in SDP or TTY modes. ATT1 is used to send a break to the terminal manager.
ATT2	Action to be taken when ATT2 is received in SDP or TTY modes. ATT2 is used to send attention message 2 to the correspondent.
AUTCR	The terminal returns the carriage (or cursor) to column 1 at the end of the physical line. Terminal manager will send only an "LF" character at the end of line (see also AUTLF).
AUTFE	The terminal gives a "LF" when it receives a "CR". Terminal manager will only send a "CR" for a new line.
AUTLF	The terminal feeds one line at the end of the physical line. The Terminal manager will send only a "CR" character for a new line.
BCD	Terminal code is BCD.
BIN	Terminal code is BINARY.
BREAK	Introduces 1 or 2 values to define the characters are used to send a BREAK. This is for VIP and TGX terminals which have no break key.

BRK — Interpretation of the break signal. It will be converted into:

- ATTL (prompt request to the terminal manager) or ATT1 (break to the terminal manager) or ATT2 (attention message 2 to the correspondent) or IGN (ignored). If the LG parameter is declared, on a break, the terminal manager will make the terminal busy for 1 second.

BS — Back Space sequence sent to the device when the terminal manager has received a "BS" from an application.

The values associated with this parameter are:

- v1 gives the number of characters in the sequence
- v2 to v7(up to six) are the characters that are used in the sequence.

BUF — The maximum size of data that can be sent to the device. This limit is usually the controller buffer size. This parameter may be redefined in the device directive by the parameter BUFF. A value of 0 means undefined.

COLOR — Device equipped with multi-colour capability. COLOR may be switched by means of "$*$RR (or RB) ON or OFF". Two more complementary keyword functions -RR and -RB must be defined in the SEQ parameter string.

CNXFIN — Action to be taken when the minitel terminal "CONNEXION/FIN" key is received in SDP or TTY modes. This is only valid for direct connection, it is invalid for VIDEOPAD connections.

CORCT — Action to be taken when the minitel terminal "CORRECTION" key is received in SDP or TTY modes.

CR — Carriage Return sequence sent to the device when the terminal manager receives a "CR" from the application.

The values associated with this parameter are:

- v1 gives the number of characters in the sequence
- v2 to v7(up to six) are the characters that are used in the sequence.

CTRLF — This device has filling capability. If this parameter is declared, those parameters defining filling algorithms are ignored.

EBCD — Terminal code is EBCDIC.

EOI — Action (Data Transfer) to be taken when the correspondent key is received in SDP or TTY modes.

EOI1 — CR + EOI action.

EOI2 — CR + LF + EOI action.

FF — Form Feed-Clear Screen sequence sent to the device when the terminal manager receives an "FF" from the application.

The values associated with this parameter are:

- v1 gives the number of characters in the sequence
- v2 to v7(up to six) are the characters that are used in the sequence.

FILL — Hexadecimal value of the filling character.

In the following explanations of the parameters FILLBS, FILLDL, FILLHT and FILLNL, the algorithms referred to are common to all.

The parameter v0 defines the algorithm to be used. It can take one of seven values. Depending on the value of v0, a number of other parameters must be declared.

Value of Vo	**meaning**
0	No algorithm used
1	Linear filling algorithm
2	Bilinear filling algorithm
3	"minimum" algorithm
4	Bi-constant algorithm
5	Algorithm for repeated function, with threshold
6	Algorithm for repeated function, without threshold

The time delay(t) representing the filling characters is calculated by the table below:

Vo	**t=**
1	t=V1+n.V2/100
2	If n<V1, t=V2+n.V3/100If n>=V1, t=V4+n.V5/100
3	t=V1
4	If n<V1, t=V2If n>=V1, t=V3
5	t=n.V1
6	If n>V1, t=V2 If n

FILLBS — Algorithm used for back space filling characters.

The values for v0 may be 0 or 1.

The algorithms are explained above n represents the cursor position (column).

FILLDL — Algorithm used for line feed filling characters.

The values for v0 may be 0, 4, 5 or 6.

The algorithms are explained above; n represents the number of consecutive line feed characters.

FILLFF

Algorithm used for form feed filling characters.

v0 may take one of the values 0 or 1. If v0 = 0, no algorithm is used; if v0 = 1, the linear algorithm below is applied.

$$t = v1 + \frac{n.v2}{10}$$

Where t is the time delay representing the filling characters, and n is the number of lines to reach the end of the page. The system calculates the value of n by using the value declared in the -PAGE parameter, which **must** therefore be declared.

FILLHT

Algorithm used for horizontal tabulation filling characters.

The value of v0 may be 0, 1, 2 or 3.

The algorithms are explained above the definition of the FILLBS parameter. n represents the cursor position (column).

FILLNL

Algorithm used for new line filling characters.

Values of v0 may be 0, 1, 2 or 3.

The algorithms are explained above the description of the FILLBS parameter. n represents the cursor position (line).

FILLVT

Algorithm for vertical tabulation filling characters. v0 may take one of the values 0 or 1. If v0 = 0, no algorithm is used; if v0 = 1, the linear algorithm below is applied.

$$t = v1 + \frac{n.v2}{10}$$

Where t is the time delay representing the filling characters, and n is the number of lines to reach the next vertical tabulation mark. The system calculates the value of n by using the values declared in the -PAGE and -VT parameters, which **must** therefore be declared.

GUIDE

Action to be taken when the minitel terminal GUIDE key is received in SDP or TTY modes.

HC

Hard Copy model name used with the HCON/HCOFF local dialogue commands.

HT

Horizontal Tabulation sequence sent to the device when the terminal manager receives an "HT" from the application.

The values (Vi) associated with this parameter have the following significance.

The first value declares the number of characters in the sequence.

The following characters (maximum of six) are the characters in the sequence used.

IDNB	DSA Identifier. For further details see the *Terminal Management Reference Manual*. If this parameter is not declared, the IDNB of the model declared in the LIKE parameter will be used.
KYPAP	The device is a keyboard/printer.
LF	Line Feed sequence sent to the device when the terminal manager receives an "LF" from the application. The values associated with this parameter are: - v1 gives the number of characters in the sequence - v2 to v7(up to six) are the characters that are used in the sequence.
LIKE	Name of a standard model of the same type. The parameters of the new model are then identical to those defined in the standard model, when not redefined in this directive.
LINE	Line length of the device in characters. This parameter may be redefined in the device directive. A value of 0 gives an undefined length.
LOWCAS	The device accepts lower case characters. The characters may be displayed as lower or upper case by the device.
MOTOR	Time, in seconds, after which the motor stops if nothing is received on the line.
NAUTCR	No carriage return done by the terminal at end of line(see the AUTCR parameter).
NAUTFE	No line feed done by the terminal on a carriage return (see the AUTFE parameter).
NAUTLF	No line feed done by the terminal at the end of a physical line (see the AUTLF parameter).
NBRK	Break signal is not operative.
NCOLOR	The device does not have multi-colour capability.
NCTRLF	Device does not have a filling capability. If this parameter is declared, those parameters defining filling algorithms must be declared.
NKYPAP	Device is not a keyboard/printer.

NL	New Line sequence sent to the device when the terminal manager receives the "CR" + "LF" sequence from the application. The values associated with this parameter are: - v1 gives the number of characters in the sequence - v2 to v7(up to six) are the characters that are used in the sequence.
NOSTAT	Status dialogue request with the screen (for VIP 7804) is not done. In this case, some errors are not fully reported to the TM.
NWNAME	Model name will be sent to the correspondent at connection time. If not present the model in the LIKE parameter is be sent.
NSGOUT	No output segmentation on the device. See also the SGOUT parameter.
PAGE	Page length of the device in lines. This parameter may be redefined in the device directive. A value of 0 indicates an undefined page length.
PROFIL	Name of the PROFIL directive. This is used for asynchronous terminals used on a PAD.
RETOUR	Action to be taken when the minitel "RETOUR" key is received in SDP or TTY modes.
RACK	Status of the minitel device should be transmitted to the application. This parameter in MD overrides the associated DV directive.
REPET	Action to be taken when the minitel terminal "REPETITION" key is received in SDP or TTY modes.
ROP	Receive Only Printer.
SECR	Secret Read sequence sent by the terminal manager to allow non-displayed entry. This is commonly used for passwords. The values associated with this parameter are: - v1 gives the number of characters in the sequence - v2 to v7(up to six) are the characters that are used in the sequence.
SEQIN	SEQ -IN mapped from this MD. LIKE is mandatory when using SEQIN.
SEQOUT	SEQ -OUT used to specify the terminal sequence list. LIKE is mandatory when using SEQOUT.

SEQSES	SEQ -SESS used to specify the character sequence which is sent to the application instead of the given input character list fromthe terminal. LIKE is mandatory when SEQSES is used.
SFAP	Structured field and attribute processing option, is supported by the terminal (see the documentation with the terminal).
SGOUT	Output segmentation on the device (e.g., VIP7804). The data sent to the device is divided into segments of a size defined in the BUF parameter.
SNM	Sequence of characters sent by the terminal manager at the start of a secondary dialogue message, to set the terminal in normal mode, for a terminal having SDP capability. The values associated with this parameter are: - v1 gives the number of characters in the sequence - v2 to v7(up to six) are the characters that are used in the sequence.
SOMR	Action to be taken when the Minitel "SOMMAIRE" key is received in SDP or TTY modes.
SPEED	Device speed in characters per second. This value is used to compute the number of filling characters or the delay before the next selection. This parameter may be redefined in the DV directive.
STOP	Number of stop bits for the end of a character in asynchronous mode. Default is 1.
SUITE	Action to be taken when the Minitel "SUITE" key is received in SDP or TTY modes.
S64	The device uses the 64 symbols subset. See the device directive (DV), where this parameter may be *redefined.
S96	The device uses the 96 symbols set. See the device directive (DV), where this parameter may be redefined.
TEXT	The device works in text mode (data is sent in blocks).
TRSIN	Name of the code conversion table (TRS) to convert input codes.
TRSOUT	Name of the code conversion table (TRS) to convert output codes.
UPCAS	The device only accepts upper case characters. A translation may be done by the Terminal Manager. This parameter may be redefined in the device directive (DV).

VT — Vertical Tabulation sequence sent to the device when the terminal manager receives a "VT" from the application.

The values associated with this parameter are:

- v1 gives the number of characters in the sequence
- v2 to v7(up to six) are the characters that are used in the sequence.

5.2.25 NR - NETWORK ROUTE

5.2.25.1 Description

A NETWORK ROUTE object defines the route out of the system towards a destination. The external destination may be:

- A PAD device,
- A Cluster of devices,
- A DSA system.
- An ISO/DSA workstation.

5.2.25.2 Syntax for NR -HDLC

Used to describe a Network Route using no network level protocol, and using directly the link level protocol, circuit oriented.

```
NR name HDLC
    [-N v]          (1, 15) 3
    [-NS name]
    [-T1 v]         (10, 900) 50 (in 1/10 s)
    [-T2 v]         (250, 6000) 900 (in 1/10 s)
```

Example:

```
NR NR02 HDLC      -NS NS02
```

5.2.25.3 Syntax for NR -LAN1

Used to declare a Network Route over an ISL or Bull Establishment Network (E-LAN).

```
NR name   LAN1    -PL name
```

Example:

```
NR CHHB   LAN1    -PL CHHB
```

5.2.25.4 Syntax for NR -LPAD

Used to declare PAD devices connected to an intermediate system, which is connected to the local system by a Bull Establishment network (E-LAN).

```
NR name LPAD
    [-CCLOC]
    [-CCREM]
    [-GROUP v]
    [-RMT name]
    [-RTRAF v]
    -SC name
    [-STRAF v]
    [-BAN]
    [-NBDEV v]
```

Example:

```
NR M152   LPAD    -RMT  M152   -SC 15
NR M153   LPAD    -RMT  M153   -SC 15
NR CSTP   LPAD    -GROUP 1     -SC SCTP
NR PDBN   LPAD    -BAN         -SC 15
```

5.2.25.5 Syntax for NR -PAD

Used for the route to a PAD terminal (local system connected directly to the X.25 network).

```
NR name PAD

     [-CCLOC]

     [-CCREM]

     [-GROUP v]          (0, 255)

     [-NBDEV v]          1

     -NS name

     [-RMT name]

     [-RTRAF v]          (3, 11)

     [-SIZE v]          (16, 32, 64, 128, 256, 512, 1024,

              2048, 4096)

     [-STRAF v]          (3, 11)

     [-W v]              (1, 127)
                         if extended numbering used
                         with NS, otherwise (1, 7)
```

Examples:

```
NR NR01 PAD    -NBDEV 10    -NS NSTP    -CCLOC (general purpose)
NR NR02 PAD    -NS NSTP     -RMT NSPD
NS NSPD RMT    -CALL 195022345                  (specialized)
```

5.2.25.6 Syntax for NR -PER

Used for the route using a permanent virtual circuit on an X.25 public network.

```
NR name PER

     -LCN v

    [-N v]           (1, 15) 3

     -NS name

    [-RESP]

    [-T1 v]          (10, 900) 50 (in 1/10 s)

    [-T2 v]          (250, 6000) 900 (in 1/10 s)
```

Example:

```
NR NR01 PER      -LCN 1           -NS NSTP
```

5.2.25.7 Syntax for NR -SLAN

This is used to route X.25 PAD calls over a LAN. This is declared when the local system is the intermediate system described in the LPAD description.

```
NR name SLAN     -SC name
```

Example:

```
NR NR15 SLAN     -SC CS15
```

5.2.25.8 Syntax for NR -SW

Used to describe a network route using switched virtual circuits on X.25 private and public data networks.

```
NR name SW
[-CCLOC]
[-CCREM]
[-GROUP v]          (0, 255)
[-N v]              (1, 15) 3
 -NS name
[-RMT name]
[-RTRAF v]          (3, 11)
[-SIZE v]           (16, 32, 64, 128, 256, 512,
                     1024, 2048, 4096)
[-STRAF v]          (3, 11)
[-T1 v]             (10, 900) 50 (in 1/10 s)
[-T2 v]             (250, 6000) 900 (in 1/10 s)
[-W v]              (1, 127)
                    if extended numbering used
                    with NS, otherwise (1, 7)
```

Example:

```
NR NRTS SW   -GROUP 1   -SIZE 256    -W 2   -NS NSTP  -RMT RMT1
NS NSTP X25  -NBVC 5    -CALL 175060122  -FLCT  -LL LLTP
NS RMT1 RMT  -CALL 178020220
```

5.2.25.9 Syntax for NR -SX25

Used to describe a Network Route when the local system is acting as a packet switch.

```
NR name SX25

      [-CCLOC]

      [-CCREM]

      [-GROUP v]          (0, 255)

      -NS name

      [-RMT name]

      [-RTRAF v]          (3, 11)

      [-SIZE v]           (16, 32, 64, 128, 256,

                          512, 1024, 2048, 4096)

      [-STRAF v]          (3, 11)

      [-W v]              (1, 127)
                          if extended numbering used
                          with NS, otherwise (1, 7)
```

Examples:

```
NR NR01 SX25  -GROUP 2  -NS NSTP   -RMT TPC  -RTRAF 9  -STRAF 9
NR NR02 SX25  -NS PRIV  -SIZE 1024
```

5.2.25.10 Description of Parameters

BAN	Generalised access. This NR will receive calls from PAD terminals connected to a system which is declared in the EQU file.
CCLOC	Collect calls from a remote correspondent may be accepted locally (the local system is billed and the CCREM parameter may be needed on the remote system).
CCREM	Calls to a remote correspondent will be sent with the collect call indicator set, billing is made at the remote end of the X.25 switched virtual circuit. (Request reverse charge).
GROUP	Closed user group index used for connection to the correspondent.

LCN	The logical channel number for a permanent Network Route. It must have the same value as defined on the subscription form for the network subscription.
N	Number of retries that may be attempted after failure and before using another network route (Recovery phase).
NBDEV	Maximum number of generalised PAD incoming calls (number of PAD terminals simultaneously connected).
NS	Name of the local network subscription (NS -X25) onto which this network route is mapped.
PL	Name of the physical line of CSM1 type onto which this NR of LAN1 type is mapped.
RESP	The local system is responsible for the charges for a permanent X.25 circuit.
RMT	Name of the remote network subscription (NS -RMT) which is needed to connect via an X.25 network (public or private). It identifies the remote system or PAD terminal. This parameter must not be declared if the BAN parameter is used.
RTRAF	Throughput class on the system which receives the call packet. The default value is 0, meaning that the facility is not defined. Consult the network documentation for available values.
SC	Sc-id of the remote system over the E-LAN if the terminal is connected to the intermediate system via an X.25 PDN.
SIZE	Gives the packet size. This parameter is used to negotiate a special packet size if the local subscription has requested flow control parameter negotiation (FLCT parameter) on public or private networks. See the permitted values for the network. It must equal to, or less than the SIZE value on NS -X25. **Warning**: the value must be a power of 2.
STRAF	The throughput class on the system which sends the call packet. The default value is 0, meaning that the facility is not defined. See the network documentation for available values. (This parameter must be compatible with the network subscription).

T1	Identifies the delay after which a permanent network route is considered as able to work after sending the ineffective packet. For a switched network route, it is the delay after which the TS will retry the call in the recovery phase.
T2	Timeout after which the TS will re-attempt to use a Network Route after N consecutive failures.
W	Window size. This parameter is used to negotiate a special window size value if the local subscription has requested the flow control parameter negotiation facility (FLCT parameter). See the permitted values for the network. The value of this parameter must be less than or equal to the W parameter on NS -X25.

5.2.26 NS - NETWORK SUBSCRIPTION

5.2.26.1 Description

A NETWORK SUBSCRIPTION object provides the information necessary to establish connections across a data network.

5.2.26.2 Syntax for NS -HDLC

```
NS name HDLC     -LL name
```

Example:

```
NS NS01 HDLC -LL LL01
```

5.2.26.3 Syntax for NS -RMT

This object is used for a remote system on a public X.25 network for:

- DSA transport stations
- non DSA transport stations to provide the call number (address).

```
NS  name RMT
    -CALL string          (15 digits max)
    [{-DFSB|-SB name}]
```

5.2.26.4 Syntax for NS -X25

```
NS name X25
     -LL name
     -NBVC v                 (1, 4096)
     [-CALL string]          (15 digits max)
     [-DCE ]
     [-FLCT]
     [-NTW string]           See Table 5-9
     [-PASS string]          (4 chars. max)
     [-RTRAF v]              (3,11)
     [-SIZE v]               (16, 32, 64, 128, 256, 512,  1024,
                             2048, 4096)
     [-STRAF v]              (3,11)
     [-W v]                  (1,7*)
     [{-DFSB|-SB name}]
     [{-TPCNLO|-NUMEXT}]
     [ -ACSISO name  ]
     [ -NBNCIN v  ]
     [ -NEIGHB string ]      (15 digits max.)
```

Examples :

```
NS NSTP X25-LL LLTP  -NBVC 15 -CALL 150004210 -FLCT -RTRAF 9 &
             -STRAF 9
NS NSPV X25-LL LLPV   -NBVC 10 -DCE            -FLCT -NTW DSA
NS NSIT X25-LL LLIT   -NBVC 9  -CALL 1404500   -NTW ITAPAC
NS NWIP X25-LL LLIP   -NBVC 4  -DCE -NEIGHB 20 -NTW PRIVATE
```

5.2.26.5 Description of Parameters

ACSISO	Accept incoming connections on the NS from systems declared in the EQU file. This parameter enables the Dynamic Network Extension facility, described in more detail in Appendix A. When these remote stations are ISO/DSA workstations, the number of virtual circuits which may be open simultaneously is limited by the NBNCIN parameter if declared (or NBVC by default).
CALL	Subscription call number in decimal digits. It is mandatory when connected to a public network, and to permit X.25 in-line testing.
DCE	The local system is Data Communication Equipment (DCE) in a private network. In this case it can choose logical channels and manage call collisions. The default parameter indicates that this side acts as Data Terminal Equipment (DTE).
DFSB	An default Statistic Block (SB) is applied to this Network Subscription. The type is SBV1 and the -SAMIN value is 300s.
FLCT	Flow control parameter negotiation facility may be used on this subscription (network-dependent). Mandatory if the public data network subscription needs it.
LL	Name of the logical line used by this network subscription.
NBNCIN	Maximum number of virtual circuits opened by the systems declared in the EQU file. Default value is the value declared for NBVC.
NBVC	Maximum number of virtual circuits allowed on this network subscription simultaneously (see both the network subscription form and the Bull Publication*, DSA Network Configuration Guide*).
NEIGHB	Call number of the direct X.25 network neighbor. Mandatory when NTW = PRIVATE (to identify the neighboring system).
NTW	The X.25 network name: ARPAC, AUSTPAC, DATAPAC, DATEX_P, DCS, DDXP, DATANET, DSA, EURONET, IBERPAC, ITAPAC, LUXPAC, PRIVATE, PSS, REDT, SCT, TELENET, ,TELEPAC, TELEPACP, DATAPAK, TYMNET, TRANSPAC, UNINET, VENUS_P, INFOSWITCH. The default network name is TRANSPAC.

NUMEXT	Extended numbering is used with this subscription (when NTW takes = DSA or PRIVATE).
PASS	Password which is matched against the PAD device password during a connection attempt. If no PAD calls are to be accepted, this parameter is not used.
RTRAF	Throughput class on the receiving side. See the subscription documentation for available values.
SB	Name of the SBV1 Statistic Block applied to this network subscription.
SIZE	Packet size for this local subscription. The value must be a power of 2. The default values are particular to each network (refer to the table below). Also, consult the network subscription documentation for available values.
STRAF	Throughput class on the sending side. See the network subscription documentation for values.
TPCNLO	The TRANSPAC parameter to be used with TRANSPAC subscriptions which do not use logical channel number 0 for virtual circuits.
W	Window size for this local subscription. The default values are particular to each network (refer to the table below). See the network subscription documentation for available values.

Table 5-8. Default Packet/Window Sizes

NETWORK TYPE	DEFAULT PACKET SIZE	DEFAULT WINDOW SIZE PACKET SIZE	OTHER PERMITTED WINDOW SIZE	OTHER PERMITTED
ARPAC*	128	2	128	3-<>7
AUSTPAC	128	2	256	1-3-4
COMPSERV	128	2	-	3
DATAPAC	256	2	128	-
DATAPAKS	128	2	16-<>1024	1-<>7
DATEX P*	128	2	-	1-<>7
DCS*	128	2	-	1-<>7
DDPX	256	15	-	1-<>7
DATANET*(DN1)	128	2	16,32,64,128 256,512,1024	3
DOMPAC	128	2	-	-
DSA/PRIVATE	256	3	64,128,256, 512,1024, 2048,4096	2-<>7 1-127**
EIRPAC	128	2	-	-
ELAN	128	2	-	-
EURONET	128	3	-	-
IBERPAC*	128			3-<>7
INFOSW	256	2	16,32,64,128 256	-
ITAPAC	128	Throughput class dependent	-	2-<>6
LUXPAC*	128	2	32,64,256	1-3-4
PSS	128	2	-	-
RETD	128	2	-	3-<>7
SCT	-	-	-	-
TELENET	128	2	256,512,1024	1-<>7
TELEPAC*	128	2	256	1-<>7
TELEPACP	128	2	16,32,64,128 256,512	1-<>7
DATAPAK*	128	2	16,32,64,128 256,512	1-<>7
TYMNET	128	2	256,512,1024	1-<>7
TRANSPAC*	128	3	32,64,256	2-4
UNINET	128	2	-	-
VENUS	128	2	-	1-<>4

* Connection to these networks has been qualified by Bull. The other connections are unqualified, but the interfaces conform to Bull Specifications.

** For PRIVATE or DSA networks the may be from 1 127 if working with extended numbering (parameter NUMEXT is set).

5.2.27 NU - NETWORK USER

5.2.27.1 Description

A NETWORK USER is a routing object used in a X.25 private network, using X.25 addressing.

5.2.27.2 Syntax for NU -LOC

```
NU name LOC -CALL string    (1 to 15 digits)
```

Example:

```
NU NUBK LOC -CALL 13
```

5.2.27.3 Syntax for NU -X25

```
NU name X25
     -CALL string          (1 to 15 digits)
     -NR name1 [name2[name3...]]
     [-NBWAY v]            (1 to 15) 1
```

Example:

```
NU  U151  X25   -CALL 151   -NR SLU1
NU N492   X25   -CALL 178000015492   -NR NX92
```

5.2.27.4 Description of Parameters

CALL	For NU-LOC: X.121 call number of the local system. This may be the complete number or the complementary number. For NU-X25: X.121 call number of the remote system towards which the local system is switching (complete number if routing towards an X.25 public network, if not, complementary number).
NR	The name of the network route needed to do the routing. The NR type can be:

SX25: towards an X.25 network;

SLAN: towards local area network.

NBWAY — The number of network routes that may be used simultaneously from the list entered in NR parameter. This parameter is not used if switching from X.25 to local area networks.

5.2.28 OP - OPERATOR

5.2.28.1 Description

The OP object represents a network operator's terminal which may be connected to the NOI on your system.

OP may be associated with Filters (FL), which control the flow of administrative traffic between itself and the NOI. The filters may be mapped directly to OP or to the associated AG of type OP. Input filters may be used to define which NOI commands the network operator may use at this terminal.

5.2.28.2 Syntax

```
OP name OP
     [-FL  name1 [name2 [ name3 ...]]]
     -MBL name          (4 char. max.)
     -MBR name          (4 char. max.)
     -PSSW string       (12 characters max). 12 spaces
     [-AG name]
     [-THR v]           (0, 32767) 10
```

Example:

```
OP GOP1 OP        -MBL L6BA   -MBR L6BA   -PSSW TEST
```

5.2.28.3 Description of Parameters

AG	AG -OP for this operator.
FL	Name(s) of the filter(s) associated with this OP. Note that a filter (FL) object may be mapped from only one operator object (OP), and may not be shared by several OPs.
MBL	Sc-id of the local system.
MBR	Sc-id of the system containing the terminal manager AG to which the operator terminal is connected.
PSSW	Password to be given at log-on time by the operator. This password must be unique, as the OP object (thus, the access rights are associated with it).
THR	Maximum number of waiting messages for this operator. THR must be at least 150 if the in/on line tests are used at the terminal described by this OP.

5.2.29 PATCH1 - PATCH1

5.2.29.1 Description

This directive introduces the list of names of the patch files. The files contain patches that will be incorporated in the software image that will be saved in the absolute image file and used again in a subsequent loading.

5.2.29.2 Syntax

```
PATCH1 string1 [string2 string3... stringn]
```

5.2.29.3 Description of Parameters

string1-stringn	The list of names of the patch files, separated by blanks.

The name of the file is SLIBPATCH1, defined in the *GCOS 7 Network Operations manual*.

5.2.30 PATCH2 - PATCH2

5.2.30.1 Description

This directive introduces the name of the secondary patch file. The file contains patches that will be incorporated in the image loaded directly into memory and will be effective only until the next loading.

5.2.30.2 Syntax

```
PATCH2  patch-file-2
```

5.2.30.3 Description of Parameters

patch-file-2 The name of the secondary patch file.

The default name of this file is SLIBPATCH2.

5.2.31 PL - PHYSICAL LINE

5.2.31.1 Description

A PHYSICAL LINE object defines a line adaptor.

A line adaptor is a component attached to the communications controller mother board.

There may be more than one line on an adaptor. Each line needs a PL declaration.

5.2.31.2 Syntax for PL -ASY

```
For asynchronous lines.

PL name ASY

    -PHAD addr              (0,3)

    {-SPD|AUTSPD} v         (300, 600, 1200, 2400, 4800,
                             9600, 19200 in bps)

    -CT name

    [-SWITCH v]             (0 , 32767)

    [{-FULL|-HALF}]

    [{-108_2|-108_1}]

    [{-DFSB|-SB name}]

    [-NORING]
```

NOTE: Line 0 of the DCA controller is a V35 interface and cannot be used for asynchronous communication. The 108_1 option is not available on LNA lines.

Example:

```
PL PLA1 ASY  -AUTSPD 1200  -CT CT01   -PHAD 1
```

5.2.31.3 Syntax for PL -CSMA

```
For LAN controllers.

PL name CSMA

-CT name

[-ETHAD v]          (12 hexa digits.)

[{-DFSB|-SB name}]
```

Example :

```
PL  PLE1  CSMA  -CT CTE1 -DFSB
PL  PLE2  CSMA  -CT CTE1
```

5.2.31.4 Syntax for PL -CSM1

Used for LAN controllers when the remote system is DSA,SID or ISO with null Internet protocol. It represent the LAN comunications adaptor in the remote system.

```
PL name CSM1

-ETHAD v          (12 hexa digits.)

-CB name
```

Example :

```
PL  CH75  CSM1  -ETHAD 080002000075  -CB LLE1
```

5.2.31.5 Syntax for PL -HDLC

For HDLC lines except X.21 which use PL -X21.

```
PL name HDLC

-PHAD addr          (0,3)

-CT name

[-DIRECT]

[-HISPD]

[-SPD v]          (300, 600, 1200, 2400, 4800,
                   9600, 19200, 20480, 24576,
                   25600, 30720, 38400, 40960,
                   51200, 61440) With direct option

[-SWITCH v]       (0,32767)

[{-108_2|-108_1}]

[{-DFSB|-SB name}]

[{-FULL|-HALF}]

[-HALF4]

[-HALF2]

[-NORING]
```

Example:

```
PL HDC3 HDLC   -CT CT03   -PHAD 1   -SPD 19200
```

5.2.31.6 Syntax for PL -SYN

```
For synchronous lines.

PL name SYN

-PHAD addr          (0,3)

-CT name

[-DIRECT]

[-HALF4]

[-HISPD]

[-SPD v]            (300, 600, 1200, 2400, 4800,
                     9600, 19200) with DIRECT
                     parameter

[-SWITCH v]         (0,32767)

[{-HALF|-FULL}]

[{-108_2|-108_1}]

[{-DFSB|-SB name}]

[-NORING]
```

5.2.31.7 Syntax for PL -X21

```
PL name X21

-PHAD addr                    (0,3)

[-CT name]

[-SPD v]

[{-DFSB|-SB name}]
```

Example:

```
PL AX21 X21 -CT DCB1 -PHAD 2
```

5.2.31.8 Description of Parameters

AUTSPD	Automatically finds the speed and parity of asynchronous line. The speed declared (v) allows for the speeds v, v/2 and v/4. Possible values for v are 300, 600, 1200, 2400, 4800, 9600, 19200 b.p.s. This is incompatible with -AUTOCN in DV for asynchronous devices.
CB	Name of a LAN1 type cable object.
CT	Name of the controller object for this line.
DFSB	A default Statistic Block (SB) is applied to this line. For SYN, the SB type is SBPS and the SAMIN value is 300s. For other physical lines, the SB type is SBPH and the -SAMIN value is 60s.
DIRECT	Used for HDLC and SYN physical lines to describe a direct connection, where the remote system does not supply the clock. CNP7 provides the clock for transmission synchronization. With MNLA controller, this parameter can only be used with LNA2 boards.
ETHAD	**For PL-CSMA**: LAN address (Ethernet or StarLAN) of the local system. It is optional and if declared this value will be used in place of the address in PROM in the CNP7. **For PL-CSM1:** LAN address of the remote system.
FULL	A full duplex line. The carrier detect signal and the data set ready signal are supervised by CNS7 and must always be present. In addition, the request to send (RTS) signal is held ON by CNS7.
HALF	A half duplex line. The carrier detect signal may not be present all the time. The data set ready signal is supervised by CNS7 and must always be present.
HALF2	If present with HDLC lines, CNS7 verifies the shutdown of carrier detect before transmitting a frame. The standard use is for full duplex protocol on 2 wire lines. This parameter is ignored if FULL or HALF4 is used.
HALF4	Used with HALF option, the request to send signal is held ON by CNS7.
HISPD	Selects the highest speed for modems which can work **automatically** with two different speeds.
NORING	Inhibit monitoring of the RING signal for a V24 or V35 interface.

PHAD	Physical address of the communication line.
ETHAD	For PL of type CSMA : an E-LAN local address. If provided, this value will be used as the E-LAN local station address in place of the address loaded in the PROM of the CNP7. For PL of type CSM1 : gives the E-LAN address of the remote attachment.
SB	Name of the Statistic Block applied to this physical line. For SYN physical line, the SB type is SBPS. For other physical lines, the SB type is SBPH.
SPD	Line speed. Mandatory for asynchronous lines, if AUTSPD is not specified. When used for HDLC, synchronous lines, X.21 and without the DIRECT option, it is a comment in bps (on operator displays). When used for HDLC lines with the DIRECT option, the speed must be greater than 600bps with a DCBE controller. **NOTE**: Maximum speed on a V24 interface is 19200bps. Minimum speed on a V11 interface is 2.400bps.
SWITCH	No traffic time-out on switched lines (in tenths of a second). If this parameter is not present (or if the value is 0) there is no traffic survey. For VIP, it is important to choose a time-out value larger than the T6 (LL) slow survey time-out . If not, the system will replace it by the T6 value, ensuring that all terminals are polled at least once before the physical connection is broken.
108_1	Select the 108_1 capability of the V24/RS232C interface. (Send 108 after receiving an incoming call). CANNOT be used with an MLNA type controller.
108_2	Select the 108_2 capability of the V24/RS232C interface. (Send 108 immediately). This is the default option.

NOTE: Enhanced performance is given on lines with DMA (Direct Memory Access). CNS uses DMA as follows:

1. SYNchronous lines on DCE (all 4 lines).

2. HDLC lines on DCA/DCBE (lines 0 and 1) and DCE (all 4 lines).

DMA is never used on ASYnchronous lines.

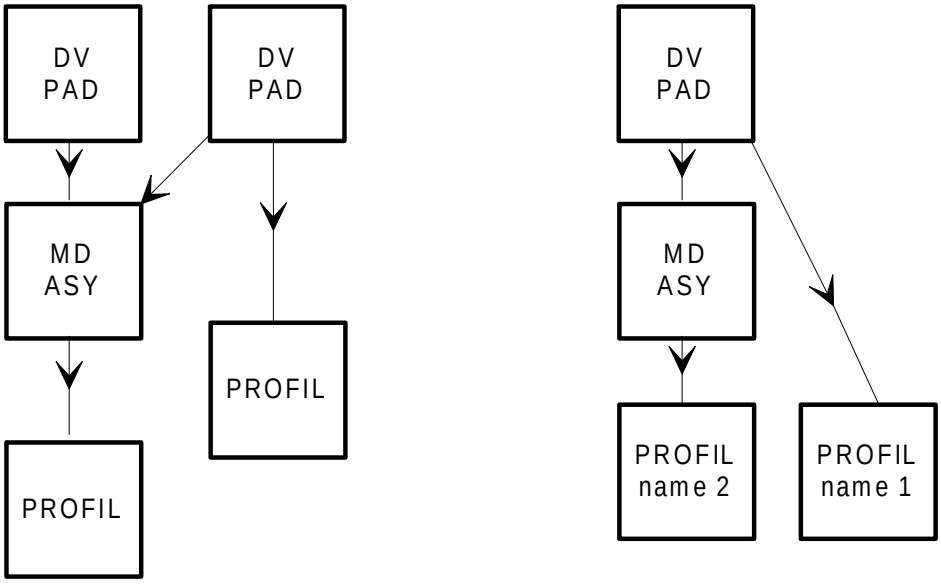
5.2.32 PROFIL - PAD PROFILE

5.2.32.1 Description

This directive defines the parameters for PAD devices. When the PROFIL directive (or PROFIL parameter in DV directive) is used, the new values override the values defined at subscription time. The parameters defined are in accordance with the X3 recommendation of the CCITT.

Note that if PROFIL is not to be modified, use the -NOX29 and -NOX29S options in the DV directive.

PROFIL may either be mapped to by an MD or a DV object, or both. In the case of both, the options defined in the PROFIL mapped to by a DV will override the options specified in a PROFIL mapped to by an MD object.



5.2.32.2 Syntax

```
PROFIL name

[ -DLE v ]

[ -ECH v ]

[ -ENV v ]

[ -DLA v ]

[ -ASS v ]

[ -IND v ]

[ -BRK v ]

[ -REM v ]

[ -FIL v ]

[ -PLI v ]

[ -ARGp : v [-ARGp : v ] [-ARGp : v ] ...]]
```

Notes:

1. p can range from 1 to 22. The range of v depends on p and is defined in the X3 standard, also given in Table 5-8.

2. The values defined by the ARG keyword are processed after the other parameters defined by the other keywords of the PROFIL directive.

3. Parameters must not be defined twice. For example, the following is not allowed: -DLA v1 -ARG4: v1

5.2.32.3 Default Profile

CNS uses the following profile, if it is not specified in the model directive (MD), or device directive (DV).

```
-DLE 0 -ENV 126 -DLA 0 -BRK 21 -REM 0 -ASS 1
```

Possible values and combinations of PAD parameter values are shown in the tables overleaf.

Note that the -ECH parameter for PROFILs associated with a DV PAD serve no purpose, as the {-ECHON|-ECHOFF} parameter of the DV overrides it

Table 5-9. Possible Values and Combinaisons of PAD Parameter Values (See Notes later in this section) CCITT X3 Recommendation. (1/4)

PARAMETER				**VALUE**		
Ref.No.	CNS Keyword	Description	Availability	Mandatory	Optional	Meaning
1	-DLE	PAD recall character	E	0		Not possible
				1		Using a DLE character
				32-126		Graphic user -defined character
2	-ECH	Echo	E	0		No echo
				1		Echo
3	-ENV	Selection of "data forwarding" signals	E	0		No "data forwarding" signal
				2		Character CR
				126		All character in columns 0 and 1 and character DEL
			6			Characters CR,ESC,BEL,ENQ,ACK
			18			Characters CR,EOT,ETX
4	-DLA	Selection of idle timer delay	E	0 1-254		Value of idle timer delay in twentieths of a second
				20		
				255		
5	-ASS	Ancillary device control		0		No use of X-ON (DC1) and X-OFF
				1		Use of X-ON and X-OFF (DC3)
6	-IND	Control of PAD "service" signals	E	0		No PAD "service" signals are transmitted to the start/stop mode DTE
				1		PAD "service" signals are transmitted in the standard format
				5		PAD "service" signals and the prompt PAD service signal are transmitted in the standard format.
				8-15		PAD service signals are transmitted in a network dependent format
7	-BRK	Selection of operation of PAD on receipt of break signal from the PAD device	E	0		Nothing Interrupts
				1		Reset Escape
				2		from transfer state Discard
				8		Discard output
				21		interrupt and indication of break
				5		Interrupt and indication break

Table 5-9. Possible Values and Combinaisons of PAD Parameter Values (See Notes later in this section) CCITT X3 Recommendation. (2/4)

8	-REM	Discard	E	1		Discard output
			0		Normal data delivery	
9	-FIL	Padding after carriage return (CR)	E 1-7	0		No padding after CR
					8-255	Number of pedding characters inserted after CR
10	-PLI	Line folding	E	0		No line folding
					1-255	Number of graphic characters per line
11	-FIL	Binary speed of PAD device	E	0	1	100 bits/s 134.5 bits/s
					2	300 bits/s
					3	1200 bits/s
					4	600 bits/s
					5	75 bits/s
					6	150 bits/s
					7	1800 bits/s
					8	200 bits/s
					9	100 bits/s
					10	50 bits/s
					11	75/1200 bits/s
					12	2400 bits/s
					13	4800 bits/s
					14	9600 bits/s
					15	19200 bits/s
					16	48000 bits/s
					17	56000 bits/s
					18	64000 bits/s
12		Flow control of the PAD	E	0		No use of X-ON (DC1) and X-OFF (DC3)
					1	Use of X-ON (DC1) and X-OFF (DC3)

Table 5-9. Possible Values and Combinaisons of PAD Parameter Values (See Notes later in this section) CCITT X3 Recommendation. (3/4)

13		Linefeed insertion after carriage return	A	0		No linefeed insertion
					1	Insert linefeed after transmission of CR to PAD device
					4	Insert linefeed after echo of CR to PAD device
					5	Insert linefeed after transmission to the PAD device and after echo of CR
					6	Insert linefeed in data stream after CR from PAD device and after echo of a CR to the PAD device.
					7	Insert linefeed in data strem to/from the PAD device DTE and after echo of a CR to the PAD device
14		Padding after linefeed	A	0		No padding after linefeed
					1-7	Number of padding characters
					8-255	inserted after linefeed
15		Editing	A	0		No use of editing in the data transfer state.
				1	1	Use to editing in the data transfer state.
16		Character delete	A	127	0-126	One character from IA5 Character 7/15 (DEL)
17		Line delete	A	24	0-23	One character from range of IA5 Character 1/8 (CAN) 25-127 One character from IA5
18		Line display	A	0-17		One character from IA5
					18	Character 1/2 (DC2)
					19-127	One character from IA5
19		Editing PAD service signals	A	1	0	No editing PAD service signals Editing PAD service signals for printing terminals
					2	Editing PAD service signals for display terminals
					8	Editing PAD service signals
					32-126	using one IA5 character

Table 5-9. Possible Values and Combinaisons of PAD Parameter Values (See Notes later in this section) CCITT X3 Recommendation. (4/4)

20		Echo mask	A	0		No echo mask (all characters echoed)
					1	No echo of CR
					2	No echo of LF
					4	No echo of VT,HT,FF
					8	No echo of BEL,BS
					16	No echo of ESC,ENQ
					32	No echo of ASK,NAK,STX,SOH,EOT,ETB,ETX
					64	No echo of editing characters as designated by parameters 16, 17, 18, 128 No echo of all other characters in column 0 and1 not mentioned above and DEL Values may be formed by additionof basic values
21		Parity treatment	A	0		No parity checking or generation
					1	Parity checking
					2	Parity generation
					3	Parity checking and generation
22		Page wait	A	0		Page wait disable
					1-22	Number of line feed
					23	characters considered by the
					24-255	PAD for the page wait function

1. Other values and combinations are currently undefined.

2. Some PAD implementations may not offer all possible idle timer delay values within the selectable range. In such cases, where the value selected is unavailable, the PAD will assume the next highest value available.

3. These parameter values provide additional user facilities, not necessarily provided in all PADs.

4. There is no padding after CR except that PAD service signals will contain a number of padding characters according to the data signalling rate of the start-stop mode DTE.

5. When implemented, both parameters 13 and 14 and all of the "mandatory values" are provided.

6. When parameter 15 is implemented the value of parameters 16, 17 and 18 are either default values or are selectable from the optional range shown. The editing function is provided during the PAD command state whether parameter 15 is implemented or not. If parameters 16, 17 and 18 are implemented, the editing characters during the PAD command state are defined by the appropriate values of these parameters.

7. The default values for parameters 16 and 18 are undefined at present.

5.2.33 PS - PHYSICAL SUBSCRIPTION

5.2.33.1 Description

This directive defines the parameters of one X.21 network physical subscription (local for the X.21 PS and remote for the RMT PS).

5.2.33.2 Syntax for PS -RMT

```
PS name RMT
-NOS [O:]n1[[O:]n2.....]
[-SPD v]                          (0, 65535)  in bps
[{-PS name|{-SGI name|-NOSGI}{-SGO name|-NOSGO}}]
[-FRGN]
[-IDN]
[-RTRC v1:v2]                     v1 = (0, 255) 0
          v2 = (0, 255) 0 (in 1/10S)
[-CGLI]
[-T1 v [{-NOMTN|-MTN}]]           (0,65535) 0 (in 1/10S)
-FRB
```

5.2.33.3 Syntax for X.21 Physical Subscription

```
PS name X21
-PL name
-SN v
[-SPD v]            (0, 65535) in bps
[-CA]
[-CTR]
[-CGLI]
[-DC]
[-DNIC n]           (3 or 4 ASCII chars.)
[-FRB]
[-ICB]
[-IICB]
[-INTP n]           ( 4 ASCII chars.)
[-OCB]
[-OICB]
[{-QBF | -QF v}]    (0, 65535) (in 1/10 S)
[-T2]
[-T4B]
```

5.2.33.4 Description of Parameters

CA	The charge advice option of the X21 network is used for this subscription.
CGLI	The calling line identification option of the network is used for this subscription (remote or local). The CGLI parameter means that the CLI is expected from the network during the calling phase. No CGLI parameter means that the facility is simulated.
CTR	The charge transfer option of the X.21 network is used for this subscription.
DC	The direct call option of the X.21 network is used for this subscription. All the outgoing calls will be made without sending the selection signal.
DNIC	The DNIC of the network, or the DCC for the country. (coded according to X.121).

FRB	Facility request block (following the X.21 standard): up to nine characters can be added before the call number for outgoing calls.
FRGN	The correspondent is in a foreign country. When CNS calls that correspondent the number must have an international prefix.
ICB	If present, incoming calls are forbidden on this PS.
IDN	The correspondent call number conforms to the IDN form defined by the X.121 standard.
IICB	If present, international incoming calls are forbidden for this PS.
INTP	Gives the international prefix of the country for the PS. Mandatory, if this PS is used for international outgoing calls.
MTN	For temporary X.21 disconnection, the local subscription is reserved. Used only if the remote system requires the circuit to be re-established using the same subscriptions (local and remote).
NOMTN	For temporary X.21 disconnection, the local subscription is not reserved (this is mandatory for multiple port sharing).
NOS	Gives the list of the call numbers for that correspondent. The maximum length of n is 20 without an IDN or 24 with IDN. The O: prefix gives a number that can only be used when a remote system calls your system. In the case of multiple call numbers for a correspondent, CNS first tries the call number that was used for the preceding connection. Then, if there is a temporary disconnection (see T1 and NOMTN parameters of this directive) and the correspondent has declared his subscription, the call will be successful on the first attempt.
NOSGI	Incoming calls are not allowed.
NOSGO	Outgoing calls are not allowed.
OCB	The outgoing calls barred option of the X.21 network is used for this subscription. Outgoing calls are forbidden for this PS.
OICB	The outgoing international calls barred option of the X.21 network is used for this subscription. If present, international outgoing calls are forbidden for this PS.
PL	Gives the name of the physical line used by this network subscription.

PS	Identifies the name of the X.21 local physical subscription on which this remote subscription is mapped. There is then a fixed mapping between the PS RMT and PS X21. Hence the PS X21 is dedicated to the PS RMT. For an X21 network, if PS is not declared and if neither NOSGI nor SGI are declared, the input subscription group is a standard one. All PS are usable for the input. If neither NOSGO nor SGO are declared, the output subscription group is a standard one. All PS are usable for the output.
QBF	Outgoing calls will not be queued. For a remote subscription with a 'connect when free' facility, this is the default option.
QF	Outgoing calls can be queued for time v (given in 1/10s of a second), when the remote subscription has a 'connect when free' facility (0 to 65535).
RTRC	The retries count (v1) and the delay between retries (v2), given in 1/10s of a second. The maximum value for v1 is 255, for v2 65535..
SGI	SGI Gives the name of the local subscription group (SG) for the incoming calls from this correspondent.
SGO	Introduces the name of the local subscription group (SG) for the outgoing calls to that correspondent.
SN	The subscription number of the subscription, up to 20 digits.
SPD	The line speed for this subscription. as a comment only.
T1	No-traffic time-out for an X.21 port given in 1/10s of a second. If this parameter is present, when there is no traffic on the line during this time, the X.21 connection with this correspondent is provisionals broken. The X.21 circuit is then freed if the NOMTN parameter is present. This function is called the Short Hold Mode (SHM) and is intended to allow no billing for an X.21 circuit which has no traffic. This function may also be used for the Multi-Port Sharing (MPS) option. The MPS allows the support of more connections with X.21 correspondents than there are available physical ports by re-allocating liberated resources obtained thanks to the SHM. To share an X.21 port, the NOMTN option is mandatory. CNP7 performs MPS function by creating a queue of outgoing calls which wait for free ports. The default value of T1 is 0 and means that there is no temporary disconnection with the correspondent.
T2	Time out T2 (given in 1/10s of a second) as given by X.21. The default value is the standard value of the standard, 210.
T4B	Time out T4B (given in 1/10s of a second) as given by X.21.The value can range from 0 to 65535. The default value is the standard value from X.21, that is, 70.

5.2.34 SB - STATISTIC BLOCK

5.2.34.1 Description

A STATISTIC BLOCK describes a statistics monitor applied to one or to several objects.

A STATISTIC BLOCK is mapped from an addressing object. However, it relates to the objects created at connection time for addressing objects. If no Statistics Block is defined, no Unsolicited Messages will be emitted on the connection object concerned.

5.2.34.2 Syntax for SB

```
SB name

SBCT                    120
SBLC                    300
SBLH                    60
SBLS                    300
SBN1        -SAMINv     300
SBN2                    600
SBPH                    60
SBPS                    300
SBSR                    180
SBV1                    480
```

5.2.34.3 Description of Parameters

SAMIN	Frequency for statistics on a given connection object.
SBCT	For all Controller (CT) types; collection of information from CT objects.
SBLC	For all Session Control (SC) types, collecting information from LC objects;
SBLH	For all Logical Line (LL) types except for VIP and 3270 Logical Lines, collecting information from LK objects;
SBLS	For VIP and 3270 Logical Lines (LL), collecting information from LK objects;
SBN1	For DSA Transport Station (TS), collecting information from TC objects;
SBN2	For all Transport Station (TS) types, except for DSA Transport Station, collecting information from TC objects;
SBPH	For all Physical Line (PL) types except for SYN Physical Line, collecting information from PC objects;
SBPS	For SYN Physical Line (PL), collecting information from PC objects;

SBSR	For all Session Route (SR) types, collecting information from NC objects;
SBV1	For all Network Subscription (NS) types, collecting information from VC objects.

5.2.35 SC - SESSION CONTROL

5.2.35.1 Description

A SESSION CONTROL describes a session control entity. It is identified by a session control identifier (SC-id).

SC -LOC represents the session control identity in the local system.

An SC of type RMT (or EQU) is the view of a session control entity in a different system. The entry gives information on how to reach the remote entity. This is done by mapping onto one or several session routes. In the case of LAN systems or non ISO/DSA systems on X.25, this may be done by addressing parameters and a mapping onto a non-specific session route (see Appendix A).

5.2.35.2 Syntax for SC -LOC

NOTE: This defines the local system and is mandatory.

```
SC name LOC
-ADDR v1: v2              (0, 255)
[-BRK {AT|ATPGLT|ATPGWR|PGWR}]
[-DFLT]
[-ISOPLG]
[-PADPLG]
[-PRMOUT string]          (2 characters) $$
[-PROMPT string]          (3 characters max.) $*$
[{-DFSB|-SB name}]
```

5.2.35.3 Syntax for SC -RMT

```
SC name RMT
-ADDR v1: v2              (0, 255)
[-BRK {AT|ATPGLT|ATPGWR|PGWR}]
[-TSAP  string]           (40 hexadecimal digits)
[-DFLT]
[-NAT {DSA|ALL|ISO}]
[-SR name 1 [name 2 [name 3 ....]]]
[{-DFSB|-SB name}]
```

5.2.35.4 Syntax for SC -EQU

Note that the maximum number of SC of type EQU is defined by the -NBCREQ parameter of the EX directive.

```
SC name EQU
-ADDR v1: v2                      (0, 255)
[-BRK {AT|ATPGLT|ATPGWR|PGWR}]
[-DFLT]
[-NAT {DSA|ALL|ISO}]
[-TSAP string -FOREIG ]           (40 hex. digits max.)
[{-NSAP   string|                 (15 digits maxi)
  -MACSAP string}]                (12 hexadecimal digits)
[-SR name]
```

Example:

```
SC  CSIS  EQU  -MACSAP  08000020000CA  -TSAP 400343533135
                   -FOREIG   -SR CHIX
```

5.2.35.5 Description of Parameters

ADDR	Network address of the Session Control Format is v1: v2 with v1 and v2 <255. Addresses 0:0 and 255:255 are not allowed.
BRK	Processing to be performed when a break signal is received from a device when the TM is connected to a DSA correspondent. AT : Sends an attention message to a DSA correspondent. ATPGLT : Purges all letters received from a DSA correspondent and sends an attention message received from the device. ATPGWR : Purges the current output and sends an attention message to a DSA correspondent. PGWR : Purges the current outputs when a break signal is received from the device.
DFLT	This session control (only one SC may have this parameter) is the default for a terminal connection. If this parameter is not declared in any SC directive, the local system (CNS7) will be taken as the default system. See the *Terminal Management Reference* manual for the use of this parameter.
DFSB	An default Statistic Block (SB) is applied to this Session Control. The type is SBLC and the -SAMIN value is 300 seconds.
FOREIG	Specifies that the standard TSAPID (see the SID 1.0 manual) is not to send and that a non standard TSAPID is defined by the TSAP parameter.
ISOPLG	Enables the ISO-DSA plug.
MACSAP	Introduces the E-LAN address on the cable.
name	Session control identifier (sc-id) of the system, 1 to 4 alphanumeric characters.
NAT	Protocols supported by the Session Control entity: DSA, ISO or ALL (both DSA and ISO) protocols.
NSAP	Gives the X.25 call number.
PADPLG	Allows a PAD terminal to connect to the local system via an intermediate system which is connected to this system by an E-LAN.
PRMOUT	Terminal manager message prompt.
PROMPT	Terminal manager command prompt.
SB	SBLC Statistic Block name applied to this SC.

SR	Name of the session route(s) through which the session control object may be reached. For an SC object of type EQU. This name must be the same as that in the: - ACSISO of the CB LAN1 or NS X25 object - the ACSBAN parameter of the TS DSA or DIWS object
TSAP	Even hexadecimal string (Transport Services Access Point), which identifies the users of the Transport layer. It identifies the remote session control entity as declared in the remote system, and must be used with the FOREIG parameter.

5.2.36 SEQ - CHARACTER SEQUENCE

5.2.36.1 Description

This directive has 3 different types. Each defines the action of the asynchronous terminal handler under given conditions:

- The SEQ directive of type IN defines the action of the TM on reception of a given sequence of characters from the device.
- The SEQ directive of type OUT defines the sequence of characters to be sent to a terminal, corresponding to a given TM action.
- The SEQ directive of type SESS defines the TM function sent over a session (to a remote application). This is only takes effect if the presentation protocol is real TTY.

The actions defined by these directives and SEQ tables for device models which are predefined as standard in CNS7 are shown in the Terminal Management Reference manual.

5.2.36.2 Syntax for SEQ -IN

```
                SEQ  name  IN
[-EOI {input_char|escape_char:input_char
          |T :value
          |C:value}
       fill-b fill-a echseq-a echseq-e [move]]

[-EOR {input_char|escape_char:input_char
          |T :value
          |C:value}
       fill-b fill-a echseq-a echseq-e [move]]
```

```
[-ERC {input_char|escape_char: input_char}
      fill-b fill-a echseq-a echseq-e [move]]
[-ERL {input_char|escape_char: input_char}
      fill-b fill-a echseq-a echseq-e [move]]
[-RPTL {input_char|escape_char: input_char}
       fill-b fill-a echseq-a echseq-e [move]]
[-HT {input_char|escape_char: input_char}
     fill-b fill-a echseq-a echseq-e [move]]
[-INEF {input_char|escape_char: input_char}
       fill-b fill-a echseq-a echseq-e [move]]
[-VT {input_char|escape_char: input_char}
     fill-b fill-a echseq-a echseq-e [move]]

[-ATT0          {input_char|escape_char:input_char} 0 0 * * [*]]
[-ATT1          {input_char|escape_char:input_char} 0 0 * * [*]]
[-ATT2          {input_char|escape_char:input_char} 0 0 * * [*]]
[-BRK           {input_char|escape_char:input_char} 0 0 * * [*]]
[-ETB           {input_char|escape_char:input_char} 0 0 * * [*]]
[-STB           {input_char|escape_char:input_char} 0 0 * * [*]]
[-QUOTE         {input_char|escape_char:input_char} 0 0 * * [*]]
[-PRG           {input_char|escape_char:input_char} 0 0 * * [*]]
[-WRS           {input_char|escape_char:input_char} 0 0 * * [*]]
[-WRG           {input_char|escape_char:input_char} 0 0 * * [*]]
[-ESCAP         {input_char|escape_char:input_char} 0 0 * * [*]]
[-IGN           {input_char|escape_char:input_char} 0 0 * * [*]]
[-NBF           {input_char|escape_char:input_char} 0 0 * * [*]]
```

5.2.36.3 Syntax for SEQ -OUT

```
SEQ  name  OUT
[-CR              fill-b  fill-a  outseq]
[-LF              fill-b  fill-a  outseq]
[-NL              fill-b  fill-a  outseq]
[-FF              fill-b  fill-a  outseq]
[-BS              fill-b  fill-a  outseq]
[-CUFWD           fill-b  fill-a  outseq]
[-CUUP            fill-b  fill-a  outseq]
[-BLANK           fill-b  fill-a  outseq]
[-BELL            fill-b  fill-a  outseq]
[-EOLER           fill-b  fill-a  outseq]
[-ERLINE          fill-b  fill-a  outseq]
[-CLEAR           fill-b  fill-a  outseq]
[-INIT            fill-b  fill-a  outseq]
[-ECHON           fill-b  fill-a  outseq]
[-ECHOFF          fill-b  fill-a  outseq]
[-SETHT           fill-b  fill-a  outseq]
[-SETVT           fill-b  fill-a  outseq]
[-CLRHT           fill-b  fill-a  outseq]
[-CLRVT           fill-b  fill-a  outseq]
[-HT              fill-b  fill-a  outseq]
[-VT              fill-b  fill-a  outseq]
[-PAGE            fill-b  fill-a  outseq]
[-HCON            fill-b  fill-a  outseq]
[-HCOFF           fill-b  fill-a  outseq]
[-CHARMD          fill-b  fill-a  outseq]
[-BLOCMD          fill-b  fill-a  outseq]
[-XON             fill-b  fill-a  outseq]
[-XOFF            fill-b  fill-a  outseq]
[-TAPON           fill-b  fill-a  outseq]
[-TAPOFF          fill-b  fill-a  outseq]
[-MTRON           fill-b  fill-a  outseq]
[-MTROFF          fill-b  fill-a  outseq]
```

```
[-UNLOCK          fill-b  fill-a  outseq]
[-LOCK            fill-b  fill-a  outseq]
[-SETC            fill-b  fill-a  outseq]
[-SNM             fill-b  fill-a  outseq]
[-RR              fill-b  fill-a  outseq]
[-RB              fill-b  fill-a  outseq]
```

5.2.36.4 Syntax for SEQ -SESS

```
SEQ  name SESS

-CHAR          input_char          appliseq
-CHAR          escape_char:input_char appliseq
-TIMER         * appliseq
-COUNT         * appliseq
```

5.2.36.5 Description of Parameters

appliseq	character sequence sent to the application on input_char, escape sequence (escape character+input character), character count (see C in EOI/EOR) or timer (see T in EOI/EOR).
ATT0	Local attention used to invoke secondary dialogue.
ATT1	Level one attention sent to the application.
ATT2	Level two attention sent to the application.
BELL	Terminal bell sequence.
BLANK	Blank character sequence.
BLOCMD	Set block mode on terminal.
BRK	Break sequence sent to the application.
BS	Backspace sequence.
C:value	End of Interaction or End or Record is given by a byte count given by value. values for input_char are X'00' through X'FF'.
CHAR	(Followed by either a single character or an escape sequence). This parameter defines a new character sequence (sq) to be sent instead of a single character (v1) or an escape sequence (#:v1) of 2 characters. The # character is the escape (ESC) character defined by the ESCAP parameter.
CHARMD	Set character mode on terminal.
CLEAR	Clear screen sequence.
CLRHT	Clear horizontal tabulation sequence.

COUNT	On reception of the defined number of bytes, a new sequence (defined by sq) is sent to the application.
CR	Carriage return sequence.
CUFWD	Cursor forward sequence.
CUUP	Cursor up sequence.
echseq-a	Echo sequence sent to the terminal if it is in alternate mode.
echseq-e	Echo sequence sent to the terminal if it is in echoplex mode. This sequence may comprise up to 255 hexadecimal characters, separated by a colon (:). Characters must be from: X'00' to X'7F' for ASCII models, X'00' to X'FF' for other models. An empty sequence is declared with an asterisk (*).
ECHOFF	Local echo off sequence.
ECHON	Local echo on sequence.
EOI	End of interaction level (gives the TURN to the correspondent).
EOR	End of record. The characters immediately preceding EOR are sent to the application, but the turn is not. Not all applications accept the EOR function.
EOLER	End of line erase sequence.
ERC	Erase character.
ERL	Erase line. Deletes the TM editing buffer.
ERLINE	Erase line sequence to terminal.
ESCAP	Escape declaration, used to define the escape sequence of two characters.
escape_char	escape characters as defined by ESCAP.
ETB	End of block character (block mode).
FF	Form feed sequence on terminal.
fill-b	Filling values. These two values are time values in hundredths of a second.

fill-a	Filling characters sent before the echo sequence, and f2 defines those sent after it. Values (for both) min: 0, max: 255. Default value: the character * (asterisk); in this case default filling values are taken from the MD (model) directive.
HCOFF	Hard copy off sequence.
HCON	Hard copy on sequence.
HT	Horizontal tabulation.
IGN	When this character is received by the TM, it is ignored, and no echo is sent.
INEF	Sequence used to delete a special action defined in the model (MD) directive, or to define a special echo character sequence which will be echoed to the terminal on reception by TM.
INIT	"Initialization" (init) sequence sent on establishment of the connection of the terminal to the terminal manager.
input-char	Input character: - X'00' through X'7F' for ASCII models - X'00' through X'FF' for others
LF	Line feed sequence.
LOCK	Lock keyboard sequence.
move	Cursor movement action. This indicates the cursor movement performed on the terminal by the input sequence, and the corresponding alternate or echoplex sequence. Permitted values are: `NMV` * or no movement. `PRT` printable `CR` carriage return `LF` line feed `NL` new line `BS` backspace `FF` Form feed
MTRON	Terminal-motor-on sequence. This should be declared in conjunction with the MOTOR parameter of the model directive (MD).
NBF	Sequence sent by terminal to TM which, when received at TM, is ignored (not sent to the application) although an echo **is** made to the terminal.
NL	New line sequence.

outseq	The sequence sent to the terminal by the TM. The format is a sequence of values v1:v2:----vn (0<n<255) The values are X'00' through X'7F' for ASCII devices and X'00' through X'FF' for others. An empty sequence is declared by the use of the * (asterisk).
PRG	Type ahead buffer purge. When the terminal handler receives this character, the type ahead buffer is purged. This action is not supported by the PAD terminal handler (no type ahead buffer).
QUOTE	Quote character. When this precedes a special TM action character, the latter is taken as a normal character and the quote character is not put into the editing buffer.
RB	Black ribbon sequence.
RPTL	Repeat line sequence. The editing buffer contents are sent to the terminal.
RR	Red ribbon sequence.
SETHT	Set horizontal tabulation sequence.
SNM	Set normal mode sequence (sent before a secondary dialog command), used to change from graphic mode.
STB	Start of block character, in block mode.
T:value	End of Interaction or End of Record is given by a time out. value is the time-out value in tenths of a second.
TAPOFF	Paper tape punch stop sequence.
TAPON	Paper tape punch start sequence.
TIMER	When the timer runs out, the associated sq parameter is the sequence sent to the application, and is composed of up to 255 values separated by a colon (:). These values should lie in the range X'00' through X'FF', an empty sequence is declared by the use of the asterisk(*).
UNLOCK	Unlock keyboard.
v1	Character value used in association with the -CHAR parameter. Values permitted are X'00' through X'FF'.
VT	Vertical tabulation.
WRG	Write go. When the system receives this, it restarts the output data flow to the terminal.
WRS	Write stop. When the system receives this, it stops the output data flow to the terminal.
XOFF	Paper tape reader stop sequence.
XON	Paper tape reader start sequence.

5.2.37 SG - SUBSCRIPTION GROUP

5.2.37.1 Description

This directive lists the local physical subscriptions (of an X.21 network) which can be used in input and on output. SG provides complementary information for PS.

5.2.37.2 Syntax for SG -X21

```
SG name X21

   -PS name1 [name2 [name3 .....]]
```

5.2.37.3 Description of Parameters

PS	The list of the physical subscription names (PS) in this subscription group.

5.2.38 SN - TERMINAL STATION

5.2.38.1 Description

SN represents a logical terminal station. It comprises one or more logical devices (LD) and is the entity seen by the application, for communications purposes. The station may comprise one or several of the following:

- a device,
- a pool of devices,
- part of the resources of a device,

5.2.38.2 Syntax for SN -TMG

```
SN name TMG

    -LD name 1 [name 2 ...]

    [-CD name  {-CDOV|-NOCDOV}]

    [{-MB name|-TX name}]
```

Example:

```
SN SN01 TMG        -CD TDS    -CDOV    -LD CRT PRT
```

5.2.38.3 Description of Parameters

CD	Connection descriptor object which may be used during the connect phase.
CDOV	The terminal operator is allowed to select another connection descriptor object by using the Connection (CN) command.
LD	Logical devices which form the station.
MB	Mailbox name to be used.
NOCDOV	The terminal operator is not allowed to use this Station (SN) with another Connection Descriptor (CD).
TX	Mailbox extension name to be used.

5.2.39 SR - SESSION ROUTE

5.2.39.1 Description

A SESSION ROUTE object is a view of a route out of the system, towards an external destination. This route is through a Transport-Station image (TS).

5.2.39.2 Syntax for SR -BAN

This SR of BAN type is not to be declared at generation time.

5.2.39.3 Syntax for SR -DSA/ISO

```
SR name {DSA|ISO}

   -TS name
```

5.2.39.4 Description of Parameters

TS	Identifies the name of the Transport Station which may be reached via this Session Route.

5.2.40 TBFL - TABLE FILE

5.2.40.1 Description

This directive is mandatory. It gives the pathname of the file containing the tables necessary for generation.

5.2.40.2 Syntax

```
TBFL string
```

5.2.40.3 Description of Parameters

string	Name of the table system file. The default value for this parameter is BLIBYTABLE.

Example:

```
TBFL BLIBYTABLE
```

5.2.41 TMP - TEMPORARY FILE

5.2.41.1 Description

This directive contains a pointer to the location of the mandatory temporary file for the generation.

5.2.41.2 Syntax

```
TMP string
```

5.2.41.3 Description of Parameters

String is the name of the temporary file.

WARNING

If this directive is not present,
the generation will abort with the error message 8002.

5.2.42 TRS - TERMINAL CODE CONVERSION TABLE

5.2.42.1 Description

The TRS directive defines code conversion tables for non-standard terminal devices to convert codes in the following cases:

- the terminal code to be converted to ASCII for input
- the ASCII code to be converted to the terminal code for output
- an ASCII to ASCII code conversion; for lower to upper case conversion.

With this function, the character code associated with an input code may be changed so as to give a different graphical representation for the corresponding output character. A keyboard having keys which are rarely used, or which have no definite purpose may be allocated a character representation (underscore,_ , may be provided on a minitel by this method).

5.2.42.2 Syntax

```
TRS    name

{ASCII|ASEB|EBAS|UPCAS}

[ v1:v2 ]...          For as many codes as
                      required

[-UPCAS name]         (1 to 4 characters)
```

5.2.42.3 Description of Parameters

ASCII	Use a standard ASCII table as a reference. This is used for ASCII terminals (in either input or output).
ASEB	Use a standard ASCII to EBCDIC conversion table as a reference. This is used for EBCDIC terminals in output.
EBAS	Use a standard EBCDIC to ASCII conversion table as a reference. This is used for EBCDIC terminals in input.
UPCAS	Use a standard ASCII lower to upper case conversion table. The value for name is the name of another TRS which is to be used as the code conversion table in cases of non-standard lower to upper case conversion.
v1:v2	These entries represent the codes to be converted: - v1 is the value of the character to be converted - v2 is the value of the character output after conversion

5.2.43 TS - TRANSPORT STATION

5.2.43.1 Description

A TRANSPORT STATION object represents the transport layer in a local or remote system. It is the end point for a transport connection.

- TS-LOC represents the transport layer in the local system,
- TS-SX25 is used for switch systems switching packets which use DSA addresses (it represents the transport layer in a DSA end-point system as seen by the X.25 switch),
- all other TS types represent the transport layer in remote systems as seen by the local system.

5.2.43.2 Workstation

```
TS name DIWS

[-CLASS v]          (2, 4)
                     3 for X.25, 4  for LAN

[-CRRE v]           (1,15)

[-FEN v]            (0, 15)

[-NR name 1 [name 2[name 3 ...]]]

[-NSDU v]           (9,32764) TPDU v

[-RTRY v]           (1, 9) 5

[-TPDU v]           (128, 256, 512, 1024,
                     2048, 4096 or 8192).

[-T1 v]             (40, 1000) 100

[-T2 v]             (10, 1800) 600

[{-DFSB|-SB name}]

[ -ACSBAN name ]

[ -NBNCIN v]        (0,2000) 1
```

Example:

```
TS TMF1 DIWS   -NR NR01   -TPDU 1024
```

5.2.43.3 Syntax for TS -DSA

```
TS name DSA
[-ADDR v1: v2]          mandatory if X.25
[-CRDT v]               (1, 15) 15
[-CRRE v]               (1, 15)
[-FEN v]                (0, 15)
[-FRL v]                (1, 32756)  0
[-NBWAY v]              (1, - ) 1
[-NR name 1 [name 2[name3 ...]]]
[-RTRY v]               (1, 9) 3
[-TUL v]                (9, 32764)
[-T1 v]                 (40, 1000) 100
[-T2 v]                 (10, 1800) 600
[{-BASE|FLCT|FULL|RECV}]
[{-KILL|-NOKILL}]
[{-DFSB|-SB name}]
[-ACSBAN name ]
```

Example:

```
TS HTS1 DSA   -ADDR 1:2   -NR NRD1 NR02
```

5.2.43.4 Syntax for TS -LOC

```
TS name LOC
[-ADDR v1: v2]          mandatory if X.25
[-CNX v]                (1, 2000) 100
[{-DFSB|-SB name}]
```

Example:

```
TS TSLC LOC   -ADDR 1:1
```

5.2.43.5 Syntax for TS -SX25

When the local system is acting as an X.25 switch, this directive declares the access to a remote DSA Transport Station which is identified by the DSA transport address. The switching is performed at packet level (X.25.3), transport protocol is not involved.

```
TS name SX25

-ADDR v1: v2

-NR name1 to namen          (separated by blanks)

[-NBWAY v]                  (1, - ) 1
```

Example:

```
TS SWT1 SX25   -ADDR 1:2   -NR NSD1 NSD2
```

5.2.43.6 Description of Parameters

ACSBAN	Enables the DNE facility on this TS. An SR -BAN object with the same name will be generated and mapped to this TS.
ADDR	DSA network address of the transport station. The format is v1:v2 with v1 and v2<255. This network address is only mandatory when X.25 is used, but it is recommended to give an address to all DSA transport stations. It is advisable to choose the same address as that of the corresponding session control. When used, an address must also be given for the local transport station (see TS LOC).
BASE	The DSA Transport Station provides only a basic service. Basic service is used when flow control is at application level (conversational subsystems for instance) and no error recovery is needed at transport station level. No additional traffic is generated.
CLASS	Maximum transport class in which the remote transport station will work. The values permitted are: 2. basic flow control 3. basic flow control with error recovery (default for X.25) 4. for E-LAN or ISL connections.

CNX	The value of v is: Primary-network-sessions*2 + Secondary-Network-Sessions Primary-network-session are, terminals and applications operated over the primary network (remote site terminals, UFT, X.25 cluster terminals). These need one transport connection from the network and one between the CNP7 and the DPS7. Secondary-network-session are terminal which are connected directly to the CNP7, either via modem or cabling. These do not require transport on the 'network' side of the link.
CRDT	Maximum credit which the local transport station allows the remote system to give. This is only valid for connections between DSA transport stations. This is the number of fragments sent without acknowledgment (ineffective with BASE option). Memory cost increases with credit allowed but overhead (for acknowledgments) decreases.
CRRE	The credit value for the remote sending system on each connection. By default, the transport chooses a value depending on the number of paths used, so as to allow for greater anticipation. For one path, the default value is 3.
DFSB	An implicit Statistic Block (SB) is applied to this TS. For DIWS and LOC Transport Stations, the type is SBN2 and the -SAMIN value is 600 Seconds. For DSA Transport Stations, the type is SBN1 and the -SAMIN value is 300 Seconds.
FEN	Window for the receive transport credit. This is the credit not yet used by the remote sending station, before the local station sends an ACK.
FLCT	Indicates that the DSA transport station provides flow control in addition to a basic service. The FLCT option is used when flow control is needed at the transport station level (file transfer for instance). Acknowledgments are sent from end-to-end. No error recovery is provided (see the RECV option in this section for this particular case) at transport station level.

FRL

The fragment length negotiated by the transport station at connection time.

It is advisable (within the network limits) to avoid fragmentation and, ideally, to use the letter length as the fragment length (FRL). The maximum FRL is determined by the Transport Unit Length (TUL) and is equal to TUL-8. The TUL must exceed the FRL by at least 8 bytes to allow for a header and an (optional) ACK. With a DIWS transport station, the NSDU parameter corresponds to the TUL parameter, and the TPDU parameter to the FRL parameter.

Limits:

network type	values allowed
HDLC point-to-point	FRL between 1000 and 2000
X.25 network	Actual limits set by packet level between 1000 and 2000
E-LAN or ISL	maximum of 1024

A value of 0 (default) means that the system will compute the value itself (usually around 1K bytes).

FULL

The DSA Transport Station provides full flow control, with error recovery and multipath service. (Default option). This is the recommended value

This is mandatory when a Bull DPS 6 remote system is connected (fragment re-ordering). This is also mandatory if two or more paths are to be used concurrently (NBWAY > 1).

KILL

The transport station releases the network connection to the remote station if there is no transport connection for more than T2.

This advised with a switched virtual circuit (but the overhead for re-opening a virtual circuit must also be considered).

NBNCIN

Maximum number of Virtual Circuits which may be opened by the remote system.

NBWAY

Number of Network Routes that may be used simultaneously from the list in the NR Parameter. This can only be used when the FULL option is present (default). Maximum value is the number of Network Routes in the NR list.

NOKILL	No operation is done when connection from the local system to this transport station is ended. When used, NOKILL forces the transport station to stay active when there are no logical connections. NOKILL is recommended with an HDLC point-to-point or permanent virtual circuit. NOKILL is not recommended with switched virtual circuits but the overhead for re-opening a virtual circuit has to be considered.
NR	Name of the Network Route(s) used by this transport station. Up to 10 Network Routes can be declared in one TS. Only one NR (of type LAN1) may be declared with a TS of type DIWS.
NSDU	Network Service Data Unit in accordance with the ISO document DIS8073/N1169. The default value is the TPDU (Transport Protocol Data Unit), see TPDU option below.
RECV	The DSA Transport Station provides error recovery and flow control.
RTRY	Maximum number of retries. Default value is 3 for DSA and 5 for DIWS. With an ISL or E-LAN connection, the value of 5 is imposed and cannot be changed.
SB	Name of the Statistic Block applied to this TS. For a DIWS Transport Station, the type is SBN2. For a DSA Transport Station, the type is SBN1.
TPDU	Transport Protocol Data Unit in accordance with the ISO document DIS8073/N1169. Values must be one of the following: 128, 256, 512, 1024, 2048, 4096 or 8192.
TUL	Maximum transport unit length for this station. When not specified, the value is 1024 for HDLC or X.25 network.
T1	**For a DSA Transport Station** The acknowledgment time-out. Values are given in tenths of a second. Default value is 100 (minimum 40 - maximum 1000). The timer is started by transport upon the transmission of each new fragment from the transport layer. Transport must receive an acknowledgement otherwise the last fragment transmitted by it will be assumed to be lost and re-transmitted. **For DIWS** The connection establishment time. For DIWS class 4, a value of 100 is imposed.

T2

For a DSA Transport Station

Activity time-out. Values are given in tenths of a second (min=10, max=1800, default=600).

For a DIWS Transport Station

The maximum delay for resynchronization from the remote Transport Station, and the maximum delay for a connection to be established (TS1 and TWR of ISO - see ISO document DIS8073/N1169). For a DIWS class 4 transport station, a value of 600 is imposed.

NOTE: The FULL option is recommended at all times, however the table below shows the **minimum** option to declare.

	1 PATH	**1 PATH with X25 error notification**	**1 PATH with Back-up**	**Multi-path or connection to Bull DPS 6**
Transactional Type	BASE	RECV	RECV	FULL
File Transfer Type	FLCT	RECV	RECV	FULL

5.2.44 TU - TERMINAL UNIT

5.2.44.1 Description

The TERMINAL UNIT object represents a physical workstation which has several devices (e.g. screen with printer). For example, a VIP7700 controller may be represented by a Terminal Unit object of type VIP.

5.2.44.2 Syntax for TU -ASY (FOR VIP7801 ONLY)

```
TU name ASY

-LL name

{-SWITCH v|-LEASED}          (0, 32767) 10 in seconds

-RTRY v                      (0, 255)    3

-T1 v                        (0, 32767) 10 in seconds
```

5.2.44.3 Syntax for TU -PAD (FOR VIP7801 ONLY)

```
TU name PAD
-NR name
{-SWITCH v|-LEASED}          (0, 32767) 10 in seconds
-RTRY v                      (0, 255)    3
-T1 v                        (0, 32767) 10 in seconds
```

5.2.44.4 Syntax for TU -TGX

```
TU name   TGX
-CL name
-PHAD v            (0, 31)
```

5.2.44.5 Syntax for TU -VIP

```
TU name VIP
[{-CL name|-LL name}]
-PHAD v          (0,31)
[-ACKDL]
[-NOACK]
```

5.2.44.6 Description of Parameters

ACKDL	Delayed acknowledgements are accepted for the text messages sent to the screen device of this TU. This parameter supports devices which are not fully compatible and which do not immediately acknowledge text sent to a screen. The normal action is to retransmit the text immediately when no ACK is received. Parameter ACKDL prevents this by allowing a 1 minute delay before re-transmitting. For most TUs, this option is not necessary and the acknowledgement is expected immediately.
CL	The name of the cluster onto which the TU is to be mapped.

LEASED — The terminal unit is connected through a leased line and there is no timeout for the physical connection (if no terminal manager is associated with the terminal unit). When the terminal unit is connected via a PAD, the virtual circuit is not broken by CNS7 (if no terminal manager is associated with the terminal unit).

LL — Specifies The name of the logical line for this TU.

NOACK — Acknowledgement will not be sent for text frames received.

NR — The name of the Network Route (of the PAD type) onto which the TU is to be mapped.

PHAD — The physical address (between 0 and 31) of this Terminal Unit (TU). All Terminal Unit addresses mapped onto the same Logical Line (LL) must be different, even if they are mapped through a different Cluster. Each Cluster (CL) address must also be unique.

This refers to the TU or CL physical addresses of the VIP type, used to poll or select them. In the generation, these physical addresses constitute the PHAD parameter of the TU or CL declaration.

Where the TU and CL belong to the same LL, Clusters are optional and Terminal Units can be mapped onto them or directly onto the Logical Line.

It is also possible for a TU (mapped directly onto an LL) and CL (with a TU mapped onto it) to co-exist on the same Logical Line (LL). The maximum number of CLs on a line is 8 (addresses 0 to 7) and the maximum number of TUs on a line is 32 (addresses 0 to 31).

A CL can have from 1 to 32 TUs and each CL or TU will have its own address. For example, the following configuration is INCORRECT:

```
CL      CL01      -PHAD 01     -LL LLS1
TU      TU01      -PHAD 0      -CL CL01
TU      TU02      -PHAD 1      -CL CL01
TU      TU03      -PHAD 2      -CL CL01
.......
CL      CL02      -PHAD 02     -LL LLS1
TU      TU11      -PHAD 0      -CL CL02
TU      TU12      -PHAD 1      -CL CLO2
TU      TU13      -PHAD 2      -CL CL02
```

Because the same logical line is used (LLS1), the terminal units TU01 and TU11 must have different addresses. The same is true for the other terminal units.

If an incorrect configuration (an example is shown on the previous page) is used, the STATUS of several TUs and CLs will be set to LOCK preventing any two CLs or TUs from having the same physical address. The following message will then be displayed:

PHYSICAL ADDRESS DUPLICATION OF CL/TU/DV. OBJECTS MAY BE LOCKED.

Terminal Units And Clusters Which Are Not Physically Present.

A frequent cause of degraded performance is the declaration of TUs or CLs which are not present on the line. This can happen when the physical configuration is modified without modifying the generation.

Non-existent terminals will be polled. They will not answer and will remain in the slow survey list, and each polling will cause T7 time loss for the line (default: 4/10s).

If T6 (which controls the slow survey list), is badly chosen, it can give a heavily degraded response time, with just 3 or 4 non-existent terminals.

It is therefore recommended that the generation is changed to describe the current physical configuration. If this is not possible, the non-existent TUs must be locked via the NOI and will not be polled.

RTRY — The maximum number of retries for the printer (see also T1).

SWITCH — The terminal is connected through a switched line. This keyword introduces the time out value after which the line is disconnected when no terminal manager is associated with this terminal unit. When the terminal unit is connected via a PAD, the virtual circuit is broken after time out.

T1 — The time out value after which the text for the printer is retransmitted.

5.2.45 TX - MAILBOX EXTENSION

5.2.45.1 Description

This directive introduces the extension which is part of the standard global address of a Terminal Station (SN).

5.2.45.2 Syntax for TX -TMG

```
TX name TMG

-MB name

-SN name

[-EXT string]          (4 chars. max) Space
```

Example:

```
TX TX01 TMG   -MB MB01   -SN SN01   -EXT CRT1
```

5.2.45.3 Description of Parameters

EXT	The name of the extension. This is a four-character alphanumeric string, left-justified and filled with blanks. The default is blank.
MB	The name of the mailbox object of the TMG type.
SN	The name of the terminal station object addressed via this extension.

WARNING

If a terminal Station (SN) has a mailbox of type STAT, it will not have a terminal extension (TX).

5.2.46 UD - USER DESCRIPTOR

5.2.46.1 Description

The User Descriptor object provides a way to retrieve login and connection descriptors specific to a user whose user-id is the name of this object. Several users can use the same User Descriptor (UD).

5.2.46.2 Syntax for UD -TMG

```
UD name TMG
[-CD name]
[-LN name]
[{-CDOV|-NOCDOV}]
[{-LNOV|-NOLNOV}]
```

Example:

```
UD SMITH TMG   -CD CD01   -LN DU30   -CDOV
```

5.2.46.3 Description of Parameters

Name	Ranges from 1 to 8 alphanumeric characters.
CD	The name of the connection descriptor object to be used when this user-id is specified in the connect command.
CDOV	The terminal operator is allowed to enter a new Connection Descriptor (CD) using a connect (CN) command.
LN	The login descriptor object to be used when this user-id is given in the login command.
LNOV	The terminal operator is allowed to specify a login descriptor (LN) object name in the login (LI) command.
NOCDOV	The terminal operator is not allowed to specify a connection descriptor (CD) object name in a connect (CN) command.
NOLNOV	The terminal operator is not allowed to specify a login descriptor (LN) object name in the login (LI) command.

5.2.47 USER

5.2.47.1 Description

The USER directive defines call packet data. Used only with PAD devices.

5.2.47.2 Syntax for USER

```
USER name

v1 [:v2[:v3.....[:v16]]]          ( 1 , 16) *
```

Example:

```
USER PBZ0 X'01':X'01':X'01':X'01':X'41':X'42':X'43':X'44'
```

5.2.47.3 Description of parameters

v1, v2, v3 ..., v16 — are the user data which will be included the call packet (max. 16 characters).

The user data depends on the type of remote device and also on the type of network. It may contain a password, mailbox name, etc. necessary for accessing the remote PAD device (or system emulating a PAD device).

For example, for a PAD on TRANSPAC (the French X.25 PDN), the first four characters of the user data must be:

```
X'01' X'00' X'00' X'00'  (hexadecimal)
```

These characters indicate that CNS is using the PAD protocol. For other networks, refer to the network documentation.

6. System Generation And Startup

6.1 GENERAL

CNS7 software includes programs which control generation and startup.

The system is loaded from the Bull DPS7000 host system.

CNS7 is installed in three stages:

- preparing the files
- doing the generation
- loading the CNP7 with CNS7.

6.2 PREPARING THE NECESSARY FILES

In all cases, the generation file must reflect the current system configuration.

Scenario files, which automate some CNS7 generation operations may be created or modified. For example they can be used to:

- load
- start
- dump.

See, also, the Bull Publication GCOS 7 Network Operation.

The GO function can be used in these files, see the paragraph on this subject later in this section.

You may also need to modify the NG file of the Bull DPS7000 host (as a function of the communications requirements). See also Bull Publication GCOS 7 Network Generation.

6.2.1 Writing the Generation File

To access FPG7 or the GCOS7 editor, a preconfigured CNS7 system file (called SYSGEN which permits connection of selected terminals, see Appendix B) and a CRNETGEN configuration file is delivered with the system. The system file is loaded by the system operator using the INSTALL scenario in the standard scenario file STD_SCEN.

Generation involves the following steps:

- access from a terminal, via IOF, to create the generation file. The connection command is:

```
$*$CN -DBM IOF -SCID DPS7
```

- the generation file can then be created using:
  - the FPG7 interactive simple generation tool (for further details, see the Bull Publication, FPG7 User's Guide)
  - the GCOS7 editor, entering the directives described in this manual.

Also, a generation file can be created with FPG7, and then modified with an editor. This is not recommended for normal operation as it will not be possible to use FPG7 to modify the generation member.

6.2.2 Writing or Modifying Other Files

Use the editor to prepare any scenario files or to modify the NG file (GCOS7 Network Generation).

NOTE: A standard scenario file STD_SCEN is delivered with the system and this file can be modified. For further information, see section 6.3.1 of this manual.

6.3 PERFORMING GENERATION

Request CNS7 to compile the generation file. This can be done as follows:

- via a scenario
- via the SYSG mailbox, either:
  - using a scenario

or
  - entering a command

- via the NOI.

6.3.1 Performing Generation Via The SYSG Mailbox

Connect to the SYSG mailbox on CNS7 which is specially created for the generation phase. The connection command is:

```
$*$CN SYSG
```

the system prompts you to give the command to perform generation.

This command can be input at the terminal or via reference to a scenario file.

6.3.1.1 ENTERING THE COMMAND DIRECTLY

The command syntax is:

```
CONF=config,  HIST=history  [, ASF=site-name]  [, RLS=release]
```

The parameters are described at the end of this section.

For example:

```
CONF=CONFSOURCE, HIST=CONFHISTORY
```

These files must be in the SYS.DSACONF library:

CONFSOURCE will already exist, and CONFHISTORY is created.

Messages for the generation procedure will appear at the terminal. No other messages will be sent apart from these.

To abort the execution, type

```
ABORT
```

The generation may continue for a short time before stopping. When the job has been finished you can reload with the appropriate memory image.

6.3.1.2 USING A SCENARIO FILE

A scenario file contains the commands to generate a given generation file, typically through the GO function in a load command . A command allows a generation to be requested via another scenario file:

```
SCEN=CONFscenario-file-name
```

6.3.2 Performing Generation Via The NOI

This operation is only possible under the IMA 'SYSGEN' delivered in the SYS.DSABLIB library.

Log-in to the NOI from a terminal or from the system console using the passthrough facility (for further details of the EDD command, see the Bull Publication GCOS7 Network Operations). The connection command is:

```
$*$CN NOI
```

The NOI command to do the generation has the following format:

```
TX AF SYSG -MSG "CONF=CONFconfig,HIST=CONFhistory"
    [, ASF=site-name] [, RLS=release]
```

The parameters are described at the end of this section.

For example:

```
TX AF SYSG -MSG "CONF=CONFCONFIG, HIST=CONFLISTING"
```

Messages for the generation procedure will appear at the terminal. However, other network messages may also be sent.

To abort the execution, type:

```
TX AF SYSG -MSG ABORT
```

The generation may continue for a short time before stopping.

NOTE: In order that the facilities described in sections 6.3.2 and 6.3.3 of this manual exist in the system created by generation, the following series of directives should appear in the generation file.

```
AF SYSG SYSG -SC name
CO SYSG TMG  -DMB $SYSGEN  -CD SYSG -SCID name
CD SYSG TMG  -CO SYSG
MB $SYSGEN USER  -CNX I_SYSGEN
```

This is only required for:

- modification of an existing memory image (patch)
- changing the name of the file containing a memory image.

6.3.3 Performing Generation From The DPS 7000 Console

To perform generation from the system console, certain preparations should be made, initially, you should read the Bull Publication, GCOS 7 Network Operations.

A scenario file (in the SYS.DSACONF library) must be created or modified. The default member is STD_SCEN. The scenario must contain:

LOAD	to load the initial preconfigured CNS7 system file (initially called SYSGEN).
GO	having the SYSGEN option, by which the generation is requested.

NOTE: In all of the above cases, the CNS7 generator will perform a generation of the generation file. The resulting memory image should then be saved for future loading of the CNP7 system.

6.4 LOADING THE SYSTEM

When generation has been successfully performed, and stored, it can be loaded into the CNP7 to replace the system which is currently running. The operator must do a load procedure from the system console (preceded by an implicit reset). This is performed through a user-created scenario, which is a member of the SYS.DSACONF library. See the *Bull Publication*, GCOS 7 Network Operations for further details.

6.4.1 Application of Patches

Patch files are used to introduce software corrections. These are

PATCH1	Used as input to the generation file, and which is saved with the memory image. A change in this file involves a new generation, or the application of new patches.
PATCH2	Used at each load for corrections which have to be tested, or have been introduced since the last generation.

Before a generation, or when loading a memory image, specific modifications may be applied to the memory image from the PATCH2 file. The thus modified memory image may also be saved for future loading.

6.5 THE GO FUNCTION

6.5.1 Description

This function defines parameters used during generation, loading, and other configuration actions.

The scenario file containing the GO function must be adapted to the action required (load, dump, start, or a combination of these). The default scenario file for installation contains the following:

GO -NL

With each load, the system interprets the GO function. The options are described below.

```
GO [-DA v]     (0,32767) 2500

[-FOR stringa stringb .... stringz]

[-SYSGEN parameter-list]

[-SITE name]

[-REMOTE name]

[-MAP]

[-EQU string]

[-GF string]
```

6.5.2 Syntax

```
[{-P2 [string string ... string][-NL]|-NP}]     PATCH2
```

6.5.3 Description of Parameters

DA	(Debug Area): the size in words of the insert zone, required to store the patch, for the interactive debug.

EQU — To access further systems connected to an Establishment Local Area Network (E-LAN) or X.25 network. These further systems are added by declaring sessions control entities (SC) of type EQU in a configuration extension file - thus avoiding a regeneration of CNS.

The name of the configuration extension file, which is compiled during the load time of CNS.

FOR — Special symbols for patch validation. It is used to select specific corrections in the patch file.

GF — (Go File): gives the name of the file containing further GO functions, allowing the declaration of further parameter combinations.

MAP — Asks for the load map to be printed at load time.

NL — (No List): A list of the PATCH2 files will not be printed as the patches are applied.

NP — (No Patch2): No PATCH2 file will be applied.

P2 — (Patch2): The names of the PATCH2 files to be applied. The default file name is PATCH2.

REMOTE — The session control name of the site from which the system is to be loaded; this is in the form:

```
sc-id    dsa-address    ethernet-address
```

SITE — The session control name of the site to be loaded; this is in the form:

```
sc-id    dsa-address    ethernet-address
```

For an initial load, where the CNP 7 is loaded from the local DPS 7000, the default site details are shown in Table 6-1. Note that the SC-id of the REMOTE parameter is the default password for connection to debug and that of SITE for connection to the local NOI.

SYSGEN — The configuration command. Various parameters of this command exist, depending on its use. These parameters, also used by the TX AF command described earlier, are described below.

Table 6-1. Default Site Address values

	DPS 7000	CPN 7
sc-id	DPS7	CPN7
dsa-address	01:00	02:00
ethernet-address	0800385F0100	0800385F0200

6.6 THE CONFIGURATION COMMANDS USED BY THE GENERATOR

The TX AF command is used by the NOI operator to request CNS generation. The parameters of this command may be entered in another form, through the -SYSGEN parameter of the GO function.

The TX AF command syntax is:

TX AF SYSG -MSG parameter-list

The GO -SYSGEN option syntax is:

-SYSGEN parameter-list

The parameter-list is the same in both cases. These parameters are used for four actions, described below.

6.6.1 Generation Load

The parameter-list is:

```
CONF=config, HIST=history  [, ASF=site-name] [, RLS=release]
```

6.6.2 Application of New Patches

The parameter-list is:

```
OLD=old-name, NEW=new-name, P1=list-of-patch1-names,
  HIST=history  [, ASF=site-name] [, RLS=release]
```

6.6.3 Generation File Copy

It is possible to copy the file containing the generation. This must also be used to rename the file, as the GCOS7 rename facility can not be used. The parameter-list is:

```
REN=original-name, NEW=new-name, HIST=history, [, RLS=release]
```

6.6.4 Execution of a Scenario

A scenario file may be created. To instruct the system to use this file, the parameter-list is:

```
SCEN=scenario-name  [, ASF=site-name]  [, RLS=release]
```

The parameters are described below.

6.6.5 Parameter Description

ASF	The session control name of the system upon which the files are stored.
CONF	The pathname of the generation file.
HIST	The pathname of the history file.
NEW	The pathname of the file into which the new memory image (with the patches, in the case of application of patches) will be loaded.
OLD	The pathname of the file containing the memory image resulting from a previous generation. Often, this file is called IMAMEM.
P1	A list of names of files containing the patches to be applied. The names are separated by a colon (:). The name must be a full pathname. Example - SLIBPATCH1:SLIBPATCH2
REN	The initial pathname of a file which is to be renamed.
RLS	Introduces a label. This parameter permits the labelling of new technical states of the software. For this reason, it will not be used in the first version of CNS.
SCEN	The pathname of a scenario file.

6.7 SUMMARY

Table 6-2 below is a summary of the files which are used in the procedures described in this section. Figure 6-1 shows the content of the STD-SCEN file.

Table 6-2. Summary of GCOS7 Files

Members	**Library**		**Comments**
	Name	**Type**	
Files Used			
SYSGEN	SYS.DSACORE	BIN	Minimal image to be loaded (initially)
config	SYS.DSACONF	SL	Source file of the generation directives (created by the user)
configeq	SYS.DSACONF	SL	Configuration extension file containing SC EQU directives.(created by the user)
PATCH1	SYS.DSASLIB	SL	PATCH1 files applied at generation time.
PATCH2	SYS.DSASLIB	SL	PATCH2 files applied at load time.
STD_SCEN	SYS.DSACONF	SL	File containing the default scenarios to be used.
Files Created			
history	SYS.DSACONF	SL	Generation history file.
imamem	SYS.DSACORE	BIN	User-created memory image to be loaded.(created by the user)

The Standart Scenario File File (STD_SCEN)

```
*-------------------------------------------------*
*  STANDARD ADMINISTRATION SCENARIO FILES         *
*  FOR CNP7 AND DN7X USED BY FECM SERVER.         *
*  (THE STD_SCEN SUBFILE IN SYS.DSACONF LIBRARY)  *
*-------------------------------------------------*
** STANDARD SCENARIO FOR MICROFRONTAL CNP7
*
NODE CNP7 -VERSION A0U4
SCEN RELOAD
DUMP
LOAD CORECNP7I
GO -NOPAT2 -NL
*
SCEN DUMP
DUMP
*
SCEN LOAD
LOAD CORECNP7I
GO -NOPAT2 -NL
*
SCEN INSTALL
LOAD BLIBSYSGEN
GO -PAT2 SLIBPATCH2 -NL -SITE CNP7 02:00 0800385F0200 &
                      -REMOTE DPS7 01:00 0800385F0100
*
SCEN SYSGEN
LOAD BLIBSYSGEN
GO -PAT2 SLIBPATCH2 -NL -SITE CNP7 02:00 0800385F0200 &
                      -REMOTE DPS7 01:00 0800385F0100 &
                   -SYSGEN CONF=CONFCNP7C,HIST=CONFCNP7H
*
SCEN TOL
DUMP
LOAD BLIBTOL
GO -PAT2 SLIBPATCH2 -NL
*
** STANDARD SCENARIO FOR DATANET DN7X
*
NODE DN7X -VERSION C1U5
SCEN RELOAD
DUMP
LOAD COREDN7XI
GO -NOPAT2
*
SCEN DUMP
DUMP
*
SCEN LOAD
LOAD COREDN7XI
GO -NOPAT2
*
SCEN SYSGEN
LOAD BLIBIMAEXC
GO CONFDN7XC -PATCH SLIBPATCH0 -PAT2 SLIBPATCH2 -SVPAT2
COREDN7XI
*
```

```
* DATANET LOADING FOR FPG7 RUNNING : DIRECT LINES
SCEN LOADD
LOAD BLIBDN7XD
GO -NOPAT2
* DATANET LOADING FOR FPG7 RUNNING : LINES WITH MODEM
SCEN LOADM
LOAD BLIBDN7XM
GO -NOPAT2
```

A. Dynamic Network Extension

A.1 DYNAMIC NETWORK EXTENSION

A.1.1 Introduction

The Dynamic Network Extension (DNE) facility described in this appendix refers to remote correspondents (remote systems or PAD terminals) which are added to the network after generation.

The DNE facility is primarily designed to allow the system to communicate with any new system added to a LAN without having to regenerate the CONFIG file.

It can also be used for new systems or PAD terminals on an X.25 PDN and new systems accessed via a remote TS (Transport Station) of type DSA or DIWS.

A.1.2 Calling systems and called systems

You can call a remote system only if the name of the remote system (SC-id) is "known" to CNS7. This name is generally declared in an SC-RMT object in the CONFIG file.

However, calls can be accepted by CNS7 from an "unknown" remote system when:

- the remote system makes a call via the TS entity of another system
- the TS and the route has been declared in the CONFIG file.

This possibility of accepting calls from "unknown" remote systems is inherent in the communications mechanism and is available for both ISO and DSA systems (fig A-1).

Without regenerating the system the DNE facility permits the following:

- new correspondents on a LAN or an X.25 PDN can call your system (if the new correspondent is an ISO/DSA Workstation (DIWS) or a PAD terminal)
- new correspondents on a LAN or an X.25 PDN can be called (if the new correspondent is a DIWS or a PAD terminal)

- new correspondents accessed via a remote TS (transport station) of type DSA can be called, but the new user must be a DSA system, for example, a Bull host system accessed via a remote Datanet FEP. If the remote TS is of type DIWS, the new user must be a DIWS.

In the case of new correspondents to be called, the names and call numbers of these correspondents must be declared in the EQU file with an SC object of type EQU before system loading.

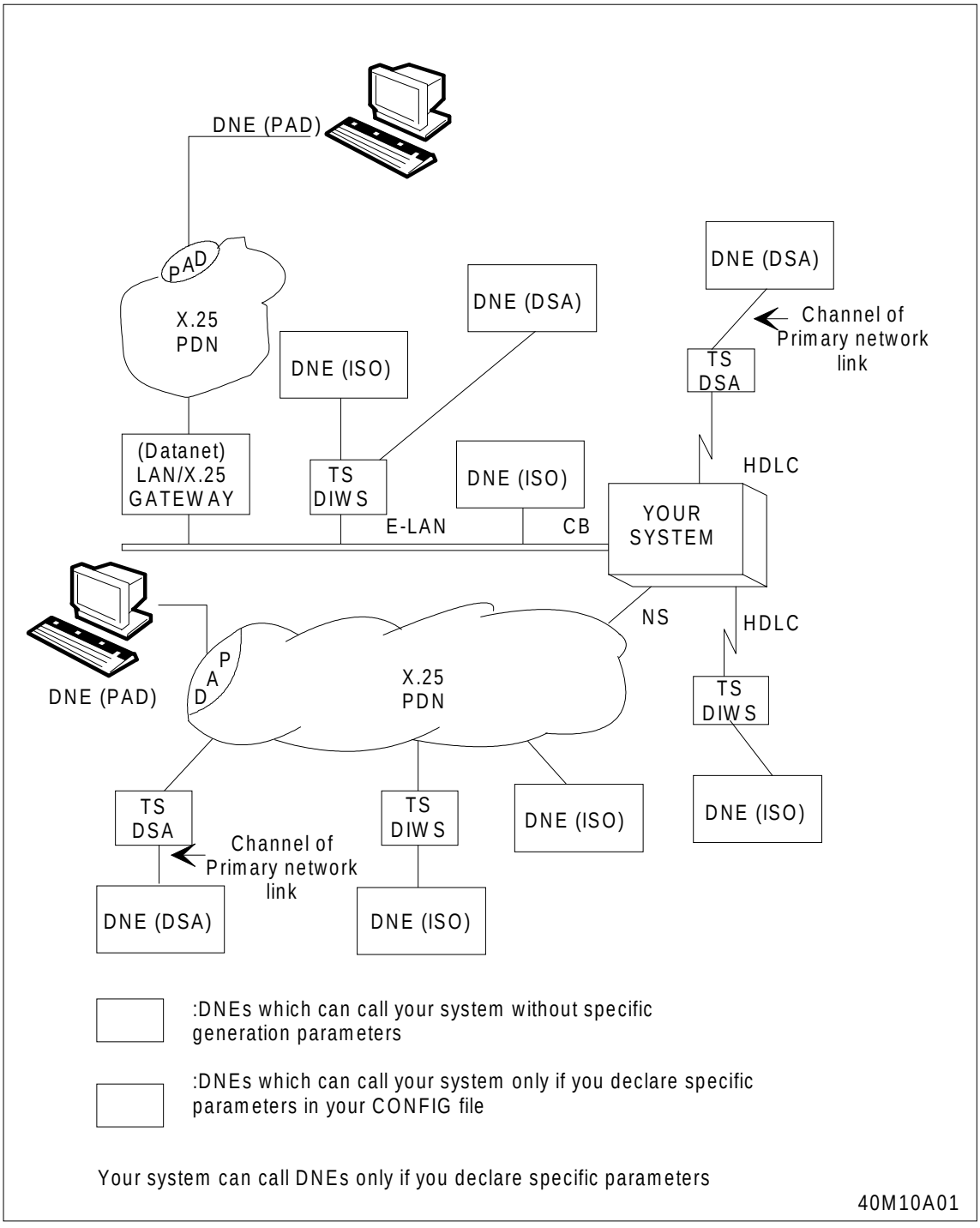


Figure A-1. Dynamic Network Extension

A.1.3 Uses and Misuses

The DNE facility can be used in the following circumstances:

- at system generation when the names of remote systems have not been defined, or the remote configuration has not been defined
- after system generation when new systems are added to the LAN
- after system generation when a system is moved from one location to another and reconnected to a different LAN
- when there are too many remote users to be included in the CONFIG file (for example, 2000 PAD terminals may access an application via the system)
- when the DNE facility automatically generates a chain of objects, for example SR-TS-NR, this can be used to avoid errors in the CONFIG file (just as the DEVICE macro is used to generate the chain MB-SN-LD-DV).

You can use the DNE facility to avoid regenerating the system (a time consuming process) when a new system is added to the network. But the name and call number of any new system must be included in the EQU file before system loading. The initial processing of the EQU file will increase the CNS7 load time, so do not add too many new systems to the EQU file. Instead, it is recommended that you should periodically update the CONFIG file and regenerate CNS7.

A.1.4 Implementing the DNE facility

IMPORTANT:

During generation, certain objects will be created automatically. These are mentioned in the following subsections. You must make sure that no other objects of the same class and with the same name exist in the CONFIG file.

A.1.4.1 ISO DNE Connected Directly to an X.25 PDN

Specify the ACSISO parameter on the NS X25 object to define the local network subscription number via which DNE can call.

Specify the NBNCIN parameter on the same NS X25 object. This parameter will be included in the TS DIWS object which is automatically generated (see below). The value "v1" is the maximum number of simultaneous incoming connections (virtual circuits) from the remote TS which the system will accept and it must be equal to or less than the value of -NBVC on the same NS-X25.

When other TS DIWS objects (specifically generated or automatically generated) are associated with the same NS X25, then the sum of all NBNCIN values must not exceed the value of NBVC.

The default value of NBNCIN for an automatically generated TS DIWS, is the value of NBVC. If you use the default value, it is possible that the maximum number of connections will be occupied by DNE systems, in which case, no other systems can be connected.

Example:

```
NS name2 X25 -ACSISO name1
             -NBNCIN v1       (v1 = 1, v2, v2)
             -NBVC v2
```

During generation the following objects will be generated automatically:

```
SR name1 BAN -TS name1

TS name1 DIWS -NR name1 -NBNCIN v1

NR name1 SW -NS name2
```

... where:

name1	name declared in ACSISO parameter of NS X25.
name2	name of NS X25 object in which ACSISO is declared.

A.1.4.2 ISO DNE Connected directly to an E-LAN

Specify the ACSISO parameter on the CB LAN1 object which represents the LAN via which DNE can call.

Example:

```
CB name2 LAN1 -ACSISO name1
```

The maximum number of systems which can simultaneously call via this link are limited by the CNX parameter on TS LOC.

```
During generation the following objects will be generated
automatically:
SR name1 BAN -TS name1

TS name1 DIWS -NR name1

NR name1 LAN1 -PL name1

PL name1 CSM1 -CB name2
```

... where:

name1	name declared in ACSISO parameter of CB LAN1.
name2	name of CB LAN1 object in which ACSISO is declared.

A.1.4.3 DSA DNE Connected Via a Remote DSA TS (Transport Station)

Accepting calls from DNEs

If you only want to accept calls from a DNE system via a DSA TS (already declared in the CONFIG file), it is not necessary to declare any additional parameters.

Calling DNEs

If you want to be able to call DNE systems via a DSA TS, it is necessary to declare the ACSBAN parameter on the TS DSA object (representing the remote system) via which you can call the DNE system.

Example:

```
TS name2 DSA -ACSBAN name1
```

The maximum number of systems which can simultaneously call via this link are limited by the CNX parameter on TS LOC.

During generation the following object will be generated automatically:

```
SR name1 BAN -TS name2
```

... where:

name1	name declared in ACSBAN parameter of TS DSA.
name2	name of TS DSA object in which ACSBAN is declared.

A.1.4.4 DNE Connected Via a Remote ISO TS (Transport Station)

Accepting calls from DNEs

If you only want to accept calls from a DNE system via an ISO TS (already declared in the CONFIG file), it is not necessary to declare any additional parameters.

Calling DNEs

If you want to call DNE systems via an ISO TS, it is necessary to declare the -ACSBAN parameter on the TS DIWS object (representing the remote system) via which you can call the DNE system.

For X.25 networks, specify the NBNCIN parameter on the same TS DIWS object. The value "v" is the maximum number of simultaneous incoming connections (virtual circuits) from the remote TS which the system will accept. The value of NBNCIN must be equal to or less than the value of NBVC on the associated NS X25 object.

If several TS DIWS objects (including automatically generated ones) use the same NS X25, then the sum of all NBNCIN values must not exceed the value of NBVC.

The default value of NBNCIN, for a declared TS DIWS, is 1.

Example:

```
TS name2 DIWS -ACSBAN name1
              -NBNCIN v1
```

The maximum number of systems which can simultaneously call via this link are limited by the CNX parameter on TS LOC.

During generation the following object will be generated automatically:

```
SR name1 BAN -TS name2
```

... where:

name1	name declared in ACSBAN parameter of TS DIWS.
name2	name of TS DIWS object in which ACSBAN is declared.

A.1.5 Calling DNE systems

Declare the DNE facility (as described in section A.1.4.1), for each type of new correspondent you wish to call. In addition, include the following information before system start up.

A.1.5.1 THE EX Directive

Declare the NBCREQ parameter in the EX directive:

```
EX  name  -NBCREQ v
```

v = maximum number of SC EQU objects which can be declared in the EQU file.

NOTE:

1. It is not necessary to declare the NBCREQ parameter if you only want to accept calls from DNE systems. It defines the maximum number of DNE systems that you will be able to call.

2. If there is a possibility that you will wish to call a DNE system after system generation, declare this parameter before system generation.

A.1.5.2 The GO Command

Include the EQU parameter in the GO command each time you start CNS7:

```
GO  -EQ file-name
```

file-name = name of the EQU file.

This parameter instructs the system to process the EQU file at start up. For further information on the GO command, consult section 6 of this manual.

The following is an example of the syntax for the GO command for a Bull DPS7000:

```
GO  -EQ CONFmember
```

member being the name of a member of SYS.DSACONF containing the SC EQU directives.

NOTE: After processing, the contents of the EQU file will appear in the loadmap.

A.1.5.3 The EQU File

For each new correspondent you want to call, declare an SC EQU object in the EQU file. (The syntax is shown below in A.1.5.4).

- map the SC EQU to an SR BAN object which has the same name as declared in the associated -ACSISO or -ACSBAN parameter.
- several SC EQU may be mapped to the same SR BAN but only one SR BAN may be mapped to a SC EQU.
- the maximum number of SC EQU declared in the EQU file is equal to the value "v" declared in the -NBCREQ parameter of the EX directive (for further information, see section A 1.5.1 of this manual).

A.1.5.4 Syntax for SC EQU

SC name EQU	"name" is the SC-id of the new correspondent.

Mandatory parameters:

-SR name1	SR of type BAN mapped to this SC. SR BAN was automatically generated at system generation. name1 is the name introduced by the ACSISO or ACSBAN parameter which caused SR BAN to be generated.
{-MACSAP string	LAN address of the new correspondent. Mandatory for correspondents on a LAN
-NSAP string}	X.121 call number and/or remote X.25 subscription. Mandatory for correspondents on an X.25 network.

Optional parameters:

[-NAT {DSA|ISO}] Protocol supported by new correspondent's SC

For example:

```
SC DNE1 EQU -SR LIB1 -NSAP 750000123 -NAT ISO
```

A.1.6 Examples of Declarations

A.1.6.1 DNE on an E-LAN

Figure A-2 shows two E-LANs linked by the system. At system generation, the DNE facility is declared for the two CB objects representing the LAN cables.

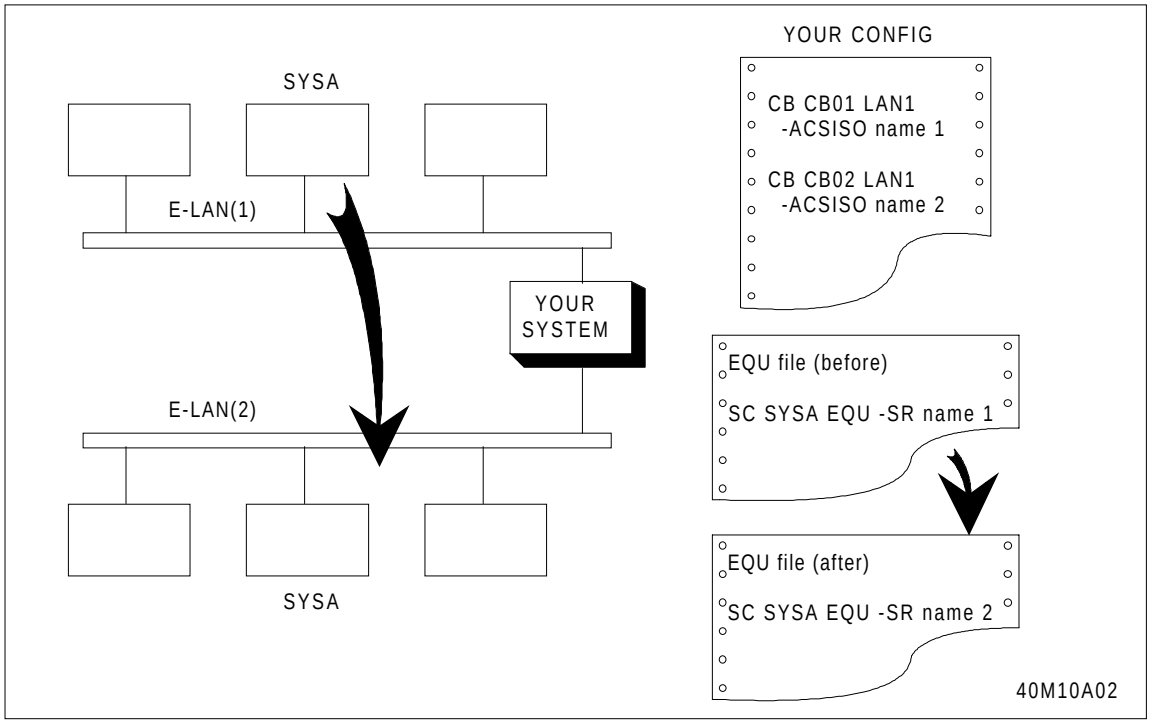


Figure A-2. DNE pn a LAN

Systems can be added to or removed from the LANs, or even swapped from one LAN to another, without changing the CONFIG file.

In the example, SYSA is moved from E-LAN1 to E-LAN2. In order that you can call SYSA at a new location, simply modify the SR parameter of the corresponding SC EQU object in the EQU file.

A.1.6.2 DNE on a PDN Subscription

Figure A-3 shows the system on a PDN. At system generation, the DNE facility is declared on the NS X25 object representing the local subscription.

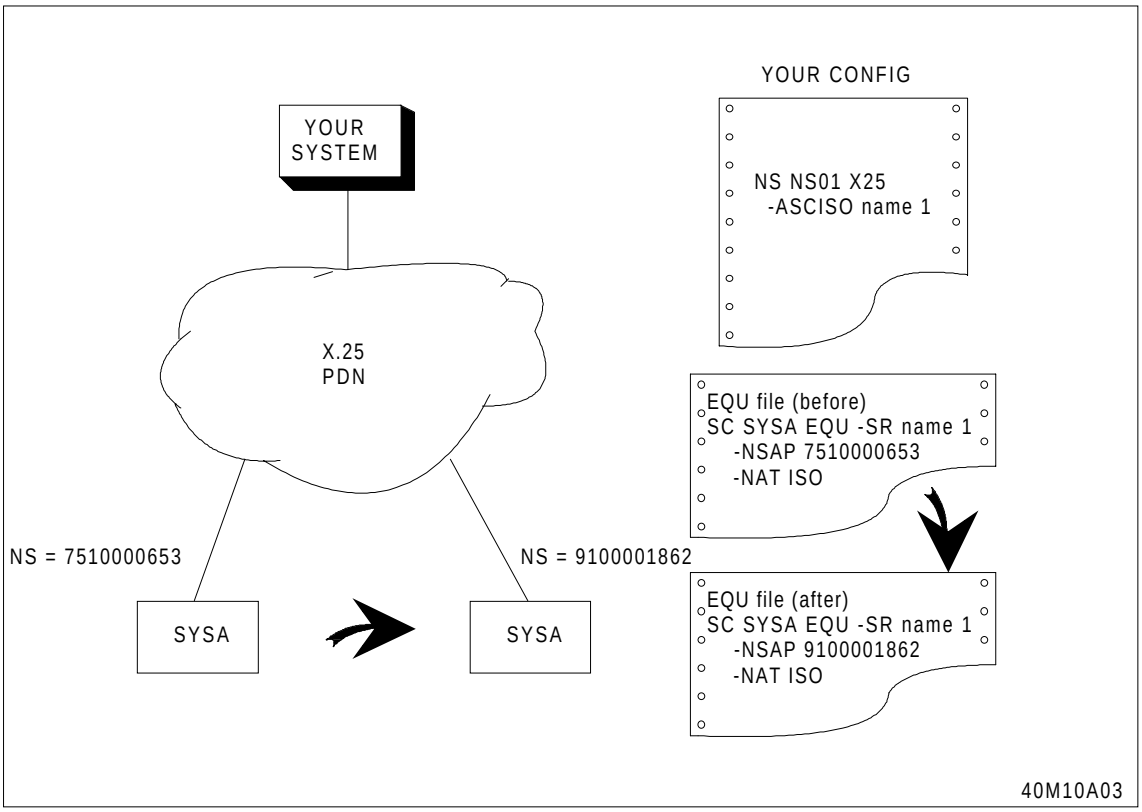


Figure A-3. DNE on a PDN

In the example, the subscription number for SYSA is changed (due to rationalisation of the telecommunications authority's standards).

In order that you can call SYSA at a new number, simply modify the NSAP parameter of the corresponding SC EQU object in the EQU file.

A.1.7 Declaring SC EQU in the CONFIG file

You generally declare the SC EQU objects in the EQU file but you can also declare them in the CONFIG file. This may be for one of the following reasons:

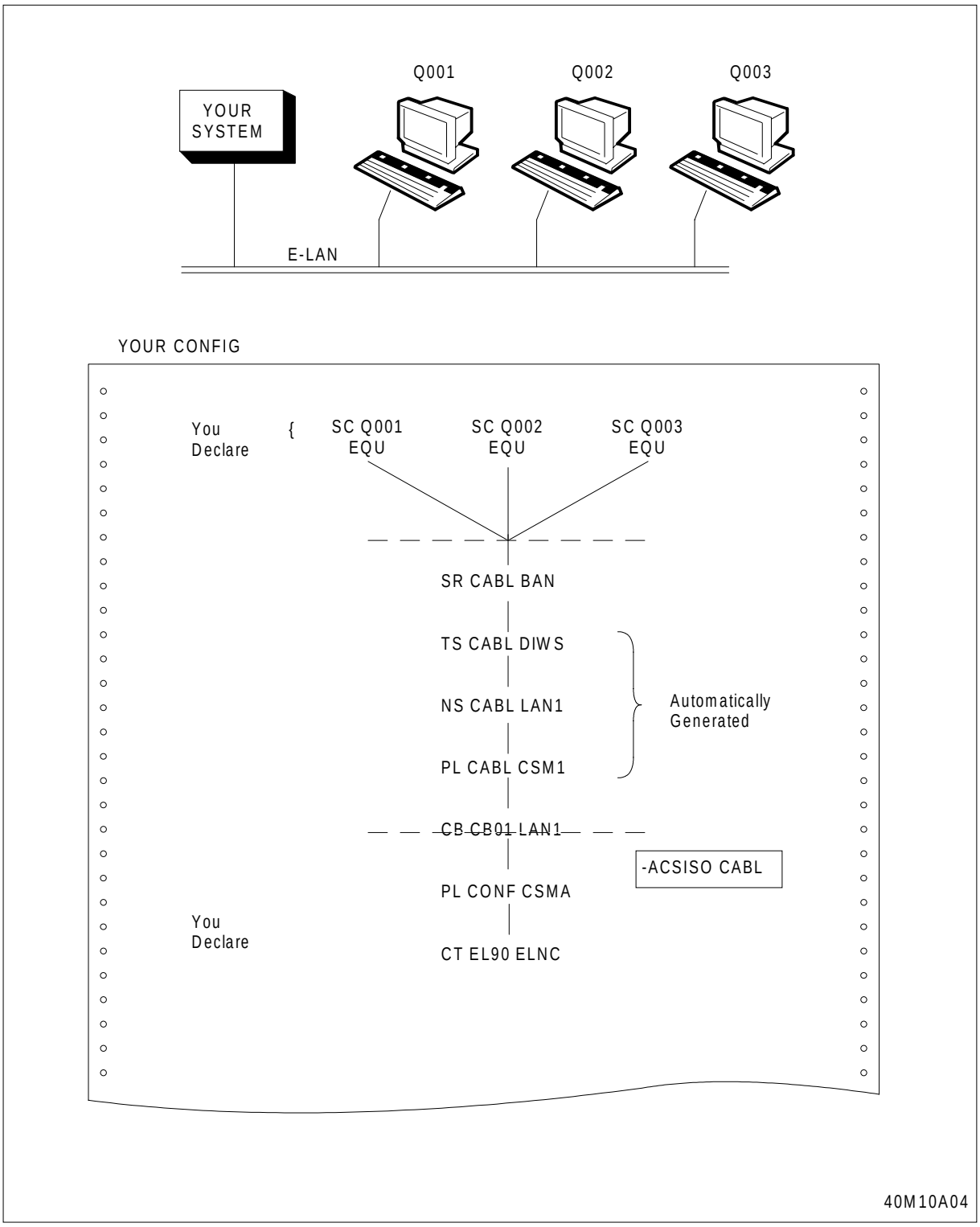
- when you update the CONFIG file, with information from the EQU file, copy from one file to the other

- when you use the DNE facility to automatically generate a chain of objects and then map SC EQU to the SR BAN object (which is automatically generated).

Also you can map several SC EQU to one SR BAN (not possible with SC-RMT). This is particularly useful, and is recommended for declaring ISO/DSA workstations, for example, the Bull Questar 400, on a LAN. Mapping in this way simplifies the CONFIG file and reduces errors.

Figure A-4 shows a configuration with several DIWS on an E-LAN. Each SC EQU is mapped to a SR with the same name as declared in the ACSISO parameter of CB LAN1 (in the example, CABL).

NOTE: Although the chain of objects SR-TS-NS-PL is only generated once, each object exists "logically" for each workstation connected to the system.



FigureA-4. Declaring ISO/DSA workstations

B. The SYSGEN IMA

The SYSGEN IMA file allows a selected set of terminals to use FPG7 (the interactive network configuration tool) via IOF. For each board of the same type (LNA,DCA,DCE,DCBE) the same configuration is defined.

It is possible to connect VIP7801, a PC with PC7800 emulation, VIP synchronous and 3270 terminals, if they are on the appropriate controller line.

WARNING

FPG7 needs the PAGEMODE option set in your system profile
(if not enter MP PAGEMODE=1) before use.

```
&
&   CONFIGURATION  FILE ## SYSGEN ##  CNP7
&                  =======
&
& =========
& TERMINALS
& =========
&
&
& ASYNCHRONOUS MODELS
& -------------------
&
MD DKU7102 ASY
MD TTU8126 ASY
MD VIP7801 ASY
MD PC7800 ASY
&
& SYNCHRONOUS MODELS
& ------------------
&
MD DKU7211 VIP
MD DKU7005 VIP
MD DKU7007 VIP
MD DKU7105 VIP
MD VIP7001 VIP
MD VIP7804 VIP
MD TTU8124V VIP
MD TTU8126V VIP
MD 3277-2E 3270
MD 3286-2E 3270
MD 3278-2E 3270
&
```

```
& ---------------------
& TERMINALS ON CT LNA N0Lx  ------> 0
& CONFIGURATION FOR EACH LNA/LNA2
& ---------------------
&
&
& 1st line :VIP without cluster with modem ;terminal address 0
& ------------------------------------------------------------
&
CO N0L0 TMG -DMB NOLO
DEVICE N0L0 VIP -ENTMD -MANLGO -MD VIP7001 -TU N0L0
TU N0L0 VIP -LL N0L0 -PHAD 0
LL N0L0 VIP -PL N0L0
PL N0L0 SYN -PHAD 0 -SPD 1200 -CT N0L
&
& 2nd line:VIP with cluster with modem;cluster address 0
terminal
&            address 1
& ------------------------------------------------------------
---
&
CO N0L1 TMG -DMB N0L1
DEVICE N0L1 VIP -ENTMD -MANLGO -TU N0L1 -MD VIP7001
TU N0L1 VIP -CL N0L1 -PHAD 1
CL N0L1 VIP -LL N0L1 -PHAD 0
LL N0L1 VIP -PL N0L1
PL N0L1 SYN -PHAD 1 -SPD 1200 -CT N0L
&
& 3rd line: 3270 with modem,cluster address 0 terminal address
0
& ------------------------------------------------------------
--
&
CO N0L2 TMG -DMB N0L2
DEVICE N0L2 3270 -ENTMD -MANLGO -CL N0L2 -MD 3277-2E -PHAD 0
CL N0L2 3270 -LL N0L2 -PHAD 0
LL N0L2 3270 -PL N0L2
PL N0L2 SYN -PHAD 2 -SPD 1200 -CT N0L
&
& 4th line: asynchronous ;VIP7801 terminal speed 2400 4800 9600
& ------------------------------------------------------------
--
&
CO N0L3 TMG -DMB N0L3
DEVICE N0L3 ASY -ENTMD -MANLGO -LL N0L3 -MD VIP7801
LL N0L3 ASY -PL N0L3
PL N0L3 ASY -PAD 3 -AUTSPD 2400 -CT N0L
&
& controller including the 4 physical lines
& ---------------------------------------
CT N0L MLNA -PHAD 0
&
&Configuration for each DCA
& --------------------
& TERMINALS ON CT DCA A0L  ------> 0
& ---------------------
&
& 2nd line:VIP without cluster without modem 9600 ;
           terminal address 0
& -------------------------------------
&
CO A0L1 TMG -DMB A0L1
DEVICE A0L1 VIP -ENTMD -MANLGO -TU A0L1 -MD VIP7001
TU A0L1 VIP -LL A0L1 -PHAD 0
```

```
LL A0L1 VIP -PL A0L1
PL A0L1 SYN -PHAD 1 -SPD 9600 -CT A0L -DIRECT
&
& 3rd line:VIP with cluster without modem 9600;cluster address
0
&            terminal address 1
&-------------------------------------------------------------
&
CO A0L2 TMG -DMB A0L2
DEVICE A0L2 VIP -ENTMD -MANLGO -TU A0L2 -MD VIP7001
TU A0L2 VIP -CL A0L2 -PHAD 1
CL A0L2 VIP -LL A0L2 -PHAD 0
LL A0L2 VIP -PL A0L2
PL A0L2 SYN -PHAD 2 -SPD 9600 -CT A0L -DIRECT
&
& 4th line:ASY
&-----------------------------------------------------
CO A0L3 TMG -DMB A0L3
DEVICE A0L3 ASY -ENTMD -MANLGO -LL A0L3 -MD DKU7102
LL A0L3 ASY -PL A0L3
PL A0L3 ASY -PHAD 3 -AUTSPD 1200 -CT A0L
&
& controller including the 3 physical lines
& ---------------------------------------
CT A0L DCA  -PHAD 0
&
&Configuration for every DCE
& --------------------
& TERMINALS ON CT DCE E0L  ------> 0
& ---------------------
&
& 2nd line:VIP without cluster without modem 9600 ;terminal
address 0
& -------------------------------------
&
CO E0L1 TMG -DMB E0L1
DEVICE E0L1 VIP -ENTMD -MANLGO -TU E0L1 -MD VIP7001
TU E0L1 VIP -LL E0L1 -PHAD 0
LL E0L1 VIP -PL E0L1
PL E0L1 SYN -PHAD 1 -SPD 9600 -CT E0L -DIRECT
&
& 3rd line:VIP with cluster without modem 9600;cluster address
0
&            terminal address 1
&-------------------------------------------------------------
&
CO E0L2 TMG -DMB E0L2
DEVICE E0L2 VIP -ENTMD -MANLGO -TU E0L2 -MD VIP7001
TU E0L2 VIP -CL E0L2 -PHAD 1
CL E0L2 VIP -LL E0L2 -PHAD 0
LL E0L2 VIP -PL E0L2
PL E0L2 SYN -PHAD 2 -SPD 9600 -CT E0L -DIRECT
&
& 4th line:ASY
&-----------------------------------------------------
CO E0L3 TMG -DMB E0L3
DEVICE E0L3 ASY -ENTMD -MANLGO -LL E0L3 -MD DKU7102
LL E0L3 ASY -PL E0L3
PL E0L3 ASY -PHAD 3 -AUTSPD 1200 -CT E0L
&
& controller including the 3 physical lines
& ---------------------------------------
CT E0L DCA -PHAD 1
&
```

```
&
&Configuration for each DCBE
& --------------------
8& TERMINALS ON CT DCBE BOL  ------> 0
& ---------------------
&
& 2nd line:VIP without cluster without modem 9600 ;terminal
address 0
& ---------------------------------------
&
CO B0L1 TMG -DMB B0L1
DEVICE B0L1 VIP -ENTMD -MANLGO -TU B0L1 -MD DKU7105
TU B0L1 VIP -LL B0L1 -PHAD 0
LL B0L1 VIP -PL B0L1
PL B0L1 SYN -PHAD 1 -SPD 9600 -CT B0L -DIRECT
&
& 3rd line:VIP with cluster without modem 9600;cluster address
0
&            terminal address 1
&-------------------------------------------------------------
&
CO B0L2 TMG -DMB B0L2
DEVICE B0L2 VIP -ENTMD -MANLGO -TU B0L2 -MD VIP7001
TU B0L2 VIP -CL B0L2 -PHAD 1
CL B0L2 VIP -LL B0L2 -PHAD 0
LL B0L2 VIP -PL B0L2
PL B0L2 SYN -PHAD 2 -SPD 9600 -CT B0L -DIRECT
&
& 4th line:ASY
&-------------------------------------------------------------
CO B0L3 TMG -DMB B0L3
DEVICE B0L3 ASY -ENTMD -MANLGO -LL B0L3 -MD DKU7102
LL B0L3 ASY -PL B0L3
PL B0L3 ASY -PHAD 3 -AUTSPD 1200 -CT B0L
&
& controller including the 3 physical lines
& ---------------------------------------
CT B0L DCBE  -PHAD 0
&
&Declaration for Network Administration
& ==============
& ADMINISTRATION
& ==============
&
&
AF AFOI NOI
AF AFAD NAD
AG AGOI NOI -AF AFAD -CNX INIT
AG AGAD NAD -AF AFOI -CNX ACCEPT
AG AGOP OP -AF AFOI
AC CAD1 NAD -AG AGAD -MBL CNP7 -MBR CNP7
AC CA01 NOI -AG AGOI -MBL CNP7 -MBR CNP7
&
```

```
CO NOI TMG -DMB $NOI -SCID CNP7 -CD NOI
CD NOI TMG -CO NOI -PSSW CNP7
&
OP CNP7 OP -AG AGOP -MBL CNP7 -MBR CNP7 $NOI -PSSW CNP7
OP DPS7 OP -AG AGOP -MBL CNP7 -MBR DPS7 $NOI -PSSW DPS7
&
```

Glossary of abbreviations

The following abbreviations are explained as they are used in this manual.

a

ACK	Acknowledgement
AEP	Administrative Exchange Protocol
AMLC	Asynchronous Multi Line Controller
ASCII	American Standard Code for Information Interchange
ASF	Administrative Storage Facility

b

BCC	Block Check Character
BCD	Binary Coded Decimal
BPF	Boot PROM FLAP

c

CCITT	International Telecommunication Consultative Committee
CD	Carrier Detection
CSMA/CD	Carrier Sense Multiple Access with Collision Detection
CSX25	X.25 Synchronous terminal Cluster
CTP	Cooperative Transaction Processing
CXI	Common eXchange Interface

d

DAC	Direct ACcess
DACQ	Direct ACcess Queued
DCC	Data Country Code
DCE	Data Circuit terminating Equipment
DCS	Data Communications System
DIA	Direct Interface Attachment
DISC	Disconnection Frame
DIWS	ISO/DSA Work Station
DNE	Dynamic Network Extension
DNIC	Data Network Identification Code
DNS	Distributed Network Supervisor
DSA	Distributed Systems Architecture
DTE	Data Terminal Equipment

e

E-LAN	Establishment Local Area Network
EBCDIC	Extended Binary Coded Decimal Interchange Code
EOT	End Of Transmission
ETB	End of Transmitted Block
ETX	End of TeXt

f

FEP	Front End Processor
FLAP	Flexible Line Adapter Package (on MLC 16 controller)
FTF	File Transfer Facility

h

HDLC	High level Data Link Protocol

i

I/O	Input/Output

IMA	The CNS system IMAge file
IMU	Interface Management Unit
IOF	Interactive Operator Facility
IOM	Input/Output Management
ISO	International Organization for Standardization
ITB	Intermediate Transmitted Block

I

LAN	Local Area Network
LAPB	Link Access Procedure : Balanced
LAPN	Link Access Procedure : NRM

m

MI	Marketing Identifier
MLC-16	Multi Line Controller : 16 lines
MLCP	Multi Line Communications Processor (8 lines)
MMPO	Main Memory PROM Option
MPS	Multi Port Sharing

n

NAD	Node ADministrator
NAK	Negative Acknowledgment
NCC	Network Control Center
NCL	Network Control Language
NGL	Node Generation Language
NOI	Network Operator Interface
NPDN	Nordic Public Data Network
NRM	HDLC Normal Response Mode

p

PAD	Packet Assembler/Disassembler

PCM	Pulse Coded Modulation
PDN	Public Data Network
PID	ISO/DSA Plug
PSI	Peripheral System Interface
PSTN	Public Switched Telephone Network
PVE	Polled VIP Emulator

r

RBF	Remote Batch Facility
RCI	Remote Computer Interface
RTS	Request To Send
RVI	Reverse Interrupt

s

SABM	Send Access Balanced Mode
SAP	Separately Addressable Printer
SCF	System Control Facility
SHM	Short Hold Mode
SLCC	Single Line Communications Processor
SOH	Start Of Header
STX	Start of TeXt
SYN	Synchronous

t

TCU	Terminal Control Unit
TDS	Transaction Driven Subsystem
TGT	Terminal Cluster on Transpac
TGX	Terminal Cluster on an X.25 network
TM	Terminal Manager
TU	Terminal Unit
TWA	Two Way Alternate

TWS	Two Way Simultaneous

v

VIP	Visual Interface Protocol

w

WAN	Wide Area Network

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