COSMOS X.21 Option
Operator Guide

ND-30.033.01

Norsk Data

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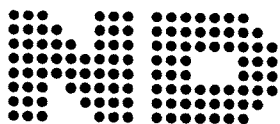
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Preface:

THE PRODUCT

This manual describes the product:

COSMOS X.21 Option   ND 10403

THE READER

This manual should be read by all system operators (supervisors) in charge of installing, loading, testing and maintaining the product COSMOS X.21 Option.

PREREQUISITE KNOWLEDGE

Detailed knowledge of the operating procedures of SINTRAN III (version H or later) and the COSMOS Basic Module with Inter System XMeSsage, (IS XMSG) is assumed.

Familiarity with the basic requirements in the CCITT X.21 recommendation is helpful, but not essential.

RELATED MANUALS

The following manuals supply additional information about products closely related to the COSMOS X.25 Option:

SINTRAN III System Supervisor Manual   ND-30.003
COSMOS Operator Guide   ND-30.025

T A B L E   O F   C O N T E N T S

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1 INTRODUCTION

1.1 Synopsis ·

The first part of this chapter gives a short introduction to the CCITT
network protocol X.21, starting with a section about system
prerequisites.

The second part gives a short presentation of the COSMOS X.21 Product.

The last part outlines the different processes involved in the
product.

1.2 The CCITT X.21 Standard

The CCITT X.21 Standard is a general purpose interface between Data
Terminal Equipment (DTE) and Data Circuit terminating Equipment (DCE)
for syncronous operation on public data networks. It is the so-called
line switched network type.

```
Your responsibility  | Carriers' responsibility
                     |
                     |
                     |
        ____         |         ____
       |DTE |        |        |DCE |       X.21 Public
    |__|____|        |        |____|       Data Network
    |__|    |        |     ____|  |
       |____|_____|____|DCX |__|
                     |    |____|
                     |
                     |
```
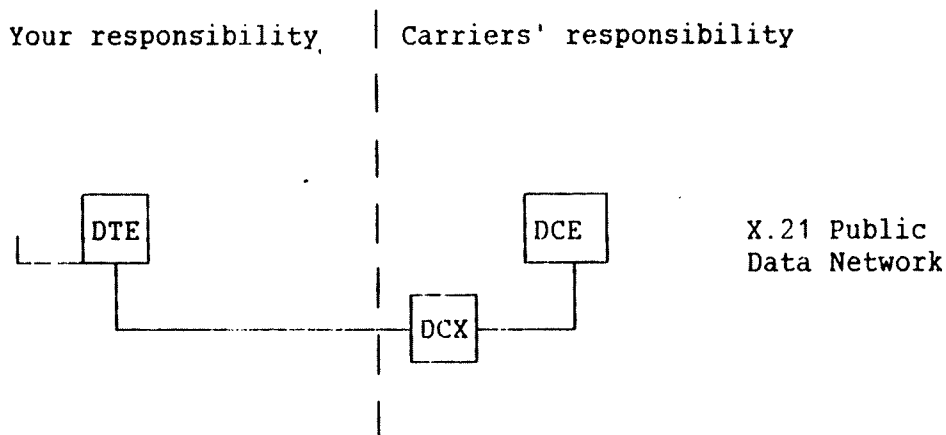
Figure 1. A Sketch of an X.21 Connection

The broken vertical line denotes the X.21 interface.

The X.21 system must always run on an ND-100 computer, or the 100 part
of the ND-500 computer.

The DTE may also be a gateway for a COSMOS LAN, where it will provide
the users with the same functions as provided inside the LAN. This
means that you can access any remote ND system in the X.21 network and
use any of the following ND communication applications:

        RTA - Remote Terminal Access
        FA   - File Access
        FT   - File Transfer
        RS   - Remote Spooling
        etc.

The figure below illustrates two connection types:
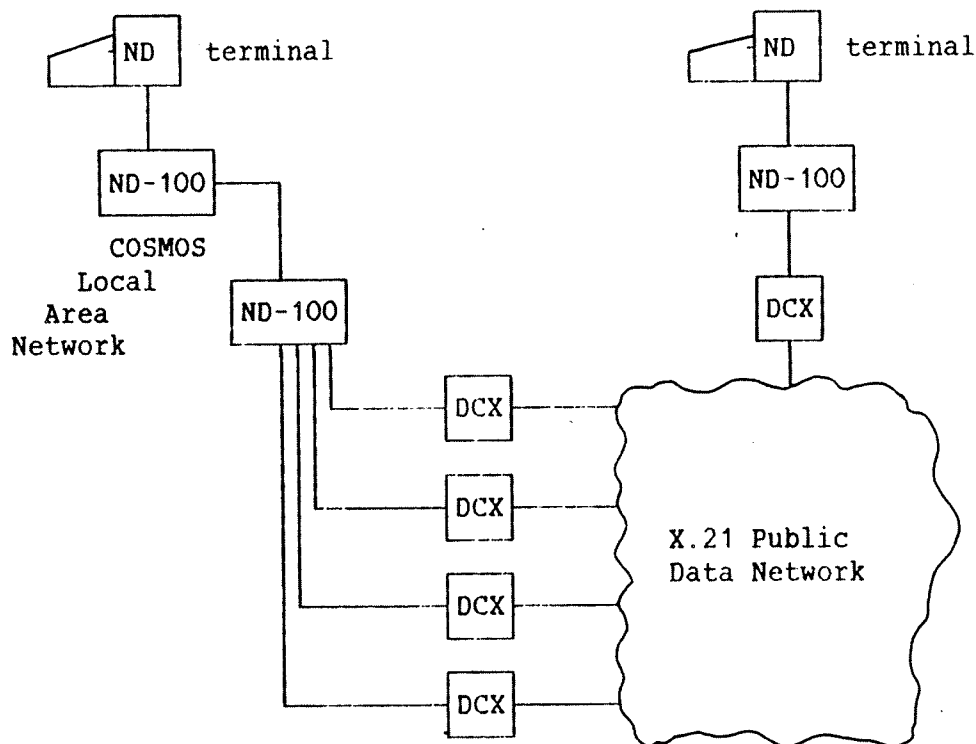
Figure 2. Example of Two Connection Types

1.3 The Different Processes of COSMOS X.21

In the figure below, the protocol relationship between the different
products/processes in an COSMOS environment are sketched:

Remote Spooling		Remote File Access			ND-MAIL
File Trans.	TAD	T-Lib	XM Lib	RPC-LIB	
XMSG Transport Layer					
XMSG Network/Datagram Layer					
X.21 Network Server	X.25 Netw Server	XMSG XLAP (Mini LAPB)	Ethernet Network Server		
	X25.3 (PL)				
	X25.2 (LAPB)		?		
X.21 Driv.	HDLC DMA Driver	Megalink Driver	Ethernet Driver		

Figure 3. Protocol Relationship within a COSMOS Networking System

As shown in the figure above, COSMOS X.21 uses the same link level
protocoll, X25.2, as COSMOS X.25 Option. The CCITT term for the
process is Link Access Procedure Balanced (LAP B).

In the figure below, the relationships between the different processes
in the COSMOS X.21 Option are shown:

```
┌─────────────────────────────────────────────────────────────────┐
│ XMSG Network/Datagram Layer                                       │
└─────────────────────────────────────────────────────────────────┘
                                    │
┌─────────────────────────────────────────────────────────────────┐
│ COSMOS X.21 Network Server                                        │
│  (The network server is active only during the con-              │
│  nection establishment phase)                                     │
└─────────────────────────────────────────────────────────────────┘
                                    │
        ┌──────────────┬───────────┴──────┬──────────────┐
┌──────────────┬─┬──────────────┬─┬──────────────┬─┬──────────────┐
│   CX21L0     │ │   CX21L1     │ │   CX21L2     │ │   CX21L3     │
├──────────────┴─┴──────────────┴─┴──────────────┴─┴──────────────┤
│                     HDLC DMA Driver                              │
└─────────────────────────────────────────────────────────────────┘
        │              │                 │              │
┌──────────┐    ┌──────────┐     ┌──────────┐   ┌──────────┐
│ HDLC     │    │ HDLC     │     │ HDLC     │   │ HDLC     │
│ Interf.  │    │ Interf.  │     │ Interf.  │   │ Interf.  │
│ Card     │    │ Card     │     │ Card     │   │ Card     │
└──────────┘    └──────────┘     └──────────┘   └──────────┘
     │               │                │              │
  ┌─────┐         ┌─────┐          ┌─────┐        ┌─────┐
  │ DCX │         │ DCX │          │ DCX │        │ DCX │
  └─────┘         └─────┘          └─────┘        └─────┘
     │               │                │              │
     ╭───────────────────────────────────────────────────╮
     │           X.21 Public Data Network                 │
     ╰───────────────────────────────────────────────────╯
```
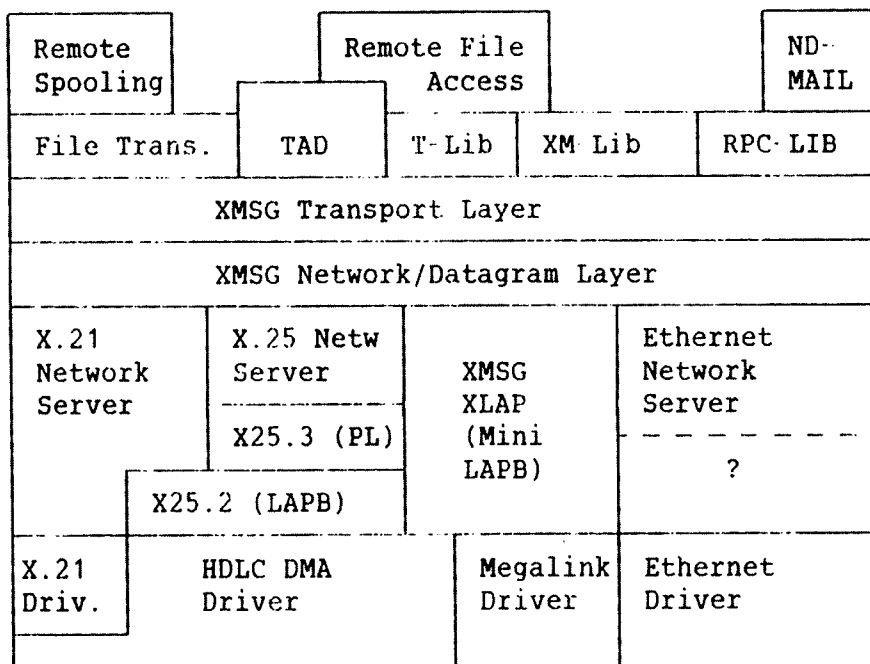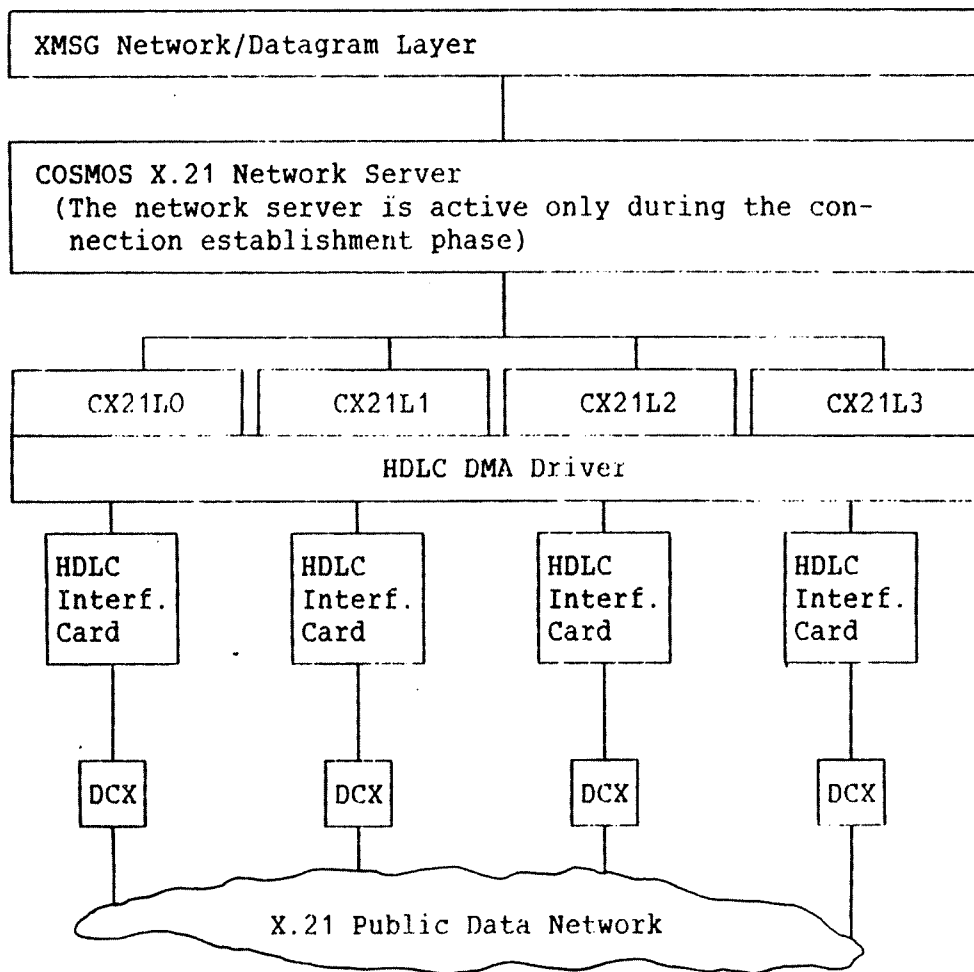
Figure 4. The COSMOS X.21 Option Protocols

When a connection is established (and no timeout has occurred), the
data will flow directly between the XMSG Network/Datagram Layer and
the network server, which sends the data to the link level process
(CX21L0). The link level process will pass the data to the HDLC driver
which handles the HDLC interface card.

The number of HDLC links must be specified when ordering SINTRAN. The
maximum number will normally be 4 links. For details, see the Program
Description document that comes with the system floppy diskettes.

1.4 The Different X.21 Processes

The SINTRAN RT names of the different X.21 real-time processes are
listed in the table below:

SINTRAN RT name	Type of process
X21NS	COSMOS X.21 Network Server
CX21L0	COSMOS X.21 Link Level process no. 0
CX21L1	COSMOS X.21 Link Level process no. 1
CX21L2	COSMOS X.21 Link Level process no. 2
CX21L3	COSMOS X.21 Link Level process no. 3
CX21LTM	COSMOS X.21 Link TiMer process
CX21PF	COSMOS X.21 Power Failure process
CX21LG	COSMOS X.21 LoG process

Table 1. The SINTRAN RT Names of the Different X.21 Processes

These SINTRAN RT processes (programs) above constitute the real-time
environment of the COSMOS X.21 Option. Together with the HDLC
interface card and the operating system prerequisites (ie., SINTRAN
drivers and special monitor calls) and COSMOS Basic Module, COSMOS
X.21 Option offers the end user totally transparent solution.

In the following chapter we will explain the steps necessary to
operate -- start, stop and configure - a COSMOS X.21 Option network.

2 HOW TO START COSMOS X.21 OPTION

2.1 Synopsis

This chapter explains the XMSG commands necessary to operate the COSMOS X.21 Option.

After an introductory explanation of the XMSG command program, the different steps involved · in the operation of X.21 are introduced sequentially.

2.1.1 System Prerequisites

Before reading any further, you should make sure you install your COSMOS X.21 Option properly.

This is explained in the Product Description document, that comes with the system floppy diskettes.

When you have loaded the system, include the command

        @MODE X21NS-LOAD-SEGM:MODE,,,,

in the SINTRAN HENT-MODE file after XMSG has been loaded.

It is possible to follow the procedures explained in this chapter manually and step by step start the system.

2.1.2 The XMSG-COMMAND Program

This command program is the central tool of all COSMOS networking systems. The product XMSG binds together the different options available under the COSMOS 'umbrella' and its command program is the central tool for the system supervisor/operator.

2.1.3 Special X.21 XMSG Commands

The following XMSG commands are of special interest when operating the
COSMOS X.21 Option:

```
*Define-network-direct connection
*Define-network-local-endpoint
*Define-network-remote-endpoint
*Define-network-remote-groupnumber
*List-network-local-endpoints
*List-network-remote-endpoints
*List-network-remote-systems
*Remove-network-local-endpoint
*Remove-network-remote-endpoint
*Remove-network-remote-groupnumber
*Remove-network-remote-system
*Start-network-server
*Stop-network server

*Define-network-connection  (only valid for version A
                             of the COSMOS X.21 Option)
```

Table 2. The Special X.21 Commands

In addition, some general XMSG commands might prove useful. Such
commands will be explained where they are used in the different
examples.

Here are the most important general commands:

```
*Define-local-system
*Define-remote-name
*Exit
*Get-error-message
*Help
*List-links
*List-names
*List-routing-info
*List-systems
*Remove-system
*Set-advanced-mode
*Set-priveleged
```

Table 3. The General XMSG Commands

See appendix A for an extensive description of the different commands necessary to operate COSMOS X.21 Option. For a complete explanation of all the XMSG commands, see the COSMOS Operator Guide.

2.1.4 Explanation of Parameters

An explanation of the most commonly used input parameters to the XMSG-COMMAND program is included in Appendix B. All the special X.21 parameters are included.

2.2 The X21-NET-START:MODE File

In this section we will have a closer look at the X21-NET-START:MODE file. The different commands will be explained as they appear in the mode file. Below is an example of what the mode file may look like after all the substitutions explained in the Product Description document are done.

In the following example we assume that SEGMENT 301 contains data and
the TPS buffer pool. The network server, X21NS, is loaded onto SEGMENT
302 and the link level routines are loaded onto SEGMENT 303.

```
@(UTILITY)XMSG-COMMAND:PROG
STOP-NETWORK-SERVER X21NS,,
EXIT
@ABORT X21NS
@ABORT CX21LO
@ABORT CX21L1
@ABORT CX21LTM
@ABORT C25LG
@CC Set TOTLG. Defined in file X25C-LOGRTN
@LOOK-AT SEG 303
113772/1
.
@CC Start X.21 network server
@LOOK-AT SEG 301
2064/0
0
.
@RT X21NS
@HOLD 0,0
@HOLD 5,2
@CC Allow Connect from both sides
@LOOK-AT SEG 303
125060/1
127756/1
.
@RT CX21LO
@RT CX21L1
@(UTILITY)XMSG-COMMAND:PROG
SET-PRIVILEGED
H cc Define remote systems
DEFINE-REMOTE-NAME,,DOLE,     284
DEFINE-REMOTE-NAME,,ND-284,   284
DEFINE-REMOTE-NAME,,KLARA,    400
DEFINE-REMOTE-NAME,,ND-400,   400
H cc Start X.21 network server
START-NETWORK-SERVER,X21NS,,,Y
H cc Define connections to the public network
Define-net-local-endpoint  X21NS,,,,,Y,1273,1370,48,100736,,
Define-net-remote-endpoint DOLE,X21NS,,100113,200,128,0,48
Define-net-remote-endpoint KLARA,X21NS,,100104,200,128,0,48
DEFINE-SYSTEM-ROUTE,,ORION,DOLE
EXIT
@cc END OF FILE
```

Example 1. The X21-NET-START:MODE File

Note that this is only an example, but it is based upon the startup
mode file on the system floppy diskettes. The system included startup
mode file may change, so you must compare it to the example above
before beginning to include your own connection definitions.

The mode file should be called from the SINTRAN LOAD-MODE file after
the XMSG startup mode file has been run. This is explained in the
Program Description document.

```
@MODE (UTILITY)X21NS-NET-START:MODE...  ←⏎
```

It is impossible to start the COSMOS X.21 Option before XMSG has been
started.

It is possible to define a new connection by giving the appropriate
commands in the XMSG-COMMAND program. But each time the system is
stopped, SINTRAN is restarted (warmstart) or XMSG is restarted, you
have to give the same sequence of commands again to be able to
reestablish your connection. Permanent connections should thus be
defined in the X21NS-NET-START:MODE file.

In the following sections we will look at the different commands given
in the startup mode file, explaining them in a way which should make
you capable of configuring your X.21 system after your needs. The
different commands are explained in the same sequence as they appear
in the startup mode file.

In the examples below we assume that the commands are executed
manually. All user input is underlined. For a complete explanation of
the parameters see Appendices A and B.

2.2.1 How to Stop the X.21 System

There are two ways of stopping the X.21 system. The normal way is to
give the XMSG command Stop-network-server, which will perform a normal
closedown of the system. This is shown in the next section. In the
following section we will explain how to stop the system if the Stop-
network-server command does not work.

2.2.1.1 Normal Stopping Procedure

Normal stopping of the X.21 system is done as follows:

```
@(UTILITY)XMSG-COMMAND:PROG ←┘


XMSG command program (ND-10130/10373H) of 84.01.14 09:13
Compiled for version 1983.07.13 (Release H)
XMSG kernel version 1983.07.13 (Release H)
Options:
    ND-100 only. PIT3. Trace.
    Inter-systenm:  File server. Network gateway.


X-C:STOP-NETWORK-SERVER X21NS,,,, ←┘
*- Warning: You can now bypass system protection mechanisms -*
OK


X-C:_
```

Example 2. Stopping the X.21 Network Server

When the network server is stopping a message, saying that the network
server has stopped, is printed on the SINTRAN error device (console).

2.2.1.2 Manual Stopping Procedure

In some special situations it may not be possible to stop the X.21
system with the Stop-network-server command. Then you must abort the
different processes manually, using the SINTRAN command ABORT. This is
shown in the example below:

```
@ABORT X21NS ←┘
@ABORT CX21LO ←┘
@ABORT CX21L1 ←┘
@ABORT CX21LTM ←┘
@ABORT C25LG ←┘
```

Example 3. Manual Stopping of the X.21 Processes

The different RT programs names are abbreviations (or acronyms) for
the process names. See chapter 1.

When the manual procedure has been used, you must patch one location (resetting a counter) on the segment 301 (the segment containing data and the TPS buffer pool). The procedure is shown below:

```
@LOOK-AT SEG 301 ↵
2064/      0      0 ↵
0

__
```

Example 4. Initializing the Network Server

2.2.2 Initializing the X.21 Processes

When the network server has been initialized, the next step is to start the X.21 processes:

```
@RT X21NS ↵
@CC Allow CONNECT from both sides
@LOOK-AT SEG 303 ↵
125060/    0      1 ↵
127756/    0      1 ↵
.
@RT CX21L0 ↵
@RT CX21L1 ↵
```

Example 5. Initializing the X.21 Processes

The reason for allowing CONNECT from both sides, which is not standard LAPB, is to speed up the establishment of a logical connection. One specified location for each link level routine must be patched (by changing its value from 0 to 1). In the example above, only two link level routines are used. In the standard X21NS-NET-START:MODE file, where four link level processes are used, four location are patched.

2.2.3 Network Definitions

When all the processes has been successfully initialized or started, the next step is to define to the system the different names and DTE numbers of the systems in the network you want to establish a connection with. You must also identify to your own system the your own DTE number(s).

The name of the local system is previously defined in the XMSG-START:MODE file.

Firstly you must start the XMSG-COMMAND program and define the COSMOS
names of the remote X.21 systems:

```
@(UTILITY)XMSG-COMMAND:PROG ←┘


XMSG command program (ND-10130/10373H) of 84.01.14 09:13
Compiled for version 1983.07.13 (Release H)
XMSG kernel version 1983.07.13 (Release H)
Options:
    ND-100 only. PIT3. Trace.
    Inter-system:  File server. Network gateway.


X-C:
X-C:SET-PRIVILEGED ←┘
OK


X-C:DEFINE-REMOTE-NAME,,DOLE,123 ←┘
OK


X-C:DEFINE-REMOTE-NAME,,KLARA,321 ←┘
OK
X-C:_
```

Example 6. Defining Names of Remote Systems

The next step is to start the network server.

```
X-C:START-NETWORK-SERVER,X21NS,,,Y ←┘
OK

X-C:_
```

Example 7. Starting the Network Server

When the network server has been started successfully, you must define
connections to the public network. Firstly you must identify to the
system its own DTE number(s). At the same time you specify some of the
configuration parameters. For a detailed description of the
parameters, see Appendices A and B. All the DTE numbers used in this
manual is fictiuos.

```
X-C:Defi-net-local-endpoint X21NS.....Y.1273.1370.48.123456..  ↵
OK

X C:_
```

Example 8. Defining the Local Endpoint

After the local endpoint has been defined, you must identify the
remote endpoints:

```
X-C:Define-net-remote-endpoint DOLE.X21NS..123457.200.128.0.48  ↵
OK

X-C:Defin-net-remote-endpoint KLARA.X21NS..123458.200.128.0.48  ↵
OK

X-C:_
```

Example 9. Defining the Remote Endpoints

The last step is to define the route to the system(s) at the remote
end. These systems may also be beyond the remote X.21 gateway system.

```
X-C:DEFINE-SYSTEM-ROUTE..ORION.DOLE  ↵
OK

X-C:EXIT  ↵

@_
```

Example 10. Defining the System Route

2.2.4 The SINTRAN LOAD-MODE File

You should include the command:

@MODE X21NS-NET-START:MODE..

in the SINTRAN LOAD-MODE:MODE file after XMSG has been started. If
your XMSG-START:MODE file include a general LIST-ROUTING-INFO listing,
you should include the MODE command in the XMSG-START:MODE file before
the LIST-ROUTING-INFO command.

2.2.5 The SINTRAN HENT-MODE:MODE File

As explained previously, you should include the command:

    @MODE X21NS-LOAD-SEGM:MODE,,

after XMSG has been loaded.

3 HOW TO CONFIGURE THE COST PARAMETERS

3.1 Synopsis

This chapter gives an outline of how to determine the cost parameters according to the different tariff structures yelding in different countries.

Information about the tariff structure yielding in your country should accompany the subscription agreement documents, issued by your local common carrier (PTT).

3.2 The Cost Parameters

The three parameters connect charge, connect cost and connect time of the command Define-network-remote-endpoint are all tied together in a way which is dependent of the tariff structure used by the PDN.

This implies that the meaning of a parameter may differ, depending on the differencies in tariff structures. To be able to choose the correct strategy for your network system, you must consult your local PDN authority (common carrier).

In the following sections the three different cost parameters will be explained. It is important to be aware that it is the relationship between the parameters which determines the systems costs strategy, and not the different parameters by themselves.

The three parameters are all integers, subsequently you must transform your local currency into integers. In addition the parameter <connect cost> must be multiplied by 100 when used. This means that if the <connect cost> is 22, you must enter 2200.

In this manual, we define currency as the curreny unit used in the different national tarifs. The currency unit in Germany is Pfennig. In Norway, Sweden and Denmark, the currency unit is øre (oere).

Generally we can say that the connect charge is what you have to pay for establishing (or trying to establish) a connection. The Connect cost is what you have to pay for keeping an active connection.

The names of the three parameters are:

    Connect charge   (100*currency)   (Integer)
    Connect cost   (currency/minute)   (Integer)
    Connect time   (Basic Time Units) (Integer)

In the following three sections we will give the three most important tariff structures.

3.3 Call Charge Independent of Line Speed

Call charge independent of the line speed means that the cost is
independent of the transmission speed of the lines used in a
connection.

Then you should use only two of the three cost parameters below:

```
<connect charge>    - the charge specified in the tariffs.
<connect cost>      - the cost specified in the tariffs.
<connect time>      - not used (ie., zero).
```

It is important to remember that when one of the parameters is not
used, it must always be zeroed.

3.4 Call Charge Dependent of Line Speed

If the call charge is depends on the line speed, this is what you
should input in the costs parameters:

```
<connect charge>    - not used (ie zero).
<connect cost>      - the cost specified in the tariffs.
<connect time>      - the ratio between charge specified in the
                      tarifs and the cost specified in the
                      tarifs. This value then gives time
                      equivalent to the call charge. This value
                      must be preceeded with a minus sign ('-').
```

The formula to calculate the parameter <connect time> is as follows

$$\text{<connect time>} = \frac{\text{charge specified in tariffs}}{\text{cost specified in tariffs}}$$

Note that the charge specified in the tariffs in the formula above,
must not be multiplied by the constant (ie., 100) used when giving the
parameter <connect charge>.

3.5 Minimum Time Charge

If the user is accounted for a minimum time (instead of a call
charge), then the costs parameters should contain the following
values:

```
<connect charge>   - <connect cost> times <connect time> (must
                     be specified).
<connect cost>     - the cost specified in the tariffs.
<connect time>     - the minimum time the user will be
                     charged for.
```

A P P E N D I X   A

THE X.21 RELATED XMSG COMMANDS

Command name : *CLEAR-PRIVILEGED*	
No: Parameter Name:	Default Value:
1 <NO PARAMETERS>	

Rules . . . . . . : Only permitted for user SYSTEM.

Related Commands: Set-privelege
                  Set-advanced

Function. . . . : Clears   the   state   set   by   the   command   Set-
                  privileged.

Command name : *DEFINE-LOCAL-SYSTEM*		
No:	Parameter Name:	Default Value:
1	⟨system number⟩	⟨local system⟩

Rules . . . . . : Only permitted for user SYSTEM. Not necessary to
use in XMSG version I or later (when using SINTRAN
version H or later), because system number is
given to XROUT when XROUT is initialized. It is
illegal to redefine the local system.

Related Commands: List-systems
List-names
List-routing-info

Function. . . . : This command defines in own system tables the
identity of the local system in its own system
tables.

Command name : *DEFINE-NETWORK-DIRECT-CONNECTION*	
No:	**Parameter Name:**	**Default Value:**

No:	Parameter Name:	Default Value:
1	<server name>	
2	<system name>	<local system>
3	<remote DTE address>	
4	<speed (x100 baud)>	
5	<own DTE address>	

Rules . . . . . : Only permitted for user SYSTEM. Applies only to the COSMOS X.21 Option.

Related Commands: Define-network-local-endpoint
Define-network-remote-endpoint

Function. . . . : If the additional service Direct Call is ordered, this command must be executed in order to give the network server the necessary additional information.

No:	Parameter Name:	Default Value:
Command name : *DEFINE-NETWORK-LOCAL-ENDPOINT*		
1	<server name>	
2	<server system>	<local system>
3	<Charging Request>	
4	<Called line identification>	
5	<Direct call>	
6	<Calling line identification>	
7	<X.21 Logical Unit Number>	
8	<HDLC Logical Unit Number>	
9	<speed (x100 baud)>	
10	<Own DTE address>	

Rules . . . . . : Only permitted user SYSTEM. Applies only to COSMOS
                  X.21 Option.

Related Commands: Remove-network-local-endpoint
                  List-network-local-endpoint

Function. . . . : This command defines the local endpoint of the
                  X.21 based public network in own system tables.

                  An explanation of the four X.21 facilities
                  parameters is included on the next page.

EXPLANATION: The four parameters, <Charging request> <Called line identification> <Direct call> and <Calling line identification> are all called X.21 facilities. They may all be looked upon as switches, and may only be answered with yes or no.

Charging request   - The purpose of this facility is to
                                      give the DTE (your endpoint) charging
                                      information about the different
                                      connections which it is debited for.
                                      Used in connection with charge
                                      transfer.

Called line identification - The purpose of this facility is to
                                      give the calling DTE (your endpoint)
                                      the identification of the called DTE.

Direct Call   - The purpose of this facility is to
                                      simplify the call procedure when
                                      only one connection is used. Your
                                      endpoint will always call the same
                                      remote DTE when this service is used.

Calling line identification - The purpose of this facility is to
                                      give the called DTE (your endpoint)
                                      the identification of the calling
                                      DTE, making it possible for the
                                      called DTE to deny a connection
                                      before it is fully established.

Remember that the X.21 facilities prompts may only be answered by Yes or No.

All of the X.21 facilities are additional services. The purpose of this 'group' parameter is to inform the network server that they are provided by the PTT and that you want to make use of these additional services.

Command name : *DEFINE-NETWORK-REMOTE-ENDPOINT*	
No:	Parameter Name:	Default Value:

No:	Parameter Name:	Default Value:
1	⟨remote system⟩	
2	⟨server name⟩	
3	⟨server system⟩	⟨your local system⟩
4	⟨remote DTE address⟩	
5	⟨connect charge⟩	
6	⟨connect cost/minute⟩	
7	⟨connect time⟩	
8	⟨speed (x100 bps)⟩	

Rules . . . . . : Only permitted user system. The command applies
                  only to COSMOS X.21 Option.

Related Commands: Remove-network-remote-endpoint
                  Remove-network-remote-system

Function. . . . : This command defines the remote system as an
                  endpoint of the network in your own system tables.

```
+-----------------------------------------------------------------+
|                                                                 |
|  Command name : DEFINE-NETWORK-REMOTE-GROUPNUMBER               |
|                                                                 |
+----+--------------------------------------+---------------------+
|    |                                      |                     |
| No:| Parameter Name:                      | Default Value:      |
+----+--------------------------------------+---------------------+
| 1  | <remote system>                      |                     |
| 2  | <server name>                        |                     |
| 3  | <server system>                      | <local system>      |
| 4  | <remote DTE addr.(group.no.)>        |                     |
| 5  | <speed (x100 baud)>                  |                     |
+----+--------------------------------------+---------------------+
```

Rules . . . . . : Only permitted for user SYSTEM. Applies only to
                  the COSMOS X.21 Option.

Related Commands: Remove-network-remote-groupnumber
                  Define-network-remote-endpoint

Function. . . . : This command defines the groupnumber received by
                  the remote site when ordering the additional
                  service, 'Multiple lines at the same address'.

                  The parameter <remote DTE addr.(group.no.)> is the
                  groupnumber of the remote endpoint.

                  The purpose of this command is to inform your
                  network server that the remote system has multiple
                  lines at the same address. Incoming calls are then
                  directed to any of the (4) lines, depending on
                  their availability, at the remote site.

Command name : *DEFINE-REMOTE-NAME*		
No:	Parameter Name:	Default Value:
1	<XROUT system>	<local system>
2	<Port or system name>	
3	<system number>	

Rules . . . . . : Only permitted for user SYSTEM. XROUT system must be local.

Related Commands: List-names

Function. . . . : This command defines a remote system name in the local system tables.

To delete a name entry in the local XMSG name tables, you just give the system name and answer the third parameter, <system number>, with carriage return (CR).

Command name : *DEFINE-SYSTEM-ROUTE*

No:	Parameter Name:	Default Value:
1	⟨XROUT system⟩	⟨local XROUT system⟩
2	⟨system⟩	
3	⟨via system⟩	

Rules . . . . . : Only permitted for user SYSTEM. The XROUT system must be the local (default) system. The names of the different systems must be defined in local name tables.

Related Commands: List-routing-info

Function. . . . : The command updates the <u>local</u> system routing tables.

EXPLANATION: In the example above, the ⟨via system⟩ parameter may be any system on the route to specified ⟨system⟩. The routing to (and name of) the ⟨via system⟩ parameter must be known by your local system. The name of the target system must also be defined in own system tables. It is not neccessary to define the route to an adjacent system.

No:	Parameter Name:	Default Value:
Command name : *EXIT*		
1	‹NO PARAMETERS›	

Rules . . . . . : Available to all user categories.

Function. . . . : Terminates the XMSG-COMMAND program and return the
                  user to SINTRAN.

Command name : *GET-ERROR-MESSAGE*		
No:	Parameter Name:	Default Value:
1	⟨Error value (dec)⟩	

Rules . . . . . : Available to all user categories.

Function. . . . : This command displays the error message
corresponding to the XMSG error value given in the
input parameter.

Legal input parameters are negative error code and
Standard Error Codes (SEC's).

Command name : *HELP*		
No:	Parameter Name:	Default Value:
1	<commands>	<all commands>

Rules . . . . . : Available to all user categories.

Related Commands: Set-advanced

Function. . . . : List all commands available to the user if default
input parameter is given. If the input parameter
<commands> is specified, a subset of commands (if
any) matching the given input will be displayed.

Command name : *LIST-LINKS*		
No:	Parameter Name:	Default Value:
1	⟨link block address⟩	⟨all links⟩

Rules . . . . . : Only permitted user SYSTEM.

Related Commands: Start-link
                  Stop-link
                  Start-network-server
                  Stop-network-server

Function. . . . : This command is used to list the current status of all links being used by XMSG. This mean those started by the START-LINK or the START-NETWORK-SERVER commands. You may specify either XMSG link index or link block address.

A link reserved by a network server is a <u>virtual link</u>. The System Identification (Sysid) then refers to a virtual system within the local system and Sysid will be in the range of 9800 to 9803. Further, the figure in the LUN coloumn, is the XMSG Port number and not the SINTRAN Logical Unit Number. The columns giving HDLC information, (Rcv, Xmit, Hard stat),will always be zero.

Turn to the next page for an explanation of the output listing.

*EXPLANATION:*In   the table below, the output information of the command
List-links is explained.

No	- link index in XMSG
Addr.	- of link block (XL-block)
State	- of connection to adjacent system. Values are:

       DEAD - crashed (fatal timeout or hardware error)
       INIT - being initialised (purely internal)
       CALL - trying to make contact with neighbour
       CONN - contact made.
       RUN - data phase.

Sysid	- of neighbour (CONN and RUN states only!)
Rcv	- last HDLC A/C bytes received (0 if netw.serv. NS)
Xmit	- last HDLC A/C bytes transmitted (0 if netw.serv. NS)
Lun	- SINTRAN Logical Unit No (Octal) (Virt.sys.no. if NS)
Timeout	- Timeout value in XTU's and counter value
Soft-stat	- HDLC software status (should be zero)
-hard	- HDLC Hardware status (should be zero)
TXData	- Number of DATA frames transm. since last startlink
Retry	- Number of retransmits
RXBad	- Number of bad frames received (CRC error, etc.)

Note: You should note that the meanings of some of the parameters
      are different when the link has been reserved by a network
      server. Then the link is a <u>virtual link</u> and the system is a
      <u>virtual system</u>.

Command name : *LIST-NAMES*	
No: Parameter Name:	Default Value:
1 \<XROUT system>	\<local XROUT system>

Rules . . . . . : Available to all users.

Related Commands: List-systems

Function. . . . : This command asks an XROUT system to dump out its name table, listing the system, port number and number of free service points for each name in XROUT's tables.

In an inter-system configuration, the command allows access to any XROUT, so the first prompt asks for the system number where the XROUT program is to be found. (Default is local.)

EXPLANATION: The output parameters of this command is:

    System   - System number
    Port   - XMSG port number
    Free SPs   - Number of free XMSG Service Points.
    Name   - Remote system or port name

It is not possible to specify a virtual system.

Command name : *LIST-NETWORK-LOCAL-ENDPOINTS*		
No:	Parameter Name:	Default Value:
1	⟨server name⟩	
2	⟨server system⟩	⟨local system⟩

Rules . . . . . : Available to all users. Applies only to the COSMOS
                  X.21 Option. Not implemented in the B version of
                  COSMOS X.21 Option.

Related Commands: List-network-remote-endpoints
                  Define-network-local-endpoints

Function. . . . : This command lists all local endpoints defined in
                  your own system tables.

EXPLANATION: In the table below, an explanation of the different
columns in the output listing is given:

    DTE number   - Data Terminal Equipment number of local
                      endpoint.
    X.21 LUN   - X.21 Logical Unit Number
    HDLC LUN   - SINTRAN HDLC input Logical Unit Number
    Speed (BPS)   - Speed in Bits per Second (baud)
    IDA   - Calling line identification Yes or No
                      (IDentification A terminal)
    IDB   Called line identification Yes or No
                      (IDentification B terminal)
    Charg.info   - Charging Information Yes or No
    Direct call   - Direct call Yes or No

The four last parameters are all defined in the ⟨X21 facilities⟩
parameter in the command DEFINE-NETWORK-LOCAL-ENPOINT.

Command name : *LIST-NETWORK-REMOTE-ENDPOINTS*		
No:	Parameter Name:	Default Value:
1	⟨server name⟩	
2	⟨system name⟩	⟨local system⟩
3	⟨remote system number⟩	
4	⟨speed (x100 BPS)⟩	

Rules . . . . . : Available to all users. Applies only to COSMOS X.21 Option. Not implemented in the B version of COSMOS X.21 Option.

Related Commands: List-network-remote-systems

Function. . . . : This command lists all remote endpoints defined in own system tables.

EXPLANATION:

System	- Remote system number
Name	- Remote system name
DTE number	- Remote DTE number
Speed (BPS)	- Speed in Bits Per Second (baud)

Command name : *LIST-NETWORK-REMOTE-SYSTEM*	
No: Parameter Name:	Default Value:
1 <server name>	
2 <server system>	<local system>

Rules . . . . . : Available to all users. Applies only to COSMOS
                  X.21 Option. Not implemented in the B version of
                  COSMOS X.21 Option.

Related Commands: List-network remote-endpoints

Function. . . . : This command lists all remote systems defined in
                  your own system tables.

EXPLANATION: Description of output information;

    System number   - Remote system number
    System name   - Remote system name
    No. of DTEs   - Number of DTEs connected to remote system
    Group number   - Remote group number
    Dir. Call   - Direct Call (Yes or No)
    Conn charge   - Connect charge (Dial up cost).
                        Relative value.
    Conn cost   - Connect cost. Relative value.
    Conn time   - Connect time. Minimum connect time.
    Max idle time (ms) - Maximum idle time before disconnection

```
+-----------------------------------------------------------------------+
|                                                                       |
|   Command name : LIST-ROUTING-INFO                                    |
|                                                                       |
+-------+------------------------------------+--------------------------+
| No:   | Parameter Name:                    | Default Value:           |
+-------+------------------------------------+--------------------------+
|  1    | <from system>                      | <local system>           |
|  2    | <to system>                        | <all systems>            |
+-------+------------------------------------+--------------------------+
```

Rules . . . . . : Available to all user categories.

Related Commands: Define-system-route
                  Remove-system-route

Function. . . . : This command lists the routing tables and checks
                  the connections. The parameters <from system> and
                  <to system> are both of type 'system' which means
                  that 'system number' or 'system name' may be
                  specified.

                  The command checks the network by sending
                  connection requests to the remote system(s). It is
                  advisable to identify the name of the <to
                  system> if you have a lot of connections through a
                  WAN. This is because of the fact that a public
                  data network may be congested, so it may take
                  minutes to get a complete list.

EXPLANATION: Explanation of output parameters:

Path according   - this is how the route is defined on the system
to local tables   given in the <from system> input parameter.

Path according   - this is how the route is defined on the system
to tables   specified in the input parameter <via system>
                      of the command DEFINE-SYSTEM-ROUTE and the
                      following systems (if any).

Actual path   - The actual path of the connection. The 'actual
                      path' and 'path according to tables' should be
                      the same. All systems on the route to the
                      target system will be listed here.

Command name : *LIST-SYSTEMS*		
No:	Parameter Name:	Default Value:
1	⟨system⟩	⟨all systems⟩

Rules . . . . . : Only permitted for user system if XMSG is older than version H.

Related Commands: List-names
                  List-routing

Function. . . . : Lists the system(s) that are defined in the local system's tables.

EXPLANATION: Description of the information listed:

```
Address        - Address of system block descriptor
Sysno          - System Number identificator
State          - >0 if connected, if <0, timeout while
                 waiting for INIT.
Link           - Address of link block descriptor.
Subaddr        - Parameter to Network Server to find the way.
Send-seq-recv  - Send and receive sequence numbers for
                 secure messages
Hops           - Number of LANs and WAN hops to this system
                 (if state>0)
```

If the link is a virtual link to a network server, Sysno and Subaddr will display the same system number. This is because Sysno and Subaddr then identify a virtual system within the local system.

Command name : *REMOVE-NETWORK-LOCAL-ENDPOINT*		
No:	Parameter Name:	Default Value:
1	<server name>	
2	<system name>	<local system>
3	<Own DTE address>	

Rules . . . . . : Only permitted for user SYSTEM. Applies only to
the COSMOS X.21 Option.

Related Commands: Define-network-local-endpoint
                  List-network-local-endpoint

Function. . . . : This command removes a local endpoint of the X.21
based public network from your own system tables.

Command name : *REMOVE-NETWORK-REMOTE-ENDPOINT*	
No: Parameter Name:	Default Value:
1 <server name> 2 <server system> 3 <remote DTE address>	<local system>

Rules . . . . . : Only permitted user SYSTEM. Applies only to COSMOS
                   X.21 Option.

Related Commands: Define-network-remote-endpoint
                   Remove-network-remote-system
                   List-network-remote-endpoint

Function. . . . : An endpoint of the X.21 based public network
                   installed in a remote system is removed from own
                   system tables.

Command name : *REMOVE-NETWORK-REMOTE-GROUPNUMBER*	
No: Parameter Name:	Default Value:
1 〈remote system〉 2 〈server name〉 3 〈server system〉 4 〈speed (x100 BPS)〉	 〈local system〉

Rules . . . . . : Only permitted for user SYSTEM. Applies only to
                  the COSMOS X.21 Option.

Related Commands: Define-network-remote-groupnumber
                  Remove-network-remote-system
                  Remove-network-remote-endpoint

Function. . . . : This command removes the groupnumber defined by
                  the command Define-network-remote-groupnumber.

```
+---------------------------------------------------------------------+
|                                                                     |
|   Command name : REMOVE-NETWORK-REMOTE-SYSTEM                        |
|                                                                     |
+-------+----------------------------------+--------------------------+
| No:   | Parameter Name:                  | Default Value:           |
+-------+----------------------------------+--------------------------+
|   1   | <remote system>                  |                          |
|   2   | <server name>                    |                          |
|   3   | <server system>                  | <local system>           |
+-------+----------------------------------+--------------------------+
```

Rules . . . . . : Only permitted for user SYSTEM. Applies only to
                  the COSMOS X.21 Option.

Related Commands: Define-network-remote-endpoint
                  Remove-network-remote-endpoint
                  List-network-remote-system

Function. . . . : All the endpoints of the X.21 based public network
                  installed in the remote system are removed from
                  your own system tables. The remote system itself
                  is also removed from your own system tables.

```
-----------------------------------------------------------------
|                                                               |
|   Command name : REMOVE-SYSTEM                                 |
|                                                               |
-----------------------------------------------------------------
| No: | Parameter Name:              | Default Value:           |
-----------------------------------------------------------------
|  1  | <XROUT system>               | <local system>           |
|  2  | <system name>                |                          |
-----------------------------------------------------------------
```

Rules . . . . . : Only permitted for user SYSTEM. It is illegal to
                  specify an XROUT system than your own.

Related Commands: List-routing-info

Function. . . . : This command removes the entries of the specified
                  system in the routing tables of your local system.
                  It does not remove the entry in the name table. To
                  remove an entry in the name tables, see the
                  command Define-remote-name.

Command name : *SET-ADVANCED*		
No:	Parameter Name:	Default Value:
1	<NO PARAMETERS>	

Rules . . . . . : Available to all user categories.

Related Commands: Set-privileged

Function. . . . : Sets the advanced user context. This means that
                  all commands are listed when typing HELP. The
                  command does not let you use privileged commands.

Command name : *SET-PRIVELEGED*		
No:	Parameter Name:	Default Value:
1	<NO PARAMETERS>	

Rules . . . . . : Only permitted for user SYSTEM.

Related Commands: Clear-privileged
                  Set-advanced

Function. .. . . : This command gives user SYSTEM the right to use
                   privileged functions without getting warnings
                   printed on the screen each time privileged
                   commands are used.

Command name : *START-NETWORK-SERVER*		
No:	Parameter Name:	Default Value:
1	\<server name\>	
2	\<system name\>	\<local system\>

Rules . . . . . : Only permitted for user SYSTEM. Applies to any of
                  the COSMOS Network Options.

Related Commands: Stop-network-server

Function. . . . : This command starts the specified COSMOS network
                  server.

Command name : *STOP-NETWORK-SERVER*	
No: Parameter Name:	Default Value:
1 <server name> 2 <system name>	<local system>

Rules . . . . . : Only permitted for user SYSTEM. Applies to any of the COSMOS Network Options.

Related Commands: Start-network-server

Function. . . . : This command stops the specified COSMOS network server.

A P P E N D I X   B

THE XMSG-COMMAND PROGRAM PARAMETERS

Special X.21 Parameters:

<connect charge>   - In local currency times 100. Local currency must be given as an integer. Further explanation is included in the chapter about costs.

<connect cost>   · In local currency per minute. Further explanation is included in the chapter about costs.

<connect time>   - In basic time units (seconds times 50). Further explanation is included in the chapter about costs.

<HDLC LUN in>   · Logical Unit Number for HDLC input part.

<X.21 LUN>   - Logical Unit Number for the X.21 datafield.

<own DTE address>   DTE number of the DCE-X connected to the public network. ASCII string. Maximum 15 characters (digits) length.

<remote DTE address>   - DTE number of the remote DCE-X connected to the public network. ASCII string. If the remote system is outside your country, remember the international prefix and leading zeroes if any. May also be the groupnumber of several lines.

<remote system number>   - Name or number of remote system.

<server name>   · Name of the server to be started (no default name). The standard name for the X.21 network server is X21NS.

<server system>   - The system on which the server is to be operated (started or stopped).

<speed (x100 BPS)   - Speed rate in Bits per Second (BPS) given as one percent of the transmission speed. To select the speed rate 9600 bps, enter 96. Range is 1200 to 9600. (12 to 96)

<X.21 facilities>   -   Additional services:

   Charging request   - Same as Charge Advice. The purpose of
                                   this facility is to give the subscriber
                                   cost information.

   Called line identification   - This facility gives the calling DTE the
                                   identity of the called DTE.

   Direct Call   - This   facility   simplifies the call
                                   procedure when only one connection is
                                   required.

   Calling line identification - The purpose of this facility is to give
                                   the called DTE the identity of the
                                   calling DTE.

General XMSG-COMMAND Parameters:

⟨commands⟩   Used in the HELP command. Default value
                                  is all commands.

⟨error value (dec.)⟩   Used in the GET-ERROR-MESSAGE command.
                                  Value less than zero will list XMSG Error
                                  Message. A positive value will list XMSG
                                  Crash Message. Decimal notation. You may
                                  also use SEC's.

⟨from system⟩   Used in the LIST-ROUTING command. Same as
                                  the ⟨system⟩ parameter.

⟨record address⟩   Used in different LIST- commands.
                                  Octal numbers.

⟨server name⟩   Name of the network server (ie., X21NS or
                                  X25NS).

⟨system name⟩   Name of the system (ie., OBELIX or
                                  ND-666).

⟨system number⟩   Number of the system (ie., 685, 10102).

⟨system⟩   This parameter will accept either ⟨system
                                  name⟩ or ⟨system number⟩.

⟨to system⟩   Used in the LIST-ROUTING command. Same as
                                  the ⟨system⟩ parameter.

⟨XROUT system⟩   Used in different commands. You are only
                                  allowed to specify the local XROUT system
                                  in XMSG version H or later. This does not
                                  apply to LIST commands.

Index

************* **SEND US YOUR COMMENTS!!!** *************

Are you frustrated because of unclear information in this manual? Do you have trouble finding things? Why don't you join the Reader's Club and send us a note? You will receive a membership card — and an answer to your comments.

Please let us know if you
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  * cannot understand information
  * cannot find information
  * find needless information
Do you think we could improve the manual by rearranging the contents? You could also tell us if you like the manual!
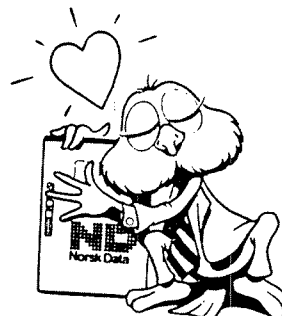
*********** **HELP YOURSELF BY HELPING US!!** ***********

Manual name: COSMOS X.21 Option Operator Guide   Manual number: ND-30.033.01

What problems do you have? (use extra pages if needed) _____

_____

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Do you have suggestions for improving this manual ? _____

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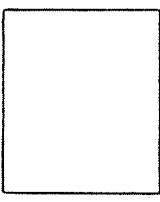
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