

Norsk Data



OSI TRANSPORT SERVICE Operator Guide

ND-30.050.1 EN



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Operator Guide

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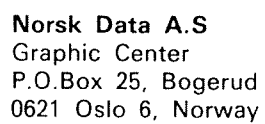
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Operator Guide
Publ.No. ND-30.050.1 EN



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PREFACE

THE MANUAL

This manual describes how to load and configure the OSI Transport Server, OSITS, which is part of the OSI Transport Service product (ND-211023). OSITS is a real-time program that enables user programs on Norsk Data computers to communicate with computers of different manufacture, using the OSI international standards.

INTERNATIONAL STANDARDS FOLLOWED

The following International Standards Organisation publications define the functions of the OSI Transport Layer.

- * ISO 8072: OSI Transport Service Definition
- * ISO 8073: OSI Transport Protocol Specification

They can be purchased from your national standards organisation.

HOW TO USE THE MANUAL

When setting up the OSI Transport Service for the first time, we recommend that you read this manual from beginning to end - the instructions are given in the order in which you will need them.

Afterwards you should read chapter 2 (Patching the OSI Transport Server) when you need to reset the variables, and chapter 3 if you want to check on an XMSG-COMMAND program command. Chapter 4 explains the logging features available.

THE READER

You should read this manual if you are responsible for network configuration on your Norsk Data computer.

This manual expects you to know about data communications principles, including the ISO standards. In addition, it assumes that you have been a system supervisor and know how to load and start XMSG and the COSMOS X.25 option.

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RELATED MANUALS

OSI Transport Service Programmer Guide ND-60.237	which describes the Transport Service library, a set of routines which can be called by user programs to set up data communications using OSI protocols.
COSMOS Programmer Guide ND-60.164	which describes the equivalent library used in ND to ND communications.
SINTRAN III Reference Manual ND-60.128	which gives an alphabetical listing of all the SINTRAN III commands and monitor calls.
SINTRAN III System Supervisor ND-30.003	which explains all the actions needed to keep an ND-100 or ND-500 system running on a day-to-day basis. This includes starting and stopping the system and patching.

1 INTRODUCTION

1 INTRODUCTION

1.1 Summary of the Product

The OSI Transport Service product enables user programs running on ND computers to communicate with programs running on other makes of computer, using standard Open Systems Interconnection (OSI) protocols defined by the International Standards Organisation (ISO). The OSI Transport Service product complements ND's COSMOS range of products, provide for communications between Norsk Data computers.

Version A of the OSI Transport Service product provides the Transport Layer of the OSI seven layer model and comprises:

- * the OSI Transport Library (OSI-TLIB). This is a set of subroutines that can be called by a user program to set up Transport connections and to pass data between the connected programs. OSI-TLIB uses XMSG (Xmessage) to carry the OSI Transport Protocol messages. Thus it can be used in the same way as the COSMOS Transport Library (TLIB) for communication between programs in ND computers.

Two sets of routines are provided: one for use by programs written in PLANC (ND's internal systems programming language), and one that provides a FORTRAN interface. The latter can be used by programs written in FORTRAN, COBOL or PASCAL. Both sets of routines provide a user interface that complies to the requirements of the OSI Transport Service Definition (ISO 8072).

To ease the transition from COSMOS TLIB to OSI-TLIB, the user program interfaces of the two libraries are compatible. This enables user programs that call TLIB routines to call OSI-TLIB routines instead, simply by recompiling and relinking. In addition, a user program calling OSI-TLIB can connect to, and exchange data with, a program calling COSMOS TLIB. This facility may be withdrawn in future versions of OSI-TLIB.

The OSI Transport Service Programmer Guide ND-60.237 tells you how to call and use the OSI-TLIB routines, and gives examples of PLANC and FORTRAN use.

- * the OSI Transport Server (OSITS). This is a real-time program that is used to convert the XMSG protocol messages produced by OSI-TLIB into OSI Transport Protocol passed over X.25 to a remote computer. The protocol conforms to the OSI Transport Protocol Specification (ISO 8073). OSITS must be used in conjunction with OSI-TLIB when communicating with a non-ND system that supports the OSI Transport Protocol. The use of OSITS is transparent to user programs.

In Version A, OSITS supports Class 0 and Class 2 of the OSI Transport Protocol. Class 0 supports basic functions and can be used where a reliable network can be assumed, or where reliability is not important, for example Teletex. Class 2 service allows multiplexing of several Transport connections, from the same or different user programs, over one network connection. It also provides flow control of data transferred over each Transport connection.

A logging facility is provided that can be used to keep a record of the actions performed by OSITS.

1.2 Statement of Conformance to the OSI Standards

The following states how the OSI Transport Service product conforms to the requirements of the OSI Transport Service specification (OSI 8073):

1. The transport protocol used over X.25 to communicate with a remote computer conforms to Classes 0 and 2 of the OSI Transport Protocol.
2. The software is capable of both initialising and responding to Transport Connection Requests.
3. Extended formats and Non-use of Flow control (optional features of the Class 2 protocol) are not implemented.
4. The maximum TPDU size supported is 512 bytes.

1.3 Restrictions in Version A

Version A of the OSI Transport Service provides for communications with non-ND systems across an X.25 packet switched Wide Area Network only.

User programs calling COSMOS TLIB, and the COSMOS facilities TRANSFER-FILE, CONNECT-TO, Remote file access and Remote Spooling cannot be used to communicate with a non-ND remote system via OSITS. This is because these facilities use internal ND protocols which are not supported by non-ND systems. Attempts to use these facilities via OSITS will result in an error message being returned to the caller.

1.4 Environment Required

The OSI Transport Service product requires the following hardware and software:

- * ND-500 or ND-100 system running SINTRAN III Version J or later.
- * XMSG Version J or later.
- * COSMOS X.25 Option Version B or later (only if OSITS is used).

1.5 Example Configurations

1.5.1 Two communicating programs in the same ND System

The programs may communicate directly using OSI-TLIB over XMSG. (OSITS is not needed.)

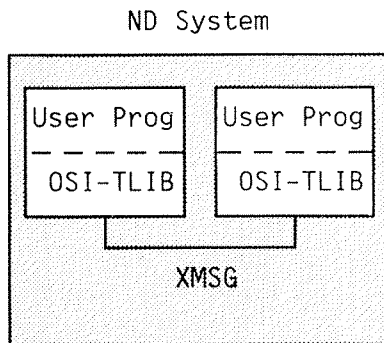


Figure 1: Two communicating programs in the same ND System

1.5.2 Two communicating programs in different ND Systems

In this configuration the ND systems may be connected directly, or via networks such as X.25 and X.21. The programs communicate using OSI-TLIB over Intersystem XMSG, where appropriate via the network servers (for example X25NS and X21NS). OSITS is not needed.

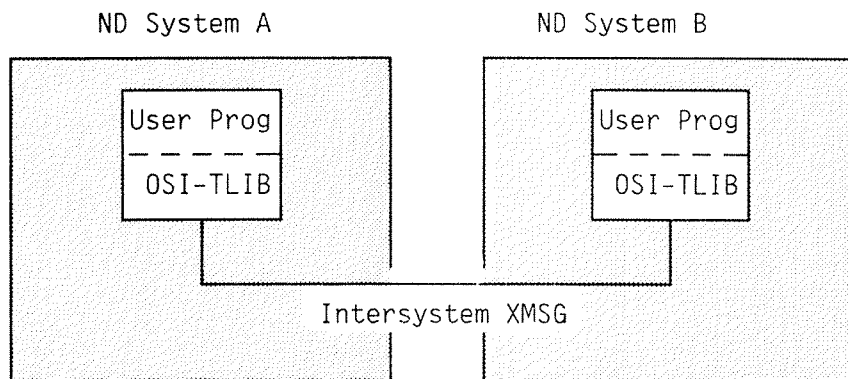


Figure 2: Two communicating programs in different ND Systems

1.5.3 Single ND System Communicating with a Non-ND System

In this configuration the ND system should contain OSITS and the X.25 software:

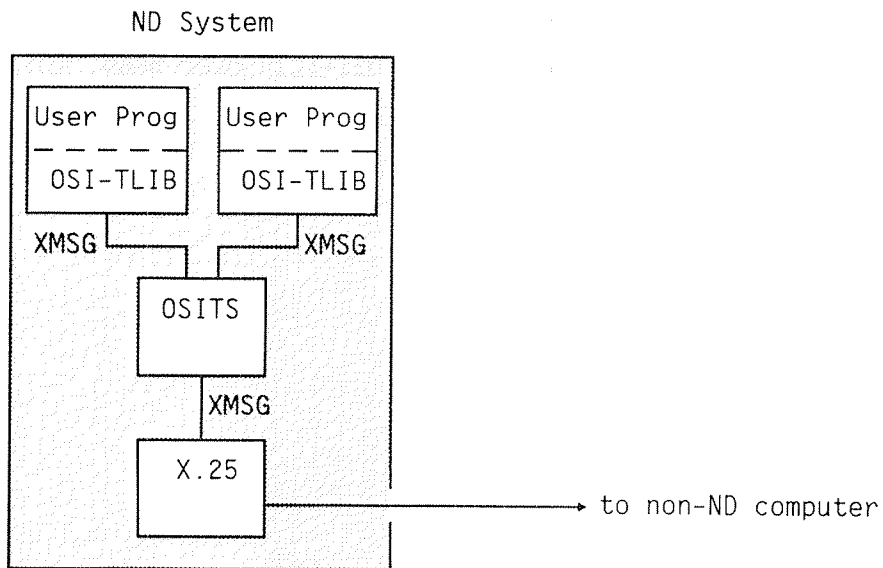


Figure 3: Single ND System Communicating with a Non-ND System

1.5.4 A COSMOS Network of ND Systems Communicating with a Non-ND System

In this configuration only one ND system contains the X.25 software, but each system that runs user programs needing to communicate with the non-ND system needs to contain a copy of OSITS. The different copies of OSITS must connect to X.25 using different DTE subaddresses so that X.25 can distinguish between them.

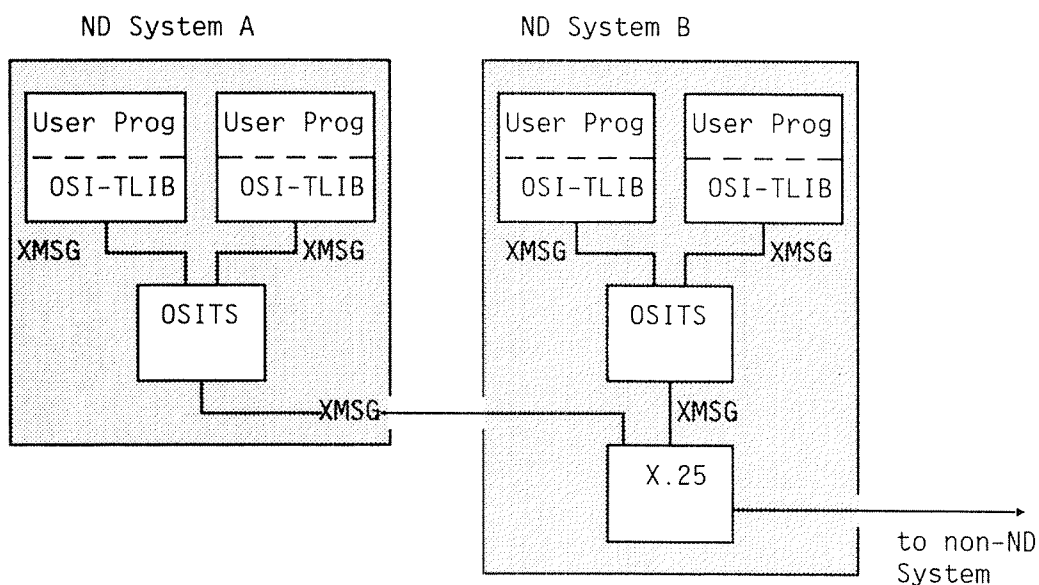


Figure 4: COSMOS Network Communicating with a Non-ND System

2 PATCHING THE OSI TRANSPORT SERVER

2 PATCHING THE OSI TRANSPORT SERVER

2.1 General

The OSI Transport Server (OSITS) contains a number of variables that you can modify by patching in order to tailor the server to the requirements of your system. These variables control:

- * the logging facility.
- * transport connections.
- * X.25 connections.
- * timeout values.

Patching can be performed before OSITS is started, or while it is running. However, some variables (notably those controlling the X.25 connections) are used by OSITS during its initialisation phase immediately after starting, so later changes to these values will have no effect. These variables are marked with an asterisk in the table in section 2.2.

For more general information on patching, please read the SINTRAN III System Supervisor ND-30.003.

2.2 Contents of the Patchable Area

The patchable variables are located in a patch area within OSITS called OSITSPA. They are:

<u>Word</u>	<u>Default</u>	<u>Meaning</u>
0	64+16	Types of logging to be performed. If zero, no logging is done, and the logging file is not opened. If non-zero, the types of logging information specified by the value of this word are written to a logging file. The possible values and their meaning are given in chapter 4.
1	500	The maximum number of lines in the logging file. When the length of the logging file reaches this limit, logging will start again at the beginning of the file, overwriting the original logging information.
2	64	The maximum number of bytes of user data that will be logged for each message. This limit prevents the logging file from being filled when large amounts of user data are sent.

Table 1: Contents of the Patchable Area

<u>Word</u>	<u>Default</u>	<u>Meaning</u>
3	32767	The maximum number of transport connections that can be multiplexed over a single X.25 connection. The default value effectively allows an unlimited number. A value of 1 will prevent multiplexing.
* 4	40	<p>The X.25 DTE subaddress that identifies this OSITS server. The default value can be used if only one OSITS is attached to the X.25 system. If more than one copy of OSITS in different machines are attached to the same X.25 system, each OSITS must have a different DTE subaddress in the range 1 to 99.</p> <p>This variable is used by OSITS during its initialisation phase; changes in value made while OSITS is running have no effect.</p>
5	60	The maximum time in seconds that OSITS will wait for the remote machine to respond to a Transport Connection Request. If no response is received within this time, the Connection Request will be refused. This variable is equivalent to the timer TS1 defined in OSI 8073.
6	60	The maximum time in seconds that OSITS will wait for the remote machine to respond to a Transport Disconnection Request. If no response is received within this time, a confirmation of disconnection will be sent to the user program that requested the disconnection. This variable is equivalent to the timer TS2 defined in OSI 8073.
7	300	The maximum time in seconds that a transport connection can be open without any data being sent or received. If nothing happens during this time period, OSITS will assume that the transport connection is no longer in use, and will disconnect it.
8	600	The maximum time in seconds that an X.25 connection can be open without a transport connection being open on it.
9	1	The minimum time in seconds that OSITS will wait after a transport disconnection before it will disconnect the X.25 connection.

Table 1: Contents of the Patchable Area (cont)

2.3 How to perform the patches

To make any changes to the above variables you must:

- * log in as user SYSTEM.
- * know the address of the OSITSPA. This is obtained by calling the Real-Time Loader as follows:

```
@RT-LOADER↵
REAL TIME LOADER, SINTRAN III - J
*WHAT-IS OSITSPA↵
OSITSPA      2003 350      DEFINED SYMBOL
*EXIT↵
@
```

The first value given is the octal address of OSITSPatchArea. The second value is the segment number containing OSITS.

You can now perform patches using the SINTRAN command @LOOK-AT. The following example sets Transport logging on and changes the logging file length to 1000 lines (1750B). Note that all numbers must be in octal.

```
@LOOK-AT SEGMENT↵
SEGMENT (NAME OR NUMBER(OCT)): 350↵
READY:
2003/      0 200↵
   764 1750↵
  32767 .
-END
@
```

The period (.) is important as it signifies the end of the command. The command @LOOK-AT is described in detail in the SINTRAN III Reference Manual ND-60.128.

3 OPERATING THE OSI TRANSPORT SERVER

3 OPERATING THE OSI TRANSPORT SERVER

3.1 Synopsis

This chapter explains how to operate the OSI Transport Server OSITS. This is done using commands sent to the XMSG-COMMAND background program. A detailed reference section on the different XMSG commands necessary to operate OSITS can be found in Appendix A.

3.2 Prerequisites

OSITS uses the facilities of the COSMOS X.25 Option to perform data transfer between machines. Therefore the underlying X.25 network system must be successfully started before trying to start OSITS. For details of how to start X.25, see the COSMOS X.25 Option Operator's Guide ND-30.034..

3.3 Using the XMSG-COMMAND Program

OSI Protocol Messages transferred between a Norsk Data machine and a machine of different manufacture must be routed via the OSITS server. In order to do this, you must define the routing to XMSG by sending commands to the XMSG-COMMAND program.

The XMSG-COMMAND program is a background program that is used to control and supervise the XMSG system and products using XMSG, such as servers. XMSG-COMMAND accepts commands in the usual SINTRAN way, abbreviations are allowed, and the program prompts for parameters that are not specified on the command line. Any command line starting with the @ sign is sent to the SINTRAN III background command processor for execution. The XMSG-COMMAND program is described in the COSMOS Operator Guide ND-30.025.

In the following sections of this chapter, only the commands necessary to operate OSITS are discussed. They must be given in the order specified. Most of these commands are privileged, and can only be used if you are logged in as user SYSTEM. The commands that you will need to use are:

- * DEFINE-REMOTE-NAME
- * START-NETWORK-SERVER
- * DEFINE-NETWORK-CONNECTION
- * STOP-NETWORK-SERVER

3.3.1 Starting the XMSG-COMMAND Program

Log in as user SYSTEM on the machine that is to run OSITS, and start the XMSG-COMMAND program.

```
@(UTILITY)XMSG-COMMAND↵
```

```
XMSG command program (10373J01) of 85:04:25 18:15
```

```
Compiled for version 1985.04.10 (Release J)
```

```
XMSG kernel version 1985.04.10 (Release J)
```

```
Options:
```

```
ND-100/CX only. PIT3. Trace.
```

```
Inter-system: File server.
```

```
(Type ? to get a list of the new commands.)
```

```
X-C:
```

3.3.2 Defining *X25GATE

The first thing to do is to define the machine containing the X.25 system so that OSITS can access X.25. The standard name *X25GATE is used for this purpose, so that it is not necessary for OSITS to know the actual name of the machine running X.25. This makes it easier to move X.25 to another machine, since only the XMSG tables need be updated.

*X25GATE is defined using the command DEFINE-REMOTE-NAME, specifying the SINTRAN III system number of the system containing X.25.

The first parameter, 'XROUT system', is defaulted so that the name is defined on the machine that will be running OSITS.

```
X-C:DEFINE-REMOTE-NAME↵
```

```
XROUT system? ↵
```

```
Port or system name: *X25GATE↵
```

```
Remote system or port no: 5568↵
```

```
OK
```

```
X-C:
```

3.3.3 Starting OSITS

The next step is to start the server. This is done using the command START-NETWORK-SERVER, as in the following example:

```
X-C:START-NETWORK-SERVER↵
Server name? OSITS↵
Server system name? ↵
Server not started - will try to start it now
Window size? ↵
Wide Area Network (Y/N)? ↵
OK
X-C:
```

The parameter 'Server system name' should be defaulted so that the command starts the OSI Transport Server on your local system. When this parameter has been entered, XMSG-COMMAND waits for 10 seconds while the OSITS server is started. If something goes wrong, an error message will be returned.

The last two parameters, 'Window size' and 'Wide Area Network', should always be defaulted when starting OSITS.

3.3.4 Defining the Remote OSI System Names

As for remote COSMOS systems, we use symbolic names to refer to the non-ND systems that are to be accessed via OSITS. The command DEFINE-REMOTE-NAME is used to define these names in the same way as remote COSMOS systems. The following example illustrates how to define such a remote system:

```
X-C:DEFINE-REMOTE-NAME↵
XROUT system? ↵
Port or system name: FOREIGN-MACHINE↵
Remote system or port no: 30123↵
OK
X-C:
```

The first parameter, 'XROUT system', is defaulted so that the remote system name is defined on the machine running OSITS.

The second parameter, 'Port name or system name', specifies the name to be used to refer to the remote machine.

The third parameter, 'Remote system or port no', should be specified in the range 30000 to 32767. This range of system numbers is allocated to non-ND machines, in order to avoid clashing with the system numbers allocated to ND systems on your network. Each different remote non-ND system should be given a different system number, but any value within this range may be chosen.

3.3.5 Defining the Route to a Remote OSI System

In order to send data to or receive data from, remote OSI systems, you must specify to XMSG that data interchanged with each remote OSI system has to be routed via OSITS, and you must tell OSITS how to connect to the remote system using X.25. Both these functions are performed by the command DEFINE-NETWORK-CONNECTION.

```
X-C:DEFINE-NETWORK-CONNECTION↵
Remote system? FOREIGN-MACHINE↵
Server name: OSITS↵
Server system name: ↵
Remote DTE address? 234264600345↵
Dial-up cost? 5↵
Connect cost/minute? 2↵
Data cost/ksegment? 1↵
OK
X-C:
```

The first parameter is the remote OSI system name. This must have been defined previously by the command DEFINE-REMOTE-NAME.

The second parameter is the name of the server.

The third parameter should be defaulted, since OSITS is running on the current system.

The fourth parameter specifies the X.25 DTE address to be used by OSITS to connect to the remote OSI system.

The parameters 'Dial-up cost' and 'Connect cost/minute' are used to tell OSITS how long to keep an X.25 connection open when there are no Transport connections open on it. Dial-up cost represents the cost of establishing an X.25 connection. Connect cost/minute represents the cost of keeping a connection.

OSITS calculates the time in minutes that it will wait before closing an X.25 connection by dividing the Dial-up cost by the Connect cost. Thus it is the ratio between Dial-up cost and Connect cost that is important, not their actual values. In the above example, the timeout value is 2.5 minutes. If the Dial-up cost is much greater than the Connect cost, the timeout value will be long, and so the number of expensive Dial-up calls will be reduced. If the Dial-up cost is much less than the Connect cost, the connection will be closed in a short time.

Two variables in the OSITS Patch Area (see chapter 2) are used to restrict the range of values for this timeout. The minimum length of the timeout is normally set to 1 second. This is to allow time for a transport connection to be fully closed before the X.25 connection is closed. The maximum length of the timeout is normally set to 10 minutes prevent an X.25 connection being left open indefinitely. These minimum and maximum values may be changed by patching.

The parameter 'Data cost/ksegment' is not used by OSITS at present. It should always be set to the value 1.

3.3.6 Stopping OSITS

OSITS may be stopped by using the command STOP-NETWORK-SERVER. Any outstanding X.25 and transport connections are disconnected.

```
X-C: STOP-NETWORK-SERVER↵
Server name? OSITS↵
Server system name? ↵
OK
X-C:
```

Note that when the server is started again, the routes to the remote OSI systems must be re-defined using the command DEFINE-NETWORK-CONNECTION (see section 3.3.5).

4 THE OSITS LOGGING FACILITY

4 THE OSITS LOGGING FACILITY

The OSITS Logging Facility can be used to keep a record of the actions performed by OSITS Logging. Information is written into the file (RT)COS-OSITS:LOGS. This file can be examined using a standard editor after OSITS has been stopped, or when logging has been turned off. The type of information that is to be logged is specified by a variable in the OSITSPatchArea (see chapter 2). The following values may be used singly or in combination:

Value	Effect of Setting the Value
1	Log all messages sent by OSITS to XMSG.
2	Log all messages sent by XMSG to OSITS.
4	Log all messages sent by OSITS to X.25.
8	Log all messages sent by X.25 to OSITS.
16	Log Transport and X.25 protocol
32	Not used.
64	Log X.25 disconnect cause/diagnostic codes.
128	Log Transport Protocol messages sent over X.25.

Table 2: Values of Log Type that can be used

Note that the use of logging decreases the throughput of OSITS and increases the CPU time that it takes because of the overheads involved in writing to the logging file. For this reason, we recommend that the default value (16+64) should normally be used, as this will only log error situations and unexpected X.25 disconnections. If such error situations occur unexpectedly, we recommend that you repeat the run with all logging values set, and then contact your local ND Service Office.

A second patchable variable controls the length of the logging file. If the specified number of lines has been logged, the next piece of logging information will be written to the start of the file, overwriting previous logging information. The default value is 500 lines.

A third patchable variable is used to restrict the amount of user data that is logged. Large amounts of user data may cause the logging file to fill up quickly with unnecessary information. The default value logs the first 64 bytes of user data.

The logging file is opened by OSITS when the first piece of logging information is to be written. If the logging file does not exist, it will be created. If for any reason, the logging file cannot be opened, OSITS outputs a message to the operator's console, and continues without logging.

The logging file cannot be examined while OSITS has opened it. It can be closed by patching the logging type variable to zero. OSITS may then take up to 20 seconds to close the file. The logging file will also be closed when OSITS is stopped.

Once the logging file has been closed, it may be examined using a standard ND editor. The last line logged is:

*** OSI Transport Server - Version A00 - Log Closed at <time> on <date>

By searching for this line, the end of the file can be found, even if the log has wrapped around because the maximum number of lines has been exceeded.

APPENDIX A XMSG-COMMAND PROGRAM COMMANDS

This appendix provides reference documentation for all the supervisory commands necessary to start, operate and maintain the OSI Transport Server. All the relevant commands of the XMSG-COMMAND program are listed alphabetically.

To start the XMSG-COMMAND program log in as user SYSTEM on the machine that is to run OSITS, and start the XMSG-COMMAND program.

```
@(UTILITY)XMSG-COMMAND-
```

```
XMSG command program (10373J01) of 85:04:25 18:15
```

```
Compiled for version 1985.04.10 (Release J)
```

```
XMSG kernel version 1985.04.10 (Release J)
```

```
Options:
```

```
ND-100/CX only. PIT3. Trace.
```

```
Inter-system: File server.
```

```
(Type ? to get a list of the new commands.)
```

```
X-C:
```

A.1 DEFINE-NETWORK-CONNECTION

Action.....: Defines the route to a remote system.

Parameters.....: <Remote system>,<Server name>,
<Server system>,<Remote DTE address>,
<Dial-up cost>,<Connect cost/minute>,
<Data cost/ksegment>

Note.....: The parameter <Data cost/ksegment> should always
be set to 1.

```
X-C:DEFINE-NETWORK-CONNECTION ↵
Remote system? FOREIGN-MACHINE ↵
Server name? OSITS ↵
Server system? ↵
Remote DTE address? 34554368259874 ↵
Dial-up cost? 10 ↵
Connect cost/minute? 70 ↵
Data cost/ksegment? 1 ↵
```

X-C:

A.2 DEFINE-REMOTE-NAME

Action.....: Defines the name of a remote system.

Parameters.....: <XROUT system>,<Port or system name>,
<Remote system or Port no>

```
X-C: DEFINE-REMOTE-NAME ↵
XROUT system? ↵
Port or system name: FOREIGN-MACHINE ↵
Remote system or Port no? 30010 ↵
OK
X-C:
```

A.3 START-NETWORK-SERVER

Action.....: Starts a network server.

Parameters.....: <Server name>,<Server system>
<Window size>,<Wide Area Network (Y/N)>

```
X-C:START-NETWORK-SERVER ↵
Server name? OSITS ↵
Server system? ↵
Server not started - will try to start it now
Window size? ↵
Wide Area Network (Y/N)? ↵

X-C:
```

A.4 STOP-NETWORK-SERVER

Action.....: Stops a network server.

Parameters.....: <Server name>,<Server system name>

```
X-C: STOP-NETWORK-SERVER ↵  
Server name? OSITS ↵  
Server system name? ↵  
OK  
  
X-C:
```


APPENDIX B GLOSSARY OF TERMS

COSMOS	<ul style="list-style-type: none">• Norsk Data's networking system for communication between ND computers.
COSMOS X.25 Option	<ul style="list-style-type: none">• A subsystem used to connect ND machines through an X.25 packet switched network.
ISO	<ul style="list-style-type: none">• International Standards Organisation, the body that defined the Open System Interconnection model of data communication.
Open System	<ul style="list-style-type: none">• A computer system that supports the OSI standards enabling it to be connected in a network with machines of other makes that also support those standards.
OSI	<ul style="list-style-type: none">• Open System Interconnection. <p>A concept of the International Standards Organisation (ISO) defining standards for the exchange of information between computer systems. These standards are based on a 7-layer communication model.</p>
Patching	<ul style="list-style-type: none">• A program modification made by changing the octal code rather than by changing the source code before compilation.
Transport Layer	<ul style="list-style-type: none">• Layer 4 of the OSI 7-layer model. The Transport Layer allows user programs to communicate without being concerned with the way in which the data is transferred. Details of the underlying network, including reliability and cost-effectiveness are hidden from the programs.

Transport Service	<ul style="list-style-type: none">• The functions provided by the Transport Layer
Transport Protocol	<ul style="list-style-type: none">• The set of rules and formats for exchanging information between different systems which support the Transport Layer. <p>The Transport Protocol is divided into a number of classes that define the functions supported.</p>
X.25	<ul style="list-style-type: none">• An internationally agreed recommendation by the CCITT for Wide Area Networks. (CCITT stands for the International Telegraph and Telephone Consultative Committee.)
XMSG	<ul style="list-style-type: none">• XMSG (read as Xmessage) is a system for program to program communications within or between computers. XMSG is called by OSI-TLIB, and in turn passes protocol messages to OSITS for conversion to OSI Transport Protocol.

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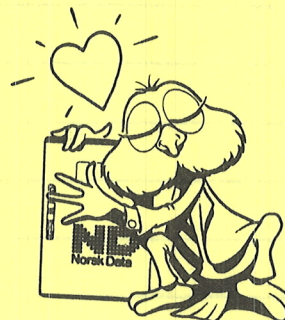


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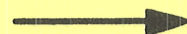
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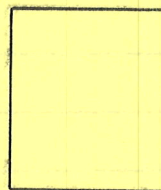
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