CODEX

6500 Series
Multipoint X.25
Operator's Manual

NOTICE

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Proprietary Material

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User Questionnaire

A User Questionair is provided in the back of this manual for your comments. Codex welcomes your comments; your input is important in helping us improve the effectiveness of this manual. Thank you.

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Preface

This manual describes the Multipoint X.25 Protocol option for the 6500 Series products. It describes only those features relevant to the Multipoint X.25 option, for other parameters of the 6500 Series, refer to the relevant documentation.

This manual is organized in the following manner:

Chapter 1. Introduction. Describes the product in a general fashion and provides application information.

Chapter 2. Configuration and Administration. Provides configuration and administration information relative to the Multipoint X.25 option.

Appendix A. Node Worksheets. Provides blank tables upon which you may write configuration details for specific nodes. Configuration information from Chapter 2 is included for ease of reference.

Chapter 1
Introduction

Contents

INTRODUCTION

Multipoint X.25 (MX25) is an optional, extra cost, feature of the 6500 Series products. It can be used with the 6505 PAD (Packet Assembler/Disassembler), the 6507 Multi-Function PAD and the 6525 Packet Switch.

This powerful feature permits up to 256 stations per node to be appended to a 6500 product, with a maximum of 32 on any single MX25 link. Any of the 6500 products can be used as the master or slave device.

In MX25 operation, a physical full-duplex circuit exists between the master and slave stations on a link. The master can send to the slave whenever it wishes, but the slave can only send when explicitly polled by the master. Traffic from the master to the slave is referred to as outbound, the reverse direction is inbound. The master can send to one slave while receiving from another, allowing efficient link utilization.

The master polls the slaves in a cyclic sequence specified by a non-configurable, internal polling table. Only one poll can be outstanding at a time. Polls carry the sequence number of the next frame expected by the master. Information frames from the slave to the master are called Enquiry Frames, and those to the slave from the master are called Response Frames. If the polled slave has Enquiry Frames to send, it can send only a certain number of them (equal to the window size). The polled slave, even if it does not send Enquiry Frames, signals the end of its turn by sending a frame with the F (final) bit set to 1.

The master delivers enquiries from the slaves to a host computer and queues response messages generated by the host. The master services the queue cyclically, using the same polling table used to poll the slaves. Responses are framed into High-level Data Link Control (HDLC) Information Frames which may include piggy-backed acknowledgements to enquiries from slaves. At most, a window of unacknowledged response frames can exist between the master and a slave at any given time.

While the master is sending response frames, it continues to send polls. If a slave sends a Final Frame which arrives in the middle of an outbound transmission from the master, the master will poll the next slave, after sending the current HDLC frame.

Related Documentation

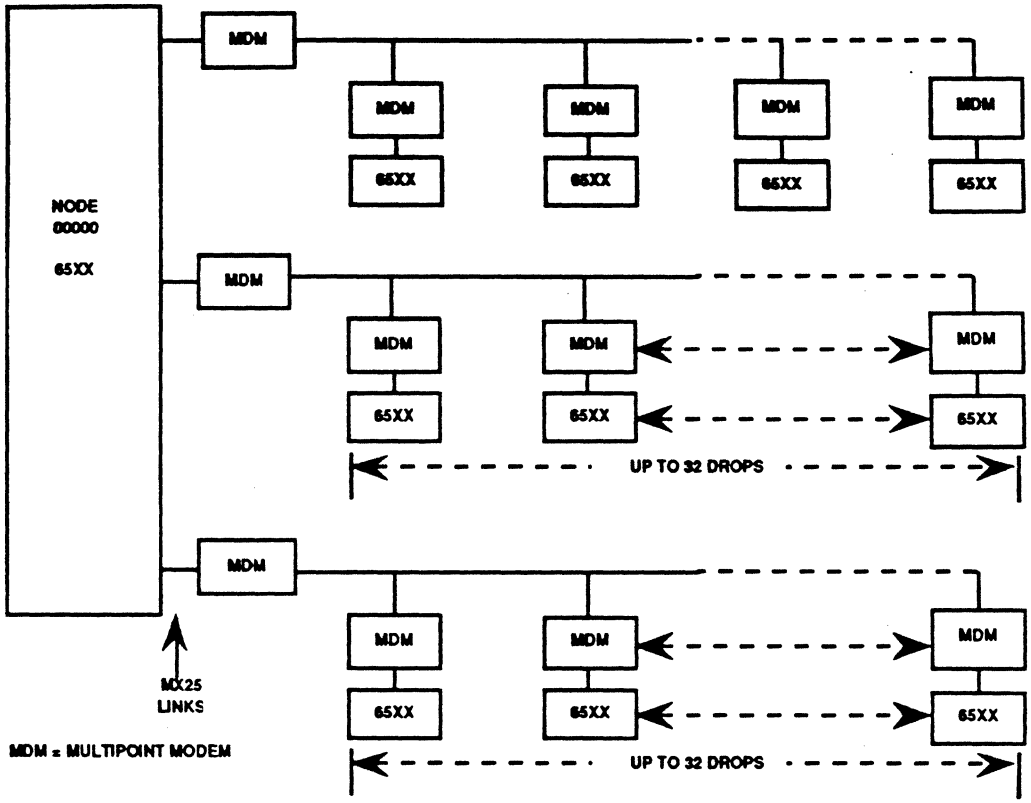
This document is related to:

Product Code	*Document Title*
68917	6500 Series Documentation Kit

APPLICATIONS INFORMATION

Multipoint allows transmission of data to/from a number of points on a single link. MX25 ports can be configured on a 6500 Series PAD . If the associated nest contains the appropriate cards, up to 48 ports can be configured in any mix.

The maximum configuration for a node with this feature is illustrated in the following figure.



Multipoint X.25 (MX25) is a synchronous, bit-oriented protocol. Up to 256 stations can be defined, with a maximum of 32 stations per MX25 port. All drops on a MX25 port must be full-duplex. Some possible configurations are:

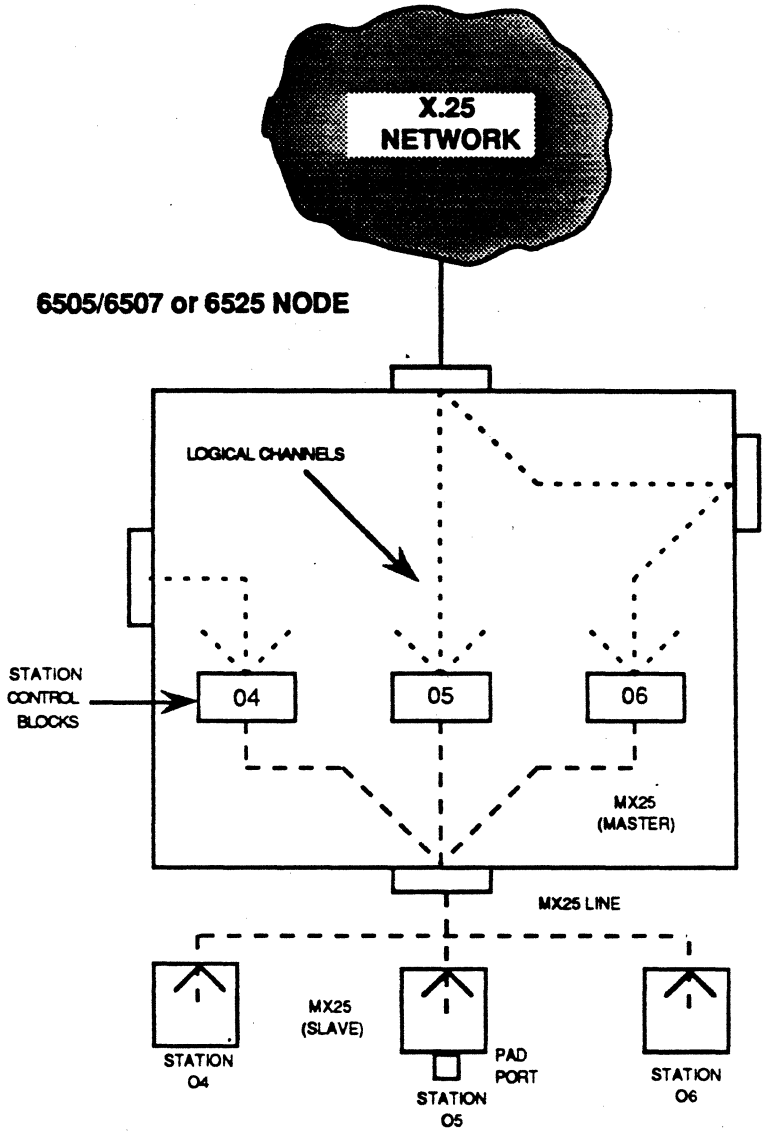
- 16 ports of 16 stations each.
- 8 ports with 9 stations each, 1 port with 32 stations, 12 ports with 12 stations, 1 port with 8 stations.
- 32 ports with 8 stations each.
- Any combination of ports/stations, totaling not more than 256 stations, with 32 or less stations per port.

MX25 can operate at transmission speeds from 1200 bps through 80 kbps. Clocking can be internal or external. MX25 ports support accounting and billing information, as well as Closed User Groups (CUGs).

All stations on an MX25 port must be members of the 6500 family of products. Multipoint modems (MDMs) or line drivers, such as the Codex 2300, 2500 or 2600 series, are required.

Both a master and a slave MX25 port can be configured on the same 6525 Packet Switch node. Only one MX25 port is allowed on a 6505 PAD or 6507 Multi-Function PAD.

A typical 6500 node using MX25 connected to an X.25 network is shown in the following figure.



Station xx, where xx is the Station Address on the Multipoint line.
Multiple SVCs on an internal Station Contrl Block.
SCBs appear as virtual ports with multiple SVCs.

In such a node, calls from the X.25 network, Muxports, or PAD ports can all be connected to channels on the MX25 link. A logical channel on an MX25 link behaves in the same manner as one on an X.25 link. For example, SNA traffic can pass through an MX25 channel. The bandwidth available to each station is approximately equal to the link bandwidth divided by the number of stations on the link.

Users can configure Port Type: MX25 (Multipoint X.25), through the Configuration Menu of the Control Terminal Port (CTP). MX25 ports can be configured in a mix of all other port types available.

Chapter 2.
Configuration and Administration

Contents

INTRODUCTION

Basic configuration and administration procedures for a 6500 node are covered in detail in the 6500 Series products manuals. Only information pertinent to Multipoint X.25 (MX25) is covered in this manual.

Configuration for Multipoint X.25 consists of the following basic steps:

- Changing Port Records to reflect Multipoint X.25 options.
- Filling in the Station Table to provide information about the stations attached to a Multipoint X.25 port.
- Adjusting the Route Selection Table to reflect individual stations on a Multipoint X.25 link.
- After all configuration changes are completed, perform a Node Boot operation.

In addition, a variety of changes have been introduced to the 6500 products to allow efficient administration and troubleshooting of Multipoint X.25 ports. Where applicable to Multipoint X.25, these changes are also covered in this manual.

Port Record Configuration

Two port records deal with MX25, these are MX25mas (master) and MX25slav (slave). Access to these for configuration purposes is via the Control Terminal Port (CTP) in the same manner as for any other 6500 Port (access the CTP Main Menu, select Configure, then, from the Port selection of the Configure Menu, enter the number of the port to be configured as Multipoint X.25.)

MX25 Master Ports. The following table indicates the parameters which must be configured for a Master MX25 port.

Port Record Configuration - MX25mas

Parameter	*Default*	*Range*	*Description/Action Required*
Port Number	1	1 - 48	Enter number of port to configure. This corresponds to the physical port position at the rear of the unit and is the Port Record reference number.
Port Type	MX25mas	NULL X25, PAD, MUX, HPADenqack, TPADenqack, HPADxonxoff, TPADxonxoff, HPADsdlc TPADsdlc MX25mas, MX25slav	Enter type of port desired. reserves the port for future use. **Note:** Node Boot needed for changes to take effect.
Clock Source	EXT	INT or EXT	Choose INT if port device does not provide clocking. Choose EXT if device generates clock signal.
Clock Speed	9600	1200-80000	This is the port speed in bits per second when using using internal clocking.
Number of stations	4	1-32	Enter number of stations for this port. **Note:** Node Boot needed for changes to take effect.

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Port Record Configuration - MX25mas (continued)

Parameter	Default	Range	Description/Action Required
Poll Timer	30	1-255	Worst case delay for a slave to respond to a poll frame sent by the master, including modem turn-around time, etc. Value in 10ths of seconds (30 = 3.0 seconds).
Poll Frequency Period	50	5 to 255 (msec)	Time between polls when no data is exchanged.
Tries	10	1-16	Maximum number of attempts to complete a transmission.
Restart Timer	180	5-255	Time in seconds. Restart-Request Timer. When timer expires, request is resent.
Reset Timer	180	5-255	Time in seconds. Reset-Request Timer. When timer expires, request is resent.
Call Timer	200	5-255	Time in seconds. Call-Request Timer. When timer expires, call is cleared.
Clear Timer	180	5-255	Time in seconds. Clear-Request Timer. When timer expires, request is cleared.

MX25 Slave Ports. The following table indicates the parameters which must be configured for a Slave MX25 port.

Port Record Configuration -MX25slav

Parameter	Default	Range	Description/Action Required
Port Number	1	1 - 48	Enter number of port to configure. This corresponds to the physical port position at the rear of the unit and is the reference number for the Port Record.
Port Type	MX25slav	NULL reserves the port for future use. PAD, X25, MUX, HPADenqack, TPADenqack, HPADxonxoff, TPADxonxoff, HPADsdlc TPADsdlc MX25mas, MX25slav	Enter type of port desired. Note: Node Boot needed for changes to take effect.
Clock Source	EXT	INT or EXT	Choose INT if port device does not provide clocking. Choose EXT if device generates clock signal.
Clock Speed	9600	1200-80000	This is the port speed in bits per second when using internal clocking.

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Station Address:

Port Record Configuration - MX25slav (continued)

Parameter	*Default*	*Range*	*Description/Action Required*
Number of PVC Channels	0	0 - 128	Enter number of PVC channels to be used on this station. Should match configuration in the master. Number of PVCs and SVCs should be as low as possible. PVC connections must be configured in the PVC Table. Note: Node Boot needed for changes to take effect.
Starting PVC Channel Number	1	1 - 255	Starting PVC channel number for this station. Should match configuration in the master. Not used if the number of PVCs = 0. Note: Node Boot needed for changes to take effect.
Number of SVC Channels	16	0 -255	Number of SVC channels on this station. Should match configuration in the master. Total SVCs and PVCs should be as low as possible. Note: Node Boot needed for changes to take effect.
Starting SVC Channel Number	1	0 - 255	Starting SVC channel number for this station. Should match configuration in the master. Not used if number of SVCs = 0. Note: Node Boot needed for changes to take effect.
Poll Timer	30	1 to 255	Worst case delay for a slave to respond to a poll frame sent by the master, including modem turn-around time, etc. Value in 10ths of seconds (30 = 3.0 seconds)
Tries	10	1-16	Minimum number of attempts to complete a transmission.
K Frame Window	7	1 to 7	Choose the same value of Frame Level Window for devices at each end of the link.
W Packet Window	2	1- 7	Packet level window size. Set to same value for devices at each end of link.
Restart Timer	180	5-255	Time in seconds. Restart-Timer Request Timer. When timer expires, request is resent.
Reset Timer	180	5-255	Time in seconds. Reset-Request Timer. When timer expires, request is resent.
Call Timer	200	5-255	Time in seconds. Call-Request Timer. When timer expires, call is cleared.
Clear Timer	180	5-255	Time in seconds. Clear-Request Timer. When timer expires, request is resent.
MX.25 Options	NONE	NONE HOLD CUG	No options specified. Hold calls over link restart. Check Closed User Group, otherwise CUG passes transparently.
Restricted Connection Port	0	0-48	Calls entering this port will be routed to the port number specified, regardless of Route Selection Table entries. Zero disables function.
CUG Membership	--,--, --,--, --,--, --,--	0-8 two digit numbers	A port may be a member of up to 8 CUGs. Separate each two-digit CUG membership by a comma (12,35,56,etc). No spaces permitted. -- = No CUG membership. 01-99 = CUG Membership.
Billing Records	OFF	OFF, ON	Controls creation of billing records for this port.

Multipoint X.25 Stations

The Multipoint X.25 Stations Table is used to provide information on the stations attached to an MX25 Port. The table is accessed via the Configure Menu it should be configured only for master stations.

Multipoint X.25 Station Record Configuration

Parameter	*Default*	*Range*	*Description/Action Required*
Port Number	1	1 - 48	Enter number of port to configure. This corresponds to the physical port position at the rear of the unit and is the Port Record reference number.
Station Number	1	Dynamic (max. 32)	Enter Slave Station Number.
Station Address	04	04-FE Hex	Enter Station Address.
Number of PVC Channels	0	0 - 255	Enter number of PVC channels to be used on this station. Should match configuration of the slave. Number of PVCs and SVCs should be as low as possible. PVC connections must be configured in the PVC Table. Note: Node Boot needed for changes to take effect.
Starting PVC Channel Number	1	1 - 255	Starting PVC channel number for this station. Should match configuration in the slave. Not used if the number of PVCs = 0. Note: Node Boot needed for changes to take effect.
Number of SVC Channels	16	0 -255	Number of SVC channels on this station. Should match configuration in the slave. Total SVCs and PVCs should be as low as possible. Note: Node Boot needed for changes to take effect.
Starting SVC Channel Number	1	0 - 255	Starting SVC channel number for this station. should match Should match configuration in the slave. Not used if number of SVCs = 0. Note: Node Boot needed for changes to take effect.
K Frame Window	7	1 to 7	Choose the same value of Frame Level Window for devices at each end of the link.
W Packet Window	2	1-7	Packet level window size. Set to same value for devices at each end of link.
MX.25 Options	NONE	NONE HOLD CUG	No options specified. Hold calls over link restart. Check Closed User Group, otherwise call passes transparently.
Restricted Connection Port Number	0	0-48	Calls entering this port will be routed to the port number specified, regardless of Route Selection Table entries. Zero disables function.
CUG Membership	--,--, --,--, --,--, --,--	0-8 two digit numbers	A port may be a member of up to 8 CUGs. Separate each two-digit CUG membership by a comma (12,35,56,etc). No spaces permitted. -- = No CUG membership. 01-99 = CUG Membership.
Billing Records	OFF	OFF, ON	Controls creation of billing records for this port.

ROUTE SELECTION TABLE

The Route Selection Table permits the Station Number for MX25 ports to be added. The Route Selection Table is accessed via the Configure Menu.

For example, to have a call with Network Address 55500123 route to Port 7 (an MX25 Port) and Station number 5, the following entry would be entered in the Route Selection Table:

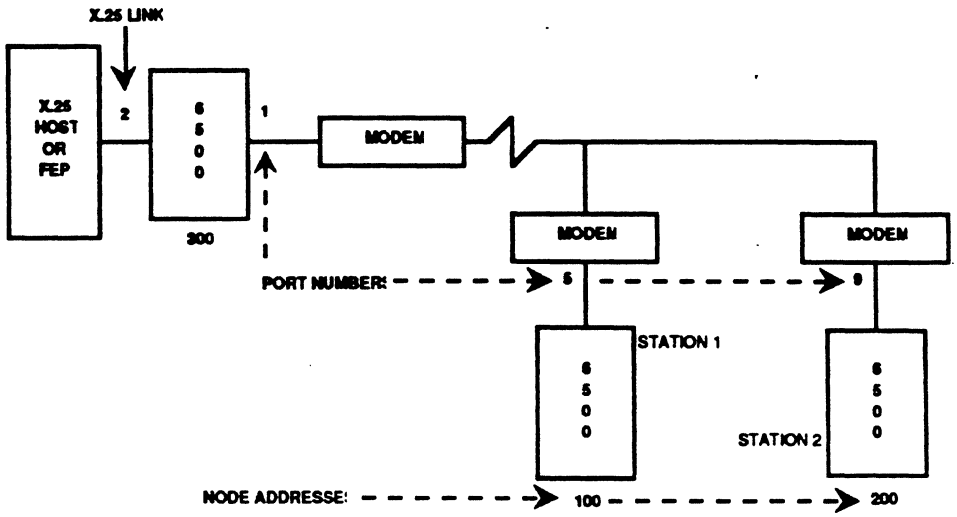
Address	*Port*	*Station*	*Priority*
55500123	7	5	1

MX25 ports are not node resources, and calls will not be routed to a Node Address plus Subaddress as with asynchronous PAD ports.

The called address must be in the routing table, along with a port that is to take calls for that address. The stations on the port will be connected on the basis of the route selection table station number attached to the port number.

CONFIGURATION EXAMPLE

A typical example of configuration for an MX25 application is shown in the following figure.



NODE 300 MX25 CONFIGURATION DETAIL

PORT RECORD
PORT 1, TYPE = MX25mas
No. Station = 2
All other parameters in Port Record = default values.

STATION RECORD
PORT 1
STATION 1
Station Address = 04
PVC, SVC, K Window, W Window parameters must match those for Node Address 100

STATION RECORD
PORT 1
STATION 2
Station Address = 05
PVC, SVC, K Window, W Window parameters must match those for Node Address 200

ROUTING TABLE

Entry	*Addr	Port	Station
1	302	2	0
2	1*	1	1
3	2*	1	2

NODE 100 MX25 CONFIGURATION DETAIL

PORT RECORD
PORT 5, TYPE = MX25slav
Station Address = 04
PVC, SVC, K Window, W Window parameters must match those for Node Address 300, Station 1, Port 1

ROUTING TABLE

Entry	Addr	Port	Station
1	3*	5	0
2	2	5	0

NODE 200 MX25 CONFIGURATION DETAIL

PORT RECORD
PORT 9, TYPE = MX25slav
Station Address = 05
PVC, SVC, K Window, W Window parameters must match those for Node Address 300, Station 2, Port 1

ROUTING TABLE

Entry	Addr	Port	Station
1	3*	9	0
2	1*	9	0

*** = Wildcard (match anything) character.**

In this example, a user on Node 100 who wishes to reach PAD Port 6 on Node 300, would enter "c 30006". Similarly, a user on node 200 wishing to access the CTP on Node 100, would enter "c 10098". Users wishing to reach the X.25 host on Port 2 of Node 300, would enter "c 302", from any node in the network.

ADMINISTRATION

Alarms and Events

The following is a list of alarms and events that could be generated by the MX25 firmware:

(1) ND10100 07 - MAR - 1990 01 - TWO MASTERS ON MULTIPOINT LINK
Indicates that two or more masters were detected on the same multipoint link.

(1) ND10100 07 - MAR - 1990 01 - MASTER POLLED EARLY
Indicates that a master polle before receiving a final frame from the slave.

(1) ND10100 07 - MAR - 1990 02s03 - STATION UP

(1) ND10100 07 - MAR - 1990 02s03 - STATION DOWN

(1) ND10100 07 - MAR - 1990 02s03 - STATION BOOT COMPLETE

(1) ND10100 07 - MAR - 1990 02s03 - STATION BOOT FAILURE

(3) ND10100 07 - MAR - 1990 02s03 (01) - CONNECTED TO 03s01 (03)
Indicates that channel 03s01 (03) on station 03 is connected to another channel.

Status and Statistics

Detailed Port Statistics. Statistics presentation for MX25 Ports are as follows:

```
                Detailed Port Stats

              Port Number:  2
                Port Type:  MX25mas
              Port Status:  up
               Port Speed:  9600
                  Data In:  2323
                 Data Out:  3443
           Data Frames In:  23
          Data Frames Out:  43
          Data In Per Sec:  23
         Data Out Per Sec:  34
  Data Frames In Per Sec:  2
 Data Frames Out Per Sec:  10
```

Detailed Station Statistics. Statistics for stations on a master MX25 Port can be viewed by invoking the proper entry in the Statistics Menu.

```
                Detailed Station Stats

                  Port Number: 2
                    Port Type: MX25mas
  Station Number (Address): 03 (C2)
              Station Status: up
                     Data In: 2323
                    Data Out: 3443
               Data Frames In: 23
              Data Frames Out: 43
              Data In Per Sec: 23
             Data Out Per Sec: 34
    Data Frames In Per Sec: 2
   Data Frames Out Per Sec: 10
```

Link Statistics. Selecting Link on the Status/Statistics Menu brings up information related to each configured link on the system. This includes: the interface/protocol type each port is configured for, the transmission speed of each, the current date and time, the number of CRC errors, Link down status (count of outages), and the number of data frames in/out. The screen will be similar to the following:

```
                        Link Statistics
      Node: MyNode Address: 00000 Date:05-APR-1990 Time: 07:10
                                                    Page: 01 of 01
                                                          Data
       Port                          State        CRC    Link  Frames
  ##   Type   State   Speed  Date/Time           Error  Down  In/Out
  01   MX25m          9600   13-Apr-1990         9             955
                                14:00:25               2     898
  s01             up          13-Apr-1990                     102
                                15:00:15               4      67
  s02             dn          13-Apr-1990                     456
                                14:00:34               3     167
  s03             up                                          102
                                                              673
```

Information in the "Type" column may be for either the MX25 master or MX25 slave.

Pressing any key returns you to the Status/Statistics Menu.

Packet Statistics. The Packet Stat selection on the Status/Statistics Menu provides information about packet transmission in general: number of current calls, maximum number of calls, calls blocked, data in/out and packets in/out. The screen will be similar to the following:

```
                    Packet Statistics
      Node: MyNode Address: 00000 Date:05-APR-1990 Time: 07:10
                                                  Page: 01 of 01

                        Current    Max.                      Data
      Port              Number     Number     Calls   Data   Packets
##    Type    State     Of Calls   Of Calls   Blocked In/Out In/Out
01    MX25m             50         80         5       3000   1000
                                                     6000   2000
s01           up        20         30         2       1000   300
                        10                            3000   1000
s02           dn                   20         2       1500   600
                                                     2000   800
```

Port level statistics is the sum of the Station level statistics.

Call Summary. The Status/Statistics Menu permits access to the Call Summary. This summarizes calls by caller port and station, called port, facility used, and the length of time connections were made.

```
                      Call Summary
      Node: MyNode Address: 00000 Date:05-APR-1990 Time: 07:10
                                                  Page: 01 of 01

 Called      Called Port      Facility      Connection
   ##          ##   Channel   R F C N          Time
 02s01         03       2

   Press any key to continue (ESC to exit) ...
```

Facility codes will be displayed if the billing option in the port or station record is enabled. The codes mean:

- R Reverse Charging
- F Fast Select
- N Network User Identification (NUI)
- C Closed User Group (CUG)

BOOT

Selecting Boot from the Main Menu calls up the following sub-menu:

```
Boot Menu


1.  Port
2.  MUX Channel
3.  Station
4.  Tables and Node Record
5.  Node

Press any key to continue (ESC to exit) ...
```

Boot Procedures. Booting updates node operation with the current version of configuration memory. When a node is booted, configuration records are examined and relevant information is copied into working memory for the ports, tables, and channels in the node. While the node is running, the CTP can change the value of parameters in the records, or add and delete records in configuration memory. However, changes will not take effect until the node is booted and configuration memory is copied into working memory.

The following rules apply to Boot Commands:

- booting disrupts communications on the section of the node being booted. For example, a Port Boot clears all calls on that port.
- changes to working configurations do not occur until a boot is completed.
- changes to parameters in any table or port, which change working memory, require a Node Boot. For example, altering the number of logical channels on an X.25 link.

Changing parameters in a record will, in most cases, require that only the table or port record be booted, not the entire node. Where a Node Boot is needed parameters are prefaced by an asterisk (*) when it is displayed by the CTP. For example, changing the number of SVCs on a link requires a Node Boot, so the Port Record parameter is displayed with an asterisk in front of the line.

A Port Boot is required after configuring an MX25 Port.

COPY/INSERT RECORD

Selecting Copy/Insert Record on the Main Menu will present the following menu:

```
     Copy/Insert Record
1.  Copy Port
2.  Copy MUX Channel
3.  Copy PAD Profile
4.  Copy MX25 Station
5.  Copy SDLC Station
6.  Copy Special PAD Profile from PROM
7.  Insert Route Selection Entry
8.  Insert Inbound Translation Entry
9.  Insert Outbound Selection Entry

 Press any key to continue (ESC to exit) ...
```

The Copy/Insert Menu eliminates the need to individually enter all data for similar ports, stations, channels, and PAD profiles, for each new record. The copy command is useful for:

- configuring many ports which are the same, or nearly the same. In the later case, simply edit small changes as required after the copy has been made.
- configuring identical records. The copy command removes the chance of error in repeatedly entered data.

The insert command is used for tables where the order in which the records occur is important. For example, in the Route Selection Table, if the addresses are arranged in the following way, the scan of the table will produce two different matches for the same called address.

Arrangement #1		*Arrangement #2*	
Address	***Port/Station/Priority***	***Address***	***Port/Station/Priority***
8*	1/0/1	89*	2/0/1
89*	2/0/1	8*	1/0/1

If the called address is 89333, then arrangement #1 will route the call out port 1, but arrangement #2 will route it to port 2, even though the individual records are identical.

There are two ways to insert a new record into an existing table:

- Enter the new record at the desired position and re-enter succeeding records one position further along.
- Insert a new default record at the desired position using the insert command. All records from this position on are automatically moved one position further. The new record will have blank addresses and port entries will be set to zero in the Route Selection Table. You can then edit to the desired values with the Configure command.

PORT/STATION/CHANNEL CONTROL

Selecting Port/Station/Channel Control on the Main Menu will cause the following menu to appear:

```
  Port/Station/Channel Control
1.  Disconnect Call
2.  Disable Port
3.  Enable Port
4.  Busy Out Port
5.  Disable Station
6.  Enable Station
7.  Busy Out Station


Press any key to continue (ESC to exit) ...
```

Disable Station

The Disable Station selection on the Port/Channel Control Menu allows selected stations to be disabled, preventing access from all sources.

Entering a valid station number causes the request to be executed following display of a warning message telling you that loss of data may occur. If you continue, the request will be acted on immediately.

Enable Station

The Enable Station selection on the Port/Channel Control Menu allows you to enable a selected station, allowing access from all sources.

Port Number:	1 - 48
Station Number:	1 - 32

Entering a valid station number will cause the request to be executed .

RETURN PROCEDURES

When returning equipment to Codex from the United States, telephone the Codex Return Material Authorization (RMA) Coordinator at (508-261-4000). You will be asked to supply the following information for each piece of equipment to be returned:

- Product name and description
- Serial number
- Customer order number
- Reason for return
- Failure Symptoms (if repair service is required)
- Warranty status

The RMA coordinator will issue an RMA number for the equipment. Mark this number clearly on the shipping container for ease of identification and faster service. The RMA number is for shipment control and does not affect the provisions of a sales/lease agreement.

Ship all equipment to the following address:

Codex Corporation,
20 Cabot Blvd.,
Mansfield, Massachusetts 02048-1193
U.S.A.

Att: ERR RMA No. _____

If possible, return the unit in the original shipping container.

Alternatively, wrap the unit in 1/2 inch (1.27 cm) air-cell material with at least 2 inches (5 cm) of cushioning and ship in a single-wall container.

At minimum, ship the unit in a single-wall container with at least 3 inches (7.6 cm) of flowable material cushioning.

Appendix A
Node Worksheets

INTRODUCTION

Before attempting on-line configuration of your network, Codex strongly recommends that it first be planned on paper. Properly completed Node Worksheets are a useful configuration tool and also provide a permanent record of the operating characteristics and configuration of your network.

Enter the characteristics for your configuration onto the appropriate Node Worksheets before attempting on-line configuration of your network. Should you require extra copies of any node worksheet to record the operating characteristics and configuration of your network, photocopy additional blank node worksheets, as required, before you record any information. These worksheets may be used with Firmware Revision 1.10.

CONTENTS

Form 1
PORT RECORD - MX25mas

Port Number					
* Port Type					
Clock Source					
Clock Speed					
* Number of Stations					
Poll Timer					
Poll Frequency Period					
Tries					
Restart Timer					
Reset Timer					
Call Timer					
Clear Timer					

Form 1
PORT CONFIGURATION - MX25mas

Parameter	*Default*	*Range*	*Description/Action Required*
Port Number	1	1 - 48	Enter number of port to configure.
* Port Type	X25	NULL X25 PAD MUX MX25mas MX25slav HPADxonxoff HPADenqack TPADxonxoff TPADenqack	Enter type of port desired. Note: Node Boot need for changes to take effect.
Clock Source	EXT	INT or EXT	Choose INT if port device does not provide clocking. Choose EXT if device generates clock signal.
Clock Speed	9600	1200-80000	This is the port speed in bits per second when using internal clocking.
* Number of stations	2	1-16	Enter number of stations for this port. Note: Node Boot needed for changes to take effect.
Poll Timer	30	1-255	Includes time to send a poll to the slave, for the slave to send a full window of frames equal to the packet size, and the modem turn-around time.
Poll Frequency Period	50	5 to 255 msec	Limits number of polls per second to this number when no data is exchanged.
Tries		1-16	Maximum number of attempts to complete a transmission.
Restart Timer	180	5-255	Time in seconds. Restart-Request Timer. When timer expieres, request is resent.
Reset Timer	180	5-255	Time in seconds. Reset-Request Timer. When timer expires, request is resent.
Call Timer	200	5-255	Time in seconds. Call-Request Timer. When timer expires, call is cleared.
Clear Timer	180	5-255	Time in seconds. Clear-Request Timer. When timer expires, request is resent.

Form 2
PORT RECORD - MX25slav

Port Number					
* Port Type					
Clock Source					
Clock Sopeed					
Station Address					
* Number of PVC Channels					
* Starting PVC Channel Number					
* Number of SVC Channels					
* Starting SVC Channel Number					
Poll Timer					
Tries					
K Frame Window					
W Packet Window					
Restart Timer					
Reset Timer					
Call Timer					
Clear Timer					
MX.25 Options					
Restricted Connection Port Number					
CUG Membership					
Billing Records					

Form 2
PORT CONFIGURATION - MX25slav

Parameter	*Default*	*Range*	*Description/Action Required*
Port Number	1	1 - 48	Enter number of port to configure.
* Port Type	X25	NULL X25 PAD MUX MX25mas MX25slav HPADxonxoff HPADenqack TPADxonxoff TPADenqack	Enter type of port desired. Note: Node Boot needed for changes to take effect.
Clock Source	EXT	INT or EXT	Choose INT if port device does not provide clocking. Choose EXT if device generates clock signal.
Clock Speed	9600	1200-80000	This is the port speed in bits per second when using internal clocking.
Station Address	01	04-FE Hexadecimal	Enter Station Address
* Number of PVC Channels	0	0 -8	Enter number of PVC channels to be used on this station. Should match configuration in the master. Number of PVCs and SVCs should be as low as possible. PVC connections must be configured in the PVC Table. Note: Node Boot needed for changes to take effect.
* Starting PVC Channel Number	1	1 - 4095	Starting PVC channel number for this station. Should match configuration used in the master. Not used if the number of PVCs = 0. Note: Node Boot needed for changes to take effect.
* Number of SVC Channels	16	0 -32	Number of SVC channels in this station. Should match configuration in the master. Total SVCs and PVCs should be as low as possible. Note: Node Boot needed for changes to take effect.
* Starting SVC Channel Number	1	0 - 4095	Starting SVC channel number for this station. Should match configuration in the master. Not used if number of SVCs is 0. Note: Node Boot needed for changes to take effect.
Poll Timer	30	1 to 255, 0 in 10ths of sec.	Sets Poll Timer . This is the time an idle link is probed for assurance of connection to the remote device. Normally set to a value greater than T1. 0 = Timer Disabled.
Tries	10	1-16	Maximum number of attempts to complete a transmission.

(continued next page)

Form 2
PORT CONFIGURATION - MX25slav (continued)

Parameter	*Default*	*Range*	*Description/Action Required*
K Frame Window	7	1 to 15	Choose the same value of Frame Level Window for devices at each end of the link.
W Packet Window	2	1-15	Packet level window size. Set to same value in devices at each end of link.
Restart Timer	180	5-255	Time in seconds. Restart-Request Timer. When timer expires, request is resent.
Reset Timer	180	5-255	Time in seconds. Reset-Request Timer. When timer ex-pires, request is resent.
Call Timer	200	5-255	Time in seconds. Call-Request Timer. When timer expires, call is cleared.
Clear Timer	180	5-255	Time in seconds. Clear-Request Timer. When timer ex-pires, request is resent.
X.25 Options	NONE	NONE HOLD CUG	No options specified. Hold calls over link restart. Check Closed User Group, otherwise call passes trans-parently.
Restricted Connection Port Number	0	0-48	Calls entering this port will be routed to the port specified, regardless of Route Selection Table entries. Zero disables function.
CUG Membership	--,--, --,--, --,--, --,--	0-8 two digit numbers	A port may be a member of up to 8 CUGs. Separate each two-digit CUG membership by a comma (12,35,56,etc). No spaces permitted. -- = No CUG membership. 00-99 = CUG Membership.
Billing Records	OFF	OFF, ON	Controls creation of billing records for this port.

Form 3
MX25 STATION TABLE

Port Number					
Station Number					
Station Address					
Number of PVC Channels					
Starting PVC Channel Number					
Number of SVC Channels					
Starting SVC Channel Number					
K Frame Window					
W Packet Window					
X.25 Options					
Restricted Connection Port					
CUG Membership					
Billing Records					

Form 3
MX25 STATION TABLE

Parameter	*Default*	*Range*	*Description/Action Required*
Port Number	1	1 - 48	Enter number of port to configure. This corresponds to the physical port position at the rear of the unit and is the Port Record reference number.
Station Number		1-16	Enter Station Number.
Station Address		04-FE Hexadecimal	Enter Station Address.
* Number of PVC Channels	0	0 -8	Enter number of PVC channels for this station. Should match configuration in the slave. Number of PVCs and SVCs should be as low as possible. PVC connections must be configured in the PVC Table. Note: Node Boot needed to take effect.
* Starting PVC Channel Number	1	1 - 4095	Starting PVC channel number for this station. Should match configuration in the slave. Not used if the number of PVCs = 0. Note: Node Boot needed to take effect.
* Number of SVC Channels	16	0 -32	Number of SVC channels on this station. Should match configuration of slave. Total SVCs and PVCs should be as low as possible. Note: Node Boot needed to take effect.
* Starting SVC Channel Number	1	0 - 4095	Starting logical channel number for SVCs on this link. Not used if number of SVCs =0. Note: Node Boot needed to take effect.
K Frame Window	7	1 to 15	Choose the same value of Frame Level Window for devices at each end of the link.
W Packet Window	2	1-15	Packet level window size. Set to same value in devices at each end of link.
X.25 Options	NONE	NONE HOLD CUG	No options specified. Hold calls over link restart. Check Closed User Group, otherwise call passes trans-parently.
Restricted Connection Port	0	0-48	Calls entering this port will be routed to the Port Number specified, regardless of Route Selection Table entries. Zero disables function.
CUG Membership	- -,...- -	0-8 two digit numbers	A port may be a member of up to 8 CUGs. Separate each two-digit CUG membership by a comma (12,35,56,etc). No spaces permitted. - - = No CUG membership. 00-99 = CUG Membership.
Billing Records	OFF	OFF, ON	Controls creation of billing records for this port.