

# I-O 8494 Remote Controller

## Quick Setup & User's Guide

### Version 1.11

I-O 8494 Remote Controller User's Guide  
Part No. 8494-OMAN01-111

Version 1.11  
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## **WARNING**

The connection of a non-shielded equipment interface cable to this equipment will invalidate the FCC Certification of this device and may cause interference levels which exceed the limits established by the FCC for this equipment. It is the responsibility of the user to obtain and use a shielded equipment interface cable with this device.

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This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

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## PREFACE

I-O Corporation (I-O) is pleased to introduce you to the I-O 8494 Remote Controller. The sections contained in this manual will give you the information you need to get the most from your I-O 8494 Remote Controller.

The first section of this user's guide contains a **QUICK SETUP GUIDE** which provides an easy-to-use setup for the I-O 8494 Remote Controller.

The five sections contained in the User's Guide that will give you the information you need are:

1. **INTRODUCTION** - Provides an overview of the I-O 8494.
2. **HOST CONFIGURATION** - Explains how to configure a host line, remote controller, and devices on your host system.
3. **CONTROLLER INSTALLATION** - Explains the installation and configuration process for the I-O 8494 Remote Controller.
4. **OPERATION** - Provides an overview of how to establish communications with the host.
5. **PROBLEM RESOLUTION** - Provides a troubleshooting guide.

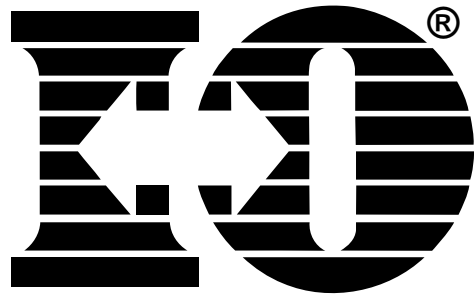
Great care has been taken in the preparation of this manual. If you encounter inaccuracies or omissions, please contact I-O at the address printed inside this manual, Attn: Product Manager, Remote Controllers.

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## GLOSSARY

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# I-O 8494 Remote Controller

## Quick Setup Guide

### Version 1.11

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Thank you for buying the I-O 8494 Remote Controller. We want to make it as simple as possible to get your I-O Remote Controller and attached devices up and running. The following information will help you get started.

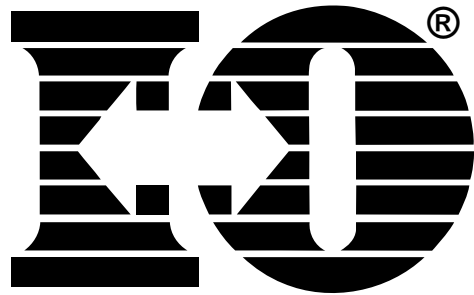
#### Introduction

The I-O 8494 Remote Controller is compatible with the IBM 5494, IBM 5394 and IBM 5294. Depending on how many twinax cards are present, and how they are grouped together, the I-O 8494 may appear to a host computer to be more than one controller. Typical emulation options include:

- Up to three 28-device IBM 5494's on the AS/400
- A 56-device IBM 5494 on the AS/400
- Up to six 14-device IBM 5494's on the AS/400
- Up to six 8-device or 14-device 5394's on the AS/400
- Up to three 16-device or 21-device IBM 5394's on the AS/400
- Up to six 8-device IBM 5294's on the AS/400, System/38, or System/36
- One APPC controller on the AS/400 for Ethernet or Token-Ring LAN gateway support (up to 80 LAN devices supported).

The operating software for the I-O 8494 is contained on a 3 1/2" diskette and is loaded using the I-O 8494's diskette drive. Configuration of the controller is set up through an attached display station, or by using a PC with the 8494UP program. After an initial configuration has been saved to the diskette, the I-O 8494 Remote Controller loads the operating software and configuration records from the diskette each time you power-on. You can alter the configuration and then save your modifications onto the diskette.

The following pages in the Quick Setup Guide show the relationships between fields in the 8494 configuration and those of the host.



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# Quick Setup Guide

## Upstream LAN Configuration (Ethernet)

### Fields on I-O 8494

AA - 5 = Ethernet  
 DX - 5 = LAN connection type<sup>1</sup>  
 1 - 00 = Default, U.S. Language  
 E - 0 = Default, IEEE 802.3 Frame Format  
 F - 04 = Default, 8494 Ethernet SAP<sup>2</sup>  
 G - 01 = Default, Response Timer (T1)<sup>2</sup>  
 H - 30 = Default, Inactivity Timer (Ti)<sup>2</sup>  
 I - 030 = Default, Receiver Ack. Timer (T2)<sup>2</sup>  
 J - 08 = Default, Retry Count<sup>2</sup> (N2)  
 P - Optional Default Printer<sup>3</sup>  
 11 - Default, local network ID (example: APPN)<sup>4</sup>  
 12 - ET5494 = 8494 LU Name  
 13 - ET5494 = Control Point (CP) Name  
 14 - QRMTWSC = Default, Mode Name  
 15 - 0 020018810000<sup>8</sup> = 8494 connection number  
 16 - 010 06 = Default, Retry Count & Interval  
 17 - N/A  
 H1:1 - S0000000<sup>8</sup> = AS/400 System LU Name  
 H1:2 - AS/400 Network Name<sup>5</sup>  
 (example: APPN)  
 H1:3 - 8494 Local Network Name<sup>6</sup>  
 (example: APPN)  
 H1:4 - QRMTWSC = Mode Name for this  
 AS/400 connection  
 H1:5 - 0 02000000A400<sup>7</sup> = Ethernet address of  
 AS/400-----  
 H1:7 - 04 = Default, AS/400 Ethernet SAP  
 H1:8 - 2 = Default, AS/400 System Max.Out  
 H1:9 - 1 = Default, AS/400 System Max.In

### AS/400 Line Description (Ethernet) (CRTLINETH)

Line description	ETLINE
Resource names	
Online at IPL	*YES
Vary on wait	*NOWAIT
Attached nonswitched NWI	*NONE
DLC identifier	*NONE
Local adapter address	02000000A400
Exchange identifier	*SYSGEN
Ethernet standard	*ALL
SSAP List:	
Source service access point	*SYSGEN
SSAP maximum	
SSAP type	
+ for more values	
Text 'description'	LAN Ethernet

### AS/400 Controller Description (CRTCTLAPPC)

Controller description	LANET01
Link type	*LAN
Online at IPL	*YES
Switched connection	*NO
Switched network backup	*NO
APPN-capable	*YES
Maximum frame size	521
Remote network identifier	APPN
Remote control point	ET5494
Exchange identifier	
LAN remote adapter address	020018810000
LAN DSAP	04
LAN SSAP	04

### IWS (PC OR PS/2) attached to the controller (type config.pcs)

```

C:\PCS>type config.pcs
SFLR 1,I, , S00000008
RTLN APPN.ET03
RTYP 5250
EMLI S00000008,0
C:\PCS>
  
```

**Note:** No APPC controller needs to be configured on the AS/400 if "auto config" is active.

## QUICK SETUP

---

- 1
- 5 = Ethernet, BNC connection
  - 6 = Ethernet, RJ-45 connection
  - 7 = Ethernet, DB-15 AUI connection

2 If any of these parameters are changed, host parameters must also be modified.

3 Refers to printer that will print out the configuration screens during the configuration of the I-O 8494 remote controller (printouts are requested via print key).

4 To find this name, from an AS/400 command line type DSPNETA for display network attributes. You can also select "Communications" (opt 6) from the AS/400 Main Menu on the host that the controller is physically connected to, select "Network Management" (opt 5) from the Communications Menu, and select "Display Network Attributes" (opt 1) from the Network Management Menu.

5 If the host you want to communicate with is on a network other than the one defined in Field #11, define the host's network ID (LCLNETID) in this field. Select option 6 (Display APPN Information) from the AS/400 Network Management menu on the host you want to communicate with to display the name of the Network ID.

6 If the remote controller is on a network other than the one defined in Field #11, define the remote controller's network ID (RMTNETID) in this field. Select option 6 (Display APPN Information) from the AS/400 Network Management Menu to display the name of the network ID.

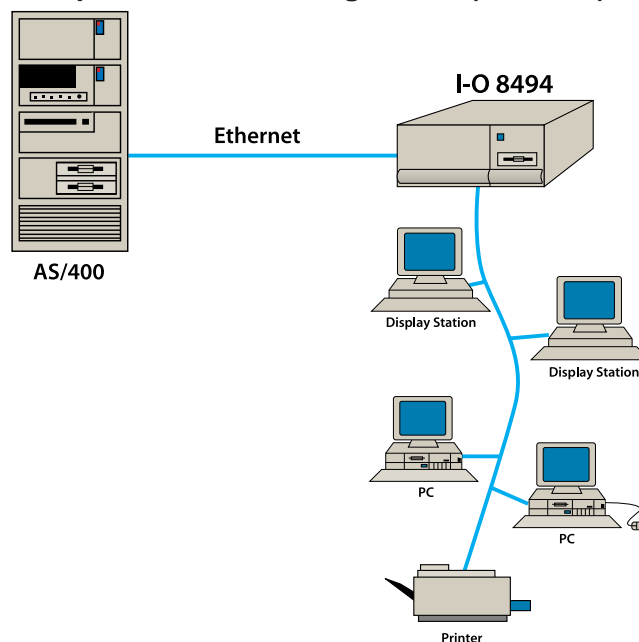
7 First field has three options 0, 1 or 2.

- 0 = Adapter address displayed by configuration program in normal style.
- 1 = Adapter address displayed by configuration program in bit swapped style.
- 2 = Uses the burned in address style.

You can display the burned-in address through the key sequence "Alt, Hex, F7" when the controller is in operational mode.

8 Each AS/400 system LU name is unique. This can be your system serial number or a specific name assigned by your system administrator.

### Upstream LAN Configuration (Ethernet)



# Quick Setup Guide

## Upstream LAN Configuration (Token-Ring)

### Fields on I-O 8494

- AA - 4 = Token-Ring
- DX - 3 = LAN connection type<sup>1</sup>
- 1 - 00 = Default, U.S. Language
- F - 04 = Default, 8494 Token-Ring SAP<sup>2</sup>
- G - 01 = Default, Response Timer (T1)<sup>2</sup>
- H - 30 = Default, Inactivity Timer (Ti)<sup>2</sup>
- I - 030 = Default, Receiver Ack. Timer (T2)<sup>2</sup>
- J - 08 = Default, Retry Count<sup>2</sup> (N2)
- P - Optional Default Printer<sup>3</sup>
- 11 - Default, local network ID (example: APPN)<sup>4</sup>
- 12 - TR5494 = 8494 LU Name
- 13 - TR5494 = Control Point (CP) Name
- 14 - QRMTWSC = Default, Mode Name
- 15 - 1 400018810000<sup>8</sup> = 8494 connection number
- 16 - 010 06 = Default, Retry Count & Interval
- 17 - N/A
- H1:1 - S0000000<sup>8</sup> = AS/400 System LU Name
- H1:2 - AS/400 Network Name<sup>5</sup>  
(example: APPN)
- H1:3 - 8494 Local Network Name<sup>6</sup>  
(example: APPN)
- H1:4 - QRMTWSC = Mode Name for this  
AS/400 connection
- H1:5 - 1 40000000A400<sup>7</sup> = Token-Ring address  
of AS/400
- H1:7 - 04 = Default, AS/400 Token-Ring SAP
- H1:8 - 2 = Default, AS/400 System Max.Out
- H1:9 - 1 = Default, AS/400 System Max.In

#### AS/400 Line Description (Token-Ring) (CRTLINTRN)

Line description	TRLINE
Resource names	
Online at IPL	*YES
Vary on wait	*NOWAIT
Attached nonswitched NWI	*NONE
DLC identifier	*NONE
Local adapter address	40000000A400
Exchange identifier	*SYSGEN
Ethernet standard	*ALL
SSAP List:	
Source service access point	*SYSGEN
SSAP maximum	
SSAP type	
+ for more values	
Text 'description'	LAN Token-Ring

#### AS/400 Controller Description (CRTCTLAPPC)

Controller description	LANTR01
Link type	*LAN
Online at IPL	*YES
Switched connection	*NO
Switched network backup	*NO
APPN-capable	*YES
Maximum frame size	521
Remote network identifier	APPN
Remote control point	TR5494
Exchange identifier	
LAN remote adapter address	400018810000
LAN DSAP	04
LAN SSAP	04

#### IWS (PC OR PS/2) attached to the controller (type config.pcs)

```
C:\PCS>type config.pcs
SFLR 1,1, , S00000008
RTLN APPN.TR03
RTYP 5250
EMLI S00000008,0
C:\PCS>
```

**Note:** No APPC controller needs to be configured on the AS/400 if the "Auto Config" is active.

## QUICK SETUP

---

- 1
- 1 = Token-Ring, 4 MB, DB-9 connection
  - 2 = Token-Ring, 4MB, RJ-45 connection
  - 3 = Token-Ring, 16MB, DB-9 connection
  - 4 = Token-Ring, 16MB, RJ-45 connection

2 If any of these parameters are changed, host parameters must also be modified.

3 Refers to printer that will print out the configuration screens during the configuration of the I-O 8494 remote controller (printouts are requested via print key).

4 To find this name from an AS/400 command line type DSPNETA for display network attributes. You can also select "Communications" (opt 6) from the AS/400 Main Menu on the host the controller is physically connected to, select "Network Management" (opt 5) from the Communications Menu, and select "Display Network Attributes" (opt 1) from the Network Management Menu.

5 If the host you want to communicate with is on a network other than the one defined in Field #11, define the host's network ID (LCLNETID) in this field. Select option 6 (Display APPN Information) from the AS/400 Network Management menu on the host you want to communicate with to display the name of the Network ID.

6 If the remote controller is on a network other than the one defined in Field #11, define the remote controller's network ID (RMTNETID) in this field. Select option 6 (Display APPN Information) from the AS/400 Network Management Menu to display the name of the network ID.

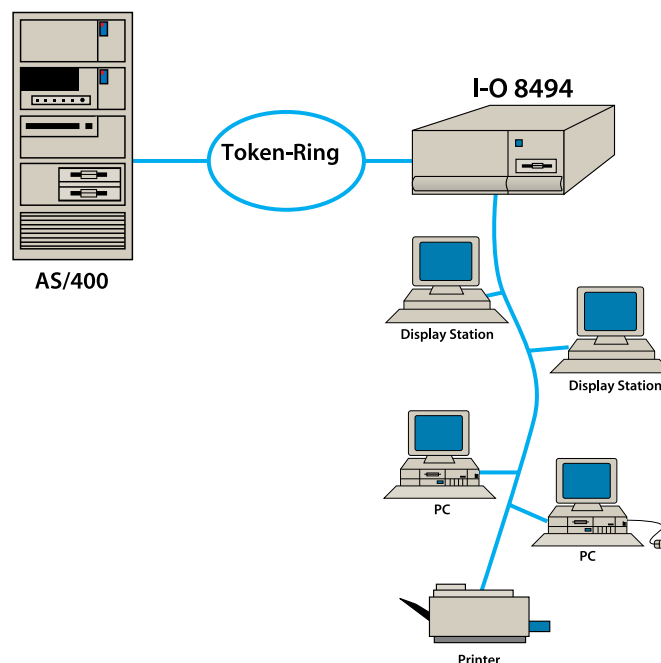
7 First field has three options 0, 1 or 2.

- 0 = Adapter address displayed by configuration program in normal style.
- 1 = Adapter address displayed by configuration program in bit swapped style.
- 2 = Uses the burnt in address style.

You can display the burned-in address through the key sequence "Alt, Hex, F7".

8 Each AS/400 system LU name is unique. This can be your system serial number or a specific name assigned by your system administrator.

### Upstream LAN Configuration (Token-Ring)



# Quick Setup Guide

## For SNA/SDLC LAN Gateway Configuration (Downstream)

### Fields on I-O 8494

AA - 0 = SNA/SDLC Communication  
 BB - 2 = 5494 Emulation Mode  
 DD - 1 = LAN Gateway Configuration  
 DX - 6 = Default, LAN connection type<sup>1</sup>  
 1 - N/A  
 2 - Controller address (example = 01)  
 3 - Line Facility & Data Encoding  
 (example = 0000000, half duplex/MP/NRZI)  
 10 - Baud rate (use only if locally attached)<sup>2</sup>  
 K - LAN address (example: 020018810000)  
 L - 04 = Default, Service Access Point (SAP)<sup>3</sup>  
 M - 01 = Default, Response Timer (T1)<sup>3</sup>  
 N - 30 = Default, Inactive Timer (Ti)<sup>3</sup>  
 O - 030 = Default, Receiver Ack. Timer (T2)<sup>3</sup>  
 Q - 08 = Default, Retry Count (N2)<sup>3</sup>  
 R - 2 = Default, LAN Maximum Out (TW)<sup>3</sup>  
 S - 1 - Default, Maximum In (N3)<sup>3</sup>  
 P - Optional, default printer<sup>4</sup>  
 11 - Default local network ID  
 (example: APPN)<sup>5</sup>  
 12 - N/A  
 13 - Control Point (CP) Name  
 (example: ET5494)  
 14 - N/A  
 15 - N/A  
 16 - 010 06 = Default, Retry Count & Interval  
 17 - N/A  
 H1:1 - S 0000000<sup>8</sup> = AS/400 System LU Name  
 H1:2 - AS/400 Network Name<sup>6</sup>  
 (example: APPN)  
 H1:3 - 8494 Local Network Name<sup>7</sup>  
 (example: APPN)  
 H1:4 - N/A  
 H1:5 - No Entry = SNA/SDLC Communications

### AS/400 Line Description (CRTLINS DLC)

Line description	TXLINE1
Resource names	LINE011
	+ for more values
Online at IPL	*YES
Data link role	*NEG
Physical Interface	*RS232V24
Connection type	*MP
Switched network backup	*NO
Exchange identifier	*SYSGEN
NRZI data encoding	*YES
LINE speed	9600
Modem type supported	*NORMAL
Maximum frame size	521
Duplex	*Half
Inactivity timer	300
Poll response delay	0
Nonproductive receive timer	320
Idle timer	30
Connect poll timer	30
Frame retry	7
Text 'description'	LINE011, SNA/SDLC, . . .

### AS/400 Controller Description (CRTCTLAPPC)

Controller description	LANTR01
Link type	*SDLC
Online at IPL	*YES
Switched connection	*NO
Switched network backup	*NO
APPN-capable	*YES
Attached nonswitched line	TXLINE1
Maximum frame size	521
Remote network identifier	APPN
Remote control point	ET5494
Exchange identifier	
Data link role	*NEG
Station address	01
APPN CP session support	*YES
APPN node type	*ENDNODE
APPN transmission group number	1
Autodelete service	1440
User-defined 1	*LIND
User-defined 2	*LIND
User-defined 3	*LIND
Text 'description'	LAN, Ethernet #01

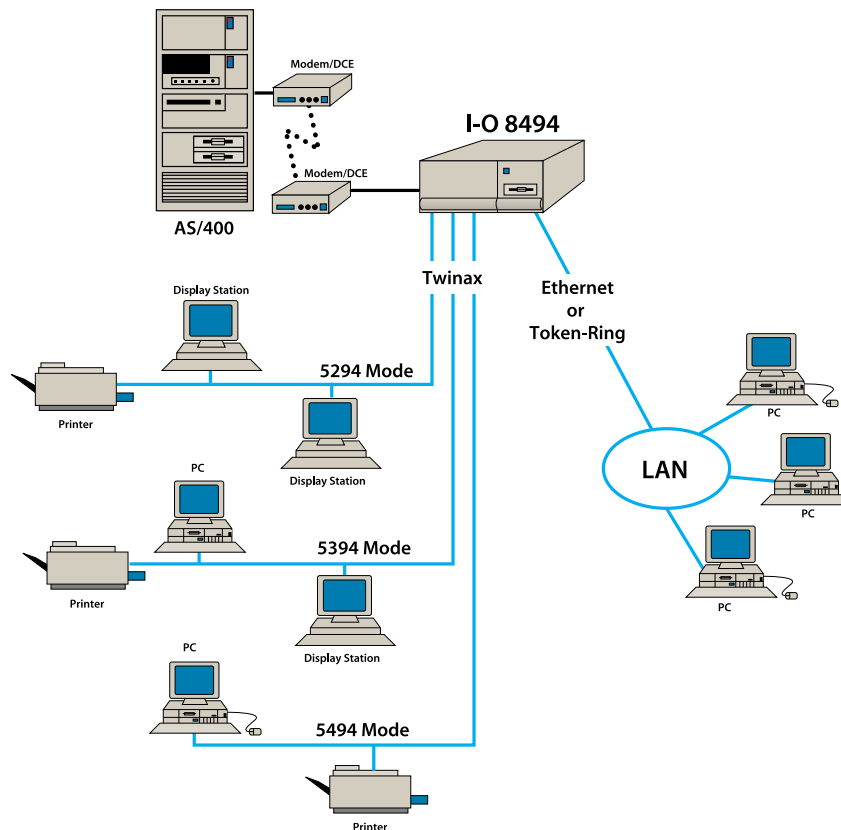
### IWS (PC or PS/2) on the LAN (type config.pcs)

```
C:\PCS>type config.pcs
SFLR 1, I, , S0000000
UPDT I:\QIWSFLR, C:\PCS, S, , , PC Support/400
RYPE ITRN
RTLN APPN.ET03
TRLI S0000000, 400018810000
C:\PCS>
```

## QUICK SETUP

- 1 = Token-Ring, 4MB, DB-9 connection  
2 = Token-Ring, 4MB, RJ-45 connection  
3 = Token-Ring, 16MB, DB-9 connection  
4 = Token-Ring, 16MB, RJ-45 connection
- 5 = Ethernet, BNC connection  
6 = Ethernet, RJ-45 connection  
7 = Ethernet, DB-15 AUI connection
- 2 This field should only be used if the controller is connected to the host using internal null modem and modem eliminator cable.
- 3 If any of these parameters are changed, PC Support setup must also be modified.
- 4 Refers to printer that should print the configuration screens during the configuration of the I-O 8494 remote controller (printouts are requested via print key).
- 5 To find this name from an AS/400 command line type in "DSPNETA" and press Enter, or select "Communications" (opt 6) from the AS/400 Main Menu on the host the controller is physically connected to, select "Network Management" (opt 5) from the Communications Menu, and select "Display Network Attributes" (opt 1) from the Network Management Menu.
- 6 If the host you want to communicate with is on a network other than the one defined in Field #11, define the host's local network ID (LCLNETID) in this field. Select option 6 (Display APPN Information) from the AS/400 Network Management menu on the host you want to communicate with to display the name of the Network ID.
- 7 If the remote controller is on a network other than the one defined in Field #11, define the remote controller's network ID (RMTNETID) in this field. Select option 6 (Display APPN Information) from the AS/400 Network Management Menu to display the name of the network ID.
- 8 Each AS/400 system LU name is unique. This can be your system serial number or a specific name assigned by you system administrator.

### SNA/SDLC LAN Gateway Configuration

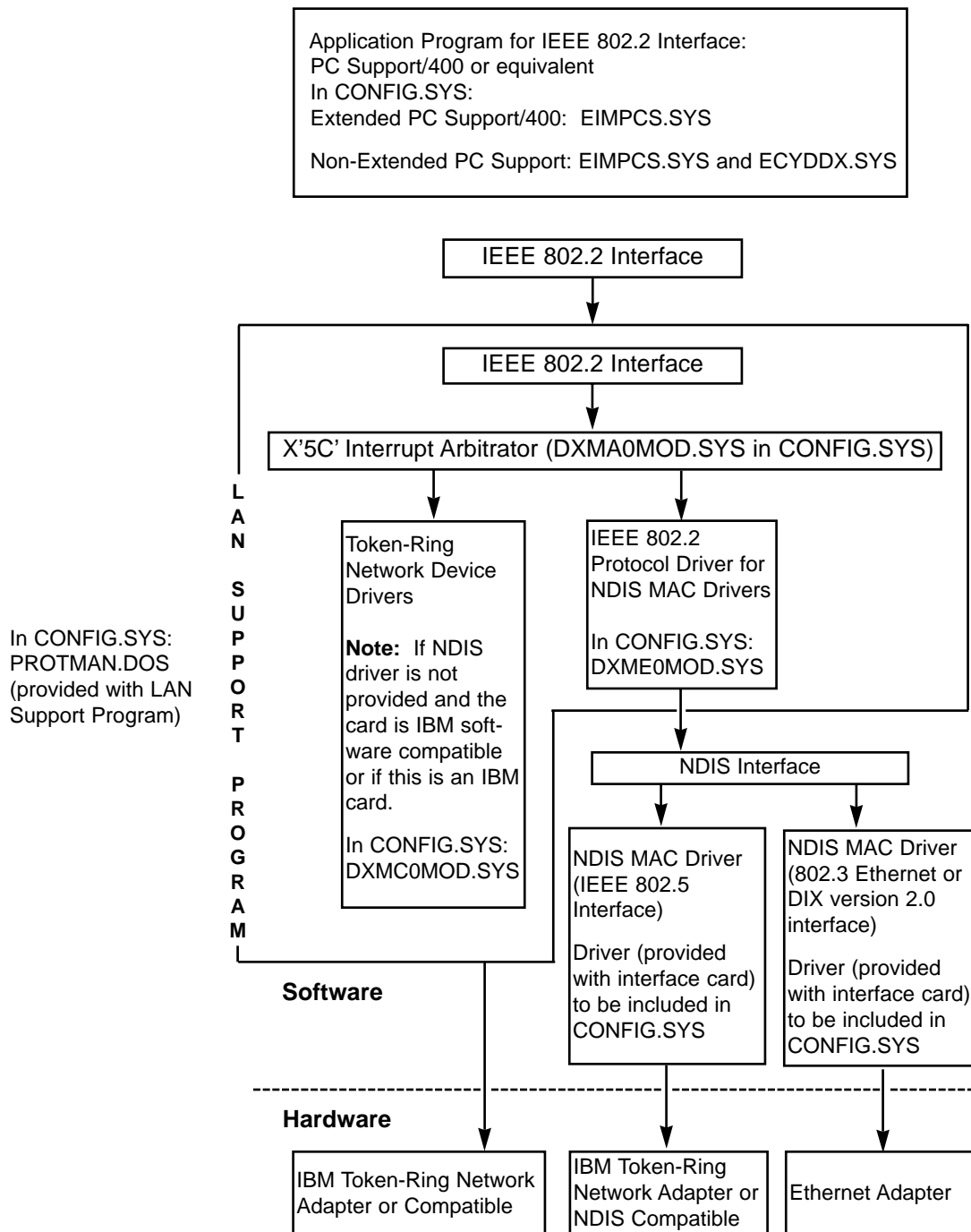


## PC NODE GATEWAY CONFIGURATION

**Note:** The CONFIG.PCS file must contain:

1. LAN address (must correspond with LAN address on the controller). **Note:** If Ethernet, the address must be inverted.
2. System name (must be equal to the AS/400 serial number).
3. RTLN XXXX.XXX (for example: "APPN" must equal the Network Name (RMTCPNAME) from the host system command CRTCTLAPPC; "TR03" must be unique among all nodes in the network).

**Note:** The AUTOEXEC.BAT file must contain NETBIND (supplied with the LAN Support Program).



## QUICK SETUP

---

### Configuration Sample Using IBM Ethernet Card:

#### CONFIG.PCS

```
C:\PCS>type CONFIG.PCS
SFLR 1,I,,S1000000
UPDT I:\QIWSFLR, C:\PCS,S,,,PC SUPPORT/400
RTYP ITRN
RTLN APPN.TR03
TRLI S1000000,400018810000
C:\PCS>
```

The following lines should be added to the CONFIG.SYS file.

#### CONFIG.SYS

```
C:\>type CONFIG.SYS
Device = C:\DOS\SETVER.EXE
Device = C:\DOS\HIMEM.SYS
Device = C:\DOS\EMM386.EXE
DOS = HIGH
FILES = 30
Device = \LSP_IBM\PROTMAN.DOS /I:\LSP_IBM
Device = \LSP_IBM\IBMENI.DOS
Device = \LSP_IBM\DXMA0MOD.SYS 001
Device = \LSP_IBM\DXME0MOD.SYS
Device = \C:\PCS\EIMPCS.SYS
C:\>
```

The following lines should be added to the AUTOEXEC.BAT file.

#### AUTOEXEC.BAT

```
C:\>type AUTOEXEC.BAT
@ ECHO OFF
\LSP_IBM\NETBIND
PROMPT $p$g
PATH C:\DOS
SET TEMP = C:\DOS\
LOADHIGH C:\DOS\DOSKEY
C:\>
```



# Quick Setup Guide

## LU6.2/PU2.1 Node SNA/SDLC Configuration

### Fields on I-O 8494

AA - 0 = SNA/SDLC Communication

BB - 0 = 5394 Emulation Mode<sup>1</sup>

2 = 5494 Emulation Mode<sup>1</sup>

DD - 1 = LU6.2/PU2.1 Node

1 - N/A

2 - Controller address (example = 01)

3 - Line Facility & Data Encoding  
(example = 000000, half duplex/multipoint/NRZI)

10 - Baud rate (use only if locally attached)<sup>2</sup>

11 - Default local network ID<sup>3</sup>

(example: APPN)

12 - SLC01 = Must be unique for each emulated controller. If only one controller is emulated, use same name as Field 13<sup>6</sup>

13 - Control Point (CP) Name<sup>6</sup>

(example: ET5494)

14 - QRMTWSC = Mode Name<sup>4</sup>

16 - 010 06 = Default, Retry Count & Interval

17 - N/A

H1:1 - AS/400 System LU Name<sup>5</sup>

H1:2 - N/A

H1:3 - N/A

H1:4 - N/A

### AS/400 Line Description (CRTLINS DLC)

Line description	TXLINE1
Resource names	LINE011
+ for more values	
Online at IPL	*YES
Data link role	*NEG or *PRI
Physical Interface	*RS232V24
Connection type	*MP
Switched network backup	*NO
Exchange identifier	*SYSGEN
NRZI data encoding	*YES
Line speed	9600
Modem type supported	*NORMAL
Maximum frame size	521
Duplex	*Half
Inactivity timer	300
Poll response delay	0
Nonproductive receiver timer	320
Idle timer	30
Connect poll timer	30
Poll cycle pause	0
Frame retry	7
Text 'description'	LINE011, SNA/SDLC, . . .

### AS/400 Controller Description (CRTCTLAPPC)

Controller description	LANTR01
Link type	*SDLC
Online at IPL	*YES
Switched connection	*NO
Switched network backup	*NO
APPN-capable	*YES
Attached nonswitched line	TXLINE1
Maximum frame size	512
Remote network identifier	APPN
Remote control point	ET5494
Exchange identifier	
Data link role	*NEG
Station address	01
APPN CP session support	*YES
APPN node type	*LENNODE
APPN transmission group no.	1
Autodelete service	1440
User-defined 1	*LIND
User-defined 2	*LIND
User-defined 3	*LIND
Text 'description'	LU6.2/PU2.1 1-5494 Node

## QUICK SETUP

---

- <sup>1</sup> 5494 or 5394 emulation mode must be selected for an LU6.2/PU2.1 node configuration.
- <sup>2</sup> This field should only be used if the controller is connected to the host using internal null modem and modem eliminator cable.
- <sup>3</sup> To find this name from the AS/400 command line, type in “DSPNETA” and press Enter, or select “Communications” (opt 6) from the AS/400 Main Menu on the host the controller is physically connected to. Select “Network Management” (opt 5) from the Communications Menu, select “Display Network Attributes” (opt 1) from the Network Management Menu.
- <sup>4</sup> Always use recommended mode name “QRMTWSC”.
- <sup>5</sup> This value should be the “Default Local Location” which is found by typing in “DSPNETA” and pressing Enter on the AS/400 menu.
- <sup>6</sup> If the I-O 8494 is configured to emulate more than one IBM remote controller and a configuration list does not exist, then it must first be created using the “CRTCFGL” command. Then, an entry for each emulated controller must be added to the list, as shown below.

AS/400 Create Configuration List (CRTCFGL)

Configuration list type    \*APPNRMT

AS/400 Add Configuration List Entries (ADDCFGL)

Configuration list type    \*APPNRMT

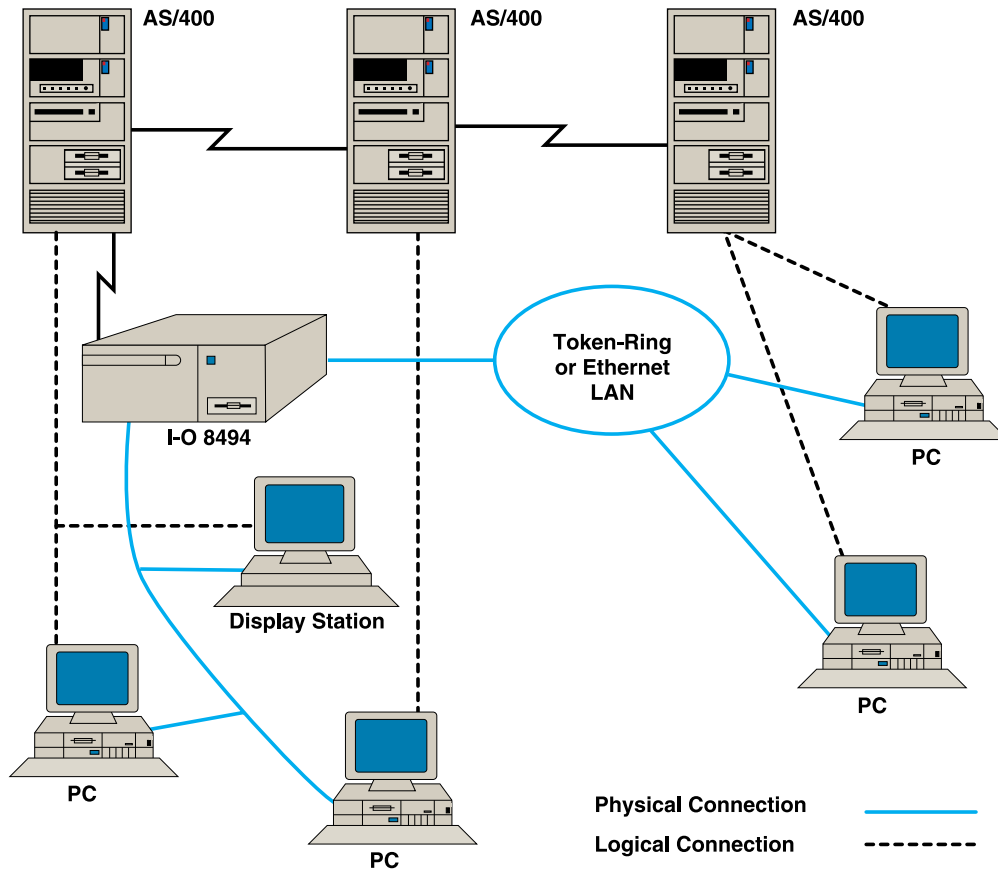
APPN remote location entry:

Remote location name	SLC01
Remote network identifier	*NETATR
Local location name	*NETATR
Remote control point	ET5494
Control point net ID	*NETATR
Location password	*NONE
Secure location	*NO
Single session	*NO
Locally controlled session	*NO
Pre-established session	*NO
Entry 'description'	*BLANK
Number of conversations	10
+ for more values	

12 - SLC01 = Must be unique for each emulated controller

13 - Control Point (CP) Name (example: ET5494)

LU6.21/PU2.1 Node SNA/SDLC Configuration



# Quick Setup Guide

## SNA/SDLC Configuration

### Fields on I-O 8494

AA- 0 = SNA/SDLC Communication  
BB - 0 = 5394 Emulation Mode  
    1 = 5294 Emulation Mode  
1 - 00 = Default, U.S. Language  
2 - 01 = Controller address (example = 01)  
3 - Line Facility & Data Encoding  
    (example = 0000000, half  
    duplex/multipoint/NRZI)  
10 - Baud rate (use only if locally attached)  
P - Optional, default printer

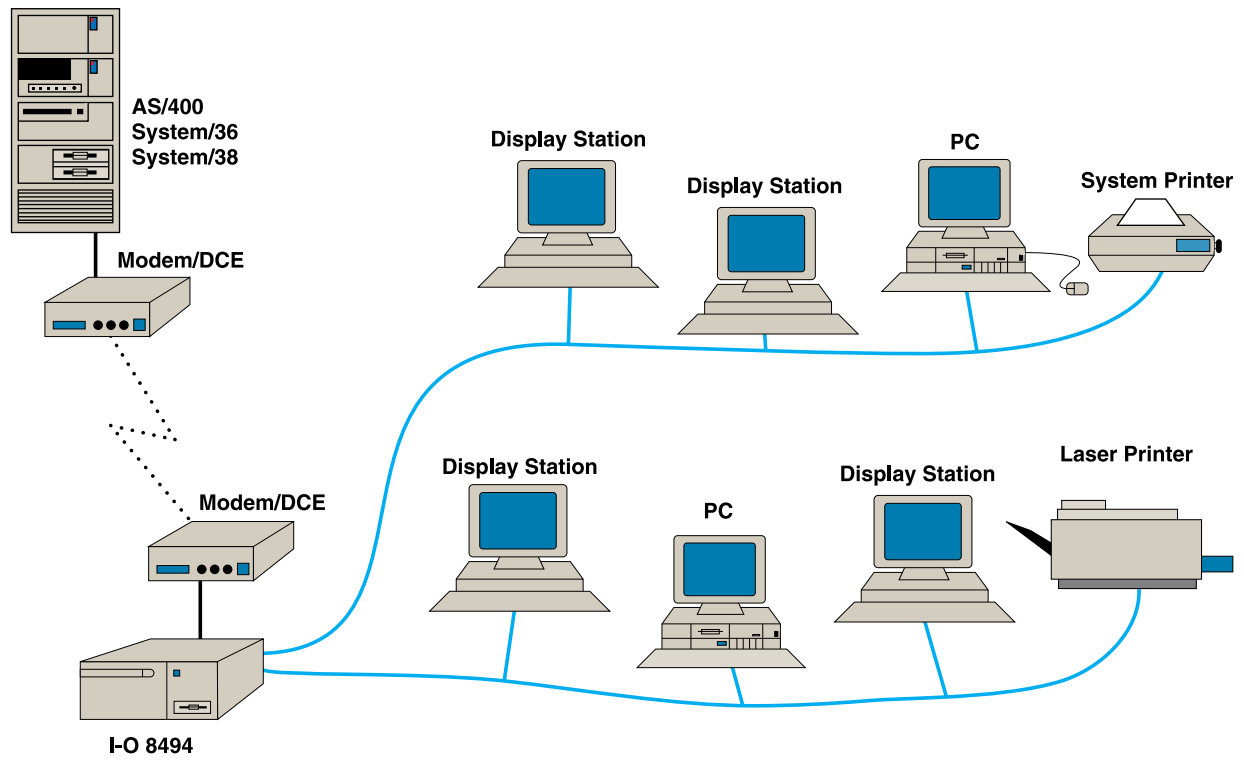
#### AS/400 Line Description (CRTLINS DLC)

Line description	TXLINE1
Resource names	LINE011
+ for more values	
Online at IPL	*YES
Data link role	*PRI
Physical interface	*RS232V24
Connection type	*MP
Switched network backup	*NO
Exchange identifier	*SYSGEN
NRZI data encoding	*YES
Maximum controllers	5
Line speed	19200
Modem type supported	*NORMAL
Maximum frame size	1033
Duplex	*HALF
Inactivity timer	300
Poll response delay	520
Nonproductive receive timer	320
Idle timer	30
Connect poll timer	30
Poll cycle pause	0
Frame retry	7
Text 'description'	Line011, SNA/SDLC

#### AS/400 Controller Description (CRTCTLRWS)

Controller description	TXTCTL01
Controller type	5394
Controller model	1
Link type	*SDLC
Online at IPL	*YES
Switched connection	*NO
Switched network backup	*NO
Attached nonswitched line	TXLINE1
Exchange identifier	*SYSGEN
Station address	01
Text 'description'	Controller #01

SNA/SDLC Configuration



# Quick Setup Guide

## X.25 SVC Configuration

### Fields on I-O 8494

AA- 1 = X.25 Communication  
BB - 2 = 5494 Emulation Mode  
    0 = 5394 Emulation Mode  
    1 = 5294 Emulation Mode  
1 - 00 = Default, U.S. Language  
2 - 01 = Controller address (example = 01)<sup>1</sup>  
    attached)  
4 - 027 = Default, Subscription Data  
5 - 1 0110 = Default, Configuration Data  
6 - 0010000 = Default, Software Data  
7 - 0A 03 = Default, Retry Parameters  
10 - Baud rate (use only if locally attached)<sup>2</sup>

### AS/400 Line Description (CRTLINX25)

Line description	TXLINE1
Resource names	LIN011
Logical channel entries:	
Logical channel identifier	007
Logical channel type	*SVCBOTH
PVC controller	
+ for more values	
Local network address	00006533
Connection initialization	*LOCAL
Online at IPL	*YES
Physical interface	*X21BISV24
Connection type	*NONSWTPP
Vary on wait	*NOWAIT
Line speed	9600
Exchange identifier	*SYSGEN
Extended network addressing	*NO
Maximum packet size:	
Transmit value	128
Receive value	*TRANSMIT
Modulus 8	
Default window size:	
Transmit value	7
Receive value	*TRANSMIT
Insert net address in packets	*YES
Text 'description'	X.25 Line

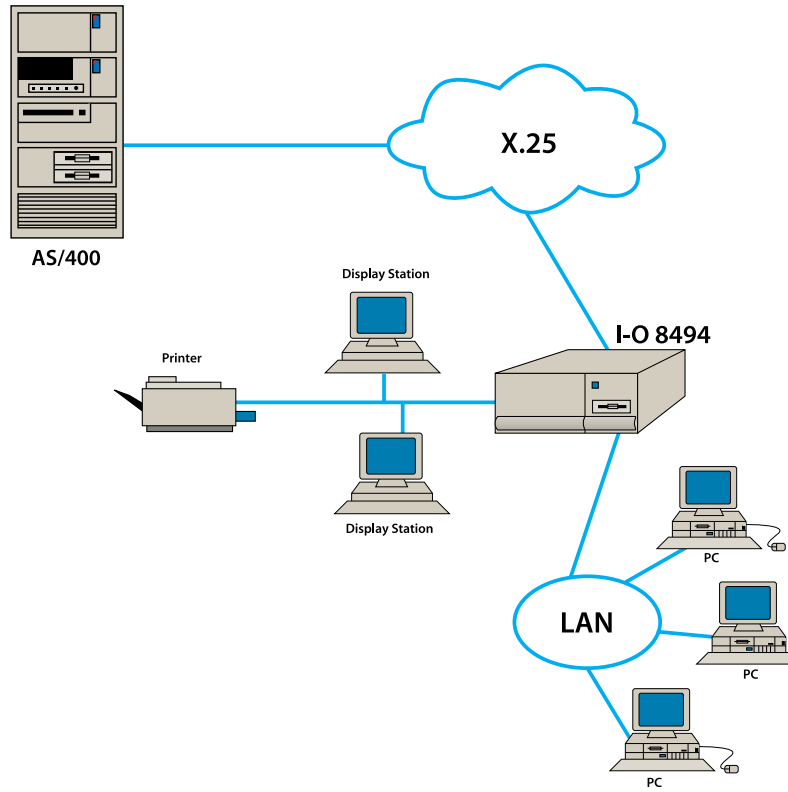
### AS/400 Controller Description (CRTCTLRWS)

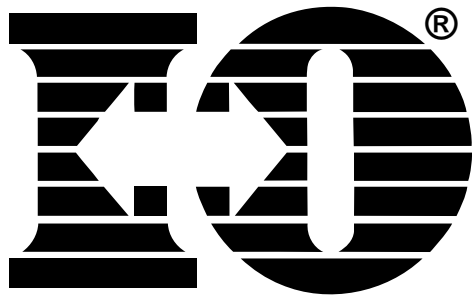
Controller description	TXTCTL01
Controller type	5494
Controller model	1
Link type	*X25
Online at IPL	*YES
Switched connection	*YES
Switched line list	
+ for more values	
Maximum frame size	256
Exchange identifier	
Initial connection	*DIAL
Dial initiation	*LINKTYPE
Connection number	00006533
Answer number	*ANY
X.25 network level	
X.25 link level protocol	*QLLC

<sup>1</sup> The controller address should match the controller's slot number where the applicable twinax card is installed.

<sup>2</sup> This field should only be used if the controller is connected to the host using an internal null modem and modem eliminator cable.

### X.25 SVC Configuration





*“Products That Work”*

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# I-O 8494 Remote Controller

## User's Guide

### Version 1.11

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#### 1 INTRODUCTION

The host system has workstation controllers that allow the host to communicate with attached devices. When attached locally, the I-O 8494 Remote Controller performs much like the built-in controllers of the host system; it allows you to connect and use a cluster of display stations and printers at the host site. You can also use the I-O 8494 for remote attachment; in which case you must use a modem or similar equipment to send and receive data across the communications line or network.

The I-O 8494 also offers optional interfaces that allow PCs that are connected to an Ethernet or Token-Ring LAN to attach to the AS/400 system. In this configuration, the I-O 8494 will manage the communications between the Ethernet or Token-Ring LAN and the AS/400.

The I-O 8494 Remote Controller supports SNA communication with a host computer via any one of several protocols and media: SDLC, X.25, Token-Ring, or Ethernet. When configured for SDLC communication, the I-O 8494 can communicate over point-to-point, multi-point, switched, or nonswitched network types with a line speed up to 128,000 bits per second (bps). Appropriate communications hardware and software must be installed on the I-O Remote Controller and host system; use of X.25, Ethernet, or Token-Ring communication requires addition of a corresponding option card to the base I-O 8494.

Twinax devices are attached to the I-O 8494 using 8-inch twinax connectors on each two-port twinax card. Each twinax connector can be used to connect a single twinax line capable of supporting up to 7 devices using standard cable-through. The total number of devices cannot exceed 8 on the 8394EL, with the total number of devices not to exceed 14 on the 8494L twinax card. Two twinax cards can appear to the host as one 5494 controller. Devices are automatically recognized by the I-O 8494 when they are attached and powered on.

The I-O 8494 Remote Controller is compatible with the IBM 5494, IBM 5394 and IBM 5294. Depending on how many twinax cards are present, and how they are grouped together during configuration of the controller, the I-O 8494 may appear to a host computer to be more than one controller. Typical emulation options include:

- Up to three 28-device IBM 5494's on the AS/400
- A 56-device IBM 5494 on the AS/400
- Up to six 14-device IBM 5494's on the AS/400
- Up to six 8-device or 14-device IBM 5394's on the AS/400

## INTRODUCTION

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- Up to three 16-device or 21-device IBM 5394's on the AS/400
- Up to six 8-device IBM 5294's on the AS/400, System/38, or System/36
- One APPC controller on the AS/400 for Ethernet or Token-Ring LAN gateway support

The operating software for the I-O 8494 is contained on 3 1/2" diskettes and is loaded using the I-O 8494's diskette drive. Configuration of the controller is set up through an attached display station, or using a PC with the 8494UP program. After an initial configuration has been saved to the diskette, the I-O 8494 Remote Controller loads the operating software and configuration records from the diskette each time it is powered on.

The following pages contain Quick Setup Guides with helpful information on setting up the Host Configuration.

### Specifications

Compatibility:	Replacement for the IBM 5494, 5394 or 5294  Connects to the IBM AS/400, System/38, or System/36
Interface Cards Available:	MPIC; communications interface card for SDLC/SNA communications over an EIA 232D/V.24, V.35, or X.21 interface  ETK; Ethernet card for Ethernet configuration  TRK; Token-Ring card for Token-Ring configuration  FHKV24; RS-232/V.24 card for X.25 communications FHKV35; V.35 card for X.25 communications FHKX21; X.21 card for X.25 communications
Line Speed:	Supports high-speed communications up to 128,000 bps in SNA/SDLC mode over a V.35 or X.21 physical interface or 19,200 bps over an EIA 232D/V.24 interface
Software:	Diskette-based software for easy upgrades, problem determination, and operation  An original and a backup 3 1/2" diskette are included
Configuration:	Uses an attached display station for easy on-screen configuration or an IBM compatible PC for off-site configuration
Indicators:	Front panel status indicators, diagnostic LEDs on the MPIC and twinax cards
Modem Eliminator:	Built-in modem eliminator for local attachment to host (when operated in SNA/SDLC mode). Note: An optional modem eliminator cable is required for the I-O 8494 to operate in this mode.
Power Supply Description:	Internal 200 watt DC power supply powers the diskette drive and up to six twinax cards, and an Ethernet or Token-Ring card.
Diskettes/Diskette Drive:	Diskette drive uses standard 3 1/2", 1.44 MB DS HD, 135 TPI diskettes
Standard Equipment:	MPIC interface card for controller to host communication

Twinax card for controller to device communication  
 I-O 8494 Remote Controller software diskettes  
 Applicable 6-foot (1.82-meters) communications cable  
 Two 8-inch twinax connector cables for each twinax card  
 Power cord  
 I-O 8494 Installation Guide  
 I-O 8494 Quick Setup and User's Guide

Dimensions:

Width	15 7/8 inches	(40.3 cm)
Height	6 1/8 inches	(15.6 cm)
Depth	15 3/4 inches	(40.1 cm)
Weight	27.0 lbs.	(12.3 kg) max

Power: Preset 115 or 230 volt

	<u>115 VAC</u>	<u>230 VAC</u>
Phase	1	1
Amperage	6.0	3.5
Watts	200	200
Hz	50	60

Operating Environment: Temperature: 40° to 110° F (5° to 42° C)  
 Relative Humidity: 0% to 90% - noncondensing

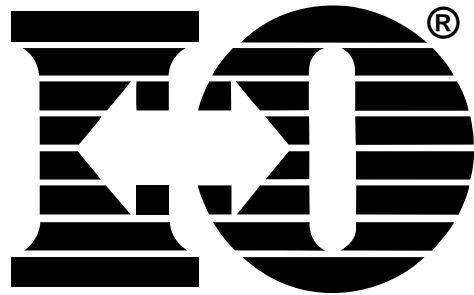
Optional: The following modem eliminator cables for local connection of the I-O 8494 are available:

CCV24M EIA 232D/V.24 interface cable  
 CCV35M V.35 interface cable  
 CCX21M X.21 interface cable

**Limitations**

IBM 5294/5394/5494 features not available on the I-O 8494 Remote Controller include:

- Graphics (5292-2)
- X.21 protocol
- Light pen
- Magnetic stripe reader
- V.25bis auto dialing
- Mouse support
- Image/Fax support
- GUI support



*“Products That Work”*

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## **2 HOST CONFIGURATION**

The I-O 8494 Remote Controller can be used on an IBM AS/400, System/38, or System/36 host. Refer to your system's configuration manual as you perform the host configuration.

The I-O 8494 appears to the host system as an IBM 5494, 5394 or 5294 controller and as an IBM 5494 for upstream or downstream LAN support. The I-O 8494 requires only one communications line and one set of modems, even when additional twinax cards are installed. If the I-O 8494 is set up to operate in SNA/SDLC mode, it provides a built-in modem eliminator and can be attached directly to the host SDLC communications cable, via an optional modem eliminator cable.

The I-O 8494 Remote Controller has the option of supporting up to six twinax cards; any combination of 8-device and 14-device cards is valid. Depending on how many twinax cards are present, and how they are grouped together during configuration of the controller (see Chapter 3, Controller Installation), the I-O 8494 may appear to the host computer to be more than one 5294/5394/5494. Host configuration must be performed for each of the emulated controllers.

### **AS/400 Configuration**

Please refer to the IBM System Configuration manuals for proper system configuration. In order to correctly define a connection to a remote controller you must do the following:

- Create a line description.
- Create a control unit description.
- Define the devices attached to the I-O 8494 Remote Controller.

### **Create Line Description**

When configuring remote devices, you should configure your line description before configuring the remote controller and attached devices.

You can create more than one line description for each communications line you attach to the system. However, only one line description can be varied on at any one time.

To create an SDLC line description, continue on page 2-2. To create an X.25 line description, continue on page 2-4. To create an Ethernet line description, continue on page 2-6. To create a Token-Ring line description, continue on page 2-7.

## SDLC

To define an SDLC communications line, take the following steps:

1. Type **CRTLINS DLC** and press ENTER from the AS/400 Main Menu.

The Create Line Description (SDLC) prompt menu will appear as shown below. All lines will not be displayed at once. As you fill in the options and press ENTER additional options will be displayed.

In the example below, a nonswitched, multi-point line with a line speed of 9600 bps is defined.

```

                                AS/400 Main Menu
Select one of the following:      System: S2037813
1.      User tasks
2.      Office tasks
3.      General system tasks
4.      Files, libraries, and folders
5.      Programming
6.      Communications
7.      Define or change the system
8.      Problem handling
9.      Display a menu

90.     Sign off

Selection or Command
== => CRTLINS DLC _____
_____
    
```

2. Enter the appropriate information in each applicable field.

### Multi-Point

```

                                Create Line Description (SDLC) (CRTLINS DLC)

Type choices, press Enter.

Line description.....TXLINE1      Name
Resource name.....LINE011         Name
Online at IPL .....*YES           *YES, *NO
Data link role.....*PRI            *NEG, *PRI, *SEC
Physical interface.....*RS232V24   *RS232V24, *V35, *X21,..
Connection type .....*MP          *NONSWTPP, *SWTPP, *MP
Switched network backup .....*NO   *NO, *YES
Exchange identifier .....*SYSGEN   05600000-56FFFFFF, *SYSGEN
NRZI data encoding.....*YES       *YES, *NO
Maximum controllers.....5          1-254
Line speed .....9600              600, 1200, 2400, 4800
Modem type supported .....*NORMAL  *NORMAL, *V54, *IBMWRAP
Maximum frame size.....521        265, 521, 1033, 2057
Duplex.....*HALF                  *HALF, *FULL
Nonproductive receive timer ...320  160-4200 (0.1 seconds)

F3=Exit      F4=List      F5=Refresh      F10=Additional parameters
F11=Keywords F12=Previous F13=How to use this display
    
```

Switched Point-to-Point (Dial up)

```

                                Create Line Description (SDLC) (CRTLINS DLC)

Type choices, press Enter.

Line description.....TXLINE1      Name
Resource name.....LINE011         Name
      + for more values
Online at IPL.....*YES             *YES, *NO
Data link role.....*PRI             *NEG, *PRI, *SEC
Physical interface.....*RS232V24   *RS232V24, *V35, *X21,. .
Connection type.....*SWTPP         *NONSWTPP, *SWTPP, *MP
Vary on wait.....*NOWAIT           *NOWAIT, 15-180 (1 second)
Autocall unit.....*NO               *NO, *YES
Exchange identifier.....*SYSGEN     05600000-56FFFFFF, *SYSGEN
NRZI data encoding.....*YES         *YES, *NO
Line speed.....9600                 600, 1200, 2400, 4800
Modem type supported.....*NORMAL    *NORMAL, *V54, *IBMWRAP
Switched connection type.....*BOTH  *BOTH, *ANS, *DIAL
Autoanswer.....*YES                 *YES, *NO
Autodial.....*NO                    *NO, *YES

                                                                More . . .
F3=Exit      F4=Prompt      F5=Refresh      F12=How to use this display
F24=More keys
    
```

Non-Switched Point-to-Point

```

                                Create Line Description (SDLC) (CRTLINS DLC)

Type choices, press Enter.

Line description.....TXLINE1      Name
Resource name.....LINE011         Name
      + for more values
Online at IPL.....*YES             *YES, *NO
Data link role.....*PRI             *NEG, *PRI, *SEC
Physical interface.....*RS232V24   *RS232V24, *V35, *X21,. .
Connection type.....*NONSWTPP     *NONSWTPP, *SWTPP, *MP
Switched network backup.....*NO     *NO, *YES
Exchange identifier.....*SYSGEN     05600000-056FFFFFF,
*SYSGEN
NRZI data encoding.....*YES         *YES, *NO
Line speed.....9600                 600, 1200, 2400, 4800
Modem type supported.....*NORMAL    *NORMAL, *V54, *IBMWRAP
Maximum frame size.....521          265, 521, 1033, 2057
Duplex.....*HALF                    *HALF, *FULL
Nonproductive receive timer...320    160-4200 (0.1 seconds)
Idle timer.....30                   5-300 (.01 seconds)

                                                                More . . .
F3=Exit      F4=Prompt      F5=Refresh      F10=Additional parameters
    
```

3. Press ENTER to return to the Main Menu.
4. Go to “Create Control Unit Description, SDLC” on page 2-8.

## X.25

To define an X.25 communications line, take the following steps:

1. Type **CRTLINX25** and press ENTER from the AS/400 Main Menu.

The Create Line Description (X.25) prompt menu will appear as shown below. All lines will not be displayed at once. As you fill in the options and press ENTER additional options will be displayed.

In the example below, a nonswitched multi-point line with a line speed of 9600 bps is defined.

```

AS/400 Main Menu

Select one of the following:                               System: S2037813

1. User tasks
2. Office tasks
3. General system tasks
4. Files, libraries, and folders
5. Programming
6. Communications
7. Define or change the system
8. Problem handling
9. Display a menu

90. Sign off

Selection or Command
== => CRTLINX25
  
```

```

Create Line Description (X.25) (CRTLINX25)

Type choices, press Enter.
Line description          TXLINE1X25  Name
Resource name            LINE011     Name, *NWID
Logical channel entries:
  Logical channel identifier  001        001-FFF, *PROMPT
  Logical channel type      *PVC       *PVC, *SVCIN, *SVCBOTH. . .
PVC controller           Name
+ for more values
Local network address     44600002
Connection initialization  *REMOTE    *LOCAL, *REMOTE, *WAIT
Online at IPL              *YES       *YES, *NO
Physical interface        *X21BISV24 *X21BISV24, *X21BISV35, . . .
Connection type           *NONSWTPP *NONSWTPP, *SWTPP
Vary on wait              *NOWAIT    *NOWAIT, 15-180 (1 second)
Line Speed                9600      *CALC, 600, 1200, 2400. . .
Exchange identifier       *SYSGEN    05600000-056FFFFFF, *SYSGEN
Extended network addressing *NO        *YES, NO

More. . .
F3=Exit  F4= Prompt  F5=Refresh  F10=Additional parameters 12=Cancel
F13=How to use this display  F24=More keys
  
```



2. Enter the appropriate information in each applicable field.

The logical channel identifier must be defined as shown in the table below.

**Note:** The network must be configured for the correct "Logical Channel Identifier" by the network provider (phone company). For example: "007 through 00A" (see table below) for an SVC (dial up) connection provided for a controller with four (4) installed cards, each configured as an individual controller.

If the installed twinax cards are strapped together in pairs of two (2) and configured as two controllers instead of four (4), then "Logical Channel Identifier" "007 and 008" should be used (for an SVC Line).

# of Cards Installed	Logical Channel IDs used if PVCs	Logical Channel IDs used if SVCs
1	001	007
2	001-002	007-008
3	001-003	007-009
4	001-004	007-00A
5	001-005	007-00B
6	001-006	007-00C

3. Press ENTER to save and return to the Main Menu.
4. Go to "Create Control Unit Description, X.25" on page 2-9.

## HOST CONFIGURATION

**Ethernet (upstream)** To define an AS/400 connection to the I-O 8494 through an Ethernet network, take the following steps:

1. Type **CTRLINETH** and press ENTER from the AS/400 Main Menu.

The Create Line Description (Ethernet) prompt menu will appear as shown below. All lines will not be displayed at once. As you fill in the options and press ENTER additional options will be displayed.

The following is an example of an Ethernet Line description.

```
AS/400 Main Menu

Select one of the following:                               System: S2037813

1. User tasks
2. Office tasks
3. General system tasks
4. Files, libraries, and folders
5. Programming
6. Communications
7. Define or change the system
8. Problem handling
9. Display a menu

90. Sign off

Selection or Command
= = => CTRLINETH_____

_____
```

```
Create Line Description (Ethernet) (CTRLINETH)
Type choices, press Enter.

Line description .....ETLINE           Name
Resource name .....CMN08              Name, *NWID
Online at IPL .....*YES                *YES, *NO
Vary on wait .....*NOWAIT              *NOWAIT, 15-180 (1 second)
Attached nonswitched NWI ..*NONE        Name, *NONE
DLC identifier ..... *NONE             1-1018, *NONE
Local adapter address .....02000000A400* 020000000000-FEFFFFFFF . .
Exchange identifier .....*SYSGEN        05600000-056FFFFF,
Ethernet standard .....*ALL            *ETHV2, *IEEE8023, *ALL
SSAP list:
Source service access point. *SYSGEN    02-FE, *SYSGEN
SSAP maximum frame .....               *MAXFRAME, 265-1496, 265 . .
SSAP type .....                        *CALC, *NONSNA, *SNA
+ for more values
Text 'description' .....*BLANK

Bottom

F3=Exit  F4= Prompt      F5=Refresh      F10=Additional parameters
F12=Cancel  F13=How to use this display      F24=More keys

*May use internal system I.D. card value.
```

2. Enter the appropriate information in each applicable field.
3. Press ENTER to return to the Main Menu.
4. Go to Create Control Unit Description, "Ethernet (upstream)" on page 2-10.

**Token-Ring (upstream)**

To define an AS/400 connection to the I-O 8494 through a Token-Ring network, take the following steps:

1. Type CRTLINTRN and press ENTER from the AS/400 Main Menu.

The Create Line Description (Token-Ring) prompt menu will appear as shown below. All lines will not be displayed at once. As you fill in the options and press ENTER, additional options will be displayed.

The following is an example of a Token-Ring Line description.

```

AS/400 Main Menu
Select one of the following:                               System: S2037813
1. User tasks
2. Office tasks
3. General system tasks
4. Files, libraries, and folders
5. Programming
6. Communications
7. Define or change the system
8. Problem handling
9. Display a menu
90. Sign off
Selection or Command
== => CRTLINTRN _____
_____
    
```

```

Create Line Description (Token-Ring) (CRTLINTRN)
Type choices, press Enter.
Line description .....TRLINE          Name
Resource name .....CMN08              Name
Online at IPL .....*YES                *YES, *NO
Vary on wait. ....*NOWAIT              *NOWAIT, 15-180 (1 second)
Maximum controllers .....40            1-256
Attached nonswitched NWI ...*NONE      Name, *NONE
DLC identifier .....*NONE              1-1018, *NONE
Line speed .....4M                     4M, 16M, *NWI
Maximum frame size .....16393          265-16393, 265, 521,1033 ...
Local adapter address .....40000000A400* 400000000000-7FFFFFFF .
Exchange identifier .....*SYSGEN       05600000-056FFFFF, *SYSGEN
SSAP list:
  Source service access point *SYSGEN   02-FE, *SYSGEN
  SSAP maximum frame .....             *MAXFRAME, 265-16393
  SSAP type .....                       *CALC, *NONSNA, *SNA
  + for more values
More...
F3=Exit F4= Prompt F5=Refresh F10=Additional parameters
F12=Cancel F13=How to use this display F24=More keys
*May use Internal System ID Card Value.
    
```

2. Enter the appropriate information in each application field.
3. Press ENTER to return to the Main Menu.
4. Go to "Create Control Unit Description, Token-Ring on page 2-12.

## HOST CONFIGURATION

### Create Control Unit Description

The following sections describe the steps to create a control unit description for SDLC or X.25 communications modes.

**Note:** For an APPN Network or SNA Subarea Network, refer to "LAN Gateway/SNA LU6.2-PU2.1 Node" on page 2-14

For an upstream Ethernet connection, refer to "Ethernet (Upstream)" on page 2-10.

For an upstream Token-Ring connection, refer to "Token-Ring (Upstream)" on page 2-12.

### SDLC

Take the following steps to define a control unit description for SDLC protocol.

1. Type **CRTCTLRWS** from the AS/400 Main Menu, and then press F4. The Create Controller Description menu will appear, as shown below.

Multi Point CTL Description.

```

                                Create Ctl Desc (Remote WS) (CRTCTLRWS)
Type choices, press Enter.
Controller description          TXCTL1          Name
Controller type                5394           3174, 3274, 5251, 5294
Controller model               1           0, 1, 0001, 2, 0002, 12
Link type                      *SDLC      *IDL, *LAN, *NONE, . . .
Online at IPL                  *YES      *YES, *NO
Switched line                  *NO       *NO, *YES
Switched network backup       *NO       *NO, *YES
Attached nonswitched line     TXLINE1   Name
Maximum frame size            *Linktype
Exchange identifier           *Leave Blank 00100000-FFFFFFFF
Station address               01        01-FE
Text 'description'            *BLANK
  
```

Switched Point-to-Point CTRL Description. (Dial up Example)

```

                                Create Line Description (Remote WS) (CRTCTLRWS)
Type choices, press Enter.
Controller description . . . . .TXCTL1          Name
Controller type . . . . .5394                 3174, 3274, 5251, 5294. . .
Controller model . . . . .1                   0, 1, 0001, 2, 0002, 12, 0012
Link type . . . . .*SDLC                     *IDL, *LAN, *NONE, *SDLC. .
.
Online at IPL . . . . .*YES                   *YES, *NO
Switched connection . . . . *YES              *NO, *YES
Short hold mode . . . . .*NO                  *NO, *YES
Switched line list . . . . .TXLINE1           Name
+ for more values
Maximum frame size . . . . *LINKTYPE         265-1994, 256, 261, 265. . .
Exchange identifier . . . . .05F000AA         00100000-FFFFFFFF
Initial connection . . . . *DIAL              *DIAL, *ANS
Dial initiation . . . . .*LINKTYPE           *LINKTYPE, *IMMED, *DELAY
Connection number . . . . .'555-1212'
Station address . . . . .AA                   01-FE
                                                    More

F3=Exit  F4= Prompt      F5=Refresh      F10=Additional parameters
F12=Cancel  F13=How to use this display      F24=More keys
  
```

Non-Switched Point-to-Point CTRL Description.

```

                Create Line Description (Remote WS) (CRTCTLRWS)
Type choices, press Enter.

Controller description .....TXCTL1      Name
Controller type .....5394                3174, 3274, 5251, 5294. . .
Controller model .....1                   0, 1, 0001, 2, 0002, 12, 0012
Link type .....*SDLC                      *IDL, *LAN, *NONE, *SDLC. .
.
Online at IPL .....*YES                   *YES, *NO
Switched connection .....*NO              *NO, *YES
Short hold mode .....*NO                  *NO, *YES
Switched line list .....TXLINE1           Name
Maximum frame size .....*LINKTYPE         265-1994, 256, 261, 265. . .
Exchange identifier .....                 00100000-FFFFFFFF
Station address .....AA                   *01-FE
Text 'description' .....*BLANK

                                                    Bottom
F3=Exit  F4= Prompt      F5=Refresh      F10=Additional parameters
    
```

2. Fill in all applicable data. All lines will not display at once but will appear as you fill in the options and press ENTER.
3. Go to "Define Attached Devices" on page 2-16.

**X.25**

Take the following steps to define a control unit description for X.25 protocol.

**Note:** For an APPN Network or SNA Subarea Network, refer to "LAN Gateway/SNA LU6.2-PU2.1 Node".

1. Type **CRTCTLRWS** from the AS/400 Main Menu, and then press F4. The Create Controller Description menu will appear, as shown below.

```

                Create Ctl Desc (Remote WS)

Type choices, press Enter.

Controller description      LINE1X25      Name
Controller type             5494          3174, 3274, 5251, 5394. . .
Controller model            2           0, 1, 0001, 2 0002, 12, 0012
Link type                   *X25       *IDL, *LAN, *NONE, *SDLC
Online at IPL               *YES       *YES, *NO
Switched connection        *NO        *NO, *YES
Attached nonswitched line  TXLINE1X25 Name
Maximum frame size        *LINKTYPE  265- 1994, 256, 261, 265. . .
Exchange identifier        .....         00100000-FFFFFFFF
X.25 network level        1984       1980, 1984, 1988
X.25 link level protocol  *QLLC      *QLLC, *ELLC
X.25 logical channel ID   001         001-FFF
Text 'description'        'I-O 8494 Remote Controller running X.25'
    
```

2. Fill in all applicable data. All lines will not display at once but will appear as you fill in the options and press ENTER.
3. Continue with "Define Attached Devices" on page 2-16.

## HOST CONFIGURATION

### Ethernet (Upstream)

Take the following steps to define a control unit description for an upstream Ethernet configuration.

1. Type CRTCTLAPPC from the AS/400 main menu, then press F4. The Create Controller Description (APPC) menu will appear, as shown on the following page.

```

                                Create Ctl Desc (APPC) (CRTCTLAPPC)

Type choices, press Enter.

Controller description          LANTR01      Name
Link type                      *LAN        *FAX, *FR, *IDLC, *LAN. . .
Online at IPL                  *YES        *YES, *NO
APPN-capable                   *YES        *YES, *NO
Switched Line List
+ for more values
Maximum frame size             *LINKTYPE   265-16393, 256, 265, 512. . .
Remote network identifier      APPN        Name, *NETATR, *NONE, *ANY
Remote control point           *ANY        Name, *ANY
Exchange identifier            00000000-FFFFFFFF
Initial connection             *ANS        *DIAL, *ANS
Dial initiation                 *LINKTYPE   (LINKTYPE, *IMMED, *DELAY
LAN remote adapter address     02001881000 000000000001-FFFFFFFFFFFF
APPN CP session support        *YES        *YES, *NO
APPN node type                 *ENDNODE    *ENDNODE, *LENNODE. . .
APPN transmission group number 1 1-20, *CALC

                                                                More. . .
F3=Exit  F4=Prompt  F5=Refresh  F10=Additional parameters  F12=Cancel
F13=How to use this display          F24=More keys

```

2. Fill in applicable data. All lines will not display at once, but will appear as you fill in the options and press ENTER.

```

                                Create Ctl Desc (APPC) (CRTCTLAPPC)

Type choices, press Enter.

Autodelete device             1440        1-10000, *NO
User-defined 1                 *LIND        0-255, *LIND
User-defined 2                 *LIND        0-255, *LIND
User-defined 3                 *LIND        0-255, *LIND
Text description               LAN, Token-Ring #01

                                                                Bottom
F3=Exit  F4=Prompt  F5=Refresh  F10=Additional parameters  F12=Cancel
F13=How to use this display          F24=More keys

```

- 3a. If the I-O 8494 is configured to emulate more than one IBM remote controller, a configuration list must be created. This is done by typing in **CRTCFGL** on the AS/400 command line and pressing ENTER. Select list type **"\*APPNRMT"**.

```

Create Configuration List (CRTCFGL)

Type choices, press Enter.

Configuration list type      *APPNRMT      *APPNLCL, *APPNRMT
                                                                    Bottom
F3=Exit  F4=Prompt  F5=Refresh  F10=Additional parameters  F12=Cancel
F13=How to use this display      F24=More keys
    
```

- 3b. Each emulated remote controller must be added to the newly created configuration list. This is done by typing **ADDCFGLE** on the AS/400 command line and pressing ENTER.

**Note:** The remote location name and remote control point must match each emulated controller.

```

Add Configuration List Entries (ADDCFGLE)

Type choices, press Enter.

Configuration list type      *APPNRMT      *APPNLCL, *APPNRMT . . .
APPN remote location entry:
  Remote location name      SLC01          Name, generic*, *ANY
  Remote network identifier *NETATR        Name, *NETARTR, *NONE
  Local location name       *NETATR        Name, *NETARTR
  Remote control point      ET5494         Name, *NONE
  Control point net ID     *NETATR        Name, *NETATR, *NONE
  Location password         *NONE
  Secure location           *NO            *YES, *NO
  Single session            *NO            *YES, *NO
  Locally controlled session *NO            *YES, *NO
  Pre-established session   *NO            *YES, *NO
  Entry 'description'       *BLANK
  Number of conversations   10             1-512
    + for more values

                                                                    Bottom
F3=Exit  F4=Prompt  F5=Refresh  F10=Additional parameters  F12=Cancel
F13=How to use this display      F24=More keys
    
```

4. Go to Chapter 3, Controller Installation on page 3-1.

## HOST CONFIGURATION

### Token-Ring (Upstream)

Take the following steps to define a control unit description for an upstream Token-Ring configuration.

1. Type CRTCTLAPPC from the AS/400 Main Menu, then press F4. The Create Controller Description (APPC) menu will appear, as shown on the following page.

```

                                Create Ctl Desc (APPC) (CRTCTLAPPC)

Type choices, press Enter.

Controller description          LANTR01      Name
Link type                      *LAN        *FAX, *FR, *IDLC, *LAN. . .
Online at IPL                  *YES        *YES, *NO
APPN-capable                   *YES        *YES, *NO
Switched Line List
+ for more values
Maximum frame size             *LINKTYPE   265-16393, 256, 265, 512. . .
Remote network identifier      APPN        Name, *NETATR, *NONE, *ANY
Remote control point           *ANY        Name, *ANY
Exchange identifier            00000000-FFFFFF
Initial connection             *ANS        *DIAL, *ANS
Dial initiation                 *LINKTYPE   (LINKTYPE, *IMMED, *DELAY
LAN remote adapter address     400018810000 000000000001-FFFFFFFFFFFF
APPN CP session support        *YES        *YES, *NO
APPN node type                 *ENDNODE    *ENDNODE, *LENNODE. . .
APPN transmission group number 1      1-20, *CALC

                                                                More. . .
F3=Exit  F4=Prompt  F5=Refresh  F10=Additional parameters  F12=Cancel
F13=How to use this display          F24=More keys

```

2. Fill in applicable data. All lines will not display at once, but will appear as you fill in the options and press ENTER.

```

                                Create Ctl Desc (APPC) (CRTCTLAPPC)

Type choices, press Enter.

Autodelete device              1440        1-10000, *NO
User-defined 1                  *LIND        0-255, *LIND
User-defined 2                  *LIND        0-255, *LIND
User-defined 3                  *LIND        0-255, *LIND
Text description                LAN, Token-Ring #01

                                                                Bottom
F3=Exit  F4=Prompt  F5=Refresh  F10=Additional parameters  F12=Cancel
F13=How to use this display          F24=More keys

```

- 3a. If the I-O 8494 is configured to emulate more than one IBM remote controller, a configuration list must be created. This is done by typing in **CRTCFGL** on the AS/400 command line and pressing ENTER. Select list type **"\*APPNRMT"**.



```

                                Create Configuration List (CRTCFGL)

Type choices, press Enter.

Configuration list type      *APPNRMT      *APPNLCL, *APPNRMT

                                                                    Bottom
F3=Exit  F4=Prompt  F5=Refresh  F10=Additional parameters  F12=Cancel
F13=How to use this display      F24=More keys
    
```

3b. Each emulated remote controller must be added to the newly created configuration list. This is done by typing **ADDCFGLE** on the AS/400 command line and pressing ENTER.

**Note:** The remote location name and remote control point must match fields 12 and 13 for each card or pair of cards.

```

                                Add Configuration List Entries (ADDCFGLE)

Type choices, press Enter.

Configuration list type      *APPNRMT      *APPNLCL, *APPNRMT . . .
APPN remote location entry:
  Remote location name      SLC01          Name, generic*, *ANY
  Remote network identifier *NETATR       Name, *NETARTR, *NONE
  Local location name       *NETATR       Name, *NETARTR
  Remote control point      TR5494       Name, *NONE
  Control point net ID     *NETATR       Name, *NETATR, *NONE
  Location password        *NONE
  Secure location          *NO           *YES, *NO
  Single session           *NO           *YES, *NO
  Locally controlled session *NO           *YES, *NO
  Pre-established session  *NO           *YES, *NO
  Entry 'description'      *BLANK
  Number of conversations   10           1-512
  + for more values

                                                                    Bottom
F3=Exit  F4=Prompt  F5=Refresh  F10=Additional parameters  F12=Cancel
F13=How to use this display      F24=More keys
    
```

4. Go to Chapter 3, Controller Installation on page 3-1.

## HOST CONFIGURATION

### LAN Gateway/ SNA LU6.2-PU2.1 Node

Take the following steps to define a control unit description for a Token-Ring or Ethernet Gateway configuration and an APPN Network or SNA Subarea Network.

1. Type CRTCTLAPPC from the AS/400 Main Menu, then press F4. The Create Controller Description (APPC) menu will appear:

```

                                Create Ctl Desc (APPC) (CRTCTLAPPC)

Type choices, press Enter.

Controller description      LANTR01      Name
Link type                  *SDLC       *IDLC, *LAN, *LOCAL, *SDLC. .
Online at IPL              *YES        *YES, *NO
Switched connection        *NO         *NO, *YES
Switched network backup    *NO         *NO, *YES
APPN-capable               *YES        *YES, *NO
Attached nonswitched line  TXLINE1     Name
Maximum frame size         521         265-16393, 256, 265, 512. . .
Remote network identifier  APPN        Name, *NETATR, *NONE, *ANY
Remote control point       *ANY        Name, *ANY
Exchange identifier        00100000-FFFFFF
Data link role             *NEG        *NET, *PRI, *SEC
Station address            01         00-FE
APPN CP session support    *YES        *YES, *NO
APPN node type             *ENDNODE    *ENDNODE, *LENNODE. . .
APPN transmission group number 1          1-20, *CALC

                                                                More. . .
F3=Exit  F4=Prompt  F5=Refresh  F10=Additional parameters  F12=Cancel
F13=How to use this display          F24=More keys

```

2. Fill in applicable data. All lines will not display at once, but will appear as you fill in the options and press ENTER.

```

                                Create Ctl Desc (APPC) (CRTCTLAPPC)

Type choices, press Enter.

Autodelete device          1440        1-10000, *NO
User-defined 1              *LIND       0-255, *LIND
User-defined 2              *LIND       0-255, *LIND
User-defined 3              *LIND       0-255, *LIND
Text description            LAN, Token-Ring #01

                                                                Bottom
F3=Exit  F4=Prompt  F5=Refresh  F10=Additional parameters  F12=Cancel
F13=How to use this display          F24=More keys

```

- 3a. If the I-O 8494 is configured to emulate more than one IBM remote controller, a configuration list must be created. This is done by typing in **CRTCFGL** on the AS/400 command line and pressing ENTER. Select list type "APPNRMT".

```

                                Create Configuration List (CRTCFGL)

Type choices, press Enter.

Configuration list type      *APPNRMT      *APPNLCL, *APPNRMT

                                                                    Bottom
F3=Exit  F4=Prompt      F5=Refresh      F10=Additional parameters
F12=Cancel  F13=How to use this display  F24=More keys
    
```

- 3b. Each emulated remote controller must be added to the newly created configuration list. This is done by typing **ADDCFGLE** on the AS/400 command line and pressing ENTER.

**Note:** The remote location name and remote control point must match fields 12 and 13 for each card or pair of cards.

```

                                Add Configuration List Entries (ADDCFGLE)

Type choices, press Enter.

Configuration list type      *APPNRMT      *APPNLC, *APPNRMT . . .
APPN remote location entry:
  Remote location name      SLC01          Name, generic*, *ANY
  Remote network identifier *NETATR        Name, *NETARTR, *NONE
  Local location name       *NETATR        Name, *NETARTR, *NONE
  Remote control point      ET5494        Name, *NETATR, *NONE
  Control point net ID     *NETATR        Name, *NETATR, *NONE
  Location password        *NONE
  Secure location          *NO            *YES, *NO
  Locally controlled session *NO            *YES, *NO
  Pre-established session  *NO            *YES, *NO
  Entry 'description'      *BLANK
  Number of conversations  10             1-512
  + for more values

                                                                    Bottom
F3=Exit  F4=Prompt      F5=Refresh      F10=Additional parameters
F12=Cancel  F13=How to use this display  F24=More keys
    
```

4. Go to Chapter 3, Controller Installation on page 3-1.

## HOST CONFIGURATION

### Define Attached Devices (Twinax Attached Only)

Take the following steps to configure the devices attached to the I-O 8494.

- From the AS/400 Main Menu, type **CRTDEV DSP**, and press F4. The Create Device Description menu is displayed, as shown below.

Create Device Desc (Display) (CRTDEV DSP)

Type choices, press Enter.

Device description	TXIO119701	Name
Device class	*RMT	*LCL, *RMT, *VRT
Device type	3197	3179, 3180, 3196, 3197
Device model	D1	*DHCF, 0, 1, 2, 11, A1, A2
Local location address	01	00-41
Online at IPL	*YES	*YES, *NO
Attached controller	TXCTL1	Name
Drop line at signoff	*NO	*YES, *NO
Character identifier:		
Graphic character set	*SYSVAL	1-32767, *SYSVAL
Code page		1-32767
Allow blinking cursor	*YES	*YES, *NO
Printer		Name
Print file	QSYSPRT	Name
Library	*LIBL	Name, *LIBL, *CURLIB
Max length of request unit	*CALC	*CALC, 241, 245, 247 256

F3=Exit      F4=List      F5=Refresh      F10=Additional parameters  
 F11=Keywords      F12=Previous      F13=How to use this display

- Fill in all applicable data. As you fill in the fields and press ENTER, more lines and options will be displayed.

Use the following table to determine each device's local location address.

Address							
Port	0	1	2	3	4	5	6
0	00	01	02	03	04	05	06
1	07	08	09	0A	0B	0C	0D
2	0E	0F	10	11	12	13	14
3	15	16	17	18	19	1A	1B
4	1C	1D	1E	1F	20	21	22
5	23	24	25	26	27	28	29
6	2A	2B	2C	2D	2E	2F	30
7	31	32	33	34	35	36	37

- Go to Chapter 3, Controller Installation on page 3-1.

## System/38 Configuration

The following configuration instructions are summarized from the manual *IBM System/38, Guide to Program Products Installation and Device Configuration (GC21-7775)*. Refer to that manual for further details.

To correctly define a communications line with remote controller(s) and devices and then establish host communications, you must do the following.

- Create a line description.
- Create a control unit description.
- Define the devices attached to the I-O 8494 Remote Controller.
- Create a subsystem (optional).
- Cancel and/or restart the subsystem (optional).

**Note:** It is recommended that you define one subsystem per communications line to prevent locally attached users and users on other lines from being affected by problems related to a specific communications line.

## Create Line Description

Take the following steps to define a communications line.

1. From the System Operator menu, enter **80** at the option field to retrieve the Command Grouping menu.

```

                                SYSTEM OPERATOR MENU

Select one of the following:

1.  DSPJOBQ (jobq)
2.  DSPOUTQ (outq)
3.  SNDMSGtomsgq, (type), msg
4.  CALL program
5.  Execute command
6.  SBMJOB (job), (jobd), (cmd)
7.  STRPRTWTR dev, outq
8.  DSPWTR (writer)
9.  SBMDKTJOB dev, label, (loc)
10. SBMDBJOB file, (member)
11. DSPSBMJOB
12. DSPACTJOB (reset)
80. DSPMNU (menu)
90. SIGNOFF (*NOLIST *LIST)

Option:  80  Parms:
Cmd or parm:
Log requests:  *YES    CF3-Command entry    CF4-Prompt (5,6 only)
CF6-DSPMSG QSYSOPR    CF7-DSPSBS    F8-DSPSYS
```

2. From the Command Grouping menu, select "Configuration Menu," option 15.
3. From the Configuration menu, select "Line Description Menu", option 11.
4. Select "Create Line Description", option 2 on the Line Description menu.
5. From the Create Line Description Prompt menu, enter the selections for the line being defined. Two more screens will appear after the first one.

## HOST CONFIGURATION

CREATE LINE DESCRIPTION (CRTLIND) PROMPT

Enter the following:

Line description name:	LIND	R	<b>TXLINE1</b>
OU number of line port:	LNNBR	R	<b>21</b>
Line type:	TYPE	R	<b>*SDLCP</b>
Connection type (*SWT *PP *MP):	CNN	R	<b>*PP</b>
Data rate:	RATE	R	<b>9600</b>
Switched network backup?	SWNBKU		<b>*NO</b>
Speed select feature?	SELECT		
NRZI decoding (*NO *YES):	NONRTNZ		<b>*YES</b>
S/38 provided clock (*NO *YES):	CLOCK		<b>*NO</b>
Autocall feature (*NO *YES):	AUTOCALL		<b>*NO</b>
Autoanswer feature (*NO *YES):	AUTOANS		<b>*NO</b>
S/38 answer tone (*NO *YES):	ANSTONE		<b>*NO</b>
Physical wire connection WIRE			
Normal wire type (2 4):			<b>4</b>
Backup type, if SWNBKU (2 4)			
Data comm equipment group:	DCEGRP		
Non-IBM modem (*NO *YES):	OEMMDM		<b>*NO</b>
Switched connected type:	SWTCNN		<b>*BOTH</b>
Speed rate type (*FULL *HALF):	RATETYPE		<b>*FULL</b>
Dial mode (*MANUAL *AUTO):	DIALMODE		
Answer mode (*MANUAL *AUTO):	ANSMODE		

CREATE LINE DESCRIPTION (CRTLIND) PROMPT

Data terminal ready delay:	DTRDLY	<b>1</b>
Idle detection time:	IDLETIME	<b>38</b>
BSC receive timeout timer:	RCVTMR	<b>15</b>
Nonproductive receive time:	NONPRDRCV	<b>2</b>
Number of error retries:	RETRY	<b>1</b>
Online at CPF start (*YES *NO):	ONLINE	<b>*YES</b>
Nonswitched control units	CTLU	
+ for more		
BSC switched control units:	SWTCTLU	
+ for more		
Station address:	STNADR	
Exchange identifier in hex:	EXCHID	<b>*NONE</b>
Line code (*EBCDIC *ASCII):	CODE	<b>*EBCDIC</b>
Remote job entry (*NO *YES):	RJE	<b>*NO</b>
BSC switched line disconnect?	BSCSWTDSC	<b>*YES</b>
3270 device emulation?	EML3270	<b>*NO</b>
X.25 network type:	X25NETTYPE	<b>0101</b>
X.25 network local address:	LCLNETADR	<b>*NONE</b>
X.25 default packet size:	DFTPFSIZE	<b>128</b>
X.25 maximum packet size:	MAXPKFSIZE	<b>*DFTPFSIZE</b>
X.25 default window size:	DFTWDWSIZE	<b>2</b>

CREATE LINE DESCRIPTION (CRTLIND) PROMPT		
X.25 Maximum PIU size:	NETMAXPIU	521
X.25 logical channel entries	LGLCHLE	
Logical channel group nbr:		
Logical channel nbr:		
Logical channel type:		
PVC control unit name:		
+ for more		
Public authority	PUBAUT	
(*NORMAL *ALL *NONE):		<b>*NORMAL</b>
Text 'description':	TEXT	<b>*BLANK</b>

If YES is indicated for NRZI decoding, the host is set for NRZI (non-return-to-zero inverted), if NO, NRZ (NONRZI, non-return-to-zero) is selected. This is the SDLC transmission coding option used to keep synchronization loss between modems to a minimum. Both the host and controller must use the same setup option. The recommended initial setting is NO (NRZ) if the EIA interface is connected to digital modems/DCEs, and YES (NRZI) when the EIA interface is used with analog modems/DCEs.

### Create Control Unit Description

Take the following steps to create a control unit description.

1. After the Line Description is defined, the Line Description menu will be displayed on your screen. Press CF2 to retrieve the Configuration menu.
2. Select "Control Unit Description Menu," option 7, from the Configuration menu.
3. From the Control Unit Description menu, select option 2, "Create Control Unit Description."
4. From the Create Control Unit Description Prompt menu, enter the selections related to the control unit you are defining. There are two more prompt menus following the first one.

The CTLADR (control unit address) is a four-digit number where the first two digits (03 in the example) are the control unit address in hex and the last two digits (21 in the example) represent the number of the line.

The EXCHID (exchange identifier index) is a required option where "045000" is a fixed value and the last two digits (03 in the example) - represent the controller address in hex.

## CREATE CONTROL UNIT DESC (CRTCUD) PROMPT

Enter the following:

Control unit description name:	CUD	R	<b>TXCUC1</b>
Control unit type:	TYPE	R	<b>5294</b>
Model number:	MODEL	R	<b>1</b>
Control unit address:	CTLADR	R	<b>0321</b>
Switched line (*NO *YES):	SWITCHED		<b>*NO</b>
Nonswitched line name:	LINE		<b>TXLINE1</b>
Speed select feature:	SELECT		<b>*NO</b>
Switched telephone number:	TELNBR		<b>*NONE</b>
Switched initial connection:	INLCNN		<b>*ANS</b>
Exchange identifier in hex:	EXCHID		<b>4500003</b>
BSC local identifier:	LCLID		<b>*NONE</b>
BSC remote identifiers:	RMTID		<b>*NONE</b>
+ for more			
SSCP identifier:	SSCPID		
SSCP identifier checking:	SSCPIDCHK		<b>*NO</b>
Online at CPF start (*YES *NO):	ONLINE		<b>*YES</b>
Switched line names:	LINLST		
+ for more			
Switched network backup:	SWNBKU		<b>*NO</b>
Allow delayed connection:	DLYFEAT		<b>*YES</b>
Attached device names:	DEV		

## CREATE CONTROL UNIT DESC (CRTCUD) PROMPT

Attached device names:	+ for more		
BSC device delay in sec:	DEVPLY		<b>120</b>
BSC program delay in sec:	PGMDLY		<b>120</b>
Remote job entry (*NO *YES):	RJE		<b>*NO</b>
RJE host:			
	RJEHOST		<b>*NONE</b>
RJE host 'signon'/'logon':	RJELOGON		<b>*NONE</b>
3270 device emulation	EML3270		<b>*NO</b>
Maximum length PIU:	MAXLENPIU		<b>521</b>
Data compression:	DTACPR		<b>*NO</b>
Device wait timeout value:	DEWAI		<b>*TYPE</b>
Link type:	LINKTYPE		<b>*SDLCSEC</b>
Controller code:	CODE		
X.25 address:	X25ADR		
X.25 default packet size:	DFTPFSIZE		<b>*LIND</b>
X.25 default window size:	DFTWFSIZE		<b>*LIND</b>
X.25 LLC protocol:	NETPCL		<b>*QLLC</b>
X.25 response timer:	NETRSPMTR		
X.25 reverse charging	NETRVSCRG		
Incoming calls:			<b>*NO</b>
Outgoing calls:			<b>*NO</b>

## CREATE CONTROL UNIT DESC (CRTCUD) PROMPT

X.25 closed user group ID:	NETCUGID		<b>*NONE</b>
X.25 connection password:	NETCNNPWD		<b>*NONE</b>
X.25 user facilities:	NETUSRFCL		<b>*NONE</b>
Public authority	PUBAUT		
(*NORMAL *ALL *NONE):			<b>*NORMAL</b>
Text description:	TEXT		<b>*BLANK</b>



## Define Attached Devices

Take the following steps to create device descriptions for the devices attached to the I-O 8494 Remote Controller.

1. After the control unit is defined, press CF2 from the Control Unit Description menu to retrieve the Configuration menu.
2. From the Configuration menu, select "Device Description Menu," option 8.
3. From the Device Description menu, select "Create Device Description," option 2.
4. From the Create Device Description Prompt menu, enter the valid values for the device being created. Two more prompt menus follow the first one (as shown below).

CREATE DEVICE DESCRIPTION (CRTDEVD) PROMPT			
Enter the following:			
Device description name:	DEVD	R	TXW1
Device address:	DEVADR	R	020321
Device type code:	DEVTYPE	R	5251
Model number:	MODEL	R	11
Control unit description name:	CTLU		TXCUC1
Online at CPF start (*YES *NO):	ONLINE		*YES
DKT/tape error retries RETRY			
Error type:			
Maximum times to retry:			
+ for more			
DKT/tape error log threshold	THRESHOLD		
Threshold error type:			
Number of errors allowed:			
+ for more			
Drop line at signoff:	DROP		*YES
Associated work stn printer:	PRINTER		*NONE
Message queue name:	MSGQ		QSYSOPR
Library name:			
Print image name:	PRTIMG		*LIBL
Library name:			
			*LIBL

CREATE DEVICE DESCRIPTION (CRTDEVD) PROMPT		
Printer file Name:	PRTFILE	GSYSVRT
Library name:		
		*LIBL
Work stn controller address:	WSCADR	*NONE
Work stn controller keyboard:	WSCKBD	*NONE
Allow blink (*YES *NO):	ALWBLN	*YES
BSC contention resolution:	CONTN	
Local LU name:	LCLLU	*SYS
Remote LU name:	RMTLU	
System validation password:	SYSVDPWD	*NONE
Secure LU:	SECURELU	*NO
Font identification:	FONT	
Form feed:	FORMFEED	*CONT
Emulation device type:	EMLDEVTYPE	3277
Emulation keyboard type:	EMLKBDTYPE	*UPPER
Maximum length RU:	MAXLENRU	256
Auxiliary device AUXDEV		
Auxiliary device type:		
		*NONE
Auxiliary device address:		
+ for more		
Network device address:	NETDEVADR	*NONE

## HOST CONFIGURATION

CREATE DEVICE DESCRIPTION (CRTDEVD) PROMPT		
Character identifier	CHRID	
Graphic character set:		<b>*SYSVAL</b>
Code page:		
Public authority	PUBAUT	
(*NORMAL *ALL *NONE):		<b>*NORMAL</b>
Text description:	TEXT	<b>*BLANK</b>

Use the following table to determine each device address.

Address							
Port	0	1	2	3	4	5	6
0	00	01	02	03	04	05	06
1	07	08	09	0A	0B	0C	0D

### Create Subsystem

Take the following steps to create a subsystem on a communications line.

1. From the System Operator menu, enter option 80 to retrieve the Command Grouping menu.

SYSTEM OPERATOR MENU	
Select one of the following:	
1. DSPJOBQ (jobq)	
2. DSPOUTQ (outq)	
3. SNDMSGtomsgq, (type), msg	
4. CALL program	
5. Execute command	
6. SBMJOB (job), (jobd), (cmd)	
7. STRPRTWTR dev, outq	
8. DSPWTR (writer)	
9. SBMDKTJOB dev, label, (loc)	
10. SBMDBJOB file, (member)	
11. DSPSBMJOB	
12. DSPACTJOB (reset)	
80. DSPMNU (menu)	
90. SIGNOFF (*NOLIST *LIST)	
Option: <b>80</b>	Parms:
Cmd or parm:	
Log requests: *YES	CF3-Command entry
CF6-DSPMSG QSYSOPR	CF4-Prompt (5,6 only)
	CF7-DSPSBS
	CF8-DSPSYS

2. From the Command Grouping menu, select option 14, "Work Management Menu."
3. Select option 5 from the Work Management menu to retrieve the Subsystem Description menu.

- Select option 2 on the Subsystem Description menu to retrieve the Create a Subsystem Description menu.

```

CREATE SUBSYSTEM DESCRIPTION (CRTSBSD) PROMPT

Enter the following:

Subsystem description name:      SBSDB      R      TXLINE1
Library name:                   QGPL
Storage pool                    POOLS    R
Pool identifier (1-10):         1
Stg size or *BASE *NOSTG:      *BASE
Activity level, if stg size:
+ for more
Maximum number of jobs:        MAXJOBS  P      *NOMAX
Display file name:             SGNDSPF  *QDSIGNON
Library name:
Public authority                PUBAUT
(*NORMAL *ALL *NONE):
Text description:              TEXT      *BLANK
    
```

- Enter the information required for the subsystem you are creating.

**Note:** Follow the procedures outlined in Define Attached Devices on page 2-21, to define devices for the subsystem.

## Cancel/Restart Subsystem

If a Line/Controller/Device is related to an existing subsystem, you must terminate the subsystem by selecting option 5 from the System Operator menu, and entering TRMSBS [subsystem name] on the line "Cmd or parm:".

To start the subsystem (this must be done for a newly created subsystem or for an existing terminated subsystem), select option 5, and enter **STRSBS TXLINE1** on the line "Cmd or parm:". In the example, TXLINE1 is the name of the subsystem.

```

SYSTEM OPERATOR MENU

Select one of the following:

1. DSPJOBQ (jobq)
2. DSPOUTQ (outq)
3. SNDMSGtomsgq, (type), msg
4. CALL program
5. Execute command
6. SBMJOB (job), (jobd), (cmd)
7. STRPRTWTR dev, outq
8. DSPWTR (writer)
9. SBMDKTJOB dev, label, (loc)
10. SBMDBJOB file, (member)
11. DSPSBMJOB
12. DSPACTJOB (reset)
80. DSPMNU (menu)
90. SIGNOFF (*NOLIST *LIST)

Option: 5   Parms:
Cmd or parm: STRSBS TXLINE1
Log requests: *YES   CF3-Command entry   CF4-Prompt (5,6 only)
CF6-DSPMSG QSYSOPR  CF7-DSPSBS   CF8-DSPSYS
    
```

## HOST CONFIGURATION

### System/36 Configuration

The following configuration instructions are summarized from the manual IBM System/36, Changing Your System Configuration (SC21-9052). Refer to that manual for further details. Before you begin, make sure you have security clearance (if security is installed). Print a copy of the existing configuration member for reference.

To correctly define a communications line on a System/36, you must do the following.

- Define and run the SETCOMM procedure.
- Create or change the configuration member.
- Define a communications line.
- Define the remote controller.
- Define the devices attached to the remote controller.
- IPL the system.

### Define SETCOMM Procedure

The SETCOMM procedure sets the communications configuration parameters. On your default menu, enter the procedure SETCOMM, and assign the values that apply to your configuration (see below).

SETCOMM Procedure		
Set the communications configuration parameters		
Line number	1-10	<b>1</b>
Line type	SHM, Multcont, Multtrib, Swtch, Nonswtch	<b>Nonswtch*</b>
Multipoint control	Yes, No	<b>No</b>
Use system clocking facility	Clock, Noclock	<b>Noclock</b>
NRZI data encoding	NRZI, NONRZI	<b>NONRZI*</b>
Use continuous carrier feature	Concar, noconcar	<b>Noconcar*</b>
Use non-U.S. answer tone	Tone Notone	
Use autocal separator characters	SEP, NOSEP	
Use autocal end-of-number characters	EON, NOEON	
Primary SDLC time-out value	5-80	<b>5</b>
Number of primary SDLC error retries	1-5	<b>3</b>
Modem	IBMLPDA, IBMWRAP, NONIBM	<b>NONIBM</b>
X.25 support	X25, NOX25	
DDSA line speed	2400BPS, 48700BPS, 9600BPS, 56KBPS	
Secondary SDLC inactivity time-out value	0-20	<b>5</b>
IBM Token-Ring Network adapter address override	4000000-7FFFFFFF,R	
Cmd3-Previous Menu		

**Note:** If you have multiple twinax cards installed in the controller, you must specify "Nonswitched Line" when configuring for the I-O 8494 Remote Controller.

The SETCOMM procedure options select either NRZI (non-return-to-zero - inverted) or NONRZI (NRZ, non-return-to-zero) SDLC transmission coding options. These options keep synchronization loss between the modems to a minimum. Host and controller must use the same coding option.

A NONRZI selection is recommended for an EIA interface with digital modems/DCEs, and a NRZI selection is recommended for EIA interfaces with analog modems/DCEs.

**Note:** Enabling continuous carrier on a multi-drop line is not recommended. However, this option can increase performance if enabled on a point-to-point leased line.

If your SETCOMM procedure has already been run, you may display system communications status by typing **D H**, then pressing ENTER.

### Create or Change Configuration Member

Take the following steps to create or change the configuration member.

1. From the Main System/36 Help menu, enter the **CNFIGSSP** command to start the System/36 workstation configuration.

```

Main System/36 help menu

Select one of the following:

1.  Display a user menu
2.  Perform general system activities
3.  Use and control printers, diskettes, or tape
4.  Work with files, libraries, or folders
5.  Use programming languages and utilities
6.  Communicate with another system or user
7.  Define the system and its users
8.  Use problem determination and service
9.  Use office products
10. Sign off the system

Cmd3-Previous Menu  Cmd7-End  Cmd12-How to use help  Cmd-Sign on menu
Ready for option or command
CNFIGSSP
```

The CNFIGSSP Main menu will appear.

```

1.0          CNFIGSSP - MAIN MENU

Select one of the following:

1.  How to use CNFIGSSP
2.  Create, change, or delete a configuration member
3.  Review a configuration
4.  Print a configuration
10. Configuration support aids
12. Apply change to the master configuration record
13. Rebuild the master configuration record (update to next release)
14. End CNFIGSSP

Option:  2

Cmd 3-Previous menu
Help text is available throughout the CNFIGSSP
procedure by pressing the help key
```

**Note:** You can also select the CNFIGSSP Main menu by selecting option 7 from the Main System/36 Help menu. The DEFSYS menu will be displayed. Select option 2 from the DEFSYS menu to retrieve the CNFIGSSP Main Menu.

- From the CNFIGSSP - Main menu, select option 2, "Create, change, or delete a configuration member." Options 12 and 13 will not display if you don't have proper security clearance.

3.0	CONFIGURATION MEMBER DEFINITION
Select one of the following:	
1. Change an existing configuration member	
2. Create a new configuration member	
3. Delete a configuration member	
Option:	.....1
Member name:	.....SYSCNFIG
Library name:	.....#CNFGLIB
Cmd3 -Previous Menu	

- From menu 3.0, Configuration Member Definition, select option 1, "Change an existing configuration member," and press ENTER. The member name and library name may be different depending on the configuration of your system.

6.0	CONFIGURATION MEMBER DESCRIPTION	SYSCNFIG
1. Describe the configuration member (up to 60 characters): MASTER CONFIGURATION		
2. Specify main storage size in K-bytes 0128-7168 1024		
3. Specify disk storage size in M-bytes 0030-1432 0200		
Cmd3-Previous menu		

- From menu 6.0, Configuration Member Description, press ENTER. The information on the screen will vary depending on the configuration of your system.

5.0 CONFIGURATION MEMBER MENU SYSCNFIG

Select one of the following:

1. Work with display stations and printers
2. Add or delete program products, optional SSP, and features
3. Define base SSP values
4. Specify sizes for disk VTOC, history file, and task work area

If no more changes are to be made to your configuration member select the following option:

5. Save configuration member and return to main menu for CNFIGSSP

Option: 1

Cmd3-Previous menu

Cmd19-Cancel

5. From menu 5.0, Configuration Member menu, select option 1, "Work with display stations and printers."

27.0 CONFIGURATION - DISPLAY STATION AND PRINTER MENU SYSCNFIG

Select one of the following:

1. Add or delete local display stations and printers
2. Add or delete remote line characteristics
3. Add or delete remote controllers, display stations, and printers.
4. Assign default printers to display stations
5. Assign display station control (subconsoles) for printers
6. Change display station or printer workstation IDs
7. Change display station or printer characteristics
8. Select the system printer
9. Add remote service device definition
10. Delete remote service device definition
11. Return to previous menu

Option: 2

6. From menu 27.0, Configuration Display Station and Printer menu, select option 2, "Add or delete remote line characteristics."

## HOST CONFIGURATION

---

### Define Communications Line

Take the following steps to define a communications line.

1. Retrieve menu 10.0, CNFIGSSP Communications Line Definition.

```
10.0          CNFIGSSP - COMMUNICATIONS LINE DEFINITION   SYSCNFIG
                FOR REMOTE WORK STATIONS

The following lines have been defined:

1.  Which line is being defined? . . . . .1-10   1

Cmd3-Previous menu   Cmd9-Drop line   Cmd19-Cancel
```

2. From menu 10.0, CNFIGSSP Communications Line Definition for Remote Workstations, type in the number of the line that is being defined.

```
10.0          CNFIGSSP - COMMUNICATIONS LINE DEFINITION   SYSCNFIG
                FOR REMOTE WORK STATIONS

The following lines have been defined:

1.  Which line is being defined? . . . . .1-10   1
2.  What type of line is it? . . . . .          1
    1 - Nonswitched                2 - Switched manual call
    3 - Switched autoanswer         4 - Switched manual answer
    5 - X.21 short-hold mode        6 - IBM Token-Ring Network
3.  Automatic reconnect for the line? . . . .Y, N   N
4.  If line is X.25, enter X.25 member name . . .

Cmd3 - Previous menu   Cmd9 - Drop line       Cmd19 - Cancel
```

3. Enter the selections for the line being defined. The example shows a nonswitched (point-to-point or multi-point) line defined as line number 1.
4. Continue to define each line in the same manner.



**Define Remote Controller and Attached Devices**

Take the following steps to define a remote controller and its attached devices.

1. After you have configured the line(s), press ENTER or CMD3 until you reach screen 27.0, Configuration Display Station and Printer menu.

```

27.0                                CONFIGURATION - DISPLAY
STATION AND PRINTER MENU           SYSCNFIG

Select one of the following:

1.  Add or delete local display stations and printers
2.  Add or delete remote line characteristics
3.  Add or delete remote controllers, display stations, and printers
4.  Assign default printers to display stations
5.  Assign display station control (subconsoles) for printers
6.  Change display station or printer workstation IDs
7.  Change display station or printer characteristics
8.  Select the system printer
9.  Add remote service device definition
10. Delete remote service device definition
11. Return to previous menu

Option:    3

Cmd3-Previous Menu      Cmd19-Cancel
    
```

2. Select option 3, "Add or delete remote controllers, display stations, and printers."

```

13.0      CNFIGSSP - REMOTE CONTROLLER DEFINITION      SYSCNFIG

EDIT      Controller:      C01

1.  Describe the remote controller      . . . . .      8494 CONTROL UNIT
2.  Controller type      . . . . .      2
    1. 5251 Model 12      2. 5294      3. 3274
3.  Controller station address      . . . . .01-FD      01
4.  Communications line      . . . . .1-10      1
5.  For a switched line, optionally specify 1 to 3 alternative lines.

Cmd2-Scan      Cmd3-Previous menu      Cmd5-Add controller
Cmd6-Restart      Cmd9-Delete remote controller
    
```

3. From menu 13.0, CNFIGSSP Remote Controller Definition, enter the selections for the control unit being defined. The example defines a controller on line number 1. Your selections might be different depending on the line you have defined.

```
12.0    CNFIGSSP - WORKSTATION DEFINITION    REMOTE    SYSCNFIG

Specify the arrangement of your display stations and printers. The positions
correspond to the workstation address.

Displays: 00. Single Color display station

  0  1  2  3  4  5  6  ← Workstation address
01  10
01  PC 10 10
                                0 — P _____
                                1 — 0  C01
                                2 — R
                                3 — T  5294
                                _____

Cmd3-Previous menu      Cmd5-Display device codes  Cmd19-Cancel
```

4. From menu 12.0, CNFIGSSP Workstation Definition, assign the appropriate device code to each workstation address. Only port 0 and 1 can be used (the I-O 8494 Remote Controller has two ports for each 5294 emulation).
5. Continue to define the next control unit or end the session with CMD 3.

## IPL the System

When you have finished defining the communications line(s) and/or the controller(s), take the following steps.

1. From menu 27.0, Configuration Display Station and Printer menu, select options 4, 5, 6, and 7 as applicable for your configuration.
2. From menu 5.0, Configuration Member menu, select option 5, "Save configuration member," and return to Menu 1.0, the CNFIGSSP - Main Menu.
3. To apply the changes, you must have a dedicated system (all devices signed off and no active spool jobs). Select option 12 on the CNFIGSSP - Main Menu to apply the changes permanently. This will IPL your system.

### **3 CONTROLLER INSTALLATION**

The front of the I-O 8494 Remote Controller has a power on switch, a test switch, status indicators and a diskette drive. The rear panel has cable and power connections, card installation slots, and status indicators. The communications interface card (MPIC Card) is factory installed.

The host must have appropriate communications software installed, for example, Remote Workstation Support on an IBM 5360

The software which runs on the Controller depends on how it is connected to the host. One of the following diskettes will come with your controller.

- I-O 8494 Remote Controller system diskettes:  
8494XXADSK01XXX    SDLC without LAN  
8494XXADSK02XXX    SDLC with LAN  
8494XXADSK03XXX    X.25 without LAN  
8494XXADSK04XXX    X.25 with LAN

**Note:** "XXX" represents the version number.

#### **Site Considerations**

Locate the I-O 8494 Remote Controller on a desk or table top. Make sure the controller has at least six inches of clearance (air space) on the top, sides and back for cooling. You should also remember that you will need access to the controller to add devices, cards, cables, and new software. The guidelines below will help you choose the proper site for your new controller.

Place the I-O 8494 away from electromagnetic sources such as electric motors, transformers and high voltage power lines. Keep the controller away from other electronic devices (their power supplies may cause interference), high humidity, dust, and water.

If you're unfamiliar with how site selection can affect the proper operation of your controller, please review the following site cabling and electrical considerations.

## CONTROLLER INSTALLATION

---

### Twinax Cable

Workstations are connected to the I-O 8494 Remote Controller and to each other by twinax cable. This cable is a shielded, two-conductor cable that can be used indoors or outdoors with lightning protectors on both ends.

**Note:** *To avoid interference, do not install twinax cables within 1 foot (.3 m) of power equipment or power lines.*

Installation of cabling should include tests to ensure that there are no faults, no high-resistance connections, and no circuit imbalances. Tests should ensure that the following common cable problems are eliminated.

- No open circuits in individual conductors or shields
- No short circuits between conductors of the same pair
- No grounds on individual conductors, either between a conductor and a shield, or between a conductor and a grounded object
- No reversed polarities

The twinax cabling must comply with standard twinax requirements, such as no extended "T"s, no more than 11 "T" connections per cable, and correct cable-through and termination. Refer to Appendix A, Related Documentation, for manuals that are useful in determining twinax cabling requirements.

### Twisted Pair

Each twinax card has a jumper (location J2) that should be removed from one of the jumper pins if twisted pair/balun cabling systems are used and devices do not establish communication with the host. This will customize the installation of the remote controller to meet the requirements in such installations.

**Note:** *Non-twisted pair cable (also referred to as "silver satin") is not within specification and cannot be used. If this is used, your connection may not work at all, or you may encounter intermittent problems.*

### Communications Cable

Cable	Connection	Description
CCV24	SNA/SDLC	communications using an EIA 232D/V.24 interface
CCV35	SNA/SDLC	communications using a V.35 interface
CCX21	SNA/SDLC	communications using an X.21 interface
FHCCV24	X.25	communications using an RS-232D/V.24 interface
FHCCV35	X.25	communications using a V.35 interface
FHCCX21	X.25	communications using an X.21 interface

The appropriate interface communications cable is used to connect the I-O 8494 to the modem or DCE and should correspond to your host system's communications protocol (SDLC or X.25).

*One of the following 6-foot communications cables is supplied with the I-O 8494 Remote Controller (as specified at time of order).*

If your remote controller is set up for SNA/SDLC communications and you wish to connect it locally, one of the optional cables below is required. These cables are available from your dealer.

Cable	Connection	Description
CCV24M	Local SNA/SDLC	EIA 232D/V.24 interface
CCV35M	Local SNA/SDLC	V.35 interface
CCX21M	Local SNA/SDLC	X.21 interface

### Electrical Requirements

Standard voltages of 115 VAC at 50Hz or 230 VAC at 60 Hz are preset at the factory. The voltage is marked on the power supply module in the unit. See Specifications in Chapter 1 for detailed information on power requirements.

The I-O 8494 has a three-wire power cord that includes an equipment ground wire. Be sure that correctly grounded receptacles are located within reach of the power cord and away from traffic areas.

### Setup

To set up the I-O 8494, you will need to do the following. (Also refer to the I-O 8494 Remote Controller Installation Guide).

- If you are going to use X.25 communications protocol, install the appropriate X.25 interface card (if applicable). (See page 3-4)
- Install any additional twinax cards (if applicable). (See page 3-7)
- Install any LAN cards (if applicable).

If none of the above applies, continue to section "Software Configuration of the I-O 8494 on page 3-8".

### Configure Interface Card

The following six interface cards for host communications are available with the I-O 8494 Remote Controller.

#### MPIC

Card	Connection	Description
MPIC	EIA 232D/V.24, V.35, and X.21	for SNA/SDLC communications
FHKV24	RS-232/V.24	for X.25 communications
FHKV35	V.35	for X.25 communications
FHKX21	X.21	for X.25 communications
TRKSDLC	SNA/SDLC	Token-Ring attachment
ETKSDLC	SNA/SDLC	Ethernet attachment

The MPIC (Multipurpose Communications Interface Card) is identified through the DB-44 connector (44 pin female connector) with 5 LEDs directly under the connector. It is used for SNA/SDLC communications.

The MPIC is already installed in your remote controller. You can attach the I-O 8494 directly to the host system for local applications (DCE mode) with a special modem eliminator communications cable. Note: The MPIC card is required, even when an X.25 interface card is installed.

# CONTROLLER INSTALLATION

## Remote (DTE) Mode

In remote mode, the MPIC's port functions like a data terminal and should be connected to the host through modems.

## Local (DCE) Mode

In local (DCE) mode, the MPIC's port functions like a modem interface. The controller can be connected directly to a local host. You must use a special modem eliminator cable (available from your dealer) to connect the I-O 8494 to the host to operate in local mode.

If set up for local attachment, make sure the baud rate is set to the desired value when configuring the I-O 8494 software. The baud rate is set in field 10 of the configuration screen. (See page 3-19.)

For an installation using the SNA/SDLC protocol, continue on page 3-7, "Install Twinax Card."

## X.25 RS-232/V.24 Card

The FHKV24 interface card will only work for X.25 networks with an RS-232/V.24 physical connection. The card is identified through the DB-25 connector. It doesn't have any other connectors or LEDs. This card should be installed in Slot #7 (labeled on the back of the controller as Opt.).

The RS-232/V.24 card has two switches (SW1 and SW2) and two jumper blocks (J1 and J2) that are used to configure the card (see Figure 3-1).

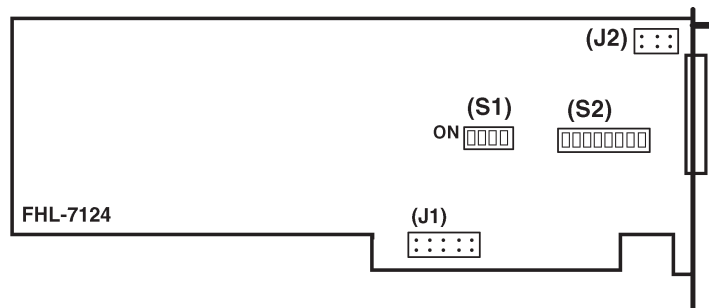


Figure 3-1

These switches and jumpers should always be set as follows.

SW:1 Memory Window Addresses		SW2: I/O Base Address	
Switch	Setting	Switch	Setting
		1	ON
1	OFF	2	ON
2	ON	3	ON
3	ON	4	OFF
4	OFF	5	OFF
		6	ON
		7	ON
		8	OFF

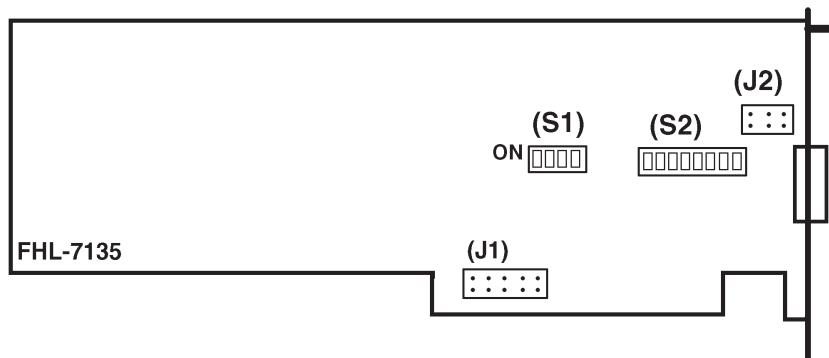
<b>Jumper</b>	<b>Setting</b>
J1: Interrupt Request Level	IRQ5 : : :
J2: Not Used	N/A

Go to “Install Twinax Card” on page 3-7.

**X.25 V.35 Card**

The FHKV35 interface card will only work for X.25 networks with a V.35 physical connection. The card is identified through the DB-15 connector, and the placement of the switches and jumper. It doesn't have any other connectors or LEDs. This card should be installed in Slot #7 (labeled on the back of the controller as Opt.).


The V.35 card has two switches (SW1 and SW2) and two jumper blocks (J1 and J2) that are used to configure the card (see Figure 3-2).



**Figure 3-2**

These switches and jumpers should always be set as follows.

<b>SW:1 Memory Window Addresses</b>		<b>SW2: I/O Base Address</b>	
<b>Switch</b>	<b>Setting</b>	<b>Switch</b>	<b>Setting</b>
1	OFF	1	ON
2	OFF	2	ON
3	ON	3	ON
4	ON	4	OFF
5	OFF	5	OFF
		6	ON
		7	ON
		8	OFF

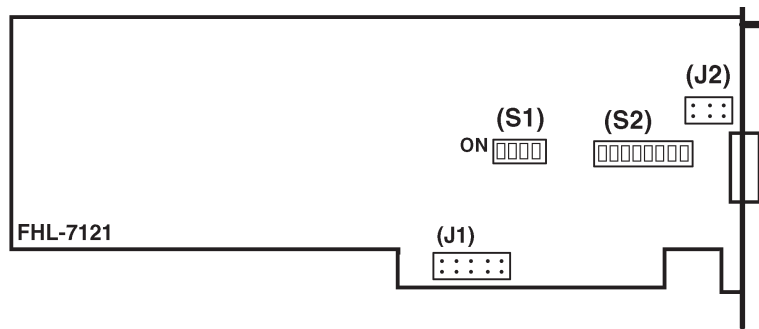
Jumper	Setting
J1: Interrupt Request Level	IRQ5
J2: Clocking Sensor	External Clock 

Go to “Install Twinax Card” on page 3-7.

**X.25 X.21 Card**

The FHKX21 interface card will only work for X.25 networks with an X.21 physical connection. The card is identified through the DB-15 connector, and the No. 7121 in the lower left hand corner of the board. It doesn't have any other connectors or LEDs.



The X.21 card has two switches (SW1 and SW2) and two jumper blocks (J1 and J2) that are used to configure the card (see Figure 3-3).



**Figure 3-3**

These switches and jumpers should always be set as follows.

SW1: I/O Base Address		SW2: Memory Window Addresses	
Switch	Setting	Switch	Settings
1	OFF	1	ON
2	ON	2	ON
3	ON	3	ON
4	OFF	4	OFF
		5	OFF
		6	ON
		7	ON
		8	OFF

Jumper	Setting
J1: Interrupt Request Level	IRQ5 
J2: Not Used	N/A 

Continue with section “Install Twinax Card” on the next page.



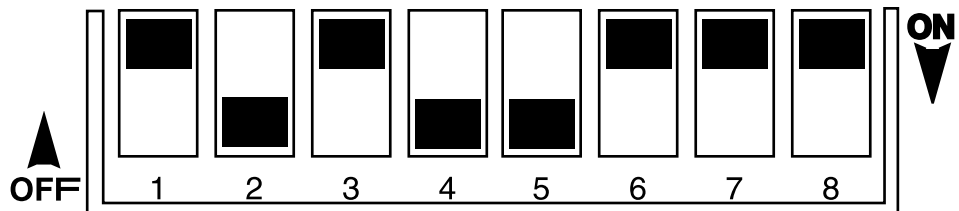
**Install Twinax Card**

The basic controller comes with one twinax card installed for attaching twinax devices. If you ordered additional twinax cards, you will need to install them. Follow the instructions below to install twinax cards.

**Note:** *Like most circuit boards, the twinax cards can be damaged by static electricity discharges. Take static precautions, such as touching a grounded surface or wearing a wrist strap connected to a grounded surface, during installation of the twinax card(s).*

1. Turn off power to the controller.
2. Remove the single screw at the top center of the back cover.
3. Locate the next available slot in the controller (as marked 1 through 6), and remove the slot cover bracket. Save the screw.
4. Install the twinax card, making sure the card aligns in the card brackets at the front and rear of the controller. Firmly seat the card until the slot bracket on the twinax card is flush against the controller chassis and the holes align. Fasten with the screw you removed in the previous step.
5. The twinax card's DIP switches must be set for the slot number in which the card is installed, as shown in the table below. Figure 3-4 shows how the DIP switches are set.

Slot Number	Switch Number							
	1	2	3	4	5	6	7	8
Slot 1	OFF	ON	OFF	ON	ON	OFF	OFF	OFF
Slot 2	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
Slot 3	OFF	OFF	ON	ON	ON	OFF	OFF	OFF
Slot 4	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
Slot 5	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
Slot 6	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF



**Figure 3-4**

6. After setting the DIP switches, reassemble the controller.

## CONTROLLER INSTALLATION

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### Connect

#### Communications Cable

The communications cable is used to connect the I-O 8494 to the modem or DCE and should correspond to your system's communications protocol (SDLC or X.25).

Take the following steps to connect the communications cable to the I-O 8494 Remote Controller.

1. Turn off power to the I-O 8494 Remote Controller.
2. Connect one end of the supplied communications cable to the modem or host (for local communications).

Ensure the modem or DSU/CSU is setup according to the manufacturer's instructions. In order to communicate, the I-O 8494 requires that the modem respond to an RTS signal by turning on the CTS signal.

Some modems may require a half-duplex setting (sometimes referred to as hdx or 2-wire) before the modem will provide the CTS response. The I-O 8494 supports modems operating in full duplex mode if appropriate CTS response is provided.

**Note:** *If the strappings on the modem for Ready to Send and Clear to Send are not set properly, the I-O 8494 Remote Controller may not operate.*

3. Connect the other end of the communications cable to the appropriate communications port on the interface card.

For SNA/SDLC communications, connect the cable to the MPIC interface (5 LEDs under the DB-44 connector) installed in the MPIC slot.

For X.25 communications, connect the cable to the X.25 interface (no LEDs under the connector) installed in the Opt. slot.

4. Tighten the attachment screws by hand to secure the connections.
5. If a LAN configuration is used, the cable between the remote controller and the LAN must be attached and properly terminated prior to powering on the controller. If this is not done, the remote controller will not operate.

#### Software Configuration of the I-O 8494

Before the I-O 8494 can be used in normal operation, a software configuration procedure must be performed. This procedure provides the controller software with parameters it needs in order to communicate successfully with the host computer. Configuration information is stored in a data file that resides on the controller's software diskette.

Configuration can be performed either "on-line" or "standalone". On-line configuration is done using the controller itself; the software diskette is loaded into the controller, and configuration parameters are entered using a twinax display attached to the controller. Standalone configuration is performed using a PC with the software diskette loaded into a 3 1/2" drive on the computer. Most details of the configuration process are very similar in the two cases; differences will be described later on.

Before performing the software configuration, you may wish to make a backup copy of your I-O 8494 software diskette. The backup needs to be made by

using the DISKCOPY command on a PC. From a DOS prompt type  
A: <Return> followed by Diskcopy.

If you decide to change controller parameters after you do your initial configuration of the I-O 8494, simply repeat the configuration process.

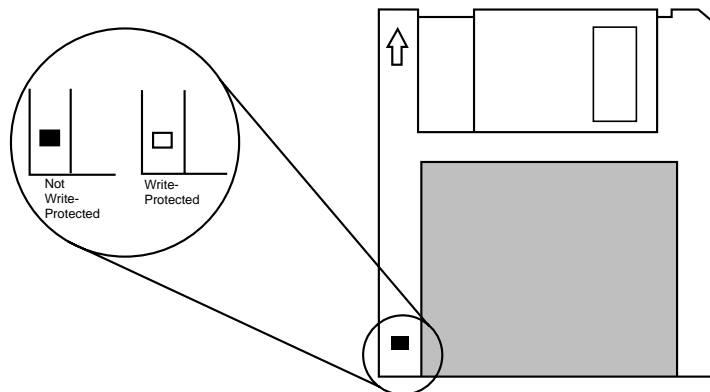
During configuration, the program collects information by presenting you with three different data input screens. These are the “Configuration Menu”, the “Basic Configuration” and the “Network Information” screens. These screens appear much the same whether you are configuring on-line or standalone, but some of the keystroke sequences are slightly different in the two cases because of differences between PC and twinax display keyboards. The three screens are described in more detail below.

**Note:** *In some configurations, the Network Information screen is not used.*

When doing a software configuration, please be sure that:

- The software diskette is not write-protected, and
- You save your configuration parameters to diskette before exiting the configuration program.

Instructions for saving your configuration to diskette are given later in this chapter. The configuration save will fail if your diskette is write-protected; verify that the diskette’s write protect window is in the closed, not write-protected, position. (See figure 3-5.)



**Figure 3-5**

## CONTROLLER INSTALLATION

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### Starting and Ending On-line Configuration

To start on-line configuration:

1. Power off the I-O 8494 if it's powered on.
2. Ensure that the display that you will use for entering configuration data is connected to one of the controller's twinax ports and powered on.
3. Insert the controller's software diskette into the controller's diskette drive, label side up. Be sure that the diskette is not write-protected.
4. Place the TEST/NORMAL switch on the front of the controller in the TEST position.
5. Power the controller on and wait for the front panel READY light to turn on. This will take about one minute. Shortly after the READY light comes on, a Copyright screen will appear on your display. The on-line configuration can be performed at any display that shows the Copyright screen, but you cannot run the procedure at more than one display at the same time.
6. At your display terminal, key the TEST key sequence. The Configuration Menu screen will appear, and you can begin configuration. The TEST key sequence varies according to the kind of keyboard your terminal has:
  - 83-key keyboard: CMD, BACKSPACE
  - 102 or 122-key keyboard: Press and hold ALT, then press TEST

If your display is a PC running a terminal emulation, check your keyboard mapping to determine the correct keystrokes for CMD BACKSPACE. Typical mappings are ALT, PAUSE or LEFT SHIFT, PAUSE.

7. Enter configuration data using the Configuration Menu, Basic Configuration, and Network Information screens described starting on page 3-12. After completing the configuration, return here to end the on-line configuration.

To end on-line configuration:

1. Be sure your configuration has been saved to diskette. (See "Saving Your Configuration to Diskette" on page 3-11.)
2. Return to the Configuration Menu screen. From the other screens you can return to the menu screen by keying RESET.
3. Select menu option 9 (EXIT), and press ENTER.
4. Power off the controller.
5. Return the TEST/NORMAL switch to the NORMAL position.

### Starting and Ending Standalone Configuration

To start standalone configuration:

1. Insert the controller software diskette into a diskette drive on your PC. The diskette drive must be compatible with a 1.44 mb diskette. Be sure the diskette is not write-protected.
2. Set your computer's default drive to the drive containing the controller diskette.

For example:

```
C:\> A:<Enter>
```

3. Run the configuration program, which is 8494UP.EXE.

```
A:\> 8494UP<Enter>
```

The Configuration Menu screen will appear.

4. Enter configuration data using the Configuration Menu, Basic Configuration, and Network Information screens described on page 3-12.
5. After completing the configuration, return here to end the stand alone configuration.

To end standalone configuration:

1. Be sure your configuration has been saved to diskette (see "Saving Your Configuration to a Diskette" on page 3-11).
2. Return to the Configuration Menu screen. You can return to this menu screen by keying ESC from the other screens.
3. Select menu option 9 (EXIT), and press ENTER.

### Saving Your Configuration To Diskette

Before exiting from either the on-line or the standalone configuration program, you should be sure you have saved your configuration to the controller diskette. To save a configuration:

1. If you are in the Configuration Menu screen, go to the Basic Configuration screen by selecting a menu option in the range 1 to 7.
2. If you are in the Basic Configuration screen, press ENTER twice. The first ENTER will cause all configuration data fields to be highlighted; the second ENTER will cause the Network Information screen to appear. If your configuration does not use the Network Information screen, then the second ENTER will write your configuration to diskette.
3. If you are in the Network Information screen, press ENTER twice. The first ENTER will cause all configuration data fields to be highlighted; the second ENTER will write your configuration to diskette.

### Using the Configuration Menu Screen

Once your configuration has been written to diskette, you can safely end configuration by exiting through the menu screen as described in the previous section.

A typical Configuration Menu screen offers up to nine menu options and looks similar to this:

CONFIGURATION MENU			
1.	CARD 1-2	5394/2	8
			8
3.	CARD 3-4	5394/2	8
			8
5.	CARD 5-6	5394/2	8
			14
7.	LAN GATEWAY		
8.	COPY CONFIGURATION		
9.	EXIT		

Menu selections 1 through 7 display Basic Configuration screens for each of the cards installed in the I-O 8494 Remote Controller. Menu selection 8 copies the controller configuration data from one controller diskette to another. Use selection 9 to end the configuration procedure. The Configuration Menu Screen shown above is for an on-line configuration of a controller that contains six twinax interface cards and a LAN adapter. Your Configuration Menu screen will appear slightly different if you are running a standalone configuration, or if your controller has fewer adapter cards installed.

In addition to providing menu options, the Configuration Menu screen serves a second purpose; use this screen to group the twinax cards together for multi-card controller emulations, and to select the type of controller (5294, 5394, or 5494) to be emulated by each card or group of cards.

Keys that are recognized in the Configuration Menu screen are:

Up-arrow and down-arrow:	Position the cursor bar to menu options 1 through 9
Numeric keys (1-9):	Position the cursor bar to menu options 1 through 9
ENTER key:	Select the menu option currently highlighted by the cursor bar
Left-arrow and right-arrow:	Active only when one of the top six menu options is highlighted. These are used to cycle through emulation and card grouping choices for a twinax card or a group of cards.
Space bar:	Same as right-arrow.

If the twinax card groupings and controller emulations shown when the Configuration Menu first displays are not what you want them to be, you should adjust those groupings and emulations before moving on to the Basic Configuration for each card or group. Follow these steps:

1. Move the cursor bar to the menu line for a card that you want to be the first or only card in a controller emulation.

2. Repeatedly press left-arrow, right-arrow, or space bar to see available options displayed.
3. When your desired grouping and emulation is displayed either press ENTER to go to the Basic Configuration for that emulated controller, or repeat steps 1 and 2 for another card or group.

After you have arranged the cards into groups, use the menu options in the range 1 to 7 to perform the Basic Configuration and Network Information configuration steps for each card or group of cards displayed on the menu screen.

During the card grouping process, the configuration program will not reassign a card directly from one multi-card group to another. If you have trouble forming the groupings, assign all available cards as single-card emulations, and then redo the grouping.

If configuring on-line, the Configuration Menu shows only as many twinax cards as are actually present in the controller running the configuration program. If you are running standalone configuration, the screen always shows six twinax cards; in this case, only configure as many cards as you have in the controller.

If configuring on-line, the menu screen will show an 8 or 14 at the right end of each twinax card menu entry. This lets you know whether the card is an 8-device or a 14-device card, information which is not available if you're doing a standalone configuration. If you're on-line and an 8-device card entry is followed by an 'a' or a 'b', it means that the card has been electrically connected to another card by a strapping jumper. It is recommended that you remove all strapping jumpers before proceeding with configuration; see Appendix D - Connecting Twinax Cards for further information.

The Configuration Menu screen will not show selection 7 if your software diskette does not support a LAN adapter option.

### Using the Basic Configuration Screen

A typical Basic Configuration screen looks similar to this:

```
-- 1 --  
  
      0      1      2      3      4      5      6  
-----  
0/  D      .      D      .      D 01      .      P  
1/  .      . 06      .      .      .      .      .  
2/  .      .      .      .      .      .      .  
  
AA-> 0      BB-> 0      DD-> 1      10-> 0000  
1-> 00 - -      2-> 1F      3-> 0 0 0 0 0 0  
  
P-> 0 6
```

The detailed contents of the screen for a specific controller emulation vary considerably, depending on the card grouping and emulation selected, and on other factors.

## CONTROLLER INSTALLATION

---

The top portion of this screen shows information for each supported twinax device. If configuring on-line, each attached device that is powered-on is identified by a 'D' (if a display), a 'P' (printer), or an 'S' (PC running an APPC application such as PC Support or Client Access). In addition, if individual language codes have been assigned to any displays, the language codes are shown here (see Appendix B - Multiple Languages for further information). If you are configuring standalone, only the language codes are shown.

The top portion of the Basic Configuration screen can be helpful in verifying good twinax connections to attached twinax devices; you may wish to power-on all attached devices during on-line configuration. However, the configuration process does not require that attached devices be either powered-on or otherwise identified. Devices can be attached to the controller, or removed, or moved at any time before, during, or after configuration, and they will be recognized and supported by the controller. In many cases the host computer configuration must be updated to reflect such changes in device attachments.

The bottom portion of the screen contains named parameter fields that can be modified to enter configuration parameter values. Refer to the field descriptions that appear later in this chapter for help in determining what values you should enter into the fields that appear on the screen.

Keys that are recognized in the Basic Configuration screen are:

Up-arrow and down-arrow:	Change the value under the cursor
Left-arrow and right-arrow:	Move the cursor from field to field
ENTER key:	Press twice to move from the Basic Configuration screen to the Network Information screen. If your configuration doesn't use the Network Information screen, pressing ENTER twice saves the configuration to diskette.
RESET key:	On-line configuration only. Return to Configuration Menu screen. Can also be used to cancel the effect of a single ENTER.
Escape (ESC) key:	Standalone configuration only. Same function as RESET key in on-line configuration.
PRINT key:	On-line configuration only. Prints a copy of the currently-displayed screen to the printer identified by the port number and address specified in the 'P' field.

After entering all desired parameter's in this screen, press ENTER twice to either save your work, or move on to the Network Information screen if the configuration requires it.



## Using the Network Information Screen

Some configurations do not use the Network Information screen. This screen appears only if the configuration requires use of the LU6.2 (or PU2.1) protocols. If this screen is required, it will appear when you press ENTER twice in the Basic Configuration screen. A typical Network Information screen looks similar to this:

11-> <u>APPN</u>	12-> <u>NET8494</u>	13-> <u>NET8494</u>	14-> <u>QRMTWSC</u>
	16 -> 010 06	17 ->	
H1 :1-> <u>S1234567</u>	H1 : 2-> <u>APPN</u>	H1 : 3-> <u>APPN</u>	H1 : 4-> <u>QRMTWSC</u>
			P-> <u>0 6</u>

The detailed contents of the screen for a specific controller emulation vary depending on the method of host communication selected, and on other factors. There are several different combinations of fields that may appear in this area. Refer to the field descriptions later in this chapter for help in determining what values you should enter into the fields.

Keys that are recognized in the Network Information screen are:

Alphanumeric keys:	Enter data at the cursor position
Left-arrow and right-arrow:	Move the cursor from field to field
ENTER key:	Press twice to save the configuration to diskette
RESET key:	On-line configuration only. Return to Configuration Menu screen. Can also be used to cancel the effect of a single ENTER.
Escape (ESC) key:	Standalone configuration only. Same function as RESET key in on-line configuration.
PRINT key:	On-line configuration only. Prints a copy of the currently-displayed screen to the printer identified by the port number and address specified in the 'P' field.

After you have entered all desired parameter values in this screen, you will normally press ENTER twice to save the configuration. Then return to the menu screen (press RESET or ESC) to exit from configuration, or to select another card or card group for configuration.

## Configuration Parameter Fields

### AA Communications Mode:

Selects from available host communications modes:

- 0 = SDLC
- 1 = X.25
- 4 = Token-Ring
- 5 = Ethernet

**BB Emulation Mode:**

Indicates the kinds of IBM remote controller being emulated.

0 = 5394

1 = 5294

2 = 5494

This field cannot be changed in the Basic Configuration screen. It reflects the emulation that was selected in the Configuration Menu screen.

**DD SNA LU6.2/PU2.1 Node Support:**

This field is used to select SNA LU6.2/PU2.1 node support. A zero (0) in this field indicates no SNA LU6.2/PU2.1 node support, and a one (1) indicates that SNA LU6.2/PU2.1 node support is active. This will allow connection to an APPN network or SNA subarea network. A second screen with additional configuration parameters will appear as the configuration values on the current screen are saved. If zero is entered in this field when configuring a LAN Gateway (Configuration Menu Option 7), the LAN gateway will be disabled.

**DX Type of LAN:**

This field is used to select the type and/or speed of the LAN network attached to the I-O 8394Ei. Valid entries are:

1 = Token-Ring, 4MB, DB-9 connection

2 = Token-Ring, 4MB, RJ-45 connection

3 = Token-Ring, 16MB, DB-9 connection

4 = Token-Ring, 16MB, RJ-45 connection

5 = Ethernet, BNC connection

6 = Ethernet, RJ-45 connection

7 = Ethernet, DB-15 AUI connection

## 1 Language:

The default language is U.S. (00). See the table below for the codes used to set the controller for other languages. The language selection must match that configured on the host.

Language Codes			
Code	Description	Code	Description
00	US/Canada	18	Portugal
01	Japan Katakana	19	Portugal Universal
02	Japan English	1A	France Qwerty
03	Japan Universal	1B	France Qwerty Universal
04	France Azerty	1C	Spain
05	France Azerty Universal	1D	Spain Universal
06	Belgium	1E	Sweden
07	Belgium Universal	1F	Sweden Universal
08	Canada (French)	20	Brazil
09	Canada Universal	21	Brazil Universal
0A	Denmark	22	Austria/Germany
0B	Denmark Universal	23	Austria/Germany Universal
0C	Finland	24	US/Canada Universal
0D	Finland Universal	25	Mixed Swiss/French
0E	Spanish Speaking	26	Mixed Swiss/French Universal
0F	Spanish Speaking Universal	27	Mixed Swiss/German
10	Italy	28	Mixed Swiss/German Universal
11	Italy Universal	29	Swiss/French
12	United Kingdom	2A	Swiss/French Universal
13	United Kingdom Universal	2B	Swiss/Germany
14	International	2C	Swiss Germany Universal
15	International Universal	2D	ASCII
16	Norway	2E	ASCII Universal
17	Norway Universal		

### **2 Controller Address:**

For SDLC, the controller address should be the same address as that used in the host configuration. Allowable values range from **01** to **FE**. Change the default setting of **00** to the correct address for the controller.

For X.25 communication, this number is used only to form the last two digits of the controller XID. It is recommended that you enter the twinax card number (01 through 06).

### **3 SDLC Communication Options:**

The second digit indicates whether the modem is set to duplex or half-duplex. Set the second digit to a **1** for duplex or **0** for half-duplex. The third digit specifies connection type. Set this digit to **0** for Multipoint or **1** for Point-to-Point. Note that only Point-to-Point can be used with the full duplex option. The fourth digit should be **0** for NRZI or **1** for NONRZI. The selection for this digit must be the same as the used in the host configuration.

### **4 X.25 Subscription Data:**

This field has three positions. The first position should have a value of **0** to indicate a packet level sequence numbering of Modulo 8. In the second position, select a value from **2** to **7** to indicate the packet window size. In the third position, select a value from **1** to **7** to indicate the link window size.

### **5 X.25 Configuration Data:**

This field has five positions. The first position is used to indicate the packet size as follows: **0** indicates 64 bytes, **1** indicates 128 bytes, **2** indicates 256 bytes, and **3** indicates 512 bytes.

The second position is used to select the virtual circuit type as follows: **0** indicates PVC (permanent virtual circuit), SVC (switched virtual circuit) Answer, or SVC Call allowed, **1** indicates PVC only, **2** indicates SVC Answer only. If multiple twinax cards are installed, option **0** is recommended (see “Establish X.25 Connection on an AS/400” in Chapter 4). If option 1 or 2 is selected, the controller will begin link initialization after power-on without any operator input (single controller only).

The third position should have a value of **1** to indicate that flow control negotiation is not permitted. The fourth position should have a value of **1** to indicate that the operator enters only the network address and pass-work options. The fifth position should have a value of **0** to indicate that local loopback is not supported by a modem or DCE.

### **6 X.25 Software Data:**

This field has six positions. The first position should have a value of **0**, which indicates that the reverse charging facility is not accepted. The second position (second and third digits) should have a value of **01** to indicate a Qualified Logical Link Control (QLLC) facility.

The third position (fourth digit) is used to indicate a special network attachment. Select **0** to indicate a Telenet-type network (the I-O 8494 responds with unnumbered acknowledgement [UA] when polled with disconnect [DISC] before sending set asynchronous balanced mode [SABM]). Select **1** to indicate that there is not Telenet-type network attached (the I-O 8494 responds with disconnect mode [DM] to a DISC received before sending SABM).

The fourth position (fifth digit) is used to specify whether the network only or the network and the controller can initiate the link by sending a SABM. Select **0** to indicate network or I-O 8494 link initiation. Select **1** to indicate network only link initiation.

The fifth position indicates which CCITT X.25 Recommendation the I-O 8494 must support. **0** indicates CCITT X.25 Recommendation (1984). **1** indicates CCITT X.25 Recommendation (1980). Only option **0** is supported.

The sixth position is used to select the format of diagnostic codes used by the I-O 8494. **0** indicates the Systems Network Architecture (SNA) format, **1** indicates the International Standards Organization (ISO) format, and **2** indicates the 1980 SNA format. Only option **0** is supported.

### **7 X.25 Retry Parameters:**

This field has two positions. The first position specifies the number of retries the DCE should make to reestablish a virtual circuit. This value can range from **00** (no retries) to **0F** (15 retries). The default value is **0A** (10 retries). Your network supplier may impose restrictions on this value to limit network congestion.

The second position specifies the time, in seconds, between retry attempts. This value can range from **01** to **0A** (10 seconds) with a default of **03** (3 seconds).

### **10 SDLC Baud Rate:**

This field indicates the baud rate of the built-in modem eliminator when the I-O 8494 Remote Controller is attached directly to the host. If the I-O 8494 is attached to a modem, the contents of this field will be ignored.

If the I-O 8494 is attached directly to the host without a modem, the recommended baud rate is 19,200 bps, except on the IBM 5364, which should use 9600 bps.

### **E Ethernet Frame Format:**

**0** (zero) is the only valid option for this field indicating that IEEE 802.3 frame format is being used.

### **F Local LAN SAP:**

Set the SAP value for the 8494. Values must be hexadecimal and range from **04** to **FC** in multiples of 04. Default value is **04**.

### **G LAN Response Timer (T1):**

Defines the response timer (T1) for the 8494. It is the maximum number of seconds allowed to detect a failure to receive a required acknowledgment on response from the remote link station. This value must be greater than the total number of delays that a frame might receive in the network. Valid values range from **01** to **20** seconds. Default value is **01**.

### **H LAN Inactive Timer (Ti):**

Defines the inactive timer for the I-O 8494. Whenever the response timer is not running, the I-O 8494 inactivity timer is running. If this timer expires, the communications link can be lost. If so, the controller will attempt to re-establish communication. This value should be at least 5 to 10 times greater than the response timer (T1). Default value is **30**.

### **I LAN Receiver Acknowledgement Timer (T2):**

The acknowledgment timer must be set to a value that is less than the Response Timer (T1) setting at the link station. This value is the maximum number of milli-seconds allowed before acknowledgments are sent to the AS/400 system. Default value is **030**.

### **J LAN Retry Count (N2):**

This field defines the maximum number of times the 8494 will check the status of a receiving link station after the I-O 8494 Response Timer (T1) expires. The combination of the T1 value and the Retry Count (N2) value must be large enough to allow for error detection and recovery on the network. Valid values range from **01** to **99** with a default value of **08**. A setting of 10 retries or less is typical.

### **K LAN Address (LAN Gateway):**

This field defines the 8494's LAN address. You can allow the 8494 to use its LAN adapter's native burned-in address, or you can override the native address with a locally-administered address that you specify. Use the 1-character prefix portion of this field to select from 3 available modes:

Prefix 0: Use a locally-administered address. The first four digits of the adapter address will be forced to be 4000 (if token-ring) or 0200 (if ethernet). You must provide the eight remaining hexadecimal digits of the address to be used.

Prefix 1: Use a locally-administered address, in bit-swapped format. Use this option only if you are using token-ring LAN attachment but wish to enter the LAN address in ethernet format, or if you are using ethernet LAN attachment but wish to enter the LAN address in token-ring format. This option is intended primarily for use when there is a token-ring to ethernet bridge between the client workstations and the controller. The first four digits of the adapter address will be forced to be 0200 (if token-ring) or 4000 (if ethernet). You must provide the eight remaining hexadecimal digits of the address to be used.

Prefix 2: Use the adapter's native address. The 12-digit portion of the field will remain blank.

**Note:** When your controller is operating in normal mode, you can determine what its LAN address is by going to any attached display station and keying the sequence ALT-HEX, CMD7. The LAN address will be displayed on the display's error line, both in normal and bit-swapped form.

### **L LAN Gateway Service access Point (SAP):**

Set the SAP value. Values must be hexadecimal and range from **04** to **FC** in multiples of 04. Default value is **04**

### **M LAN Gateway Response Timer (T1):**

Defines the LAN response timer (T1). It is the maximum number of seconds allowed to detect a failure to receive a required acknowledgement on response from the remote link station. This value must be greater than the total number of delays that a frame might receive in the network. Valid values range from **01** to **20** seconds. Default value is **01**.

### **N LAN Gateway Inactive Timer (T1):**

Defines the LAN inactive timer. Whenever the response timer is not running, the I-O 8494 inactivity timer is running. If this timer expires, the communications link can be lost. If so, the controller will attempt to re-establish communications. Valid values range from **01** to **99** seconds. Default value is **30**.

### **O LAN Gateway Receiver Acknowledgement Timer (T2):**

The acknowledgement timer must be set to a value that is less than the Response Timer (T1) setting at the link station. Valid values range from 001 to 225 milliseconds. A setting of **30** to **255** milliseconds is typical. Default value is **030**.

### **P Printer Address:**

Refers to printer that should print printouts of the configuration screen during the configuration of the I-O 8494 remote controller (printouts are requested via the printer key).

The first digit indicates the port the printer is attached too. The second digit indicates the printer's address.

### **Q LAN Gateway Retry Count (N2):**

This field defines the maximum number of times the I-O 8494 will check the status of a receiving link station after the I-O 8494 Response Timer (T1) expires. The combination of the T1 value and the Retry Count (N2) value must be large enough to allow for error detection and recovery on the network. Valid values range from **01** to **99** with a default value of **08**. A setting of 10 retries or less is typical.

### **R LAN Gateway Maximum Out (TW):**

This field defines the maximum number of sequentially numbered frames that the I-O 8494 can send before waiting for an acknowledgement. This value must be at least twice the value of the Maximum In (N3) count at the receiving IWS. Otherwise, network response time can severely degraded. Valid values range from **2** to **8**. Default value is **2**.

### **S LAN Gateway Maximum In (N3):**

This field defines the maximum number of frames the I-O 8494 can receive from the AS/400 before sending an acknowledgement. This value must not be more than one-half of the Maximum Out (TW) value at the sending link station. Valid values range from **1** to **4**. Default is **1**.

### **11 Local Network ID:**

Enter the local network ID. This name will be used as a default if the AS/400 network is not provided for the host (field H1:2).

### **12 8494 Logical Unit (LU) Name:**

This parameter must match the remote location name configured on the AS/400 for this controller (Different for each emulated controller). Refer to the Quick Setup Guide. Leave this field blank if you are configuring a LAN gateway (Configuration Option 7).

### **13 8494 Control Point (CP) Name:**

This parameter must match the remote control point name in the APPC Controller description on the host AS/400. This name must begin with a letter. It cannot begin with a number.

### **14 Default Mode Name:**

This mode name is used as a default if the AS/400 mode name is not provided for the host (field H1:4). This parameter (if used) must match the mode name configured on the AS/400. Refer to the Quick Setup Guide.

### **15 Connection Number:**

You must make an entry in this field if you use LAN host attachment; the field is not used for SDLC, and is optional for X.25 host attachment.

For LAN host attachment, this field defines the 8494's own LAN address. The 8494 can use its LAN adapter's native burned-in address, or it can override the native address with a locally-administered address that you specify. Use the 1-character prefix portion of this field to select from 3 available modes:

Prefix 0: Use a locally-administered address. The first four digits of the adapter address will be forced to be 4000 (if token-ring) or 0200 (if ethernet). You must provide the eight remaining hexadecimal digits of the address to be used.

Prefix 1: Use a locally-administered address, in bit-swapped format. Use this option only if you are using token-ring host attachment but wish to enter the LAN address in ethernet format, or if you are using ethernet host attachment but wish to enter the LAN address in token-ring format. This option is intended primarily for use when there is a token-ring to ethernet bridge between the host and the controller. The first four digits of the adapter address will be forced to be 0200 (if token-ring) or 4000 (if ethernet). You must provide the eight remaining hexadecimal digits of the address to be used.

Prefix 2: Use the adapter's native address. The 12-digit portion of the field will remain blank.

**Note:** When your controller is operating in normal mode, determine what its LAN address is by going to any attached display station and keying the sequence ALT-HEX, CMD7. The LAN address will be displayed on the display's error line, both in normal and bit-swapped form.

For X.25 host attachment, this field is optional; if a number is entered here, it is used as the default 8494 X.25 network address (can be overridden by an operator when making an X.25 call).

### **16 Retry Count and Retry Interval:**

The retry count specifies the number of retries the I-O 8494 will make to re-establish the controller session with the AS/400. Valid values range from **000** to **255**. Default value is **10**.

The retry interval specifies the number of 10 second intervals between the retries. Valid values range from **1** to **60** with a default value of **6** (60 seconds).



**17 Serial Number:**

This field is used to enter the I-O 8494's serial number. The number will be sent to the AS/400 when communication is established. This is not a required field, if no number is provided, zeros will be used. If the serial number is larger than the field, exclude the last digits or use zeros for this field.

**H1:1 AS/400 Logical Unit Name:**

This parameter must match the local location name configured on the AS/400.

**H1:2 AS/400 Network Name:**

This parameter must match the local network ID configured on the AS/400. **Note:** *If this field is left blank, the default local network name (field 11) will be used.*

**H1:3 AS/400 Local Network Name:**

This parameter must match the remote network ID configured on the AS/400. **Note:** *If this field is left blank, the default local network name (field 11) will be used.*

**H1:4 Mode Name:**

Enter the remote controller's mode name. If used, this parameter must match the mode name configured on the AS/400. **Note:** *If this field is blank, then the Default Mode Name (field 14) will be used.*

**H1:5 AS/400 Connection Number:**

You must make an entry in this field if you use LAN host attachment; the field is not used for SDLC, and is optional for X.25 host attachment.

For LAN host attachment, this field defines the host computer's LAN address. Use the 1-character prefix portion of this field to select from 2 available modes:

Prefix 0: Enter the host LAN address in normal format (token-ring format for token-ring attachment, ethernet format for ethernet attachment).

Prefix 1: Enter the host LAN address in bit-swapped format. Use this option only if you are using token-ring host attachment but wish to enter the LAN address in ethernet format, or if you are using ethernet host attachment but wish to enter the LAN address in token-ring format. This option is intended primarily for use when there is a token-ring to ethernet bridge between the host and the controller.

For X.25 host attachment, this field is optional; if a number is entered here, it is used as the default host computer X.25 network address (can be overridden by an operator when making an X.25 call).

**H1:7 AS/400 System SAP:**

Enter the appropriate AS/400 SAP in this field valid values are hexadecimal 04 to FC in new links of 04. Default value is **04**.

**H1:8 AS/400 System Maximum Out (TW):**

Valid values are 2 to 8. Default value is **2**. Enter appropriate maximum out value.

## CONTROLLER INSTALLATION

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### **H1:9 AS/400 System Maximum In (N3):**

Valid values are 1 to 4. Default value is 1. Enter appropriate value.

### **Concurrent Host Attachment**

Concurrent host attachment is configured by filling in fields **H1:1** through **H2:4**, **H3:1** through **H3:4** and **H4:1** through **H4:4**. (See Appendix E - Concurrent Host Attachment for further information.)

The Primary AS/400 is identified in the 8494 configuration screen as **H1:1**. The fields **H1:1** through **H1:4** describe the 8494's connection to the Primary host. Fields contained in **H2**, **H3**, and **H4** refer to the secondary AS/400's. The last field on each concurrent host attachment line should contain the QRMTWSC mode

H1:1-> \_\_\_\_\_ H1:2-> \_\_\_\_\_ H1:3-> \_\_\_\_\_ H1:4->QRMTWSC

H2:1-> \_\_\_\_\_ H2:2-> \_\_\_\_\_ H2:3-> \_\_\_\_\_ H2:4->QRMTWSC

H3:1-> \_\_\_\_\_ H3:2-> \_\_\_\_\_ H3:3-> \_\_\_\_\_ H3:4->QRMTWSC

H4:1-> \_\_\_\_\_ H4:2-> \_\_\_\_\_ H4:3-> \_\_\_\_\_ H4:4->QRMTWSC

## 4 OPERATION

Before you power on the I-O 8494 Remote Controller, insert the system diskette in the diskette drive with the label facing upwards and make sure the switch on the front panel is set to Normal. Then power on the controller with the power switch on the front panel.

**Note:** *Do not remove the system diskette from the drive until the disk access light has gone out.*

When the I-O 8494 is powered on and working correctly, the front panel display will show "Ready."

After the controller is powered on and the attached devices are communicating (cursor in the upper left corner of the attached display stations), communications with the host must be established. If your controller is using SDLC communications, this is done by varying the line and the controller on. If you are using X.25 communications, this is done through a permanent virtual circuit (PVC) or switched virtual circuit (SVC).

### Establish SDLC Connection

If the I-O 8494 uses the SDLC communications mode, vary on the controller from the host to establish host/controller communications. The method for varying on differs on each host system as described in the following sections.

#### AS/400

On an AS/400 host, do the following to vary on the I-O 8494 Remote Controller.

1. From the main menu, select option 6, "Communications".
2. From the communications menu, choose "Configure Communications and Remote Hardware Menu"
3. Select position 1, "Lines."
4. When the Work with Line Descriptions menu is displayed, press the F14 key, "Work with status." The options to vary a line, controller, or devices on or off line are displayed.

Work with Configuration Status		
Type options, press Enter.		
1=Vary on	2=Vary off	3=Hold device
4=End recovery	5=Work with job	6=Release device
		7=Resume recovery
Opt	Lin/Ctl/Dev/Mod	Status
1_	TXLINE1	VARIED OFF
	TXCTL1	VARIED OFF
	TXI01197	VARIED OFF

5. Enter a 1 in front of the line description to vary on the line. The controller description should vary on as well

#### System/38

On a System/38 host, do the following to vary on the I-O 8494 Remote Controller:

1. From menu LIN, Line Menu, select option 5, "Vary Line" and vary on the line. (This should vary on line, CTRL and devices)

## OPERATION

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2. From menu CTLU, Control Unit Menu, select option 3, "Vary Control Unit" and vary on the control unit.
3. From menu DEV, Device Menu, select option 9, "Vary Device," and vary the devices on line.

After approximately ten seconds, the IBM sign-on menu should display on the terminals attached to the I-O 8494 Remote Controller.

### System/36

On the System/36 host, vary on the line/devices with one of the following commands:

V ON,,1	Vary on all the control units/devices on line 1.
V ON,C01	Vary on all the devices attached to Control Unit C01 (the character after the "C" is a zero).
V ON,W1	Vary on workstation W1.

The values 1, C01, and W1 are optional values that change depending on what line, control unit, or device is being varied ON or OFF. To vary off a line, control unit, or device while on-line, change the command from ON to OFF.

After approximately ten seconds, the IBM sign-on menu should display on the terminals attached to the I-O 8494 Remote Controller.

### Establish X.25 Connection on an AS/400

One of the following three methods is used to establish communications between the host and the I-O 8494 (after the controller has been varied on at the host) if your controller uses the X.25 communications mode.

- Permanent Virtual Circuit (PVC)
- Switched Virtual Circuit (SVC) Call
- SVC Answer

**Note:** *The controller must be varied on from the host to establish host/controller communications.*

The commands for establishing a host/controller session and the DETACH command are only valid from the system request line when no session is established.

### PVC

If you subscribe to a PVC service on the X.25 line, use the OPEN command to establish communications. Press SHIFT, SYS REQ to receive the System Request Line. Type O (alpha), and then press ENTER on the system request line.

**Note:** *If multiple twinax cards are installed in the controller, SVC Call is recommended instead of PVC to establish a connection.*

### SVC Call

If subscribing to an SVC service on the X.25 line, use the CALL command to establish communications. Press SHIFT, SYS REQ to receive the System Request Line. Type C,Nyyyyyy,Xzzzzzzz, and then press ENTER on the system request line; where yyyyyy is the network address of the host, and zzzzzzzz is the password that must be specified if a password has been configured on the host.

**Note:** *Vary on the line and the controller before making the call. An individual password should always be used if multiple twinax cards are installed in the controller.*

**SVC Answer**

If subscribing to an SVC service on the X.25 line and want the controller to wait for a call from the host before establishing communications, use the ANSWER command. Press SHIFT, SYS REQ to receive the System Request Line. Type A, and then press ENTER on the system request line. The first incoming call from any network node will be accepted.

**Note:** If multiple twinax cards are installed in the controller, SVC call is recommended instead of SVC Answer to establish a connection.

**Detach**

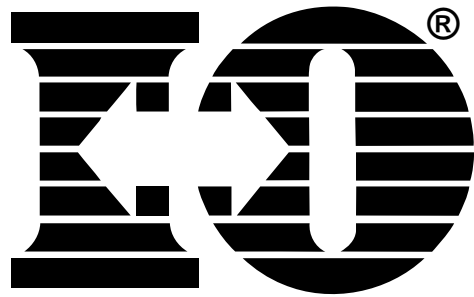
Use the DETACH command to terminate a PVC or SVC answer request condition on the controller. Press SHIFT, SYS REQ to receive the System Request Line. Type D, and then press ENTER on the system request line.

**Set Type Ahead Mode**

The I-O 8494 Remote Controller supports keystroke type ahead buffering on a terminal-by-terminal basis. You can enable or disable the type ahead mode on an attached terminal at any time by pressing ALT + HEX (CMD + diacritic key [the key to the right of the CMD key]) followed by the K or k key. This sequence toggles the current mode, alternately enabling and disabling the type ahead feature.

You can determine whether type ahead is enabled by pressing ALT + HEX (CMD + diacritic key [the key to the right of the CMD key]) followed by M or m. This sequence causes either the code 1111 (type ahead enabled) or the code 9999 (type ahead disabled) to be displayed on the error line. Press the RESET key to clear the status code from the error line.

Type ahead buffering for a terminal is limited to 128 keystrokes. When the type ahead buffer for a terminal becomes full, an alarm will sound and the keystroke that triggered the alarm is not buffered.



*“Products That Work”*

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## **5 PROBLEM RESOLUTION**

### **Customer Support**

If assistance is needed to solve a problem related to the I-O 8494 Remote Controller, contact the dealer who sold you the controller. Your dealer is familiar with your needs, equipment, and software and has been trained to provide you with the support you need. Be sure to read this manual and keep it handy. It is your first level of support should you need any.

I-O Corporation's Customer Support team is also available to assist while installing the I-O 8494 Remote Controller. To reach a customer support representative between 8:00 a.m. and 5:00 p.m. (MST) call one of the following numbers:

#### **U.S. & International:**

Phone: (801) 972-1446

Fax: (801) 973-0132

#### **Europe:**

Phone: 44(0) 1908 567 722

Fax: 44(0) 1908 565 599

If, after talking to your Dealer or I-O Corporation, you need to ship the unit back to the factory for repair, follow the steps under Shipping on page 5-10.

### **IBM Verification Test**

This section contains information on verification tests. These will test workstations and printers attached to the I-O 8494 Remote Controller. Throughout these tests you are required to make selections from a menu. If you make an error, you can do one of the following.

- Press BACKSPACE and enter the correct selection, or
- Press "C" and ENTER to return to the previous menu and make the correct selection.

To run the verification tests on the System/36, System/38, or the AS/400 follow these steps.

1. If necessary, start communications with the host system (refer to Chapter 4).
2. When the sign-on screen displays, press the CMD key followed by the TEST REQUEST (Character Backspace) key. If you have a 102-key or 122-key keyboard, press and hold the ALT key while you press the TEST key. The Test Request menu will appear.
3. Select the desired options from the following:

#### **Previous screen:**

Press "C" and ENTER to return to the previous screen.

#### **End:**

This option returns you to the Prime Option menu.

**Display Verification:**

This option provides test patterns that show various character display capabilities; a test is also performed on the function keys.

**Work Station Printer Verification:**

This option checks out a printer. A printed report shows print patterns.

**Configuration Data:**

This option displays descriptive information, such as system addresses, for the twinax card the display is attached to.

**ERAP:**

This option is not supported by the I-O 8494 Remote Controller.

Follow the instructions and prompts provided with each option to complete the verification test.

**Note:** *See the appropriate workstation/printer manual for operational requirements and meaning of error codes.*

### Problem Resolution Guide

The problem resolution guide on the following pages describes common problems with the I-O 8494 Remote Controller and their solutions.

If the controller does not power on, check that the controller's power cord is plugged in, the controller is powered on, and the power outlet to the controller has power.

If you have problems with a twinax connection, check the installation of the twinax cards. Make sure the cards are installed properly and the switches and jumpers on the cards are set properly (refer to Figure 3-4 on page 3-7).

The most common problem in device installations is cabling. Make sure all devices are properly attached, the end of each cable line is terminated properly, and do not exceed the maximum cable connections (11) allowed per line. Do not place twinax cables over or near power sources as this disrupts the communication signals flowing in the cable. Locate cables at least one foot (.3 m) away from all power sources. Check each cable if necessary to determine if the cable is faulty.

Host configuration, modem settings, and the controller configuration are also common problems. Since the devices attached to the controller must be recognized by the host, make certain the device configuration (device description, address, emulation) at the controller matches the device configuration at the host. Check NRZI vs. NONRZI if using SDLC communications. This setting must be the same on the host and the controller. Make sure the modem settings match the type of network the controller is operating on.

**Note:** *Error codes that may appear on display stations due to operator or system errors are listed and described in Appendix C, System Reference Codes.*

If the display station or remote controller do not communicate with the host, the ENTER key must be pressed for the applicable error code to be displayed.



<b>Problem</b>	<b>Probable Cause</b>	<b>Action</b>
No power to controller (LEDs remain dark).	Power cord not plugged in.	Check power cord connection.
	No power at outlet.	Check wall outlet.
	Controller not powered on.	Power on the controller with the front panel switch.
Ready light doesn't come on or remains flashing.	Faulty, damaged or improper cabling.	Most common problem. Isolate each cable length and twinax connector to make sure it is not faulty. Change with known good cables if necessary. Check each connection for good contact (no pushed pins). Make sure cables are not routed near power sources. If using twisted pair cabling, check balun compatibility (some baluns are for specific uses only).
	Error in software diskette.	Verify proper insertion of diskette and retry; try backup diskette. If unsuccessful, call your service dealer.
	Defective twinax card.	Check MPIC and twinax card LEDs for card status. See discussion of I-O 8494 status later in this chapter.
	Twinax card(s) or interface card not installed properly.	Make sure card(s) is fully seated into the controller, DIP switches are set properly, and check that the interface card is fully seated.
	Improper termination.	Make sure each cable run is terminated properly. Make sure the last device on the cable is terminated properly; exchange with a known good device if necessary.
Unable to configure workstations on the I-O 8494 Remote Controller.	Faulty, damaged or improper cabling.	Most common problem. Isolate each cable length and twinax connector and make sure it is not faulty. Change with known good cables if necessary. Check each connection for good contact (no pushed pins). Make sure cables are not routed near power sources. If using twisted pair cabling, check balun compatibility (some baluns are for specific uses only).
	Duplicate device address.	Verify all devices are connected to the proper port and set at the correct address as the configuration at host.
	TEST switch (see Chapter 3) is not set ON.	Power controller off, turn TEST switch ON, then power controller on.
	Devices not connected or not powered on.	Verify proper cable connection and that all devices are powered on and in "Ready" state.
	Wrong selections on the configuration screen (Chapter 2).	Use scroll up/down keys to change values in controller to host configuration fields.
	Modem is attached to the controller and is active.	Controller will not configure with active modem attached. Disconnect the modem cable, configure the controller, then reattach the modem cable.

## PROBLEM RESOLUTION

Problem	Probable Cause	Action
Unable to configure workstations on the I-O 8494 Remote Controller. (Continued)	Improper termination.	Make sure each cable run is terminated properly. Make sure the last device on the cable is terminated properly; exchange with a known good device if necessary.
Device does not show up on configuration screen.	Faulty, damaged or improper cabling.	Most common problem. Isolate each cable length and twinax connector and make sure it is not faulty. Change with known good cables if necessary. Check each connection for good contact (no pushed pins). Make sure cables are not routed near power sources. If using twisted pair cabling, check balun compatibility (some baluns are for specific uses only).
	Device not powered on, not in ready state, or faulty.	Power device on, make sure it is in a ready state (printers may need paper loaded to show ready), try known good device in place of the suspect one. Displays will show "© 199X SDE Corp. [twinax card number]" in the upper right corner of screen when recognized by controller.
	PC emulator not in emulation mode.	PCs with emulator cards must be in emulation mode during configuration of the controller.
Configuration will not store properly.	Test switch not ON.	Power off the controller, put the test switch on the front panel in the ON position, then power the controller on.
	Configuration screen selections not made for each twinax card installed.	Follow the steps under the section Configure I-O 8494 in Chapter 3. Each card installed in the controller must be configured and the configuration saved to diskette before continuing to the next card's configuration.
	Controller hasn't stored the previous configuration to diskette.	Do not proceed to configure additional twinax cards before the disk access light goes off so the configuration for the preceding twinax card is stored.
	Diskette not in drive, diskette write-protected or faulty.	Make sure diskette is installed into the drive, "shutter" side up. Try backup diskette if necessary.
	Request to store configuration not properly keyed.	Be sure to press the <ENTER> key twice after entering all desired parameters into fields on the configuration screen.
No host communication controller won't come on-line or can not be varied on.	Host communication line not operating properly.	Contact your system operator; may need to IPL the host. Make sure host/modem cable is attached to controller. Have line checked by phone company.

<b>Problem</b>	<b>Probable Cause</b>	<b>Action</b>
No host communication controller won't come on-line or cannot be varied on. (Continued)	NRZI or NONRZI not set properly.	NRZI and /or NONRZI setting must be the same at both the host and the controller. If you are unsure, change this setting at the controller and try to bring it on-line again.
	Controller has not been configured.	Configure the controller as described in Chapter 3.
	Local configuration doesn't match the host's configuration.	Verify that local configuration matches host configuration. The most common configuration mismatches are controller address (Field 2 on configuration screen) and emulation mode (field BB). Note that for S/36 and S/38 hosts, Field BB MUST be set to 1 (5294 emulation mode), as these hosts do not support the 5394 mode. For all hosts, the number in Field 2 must match the station address configured for the controller on the host.
	Modem is not the proper type or not strapped properly.	Verify proper modem type for the network. Make sure modem can communicate at the line speed you have chosen. Check that the modem is "strapped" for the network type (half or full duplex, etc.). Perform loopback or end-to-end tests to make sure host-site and controller-site modems communicate. Host not configured for the controller.
	Host not configured for the controller.	Make sure the host is configured for the controller. Each twinax card installed is recognized by the host as a separate controller.
	Host configuration not correct.	Make sure the controller address is correct at the host, the emulation (5294, 5394, or 5494) is correct at the host, the network type (point-to-point, multi-point, etc.) is correct (a multiple-card controller must use a multi-point network), NRZI or NONRZI is the same at the host and controller, and the XID is correct at the host.
	Controller not varied on or subsystem not started.	Vary on the controller as described in Chapter 4. Some hosts require the line, device and subsystem to be varied on before the host can communicate. Make sure subsystem is started.
	Twinax cabling is damaged or improper.	Make sure cable and all connections are not damaged. Verify that all IBM cabling conventions are followed, including: line length not greater than 5,000 feet; proper termination of all devices; verify all on-line devices are operating correctly.
Workstation(s) drop off line or will not come up.	Faulty, damaged or improper cabling.	Most common problem. Isolate each cable length and twinax connector and make sure it is not faulty. Change with known good cables if necessary. Check each connection for good contact (no pushed pins). Make sure cables are not routed near power sources. If using twisted pair cabling, check balun compatibility (some baluns are for specific uses only).
	Conflicting device descriptions on the host.	Remove device descriptions from the configuration record at the host for devices not configured on the remote controller.

## PROBLEM RESOLUTION

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Problem	Probable Cause	Action
Workstation(s) drop off line or will not come up. (Continued)	Improper termination.	Make sure each cable run is terminated properly. Make sure the last device on the cable is terminated properly; exchange with a known good device if necessary.
	Device damaged.	Change with a known good device to verify proper operation. If damaged, repair or replace.
Controller drops off-line and will not come back up or stays at a "Vary on pending" status.	Telephone line has interference.	Have the phone company check the telephone line.
	Active job on host or in spool file.	Delete job and continue.
	Message on console.	Answer then delete message.
	Modem or controller "locked-up."	Power off then power on both modems and the controller.
	Subsystem terminated.	Restart subsystem.
	Drop line upon sign off selected as "yes" on the controller description (AS/400).	Select "No" to the drop off line upon sign off in the controller description.
	Interference on communications line.	Check communications line to host for interference.
	Selected baud rate is too slow for the number of attached devices or the application.	Increase baud rate in controller configuration and on modem settings.
Disk Error Light appears.	Diskette is not bootable.	Try booting from the spare controller diskette.
	Loose cards.	Make sure all of the controller's cards are in the slots tightly. Reseat cards.

**I-O 8494 Remote Controller**

There are LED status indicators on the back of the I-O 8494 Remote Controller. These LEDs will help you determine the status of host communications and the condition of the twinax card(s) installed in the controller.

**Twinax Cards**

Each twinax card has two LEDs, one at the top for the upper port and one at the bottom for the lower port. The LEDs have four possible indications:

**Flashing rapidly:**

Software is being downloaded to the twinax card.

**Flashing slowly:**

Twinax card is active, but no devices are connected.

**Steady on:**

Twinax card is active and devices are connected (normal working status).

**Off:**

Twinax card is not active. This indication will be accompanied by a flashing ready indicator on the front panel and an error status for this card on the card indicators.

**MPIC Card**

The Multipurpose Communications Interface Card (MPIC) has five LEDs underneath the host port. If some of the LEDs remain lighted, use the diagrams below to determine the status. When the lights indicate a defective twinax card, the problem may be either the card itself or most likely a cable attached to the card. The following procedure can further isolate the problem.

1. Turn off power to the controller.
2. Tag all twinax cables with Slot #/ Port # labels.
3. Disconnect all twinax cables from all twinax cards.
4. Turn on power to the controller, and wait for either a steady "Ready" light or a reappearance of the LED error indication.
5. If an error is reported when all cables are disconnected, a defective card is indicated. Otherwise, a defective cable is indicated. In the latter case, the faulty cable can be isolated by connecting each individual cable in turn and repeating the power-off/power-on sequence.

# PROBLEM RESOLUTION

Twinax Card #1 defective



Twinax Card #2 defective



Twinax Card #3 defective



Twinax Card #4 defective



Twinax Card #5 defective



Twinax Card #6 defective



MPIC Card defective



Error while reading the configuration file  
Cause: a) faulty diskette;  
b) faulty diskette drive



Error while reading the twinax card hex file  
Cause: a) faulty diskette;  
b) faulty diskette drive



Insufficient Memory



**Note:** *A filled circle indicates LED On.*

## LEDs on the Front Panel

### Top Row

### Description

POWER

When on, indicates that +5 VDC is present

TEST

When on, indicates that the TEST switch is set to ON for configuration purposes

READY

When on, indicates that the power-on sequence has been successfully completed and the remote controller is ready for operation. When flashing, indicates an error condition. Check LEDs on the MPIC card and twinax cards.

COM LINE

When flashing, indicates that valid data bytes are being received from the communications line

WS ACTIVE

When on, indicates that one or more attached workstations are responding to polls

DISK ERROR

When on, indicates one of the following error conditions:

- a. Faulty diskette
- b. Faulty diskette drive
- c. Faulty floppy disk controller

**Note:** *The Disk Error LED might come on briefly during the loading of the operation software and then extinguish after the operating software is loaded. This does not indicate an error.*

These LEDs give an indication of the status of the signals as they are being received and transmitted to the modem or equivalent equipment.

**Note:** *These LEDs do not fill any function and should be ignored when the remote controller is operated in X.25 mode.*

<u>Bottom Row</u>	<u>Description</u>
TXD	(Transmitted Data) When flashing, indicates data is being transmitted from the remote controller to the modem.
RXD	(Received Data) When flashing, indicates data is being received by the remote controller from the modem. This LED will appear steady (solid) at high transmission speeds.
RTS	(Request to Send) Asserted by the remote controller to indicate it has data to send.
CTS	(RFS, Clear to Send) Asserted by the modem in response to the RTS signal. This signal allows the remote controller to transmit.
DSR	(Data Set Ready) Asserted by the modem when it is powered on and ready to function. <b>Note:</b> <i>This LED should be on continuously during normal operation.</i>
DTR	(Data Terminal Ready) Indicates to the modem that the remote controller is ready to operate. <b>Note:</b> <i>This LED should be on continuously during normal operation.</i>
CD	(DCD, Carrier Detected) Asserted by the modem when the remote host has control of the line and is transmitting (some systems assert carrier continuously).
TXC	(TEST, Transmitted Signal Element Timing) When on, indicates the transmit clock supplied by the modem is present. For local attachment, the remote controller has a built-in modem eliminator which supplies the appropriate signals and clocks. <b>Note:</b> <i>This LED should be ON continuously during normal operation.</i>
RXC	(RSET, Received Signal Element Timing) When on, indicates that the receive clock supplied by the modem is present (this clock may only be present during the receipt of data). For local attachment, the remote controller has a built- in modem eliminator which supplies the appropriate signals and clocks.

## PROBLEM RESOLUTION

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### Keyboard Entry Errors

One of the following may happen when a keyboard entry error occurs.

- The keyboard locks.
- The "inhibit" message appears at the bottom of the screen.
- A system error code is displayed in the left-hand corner of the screen (see "Operator Entry System Reference Codes" in Appendix C).

An error may occur due to one of the following reasons.

- The system is not accepting the key you just pressed.
- There is something wrong with the system.
- There is something wrong with your display station.

To recover from the error, press the ERROR RESET key and continue to input information. If you are unable to recover from an error condition, contact your systems programmer. If you need further information, refer to the display station's documentation.

**Note:** *After sign on, you can press the Help key to display a message that describes the error.*

### Shipping

If for any reason the I-O 8494 Remote Controller must be shipped, please follow the directions below.

1. If the unit is being returned to I-O Corporation or your dealer for repair, call your dealer or I-O and obtain a Return Merchandise Authorization Number. - Attach a note with the RMA number obtained from your dealer or I-O Corporation and an explanation as to why the I-O 8494 Remote Controller is being returned.
2. Mark the RMA number on the outside of the shipping container.
3. Use the original packaging to ship the I-O 8494 Remote Controller.
4. Make sure the controller is protected against water damage (wrap unit in a plastic bag).



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## APPENDIX A

### Related Documentation

The following manuals may be helpful in the installation and operation of the I-O 8494 Remote Controller and attached devices.

**IBM 5250 Information Display System Introduction, GA21-9246.**

Describes the workstations that make up the 5250 information display system and their available functions and features.

**IBM 5250 Information Display System Planning and Site Preparation Guide, GA21-9337.**

Provides information on system limitations and physical planning including detailed cabling and switch setting.

**IBM 5250 Information Display System Functions Reference Manual, SA21-9247.**

Provides information about SNA, SDLC, and Data Streams for 5250 type devices.

**IBM Systems Network Architecture Concepts and Products Manual, GC30-3072.**

Presents an overview of SNA including basic descriptions of terminology, concepts, and scope.

**IBM Synchronous Data Link Control General Information, GA27-3093.**

Describes procedures that comprise synchronous data link control (SDLC), a brief background, and a basic description of the terminology and concepts of SDLC.

**IBM System/36 Changing Your System Configuration, SC21-9052.**

Provides instructions and reference information on how to change your system configuration.

**IBM System/38 Guide to Program Products Installation and Device Configuration, GC21-7775.**

Gives setup and configuration information.

**IBM AS/400 Device Configuration Guide, SC21-8106.**

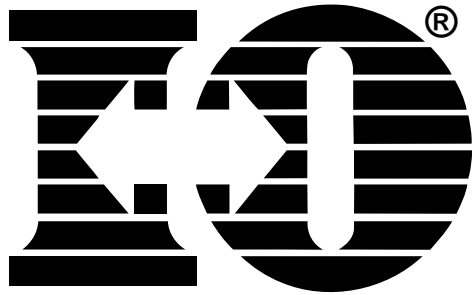
Gives setup and configuration information.

**IBM 5394 Remote Control Unit Type 2.1 Node Support RPQ 8Q0775, SC30-3531-01.**

Explains how to setup, configure and operate Control Unit Type 2.1 Node Support RPQ

**IBM 5494 Remote Control Unit Attachment to Subarea Network RPQ 8Q0932, SC30-3566-01.**

Explains how to setup, configure and operate control unit attachment to Subarea Network RPQ



*“Products That Work”*

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## APPENDIX B

### Multiple Languages

#### Configure Languages

Take the following steps to configure the I-O 8494 Remote Controller for one of the available languages as shown in the table on the next page.

1. Display the configuration screen using the following keystrokes:
  - 83 keyboard - CMD, BACKSPACE
  - 102 keyboard - Press and hold ALT, then press TEST
  - 122 keyboard - Press and hold ALT, then press TEST
2. Use the CURSOR LEFT or CURSOR RIGHT keys to position the cursor under field 1, which specifies the language code to be used.
3. Use the CURSOR UP or CURSOR DOWN keys to select the language code.
4. Press the ENTER key twice to save the configuration. This selects a "master" language code, which will apply to all display stations attached to the workstation controller card being configured. If you did not select a universal language code or you do not require multiple languages, skip to step 12. Continue to step 5 to configure specific display stations for language codes that are different from the "master" language code.
5. Use the CURSOR UP and CURSOR DOWN keys at field 1 to select the language code for the display station using a language code that is different from the "master" language code. This code must be a universal code.
6. Use the CURSOR RIGHT key to position the cursor under the first of the two dashes.
7. Use the CURSOR UP and CURSOR DOWN keys to select the port number of the desired display.
8. Use the CURSOR RIGHT key to position the cursor under the second dash.
9. Use the CURSOR UP or CURSOR DOWN keys to select the workstation address of the desired display.
10. Press the ENTER key twice to save the configuration of the display station.

## APPENDIX B

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11. Repeat steps 5 through 10 for any other display stations using language code that differs from the "master" language code.
12. When finished, press ERROR RESET to exit from the configuration menu.

Language Codes			
Code	Description	Code	Description
00	US/Canada	18	Portugal
01	Japan Katakana	19	Portugal Universal
02	Japan English	1A	France Qwerty
03	Japan Universal	1B	France Qwerty Universal
04	France Azerty	1C	Spain
05	France Azerty Universal	1D	Spain Universal
06	Belgium	1E	Sweden
07	Belgium Universal	1F	Sweden Universal
08	Canada (French)	20	Brazil
09	Canada Universal	21	Brazil Universal
0A	Denmark	22	Austria/Germany
0B	Denmark Universal	23	Austria/Germany Universal
0C	Finland	24	US/Canada Universal
0D	Finland Universal	25	Mixed Swiss/French
0E	Spanish Speaking	26	Mixed Swiss/French Universal
0F	Spanish Speaking Universal	27	Mixed Swiss/German
10	Italy	28	Mixed Swiss/German Universal
11	Italy Universal	29	Swiss/French
12	United Kingdom	2A	Swiss/French Universal
13	United Kingdom Universal	2B	Swiss/Germany
14	International	2C	Swiss Germany Universal
15	International Universal	2D	ASCII
16	Norway	2E	ASCII Universal
17	Norway Universal		

## APPENDIX C

### System Reference Codes

This appendix provides a list of system reference codes (SRCs). System reference codes are error codes, counters, and messages used by the I-O 8494 Remote Controller. When displayed, the SRC codes appear in the lower left hand corner of the screen on display stations attached to the remote controller. Some error codes require a specific key sequence to be displayed as specified (if applicable) for each type of error code.

**Note:** *The I-O 8494 Remote Controller will log any errors occurring during its last hour of operation. These can be displayed by pressing the ALT key and while holding it depressed, pressing the HEX key, followed by the F3 key. Repeat the same key sequence to display the next to last logged error, etc.*

System Reference Code (SRC)	Reason Received	Location Displayed	Definition Found
0000 through 003F	An operator error occurred during an entry operation.	Display station where the error originated	"Operator Entry System Reference Codes" on page C-2.
0040 through 005F	An error occurred on the communications network during the time the I-O 8494 was communicating with the host system.	All affected display stations	"Communications Network System Reference Codes" on page C-5.
0080 through 008F	An error occurred during configuration of the remote controller.	Display station used for configuration of the remote controller	"Operator Entry System Reference Codes" starting on page C-2.
0090 through 009F	A display station operator caused an error that involves the host system capabilities.	Display station where the error originated	"Host Support System Reference Codes" on page C-6.
0100 through 0145	An error occurred on the communications network during the time the I-O 8394Ei was communicating with the host system.	All affected display stations.	"Host Communications status codes for upstream LAN" starting on page C-7
100000 through 10FFFF	A display station operator attempted to enter an incorrect or invalid X.25 command or parameter from the keyboard.	Display station where the error originated	"X.25 Operator System Reference Codes" on page C-8.
110000 through 1FFFFF	An error was detected by the DTE or DCE on an X.25 network.	All active display stations	"X.25 Communications System Reference Codes" on page C-9.
400000 through 5FFFFFFF	An error related to the connected LAN was detected by the controller.	On a twinaxial connected display station, press a key sequence defined on page C-7.	"LAN Communications System Reference Codes" on page C-17.

## APPENDIX C

### Operator Entry System Reference Codes

SRC	Description	Explanation
0000	Help Key Not Allowed	The display station operator pressed the HELP key; however, either no SRC appeared or the application program did not support the HELP key.
0001	Keyboard Overrun	The I-O 8494 did not keep up with the rate of information entered. The last character entered was not recognized.
0002	Invalid Scan Code	The I-O 8494 received an invalid key code from the display station. Either the keyboard code is incorrect for the keyboard at the display station or an error occurred in translating the keystroke.
0003	Invalid Command/PF Key	The display station operator pressed either a COMMAND key sequence, a PF key that was not supported or not valid for the current field, or an invalid ALT key sequence.
0004	Data Not Allowed in this Field	The display station operator tried to enter data from the keyboard into a field where only MSR or SLP entries are allowed.
0005	Cursor in Protected Area of Display	The display station operator tried to enter data, but the cursor was not in an input field on the display. Data cannot be entered in a protected area of the display.
0006	Key Following Sys Req Key Not Valid	The display station operator pressed the SYS REQ/ATTN key while establishing an X.25 circuit or pressed an invalid key after pressing the SYS REQ/ATTN key and before pressing the ENTER/REC ADV key or the ERROR RESET key.
0007	Mandatory Entry Field Must Enter Data	There is at least one mandatory entry field on the screen that the display station operator must enter data into before the screen can be changed or processed. (The cursor goes to the first character position of the first unentered mandatory entry field.)
0008	This Field Must Have Alphabetic Characters	The display station operator tried to enter non-alphabetic characters into a mandatory alphabetic field. Valid characters are A through Z, blank, comma, period, hyphen, apostrophe, and DUP. The DUP key may be used to duplicate these characters in the field.
0009	This Field Must Have Numeric Characters	The display station operator attempted to enter nonnumeric characters into a mandatory numeric field. Valid characters are 0 through 9, blank, comma, period, plus, minus, and DUP. The DUP key may be used to duplicate these characters in the field.
0010	Only Characters 0 Through 9 Permitted	The key pressed is not valid for a signed numeric field. Valid entries are 0 through 9 and DUP key.
0011	Key for Sign Position of Field Not Valid	The display station operator tried to enter data into the last position of a signed numeric field.
0012	Insert Mode No Room to Insert Data	There is no room to insert data into this field. Either there is no room in the field, or the cursor is in the last position of the field. Do not use Insert mode to change data or to enter the last character into the field.
0013	Insert Mode Only Data Keys Permitted	The display station operator tried to exit a field while the display station was still in Insert mode.
0014	Mandatory-Fill Field Must Fill to Exit	The display station operator pressed a function key that moves the cursor out of this field; however, the requirements of this mandatory-fill field were not met. A mandatory-fill field must be completely filled or left blank.

SRC	Description	Explanation
0015	Modulo 10 or 11 Check Digit Error	The display station operator entered data into a self-check field, and the number entered and the check digit did not compare.
0016	F-key Not Valid in this Field	The display station operator pressed the FIELD key when the cursor was not in a numeric only, digits only, or signed numeric field.
0017	Mandatory Fill Field Key Pressed Is Not Valid	The display station operator pressed the FIELD-, FIELD+, or FIELD EXIT key; however, the requirements for this mandatory fill field were not met. A mandatory fill field must be completely filled unless the operator exits it from the first position of the field.
0018	Key Used to Exit this Field Not Valid	The cursor is in a right adjust or field exit required field, and the display station operator pressed a data key.
0019	Dup or Field Mark Key Not Permitted in this Field	The display station operator pressed the DUP or FIELD MARK key; however, the key is not permitted in this field.
0020	Function Key Not Valid for Right Adjust Field	The display station operator pressed a function key that is not permitted in this field. Press the FIELD EXIT, FIELD+, or FIELD- key to exit this field before pressing one of the following function keys: TEST REQ, CLEAR, ENTER/REC ADV, PRINT, HELP, ROLL, HOME (when the cursor is in the home position), PF/CMD 1-24, SYS REQ, REC BACKSPACE
0021	Mandatory Entry Field Must Enter Data	The cursor is positioned in a mandatory entry field. The operator must enter data into a mandatory entry field before exiting the field by pressing the FIELD-, FIELD+, or FIELD EXIT key.
0022	Status of Field Not Known	A system error occurred. The status of the current field is not known. This error can occur during an insert or delete operation.
0023	Hex Mode Entry Not Valid	The display station operator is in hexadecimal mode, but the first or second key pressed was not a character 0 through 9 or A through F. This error also occurs when hexadecimal code is used in a numeric, signed numeric, alpha only, digits only, or I/O field.
0024	Decimal Field Entry Not Valid	The display station operator pressed a key that is not valid. Only characters 0 through 9 and the DUP key (if specified in the field format word) are allowed in this field.
0026	Field-key Entry Not Valid	The display station operator pressed the FIELD key to exit a numeric only field, but the last position of the field was not a character 0 through 9.
0027	Key Not Defined Key Cannot Be Used	The display station operator pressed a key that is either blank or not defined for this display station.
0029	Diacritic Character Not Valid	The second key pressed during a diacritic key function in a two-key sequence did not produce a valid diacritic character.
0031	Data Buffer Overflow	The data received from the MSR card was longer than the maximum allowed.
0032	MSR Data Error	Data received from the MSR was not valid.
0033	MSR Secure Data Read Not Authorized	The MSR data received was not secured data (the operator ID card), and this field was not specified for secured data
0034	MSR Data Exceeds Length of Field	The magnetic stripe reader data received will not fit into the active input field.
0035	MSR Error	The card to be read was incorrectly inserted into the magnetic stripe reader, incorrectly made, or is damaged.

## APPENDIX C

SRC	Description	Explanation
0036	Cursor Select Not Allowed in Field Exit Required State	The display station operator pressed the CURSOR SELECT key while in a field exit required state.
0037	Cursor Select Attempted in Nonselectable Field	The operator pressed the CURSOR SELECT key in a nonselectable field.
0044	<b>Token-Ring:</b> No valid frame before the time (Ti) expired.	Verify that the I-O 8494 cable to the modem/DCE is securely connected; that the modem/DCE is turned on; and the communication line is attached to the modem.
0046	<b>X.25 or Token-Ring:</b> Frame reject received.	Verify that the I-O 8494 cable to the modem/DCE is securely connected; that the modem/DCE is turned on; and the communication line is attached to the modem. If no problem is found, retry the procedure used to start AS/400 system communication. If this occurs again, contact I-O Customer Support.
0047	<b>X.25 or Token-Ring:</b> An unexpected disconnect mode (DM) or a disconnect (DISC) command was received while in information transfer state.	Verify that the I-O 8494 cable to the modem/DCE is securely connected; that the modem/DCE is turned on; and the communication line is attached to the modem. If no problem is found, retry the procedure used to start AS/400 system communication. If this occurs again, contact I-O Customer Support.
0081	Too many workstations are attached to the I-O 8494	The maximum number of attachments allowed is 8 or 16, depending on emulation. Determine which workstations are extra and disconnect them.
0089	One or more fields required for operation are blank.	When you press Enter, the I-O 8494 Remote Controller checks for blank fields and moves the cursor to the first blank. Press Error Reset and fill in the required field.
008A	One or more fields contain an embedded blank.	When you press Enter, the I-O 8494 Remote Controller checks for embedded blanks and moves the cursor to the first embedded blank. Press Error Reset and fill in the embedded blanks.
008C	Same Logical Unit (LU) mode name used for two emulated controllers.	When you press Enter, the I-O 8494 Remote Controller checks if the Logical Unit (LU) mode name (Field 12) has been used for another emulated controller. Press Error Reset and select another name, as found appropriate.
008E	One or more fields contain an insufficient number of characters. The cursor is positioned in the field that contains an insufficient number of characters.	Press <b>Error Reset</b> . Refer to the configuration worksheets for the correct field value. If you entered the value incorrectly, correct the entry. If the value from the configuration worksheet is not correct contact your Network Administrator for the correct information.



## Communications Network System Reference Codes

**Note:** Press the ALT key and while holding it, press the HEX key, followed by the F1 key to display these error codes. If no host session is active (screen is blank), these codes may also be displayed by pressing ENTER.

Error Code	Description	Cause
0040	It has been at least 30 seconds since any valid SDLC frame has been received for any address, and it has also been at least 30 seconds since the DSR signal has been present on the cable from the modem. This code indicates conditions that would normally result in either error code 0055 or 0056, but gives the additional information that DSR is not present.	<ul style="list-style-type: none"> <li>a. The modem is not powered on.</li> <li>b. The telephone connection between the modems is down.</li> <li>c. The modem cable is bad or not connected correctly.</li> <li>d. The remote controller is connected to a modem using a null-modem cable, or is direct-connected using a modem cable. (If applicable, the jumpers are in the wrong position on the SDLC card.)</li> <li>e. Modems are configured incorrectly.</li> <li>f. Remote controller is not varied on at the host (turns off DSR only in certain host/modem configurations).</li> </ul>
0049	Software has detected that the MPIC communications interface card has functioned in an invalid manner.	The MPIC (or SDLC card, if applicable) is bad or not installed correctly.
0055	Since startup of the 8494, no valid SDLC frame has been received for the address. This error code will not be displayed if the 8494 has ever received ANY good SDLC frames containing ANY SDLC address. This is true even if the address in the frame is not the address configured for the remote controller, or any of the addresses configured for a multi-card 8494.	<ul style="list-style-type: none"> <li>a. The remote controller has not been varied on at the host.</li> <li>b. NRZI configured on the remote controller does not match the host configuration.</li> <li>c. The cable connecting the remote controller to the modem is bad or too long for the baud rate. The host-to-modem cable could also be the problem.</li> <li>d. The remote controller is connected to a modem using a null-modem cable, or is direct-connected using a modem cable. (If applicable, the jumpers are in the wrong position on the SDLC card.)</li> <li>e. Modems are configured incorrectly.</li> <li>f. Disk in 8494 not configured correctly.</li> </ul>
0056	It has been at least 30 seconds since any valid SDLC frame has been received for any address. However, valid frames were received earlier. This error code will not be displayed if the 8494 has received ANY good SDLC frames containing ANY SDLC address in the last 30 seconds. This is true even if the address in the frame is not the address configured for the remote controller, or any of the addresses configured for a multi-card 8494.	The remote controller has been varied off at the host.
0057	Since startup of the 8494, no valid SDLC frame has been received for the display station's remote controller. At least 30 seconds has elapsed since the 8494 startup was completed.	<ul style="list-style-type: none"> <li>a. The display station's remote controller has not been varied on, but one or more other remote controllers configured on the 8494 are varied on.</li> <li>b. The SDLC address configured for the display station's remote controller does not match the address configured on the host.</li> <li>c. The display station's remote controller has not been configured on the host at all.</li> </ul>

## APPENDIX C

Error Code	Description	Cause
0058	It has been at least 30 seconds since any valid SDLC frame has been received for this display station's remote controller. However, frames addressed to this remote controller were received earlier. This error normally shows up only on multi-card 8494's because it implies that valid SDLC frames are still being received for other remote controller addresses; otherwise, error code 0056 would be displayed, indicating no frames are being received for any address.	The display station's remote controller has been varied off, but one or more emulated remote controllers in the same 8494 are still varied on.
0059	AN SDLC XID command was received for the display station's remote controller, but that was at least 30 seconds ago and no SDLC i-frame (data frame) has since been received.	The remote controller model (5294 or 5394) configured for the remote controller does not match the host configuration. The Duplex option in the host's Line Description is not correct.
0099	There is no SNA session active for the display station. Normally, this means that the display station and/or its remote controller is varied off, and the screen is blank.	<p>In many cases, when this error code appears it will be replaced in about 30 seconds with one of the following seven error codes. If this happens, the new error code will be the more specific one, and should be used to determine the problem. If this error code does not get replaced, the problem may be:</p> <ul style="list-style-type: none"> <li>a. The display station has been varied off at the host, though its remote controller is varied on.</li> <li>b. The display station is not configured on the host, or its twinax address (0 through 6, "local station address") is configured incorrectly.</li> </ul>

### Host Support System Reference Codes

SRC	Description	Explanation
0099	Host Support Not Currently Available	A key requiring host system action was pressed, but either the requested function is not supported or the workstation is not in session with the host system.

## Host Communication Status Codes for Upstream LAN

**Note:** Press the ALT key and while holding it, press the HEX key, followed by the F1 key to display these error codes. If no host (screen is blank), these codes may also be displayed by pressing ENTER.

**Note:** In the error codes that follow, the 4th digit of the error code (the 'x') is a digit from 0 to 5 that indicates the most-advanced stage that the 8494 has ever reached (since power-up) in its attempts to establish communication with the AS/400. Meanings of the valid values for this digit are:

- 0: Adapter open failed, and no connect is requested.
- 1: Adapter open failed, connect is requested.
- 2: No connect is requested.
- 3: No TEST received from AS/400.
- 4: No SABME received from AS/400.
- 5: LAN connection to AS/400 established successfully.

SRC	Description	Cause
010X	No LAN connection to the AS/400 has been established. The communication status is 'adapter open failed, and no connect is requested', meaning that the LAN adapter in the 8494 has failed to open, and an operator at an attached display has requested a 'disconnect'. The 8494 will periodically re-try to open the LAN adapter; but if a retry succeeds, no attempt will be made to contact the AS/400 until an operator requests a 'connect'.	The most probable cause for failure of the adapter to open is a bad cable connection between the 8494 LAN adapter and the LAN segment, MAU, or hub. Other possible causes are improperly-seated LAN adapter, permanently failed LAN adapter, or hardware failure of some other piece of LAN equipment.
011X	No LAN connection to the AS/400 has been established. The communication status is 'adapter open failed, connect is requested', meaning that the LAN adapter in the 8494 has failed to open, but connection to the AS/400 is requested. The 8494 will periodically re-try to open the LAN adapter; but if a re-try succeeds, attempts to contact the AS/400 will commence immediately.	The most probable cause for failure of the adapter to open is a bad cable connection between the 8494 LAN adapter and the LAN segment, MAU, or hub. Other possible causes are improperly-seated LAN adapter, permanently failed LAN adapter, or hardware failure of some other piece of LAN equipment.
012X	No LAN connection to the AS/400 has been established. The communication status is 'no connection is requested', meaning that an operator at an attached display has requested a 'disconnect', cancelling attempts to contact the AS/400.	An operator has requested that the 8494 make no attempts to establish communication with the AS/400. Make a 'connect' request at any display attached to the 8494 in order to re-enable connection attempts.
013X	Establishment of LAN connection to the AS/400 is not yet complete. The communication status is 'no TEST received from AS/400', meaning that the 8494 is periodically sending TEST commands to the AS/400, but has not yet received a TEST in response.	The most-likely cause for this condition is that the LAN line description on the AS/400 is varied off. The problem may also be caused by configuration errors on the host or on the controller; verify that all LAN addresses entered during configuration are correct. Other possible causes are poor connections to the LAN, or failure of LAN cabling, MAU, or hub.
014X	Establishment of LAN connection to the AS/400 is not yet complete. The communication status is 'no SABME received from AS/400', meaning that some communication messages have been successfully exchanged between the 8494 and the AS/400, but no SABME mode-setting command has yet been received from the AS/400.	The most-likely cause for this condition is that the 8494's controller description on the AS/400 is varied off.

## APPENDIX C

### X.25 Operator System Reference Codes

If the I-O 8494 is in X.25 communications mode, and an error occurs during keyboard entry of commands, options, or parameters, an SRC between 100000 and 10FFFF is displayed.

SRC	Description
100000	A previous CALL command is in progress.
100100	A virtual circuit has already been established.
100200	An ANSWER command was entered for a permanent virtual circuit (PVC).
100300	A CALL command was entered for a permanent virtual circuit (PVC).
100600	The password option is invalid because it is longer than eight characters.
100700	The host network address (TO network address) is invalid because it is greater than 15 decimal digits.
100800	Your network address (FROM network address) is invalid because it is greater than 15 decimal digits.
100900	The network address is invalid because it does not contain all numeric digits (0 through 9).
101100	An invalid control character was entered.
101200	The host network address is missing for a CALL command.
101300	An A, O, C, or D was not entered as the first control character or was previously entered.
101400	A network address was entered for a permanent virtual circuit (PVC).
101500	The password option was entered for a permanent virtual circuit (PVC).
101600	The password option is invalid because it is not all alphanumeric characters.
101C00	An OPEN command was entered for an answer-only switched virtual circuit (SVC).
101D00	A CALL command was entered for an answer-only switched virtual circuit (SVC).
101E00	An ANSWER command is invalid because one or more parameters were included.
101F00	A DETACH command is invalid because one or more parameters were included.

## X.25 Communications System Reference Codes

If the I-O 8494 Remote Controller accepts the keyboard entered options, but the network operation with the host system fails, an SRC between 110000 and 1FFFFFF is displayed on all attached display stations. These SRCs indicate a communications network problem at the packet level.

### 1100ff or 1180ff System Reference Codes

System reference codes 1100ff through 1180ff occur if the I-O 8494 issued a Clear Request packet after detecting an error. The cause of the error is contained in the diagnostic field (ff) as shown in the table below.

SNA Diagnostic Code (ff)	ISO Diagnostic Code (ff)	Description
14	14	Invalid packet type for state p1
15	15	Invalid packet type for state p2
17	17	Invalid packet type for state p4
18	18	Invalid packet type for state p5
1B	1B	Invalid packet type for state d1
31	31	Call connected not received within 200 seconds
32	32	Clear confirmation not received within 200 seconds
50		General ELLC/QLLC error
51		Undefined ELLC C-field
54		Undefined ELLC I-field
56		ELLC frame reject received
57		ELLC header invalid
59		ELLC timeout (LT1 x LN2) condition
5A		ELLC receive sequence count (LNr) invalid
5B		ELLC recovery rejected or terminated
60		General PSH error
61		PSH sequence error
A1		Invalid M-bit packet sequence
A6	26	Packet too short. Make sure that the packet size entered (in the configuration or manually) matches the network subscription.
A7	27	Packet too long. Check that the packet size entered (in the configuration or manually) matches the network subscription.
AA		Interrupt packet not supported
AB	01	Invalid packet send sequence number (Ps)
AC	02	Invalid packet receive sequence number (Pr)

SNA Diagnostic Code (ff)	ISO Diagnostic Code (ff)	Description
AD		Invalid D-bit received
D0	F4	General resources error
D2	F5	PIU too long
E0	69	Invalid facility length
E2	29	LCID is not equal to 0 on restart indication confirmation
E6	42	Facility parameters not supported
E7	41	Facility not supported
E8	46	Call from unexpected DTE
E9		Invalid D-bit requested. There is a host system problem or you are connected to the wrong DTE.
EA		Reset indication on virtual call
EB		Invalid protocol identifier
EC		Password mismatch
	00	No additional information
	20	Packet not allowed

**1200ff or 1280ff System  
Reference Codes**

System reference codes 1200ff through 1280ff occur if the I-O 8494 issued a Reset Request packet after detecting an error. The cause of the error is contained in the diagnostic field (ff) as shown in the table below.

SNA Diagnostic Code (ff)	ISO Diagnostic Code (ff)	Description
1B	1B	Invalid packet type for state d1
33	33	Reset confirmation not received within 200 seconds
50		General ELLC/QLLC error
51		Undefined ELLC C-field
54		Undefined ELLC I-field
55		ELLC-I field too long
56		ELLC frame reject received
57		ELLC header invalid
59		ELLC timeout (LT1 x LN2) condition
5A		ELLC receive sequence count (LNr) invalid
5B		ELLC recovery rejected or terminated
60		General PSH error. Host system or network problem
61		PSH sequence error. Host system or network problem
A1	2D	Invalid M-bit packet sequence
A6	26	Packet too short
A7	27	Packet too long
AA		Interrupt packet not supported
AB	01	Invalid packet send sequence number (Ps)
AC	02	Invalid packet receive sequence number (Pr)
AD		Invalid D-bit received
D0	F4	General resources error
D2	F5	PIU too long
	00	No additional information
	20	Packet not allowed

## APPENDIX C

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### 18ccdd, 19ccdd and 1Accdd System Reference Codes

SRCs 180000 through 1AFFFF have the following format:

TTccdd

where:

TT = general error category (18, 19, or 1A)

cc = cause code

dd = diagnostic code

A description of each error category and its cause codes follows. The diagnostic codes for all errors in this range are listed in the table on page C-9.

**Note:** *Most cause codes (cc) and diagnostic codes (dd) are issued by the network and may vary from network to network.*

*The cause codes and diagnostic codes listed here are defined by CCITT Recommendation X.25. I-O does not guarantee that they will apply to the network.*

### 18ccdd Errors

18ccdd errors occur if the DCE issues a Clear Indication packet after detecting an error.

Cause Code (cc)	Description
00	Call clearing originated at host system
01	Host system busy
03	Invalid facility request
05	Network congestion
09	Out of order host not ready
0B	Access to the host system not allowed
0D	Unrecognized host network address
11	Error at the host system
13	Error at the I-O 8494
15	Recognized Private Operating Agency (RPOA) out of order
19	Reverse charging not subscribed
21	Incompatible destination
29	Fast select not supported
80-FF	Call clearing originated at host system



**19ccdd Errors**

19ccdd errors occur if the DCE issues a Reset Indication packet after detecting an error.

<b>Cause Code (cc)</b>	<b>Description</b>
00	Reset originated at host system
01	Out of order - disconnection host system
03	Error at the host system
05	Error at the I-O 8494
07	Network congestion
09	Remote DTE operational. This is not an error. It is a normal condition at startup.
0F	Network operational. This is not an error. It is a normal condition at startup.
11	Incompatible destination
1D	Network out of order
80-FF	Reset originated at host system

**1Accdd Errors**

1Accdd errors occur if the DCE issues a Restart.

<b>Cause Code (cc)</b>	<b>Description</b>
00	DTE (host) originated
01	Local procedure error
03	Network congestion
07	Network is operational. This is not an error. It is a normal condition at startup.
7F	Registration or cancellation confirmed. This is not an error.

## APPENDIX C

### Diagnostic Codes for 18ccdd, 19ccdd, and 1Accdd Errors

Diagnostic Code (dd)	Description
00	No additional information
01	Invalid send sequence P (S)
02	Invalid receive sequence P (R)
10	Invalid packet type
11	State r1
12	State r2
13	State r3
14	State p1
15	State p2
16	State p3
17	State p4
18	State p5
19	State p6
1A	State p7
1B	State d1
1C	State d2
1D	State d3
20	Packet not allowed
21	Unidentifiable packet
22	Call on one-way logical channel
23	Invalid packet type on a permanent virtual circuit
24	Packet on unassigned logical circuit
25	Reject not subscribed to
26	Packet too short
27	Packet too long
28	Invalid general format identifier
29	Restart with LCI not equal to X'000'
2A	Packet type not compatible with facility
2B	Unauthorized interrupt confirmation
2C	Unauthorized interrupt
2D	Unauthorized reject
30	Timer expired, general

<b>Diagnostic Code (dd)</b>	<b>Description</b>
31	Timer expired for incoming call
32	Timer expired for Clear Indication packet
33	Timer expired for Reset Indication packet
34	Timer expired for Restart Indication packet
40	Call setup or call clearing problem
41	Facility code not allowed
42	Facility parameter not allowed
43	Invalid called address
44	Invalid calling address
45	Invalid facility/registration length
46	Incoming call barred
47	No logical channel available
48	Call collision
49	Duplicate facility requested
4A	Nonzero facility length
4B	Nonzero facility length
4C	Facility not provided when expected
4D	Invalid CCITT-specified DTE facility
50	Miscellaneous problems
51	Improper cause code from DTE
52	Octet not aligned
53	Inconsistent Q bit setting
60-6F	Not assigned
70	International problem
71	Remote network problem
72	International protocol problem
73	International link out of order
74	International link busy
75	Transit network facility problem
76	Remote network facility problem
77	International routing problem
78	Temporary routing problem
79	Unknown called DNIC
7A	Maintenance action
80-FF	Network specific diagnostic information

## APPENDIX C

### 1Bccyy System Reference Codes

1Bccyy system reference codes occur if the I-O 8494 issued a Restart Request packet after detecting an error. The cause code is contained in the cause field (cc) as shown in the table below.

SNA Cause Code (cc)	ISO Cause Code (cc)	Description
11	11	Unsolicited Restart Confirmation packet received
34	34	Confirmation packet not received within 200 seconds
A5	A5	Diagnostic packet received*
A6	A6	Packet too short
AB	AB	Invalid GFI (restart indication or confirmation only)
E2	29	LCID not equal to 0 on restart indication or confirmation
E5	24	LCID = 0 on non-restart or diagnostic packet
* The error code for Diagnostic Packet Received has two additional descriptive characters appended, for example, 1BA5yy. The definitions of yy are described in <i>The X.25 Interface for Attaching IBM SNA Nodes to Packet-Switched Data Networks General Information Manual</i> . This packet does not generate a restart request., +, +		

## LAN Communications System Reference Codes

**Note:** To display these error codes, press the ALT key and while holding it depressed, press the HEX key, followed by the F2 key. This will display the error codes related to host communication for the LAN gateway. Repeat the same sequence to display error codes specific to the LAN controller communication.

Cause Code	Description	Action
400000	A connection attempt is already in progress.	Wait for a sign-on screen or until an SRC other than 400000 appears. If attempting to stop continuous retries, wait and retry the attempt in a few seconds.
400300	One of the following conditions: 1) You are trying to disconnect from an AS/400 system that is not currently connected 2) You are trying to connect to an AS/400 system that already has established a connection or is in the process of establishing a connection.	If you have selected the wrong AS/400 system, correct the request and retry.
400600	The format of the command is not valid.	See Chapter 7, "Communicating with Your AS/400 System" for the correct format. Correct and retry.
410100	One of the following XID command length errors was detected: 1) The I-field is greater than 255 bytes. 2) The I-field is less than 29 bytes. 3) The XID command length field does not match the I-field length.	Report this problem to the system operator.
410200	An XID contained an unsupported I-field format. There is a system configuration problem.	There is a system configuration problem. Report this problem to the system operator.
410300	XID command exchange state indicators are set to "not supported."	There is a system programming error or configuration problem. Report this problem to the system operator.
410400	An XID command did not specify SDLC protocol.	There is a system programming error or configuration problem. Report this problem to the system operator.
410500	An XID3 command specified asynchronous balanced mode (ABM) support.	There is a system programming error or configuration problem. Report this problem to the system operator.
410600	An XID3 command specified that an ALS is secondary.	There is a system programming error or configuration problem. Report this problem to the system operator.

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Cause Code	Description	Action
410700	AN XID3 command specified a maximum BTU length less than 265 bytes.	There is a system programming error or configuration problem. Report this problem to the system operator.
410800	An XID3 command specified an SDLC profile that is not valid.	There is a system programming error or configuration problem. Report this problem to the system operator.
410900	The XID3 command specifies a maximum I-frame's outstanding value that is not valid or supported.	There is a system programming error or configuration problem. Report this problem to the system operator.
411200	The host system reported an error in the XID response received from the I-O 8494. There could be a mismatch between the remote controller and the host system configuration.	<p>Verify the I-O 8494 configuration. Verify that the serial number field does not start with the reserved digits "XI." If it is correct, there could be a configuration problem in the host system.</p> <p>Pay particular attention to the I-O 8494 CP name and the matching remote CP name field in the host system configuration for the APPC controller.</p> <p>If the configuration is correct, call the system operator and make sure that the APPC controller description for the I-O 8494 is varied on.</p>
4510xx	<p>An error was detected during communication with an IWS. The error occurred during the XID exchange with the IWS. The possible values for xx are:</p> <ul style="list-style-type: none"> <li>• 80 = Frame length too long</li> <li>• 40 = Not a format 3 XID</li> <li>• 20 = Length inconsistency between XID and input/output block (IOB) length</li> <li>• 10 = XID exchange state was non '01'b or '00'b</li> <li>• 08 = Link station role was not '00'b</li> <li>• 04 = Maximum BTU acceptable to IWS was less than '109'x</li> <li>• 02 = IWS responded to XID with neither an XID nor a Disconnect command</li> <li>• 01 = XID frame length too short</li> </ul>	This could be a configuration problem. Verify the IWS configuration, turn the power OFF and back ON at the IWS, then restart the IWS communication program.
4523xx	<p>The Token-Ring link with the IWS terminated due to receipt of a frame with an ODAI value that is not valid in the transmission header. All sessions for this IWS are terminated.</p> <p><b>Note:</b> <i>xx is the Token-Ring workstation ID.</i></p>	Turn the power OFF and back ON at the IWS, then restart the IWS communication. If the error persists, it indicates a programming problem in the IWS.

Cause Code	Description	Action
460000	A frame was received containing an unrecognized session address.	If this error occurs frequently, report the error to the system operator.
460100	A frame was received containing an incorrect format identification (FID) type.	If this error occurs frequently, report the error to the system operator.
460200	A frame was received that was not long enough to contain a full transmission header (TH).	If this error occurs frequently, report the error to the system operator.
460300	A frame was received that was not long enough to contain a full transmission header (TH) and request header (RH).	If this error occurs frequently, report the error to the system operator.
460400	A session control frame was received that was not long enough to contain a session control request code.	If this error occurs frequently, report the error to the system operator.
460500	A segmented frame was received. The I-O 8494 does not support segmenting.	If this error occurs frequently, report the error to the system operator.
470100	A BIND request was received with an incorrect ODAI value in the local form session identifier (LFSID). The communication link to the host system was deactivated.	Report the error to the system operator.
540010	The Token-Ring adapter in the I-O 8494 failed to initialize correctly.	The Token-Ring adapter may be failing. Run extended diagnostics and test all hardware.
540106	The I-O 8494 attempted to attach to the Token-Ring (Open) and an adapter open error occurred.	The problem could be caused by a Token-Ring speed mismatch between the workstations on the Token-Ring network. Make sure that all workstations attached to the Token-Ring network are set to the same Token-Ring speed.
540122	The I-O 8494 detected a Token-Ring network wire fault.	There is a problem with the lobe between the I-O 8494 and the multi-station access unit (MSAU) to which it is connected. The Token-Ring adapter in the I-O 8494 is closed, and the remote controller will try to reopen the adapter until the problem between the I-O 8494 and MSAU to which the I-O 8494 is attached is repaired and the adapter reopens.
540124	The I-O 8494 received a remove command from the Token-Ring network.	<ol style="list-style-type: none"> <li>1. Check with the system operator to determine if an adapter remove was issued and was valid.</li> <li>2. If this SRC recurs, the Token-Ring adapter may be defective. Contact the system administrator and report that a remove command was received.</li> </ol>

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Cause Code	Description	Action
540125	The Token-Ring network is beconing due to a permanent error on the Token-Ring.	Report the problem to the system operator.
540403	(LAN AS/400 Attachment) The 8494 has not established a LAN connection to the AS/400 because an operator at a display attached to the LAN has requested a disconnect. No connection attempt will be made until a connect request is received from an operator.	If connection to the AS/400 is desired, use the 'connect' procedure at any display attached to the 8494 to request that the controller begin attempts to establish the LAN connection.
540404	(LAN AS/400 Attachment) The ALS did not respond to the TEST command sent from the 8494. This indicates that the 8494 cannot contact the ALS. The 8494 will continue to send the TEST command until the ALS responds or an operator initiates a disconnect.	<p>Contact the ALS operator to determine if the ALS is operational and configured for the 8494. Also, make sure the line is varied on at the AS/400 system.</p> <p>If the Token-Ring or Ethernet line is varied off: Have the operator vary on the line. The 8494 should recover without further action.</p> <p>If the Token-Ring or Ethernet line is varied on: Either the LAN AS/400 Attachment address or the Ethernet frame format configured in the 8494 is incorrect. Reconfigure the 8494, making sure that the AS/400 Token-Ring or Ethernet address matches the address in the line description at the AS/400 system. For Ethernet configurations, verify that the 8494 frame format matches the frame format configured at the ALS.</p> <p>If the Token-Ring or Ethernet line cannot be varied on because the AS/400 system is not operational: Wait for it to become operational.</p>
540405	(LAN AS/400 Attachment) The ALS did not respond to the XID3 command sent from the 8494. This indicates that the 8494 cannot contact the ALS. The 8494 will continue to send the XID3 command until the ALS responds or an operator initiates a disconnect.	<p>Contact that ALS operator to determine if the ALS is operational and configured for the 8494. Also, make sure the line and APPC controller descriptions are varied on at the AS/400 system.</p> <p>If the APPC controller is not varied on: Vary on the 8494. The 8494 should recover without any further action.</p> <p>If the APPC controller cannot be varied on because the AS/400 system is not operational: Wait for it to become operational.</p>



Cause Code	Description	Action
540406	(LAN AS/400 Attachment) Adapter open error. There was a problem when the 8494 attempted to attach to the LAN. The 8494 will try again to attach to the LAN. For Token- Ring, the problem could be caused by a speed mismatch between the workstations on the ring.	<p>For Token-Ring, make sure that all workstations attached to the ring are set to the same speed</p> <p>If the 8494 cannot attach to the LAN after retrying, note the following sense byte information and then refer to the IBM Token- Ring Network Problem Determination Guide for instructions on correcting the error. Verify that the cabling is connected correctly.</p> <p>Note: To obtain sense data, press the right arrow key on the 8494 keypad when this SRC is displayed.</p> <p>Token-Ring Sense Bytes:</p> <p>1100 Lobe media function failure  2600 Physical insertion ring failure  2700 Physical insertion ring failure ring beaconing  2A00 Physical insertion error timeout  2D00 No monitor detected  3200 Address verification signal loss  3500 Address verification timeout  3600 Address verification ring failure  3700 Address verification ring beaconing  3800 Address verification duplicate node address  3A00 Address verification remove received  4200 Ring poll signal loss  4500 Ring poll timeout  4600 Ring poll ring failure  4700 Ring poll beaconing  4A00 Ring poll remove received  5700 Request parameter ring failure  5900 Request parameter request  5A00 Request parameter remove received</p> <p>Ethernet Sense Bytes:</p> <p>3300 Unable to transmit  3800 Address verification duplicate node address</p>

## APPENDIX C

Cause Code	Description	Action
540422	<p>(Token-Ring AS/400 Attachment) The 8494 detected a Token-Ring network wire fault. There is a problem with the lobe between the 8494 and the multistation access unit (MSAU) to which it is connected.</p> <p>The Token-Ring adapter in the 8494 is closed. The 8494 will continue to try to reopen the adapter until a Disconnect command is received from a 8494 operator or until the problem is repaired and the adapter reopens. For information on the Disconnect command.</p>	Record the symptom wire fault, and then refer to the IBM Token-Ring Network Problem Determination Guide to repair the problem.
540424	(Token-Ring AS/400 Attachment) The 8494 received a remove command from the Token-Ring network	<ol style="list-style-type: none"> <li>1) Check with the Token Ring network administrator to determine if an adapter remove was issued and was valid.</li> <li>2) If the Token-Ring network administrator or network service representative did not issue an adapter remove, go to the operator panel and retry the Adapter Open command from the 8494 operator panel by pressing Req. typing 230, then pressing Enter.</li> <li>3) If this SRC reoccurs, the Token-Ring adapter in the 8494 may be defective. Run extended diagnostics and test all hardware.</li> </ol> <p>If the extended diagnostics did not detect a problem, contact the Token-Ring network administrator and report that a remove command was received.</p>
540425	(Token-Ring AS/400 Attachment) The Token-Ring network is beaconing due to a permanent error on the ring.	<ol style="list-style-type: none"> <li>1) Record that the Token-Ring is beaconing.</li> <li>2) Refer to the IBM Token-Ring Network Problem Determination Guide and use beaconing as the symptom</li> </ol>

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## APPENDIX D

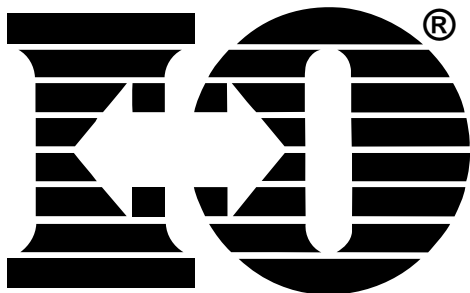
### Connecting Twinax Cards

The material in this appendix is directed to users familiar with the strapping jumpers used to combine twinax cards into pairs for use in I-O Corporation's I-O 8394E and I-O 8394Ei Remote Controllers. Every 8-device twinax card has an 8-pin connector located at the top of the board. This connector should always be connected either to a single-ended or double-ended jumper plug, or to one end of a double-ended jumper. In the I-O 8394E and I-O 8394Ei controllers, the double-ended type of jumper was used to interconnect pairs of twinax cards that were to be configured as 3-port 5394 controllers. In the I-O 8494 Remote Controller, combining of cards to be configured as multi-card controllers is done through software, and the use of the double-ended jumpers is no longer required. The same is true of older controllers that have been upgraded to use 8494 software. If your controller contains any 8-device twinax cards, please note the following points:

1. It is strongly recommended that every 8-device twinax card in an I-O 8494 Remote Controller be fitted with the single-ended type of jumper. All new 8-device twinax cards are shipped with this type of jumper in place. Your dealer can supply you with jumper plugs if those shipped with your cards are not available. Remember that an 8-device card fitted with the single-ended jumper must have switch 6 in its DIP switch block set to the OFF position (away from the number 6).
2. If you choose to leave a pair of 8-device cards strapped together with a double-ended jumper, that pair of cards should be used only as a 2-card 5394. The double-ended jumper electrically disables the top port on the second card of the pair, making the card unsuitable for use as anything but the second card of a 5394 controller emulation.
3. If you do plan to use a jumpered pair of cards as a 2-card 5394, remember that the two cards must still be software configured to emulate a 2-card controller. I-O 8494 software ignores the double-ended jumper, and will treat the two cards as two single-card controllers unless software configuration is done the same way it would be done for cards having single-ended jumper plugs.
4. You can check the main menu of the I-O 8494 online configuration program to determine whether your controller includes any hardware-jumpered pairs of twinax cards. Suppose for example that the menu screen includes the following lines:

1.	CARD 1	5494/1	8
2.	CARD 2	5494/1	8 a
3.	CARD 3	5494/1	8 b
4.	CARD 4	5494/1	8

This tells you that the controller contains four 8-device twinax cards, each configured in software as a single-card 5494. However the 'a' and 'b' at the right ends of lines 2 and 3 indicate that cards 2 and 3 are the first and second cards in a jumped pair. As long as the double-ended jumper connecting those two cards remains in place, the top port of card 3 will not work. You should replace the double-ended jumper with two single-ended plugs, and turn off switch 6 on each of the two cards. This will align the hardware configuration with the software configuration.



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## APPENDIX E

### Concurrent Host Attachment

#### Overview

The 8494 can be configured to communicate with up to four AS/400 systems at the same time over one physical link. Display stations on the 8494 can switch from one AS/400 system to another without starting a pass-through session. Connecting to multiple AS/400 hosts at the same time is made possible by using the routing capabilities of an APPN network. An APPN connection between AS/400 hosts should be set up and verified before configuring concurrent host attachment. Concurrent Host Attachment may also be referred to as “Multihost” functionality.

#### Verifying the APPN Connection Between Systems

An APPN link should exist between the primary and secondary AS/400 hosts before configuring concurrent host attachment. One way to see if this link exists is to use the **STRPASTHR** command. The target system name follows the **STRPASTHR** command on the command line. If pass-through from the primary to each of the secondary hosts works, then the APPN connections exist and will carry concurrent host attachment traffic.

#### Configuring Concurrent Host Attachment

The AS/400 that directly connects to the 8494 over the physical link is designated as the Primary AS/400 host. All concurrent host attachment traffic is routed through this host. Since the Primary AS/400 sends data from the 8494 to the secondary hosts, the Primary AS/400 should be configured as an APPN Network node. The secondary AS/400 systems can be configured as either APPN Network nodes for End nodes. The 8494 fields that need to be filled in will

```
H1:1-> _____ H1:2-> _____ H1:3-> _____ H1:4->QRMTWSC
H2:1-> _____ H2:2-> _____ H2:3-> _____ H2:4->QRMTWSC
H3:1-> _____ H3:2-> _____ H3:3-> _____ H3:4->QRMTWSC
H4:1-> _____ H4:2-> _____ H4:3-> _____ H4:4->QRMTWSC
```

appear in the Network Information Configuration screen like this.

The Primary AS/400 is identified in the 8494 configuration screen as H1:1. The field H1:1 through H1:4 describe the 8494’s connection to the Primary host. Similarly, fields contained in H2, H3, and H4 refer to the secondary AS/400’s. The last field on each concurrent host attachment line should contain the QRMTWSC mode name.

#### Switching Between AS/400 Systems

Each time the 8494 is powered up, all powered-on displays will connect to the Primary AS/400. In order to switch between AS/400 systems, do the following:

- 1 When you want to switch to a new AS/400, sign off of your current host.
- 2 Press the System Request key sequence on the display. You may see the default host identifier, **H1** appear on the System Request Line if you currently have no session with the host.
- 3 Choose the host you want to go to. This is done by entering **H1** for the first host, **H2** for the second host, **H3** for the third host, and **H4** for the fourth host.

## APPENDIX E

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For example, to go to the second configured host, enter **H2** in the first two characters of the System Request line:

**H2**  
-----

### **4** Hit **Enter**.

If you have correctly entered the host switch command, within a few seconds the 8494 will switch your display session to the host you have chosen. If the command is incorrectly entered, the 8494 will forward the request to the AS/400. You may not see an error on your screen when this happens if the display has a login screen.

## Printing

When an 8494 is configured for concurrent host attachment, and the user is on the Primary AS/400, the user may elect to print to a printer that is attached to the 8494. When a user is logged onto the Secondary AS/400, printing to printers that are attached to the 8494 is not supported. Printer sharing is also not supported.

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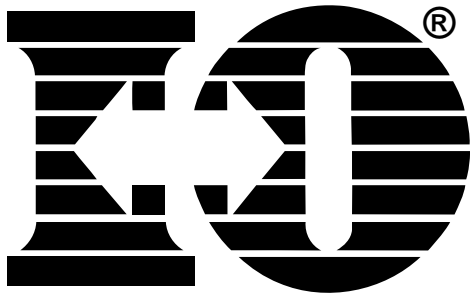
**Manufacturer's One Year Limited Warranty  
(United States)**

The following warranty applies only to products purchased and operated within the United States.

I-O Corporation (I-O) warrants this product against defects in material and workmanship for a period of one year commencing from date of purchase by the original customer, when operated and maintained in accordance with I-O's published specifications. I-O's liability shall be limited, at its option and expense, to refund to buyer the actual amount paid by buyer or to repair or replace any defective or nonconforming product or part thereof, F.O.B. I-O's authorized repair depot. Buyer may obtain a replacement product by meeting the terms of the I-O Customer On-Site Exchange Repair Policy in effect at the time of the request.

THE EXPRESS WARRANTY SET FORTH ABOVE IS IN LIEU OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES. OTHERWISE, THE PRODUCTS ARE SOLD AS IS WITHOUT FURTHER OBLIGATION OR LIABILITY ON THE PART OF I-O. I-O EXPRESSLY EXCLUDES ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

EXCEPT AS EXPRESSLY SET FORTH HEREIN, IN NO EVENT SHALL I-O BE LIABLE FOR ANY CLAIMS OR DAMAGE ARISING DIRECTLY OR INDIRECTLY FROM THE FURNISHING OR FAILURE TO FURNISH PRODUCTS, SPARE OR REPLACEMENT PARTS, INFORMATION OR SERVICES HEREUNDER. UNDER NO CIRCUMSTANCES SHALL I-O BE LIABLE IN ANY WAY FOR INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO LOST BUSINESS OR PROFITS, WHETHER OR NOT FORESEEABLE AND WHETHER OR NOT BASED ON BREACH OF WARRANTY, CONTRACT, OR NEGLIGENCE.



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**Customer On-Site Exchange Repair Policy**

Terms, Conditions, and Limitations  
Effective May 1, 1994<sup>a</sup>

For products covered by the I-O Corporation (I-O) Manufacturer's Limited Warranty (United States), I-O's Customer On-Site Exchange (COE) Repair Policy provides customers with a replacement unit for a defective product, subject to the following terms and conditions:

**Call Customer Support**

- If a product fails call I-O Customer Support for assistance at (801) 972-1446.

**Verify Product Failure**

- I-O will verify the product serial number, warranty coverage and product failure.
- \* You are responsible for assisting in verifying the product failure.
- When I-O Customer Support verifies a product failure they will issue a Return Merchandise Authorization (RMA) number for the failed product.

**Replacement Units**

- Replacement units are shipped from I-O's stock of refurbished units, subject to availability.
- Replacement units carry the same warranty as remaining on the original product.
- I-O's COE Repair Policy applies only to warranted product failures. Buyer guarantees payment for non-warranted product repairs or replacement.

**Return Your Failed Unit**

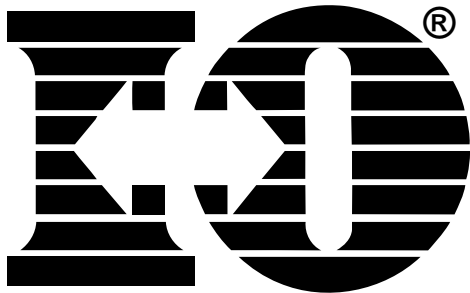
- When you return the failed product it must be shipped freight prepaid. Always note the RMA number on the outside of the package.

**Install the Replacement Unit**

- You are responsible for installing the replacement unit.
- After receiving the replacement unit please call I-O Customer Support if any assistance is required.

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<sup>a</sup> I-O reserves the right to change the terms and conditions of this policy without notice.



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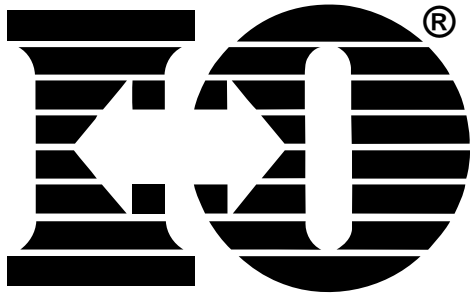
**Manufacturer's One Year Limited Warranty  
(International)**

The following warranty applies only to products purchased or operated outside the United States.

I-O Corporation (I-O) warrants this product against defects in material and workmanship for a period of one year commencing from date of purchase by the original customer, when operated and maintained in accordance with I-O's published specifications. I-O's liability shall be limited, at its option and expense, to refund to buyer the actual amount paid by buyer or to repair or replace any defective or nonconforming product or part thereof, F.O.B. I-O's authorized repair depot. Buyer may obtain warranty service by meeting the terms of the I-O Return-to-Depot Repair Policy in effect at the time of the request.

THE EXPRESS WARRANTY SET FORTH ABOVE IS IN LIEU OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES. OTHERWISE, THE PRODUCTS ARE SOLD AS IS WITHOUT FURTHER OBLIGATION OR LIABILITY ON THE PART OF I-O. I-O EXPRESSLY EXCLUDES ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

EXCEPT AS EXPRESSLY SET FORTH HEREIN, IN NO EVENT SHALL I-O BE LIABLE FOR ANY CLAIMS OR DAMAGE ARISING DIRECTLY OR INDIRECTLY FROM THE FURNISHING OR FAILURE TO FURNISH PRODUCTS, SPARE OR REPLACEMENT PARTS, INFORMATION OR SERVICES HEREUNDER. UNDER NO CIRCUMSTANCES SHALL I-O BE LIABLE IN ANY WAY FOR INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO LOST BUSINESS OR PROFITS, WHETHER OR NOT FORESEEABLE AND WHETHER OR NOT BASED ON BREACH OF WARRANTY, CONTRACT, OR NEGLIGENCE.



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**Return-to-Depot Repair Policy**

Terms, Conditions, and Limitations  
Effective May 1, 1994<sup>a</sup>

For products covered by the I-O Corporation (I-O) Manufacturer's Limited Warranty (International), I-O's Return-to-Depot (RTD) Repair Policy provides customers with warranty service for a defective product, subject to the following terms and conditions:

**Call Customer Support**

- If a product fails call I-O Customer Support for assistance at:  
  
(801) 972-1446 for all locations outside the United States.

**Verify Product Failure**

- I-O will verify the product serial number, warranty coverage and product failure.
- You are responsible for assisting in verifying the product failure
- When I-O Customer Support verifies a product failure they will issue a Return Merchandise Authorization (RMA) number to authorize return of the failed product.

**Select Your Preferred Repair Location**

- I-O's Customer Support Representative will assist you in identifying the nearest I-O authorized repair depot.
- I-O's Customer Support Representative will provide you with an RMA transmittal form referencing the assigned RMA number and the authorized repair depot address.

**Return Your Failed Unit**

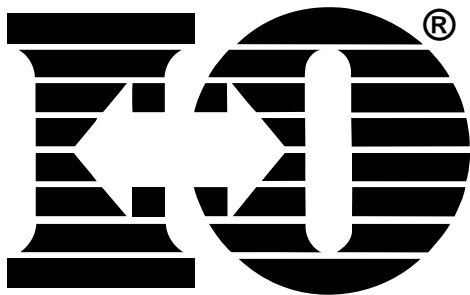
- Return the failed product to the I-O authorized repair depot previously identified, enclosing the RMA transmittal form. When you return the failed product it must be shipped freight prepaid.
- I-O's RTD Repair Policy applies only to warranted product failures. Buyer guarantees payment for non-warranted product repairs.

**Install Your Repaired Unit**

- I-O's authorized repair depot will service the faulty unit and return it to you, freight prepaid.
- You are responsible for installing the returned unit.
- After receiving the repaired unit please call I-O Customer Support if any assistance is required.

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<sup>a</sup> I-O reserves the right to change the terms and conditions of this policy without notice.



*“Products That Work”*

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**Manufacturer's One Year Limited Warranty  
(European Area)**

The following warranty applies only to products purchased and operated within the European Area.

I-O Corporation (I-O) warrants this product against defects in material and workmanship for a period of one year commencing from date of purchase by the original end-user, when operated and maintained in accordance with I-O's published specifications. I-O's liability shall be limited, at its option and expense, to refund to original end-user the actual amount paid by original end-user or to repair or replace any defective or nonconforming product or part thereof, F.O.B. I-O's authorized repair depot. Original end-user may obtain a replacement product by meeting the terms of the I-O Customer On-Site Exchange Repair Policy in effect at the time of the request.

THE EXPRESS WARRANTY SET FORTH ABOVE IS IN LIEU OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES. OTHERWISE, THE PRODUCTS ARE SOLD AS IS WITHOUT FURTHER OBLIGATION OR LIABILITY ON THE PART OF I-O. I-O EXPRESSLY EXCLUDES ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

EXCEPT AS EXPRESSLY SET FORTH HEREIN, IN NO EVENT SHALL I-O BE LIABLE FOR ANY CLAIMS OR DAMAGE ARISING DIRECTLY OR INDIRECTLY FROM THE FURNISHING OR FAILURE TO FURNISH PRODUCTS, SPARE OR REPLACEMENT PARTS, INFORMATION OR SERVICES HEREUNDER. UNDER NO CIRCUMSTANCES SHALL I-O BE LIABLE IN ANY WAY FOR INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO LOST BUSINESS OR PROFITS, WHETHER OR NOT FORESEEABLE AND WHETHER OR NOT BASED ON BREACH OF WARRANTY, CONTRACT, OR NEGLIGENCE.



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**Customer On-Site Exchange Repair Policy**

Terms, Conditions, and Limitations  
Effective June 1, 1997<sup>a</sup>

For products covered by the I-O Corporation (I-O) Manufacturer's Limited Warranty (European Area), I-O's Customer On-Site Exchange (COE) Repair Policy provides original end-users with a replacement unit for a defective product, subject to the following terms and conditions:

**Call Customer Support**

- If a product fails call I-O Customer Support for assistance at 44(0) 1908 567722.

**Verify Product Failure**

- I-O will verify the product serial number, warranty coverage and product failure.
- You are responsible for assisting in verifying the product failure.
- When I-O Customer Support verifies a product failure they will issue a Return Merchandise Authorization (RMA) number for the failed product.

**I-O Ships Replacement Unit**

- Replacement units are shipped from I-O's stock of refurbished units, subject to availability.
- I-O will invoice you for full retail value of the replacement unit upon shipment from I-O.
- Replacement units carry the same warranty as remaining on the original product.
- I-O's COE Repair Policy applies only to warranted product failures. You must pay for non-warranted product repairs or replacement.

**Return Your Failed Unit**

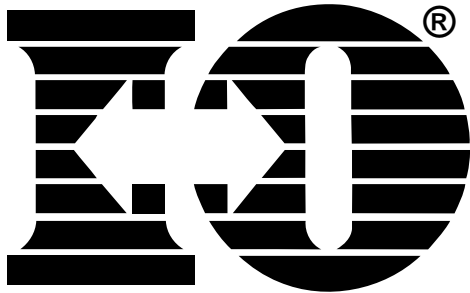
- When you return the failed product it must be shipped freight prepaid. To insure proper tracking always note the RMA number on the outside of the package.
- I-O will issue you a credit (reversing the replacement unit invoice amount) when the failed product is received by I-O.
- If you do not return the failed product (or pay the replacement unit invoice) within 14 calendar days of the date the replacement unit is shipped from I-O, your warranty coverage and service will be suspended on all I-O products you own.

**Install the Replacement Unit**

- You are responsible for installing the replacement unit.
- After receiving the replacement unit please call I-O Customer Support if any assistance is required.

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<sup>a</sup> I-O reserves the right to change the terms and conditions of this policy without



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**active session:** The host session currently being used, as opposed to an inactive session.

**application:** A task that has been automated by a computer program, such as payroll or inventory control.

**ASCII:** American Standard Code for Information Interchange. The coding used in personal computers. Systems that link personal computers to IBM mainframes must include a translating device to connect the two codes.

**attribute:** A characteristic, such as bold and italic.

**baud rate:** A unit of signaling speed equal to the number of discrete conditions or signal events per second.

**blank character:** A character that is not displayed but occupies a position on the display screen.

**bps:** Bits per second. In serial transmission, the instantaneous bit speed with which a device or channel transmits a character.

**cable-through:** A special feature or standard function that allows multiple display stations and printers to be attached to a single cable path.

**CCITT:** See International Telegraph and Telephone Consultative Committee.

**CCV24:** An EIA 232D/V.24 communications cable used to connect the I-O 8494 Remote Controller (operated in SNA/SDLC mode) to a DCE with an EIA 232D/V.24 interface. The cable has a DB-25 connector in one end and a DB-44 connector in the other end.

**CCV24M:** An EIA 232D/V.24 communications cable used to connect the I-O 8494 Remote Controller (operated in SNA/SDLC, modem eliminator mode) to the host. The cable has a DB-25 connector in one end and a DB-44 connector in the other end.

**command keys:** The keys on the top row(s) of the keyboard that are used to request a pre-assigned function of the system.

**command:** An instruction that directs the system to perform a particular operation.

**concurrent host attachment:** A method of communicating between the controller and up to four host systems over an APPN network.

**control unit:** See controller.

**controller:** A device used to coordinate and control operations of one or more attached display stations and printers and to synchronize their operation with that of the system.

**cpi:** Characters per inch.

**CSU:** Channel Service Unit. User-owned equipment installed on customer premises as the interface to phone company lines to terminate a DDS or T1 circuit. The CSU replaces a modem on a DDS or T1 circuit. The CSU transmits and receives digital signals from the circuit.

**data terminating equipment:** This term is used to refer to any machine, such as the I-O 8494 Remote Controller or its host computer, that is connected to a network.

**data circuit-terminating equipment:** In a data station, the equipment that provides the signal conversion and coding between the data terminal equipment (DTE) and the line. Note, the DCE may be separate equipment or an integral part of the DTE intermediate equipment.

**DCE:** See Data Circuit-terminating Equipment.

**DDS:** Dataphone Digital Service. A trademark of AT&T identifying a private line service for digital data communications.

**default setting:** The standard setting for a feature which automatically appears unless the user selects a different setting.

**display screen:** A cathode ray tube that is used to display alphanumeric characters.

**display station:** An input/output device containing a display screen and an attached keyboard. Also called a terminal.

**DSAP:** Destination Service Access Print.

**DSU:** Data Service Unit. The DSU replaces a modem on a Dataphone Digital Service (DDS) line. The DSU generates the digital signals for transmission over a DDS line and decodes the digital signal for non-DDSA equipment.

**DTE:** See Data Terminating Equipment

**EBCDIC:** Extended Binary Coded Decimal Interchange Code. A standard computer character set used to

## GLOSSARY

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represent 256 standard characters. IBM mainframes use EBCDIC coding.

**EIA interface:** Physical interface standard set by the Electronic Industries Association.

**emulation:** The duplication or imitation of one device by another device.

**font:** (1) A collection of characters of a given typeface and size. (2) Used generically to mean the collection of coded fonts, font character sets, and code pages. (3) A font file that contains characters that must be used in conjunction with a code page file.

**FHKV24:** An EIA 232D/V.24 communications cable used to connect the I-O 8494 Remote Controller (operated in X.25 mode) to a DCE with an EIA 232D/V.24 interface.

**FHKV35:** A V.35 communications cable used to connect the I-O 8494 Remote Controller (operated in X.25 mode) to a DCE with a V.35 interface.

**full-duplex:** Refers to the capability of the channel and the link connection to transfer data in both directions at the same time.

**half-duplex:** Refers to the capability of the channel and the link to transfer data in both directions but not at the same time.

**International Telegraph and Telephone Consultative Committee (CCITT):** An international organization within the International Telecommunications Union. This committee is an organization of common carriers and other interested parties who meet periodically to define standards that they will mutually adopt. CCITT specializes in telecommunications, data communications, telephone and telegraph issues.

**ISO:** International Standards Organization. The body which promotes the development of worldwide standards. Specializes in data communications, network management and information processing.

**leased line:** A telephone line reserved for the exclusive use of a customer, without interchange switching arrangements.

**message line:** See status message.

**modem:** Modulator-DEModulator. A device that converts digital data signals to audio signals that can be sent over telephone lines. Another modem at the receiving end converts the audio signal back to a digital signal for the receiving equipment.

**MPIC:** Multipurpose Communications Interface Card. This card is an integral part of the I-O 8494 Remote Controller and is the interface to the DCE.

**multi-point:** A telecommunication line or circuit connecting two or more stations. Contrast with point-to-point line.

**network address:** This is the number that the network uses to identify a DTE. The display station operator must key in a host network address in order to initiate a call to a host.

**multihost:** See concurrent host attachment.

**network:** The term network has at least two meanings: 1) A public network is a network established and operated by common carriers or telecommunications administrations for the specific purpose of providing circuit-switched, packet-switched, and nonswitched circuit services to the public; 2) A user application network is a configuration of data processing products (such as processing units or workstations) established and operated by users for the purpose of data processing or information exchange; such a network may use transport services offered by common carriers or telecommunications administrations.

**node:** An endpoint of a link or a junction common to two or more links in a network. Nodes can be host processors, remote communication controllers, or display stations. Nodes can vary in routing and other functional capabilities.

**nonswitched:** A permanently established communications line connection between the remote controller and the host system.

**packet switching:** Packet switching is the transfer of data by means of addressed packets that occupy the network channel only during actual transmission. The channel is available for the simultaneous transfer of packets belonging to other network users. The network determines the optimum routing of each individual packet during, rather than prior to, the transmission from a DTE.

**packet window size:** The window size is the maximum number of packets that the DTE is authorized to transmit and have outstanding at any given time. It is the basic flow control mechanism in X.25 and protects the network from accepting packets faster than they can be accepted by the remote DTE. The window can also be used by a DTE to prevent transmission of packets from the network if the DTE is unable or unwilling to queue them. A default window size, usually 2, is

assigned at subscription time. On some networks, this can be altered for a given virtual call.

**packet:** Information transmitted through a packet switching network is divided up and inserted into packets. These usually consist of control information fields giving destination, sequence number, optional facilities, and often a user data area. Various kinds of packets are used to transmit error codes and supervise the virtual circuit.

**permanent virtual circuit:** A permanent virtual circuit is the packet switching equivalent of a non-switched line. The workstation and its host system appear to the user to be permanently connected.

**pitch:** The number of characters per horizontal inch, or the positioning interval of characters in a line of text (such as "12 pitch" or "14 pitch.")

**pixel:** The smallest displayable unit on a video screen, out of which the displayed image is constructed.

**point-to-point:** A switched or nonswitched telecommunications line that connects a single remote station to a computer. Contrast with multipoint.

**protected field:** In a formatted display, a field that does not allow the operator to add, change or delete data.

**protocol:** A protocol is a mutually agreed upon format set of conventions governing the format and control of information exchange between two DTEs. While protocols can increase the complexity of an interface, they greatly increase the efficiency of communication. The English language is an example of a set of protocols used to increase the efficiency of communication between people.

**PVC:** See permanent virtual circuit.

**QLLC:** See qualified logical link control.

**qualified logical link control:** The objective of QLLC is to provide adjacent node physical services equivalent to those used by SDLC in SNA. It helps to keep the 'local DTE' informed of the situation in the 'remote DTE'.

**RS-232:** An EIA standard for serial interfaces between computers and communication equipment. It specifies a 25-pin cable connection, but all 25 wires need not be used.

**scrolling:** Moving the window horizontally or vertically so that its position over a document or worksheet changes.

**SDLC:** See Synchronous Data Link Control.

**session:** An active connection between the terminal and a host system. A session is opened when logged into a computer from the terminal.

**SNA:** See system network architecture.

**status message:** Information on the last line of the display screen that tells the operator about display station conditions.

**SVC:** See switched virtual circuit.

**switched virtual circuit:** The packet-switched service equivalent of a switched line. It allows communication between the remote controller and one of several possible hosts. Switched virtual circuits are also known as virtual calls.

**synchronous data link control:** A discipline conforming to subsets of the Advanced Data Communication Control Procedures (ADCCP) of the American National Standards Institute (ANSI) and HighLevel Data Link Control (HDLC) of the International Standards Organization (ISO) for managing synchronous, code-transparent, serial-by-bit information transfer over a link connection. Transmission exchange may be duplex or half-duplex over switched or nonswitched links. The configuration of the link connection may be point-to-point, multipoint, or loop.

**systems network architecture:** Systems Network Architecture. Provides for communication between a diverse group of IBM or IBM compatible products. SNA is a hierarchical structure that consists of seven well-defined layers. Each layer in the architecture performs services for the next higher layer, requests services from the next lower layer, and communicates with corresponding layers in the SNA-based products.

**V.24:** A list of definitions (signals (DTR, RTS, etc.) directions of signals, etc.) for interchange circuits between data terminal equipment and data circuit-terminating equipment.

**V.35:** A recommendation for group band modems that combines the bandwidth of several telephone circuits to achieve high data rates. The standard is set by the CCITT. V.35 has become known as a "high speed RS-232" interface, rather than a type of modem. The large, rectangular V.35 connector was never specified in V.35, but has become a de facto standard for a high speed interface.

## GLOSSARY

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**virtual circuit:** A virtual circuit is a logical connection between two DTEs that enables them to exchange information according to a standard communications procedure with the sequence of information preserved. A virtual circuit occupies transmission capacity only when the data is actually being transmitted.

**workstation:** A display station or printer.

**X.21:** A recommendation for interfaces set by the CCITT (International Telegraph and Telephone Consultative Committee) and amended periodically. X.21 defines the interface between DCEs and public data networks for digital leased and circuit switched synchronous services.

**X.25:** A recommendation for packet-switched interfaces set by the CCITT (International Telegraph and Telephone Consultative Committee) and amended periodically. X.25 defines the interface between DCEs and packet switching networks.

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## DECLARATION OF CONFORMITY

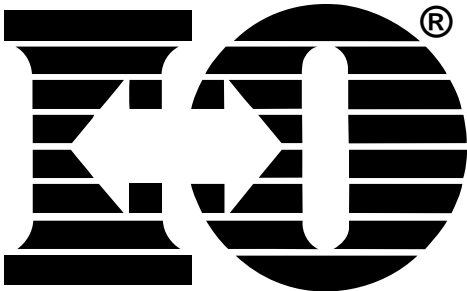
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### **EUROPEAN COMMUNITY COMPLIANCE STATEMENT:**

This product is in conformity with the protection requirements of EC Council Directives 72/23/EEC, and 89/336/EEC on the approximation of the laws of the Member States relating to: Standard EN60950 (Safety of Information Technology Equipment); Standard EN50082-1 (Generic Immunity Standard for Residential, Commercial, and Light Industrial Products); and Standard EN55022 (Limits and Methods of Measurement of Radio Interference from Information Technology Equipment).

### **WARNING:**

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.



*“Products That Work”*

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