BLACK BOX®
NETWORK SERVICES
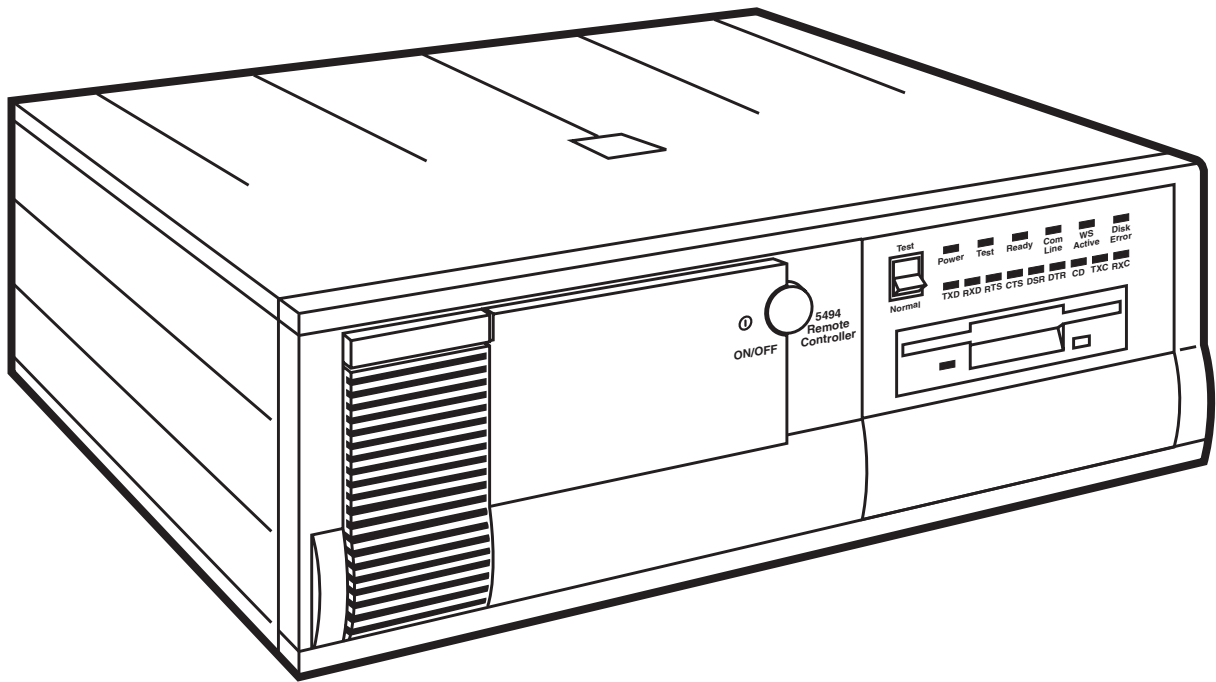
5494 Remote Controller
Quick Setup and User's Guide
plus Twinax Expansion, Token Ring, and Ethernet Add-In Cards

FEDERAL COMMUNICATIONS COMMISSION

AND

INDUSTRY CANADA

RADIO FREQUENCY INTERFERENCE STATEMENTS

This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

INSTRUCCIONES DE SEGURIDAD (Normas Oficiales Mexicanas Electrical Safety Statement)

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.

2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.

3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.

4. Todas las instrucciones de operación y uso deben ser seguidas.

5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc..

6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.

7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.

8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.

9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.

10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.

11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.

12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.

13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.

14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.

15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.

16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.

17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.

18. Servicio por personal calificado deberá ser provisto cuando:

    A: El cable de poder o el contacto ha sido dañado; u

    B: Objectos han caído o líquido ha sido derramado dentro del aparato; o

    C: El aparato ha sido expuesto a la lluvia; o

    D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o

    E: El aparato ha sido tirado o su cubierta ha sido dañada

TRADEMARKS USED IN THIS MANUAL

AS/400 and IBM are registered trademarks of International Business Machines Corporation.

Any other trademarks mentioned in this manual are acknowledged to be the property of the trademark owners.

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

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 your responsibility to obtain and use a shielded equipment interface cable with this device.

Contents

Contents (continued)

Quick Setup Guide

The following information will make it as simple as possible to get your Remote Controller and attached devices up and running.

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

- Up to three 28-device IBM 5494s on the AS/400®

- A 56-device IBM 5494 on the AS/400

- Up to six 14-device IBM 5494s on the AS/400

- Up to six 8-device or 14-device 5394s on the AS/400

- Up to three 16-device or 21-device IBM 5394s on the AS/400

- Up to six 8-device IBM 5294s 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 Remote Controller is on a 3.5" diskette and is loaded using the Remote Controller'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 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 Remote Controller configuration and those of the host.

Upstream LAN Configuration (Ethernet).

Fields on 5494

AA - 5 = Ethernet
DX - 5 = LAN connection type[1]
1 - 00 = Default, U.S. Language
E - 0 = Default, IEEE 802.3 Frame Format
F - 04 = Default,   Ethernet SAP[2]
G - 01 = Default, Response Timer (T1)[2]
H - 30 = Default, Inactivity Timer (Ti)[2]
I - 030 = Default, Receiver Ack. Timer (T2)[2]
J - 08 = Default, Retry Count[2] (N2)
P - Optional Default Printer[3]
11 - Default, local network ID (example: APPN)[4]
12 - ET5494 =   LU Name
13 - ET5494 = Control Point (CP) Name
14 - QRMTWSC = Default, Mode Name
15 - 0 020018810000[8] = 549 connection number
16 - 010 06 = Default, Retry Count & Interval
17 - N/A
H1:1 - S0000000[8] = AS/400 System LU Name
H1:2 - AS/400 Network Name[5]
        (example: APPN)
H1:3 -   Local Network Name[6]
        (example: APPN)
H1:4 - QRMTWSC = Mode Name for this
        AS/400 connection
H1:5 - 0 02000000A400[7] = 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.

---

[1] 5 = Ethernet, BNC connection
   6 = Ethernet, RJ-45 connection
   7 = Ethernet, DB15 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 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).

5494 Remote Controller

Ethernet

AS/400

Display Station

Display Station

PC

PC

Printer
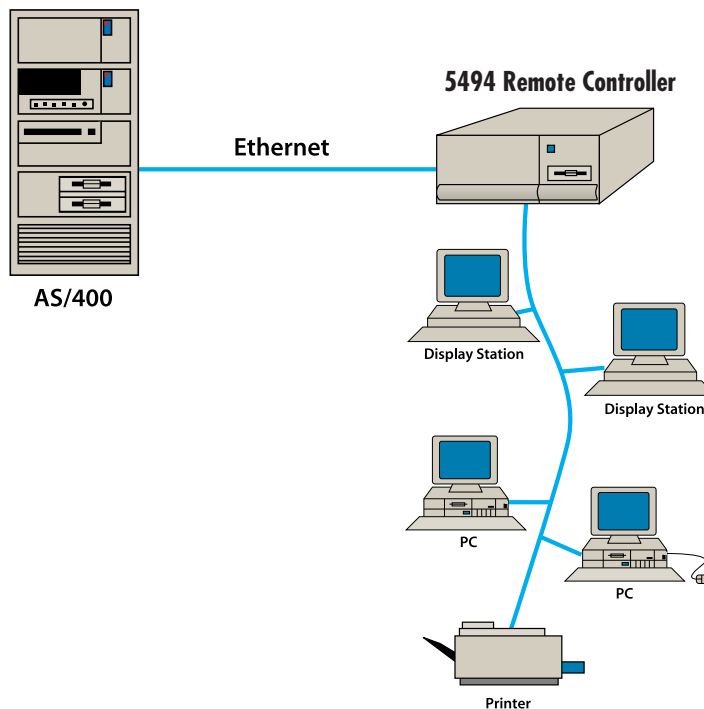
Upstream LAN Configuration (Token-Ring).

Fields on 5494

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

C:\PCS>type config.pcs
SFLR 1,I, , S0000000[8]
RTLN APPN.TR03
RTYP 5250
EMLI S0000000[8],0
C:\PCS>
```

NOTE

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

[1]　1 = Token-Ring, 4 MB, DB9 connection
　　2 = Token-Ring, 4 MB, RJ-45 connection
　　3 = Token-Ring, 16 MB, DB9 connection
　　4 = Token-Ring, 16 MB, 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 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 burned 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).

Token-Ring

5494 Remote Controller

AS/400

Display Station

Display Station

PC

PC

Printer
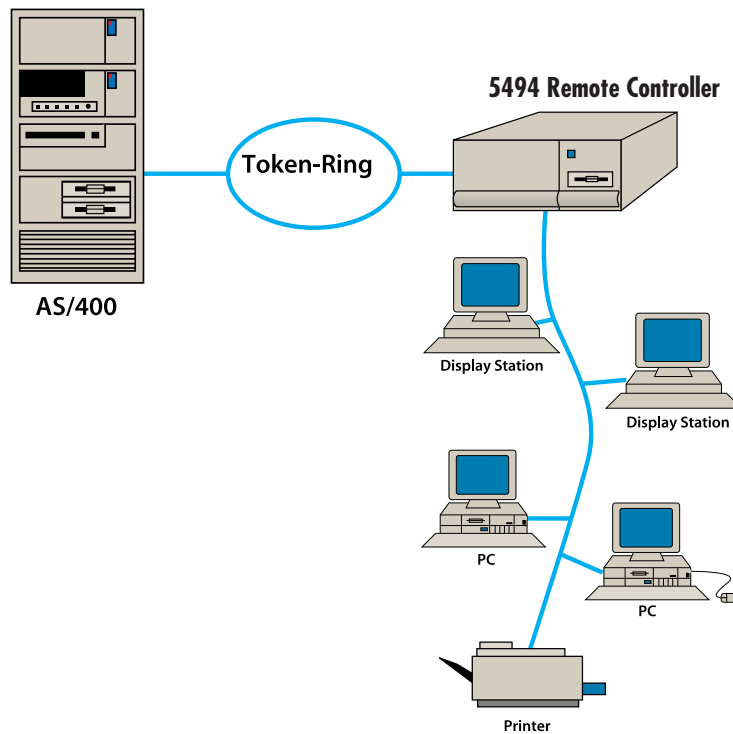
For SNA/SDLC LAN Gateway Configuration (Downstream).

Fields on 5494

AA - 0 = SNA/SDLC Communication
BB - 2 = 5494 Emulation Mode
DD - 1 = LAN Gateway Configuration
DX - 6 = Default, LAN connection type[1]
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)[2]
K - LAN address (example: 020018810000)
L - 04 = Default, Service Access Point (SAP)[3]
M - 01 = Default, Response Timer (T1)[3]
N - 30 = Default, Inactive Timer (Ti)[3]
O - 030 = Default, Receiver Ack. Timer (T2)[3]
Q - 08 = Default, Retry Count (N2)[3]
R - 2 = Default, LAN Maximum Out (TW)[3]
S - 1 - Default, Maximum In (N3)[3]
P - Optional, default printer[4]
11 - Default local network ID
   (example: APPN)[5]
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[8] = AS/400 System LU Name
H1:2 - AS/400 Network Name [6]
   (example: APPN)
H1:3 -   Local Network Name[7]
   (example: APPN)
H1:4 - N/A
H1:5 - No Entry = SNA/SDLC Communications

AS/400 Line Description (CRTLINSDLC)

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>
```

---

[1]   1 = Token-Ring, 4 MB, DB9 connection
     2 = Token-Ring, 4 MB, RJ-45 connection
     3 = Token-Ring, 16 MB, DB9 connection
   4 = Token-Ring, 16 MB, RJ-45 connection

     5 = Ethernet, BNC connection
     6 = Ethernet, RJ-45 connection
     7 = Ethernet, DB15 AUI connection

[2]   This field should only be used if the controller is connected to the host using an 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 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 your system administrator.

SNA/SDLC LAN Gateway Configuration.
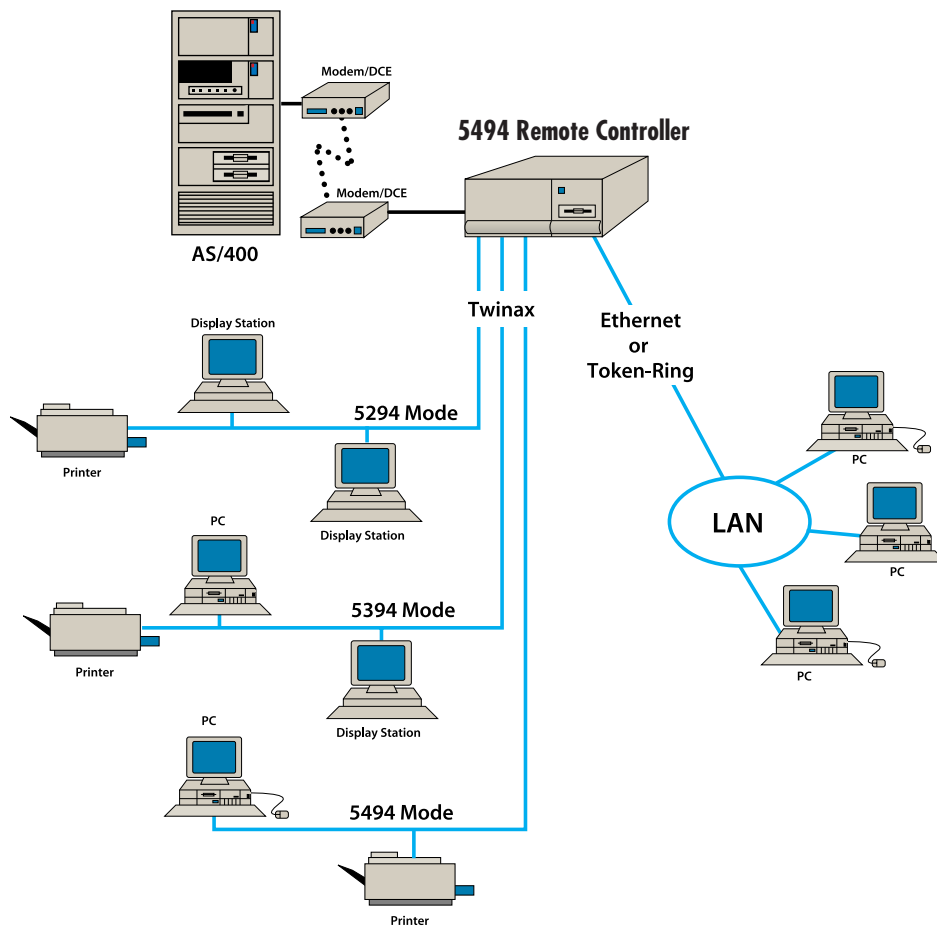
PC NODE GATEWAY CONFIGURATION

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).

```
Application Program for IEEE 802.2 Interface:
PC Support/400 or equivalent
In CONFIG.SYS:
Extended PC Support/400:  EIMPCS.SYS

Non-Extended PC Support: EIMPCS.SYS and ECYDDX.SYS
```

IEEE 802.2 Interface

IEEE 802.2 Interface

X'5C' Interrupt Arbitrator (DXMA0MOD.SYS in CONFIG.SYS)

L A N   S U P P O R T   P R O G R A M

In CONFIG.SYS:
PROTMAN.DOS
(provided with LAN
Support Program)

```
Token-Ring
Network Device
Drivers

Note:  If NDIS
driver is not
provided and the
card is IBM soft-
ware compatible
or if this is an IBM
card.

In CONFIG.SYS:
DXMC0MOD.SYS
```

```
IEEE 802.2
Protocol Driver for
NDIS MAC Drivers

In CONFIG.SYS:
DXME0MOD.SYS
```

NDIS Interface

```
NDIS MAC Driver
(IEEE 802.5
Interface)

Driver (provided
with interface card)
to be included in
CONFIG.SYS
```

```
NDIS MAC Driver
(802.3 Ethernet or
DIX version 2.0
interface)

Driver (provided
with interface card)
to be included in
CONFIG.SYS
```

Software

Hardware

```
IBM Token-Ring Network
Adapter or Compatible
```

```
IBM Token-Ring
Network Adapter or
NDIS Compatible
```

```
Ethernet Adapter
```

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:\>
```

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

Fields on 5494

AA - 0 = SNA/SDLC Commumication
BB - 0 = 5394 Emulation Mode[1]
    2 = 5494 Emulation Mode[1]
DD - 1 = LU6.2/PU2.1 Node
1 - N/A
2 - Controller address (example = 01)
3 - Line Factility & Data Encoding
    (example = 0000000, half duplex/multipoint/NRZI)
10 - Baud rate (use only if locally attached)[2]

AS/400 Line Description (CRTLINSDLC)	
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, . . .

11 - Default local network ID[3]
    (example: APPN)
12 - SLC01 = Must be unique for each emulated
    controller. If only one controller is emulated,
    use same name as Field 13[6]
13 - Control Point (CP) Name[6]
    (example: ET5494)
14 - QRMTWSC = Mode Name[4]
16 - 010 06 = Default, Retry Count & Interval
17 - N/A
H1:1 - AS/400 System LU Name[5]
H1:2 - N/A
H1:3 - N/A
H1:4 - N/A

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

[1]   5494 or 5394 emulation mode must be selected for an LU6.2/PU2.1 node configuration.

[2]   This field should only be used if the controller is connected to the host using an internal null-modem and modem-eliminator cable.

[3]   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.

[4]   Always use the recommended mode name "QRMTWSC".

[5]   This value should be the "Default Local Location," which is found by typing in "DSPNETA" and pressing Enter on the AS/400 menu.

[6]   If the Remote Controller 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 (ADDCFGLE)

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.
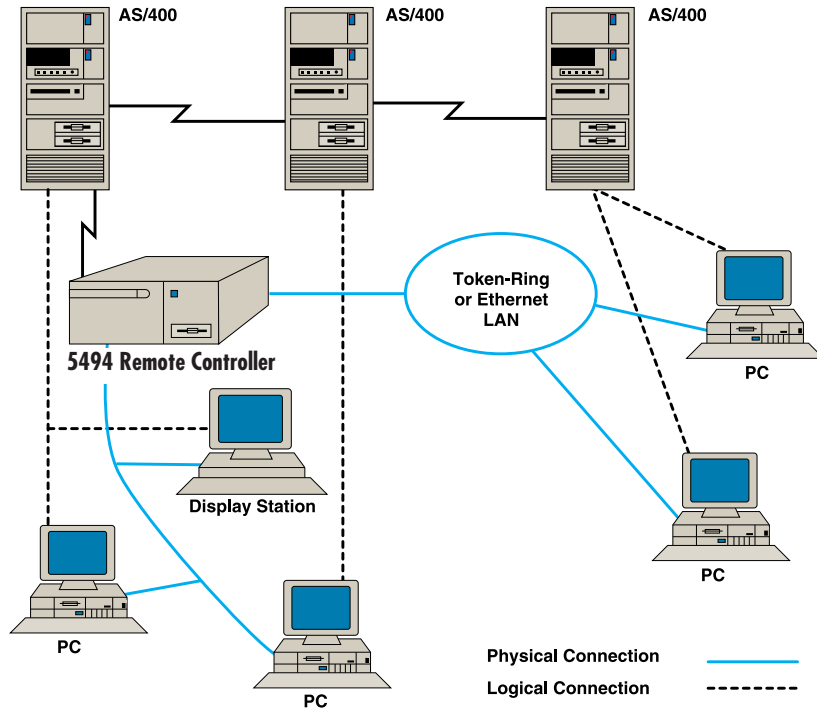
AS/400   AS/400   AS/400

Token-Ring or Ethernet LAN

5494 Remote Controller

PC

Display Station

PC

PC

PC

PC

Physical Connection   ———

Logical Connection   - - - - - -

SNA/SDLC Configuration Quick Setup Guide.

AS/400
System/36
System/38

Modem/DCE

Modem/DCE

5494 Remote Controller

Display Station

Display Station

PC

System Printer

Display Station

PC

Display Station

Laser Printer
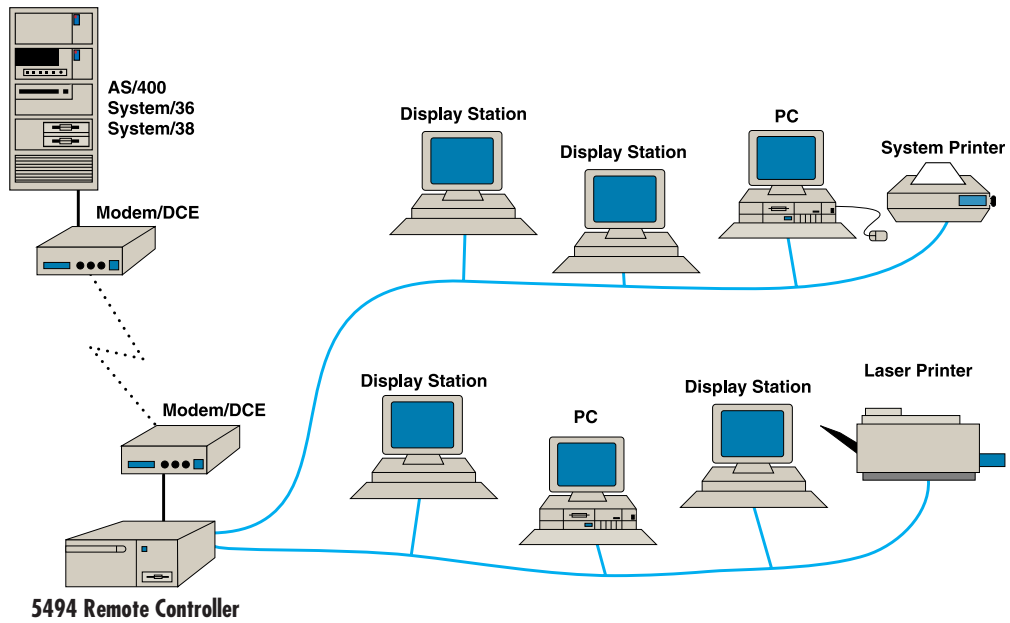
SNA/SDLC Configuration.

Fields on 5494

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 (CRTLINSDLC)

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
```

1. Introduction

An AS/400 host system has workstation controllers that allow the host to communicate with attached devices. When attached locally, the 5494 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 Remote Controller 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 Remote Controller 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 Remote Controller will manage the communications between the Ethernet or Token-Ring LAN and the AS/400.

The Remote Controller supports SNA communication with a host computer via any one of several protocols and media: SDLC, Token-Ring, or Ethernet. When configured for SDLC communication, the Remote Controller 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 Remote Controller and host system; Ethernet or Token-Ring communication requires adding a corresponding option card to the base Remote Controller.

Twinax devices are attached to the Remote Controller 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 PC394C, with the total number of devices not to exceed 14 on the PC397C twinax card. Two twinax cards can appear to the host as one 5494 controller. Devices are automatically recognized by the Remote Controller when they are attached and powered on.

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

- Up to three 28-device IBM 5494s on the AS/400

- A 56-device IBM 5494 on the AS/400

- Up to six 14-device IBM 5494s on the AS/400

- Up to six 8-device or 14-device IBM 5394s on the AS/400

- Up to six 8-device IBM 5294s 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 Remote Controller is contained on 3.5" diskettes and is loaded using the Remote Controller'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 Remote Controller loads the operating software and configuration records from the diskette each time it is powered on.

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
	PC394C: 8-device twinax card
	PC395C: Token-Ring card for Token-Ring configuration
	PC396C: Ethernet card for Ethernet configuration
	PC397C: 14-device twinax card
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 3.5" 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 Remote Controller to operate in this mode.
Power Supply:	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 3.5", 1.44 MB DS HD, 135 TPI diskettes
Standard Equipment:	MPIC interface card for controller to host communication Remote Controller software diskettes Power cord Installation Guide Quick Setup and User's Guide (this manual) These items can be ordered separately: • Applicable 6-foot (1.82-meter) communications cable • Twinax card for controller-to-device communication, which also includes two 8-inch twinax connector cables for each twinax card
Size:	6⅛"H x 15⅞"W x 15¾"D (15.6 x 40.3 x 40 cm)

Weight: Shipping weight: 23.3 lb. (10.6 kg); Remote Controller with MPIC card
                            installed: 19 lb. (8.6 kg)

Power: Preset 115 or 230 volt

	115 VAC	230 VAC
Phase	1	1
Amperage	6	3.5
Watts	200	200
Hz	50	60

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

Limitations: IBM 5294/5394/5494 features not available on the 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

2. Host Configuration

The 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 Remote Controller 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 Remote Controller requires only one communications line and one set of modems, even when additional twinax cards are installed. If the Remote Controller 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 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 Remote Controller 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.

2.1 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 Remote Controller.

2.1.1 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.

SDLC

To define an SDLC communications line:

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

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

   In the example at the top of the next page, 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

        ===> CRTLINSDLC _____
        _____
```

2. Enter the appropriate information in each applicable field.

Multi-Point.

```
                Create Line Description (SDLC)  (CRTLINSDLC)


        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              05600000-56FFFFF, *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)  (CRTLINSDLC)

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             05600000-56FFFFF, *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        F10=How to use this display
F24=More keys
```

Non-Switched Point-to-Point.

```
                      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_____
          _____
```

3. Press ENTER to return to the Main Menu.

4. Go to **Section 2.1.2** and turn to the section on SDLC.

Ethernet (upstream)

To define an AS/400 connection to the Remote Controller through an Ethernet network:

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

   The Create Line Description (Ethernet) prompt menu will appear as shown below. Not all lines will 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

===> CRTLINETH_____
_____
```

```
            Create Line Description (Ethernet)  (CRTLINETH)

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-FEFFFFFFFFFF . .
Exchange identifier  ...................*SYSGEN           05600000-56FFFFF,
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 **Section 2.1.2** and turn to the section on Ethernet (upstream).

Token-Ring (upstream)

To define an AS/400 connection to the Remote Controller through a Token-Ring network:

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. Not all lines will 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*       400000000000-7FFFFFFFFFFF .
         Exchange identifier  ....................*SYSGEN           05600000-56FFFFF, *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 I.D. card value
```

2. Enter the appropriate information in each application field.

3. Press ENTER to return to the Main Menu.

4. Go to **Section 2.1.2**, and turn to the section on Token Ring.

2.1.2 CREATE CONTROL UNIT

The following sections describe the steps to create a control unit description for SDLC communications mode.

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.

<p align="center">Multi Point CTL Description.</p>

```
            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, 0012
 Link type                       *SDLC           *IDLC, *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         *IDLC, *LAN, *NONE, *SDLC . .
 Online at IPL ............................*YES            *YES, *NO
 Switched connection  .................*YES               *YES, *NO
 Short hold mode.........................*NO              *YES, *NO
 Switched line list ........................TXLINE1          Name
   + for more values
 Maximum frame size ..................*LINKTYPE         265-1994, 265, 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         *IDLC, *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, 265, 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. Not all lines will display at once; the rest will appear as you fill in the options and press ENTER.

3. Go to **Section 2.1.3**.

Ethernet (Upstream)

Take these 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.

```
                    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                                  Name
   + 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                                 00100000-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 Remote Controller is configured to emulate more than one IBM remote controller, a configuration list must be created. Type in **CRTCFGL** on the AS/400 command line and press ENTER. Select list type "*APPNRMT".

3b. Each emulated Remote Controller must be added to the newly created configuration list. Type **ADDCFGLE** on the AS/400 command line and press ENTER.

NOTE
The remote location name and remote control point must match each emulated controller.

4. Go to **Chapter 3**.

Token-Ring (Upstream)

Take these 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.

```
                    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                               Name
    + 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                              00100000-FFFFFFFF
 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. Not all lines will display at once; the rest 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 Remote Controller is configured to emulate more than one IBM remote controller, a configuration list must be created. Type in **CRTCFGL** on the AS/400 command line and press ENTER. Select list type "*APPNRMT".

```
                   Create Configuration List (CRTCFGL)


Type choices, press Enter.

Configuration list type          *APPNRMT        *APPNCL, *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. Type **ADDCFGLE** on the AS/400 command line and press 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, *NETATR, *NONE
     Local location name           *NETATR           Name, *NETATR
     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**.

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

Take these 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-FFFFFFFF
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. Not all lines will not display at once; the rest 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 Remote Controller is configured to emulate more than one IBM remote controller, a configuration list must be created. Type **CRTCFGL** on the AS/400 command line and press ENTER. Select list type "APPNRMT".

```
                    Create Configuration List (CRTCFGL)

   Type choices, press Enter.

   Configuration list type              *APPNRMT        *APPNCL, *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. Type **ADDCFGLE** on the AS/400 command line and press 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, *NETATR, *NONE
     Local location name             *NETATR        Name, *NETATR, *NONE
     Remote control point            ET5494         Name, *NONE, *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**.

2.1.3 DEFINE ATTACHED DEVICES (TWINAX ATTACHED ONLY)

Take these steps to configure the devices attached to the Remote Controller.

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

```
                    Create Device Desc (Display)  (CRTDEVDSP)

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
```

2. 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

3. Go to **Chapter 3**.

2.2 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 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.

2.2.1 CREATE LINE DESCRIPTION
Take these 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.    SNDMSGtomsq, (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.

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 LINE DESCRIPTION (CRTLIND) PROMPT

  Enter the following:

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

```
            CREATE LINE DESCRIPTION (CRTLIND) PROMPT

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

```
                      CREATE CONTROL UNIT DESC (CRTCUD) PROMPT

        Enter the following:

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

2.2.2 CREATE CONTROL UNIT DESCRIPTION

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

```
                    CREATE LINE DESCRIPTION (CRTLIND) PROMPT


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

```
                    CREATE CONTROL UNIT DESC (CRTCUD) PROMPT


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

2.2.3 DEFINE ATTACHED DEVICES

Take the following steps to create device descriptions for the devices attached to the 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 on the next page).

```
                    CREATE CONTROL UNIT DESC (CRTCUD) PROMPT

    Enter the following:

    Device description name:          DEVD        R      TXW1
    Device address:                   DEVADR             020321
    Device type code:                 DEVTYPE            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
      Library name:                                      *LIBL
```

```
                    CREATE DEVICE DESCRIPTION (CRTDEVD) PROMPT


    Printer file name;                PRTFILE            GSYSPRT
      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:       SYSVLDPWD          *NONE
    Secure LU:                        SECURELU           *NO
    Font identification:              FONT
    Form feed:                        FORMFEED           *CONT
    Emulation device type:            EMLDEVTYP          3277
    Emulation keyboard type:          EMLKBDTYP          *UPPER
    Maximum length RU:                MAXLENRU           256
    Auxiliary device   AUXDEV
      Auxiliary device type:                             *NONE
      Auxiliary device address:
        + for more
    Network device address:           NETDEVADR          *NONE
```

```
CREATE DEVICE DESCRIPTION (CRTDEVD) PROMPT


Character identifier              CHRID
  Graphic character set:                              *SYSVL
  Code page:
Public authority                  PUBAUT
  (*NORMAL *ALL *NONE):                               *NORMAL
Text description:                 TEXT                *BLANK
```

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

2.2.4 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.    SNDMSGtomsq, (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 option 14, "Work Management Menu."

3. Select option 5 from the Work Management menu to retrieve the Subsystem Description menu.

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

```
CREATE SUBSYSTEM DESCRIPTION (CRTSBSD) PROMPT

Enter the following:

Subsystem description name:        SBSD        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):                                   *NORMAL
Text description:                  TEXT                 *BLANK
```

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

NOTE
Follow the procedures outlined in Section 2.2.3 to define devices for the subsystem.

2.2.5 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.    SNDMSGtomsq, (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         F8-DSPSYS
```

2.3 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.

2.3.1 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                      1-1-                                     1
Line type                        SHM, Multcont, Multtrib, Swtch, Nonswtch  Nonswtch*
Multipoint control               Yes, No                                  No
Use system clocking facility     Clock, Noclock                           Noclock
NRZI data encoding               NRZI, NONRZI                             NONRZI*
Use continuous carrier feature   Concar, noconcar                         Noconcar*
Use non-U.S. answer tone         Tone Notone
Use autocall separator characters SEP, NOSEP
Use autocall end-of-number characters EON, NOEON
Primary SDLC time-out value      5-80                                     5
Number of primary SDLC error retries 1-5                                  3
Modem                            IBMLPDA, IBMWRAP, NONIBM                 NONIBM
X.25 support                     X25, NOX25
DDSA line speed                  2400BPS, 48700BPS, 9600BPS, 56KBPS
Secondary SDLC inactivity time-out value                                 0-20    5
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 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.

2.3.2 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.

```
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

   Cmd3-Previous Menu
   Help text is available throughout the CNFIGSSP
   procedure by pressing the help key
```

The CNFIGSSP Main menu will appear.

```
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
```

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.

2. From the CNFIGSSP—Main menu, select option 2, "Create, change, or delete a configuration member."
   Options 12 and 13 will not appear 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
```

3. 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
```

4. 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."

2.3.3 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.

2.3.4 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..........................Remote Controller
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                                                 0—P--------------------
       01       PC       10      10                                1—0
                                                                   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 Remote Controller has two ports for each 5294 emulation).

5. Continue to define the next control unit or end the session with CMD 3.

2.3.5 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 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.

> Remote Controller system diskettes:
> 5494XXADSK01XXX   SDLC without LAN
> 5494XXADSK02XXX   SDLC with LAN
>
> Note: "XXX" represents the version number.

3.1 Site Considerations

Put the Remote Controller on a desk or table. 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 Remote Controller 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, review the following site cabling and electrical considerations.

3.1.1 TWINAX CABLE

Workstations are connected to the 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 (0.3 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.

3.1.2 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.

Category 5 cable (Black Box part number EYN737A) is the recommended cable type.

3.1.3 COMMUNICATIONS CABLE

X.21 communications cable (Black Box part number EHN060-0020)
RS-232 communications cable (Black Box part number EHN061-0020)
V.35 communications cable (Black Box part number EHN062-0020)

The appropriate interface communications cable is used to connect the Remote Controller to the modem or DCE and should correspond to your host system's communications protocol (SDLC).

One of the following 20-foot communications cables is supplied with the 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 Black Box.

X.21 cable (Black Box part number EHN063-0020)
RS-232 cable (Black Box part number EHN064-0020)
V.35 cable (Black Box part number EHN065-0020)

3.1.4 ELECTRICAL REQUIREMENTS

Standard voltages of 115 VAC at 50 Hz 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 Remote Controller 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.

3.2 Setup

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

- Install any additional twinax cards (if applicable).

- Install any LAN cards (if applicable).

If neither of the above applies, continue to **Section 3.6**.

3.3 Configure Interface Card

The following four interface cards for host communications are available with the Remote Controller.

8-Port Device Twinax Card (PC394C)
Token Ring Card (PC395C)
Ethernet Card (PC396C)
14-Device Twinax Card (PC397C)

3.3.1 MPIC

The MPIC (Multipurpose Communications Interface Card) is identified through the DB44 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 Remote Controller directly to the host system for local applications (DCE mode) with a special modem-eliminator communications cable. Note: The MPIC card is required.

3.3.2 REMOTE (DTE) MODE

In remote mode, the MPIC's port functions as a DTE and should be connected to the host through modems or CSU/DSUs.

3.3.3 LOCAL (DCE) MODE

In local (DCE) mode, the MPIC's port functions as a DCE interface. The controller can be connected directly to a local host. You must use a special modem-eliminator cable to connect the Remote Controller 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 Remote Controller software. The baud rate is set in field 10 of the configuration screen. (See **Section 3.13**.)

3.4 Install Twinax Card

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 first or 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 to align the card 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
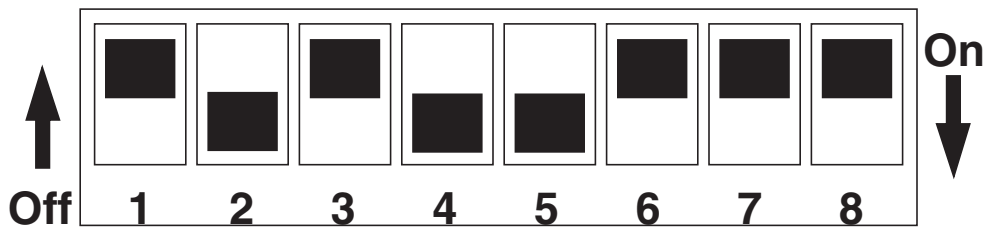
6. After setting the DIP switches, reassemble the controller.

3.5 Connect Communications Cable

The communications cable is used to connect the Remote Controller to the modem or DCE and should correspond to your system's communications protocol (SDLC).

Take the following steps to connect the communications cable to the Remote Controller.

1. Turn off power to the Remote Controller.

2. Connect one end of the 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 Remote Controller 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 Remote Controller 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 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 DB44 connector) installed in the MPIC 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.

3.6 Software Configuration of the Remote Controller

Before the Remote Controller 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 3.5" 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 Remote Controller 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 Remote Controller, 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.

3.7 Starting and Ending On-Line Configuration

To start on-line configuration:

1. Power off the Remote Controller 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 in **Section 3.10**. 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 **Section 3.9**.)

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.

3.8 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 in **Section 3.10**.

5. After completing the configuration, return here to end the standalone configuration.

To end standalone configuration:

1. Be sure your configuration has been saved to diskette (see **Section 3.9**).

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.

3.9 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.

   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.

3.10 Using the Configuration Menu Screen

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 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 appears 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.

3.11 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 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.

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 parameters in this screen, press ENTER twice to either save your work, or move on to the Network Information screen if the configuration requires it.

3.12 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) protocol. 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->APPN          12->NET8494      13->8494          14->QRMTWSC
                   16->010 06       17->

H1:1->S1234567     H1 : 2->APPN     H1 : 3->APPN    H1 : 4->QRMTWSC


                                                     P->0 6
```

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.

3.13 Configuration Parameter Fields

AA Communications Mode:
Selects from available host communications modes:

>   0 = SDLC
>   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 PC394A-R3. Valid entries are:

>   1 = Token-Ring, 4 MB, DB9 connection
>   2 = Token-Ring, 4 MB, RJ-45 connection
>   3 = Token-Ring, 16 MB, DB9 connection
>   4 = Token-Ring, 16 MB, RJ-45 connection
>   5 = Ethernet, BNC connection
>   6 = Ethernet, RJ-45 connection
>   7 = Ethernet, DB15 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.

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.

10 SDLC Baud Rate:

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

If the Remote Controller 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 Remote Controller. 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 Remote Controller. 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 Remote Controller. Whenever the response timer is not running, the Remote Controller 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 milliseconds 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 Remote Controller will check the status of a receiving link station after the Remote Controller 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 Remote Controller's LAN address. You can allow the Remote Controller 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), which 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 Remote Controller 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 Remote Controller (printouts are requested via the Print key).

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

Q LAN Gateway Retry Count (N2):
This field defines the maximum number of times the Remote Controller will check the status of a receiving link station after the Remote Controller 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 Remote Controller 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 Remote Controller 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 Remote Controller's own LAN address. The Remote Controller 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.

16 Retry Count and Retry Interval:
The retry count specifies the number of retries the Remote Controller 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 Remote Controller'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.

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.

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.

H1:9 AS/400 System Maximum In (N3):
Valid values are 1 to 4. Default value is 1. Enter appropriate value.

3.14 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** for further information.)

The Primary AS/400 is identified in the 8494 configuration screen ad H1:1. The fields H1:1 through H1:4 describe the Remote Controller's connection to the Primary host. Fields contained in H2, H3, and H4 refer to the secondary AS/400 hosts. 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 Remote Controller, insert the system diskette in the diskette drive with the label facing upward 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 Remote Controller 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.

Establish SDLC Connection

If the Remote Controller 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 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."

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 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.)

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 appear on the terminals attached to the 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 appear on the terminals attached to the Remote Controller.

5. Problem Resolution

5.1 IBM Verification Test

Verification tests check workstations and printers attached to the 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 AS/400:

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 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.

5.2 Problem-Resolution Guide

The problem-resolution guide on the following pages describes common problems with the Remote Controller and 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.

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 (0.3 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.

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

Problem	Probable Cause	Action
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 for technical support.
	Defective twinax card.	Check MPIC and twinax card LEDs for card status. See discussion of Remote Controller status later in this chapter.
	Twinax card(s) or interface card not installed properly.	Make sure card(s) is fully seated in the controller, DIP switches are set properly, and 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.

Problem	Probable Cause	Action
Unable to configure work-stations on the 5494 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 that 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.
	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 a copyright and twinax card number in the upper right corner of the screen when it's recognized by the controller.
	PC emulator not in emulation mode.	PCs with emulator cards must be in emulation mode during configuration of the controller.
Configuration will 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 sel-ections not made for each twinax card installed.	Follow the steps under the section Configure the Remote Controller in Chapter 3. Each card installed in the controller must be con-figured 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.

Problem	Probable Cause	Action
Configuration will will not store properly (continued).	Diskette not in drive; diskette write-protected or faulty.	Make sure diskette is in the drive, label side up. Try backup diskette if necessary.
	Request to store config- uration 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 cannot 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.
	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 hasn't been configured.	Configure the controller as described in Chapter 3.
	Local configuration does not 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 the 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 stations 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 can communicate.
	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, multipoint, etc.) is correct (a multiple-card controller must use a multipoint 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) and 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.

Problem	Probable Cause	Action
Workstation(s) drop off line or will not come up (continued).	Conflicting device descriptions on the host.	Remove device descriptions from the configuration record at the host for devices not configured on the remote controller.
	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 the device is damaged, repair or replace it.
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.
	Host has nonexistent controller varied on a multipoint line.	Check the host status of the line for this controller. If the line shows any nonexistent controllers as having status other than "varied off," vary them off.
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.

5.3 Remote Controller

There are LED status indicators on the back of the 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.

5.3.1 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.

5.3.2 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 on the next page 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.

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
●	○	●
●	●	●
●	○	○
○	○	○
○	○	○

Twinax Card #1 defective	Twinax Card #2 defective	Twinax Card #3 defective
●	○	●
○	●	●
○	○	○
●	●	●
●	●	●

Twinax Card #4 defective	Twinax Card #5 defective	Twinax Card #6 defective
○	●	○
○	○	●
●	●	●
●	●	●
●	●	●
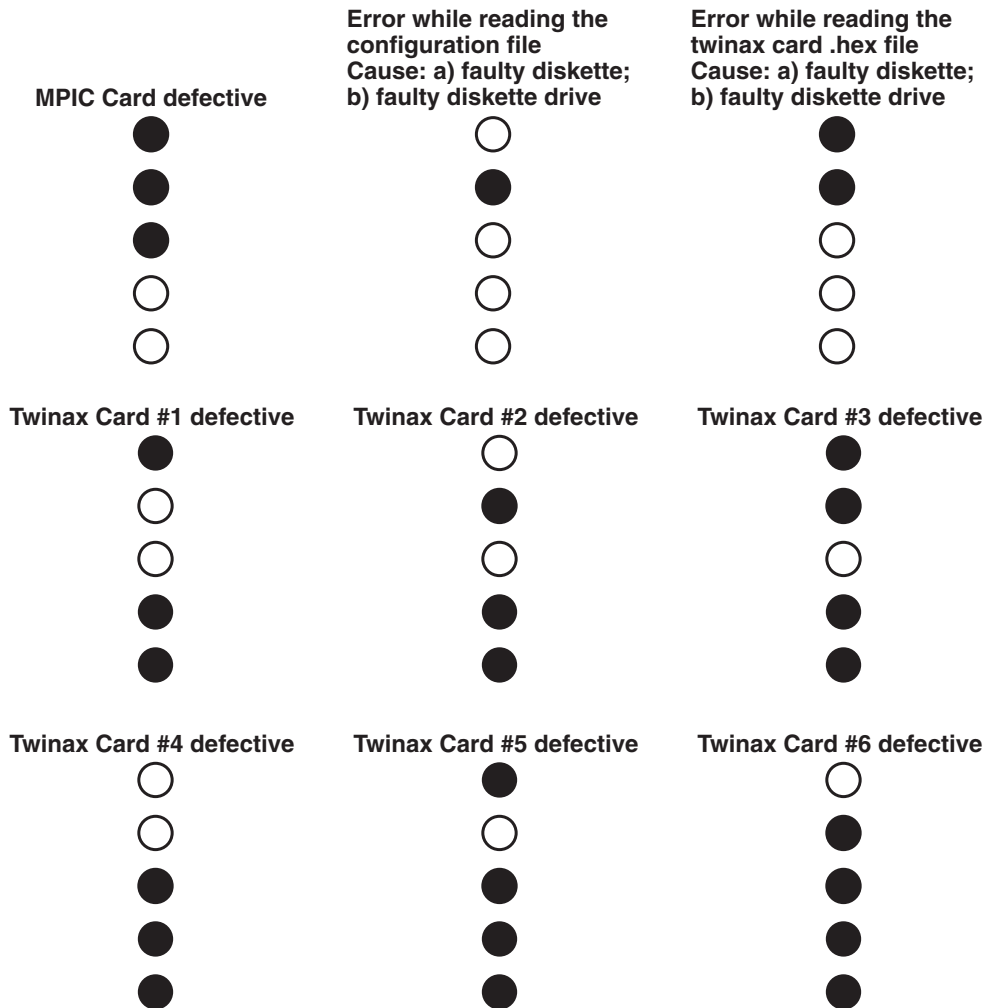
NOTE
5 LEDs on means that there is insufficient memory.

A filled circle indicates LED On.

5.4 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.

Bottom Row	Description
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. Note: This LED should be on continuously during normal operation.
DTR	(Data Terminal Ready) Indicates to the modem that the remote controller is ready to operate. Note: This LED should be on continuously during normal operation.
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. Note: This LED should be ON continuously during normal operation.
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.

5.5 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 **Section C.1**).

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.

5.6 Calling Black Box

If you determine that your Remote Controller is malfunctioning, do not attempt to alter or repair the unit. It contains no user-serviceable parts. Contact Black Box at 724-746-5500.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- the nature and duration of the problem.

- when the problem occurs.

- the components involved in the problem.

- any particular application that, when used, appears to create the problem or make it worse.

5.7 Shipping and Packaging

If you need to transport or ship your Remote Controller:

- Package it carefully. We recommend that you use the original container.

- If you are shipping the Remote Controller for repair, make sure you include everything that came in the original package. Before you ship, contact Black Box to get a Return Materials Authorization (RMA) number.

Appendix A. Related Documentation

The following manuals may be helpful in installing and operating the 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 make up 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 set up, 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 set up, configure, and operate control unit attachment to Subarea Network RPQ.

Appendix B. Multiple Languages

Take the following steps to configure the 5494 Remote Controller for one of the available languages shown on the next page.

1. Display the configuration screen using these 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 key to position the cursor under field 1, which specifies the language code to be used.

3. Use the CURSOR UP or CURSOR DOWN key 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.

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 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 5494 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
0000 through 003F	An operator error occurred during an entry operation.	Display station where the error originated.
0040 through 005F	An error occurred on the communications network during the time the 5494 Remote Controller was communicating with the host system.	All affected display stations.
0080 through 008F	An error occurred during configuration of the Remote Controller	Display station used for configuration of the Remote Controller.
0090 through 0009F	A display-station operator caused an error that involves the host-system capabilities.	Display station where the error originated.
0100 through 0145	An error occurred on the communications network during the time the Remote Controller was communicating with the host system.	All affected display stations.
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.
110000 through 1FFFFF	An error was detected by the DTE or DCE on an X.25 network.	All active display stations.
400000 through 5FFFFF	An error related to the connected LAN was detected by the controller.	On a twinaxial connected display station, press a key sequence defined in Section C.4.

C.1 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 Remote Controller did not keep up with the rate of information entered. The last character entered was not recognized.
0002	Invalid Scan Code	The Remote Controller 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 in the field.

SRC	Description	Explanation
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.
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.

SRC	Description	Explanation
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, was incorrectly made, or is damaged.
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	Token-Ring: No valid frame before the time (Ti) expired	Verify that the 5494 Remote Controller cable to the modem/DCE is securely connected; that the modem/DCE is turned on; and that the communication line is attached to the modem.
0046	X.25 or Token-Ring: Frame reject received.	Verify that the Remote Controller 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, call for technical support.
0047	X.25 or Token-Ring: An unexpected disconnect mode (DM) or a dis-connect (DISC) command was received while in information transfer state.	Verify that the 5494 Remote Controller 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, call for technical support.
0081	Too many workstations are attached to the 5494 Remote Controller	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 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 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 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.

SRC	Description	Explanation
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 Error Reset. 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.

C.2 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.	a. The modem is not powered on. b. The telephone connection between the modems is down. c. The modem cable is bad or not connected correctly. 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.) e. Modems are configured incorrectly. f. Remote Controller is not varied on at the host (turns off DSR only in certain host/ modem configurations).
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 Remote Controller, no valid SDLC frame has been received for the address. This error code will not be displayed if the Remote Controller 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 Remote Controller.	a. The Remote Controller has not been varied on at the host. b. NRZI configured on the remote controller does not match the host configuration. 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. d. The remote controller is connected to a modem using a null-modem cable. (If applicable, the jumpers are in the wrong position on the SDLC card.) e. Modems are configured incorrectly. f. Disk in 5494 not configured correctly.

Error Code	Description	Cause
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 Remote Controller 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 Remote Controller.	The Remote Controller has been varied off at the host.
0057	Since startup of the Remote Controller, no valid SDLC frame has been received for the display station's remote controller. At least 30 seconds has elapsed since the Remote Controller startup was completed.	a. The display station's remote controller has not been varied on, but one or more other remote controllers configured on the Remote Controller are varied on. b. The SDLC address configured for the display station's remote controller does not match the address configured on the host. c. The display station's remote controller has not been configured on the host at all.
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 multicard 5494 Remote Controllers 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 5494 Remote Controller 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.

Error Code	Description	Cause
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.	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: a. The display station has been varied off at the host, though its remote controller is varied on. b. The display station is not configured on the host, or its twinax address (0 through 6, "local station address") is configured incorrectly.

C.3 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.

C.4 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.

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 Remote Controller 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 5494 Remote Controller has failed to open, and an operator at an attached display has requested a "disconnect." The 5494 Remote Controller 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 5494 Remote Controller 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 5494 Remote Controller has failed to open, but connection to the AS/400 is requested. The 5494 Remote Controller 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 5494 Remote Controller 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,' canceling attempts to contact the AS/400.	An operator has requested that the 5494 Remote Controller make no attempts to establish communication with the AS/400. Make a "connect" request at any display attached to the 5494 Remote Controller in order to re-enable connection attempts.

SRC	Description	Cause
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 5494 Remote Controller 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 of 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 5494 Remote Controller and the AS/400, but not SABME mode-setting command has yet been received from the AS/400.	The most likely cause for this condition is that the 5494 Remote Controller's description on the AS/400 is varied off.

C.5 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 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.

Cause Code	Description	Action
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.
410700	An XID3 command specified a maximum BTU 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-frames 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 5494 Remote Controller. There could be a mismatch between the remote controller and the host system configuration.	Verify the 5494 Remote Controller 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. Pay particular attention to the 5494 Remote Controller CP name and the matching remote CP name field in the host system configuration for the APPC controller. If the configuration is correct, call the system operator and make sure that the APPC controller description for the 5494 Remote Controller is varied on.

Cause Code	Description	Action
4510xx1	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: 　* 80 = Frame length too long 　• 40 = Not a format 3 XID 　• 20 = Length inconsistency between XID and input/ 　　　　 output block (IOB) length 　• 10 = XID exchange state was non "01"b or "00"b 　• 08 = Link station role was not "00"b 　• 04 = Maximum BTU acceptable to IWS was less than "109"x 　• 02 = IWS responded to XID with neither an XID nor a 　　　　 Disconnect command 　• 01 = XID frame length too short	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	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. Note: xx is the Token-Ring workstation ID.	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.
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 5494 Remote Controller 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 5494 Remote Controller failed to initialize correctly.	The Token-Ring adapter may be failing. Run extended diagnostics and test all hardware.
540106	The 5494 Remote Controller 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.

Cause Code	Description	Action
540122	The 5494 Remote Controller detected a Token-Ring network wire fault.	There is a problem with the lobe between the 5494 Remote Controller and the multi-station access unit (MSAU) to which it is connected. The Token-Ring adapter in the 5494 Remote Controller is closed, and the remote controller will try to reopen the adapter until the problem between the 5494 Remote Controller and MSAU to which the 5494 Remote Controller is attached is repaired and the adapter reopens.
540124	The 5494 Remote Controller received a remote command from the Token-Ring network.	1. Check with the system operator to determine if an adapter remove was issued and was valid. 2. If this SRC recurs, the Token-Ring adapter may be defective. Contact the system administrator and report that a remove command was received.
540125	The Token-Ring network is beaconing because of a permanent error on the Token Ring.	Report the problem to the system operator.
540403	(LAN AS/400 Attachment). The 5494 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 5494 Remote Controller 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 5494 Remote Controller. This indicates that the 5494 Remote Controller cannot contact the ALS. The 5494 Remote Controller will continue to send the TEST command until the ALS responds or an operator initiates a disconnect.	Contact the ALS operator to determine if the ALS is operational and configured for the 5494 Remote Controller. Also, make sure the line is varied on the AS/400 system. If the Token-Ring or Ethernet line is varied off: Have the operator vary on the line. The 5494 Remote Controller should recover without further action. 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 5494 is incorrect. Reconfigure the 5494 Remote Controller, 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 5494 Remote Controller frame format matches the frame format configured at the ALS. 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.

Cause Code	Description	Action
540405	(LAN AS/400 Attachment) The ALS did not respond to the XID3 command sent from the 5494. This indicates that the 5494 Remote Controller cannot contact the ALS. The 5494 Remote Controller will continue to send the XID3 command until the ALS responds or an operator initiates a disconnect.	Contact that ALS operator to determine if the ALS is operational and configured for the 5494 Remote Controller. Also, make sure the line and APPC controller descriptions are varied on at the AS/400 system. If the APPC controller is not varied on: Vary on the 5494 Remote Controller. The Controller should recover without any further action. If the APPC controller cannot be varied on because the AS/400 system is not operational: Wait for it to become operational.
540406	(LAN AS/400 Attachment) Adapter open error. There was a problem when the 5494 Remote Controller attempted to attach to the LAN. The Controller 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.	For Token-Ring, make sure that all workstations attached to the ring are set to the same speed. If the 5494 Remote Controller 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 or instructions on correcting the error. Verify that the cabling is connected correctly. Note: To obtain sense data, press the right arrow key on the 5494 Remote Controller keypad when this SRC is displayed. Token-Ring Sense Bytes: 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

Cause Code	Description	Action
		4A00 Ring poll remove received 5700 Request parameter ring failure 5900 Request parameter request 5A00 Request parameter remove received Ethernet Sense Bytes: 3300 Unable to transmit 3800 Address verification duplicate node address
540422	(Token-Ring AS/400 Attachment) The 5494 Remote Controller detected a Token-Ring network wire fault. There is a problem with the lobe between the 5494 Remote Controller and the multistation access unit (MSAU) to which it is connected. The Token-Ring adapter in the 5494 Remote Controller is closed. The Controller will continue to try to reopen the adapter until a Disconnect command is received from a 5494 Remote Controller operator or until the problem is repaired and the adapter reopens.	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 5494 Remote Controller received a remove command from the Token-Ring network.	1. Check with the Token Ring network administrator to determine if an adapter remove was was issued and was valid. 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 5494 Remote Controller operator panel by pressing Req. typing 230, then pressing Enter. 3. If this SRC reoccurs, the Token-Ring adapter in the 5494 Remote Controller may be defective. Run extended diagnostics and test all hardware. If the extended diagnostics did not detect a problem, contact the Token-Ring network administrator and report that a remove command was received.
540425	(Token-Ring AS/400 Attachment) The Token-Ring network is beaconing due to a permanent error on the ring.	1. Record that the Token-Ring is beaconing. 2. Refer to the IBM Token-Ring Network Problem Determination guide and use the beaconing as the symptom.

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 PC394A-R2 and PC394A-R3 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 to either a single-ended or a double-ended jumper plug, or to one end of a double-ended jumper. In the PC394A-R2 and PC394A-R3 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 5494 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 5494 software. If your controller contains any 8-device twinax cards, please note the following points:

1. We strongly recommend that every 8-device twinax card in a 5494 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. 5494 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 5494 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.

Appendix E. Concurrent Host Attachment

E.1 Overview

The Remote Controller can be configured to communicate with up to four AS/400 systems at the same time over one physical link. Display stations on the Remote Controller 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.

E.2 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.

E.3 Configuring Concurrent Host Attachment

The AS/400 that directly connects to the Remote Controller 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 Remote Controller 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 Remote Controller fields that need to be filled in will appear in the Network Information Configuration screen like this:

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

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

E.4 Switching Between AS/400 Systems

Each time the Remote Controller 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.

    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 Remote Controller will switch your display session to the host you have chosen. If the command is incorrectly entered, the Remote Controller 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.

E.5 Printing

When a Remote Controller 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 Remote Controller. When a user is logged onto the Secondary AS/400, printing to printers that are attached to the Remote Controller is not supported. Printer sharing is also not supported.

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