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 de 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 bloquear 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 debe 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 conectado 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 física 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 líneas de energía.

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 objetos líquidos 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: Objetos 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

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European Community Compliance Statement

This product is in conformity with the protection requirements of EC Council Directives 72/23/EEC, and 89/336/EEC on the approximation of the laws of the Member States relating to: Standard EN60950 (Safety of Information Technology Equipment); Standard EN50082-1 (Generic Immunity Standard for Residential, Commercial, and Light Industrial Products); and Standard EN55022 (Limits and Methods of Measurement of Radio Interference from Information Technology Equipment).

**WARNING**

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.
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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

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>5 = Ethernet</td>
</tr>
<tr>
<td>DX</td>
<td>5 = LAN connection type¹</td>
</tr>
<tr>
<td>1</td>
<td>00 = Default, U.S. Language</td>
</tr>
<tr>
<td>E</td>
<td>0 = Default, IEEE 802.3 Frame Format</td>
</tr>
<tr>
<td>F</td>
<td>04 = Default, Ethernet SAP²</td>
</tr>
<tr>
<td>G</td>
<td>01 = Default, Response Timer (T1)²</td>
</tr>
<tr>
<td>H</td>
<td>30 = Default, Inactivity Timer (Ti)²</td>
</tr>
<tr>
<td>I</td>
<td>030 = Default, Receiver Ack. Timer (T2)²</td>
</tr>
<tr>
<td>J</td>
<td>08 = Default, Retry Count² (N2)</td>
</tr>
<tr>
<td>P</td>
<td>Optional Default Printer¹</td>
</tr>
<tr>
<td>11</td>
<td>Default, local network ID (example: APPN)⁴</td>
</tr>
<tr>
<td>12</td>
<td>ET5494 = LU Name</td>
</tr>
<tr>
<td>13</td>
<td>ET5494 = Control Point (CP) Name</td>
</tr>
<tr>
<td>14</td>
<td>QRMTWSC = Default, Mode Name</td>
</tr>
<tr>
<td>15</td>
<td>0 020018810000⁵ = 549 connection number</td>
</tr>
<tr>
<td>16</td>
<td>010 06 = Default, Retry Count &amp; Interval</td>
</tr>
<tr>
<td>17</td>
<td>N/A</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line description</td>
<td>ETLINE</td>
</tr>
<tr>
<td>Resource names</td>
<td></td>
</tr>
<tr>
<td>Online at IPL</td>
<td>*YES</td>
</tr>
<tr>
<td>Vary on wait</td>
<td>*NOWAIT</td>
</tr>
<tr>
<td>Attached nonswitched NWI</td>
<td>*NONE</td>
</tr>
<tr>
<td>DLC identifiers</td>
<td>*NONE</td>
</tr>
<tr>
<td>Local adapter address</td>
<td>02000000A400</td>
</tr>
<tr>
<td>Exchange identifier</td>
<td>*SYSGEN</td>
</tr>
<tr>
<td>Ethernet standard</td>
<td>*ALL</td>
</tr>
<tr>
<td>SSAP List:</td>
<td></td>
</tr>
<tr>
<td>Source service access point</td>
<td>*SYSGEN</td>
</tr>
<tr>
<td>SSAP maximum</td>
<td></td>
</tr>
<tr>
<td>SSAP type</td>
<td></td>
</tr>
<tr>
<td>+ for more values</td>
<td></td>
</tr>
<tr>
<td>Text ‘description’</td>
<td>LAN Ethernet</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controller description</td>
<td>LANET01</td>
</tr>
<tr>
<td>Link type</td>
<td>*LAN</td>
</tr>
<tr>
<td>Online at IPL</td>
<td>*YES</td>
</tr>
<tr>
<td>Switched connection</td>
<td>*NO</td>
</tr>
<tr>
<td>Switched network backup</td>
<td>*NO</td>
</tr>
<tr>
<td>APPN-capable</td>
<td>*YES</td>
</tr>
<tr>
<td>Maximum frame size</td>
<td>521</td>
</tr>
<tr>
<td>Remote network identifier</td>
<td>APPN</td>
</tr>
<tr>
<td>Remote control point</td>
<td>ET5494</td>
</tr>
<tr>
<td>Exchange identifier</td>
<td></td>
</tr>
<tr>
<td>LAN remote adapter address</td>
<td>020018810000</td>
</tr>
<tr>
<td>LAN DSAP</td>
<td>04</td>
</tr>
<tr>
<td>LAN SSAP</td>
<td>04</td>
</tr>
</tbody>
</table>

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

```
C:\PCS\>type config.pcs
SFLR 1, , S0000000
RTLX S0000000
RTYP 5250
EMLI S0000000,0
C:\PCS>
```

### NOTE

No APPC controller needs to be configured on the AS/400 if “auto config” is active.

---

¹ 5 = Ethernet, BNC connection  
² 6 = Ethernet, RJ-45 connection  
³ 7 = Ethernet, DB15 AUI connection  
⁴ If any of these parameters are changed, host parameters must also be modified.  
⁵ Refers to printer that will print out the configuration screens during the configuration of the Remote Controller (printouts are requested via print key).
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.

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.

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.

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.

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).**
Upstream LAN Configuration (Token-Ring).

**Fields on 5494**

- AA = 4 = Token-Ring
- DX = 3 = Token-Ring connection type
- 1 = 00 = Default, U.S. Language
- F = 04 = Default, Token-Ring SAP
- G = 01 = Default, Response Timer (T1)
- H = 30 = Default, Inactivity Timer (T1)
- I = 030 = Default, Receiver Ack. Timer (T2)
- J = 08 = Default, Retry Count (N2)
- P = Optional Default Printer
- 11 = Default, local network ID (example: APPN)
- 12 = TR5494 = LU Name
- 13 = TR5494 = Control Point (CP) Name
- 14 = QRMTWSC = Default, Mode Name
- 15 = 1 400018810000" connection number
- 16 = 010 06 = Default, Retry Count & Interval
- 17 = N/A
- H1:1 = 50000000" = AS/400 System LU Name
- H1:2 = AS/400 Network Name (example: APPN)
- H1:3 = Local Network Name (example: APPN)
- H1:4 = QRMTWSC = Mode Name for this AS/400 connection
- H1:5 = 1 40000000A400" = Token-Ring address of AS/400 connection
- 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: 521
  - SSAP type: *SYSGEN
  - 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: " connection number
- LAN remote adapter address: 400018810000
- LAN DSAP: 04
- LAN SSAP: 04

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

C:\PCS>type config.pcs
SFLR 1, I, 50000000
RTLIN APPN, TR03
RTYP 5250
EMLI 50000000, 0
C:\PCS>

**NOTE**

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

---

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).
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.

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.

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.

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”.

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

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

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line description</td>
<td>TXLINE1</td>
</tr>
<tr>
<td>Resource names</td>
<td>LINE011</td>
</tr>
<tr>
<td>Online at IPL</td>
<td>*YES</td>
</tr>
<tr>
<td>Data link role</td>
<td>*NEG</td>
</tr>
<tr>
<td>Physical Interface</td>
<td>RS232/32V24</td>
</tr>
<tr>
<td>Connection type</td>
<td>*MP</td>
</tr>
<tr>
<td>Switched network backup</td>
<td>*NO</td>
</tr>
<tr>
<td>Exchange identifier</td>
<td>*SYSGEN</td>
</tr>
<tr>
<td>NRZI data encoding</td>
<td>*YES</td>
</tr>
<tr>
<td>LINE speed</td>
<td>9600</td>
</tr>
<tr>
<td>Modern type supported</td>
<td>*NORMAL</td>
</tr>
<tr>
<td>Maximum frame size</td>
<td>521</td>
</tr>
<tr>
<td>Duplex</td>
<td>*Half</td>
</tr>
<tr>
<td>Inactivity timer</td>
<td>300</td>
</tr>
<tr>
<td>Poll response delay</td>
<td>0</td>
</tr>
<tr>
<td>Nonproductive receive timer</td>
<td>320</td>
</tr>
<tr>
<td>Idle timer</td>
<td>30</td>
</tr>
<tr>
<td>Connect poll timer</td>
<td>30</td>
</tr>
<tr>
<td>Frame retry</td>
<td>7</td>
</tr>
<tr>
<td>Text ‘description’</td>
<td>LINE011, SNA/SDLC, . . .</td>
</tr>
</tbody>
</table>

### AS/400 Controller Description (CRTCTLAPPC)

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controller description</td>
<td>LANTR01</td>
</tr>
<tr>
<td>Link type</td>
<td>*SDLC</td>
</tr>
<tr>
<td>Online at IPL</td>
<td>*YES</td>
</tr>
<tr>
<td>Switched connection</td>
<td>*NO</td>
</tr>
<tr>
<td>Switched network backup</td>
<td>*NO</td>
</tr>
<tr>
<td>APPN-capable</td>
<td>*YES</td>
</tr>
<tr>
<td>Attached nonswitched line</td>
<td>TXLINE1</td>
</tr>
<tr>
<td>Maximum frame size</td>
<td>521</td>
</tr>
<tr>
<td>Remote network identifier</td>
<td>APPN</td>
</tr>
<tr>
<td>Remote control point</td>
<td>ET5494</td>
</tr>
<tr>
<td>Exchange identifier</td>
<td></td>
</tr>
<tr>
<td>Data link role</td>
<td>*NEG</td>
</tr>
<tr>
<td>Station address</td>
<td>01</td>
</tr>
<tr>
<td>APPN CP session support</td>
<td>*YES</td>
</tr>
<tr>
<td>APPN node type</td>
<td>*ENODNE</td>
</tr>
<tr>
<td>APPN transmission group number</td>
<td>1</td>
</tr>
<tr>
<td>Autodele service</td>
<td>1440</td>
</tr>
<tr>
<td>User-defined 1</td>
<td>*LIND</td>
</tr>
<tr>
<td>User-defined 2</td>
<td>*LIND</td>
</tr>
<tr>
<td>User-defined 3</td>
<td>*LIND</td>
</tr>
<tr>
<td>Text ‘description’</td>
<td>LAN, Ethernet #01</td>
</tr>
</tbody>
</table>

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

```
C:/PCS>type config.pcs
SFLR 1, I, , S0000000
UPDT /I/QWSFLR, C:/PCS, S, , , PC Support/400
RYPE ITRN
RTLN APPN, ET03
TRL0 S0000000, 400018810000
C:/PCS>
```

---

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: EIMPCS.SYS
- Extended PC Support/400: EIMPCS.SYS
- Non-Extended PC Support: EIMPCS.SYS and ECYDDX.SYS

---

**IEEE 802.2 Interface**

**X’5C’ Interrupt Arbitrator (DXMAOMOD.SYS in CONFIG.SYS)**

**Token-Ring Network Device Drivers**
- In CONFIG.SYS: DXMC0MOD.SYS
- **Note:** If NDIS driver is not provided and the card is IBM software compatible or if this is an IBM card.

**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

---

**In CONFIG.SYS:** PROTMAN.DOS (provided with LAN Support Program)
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 Communication
- **BB - 0**: 5394 Emulation Mode
  - **2**: 5494 Emulation Mode
- **DD - 1**: LU6.2/PU2.1 Node
- **1**: N/A
- **2**: Controller address (example = 01)
- **3**: Line Facility & Data Encoding
  - (example = 0000000, half duplex/multipoint/NRZI)
- **10**: Baud rate (use only if locally attached)
- **11**: Default local network ID
  - (example: APPN)
- **12**: SLC01 = Must be unique for each emulated controller. If only one controller is emulated, use same name as Field 13
- **13**: Control Point (CP) Name
  - (example: ET5494)
- **14**: QRMTWSC = Mode Name
- **16**: 010 06 = Default, Retry Count & Interval
- **17**: N/A

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

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

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

- **Controller description**: LANTRO1
- **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**: *NEG
- **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.

<table>
<thead>
<tr>
<th>AS/400 Create Configuration List (CRTCFGL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration list type</td>
</tr>
<tr>
<td>*APPNRMT</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AS/400 Add Configuration List Entries (ADDCFGLE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration list type</td>
</tr>
<tr>
<td>*APPNRMT</td>
</tr>
<tr>
<td>APPN remote location entry:</td>
</tr>
<tr>
<td>Remote location name</td>
</tr>
<tr>
<td>SLC01</td>
</tr>
<tr>
<td>Remote network identifier</td>
</tr>
<tr>
<td>*NETATR</td>
</tr>
<tr>
<td>Local location name</td>
</tr>
<tr>
<td>*NETATR</td>
</tr>
<tr>
<td>Remote control point</td>
</tr>
<tr>
<td>ET5494</td>
</tr>
<tr>
<td>Control point net ID</td>
</tr>
<tr>
<td>*NETATR</td>
</tr>
<tr>
<td>Location password</td>
</tr>
<tr>
<td>*NONE</td>
</tr>
<tr>
<td>Secure location</td>
</tr>
<tr>
<td>*NO</td>
</tr>
<tr>
<td>Single session</td>
</tr>
<tr>
<td>*NO</td>
</tr>
<tr>
<td>Locally controlled session</td>
</tr>
<tr>
<td>*NO</td>
</tr>
<tr>
<td>Pre-established session</td>
</tr>
<tr>
<td>*NO</td>
</tr>
<tr>
<td>Entry ‘description’</td>
</tr>
<tr>
<td>*BLANK</td>
</tr>
<tr>
<td>Number of conversations</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>+ for more values</td>
</tr>
</tbody>
</table>

12 - SLC01 = Must be unique for each emulated controller
13 - Control Point (CP) Name (example: ET5494)
LU6.21/PU2.1 Node SNA/SDLC Configuration Quick Setup Guide.

SNA/SDLC Configuration Quick Setup Guide.
**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 (CRTLINSDLCL)**

- **Line description** TXLINE1
- **Resource names** LINE011
- **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 (CRTCTRLRWS)**

- **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: 6½”H x 15½”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

<table>
<thead>
<tr>
<th></th>
<th>115 VAC</th>
<th>230 VAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Amperage</td>
<td>6</td>
<td>3.5</td>
</tr>
<tr>
<td>Watts</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Hz</td>
<td>50</td>
<td>60</td>
</tr>
</tbody>
</table>

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.
2. Enter the appropriate information in each applicable field.

Multi-Point.

Create Line Description (SDLC) (CRTLINS DLC)

Type choices, press Enter.

<table>
<thead>
<tr>
<th>Line description</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resource name</td>
<td>Line011 Name</td>
</tr>
<tr>
<td>Online at IPL</td>
<td>*YES, *NO</td>
</tr>
<tr>
<td>Data link role</td>
<td>*NEG, *PRI, *SEC</td>
</tr>
<tr>
<td>Physical interface</td>
<td>*RS232V24, *V35, *X21...</td>
</tr>
<tr>
<td>Connection type</td>
<td>*MP, *NSWTPP, *SWTPP, *MP</td>
</tr>
<tr>
<td>Switched network backup</td>
<td>*NO, *YES</td>
</tr>
<tr>
<td>Exchange identifier</td>
<td>05600000-56FFFFF, *SYSGEN</td>
</tr>
<tr>
<td>NRZI data encoding</td>
<td>*YES, *NO</td>
</tr>
<tr>
<td>Maximum controllers</td>
<td>1-254</td>
</tr>
<tr>
<td>Line speed</td>
<td>600, 1200, 2400, 4800</td>
</tr>
<tr>
<td>Modem type supported</td>
<td>*NORMAL, *V54, *IBMWRAP</td>
</tr>
<tr>
<td>Maximum frame size</td>
<td>265, 521, 1033, 2057</td>
</tr>
<tr>
<td>Duplex</td>
<td>*HALF, *FULL</td>
</tr>
<tr>
<td>Nonproductive receive timer</td>
<td>160-4200 (0.1 seconds)</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Line description</th>
<th>TXLINE1</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resource name</td>
<td>LINE011</td>
<td>Name</td>
</tr>
</tbody>
</table>

+ for more values

<table>
<thead>
<tr>
<th>Online at IPL</th>
<th>*YES, *NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data link role</td>
<td>*PRI, *SEC</td>
</tr>
<tr>
<td>Physical interface</td>
<td>*RS232V24, *V35, *X21,..</td>
</tr>
<tr>
<td>Connection type</td>
<td>*SWTPP, *MP</td>
</tr>
<tr>
<td>Vary on wait</td>
<td>*NOWAIT, 15-180 (1 second)</td>
</tr>
<tr>
<td>Autocall unit</td>
<td>*NO, *YES</td>
</tr>
<tr>
<td>Exchange identifier</td>
<td>*SYSGEN 05600000-56FFFFF, *SYSGEN</td>
</tr>
<tr>
<td>NRZI data encoding</td>
<td>*YES, *NO</td>
</tr>
<tr>
<td>Line speed</td>
<td>600, 1200, 2400, 4800</td>
</tr>
<tr>
<td>Modem type supported</td>
<td>*NORMAL, *V54, *IBMWRAP</td>
</tr>
<tr>
<td>Switched connection type</td>
<td>*BOTH, *ANS, *DIAL</td>
</tr>
<tr>
<td>Autoanswer</td>
<td>*YES, *NO</td>
</tr>
<tr>
<td>Autodial</td>
<td>*NO, *YES</td>
</tr>
</tbody>
</table>

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

```plaintext
===> CRTLINX25
```

3. Press ENTER to return to the Main Menu.

4. Go to Section 2.1.2 and turn to the section on SDLC.
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
Resource name ...............CMN08
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 frame: MAXFRAME
SSAP type: CALC, SNA
+ for more values
Text "description" ..............*BLANK

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

#### Multi Point CTL Description.

<table>
<thead>
<tr>
<th>Type choices, press Enter.</th>
<th>TXCTL1</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controller description</td>
<td>TXCTL1</td>
<td>Name</td>
</tr>
<tr>
<td>Controller type</td>
<td>5394</td>
<td>3174, 3274, 5251, 5294 . .</td>
</tr>
<tr>
<td>Controller model</td>
<td>1</td>
<td>0, 1, 0001, 2, 0002, 12, 0012</td>
</tr>
<tr>
<td>Link type</td>
<td>*SDLC</td>
<td>*IDLC, *LAN, *NONE, . .</td>
</tr>
<tr>
<td>Online at IPL</td>
<td>*YES</td>
<td>*YES, *NO</td>
</tr>
<tr>
<td>Switched line</td>
<td>*NO</td>
<td>*NO, *YES</td>
</tr>
<tr>
<td>Switched network backup</td>
<td>*NO</td>
<td>*NO, *YES</td>
</tr>
<tr>
<td>Attached nonswitched line</td>
<td>TXLINE1</td>
<td>Name</td>
</tr>
<tr>
<td>Maximum frame size</td>
<td></td>
<td>*Linktype</td>
</tr>
<tr>
<td>Exchange identifier</td>
<td>*Leave Blank</td>
<td>00100000-FFFFFFFF</td>
</tr>
<tr>
<td>Station address</td>
<td>01</td>
<td>01-FE</td>
</tr>
<tr>
<td>Text &quot;description&quot;</td>
<td>*BLANK</td>
<td></td>
</tr>
</tbody>
</table>
### Switched Point-to-Point CTRL Description (Dial up Example)

<table>
<thead>
<tr>
<th>Controller description</th>
<th>TXCTL1 Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controller type</td>
<td>5394</td>
</tr>
<tr>
<td>Controller model</td>
<td>1</td>
</tr>
<tr>
<td>Link type</td>
<td>*SDLC</td>
</tr>
<tr>
<td>Online at IPL</td>
<td>*YES</td>
</tr>
<tr>
<td>Short hold mode</td>
<td>*NO</td>
</tr>
<tr>
<td>Switched line list</td>
<td>TXLINE1 Name</td>
</tr>
<tr>
<td>Maximum frame size</td>
<td>265-1994, 265, 261, 265...</td>
</tr>
<tr>
<td>Exchange identifier</td>
<td>00100000-FFFFFFFF</td>
</tr>
<tr>
<td>Station address</td>
<td>01-FE</td>
</tr>
</tbody>
</table>

| Switched connection    | *YES         |
| Short hold mode        | *NO          |

| Non-Switched Point-to-Point CTRL Description |

<table>
<thead>
<tr>
<th>Controller description</th>
<th>TXCTL1 Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controller type</td>
<td>5394</td>
</tr>
<tr>
<td>Controller model</td>
<td>1</td>
</tr>
<tr>
<td>Link type</td>
<td>*SDLC</td>
</tr>
<tr>
<td>Online at IPL</td>
<td>*YES</td>
</tr>
<tr>
<td>Short hold mode</td>
<td>*NO</td>
</tr>
<tr>
<td>Switched line list</td>
<td>TXLINE1 Name</td>
</tr>
<tr>
<td>Maximum frame size</td>
<td>265-1994, 265, 261, 265...</td>
</tr>
<tr>
<td>Exchange identifier</td>
<td>00100000-FFFFFFFF</td>
</tr>
<tr>
<td>Station address</td>
<td>01-FE</td>
</tr>
</tbody>
</table>

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.

Parameter | Value | Description
---|---|---
Controller description | LANTR01 | Name
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 | Name
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 | 1-20, *CALC

Bottom

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.
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.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Online at IPL</td>
<td>*YES</td>
<td>*YES, *NO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>APPN-capable</td>
<td>*YES</td>
<td>*YES, *NO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switched line list</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ for more values</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum frame size</td>
<td>*LINKTYPE</td>
<td>265-16393, 256, 265, 512 . .</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remote network identifier</td>
<td>APPN</td>
<td>Name, *NETATR, *NONE, *ANY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remote control point</td>
<td>*ANY</td>
<td>Name, *ANY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exchange identifier</td>
<td></td>
<td>00100000-FFFFFFFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial connection</td>
<td>*ANS</td>
<td>*DIAL, *ANS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dial initiation</td>
<td>*LINKTYPE</td>
<td>(LINKTYPE, *IMMED, *DELAY)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LAN remote adapter address</td>
<td>400018810000</td>
<td>000000000001-FFFFFFFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>APPN CP session support</td>
<td>*YES</td>
<td>*YES, *NO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>APPN node type</td>
<td>*ENDNODE</td>
<td>*ENDNODE, *LENNODE . .</td>
<td></td>
<td></td>
</tr>
<tr>
<td>APPN transmission group number 1</td>
<td>1-20, *CALC</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.
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 fields 12 and 13 for each card or pair of cards.
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:
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.

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 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

**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
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.

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           QSYSPRTR 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.

<table>
<thead>
<tr>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Port</strong></td>
</tr>
<tr>
<td>---------</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
</tbody>
</table>

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.

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.

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

<table>
<thead>
<tr>
<th>CREATE LINE DESCRIPTION (CRTLIND) PROMPT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data terminal ready delay: DTRDLY 1</td>
</tr>
<tr>
<td>Idle detection time: IDLETIME 38</td>
</tr>
<tr>
<td>BSC receive timeout timer: RCVTMR 15</td>
</tr>
<tr>
<td>Nonproductive receive time: NONPRDRCV 2</td>
</tr>
<tr>
<td>Number of error retries: RETRY 1</td>
</tr>
<tr>
<td>Online at CPF start (*YES *NO): ONLINE *YES</td>
</tr>
<tr>
<td>Nonswitched control units: CTLU</td>
</tr>
<tr>
<td>+ for more</td>
</tr>
<tr>
<td>BSC switched control units: SWTCLU</td>
</tr>
<tr>
<td>+ for more</td>
</tr>
<tr>
<td>Station address: STNADR</td>
</tr>
<tr>
<td>Exchange identifier in hex: EXCHID *NONE</td>
</tr>
<tr>
<td>Line code (*EBCDIC *ASCII): CODE *EBCDIC</td>
</tr>
<tr>
<td>Remote job entry (*NO *YES): RJE *NO</td>
</tr>
<tr>
<td>BSC switched line disconnect? BSCSWTDSCE *YES</td>
</tr>
<tr>
<td>3270 device emulation? EML3270 *NO</td>
</tr>
<tr>
<td>X.25 network type: X25NETTYPE 0101</td>
</tr>
<tr>
<td>X.25 network local address: LCLNETADR *NONE</td>
</tr>
<tr>
<td>X.25 default packet size: DFTPKTSIZE 128</td>
</tr>
<tr>
<td>X.25 maximum packet size: MAXPKTSIZE *DFTPKTSIZE</td>
</tr>
<tr>
<td>X.25 default window size: DFTWDWSIZE 2</td>
</tr>
</tbody>
</table>
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
- SSCP identifier: SSCPID
- SSCP identifier checking: SSCPIDCHK *NO
- Online at CPF start (*YES *NO): ONLINE *YES
- Switched line names: LINLST
- Switched network backup: SWNBKU *NO
- Allow delayed connection: DLYFEAT *YES
- Attached device names: DEV
### CREATE CONTROL UNIT DESC (CRTCUD) PROMPT

Enter the following:

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control unit description name:</td>
<td>CUD</td>
</tr>
<tr>
<td>Control unit type:</td>
<td>TYPE</td>
</tr>
<tr>
<td>Model number:</td>
<td>R</td>
</tr>
<tr>
<td>Control unit address:</td>
<td>R</td>
</tr>
<tr>
<td>Switched line (*NO *YES):</td>
<td>R</td>
</tr>
<tr>
<td>Nonswitched line name:</td>
<td>R</td>
</tr>
<tr>
<td>Speed select feature:</td>
<td>R</td>
</tr>
<tr>
<td>Switched telephone number:</td>
<td>R</td>
</tr>
<tr>
<td>Switched initial connection:</td>
<td>R</td>
</tr>
<tr>
<td>Exchange identifier in hex:</td>
<td>R</td>
</tr>
<tr>
<td>BSC local identifier:</td>
<td>R</td>
</tr>
<tr>
<td>BSC remote identifiers:</td>
<td>R</td>
</tr>
<tr>
<td>SSCP identifier:</td>
<td>R</td>
</tr>
<tr>
<td>SSCP identifier checking:</td>
<td>R</td>
</tr>
<tr>
<td>Online at CPF start (*YES *NO):</td>
<td>R</td>
</tr>
<tr>
<td>Switched line names:</td>
<td>R</td>
</tr>
<tr>
<td>Switched network backup:</td>
<td>R</td>
</tr>
<tr>
<td>Allow delayed connection:</td>
<td>R</td>
</tr>
<tr>
<td>Attached device names:</td>
<td>R</td>
</tr>
</tbody>
</table>

### CREATE LINE DESCRIPTION (CRTLIND) PROMPT

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attached device names:</td>
<td>+</td>
</tr>
<tr>
<td>BSC device delay in sec:</td>
<td>R</td>
</tr>
<tr>
<td>BSC program delay in sec:</td>
<td>R</td>
</tr>
<tr>
<td>Remote job entry (*NO *YES):</td>
<td>R</td>
</tr>
<tr>
<td>RJE host:</td>
<td>R</td>
</tr>
<tr>
<td>RJE host &quot;signon&quot;/&quot;logon&quot;:</td>
<td>R</td>
</tr>
<tr>
<td>3270 device emulation</td>
<td>R</td>
</tr>
<tr>
<td>Maximum length PIU:</td>
<td>R</td>
</tr>
<tr>
<td>Data compression:</td>
<td>R</td>
</tr>
<tr>
<td>Device wait timeout value:</td>
<td>R</td>
</tr>
<tr>
<td>Link type:</td>
<td>R</td>
</tr>
<tr>
<td>Controller code:</td>
<td>R</td>
</tr>
<tr>
<td>X.25 address:</td>
<td>R</td>
</tr>
<tr>
<td>X.25 default packet size:</td>
<td>R</td>
</tr>
<tr>
<td>X.25 default window size:</td>
<td>R</td>
</tr>
<tr>
<td>X.25 LLC protocol:</td>
<td>R</td>
</tr>
<tr>
<td>X.25 response timer:</td>
<td>R</td>
</tr>
<tr>
<td>X.25 reverse charging</td>
<td>R</td>
</tr>
<tr>
<td>Incoming calls:</td>
<td>R</td>
</tr>
<tr>
<td>Outgoing calls:</td>
<td>R</td>
</tr>
</tbody>
</table>
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:

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

### CREATE DEVICE DESCRIPTION (CRTDEVD) PROMPT

<table>
<thead>
<tr>
<th>Printer file name:</th>
<th>PRTFILE</th>
<th>GSYSPRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Library name:</td>
<td></td>
<td>*LIBL</td>
</tr>
<tr>
<td>Work stn controller address:</td>
<td>WSCADR</td>
<td>*NONE</td>
</tr>
<tr>
<td>Work stn controller keyboard:</td>
<td>WSCKBD</td>
<td>*NONE</td>
</tr>
<tr>
<td>Allow blink (*YES *NO):</td>
<td>ALWBLN</td>
<td>*YES</td>
</tr>
<tr>
<td>BSC contention resolution:</td>
<td>CONTN</td>
<td></td>
</tr>
<tr>
<td>Local LU name:</td>
<td>LCLLU</td>
<td>*SYS</td>
</tr>
<tr>
<td>Remote LU name:</td>
<td>RMTLU</td>
<td></td>
</tr>
<tr>
<td>System validation password:</td>
<td>SYSVLDPWD</td>
<td>*NONE</td>
</tr>
<tr>
<td>Secure LU:</td>
<td>SECURELU</td>
<td>*NO</td>
</tr>
<tr>
<td>Font identification:</td>
<td>FONT</td>
<td></td>
</tr>
<tr>
<td>Form feed:</td>
<td>FORMFEED</td>
<td>*CONT</td>
</tr>
<tr>
<td>Emulation device type:</td>
<td>EMLDEVTYT</td>
<td>3277</td>
</tr>
<tr>
<td>Emulation keyboard type:</td>
<td>EMLKBDTYP</td>
<td>*UPPER</td>
</tr>
<tr>
<td>Maximum length RU:</td>
<td>MAXLENRU</td>
<td>256</td>
</tr>
<tr>
<td>Auxiliary device AUXDEV Auxiliary device type:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auxiliary device address:</td>
<td>NETDEVADR</td>
<td>*NONE</td>
</tr>
<tr>
<td>+ for more</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Network device address:</td>
<td>NETDEVADR</td>
<td>*NONE</td>
</tr>
</tbody>
</table>
**CREATE DEVICE DESCRIPTION (CRTDEVD) PROMPT**

<table>
<thead>
<tr>
<th>Character identifier</th>
<th>CHRID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graphic character set:</td>
<td></td>
</tr>
<tr>
<td>Code page:</td>
<td></td>
</tr>
<tr>
<td>Public authority</td>
<td>PUBAUT</td>
</tr>
<tr>
<td>(*NORMAL *ALL *NONE):</td>
<td></td>
</tr>
<tr>
<td>Text description:</td>
<td>TEXT</td>
</tr>
<tr>
<td></td>
<td>*BLANK</td>
</tr>
</tbody>
</table>

Use the following table to determine each device address.

<table>
<thead>
<tr>
<th>Port</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>00</td>
<td>01</td>
<td>02</td>
<td>03</td>
<td>04</td>
<td>05</td>
<td>06</td>
</tr>
<tr>
<td>1</td>
<td>07</td>
<td>08</td>
<td>09</td>
<td>0A</td>
<td>0B</td>
<td>0C</td>
<td>0D</td>
</tr>
</tbody>
</table>
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.
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.
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).

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

**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 DH, 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.

   ![CNFIGSSP - Main Menu](image)

   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

   The CNFIGSSP Main menu will appear.

   ![CONFIGURATION MEMBER DEFINITION](image)

   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

   The CNFIGSSP Main menu will appear.

   ![NOTE](image)

   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 CONFIGSSP—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. 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.

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

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, CFIGSSP Communications Line Definition.

   ![Menu Screenshot]

   **10.0 CFIGSSP - 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

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

   ![Menu Screenshot]

   **10.0 CFIGSSP - 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.

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

3. Describe the remote controller

   Remote Controller

4. Controller type

   1. 5251 Model 12        2. 5294        3. 3274

5. Controller station address

   01-FD 01

6. Communications line

   1-10 1

7. For a switched line, optionally specify 1 to 3 alternative lines.
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

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>Workstation address</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0—P----------------</td>
</tr>
<tr>
<td>01</td>
<td>PC</td>
<td>10</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td>1—0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2—R</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3—T 5294</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Slot Number</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slot 1</td>
<td>Off</td>
<td>On</td>
<td>Off</td>
<td>On</td>
<td>On</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
</tr>
<tr>
<td>Slot 2</td>
<td>Off</td>
<td>On</td>
<td>Off</td>
<td>On</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
</tr>
<tr>
<td>Slot 3</td>
<td>Off</td>
<td>Off</td>
<td>On</td>
<td>On</td>
<td>On</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
</tr>
<tr>
<td>Slot 4</td>
<td>Off</td>
<td>Off</td>
<td>On</td>
<td>On</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
</tr>
<tr>
<td>Slot 5</td>
<td>Off</td>
<td>Off</td>
<td>On</td>
<td>Off</td>
<td>On</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
</tr>
<tr>
<td>Slot 6</td>
<td>Off</td>
<td>Off</td>
<td>On</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
</tr>
</tbody>
</table>

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:

```
<table>
<thead>
<tr>
<th>Menu Selection</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CARD 1-2</td>
<td>5394/2</td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3. CARD 3-4</td>
<td>5394/2</td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
<tr>
<td>5. CARD 5-6</td>
<td>5394/2</td>
</tr>
<tr>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>7. LAN GATEWAY</td>
<td></td>
</tr>
<tr>
<td>8. COPY CONFIGURATION</td>
<td></td>
</tr>
<tr>
<td>9. EXIT</td>
<td></td>
</tr>
</tbody>
</table>
```

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 online 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.

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

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.
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.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Probable Cause</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>No power to controller (LEDs remain dark).</td>
<td>Power cord not plugged in.</td>
<td>Check power-cord connection.</td>
</tr>
<tr>
<td>No power at outlet.</td>
<td>Check wall outlet.</td>
<td></td>
</tr>
<tr>
<td>Controller not powered on.</td>
<td>Power on the controller with the front-panel switch.</td>
<td></td>
</tr>
<tr>
<td>Ready light doesn't come on or remains flashing.</td>
<td>Faulty, damaged, or improper cabling.</td>
<td>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).</td>
</tr>
<tr>
<td>Error in software diskette.</td>
<td>Verify proper insertion of diskette and retry; try backup diskette. If unsuccessful, call for technical support.</td>
<td></td>
</tr>
<tr>
<td>Defective twinax card.</td>
<td>Check MPIC and twinax card LEDs for card status. See discussion of Remote Controller status later in this chapter.</td>
<td></td>
</tr>
<tr>
<td>Twinax card(s) or interface card not installed properly.</td>
<td>Make sure card(s) is fully seated in the controller, DIP switches are set properly, and the interface card is fully seated.</td>
<td></td>
</tr>
<tr>
<td>Improper termination.</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>Problem</td>
<td>Probable Cause</td>
<td>Action</td>
</tr>
<tr>
<td>---------</td>
<td>----------------</td>
<td>--------</td>
</tr>
<tr>
<td>Unable to configure workstations on the 5494 Remote Controller</td>
<td>Faulty, damaged, or improper cabling.</td>
<td>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).</td>
</tr>
<tr>
<td>Duplicate device address.</td>
<td></td>
<td>Verify that all devices are connected to the proper port and set at the correct address as the configuration at host.</td>
</tr>
<tr>
<td>TEST switch (see Chapter 3) is not set ON.</td>
<td></td>
<td>Power controller off, turn TEST switch ON, then power controller on.</td>
</tr>
<tr>
<td>Devices not connected or not powered on.</td>
<td></td>
<td>Verify proper cable connection and that all devices are powered on and in “Ready” state.</td>
</tr>
<tr>
<td>Wrong selections on the configuration screen (Chapter 2).</td>
<td></td>
<td>Use scroll up/down keys to change values in controller to host configuration fields.</td>
</tr>
<tr>
<td>Modem is attached to the controller and is active.</td>
<td></td>
<td>Controller will not configure with active modem attached. Disconnect the modem cable, configure the controller, then reattach the modem cable.</td>
</tr>
<tr>
<td>Improper termination.</td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>Device does not show up on configuration screen.</td>
<td>Faulty, damaged, or improper cabling.</td>
<td>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).</td>
</tr>
<tr>
<td>Device not powered on, not in ready state, or faulty.</td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>PC emulator not in emulation mode.</td>
<td></td>
<td>PCs with emulator cards must be in emulation mode during configuration of the controller.</td>
</tr>
<tr>
<td>Configuration will not store properly.</td>
<td>Test switch not ON.</td>
<td>Power off the controller, put the test switch on the front panel in the ON position, then power the controller on.</td>
</tr>
<tr>
<td>Configuration-screen selections not made for each twinax card installed.</td>
<td></td>
<td>Follow the steps under the section Configure the Remote Controller in Chapter 3. Each card installed in the controller must be configured and the configuration saved to diskette before continuing to the next card’s configuration.</td>
</tr>
<tr>
<td>Controller hasn’t stored the previous configuration to diskette.</td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>Problem</td>
<td>Probable Cause</td>
<td>Action</td>
</tr>
<tr>
<td>---------</td>
<td>----------------</td>
<td>--------</td>
</tr>
<tr>
<td>Configuration will not store properly (continued).</td>
<td>Diskette not in drive; diskette write-protected or faulty.</td>
<td>Make sure diskette is in the drive, label side up. Try backup diskette if necessary.</td>
</tr>
<tr>
<td></td>
<td>Request to store configuration not properly keyed.</td>
<td>Be sure to press the ENTER key twice after entering all desired parameters into fields on the configuration screen.</td>
</tr>
<tr>
<td>No host communication; controller won’t come on-line or cannot be varied on.</td>
<td>Host communication line not operating properly.</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>NRZI or NONRZI not set properly.</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>Controller hasn’t been configured.</td>
<td>Configure the controller as described in Chapter 3.</td>
</tr>
<tr>
<td></td>
<td>Local configuration does not match the host’s configuration.</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>Modem is not the proper type or not strapped properly.</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>Host not configured for the controller.</td>
<td>Make sure the host is configured for the controller. Each twinax card installed is recognized by the host as a separate controller.</td>
</tr>
<tr>
<td></td>
<td>Host configuration not correct.</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>Controller not varied on or subsystem not started.</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>Twinax cabling is damaged or improper.</td>
<td>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.</td>
</tr>
<tr>
<td>Workstation(s) drop off line or will not come up.</td>
<td>Faulty, damaged, or improper cabling.</td>
<td>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.</td>
</tr>
<tr>
<td>Problem</td>
<td>Probable Cause</td>
<td>Action</td>
</tr>
<tr>
<td>---------</td>
<td>----------------</td>
<td>--------</td>
</tr>
<tr>
<td>Workstation(s) drop off line or will not come up (continued).</td>
<td>Conflicting device descriptions on the host.</td>
<td>Remove device descriptions from the configuration record at the host for devices not configured on the remote controller.</td>
</tr>
<tr>
<td></td>
<td>Improper termination.</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>Device damaged.</td>
<td>Change with a known good device to verify proper operation. If the device is damaged, repair or replace it.</td>
</tr>
<tr>
<td>Controller drops off-line and will not come back up or stays at a “Vary on pending” status.</td>
<td>Telephone line has interference.</td>
<td>Have the phone company check the telephone line.</td>
</tr>
<tr>
<td></td>
<td>Active job on host or in spool file.</td>
<td>Delete job and continue.</td>
</tr>
<tr>
<td></td>
<td>Message on console.</td>
<td>Answer then delete message.</td>
</tr>
<tr>
<td></td>
<td>Modem or controller “locked up.”</td>
<td>Power off then power on both modems and the controller.</td>
</tr>
<tr>
<td></td>
<td>Subsystem terminated.</td>
<td>Restart subsystem.</td>
</tr>
<tr>
<td></td>
<td>Drop line upon sign off selected as “yes” on the controller description (AS/400).</td>
<td>Select “No” to the drop off line upon sign off in the controller description.</td>
</tr>
<tr>
<td></td>
<td>Interference on communications line.</td>
<td>Check communications line to host for interference.</td>
</tr>
<tr>
<td></td>
<td>Selected baud rate is too slow for the number of attached devices or the application.</td>
<td>Increase baud rate in controller configuration and on modem settings.</td>
</tr>
<tr>
<td></td>
<td>Host has nonexistent controller varied on a multipoint line.</td>
<td>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.</td>
</tr>
<tr>
<td>Disk Error Light appears.</td>
<td>Diskette is not bootable.</td>
<td>Try booting from the spare controller diskette.</td>
</tr>
<tr>
<td></td>
<td>Loose cards.</td>
<td>Make sure all of the controller’s cards are in the slots tightly. Reseat cards.</td>
</tr>
</tbody>
</table>
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.
5 LEDs on means that there is insufficient memory.

A filled circle indicates LED On.

**5.4 LEDs on the Front Panel**

<table>
<thead>
<tr>
<th>Top Row</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>POWER</td>
<td>When on, indicates that +5 VDC is present.</td>
</tr>
<tr>
<td>TEST</td>
<td>When on, indicates that the TEST switch is set to ON for configuration purposes.</td>
</tr>
<tr>
<td>READY</td>
<td>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.</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Bottom Row</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TXD</td>
<td>(Transmitted Data) When flashing, indicates data is being transmitted from the remote controller to the modem.</td>
</tr>
<tr>
<td>RXD</td>
<td>(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.</td>
</tr>
<tr>
<td>RTS</td>
<td>(Request to Send) Asserted by the remote controller to indicate it has data to send.</td>
</tr>
<tr>
<td>CTS</td>
<td>(RFS, Clear to Send) Asserted by the modem in response to the RTS signal. This signal allows the remote controller to transmit.</td>
</tr>
<tr>
<td>DSR</td>
<td>(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.</td>
</tr>
<tr>
<td>DTR</td>
<td>(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.</td>
</tr>
<tr>
<td>CD</td>
<td>(DCD, Carrier Detected) Asserted by the modem when the remote host has control of the line and is transmitting (some systems assert carrier continuously).</td>
</tr>
<tr>
<td>TXC</td>
<td>(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.</td>
</tr>
<tr>
<td>RXC</td>
<td>(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.</td>
</tr>
</tbody>
</table>
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

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

<table>
<thead>
<tr>
<th>System Reference Code (SRC)</th>
<th>Reason Received</th>
<th>Location Displayed</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000 through 003F</td>
<td>An operator error occurred during an entry operation.</td>
<td>Display station where the error originated.</td>
</tr>
<tr>
<td>0040 through 005F</td>
<td>An error occurred on the communications network during the time the 5494 Remote Controller was communicating with the host system.</td>
<td>All affected display stations.</td>
</tr>
<tr>
<td>0080 through 008F</td>
<td>An error occurred during configuration of the Remote Controller</td>
<td>Display station used for configuration of the Remote Controller.</td>
</tr>
<tr>
<td>0090 through 0009F</td>
<td>A display-station operator caused an error that involves the host-system capabilities.</td>
<td>Display station where the error originated.</td>
</tr>
<tr>
<td>0100 through 0145</td>
<td>An error occurred on the communications network during the time the Remote Controller was communicating with the host system.</td>
<td>All affected display stations.</td>
</tr>
<tr>
<td>100000 through 10FFFFF</td>
<td>A display-station operator attempted to enter an incorrect or invalid X.25 command or parameter from the keyboard.</td>
<td>Display station where the error originated.</td>
</tr>
<tr>
<td>110000 through 1FFFFF</td>
<td>An error was detected by the DTE or DCE on an X.25 network.</td>
<td>All active display stations.</td>
</tr>
<tr>
<td>400000 through 5FFFFF</td>
<td>An error related to the connected LAN was detected by the controller.</td>
<td>On a twinaxial connected display station, press a key sequence defined in Section C.4.</td>
</tr>
</tbody>
</table>
## C.1 Operator Entry System Reference Codes

<table>
<thead>
<tr>
<th>SRC</th>
<th>Description</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000</td>
<td>Help Key Not Allowed</td>
<td>The display-station operator pressed the HELP key; however, either no SRC appeared or the application program did not support the HELP key.</td>
</tr>
<tr>
<td>0001</td>
<td>Keyboard Overrun</td>
<td>The Remote Controller did not keep up with the rate of information entered. The last character entered was not recognized.</td>
</tr>
<tr>
<td>0002</td>
<td>Invalid Scan Code</td>
<td>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.</td>
</tr>
<tr>
<td>0003</td>
<td>Invalid Command/PF Key</td>
<td>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.</td>
</tr>
<tr>
<td>0004</td>
<td>Data Not Allowed in this Field</td>
<td>The display-station operator tried to enter data from the keyboard into a field where only MSR or SLP entries are allowed.</td>
</tr>
<tr>
<td>0005</td>
<td>Cursor in Protected Area of Display</td>
<td>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.</td>
</tr>
<tr>
<td>0006</td>
<td>Key Following Sys Req Key Not Valid</td>
<td>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.</td>
</tr>
<tr>
<td>0007</td>
<td>Mandatory Entry Field Must Enter Data</td>
<td>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.)</td>
</tr>
<tr>
<td>0008</td>
<td>This Field Must Have Alphabetic Characters</td>
<td>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.</td>
</tr>
<tr>
<td>0009</td>
<td>This Field Must Have Numeric Characters</td>
<td>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.</td>
</tr>
<tr>
<td>0010</td>
<td>Only Characters 0 Through 9 Permitted</td>
<td>The key pressed is not valid for a signed numeric field. Valid entries are 0 through 9 and DUP key.</td>
</tr>
<tr>
<td>0011</td>
<td>Key for Sign Position of Field Not Valid</td>
<td>The display-station operator tried to enter data into the last position of a signed numeric field.</td>
</tr>
<tr>
<td>0012</td>
<td>Insert Mode No Room to Insert Data</td>
<td>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.</td>
</tr>
<tr>
<td>SRC</td>
<td>Description</td>
<td>Explanation</td>
</tr>
<tr>
<td>------</td>
<td>--------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>0013</td>
<td>Insert Mode Only Data Keys Permitted</td>
<td>The display-station operator tried to exit a field while the display station was still in Insert mode.</td>
</tr>
<tr>
<td>0014</td>
<td>Mandatory-Fill Field Must Fill to Exit</td>
<td>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.</td>
</tr>
<tr>
<td>0015</td>
<td>Modulo 10 or 11 Check Digit Error</td>
<td>The display-station operator entered data into a self-check field, and the number entered and the check digit did not compare.</td>
</tr>
<tr>
<td>0016</td>
<td>F-key Not Valid in this Field</td>
<td>The display-station operator pressed the FIELD key when the cursor was not in a numeric only, digits only, or signed numeric field.</td>
</tr>
<tr>
<td>0017</td>
<td>Mandatory-Fill Field Key Pressed is Not Valid</td>
<td>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.</td>
</tr>
<tr>
<td>0018</td>
<td>Key Used to Exit this Field Not Valid</td>
<td>The cursor is in a right-adjust or field-exit-required field, and the display-station operator pressed a data key.</td>
</tr>
<tr>
<td>0019</td>
<td>Dup or Field Mark Key Not Permitted in this Field</td>
<td>The display-station operator pressed the DUP or FIELD MARK key; however, the key is not permitted in this field.</td>
</tr>
<tr>
<td>0020</td>
<td>Function Key Not Valid for Right-Adjust Field</td>
<td>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.</td>
</tr>
<tr>
<td>0021</td>
<td>Mandatory Entry Field Must Enter Data</td>
<td>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.</td>
</tr>
<tr>
<td>0022</td>
<td>Status of Field Not Known</td>
<td>A system error occurred. The status of the current field is not known. This error can occur during an insert or delete operation.</td>
</tr>
<tr>
<td>0023</td>
<td>Hex Mode Entry Not Valid</td>
<td>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.</td>
</tr>
<tr>
<td>0024</td>
<td>Decimal Field Entry Not Valid</td>
<td>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.</td>
</tr>
<tr>
<td>0026</td>
<td>Field-key Entry Not Valid</td>
<td>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.</td>
</tr>
<tr>
<td>0027</td>
<td>Key Not Defined Key Cannot Be Used</td>
<td>The display-station operator pressed a key that is either blank or not defined for this display station.</td>
</tr>
<tr>
<td>0029</td>
<td>Diacritic Character Not Valid</td>
<td>The second key pressed during a diacritic key function in a two-key sequence did not produce a valid diacritic character.</td>
</tr>
</tbody>
</table>
### APPENDIX C: System Reference Codes

<table>
<thead>
<tr>
<th>SRC</th>
<th>Description</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0031</td>
<td>Data Buffer Overflow</td>
<td>The data received from the MSR card was longer than the maximum allowed.</td>
</tr>
<tr>
<td>0032</td>
<td>MSR Data Error</td>
<td>Data received from the MSR was not valid.</td>
</tr>
<tr>
<td>0033</td>
<td>MSR Secure Data Read Not Authorized</td>
<td>The MSR data received was not secured data (the operator ID card), and this</td>
</tr>
<tr>
<td></td>
<td>Length of Field</td>
<td>field was not specified for secured data.</td>
</tr>
<tr>
<td>0034</td>
<td>MSR Data Exceeds Length of Field</td>
<td>The magnetic-stripe-reader data received will not fit into the active input</td>
</tr>
<tr>
<td></td>
<td></td>
<td>field.</td>
</tr>
<tr>
<td>0035</td>
<td>MSR Error</td>
<td>The card to be read was incorrectly inserted into the magnetic-stripe reader,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>was incorrectly made, or is damaged.</td>
</tr>
<tr>
<td>0036</td>
<td>Cursor Select Not Allowed in Field Exit Required</td>
<td>The display-station operator pressed the CURSOR SELECT key while in a</td>
</tr>
<tr>
<td></td>
<td>State</td>
<td>field exit required state.</td>
</tr>
<tr>
<td>0037</td>
<td>Cursor Select Attempted in Nonselectable Field</td>
<td>The operator pressed the CURSOR SELECT key in a nonselectable field.</td>
</tr>
<tr>
<td>0044</td>
<td>Token-Ring: No valid frame before the time (Ti)</td>
<td>Verify that the 5494 Remote Controller cable to the modem/DCE is securely</td>
</tr>
<tr>
<td></td>
<td>expired</td>
<td>connected; that the modem/DCE is turned on; and the communication line is</td>
</tr>
<tr>
<td></td>
<td></td>
<td>attached to the modem.</td>
</tr>
<tr>
<td>0046</td>
<td>X.25 or Token-Ring: Frame reject received.</td>
<td>Verify that the Remote Controller cable to the modem/DCE is securely</td>
</tr>
<tr>
<td></td>
<td></td>
<td>connected; that the modem/DCE is turned on; and the communication line is</td>
</tr>
<tr>
<td></td>
<td></td>
<td>attached to the modem. If no problem is found, retry the procedure used to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>start AS/400 system communication. If this occurs again, call for technical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>support.</td>
</tr>
<tr>
<td>0047</td>
<td>X.25 or Token-Ring: An unexpected disconnect</td>
<td>Verify that the 5494 Remote Controller cable to the modem/DCE is securely</td>
</tr>
<tr>
<td></td>
<td>mode (DM) or a disconnect (DISC) command was</td>
<td>connected; that the modem/DCE is turned on; and the communication line is</td>
</tr>
<tr>
<td></td>
<td>received while in information transfer state.</td>
<td>attached to the modem. If no problem is found, retry the procedure used to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>start AS/400 system communication. If this occurs again, call for technical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>support.</td>
</tr>
<tr>
<td>0081</td>
<td>Too many workstations</td>
<td>The maximum number of attachments allowed is 8 or 16, depending on</td>
</tr>
<tr>
<td></td>
<td>are attached to the 5494 Remote Controller</td>
<td>emulation. Determine which workstations are extra and disconnect them.</td>
</tr>
<tr>
<td>0089</td>
<td>One or more fields required for operation are</td>
<td>When you press Enter, the Remote Controller checks for blank fields and</td>
</tr>
<tr>
<td></td>
<td>blank</td>
<td>moves the cursor to the first blank. Press Error Reset and fill in the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>required field.</td>
</tr>
<tr>
<td>008A</td>
<td>One or more fields contain an embedded blank.</td>
<td>When you press Enter, the Remote Controller checks for embedded blanks and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>moves the cursor to the first embedded blank. Press Error Reset and fill in</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the embedded blanks.</td>
</tr>
<tr>
<td>008C</td>
<td>Same Logical Unit (LU) mode name used for two</td>
<td>When you press Enter, the Remote Controller checks if the Logical Unit (LU)</td>
</tr>
<tr>
<td></td>
<td>emulated controllers.</td>
<td>mode name (Field 12) has been used for another emulated controller. Press</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Error Reset and select another name, as found appropriate.</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Description</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>0040</td>
<td>It has been at least 30 seconds since any valid SDLC frame has been received</td>
<td>a. The modem is not powered on.</td>
</tr>
<tr>
<td></td>
<td>for any address, and it has also been at least 30 seconds since the DSR</td>
<td>b. The telephone connection between the modems is down.</td>
</tr>
<tr>
<td></td>
<td>signal has been present on the cable from the modem. This code indicates</td>
<td>c. The modem cable is bad or not connected correctly.</td>
</tr>
<tr>
<td></td>
<td>conditions that would normally result in either error code 0055 or 0056,</td>
<td>d. The Remote Controller is connected to a modem using a null-modem</td>
</tr>
<tr>
<td></td>
<td>but gives the additional information that DSR is not present.</td>
<td>cable, or is direct-connected using a modem cable. (If applicable, the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>jumpers are in the wrong position on the SDLC card.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e. Modems are configured incorrectly.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>f. Remote Controller is not varied on at the host (turns off DSR only in</td>
</tr>
<tr>
<td></td>
<td></td>
<td>certain host/modem configurations).</td>
</tr>
<tr>
<td>0049</td>
<td>Software has detected that the MPIC communications interface card has</td>
<td>The MPIC (or SDLC card, if applicable) is bad or not installed</td>
</tr>
<tr>
<td></td>
<td>functioned in an invalid manner.</td>
<td>correctly.</td>
</tr>
<tr>
<td>0055</td>
<td>Since startup of the Remote Controller, no valid SDLC frame has been</td>
<td>a. The Remote Controller has not been varied on at the host.</td>
</tr>
<tr>
<td></td>
<td>received for the address. This error code will not be displayed if the</td>
<td>b. NRZI configured on the remote controller does not match the host</td>
</tr>
<tr>
<td></td>
<td>Remote Controller has ever received ANY good SDLC frames containing ANY</td>
<td>configuration.</td>
</tr>
<tr>
<td></td>
<td>SDLC address. This is true even if the address in the frame is not the</td>
<td>c. The cable connecting the remote controller to the modem is bad or</td>
</tr>
<tr>
<td></td>
<td>address configured for the remote controller, or any of the addresses</td>
<td>too long for the baud rate. The host-to-modem cable could also be the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d. The remote controller is connected to a modem using a null-modem</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cable. (If applicable, the jumpers are in the wrong position on the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SDLC card.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e. Modems are configured incorrectly.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>f. Disk in 5494 not configured correctly.</td>
</tr>
<tr>
<td>Error Code</td>
<td>Description</td>
<td>Cause</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>0056</td>
<td>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.</td>
<td>The Remote Controller has been varied off at the host.</td>
</tr>
</tbody>
</table>
| 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.                      |
### C.3 Host Support System Reference Codes

<table>
<thead>
<tr>
<th>SRC</th>
<th>Description</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0099</td>
<td>Host Support Not Currently Available</td>
<td>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.</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>SRC</th>
<th>Description</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>010X</td>
<td>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.”</td>
<td>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.</td>
</tr>
<tr>
<td>011X</td>
<td>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.</td>
<td>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.</td>
</tr>
<tr>
<td>012X</td>
<td>No LAN connection to the AS/400 has been established. The communication status is &quot;no connection is requested,&quot; meaning that an operator at an attached display has requested a &quot;disconnect,&quot; canceling attempts to contact the AS/400.</td>
<td>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.</td>
</tr>
</tbody>
</table>
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.

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.

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.

<table>
<thead>
<tr>
<th>Cause Code</th>
<th>Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>400000</td>
<td>A connection attempt is already in progress.</td>
<td>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.</td>
</tr>
<tr>
<td>400300</td>
<td>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.</td>
<td>If you have selected the wrong AS/400 system, correct the request and retry.</td>
</tr>
<tr>
<td>400600</td>
<td>The format of the command is not valid.</td>
<td>See Chapter 7 for the correct format. Correct and retry.</td>
</tr>
<tr>
<td>410100</td>
<td>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.</td>
<td>Report this problem to the system operator.</td>
</tr>
<tr>
<td>Cause Code</td>
<td>Description</td>
<td>Action</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>--------</td>
</tr>
<tr>
<td>410200</td>
<td>An XID contained an unsupported I-field format. There is a system configuration problem.</td>
<td>There is a system configuration problem. Report this problem to the system operator.</td>
</tr>
<tr>
<td>410300</td>
<td>XID command exchange state indicators are set to “not supported.”</td>
<td>There is a system programming error or configuration problem. Report this problem to the system operator.</td>
</tr>
<tr>
<td>410400</td>
<td>An XID command did not specify SDLC protocol</td>
<td>There is a system programming error or configuration problem. Report this problem to the system operator.</td>
</tr>
<tr>
<td>410500</td>
<td>An XID3 command specified asynchronous balanced mode (ABM) support.</td>
<td>There is a system programming error or configuration problem. Report this problem to the system operator.</td>
</tr>
<tr>
<td>410600</td>
<td>An XID3 command specified that an ALS is secondary.</td>
<td>There is a system programming error or configuration problem. Report this problem to the system operator.</td>
</tr>
<tr>
<td>410700</td>
<td>An XID3 command specified a maximum BTU less than 265 bytes.</td>
<td>There is a system programming error or configuration problem. Report this problem to the system operator.</td>
</tr>
<tr>
<td>410800</td>
<td>An XID3 command specified an SDLC profile that is not valid.</td>
<td>There is a system programming error or configuration problem. Report this problem to the system operator.</td>
</tr>
<tr>
<td>410900</td>
<td>The XID3 command specifies a maximum I-frames outstanding value that is not valid or supported.</td>
<td>There is a system programming error or configuration problem. Report this problem to the system operator.</td>
</tr>
<tr>
<td>411200</td>
<td>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.</td>
<td>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.</td>
</tr>
<tr>
<td>Cause Code</td>
<td>Description</td>
<td>Action</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>4510xx1</td>
<td>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:</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>* 80 = Frame length too long</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* 40 = Not a format 3 XID</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* 20 = Length inconsistency between XID and input/output block (IOB) length</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* 10 = XID exchange state was non &quot;01&quot;b or &quot;00&quot;b</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* 08 = Link station role was not &quot;00&quot;b</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* 04 = Maximum BTU acceptable to IWS was less than &quot;109&quot;x</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* 02 = IWS responded to XID with neither an XID nor a Disconnect command</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* 01 = XID frame length too short</td>
<td></td>
</tr>
<tr>
<td>4523xx</td>
<td>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.</td>
<td>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.</td>
</tr>
<tr>
<td>460000</td>
<td>A frame was received containing an unrecognized session address.</td>
<td>If this error occurs frequently, report the error to the system operator.</td>
</tr>
<tr>
<td>460100</td>
<td>A frame was received containing an incorrect format identification (FID) type.</td>
<td>If this error occurs frequently, report the error to the system operator.</td>
</tr>
<tr>
<td>460200</td>
<td>A frame was received that was not long enough to contain a full transmission header (TH).</td>
<td>If this error occurs frequently, report the error to the system operator.</td>
</tr>
<tr>
<td>460300</td>
<td>A frame was received that was not long enough to contain a full transmission header (TH) and request header (RH).</td>
<td>If this error occurs frequently, report the error to the system operator.</td>
</tr>
<tr>
<td>460400</td>
<td>A session control frame was received that was not long enough to contain a session control request code.</td>
<td>If this error occurs frequently, report the error to the system operator.</td>
</tr>
<tr>
<td>460500</td>
<td>A segmented frame was received. The 5494 Remote Controller does not support segmenting.</td>
<td>If this error occurs frequently, report the error to the system operator.</td>
</tr>
<tr>
<td>470100</td>
<td>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.</td>
<td>Report the error to the system operator.</td>
</tr>
<tr>
<td>540010</td>
<td>The Token-Ring adapter in the 5494 Remote Controller failed to initialize correctly.</td>
<td>The Token-Ring adapter may be failing. Run extended diagnostics and test all hardware.</td>
</tr>
<tr>
<td>540106</td>
<td>The 5494 Remote Controller attempted to attach to the Token-Ring (Open) and an adapter open error occurred.</td>
<td>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.</td>
</tr>
<tr>
<td>Cause Code</td>
<td>Description</td>
<td>Action</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>--------</td>
</tr>
<tr>
<td>540122</td>
<td>The 5494 Remote Controller detected a Token-Ring network wire fault.</td>
<td>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.</td>
</tr>
<tr>
<td>540124</td>
<td>The 5494 Remote Controller received a remote command from the Token-Ring network.</td>
<td>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.</td>
</tr>
<tr>
<td>540125</td>
<td>The Token-Ring network is beaconing because of a permanent error on the Token Ring.</td>
<td>Report the problem to the system operator.</td>
</tr>
<tr>
<td>540403</td>
<td>(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.</td>
<td>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.</td>
</tr>
</tbody>
</table>
| 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. |
<table>
<thead>
<tr>
<th>Cause Code</th>
<th>Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>540405</td>
<td>(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.</td>
<td>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.</td>
</tr>
<tr>
<td>540406</td>
<td>(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.</td>
<td>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</td>
</tr>
</tbody>
</table>
### APPENDIX C: System Reference Codes

<table>
<thead>
<tr>
<th>Cause Code</th>
<th>Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>4A00</td>
<td>Ring poll remove received</td>
<td>4A00</td>
</tr>
<tr>
<td>5700</td>
<td>Request parameter ring failure</td>
<td>5700</td>
</tr>
<tr>
<td>5900</td>
<td>Request parameter request</td>
<td>5900</td>
</tr>
<tr>
<td>5A00</td>
<td>Request parameter remove received</td>
<td>5A00</td>
</tr>
</tbody>
</table>

**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 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 “Multithost” 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 \textbf{H1} for the first host, \textbf{H2} for the second host, \textbf{H3} for the third host, and \textbf{H4} for the fourth host.

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

   \begin{verbatim}
   H2
   \end{verbatim}

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.