IBM S/36 PC

Preparing for Data
Communications

IBM System/36

**Preparing for Data
Communications – 5364**

Program Number 5727-SS6

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Contents

About This Manual

Who should use this manual . . .

This manual should be used by the person responsible for installing data communications on the System/36 PC.

The planning work done in this manual will be used later during installation and system configuration.

How this manual is arranged . . .

This manual contains information on the following:

- How the System/36 PC can be used for communications

- How to order communications equipment

- How to establish procedures with the remote site

It also includes copies of the forms you will need as you prepare for data communications.

What you should know . . .

You should understand the basic elements and terminology of data communications at the level described in the manual *Data Communications Concepts*, GC21-5169, or an equivalent publication.

If you want more information . . .

The IBM publications listed here provide additional information about topics described or referred to in this guide.

- *Data Communications Concepts*, GC21-5169

- *Using System/36 Communications*, SC21-9082

- *Communications and Systems Management Guide*, SC21-8010

- *Using the Asynchronous Communications Support*, SC21-9143

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

- *General Information – Binary Synchronous Communications*, GA27-3004

- *Guide to Publications*, GC21-9015

- *Local Area Networks: A Review*, G320-0108

- *IBM Cabling System Catalog*, G570-2040

- *The IBM Token-Ring Network Decision*, G320-9438

- *IBM Token-Ring Network Introduction and Planning Guide*, GA27-3677

- *Performing the First System Configuration for Your System (5364)*, SC21-9115

- *Changing Your System Configuration*, SC21-9052

- *Updating to a New Release*, SC21-9242

- *PC Support/36 User's Guide*, SC21-9088

- *Setting Up Your System – 5364*, SA21-9505

- *Installing and Customizing Your System – 5364*, SA21-9910.

- *Operating Your System*, SC21-9453

- *3863, 3864, and 3865 Introduction and Site Preparation Guide*, GA27-3200

- *3833 and 3834 Modems, Planning and Site Preparation Guide*, GA33-0030

- *5810 Enclosure, 5811-10 and 5811-18 Modems, Planning and Site Preparation Guide*, GA33-0033

- *5841 Guide to Operations*, GA27-3649

- *5865 and 5866 Modems, Planning and Site Preparation Guide*, GA33-0037

- *Preparing to Install Your Work Stations – 5364*, SA21-9845

- *System/36 PC System Problem Determination*, SC21-9375

- *5364 System Unit System Reference Codes (SRC)*, SY31-9027

How this manual has changed . . .

Significant changes were made to include:

- Additional information relating to Local Area Network (LAN) Attachment

- Information describing X.25 communications support

- Instructions on how to set up the X.25/SDLC card

Preparing for Data Communications

If you are installing a data communications line to a remote system, or installing or adding to a Local Area Network (LAN), you need to:

- Define your communications environment (discussed in this manual)

- Select and order communications equipment (the modem and the line for the remote network; cables and other components for the LAN)

- Establish procedures with the remote site

- Prepare for system configuration

If you are installing a data communications line to a remote site, you must also call a representative of your local communications common carrier (the telephone company or public data network) to arrange for the installation of the communications line.

If you are installing a LAN, see the manual *Token-Ring Network; Introduction and Planning Guide.* You may need to consult (and possibly hire) a specialist in such work.

Defining Your Communications Environment

The communications environment includes the equipment, software (programs), and services your business requires to send data from one point to another.

Additional information required for this task is available from your common carrier or from communications consultants.

This task determines how your System/36 PC is to be used with communications.

The system can:

- Act as a host system to remote controllers
- Act as a terminal (work station) to a remote host system
- Communicate with other systems, on an equal basis, in a local or remote network

System/36 PC as a Host System

As the host system in a remote network, the System/36 PC can communicate with a remote work station controller (either a 5251 Model 12, a 5294 Model 1, or a 3174/3274) that has attached remote work stations, or with a personal computer (PC) emulating one of the controllers or work stations.

When the System/36 PC communicates with remote controllers, it treats the work stations as if they were directly attached to the system unit. The only difference is that, before the system can access the controller and its devices, a communications link must be established. The communications link is a systems network architecture/synchronous data link control (SNA/SDLC) switched or nonswitched communications line.

Remote work station support is included as a part of the base System Support Program (SSP); the Communications feature (6047) is *not* required.

If you use the SSP-ICF (interactive communications feature) Finance Subsystem feature 6272, the System/36 PC can also serve as a host system for the:

- 3601 Finance Controller
- 4701 Finance Controller
- 3694 Document Processor

System/36 PC Communications with a Remote System

Your System/36 PC can communicate:

- As a terminal or a secondary station with a remote host system (such as a System/370)

- On an equal basis with a remote system (such as a System/34, a System/38, or another System/36)

Several types of communications protocols are supported on the System/36 PC:

- Binary synchronous communication requires an adapter (part 1501204) and a cable (part 1502067).

- SDLC operating on line 1 requires an adapter (part 1501205) and a cable (part 1502067).

- Asynchronous communication requires an adapter (part 1502074) and a cable (part 1502067). Two adapters and cables are required to operate two asynchronous communications lines.

- X.25 packet switching data network requires a Realtime Interface Co-Processor card (X.25/SDLC, Feature 6050), an RS-232-C electrical interface board (Feature 6051), and an RS-232-C modem attach interface cable (Feature 6057).

    - SDLC on lines 3 and 4 is also available if these features are installed.

    - For more information on X.25 communication, see "System/36 PC as Part of a Packet Switching Data Network" on page 12.

    - Information required to prepare the X.25/SDLC card for Feature 6050 is in "Appendix B. Realtime Interface Co-Processor (X.25/SDLC) Card Setup Instructions."

- Local area network (LAN) communication requires an adapter (Feature 5063) and an adapter cable. For more information, see "System/36 PC as Part of a Local Area Network" on page 7.

You can use these protocols in various combinations, but you can not use all of them at the same time. The following figure shows what combinations are allowed.

Each vertical column shows one possible combination for communications lines. The numbers in the columns correspond to the notes listed below this chart.

	Without Feature 6050						
Line 1	4		5	6			
Line 2		1	1				
Line 9				2	2		2
Line 10						3	3

Notes:

1. *Used for asynchronous communications only. Adapter card must be set up for primary operation.*
2. *LAN only. Requires IBM PERSONAL COMPUTER AT.* ®
3. *LAN only. Requires IBM Personal Computer AT.*
4. *Can be BSC, SDLC, or asynchronous communications. If asynchronous, adapter card must be set up for secondary operation.*
5. *Asynchronous communication only. Adapter card must be set up for secondary operation.*
6. *Must be SDLC.*

	With Feature 6050 Requires IBM PERSONAL COMPUTER XT[1] or IBM Personal Computer AT.												
Line 1	4	4	4	4									
Line 2					Not Supported								
Line 3		5		6				5	5	5		6	6
Line 4			1	1							1	1	1
Line 9					2		2		2		2		2
Line 10						3	3			3		3	3

[1] Trademark of IBM

Notes:

1. *SDLC only. Not used if X.25 is on line 3.*
2. *LAN only. Requires IBM Personal Computer AT.*
3. *LAN only. Requires IBM Personal Computer AT.*
4. *Asynchronous communication only. Adapter card must be set up for secondary operation.*
5. *Either X.25 or SDLC is allowed.*
6. *Must be SDLC.*

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It is important to know the requirements of the remote system when you plan for such items as line speed, line type, and modem type.

System/36 PC as Part of a Remote Network

A remote data communications network consists of all the devices and communications equipment used to transfer information from one site to another. Remote networks use one or more *switched* or *nonswitched* communications lines that are attached to remote systems or controllers. Remote networks are characterized by different configurations of switched and nonswitched lines.

The System/36 PC can be included in either switched or nonswitched networks. For your planning purposes, you should know the following about communications lines:

- A switched line is always point-to-point.

- A nonswitched line that is connected to *only one* other system or device is also point-to-point.

- A nonswitched line that is connected to *two or more* systems or devices is multipoint.

The following example shows a **switched point-to-point** network:
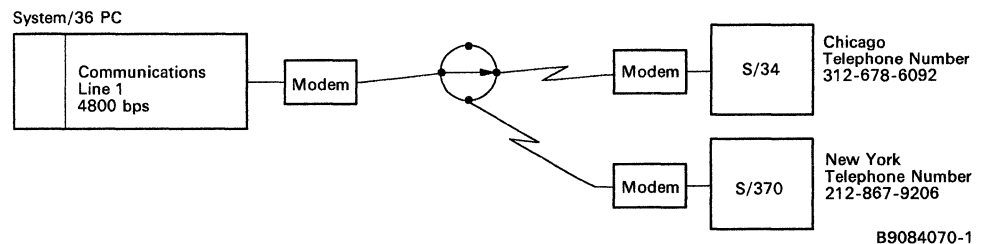
The following example shows a **nonswitched point-to-point** network:
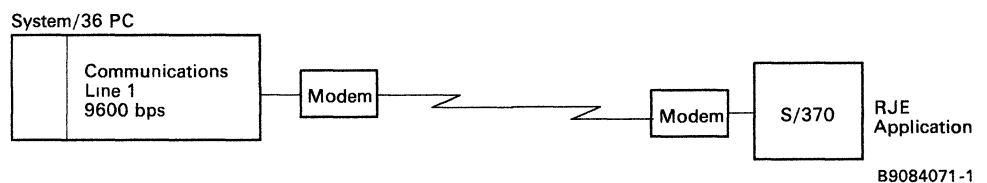
The following example shows a **multipoint** network:

System/36 PC

```
+--+------------------+     +-------+          +-------+  +---------+    +----------+
|  | Communications   |-----| Modem |---/-.     | Modem |--| 5251    |----( Display )
|  | Line 1           |     +-------+    / \    +-------+  | Model 12|    +----------+
|  | 9600 bps         |                 /   \             |         |----( Display )
+--+------------------+                /     \            +---------+    +----------+
                                      /       \              Address C1  | Printer |
                                     /         \                         +----------+
                                    /    +-------+  +---------+    +----------+
                                   /     | Modem |--| 5251    |----( Display )
                                  /      +-------+  | Model 12|    +----------+
                                                    |         |----( Display )
                                                    +---------+    +----------+
                                                       Address C2  | Printer |
                                                                   +----------+
```

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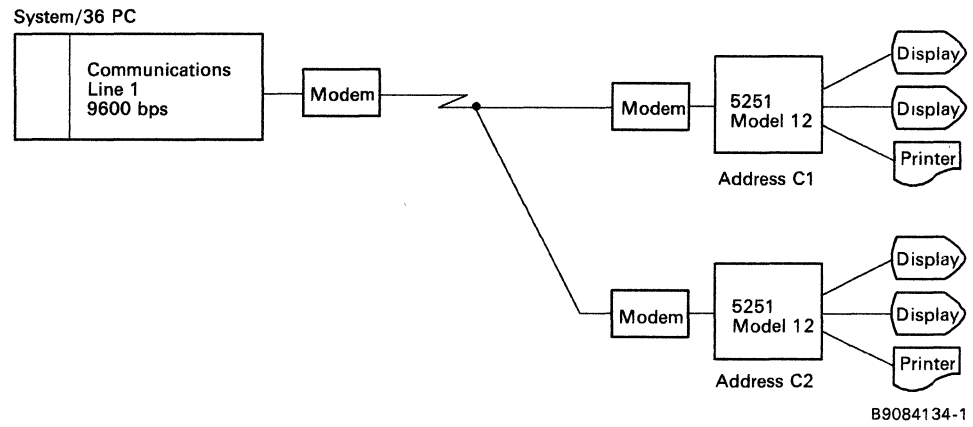
Note: *The preceding examples do not show all possible line*
type/speed considerations.

System/36 PC as Part of a Local Area Network

Overview

A local area network (LAN) is an information transport system limited to a moderate-sized geographic area such as a single office building, a hospital area, or a university campus. One type of LAN is the IBM Token-Ring Network. The System/36 can use the IBM Token-Ring Network to communicate with other systems and devices.

System/36 can be connected to one or two IBM Token-Ring Networks by using communications lines 9 and 10. These two lines can be used in combination with the regular communications line(s) on your system.

To illustrate the hardware and software required, a simplified IBM Token-Ring Network configuration is shown below. You can attach multiple systems, controllers, and devices to an IBM Token-Ring Network.

System/36   System Console   Token-Ring   Personal Computer
5364   Personal Computer   Network   Work Station
System Unit   Multistation
                                                   Access Unit
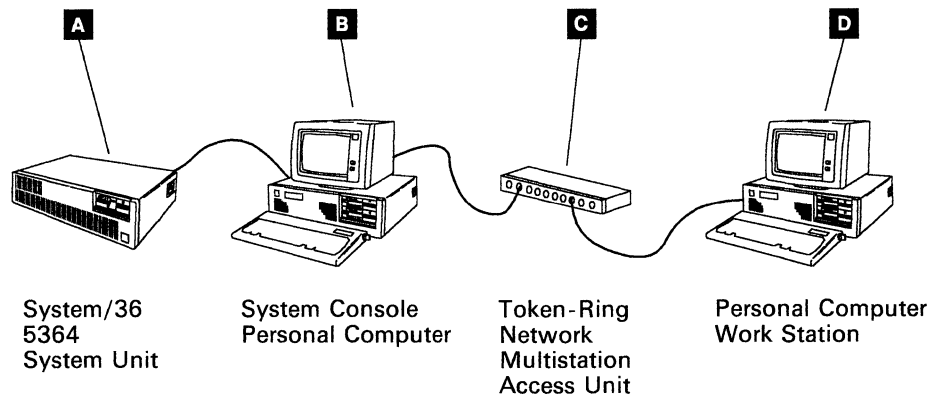
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Hardware Required

Later in this manual, you will go through an exercise to fill out Form N1, specifying the hardware required for your installation.

The following is a brief description of the hardware required for the example configuration. Installation instructions are included with each feature.

A **System/36 5364 System Unit**

No special hardware is required in the 5364 System Unit.

B **System Console Personal Computer**

An IBM personal computer supported by the System/36 LAN Attachment feature, with at least 512K bytes of memory is required as the system console personal computer for each System/36 PC that you plan to connect to the LAN. You must install the following hardware feature in the system console personal computer:

- IBM Token-Ring Network Adapter II (Feature 5063). This feature (a card, an installation manual, and a diagnostic diskette) must be ordered separately. You must install and test the card in the system console personal computer. Write down the adapter address obtained from the diagnostic procedure; you will need it when doing the system configuration.

  You must install an adapter cable (ordered separately) to connect the adapter card in the system console personal computer to the LAN. (If you have the network wiring inside the walls of your building, this cable would go from the system console personal computer to a wall receptacle; otherwise, it could go directly to the multistation access unit.)

  Two of these features (and cables) are required if you plan two LAN connections for your System/36 PC; these two connections can be to the same LAN or to two separate LANs.

  The installation manual is the *IBM Token-Ring Network PC Adapter Guide to Operations*, SX27-3617. For special considerations relating to switch settings on the adapter card, see Appendix C of this manual, *Preparing for Data Communications.*

G **Token-Ring Network Multistation Access Unit**

You will have to install (or have installed) the IBM Token-Ring Network wiring and the IBM 8228 Multistation Access Unit(s). Consult your IBM representative or your IBM-approved remarketer for vendor recommendations. In addition, many IBM publications are available for planning and installing the network wiring (see "If you want more information . . ." on page vi.

The IBM Token-Ring Network installed in buildings that have been wired with the IBM Cabling System is extremely flexible. Using this system, the IBM 8228 Multistation Access Unit is typically installed in a wiring closet. One 8228 Unit is required for every eight devices attached to the IBM Token-Ring Network. Multiple 8228 Units can be linked together (with patch cables) for networks larger than eight devices.

Using the IBM Cabling System, a patch cable is required to connect the 8228 Unit to a wiring closet receptacle for each device on the network. In addition, if you require multiple 8228 Units, one patch cable is required for each 8228 Unit to connect them in a closed ring.

D **Personal Computer Work Stations**

You will have to install a Token-Ring Network PC Adapter in each PC work station connected to the LAN, just as you did in the system console personal computer. You can use the IBM Token-Ring Network PC Adapter (Feature 9100) or the IBM Token-Ring Network PC Adapter II (Feature 5063). Feature 5063 provides more memory.

Write down the adapter address obtained from the diagnostic procedure; you will need it when doing the system configuration.

You will have to install an adapter cable between the LAN and each work station.

Software Required

When configuring your system, you will go through an exercise to fill out Forms J1, J2, and J3, specifying the software required for your installation.

The following is a list of the software features that must be installed to support the example configuration. Unless specified, all System/36 software must be at Release 5, Modification Level 1, or later.

A **System/36 5364 System Unit**

- SSP (5727-SS6)
- Base communications support (5727-SS6)
- Extended communications support (5727-SS6)
- LAN Communications support (5727-LC6)
- PC Support/36 (5727-WS6)
- PC Support/36 IBM Token-Ring Network support (5727-WS6)
- PC Support/36 Work Station Feature (Feature 6181)

While not required for the example shown, the following features would be required if another system was connected to the LAN:

- Base SSP-ICF (Feature 6268)
- APPN (Feature 6256)

These programs are installed during the system configuration process. See *Performing the First System Configuration for Your System (5364)*, or *Changing Your System Configuration*.

If you must update your system to a new release to install this software, see *Updating to a New Release*.

To make the 5364 System Unit ready for IBM Token-Ring Network communications:

1. Run the CNFIGICF procedure to create a PC Support/36 subsystem configuration member.

2. Run the ENABLE procedure to make that subsystem configuration member active.

For more information about these procedures, see *Using System/36 Communications*.

B **System Console Personal Computer**

All software used by the system console personal computer is downloaded from the 5364 System Unit when the network is enabled.

C **Token-Ring Network Multistation Access Unit**

The IBM Token-Ring Network wiring and the 8228 Unit(s) require no software.

D **Personal Computer Work Stations**

Each PC work station on the LAN requires:

- DOS 3.2 or higher

- IBM Token-Ring Network PC Adapter Support Interface

- PC Support/36 (5727-WS6)

- PC Support/36 Work Station Feature (Feature 6181)

See the *IBM Token-Ring Network PC Adapter Guide to Operations* for information about installing the IBM Token-Ring Network PC Adapter Support Interface.

See the *PC Support/36 Technical Reference*, SC21-9097 and the *PC Support/36 Work Station Feature Technical Reference*, SC21-9569, for information about installing the PC Support/36 software. A program is provided (on a PC diskette that comes with the PC Support/36 software) to help with the software installation.

See the *PC Support/36 User's Guide* and the *PC Support/36 Work Station Feature User's Guide*, SC21-9564, for information about using the PC Support/36 software.

Note: *You need only one copy of the PC Support/36 programs. You can use it in the system unit and in the work stations.*

For more information on system setup, see *Setting Up Your System* and *Installing and Customizing Your System — 5364.*

For more information about system operations, see *Operating Your System* and *Using System/36 Communications.*

System/36 PC as Part of a Packet Switching Data Network

The System/36 PC uses the X.25 support to communicate with other systems and controllers over an X.25 packet switching data network (PSDN). The X.25 support is designed to operate with public network services that comply with the 1980 X.25 CCITT[1] interface specifications.

The System/36 PC supports one nonswitched connection to an X.25 network for communications with remote systems and controllers. The maximum speed is 9600 bps.

The following example shows an X.25 packet switching data network:
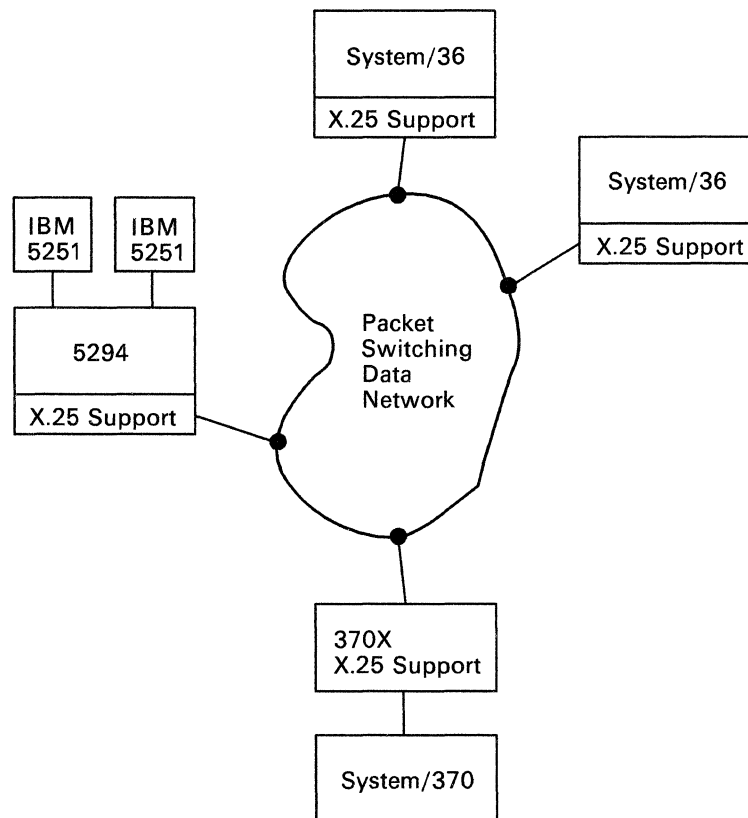
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[1]   Consultative Committee on International Telegraphy and Telephone.

To decide on a PSDN, you must first evaluate your needs and then determine which options most closely meet your needs. You should contact the PSDN carrier for information on available options and the price of each option. You should also ask the PSDN carrier which optional facilities are available because these facilities may vary with each carrier.

Use Form R to record your subscription(s) with the PSDN carrier(s).

R **X.25 Configuration Form**

Customer Name _____
Customer Number_____

X.25 Network Configuration

[1] Network type (A, B, C, or D) ____
Default is **A**

A = Modulo 8 sequencing
B = Modulo 128 sequencing
C = SABM/DISC deviation
D = Remote initiation deviation

[2] Network packet size (128, 256, 512) ____
Default is **128**

[3] Network packet window (2-15)____
Default is **2**

[4] Link level time-out in seconds (1 0-9 9) ____
Default is **3.0**

[5] Local network address _____

[6] Number of logical channels (1-16) ____
Default is **1**

X.25 Logical Channel Configuration

[7] Reference number _____ ► 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

[8] 1 Type (S-switched, P-permanent)   __ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __
Default is **S**

[9] 2 Group number (0-F)   __ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __
Default is **0**

[10] 3 Channel number (00-FF)   __ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __

[11] 4 Call direction (B-both, I-in only, O-out only)   __ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __
Default is **B**

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Note: *During X.25 configuration, you must define the X.25 network and logical channel configuration and the X.25 virtual circuit configuration. Form R covers the planning information for the X.25 network and the logical channel configuration.*

1 **Network type:** Type A supports all the standard functions of X.25 and uses modulo 8 sequencing. Type B is similar to type A, but uses modulo 128 sequencing and has some other differences unique to Japan. Type C is similar to type A, except that it supports the Set Asynchronous Balanced Mode/Disconnect (SABM/DISC) deviation. Type D is similar to type A, except that it supports the remote initiation deviation.

The following table shows, by country and network, the network type to specify when using the X.25 network configuration utility (CNFIGX25). For any network not in the table, specify network type A.

Country	Network	Type
Australia	AUSTPAC	D
Belgium	DCS	D
Denmark	DATAPAK	C
Israel	ISRANET	C
Italy	ITAPAC	D
Japan	DDX-P	B
Mexico	TELEPAC	C
Norway	DATAPAK	C
Singapore	TELEPAC	D
United Kingdom	SWITCHSTREAM 1	C
United States	TELENET	C
All other supported networks		A

2 **Network packet size:** For permanent virtual circuits, this value must be selected at subscription time. You should determine the packet size that will give you the maximum performance for your system needs.

3 **Network packet window:** Window size should be evaluated in terms of cost and performance. If a complete unit of information requires sending two or more packets, then selecting a larger window size to keep these packets together could improve performance.

4 **Link level time-out in seconds:** This value is the amount of time you want the system to wait for a response from the X.25 network.

5 **Local network address:** This address may be up to 15 decimal digits. The first 4 digits must be the network identification if you enter the local network identification with the network address.

6 **Number of logical channels:** Logical channels determine how many remote terminals or processes you would like to access at one time. You will require at least that many logical channels.

7 **Reference number:** Reference numbers are shown in ascending order. These numbers provide an easy reference to the logical channels.

8 **Type:** Permanent virtual circuits and switched virtual circuits are offered at different costs. Decide how many of your applications communicate continuously with remote applications, and how many of your applications require communications only occasionally.

9 **Group number:** Specify the group number of each logical channel in the X.25 network subscription.

10 **Channel number:** Specify the channel number of each logical channel in the X.25 network subscription.

11 **Call direction:** Specify the direction in which calls can occur on each logical channel in the X.25 network subscription. This applies only to switched virtual circuits.

Selecting and Ordering Communications Equipment and Facilities

When you order communications equipment and facilities, you need to know what to order and who to call.

This task should help you determine the equipment (such as modems) and facilities (such as the service provided by a telephone company) that are needed for your System/36 PC to communicate with other devices or systems.

To do this task, you need these forms, which are available in Appendix A:

- Form M, *Modem Ordering Information*

- Form N, *Communications Line Ordering Information*

- Form N1, *Local Area Network Ordering Form*

- Form R, *X.25 Configuration Form*

You will refer to the completed form(s) when you order the equipment.

Ordering the Modem(s)

If you are installing a remote data communications line and did not order IBM modems along with your system, you must order a modem for your System/36 PC. A compatible modem (preferably the same modem type) is also required at the remote controller or system.

You can order the modem(s) from your IBM marketing representative, your IBM-approved remarketer, a modem supplier, or the communications common carrier (telephone company or PTT).

The modem that you select depends on the network connection and the maximum line speed.

The network connection can be switched point-to-point, nonswitched point-to-point, or nonswitched multipoint.

Note: For multipoint, one modem must be a control modem and the others tributary.

The maximum line speed for the different types of communications are:

- For asynchronous communications (total for two lines)

  4800 bps on IBM Personal Computer and IBM Personal Computer XT[2]

  9600 bps on IBM Personal Computer AT®

  Note: If you are using duplex asynchronous communication facilities, the maximum line speed on the IBM Personal Computer AT is 4800 bps if one line is used, or 2400 bps for each line if two lines are used. The maximum line speed on the IBM Personal Computer or IBM Personal Computer XT is 2400 bps if one line is used, or 1200 bps for each line if two lines are used.

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[2] Trademark of IBM

• For BSC

   4800 bps on IBM Personal Computer and IBM Personal
   Computer XT

   9600 bps on IBM Personal Computer AT

• For SDLC

   9600 bps on line 1 (all personal computer models)

   19.2 kbps half-duplex each on lines 3 and 4 (supported only
   on the IBM Personal Computer XT and the IBM Personal
   Computer AT)

   Note: For SDLC communications, consider the following:

   *If you are connecting several lines in a multipoint network
   to a line splitter, you must either: (1) Specify NONRZI for
   the NRZI parameter of the SETCOMM procedure, or (2)
   Configure the splitter so that it uses the request-to-send
   line to gate transmit data on the network.*

• For X.25

   9600 bps duplex (supported only on the IBM Personal
   Computer XT and the IBM Personal Computer AT)

Fill out the upper portion of a copy of Form M for each modem
needed.

If you are ordering IBM modems:

1. Determine the appropriate modem type from the chart on the
   next page.

2. Record the IBM modem type on Form M in the space provided.

3. Refer to the appropriate manual from the following list for a
   complete description of communications line requirements and
   other planning information:

   • *3863, 3864, and 3865 Introduction and Site Preparation Guide*
   • *5841 Guide to Operations*
   • *3833 and 3834 Modems, Planning and Site Preparation Guide*
   • *IBM 5810 Enclosure, 5811-10 and 5811-18 Modems, Planning
     and Site Preparation Guide*
   • *5865 and 5866 Modems, Planning and Site Preparation Guide*

Network Connection (Line Type)	Line Speed	Mode Sync/Async	IBM Modem
Switched Point-to-Point	0-300 BPS	ASYNC	5841
	600 BPS	SYNC/ASYNC	5841
	1200 BPS	SYNC/ASYNC	5841
	2400 BPS	SYNC	3863 MODEL 02
	4800 BPS	SYNC	3864 MODEL 02
Nonswitched Point-to-Point	2400 BPS	SYNC	3833
		SYNC	3863 MODEL 01
		SYNC	5811 MODEL 10
	4800 BPS	SYNC	3834
		SYNC	3864 MODEL 01
		SYNC	5811 MODEL 10
	9600 BPS	SYNC	3865 MODEL 01
		SYNC	5811 MODEL 10
		SYNC	5865
Nonswitched Multipoint (Control or Tributary)	2400 BPS	SYNC	3833
		SYNC	3863 MODEL 01
		SYNC	5811 MODEL 10
	4800 BPS	SYNC	3834
		SYNC	3864 MODEL 10
	9600 BPS	SYNC	3865 MODEL 02
		SYNC	5911 MODEL 10
		SYNC	5865

M Modem Ordering Information

Complete this part of Form M.

System/36 PC Line Number ___1___
Modem Location __El Paso__
1 IBM EXTERNAL MODEM
  Model __3864 Model 2__
2 NON-IBM EXTERNAL MODEM

B9084072-2

4. Call your IBM representative or your IBM-approved remarketer to order the modems.

If you are ordering non-IBM modems:

1. Specify the modem options on the lower portion of Form M.

    You will need to specify modem options, either when you order
    the modems or when the modems are installed. While not all
    modems have the same options, several options are widely
    available.

M   Modem Ordering Information

System/36 PC Line Number _____1_____

Modem Location _____Branch Office_____

1 **IBM EXTERNAL MODEM**
      Model. _____

2 **NON-IBM EXTERNAL MODEM**
      Manufacturer: _____ABC_____
      Model: _____XOXX_____

3 **MODEM OPTIONS:**
   OPTIONS FOR SWITCHED AND NONSWITCHED MODEMS

Clocking	☑ Provided by modem	☐ Provided by system (1200 bps only)
Continuous Carrier (Constant Request to Send/Clear to Send [RTS/CTS])	☐ Yes	☑ No
Grounding to modem frame	☐ Yes	☑ No
Duplex (required for X 25)	☐ Yes	☐ No

   OPTIONS FOR SWITCHED MODEMS

Autoanswer control	DTR ONLY	
Autocall unit	☐ Yes	☑ No
Ring indicator	EIA level required	

ABT001-3

Some options are already marked on Form M; the other options
described in the following paragraphs are recommended for use
with System/36 PC:

**Continuous Carrier (Constant Request to Send/Clear to
Send [RTS/CTS]):**
If the System/36 PC is the control station on a 4-wire
multipoint or nonswitched point-to-point network and the
modem is for the System/36 PC, mark *Yes* for the
continuous carrier option. Otherwise, mark *No* to indicate
that the carrier is controlled by the request to send (RTS)
signal. Some switched full-duplex modems may also
require this option.

Duplex:
> Mark *Yes* if the modem is to be used to connect to an X.25 packet switching data network or to an asynchronous network.

Autoanswer control:
> If the modem is for the System/36 PC and if you want the System/36 PC to answer calls automatically, the option that indicates autoanswer is to be controlled by data terminal ready (DTR) only is required.

Ring indicator:
> EIA/CCITT signal is required on EIA/CCITT Pin 22.

2. Call the modem supplier or common carrier to order the modems.

   a. Specify the following information:

     • Network connection

     • Line speed

     • Modem options (from Form M)

   b. Request the following information needed to order the line and record it on Form N:

     • For any network:

       – Homologation numbers (for countries other than the United States or Canada)
       – Line type (the type of communications line required)
       – Line termination requirements

     • For a *nonswitched* network:

       – Line conditioning (the type of line conditioning required)

     • For a *switched* network:

       – Any other communications line requirements, such as telephone set options
       – Modem manufacturer (also record modem model)

     • If an external coupler is not required:

       – FCC registration number (United States only)
       – Ringer equivalence number

3. If an external coupler *is* required, call a coupler supplier to obtain the following information and record it on Form N:

     • Manufacturer's name

     • Coupler type

     • FCC registration number (United States only)

     • Ringer equivalence number

Ordering the Line

1. Record the line speed on Form N. (See the section on "Ordering the Modem(s)" for maximums allowed.)

   (The line interface type is preprinted on the form.)

N	**Communications Line Ordering Information**

   System/36 PC Line Number __1__

   Line Speed ___4800___ bps

   System/36 PC Line Interface Type ___EIA/CCITT___

   Homologation Numbers _____
   (not used in US & Canada)

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2. If you are ordering non-IBM modems, you should already have completed Form N when you called the modem supplier. Skip to step 4.

3. If you are ordering IBM modems, enter this information on Form N:

   - For a *nonswitched line*:

     - Line type

       These modems require a type 3002 basic (United States only) or equivalent 4-wire communications line: the 3833, 3834, and 3863 Model 1; 3864 Model 1; 3865 Model 1; 3865 Model 2; 5865, and 5866.

     - Line termination requirements

       A 404B or 459A surface-mount receptacle or a flush-mount receptacle is required. Refer to the IBM 3833, 3834, 3863, 3864, 3865, 5811, 5865, and 5866 planning and site preparation guides for additional information about connecting these modems to nonswitched lines.[2]

---

[2] When you order line terminations, some telephone companies may require a USOC code JKS for the receptacle. Contact your IBM marketing representative or your IBM-approved remarketer to get this information. Other telephone companies may need only a physical description of the receptacle (a standard 4-prong receptacle).

- Line conditioning

  D1 line conditioning may be required by the 3865-1
  modem. C1 or D2 line conditioning may be required by
  the 3865-2.

N   **Communications Line Ordering Information**

System/36 PC Line Number __1__

Line Speed __9600__ bps

System/36 PC Line Interface Type __EIA/CCITT__

Homologation Numbers
  (not used in US & Canada)

NONSWITCHED LINE INFORMATION

  Line type   __3002__

  Line termination requirements   __4-wire term in 404B surface-mount receptacle__

  Line conditioning   __D1__

SWITCHED LINE INFORMATION

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- In countries other than the United States and Canada,
  the IBM 3864-1 modem requires normal-quality data
  communications lines. The 3865 modems usually require
  communications lines meeting the requirements given by
  CCITT recommendation M1020. However, in some
  countries, lower cost facilities can be used.

  Consult your IBM marketing representative or your
  IBM-approved remarketer to get information on the
  specific procedures and facilities available in your
  country, and enter the information on Form N.

- For a *switched line*:

  - Line type

    Specify a 2-wire switched line. Also specify that the local loop must be for data transmission at speeds faster than 300 bps.

  - Line termination requirements

    For the 3863 Model 2 and 3864 Model 2 modems, request an RJ41 (fixed loss loop or programmable) data jack or an RJ45 (programmable only) data jack. The RJ45 type is recommended. If you are using a telephone handset with these modems, you will also need an RJ36 jack to connect the telephone to the line.

    For the 5841 modem, request an RJ11 data jack. For some applications, an RJ12 or RJ13 telephone jack may be needed (see the *5841 Guide to Operations*). You will not need a separate jack if you are using a telephone handset, since it can be plugged into the back of the 5841 modem.

  - Telephone set options

    For the 3863 Model 2 and 3864 Model 2 modems, the telephone set should have an exclusion key connected for data. The telephone set may also have one or more of the following recommended options:

    — Data set controls the line
    — Aural monitoring (a feature supplied by the telephone company)
    — Pushbutton dial or rotary dial
    — Voice mode indication

    For the 5841 modem, you may order an optional telephone set that the telephone service in your area supports. It may be:

    — Tone dial (Bell 2500 series or equivalent), or
    — Pulse dial (Bell 500 series or equivalent)

    Note: In the United States, the connection to the line is made through integrated protective circuits in the modem. In Canada, the connection is made through an external data coupler type CBS (supplied by the communications facility supplier).

- Modem information

  In the United States, record the following:

  — For the 3863 Model 2 or 3864 Model 2

    • FCC Registration Number: *AN09-SA-67992-DP-N*

    • Ringer Equivalence: *0.8B*

  — For the 5841 modem

    • FCC Registration Number: *AMQ9-SQ-58411*

    • Ringer Equivalence: *0.9B*

- In countries other than the United States and Canada, the characteristics of switched lines are those of the public switched network as described by the PTT in each country. Contact your IBM marketing representative or your IBM-approved remarketer for more information.
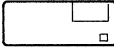
N Communications Line Ordering Information	
System/36 PC Line Number *1*	
Line Speed *4800* bps	
System/36 PC Line Interface Type	EIA/CCITT
Homologation Numbers (not used in US & Canada)	
NONSWITCHED LINE INFORMATION	
Line type	
Line termination requirements	
Line conditioning	
SWITCHED LINE INFORMATION	
Line type	*Two-wire switched line*
Line termination requirements	*RJ45 data jack*
Telephone set options	*Data set controls the line*
	Aural Monitoring
	Pushbutton dial
Modem information	
Manufacturer	
FCC Registration Number	*AN09-SA-67992-DP-N*
Ringer Equivalence	*0.8B*

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4. Call the communications common carrier and order the line, providing the information you recorded on Form N.

Ordering Parts of the Local Area Network

If you are ordering parts of the Local Area Network (LAN), complete Form N1, *Local Area Network Ordering Form*.

N1   **Local Area Network Ordering Form**

1. **Network PC Adapter**

   Token-Ring Network PC Adapter II (Feature 5063)   How many?   *2*

   Token-Ring Network PC Adapter (Feature 9100)   How many?   _____

2. **Adapter Cables**

   ☐ Type 3 Media Filter   How many?   _____

   ☑ Token-Ring   How many?   *2*

3. **Network Cabling Components**

   Multistation Access Units   How many?   *1*

   Patch Cable(s)

   2 4 m (8 ft) long   How many?   *2*

   9 1 m (30 ft) long   How many?   _____

   22.9 m (75 ft) long   How many?   _____

   45 7 m (150 ft) long   How many?   _____

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1. A Token-Ring Network PC Adapter is required for each system console personal computer and for each personal computer work station connected to the LAN. Two versions of this adapter are available:

   - The IBM Token-Ring Network PC Adapter II (Feature 5063) is **required** in each system console personal computer. If you want your System/36 PC to have two LAN connections (to the same LAN or to two separate LANs), two of Feature 5063 are required.

   - Either the IBM Token-Ring Network PC Adapter (Feature 9100) or the IBM Token-Ring Network PC Adapter II (Feature 5063) can be used in the personal computer work stations. One adapter is required for each work station.

   Determine how many adapters of each version you need and write in those numbers.

2. One adapter cable is required for each Feature 5063 or Feature 9100 ordered.

   • Order Type 3 Media Filter cables if your network uses telephone twisted-pair wiring. For more information, see the *IBM Token-Ring Network Telephone Twisted-Pair Media Guide*, GA27-3714.

   • Order Token-Ring cables if your network uses the IBM Cabling System.

   Determine which kind you need, then write in how many.

3. Other network cabling components may be required. If you have your network wiring installed for you, some of these items may be included; order only what is needed.

   • Multistation Access Units

   You can connect up to eight devices to each access unit. You can connect up to 72 devices with nine access units if you are using Type 3 Media Filter cable. You can connect up to 255 devices with 32 access units if you are using the IBM Cabling System.

   Write in how many multistation access units you need. If these units are already included in your network wiring, specify 0.

- Patch cables

  Patch cables are used in three places:

  a. To connect the multistation access unit to the closet receptacle inside the wiring closet (one cable for each device or controller attached to the LAN).

  b. To connect several multistation access units together (one for each unit).

  c. To extend other cables in the IBM Cabling System. For example, you can use a patch cable to extend the adapter cable, thus allowing a work station to be positioned farther away from the wall receptacle.

  Patch cables are available in four lengths:

  - 2.64 meters (8 feet)

  - 9.1 meters (30 feet)

  - 24.75 meters (75 feet)

  - 49.5 meters (150 feet)

  Check to see if these are already included in your network wiring. Determine how many patch cables you need of each length, and write in those numbers.

Give the completed N1 form to your IBM representative or your IBM-approved remarketer.

Establishing Procedures with the Remote Site

This task provides information on getting ready to communicate with a remote site. Basically, this involves setting up procedures and informing the remote site of your intentions.

Site with Remote Controller and Work Stations

If you have remote work stations, write a document with the procedures to be used by your local System/36 PC operator and by the remote site operator.[3] Consider the following:

1. How to establish communications. For example:

   - If your System/36 PC always starts the connection, provide your operator with the remote site telephone number, and tell the remote site operator how to answer the call (switched lines only).

   - If the remote site is to call your System/36 PC, provide the remote site with the local telephone number, and provide your operator with instructions for answering the call (switched lines only).

2. How to terminate the connection.

3. Communications security.

4. Who can be contacted for help or information.

_____

[3]   The manual *Operating Your System – 5364*, SC21-9453, provides partial instructions for establishing a connection. These instructions should be completed by the system manager or programmer after your system has been configured.

Site with Remote System

If your System/36 PC is to communicate with a remote system, prepare an informational packet for your System/36 PC operator that contains the following information:

- Location of the remote system

- For switched lines, the telephone number to call to establish connection

- How to establish communications, for example:

  - Connection procedure (call or answer)

  - Program that must be running when the connection is made

- The telephone number of the person to contact for help or information at the remote site

- The type of remote system, for example:

  - System/370 running CICS/VS under OS/VS

  - System/3033 running IMS/VS under OS/VS2

  - System/370 with BTAM under DOS/VSE

  - System/38 with BSC or APPC

  - 3600/4700 using the SSP-ICF Finance Subsystem

  - System/36 with:

        SSP-ICF Peer (SNA)
        SSP-ICF APPC (SNA)
        SSP-ICF BSCEL (BSC)
        Batch BSC
        APPN
        Async

- Communications security

- Termination process

- Address of your System/36 PC in the network

A similar packet should be prepared at the remote site for the remote site operator. You should verify that this is completed.

Preparing for System Configuration

Before you can use the communications support on your System/36 PC, you must configure the hardware and software (programs) you will use. You should fill out the following forms to prepare for the configuration process.

You describe the hardware by completing Form H, H1, or H2 in the manual *Preparing to Install Your Work Stations – 5364.*

You describe the software (if any) by completing the SSP Features portion of Forms J2 and J3 in the manual *Performing the First System Configuration for Your System – 5364.*

If you have remote work stations, you must also describe certain attributes of the line by completing Form I, Communications Line Definition Form, which is in Appendix A.

Complete Form I as follows:

Communications Line Definition Form						

Characteristics	Line Number					
	1	2	3	4	9	10
Which line is being defined? (1-10)	1	2	3	4	9	10

Line 3 usage:
    N – Not used
    S – Used for SDLC
    X – Used or X.25
        X.25 configuration member name ___ ___ ___ ___ ___ ___ ___ ___						

What type of line is it? 1 – Nonswitched 2 – Switched manual call 3 – Switched autoanswer 4 – Switched manual answer 5 – X.21 Short-hold mode 6 – IBM Token-Ring Network						
Does it have automatic reconnect for the line? Y – Yes N – No						

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- Line 3 usage:

  Specify N if line 3 is not used, S if line 3 is used for SDLC, or X if line 3 is used for X.25.

  If you are defining line 3 to be used with an X.25 network, you must assign an X.25 member name. This member name can be up to 8 characters long and must begin with an alphabetic character (A through Z), #, $, or @. The remaining characters can be any combination of characters (numeric, alphabetic, and special) except commas (,), apostrophes ('), blanks, question marks (?), slashes (/), and hyphens (-).

  You must use this same name when you are creating your X.25 configuration member using the CNFIGX25 utility.

- What type of line is it?

  For each line you are using, specify the type of line.

  - If the line is nonswitched, specify a 1 for that line.

  - If the line is switched, decide which of the following best describes the use of your communications line:

    - Specify a 2 for *manual call* if your System/36 PC operator must place the call to the remote system and place the modem in data mode to establish the communications connection.

    - Specify a 3 for *autoanswer* if your System/36 PC will automatically answer an incoming call to establish the connection (the operator is not involved).

    - Specify a 4 for *manual answer* if your System/36 PC operator must answer an incoming call and place the modem in data mode to establish the communications connection.

  - If the line is a Local Area Network, specify a 5.

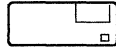- Does the line have automatic reconnect capability?

  For remote controllers that are signed on the System/36 PC, automatic reconnect provides recovery on a switched or nonswitched line. If a line error or station error occurs, automatic reconnect causes the System/36 PC to periodically try to make contact with the device and, when the device is ready, the connection is automatically reestablished.

Appendix A. Forms

This appendix contains (in alphabetic order) the forms to be used while completing the preparation tasks. The forms can be removed and copied.

- Communications Line Definition Form (Form I)

- Modem Ordering Information (Form M)

- Communications Line Ordering Information (Form N)

- Local Area Network Ordering Form (Form N1)

- X.25 Configuration Form (Form R)

Communications Line Definition Form

Characteristics	Line Number					
	1	2	3	4	9	10
Which line is being defined? (1-10)						

Line 3 usage:
  N – Not used
  S – Used for SDLC
  X – Used or X.25
     X.25 configuration member name   ___ ___ ___ ___ ___ ___ ___ ___
	■			■	■	■

What type of line is it? 1 – Nonswitched 2 – Switched manual call 3 – Switched autoanswer 4 – Switched manual answer 5 – X.21 Short-hold mode 6 – IBM Token-Ring Network		■			■	
Does it have automatic reconnect for the line? Y – Yes N – No		■			■	■

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M Modem Ordering Information

System/36 PC Line Number _____

Modem Location

1 IBM EXTERNAL MODEM

    Model: _____

2 NON-IBM EXTERNAL MODEM

    Manufacturer: _____

    Model: _____

3 MODEM OPTIONS:

    OPTIONS FOR SWITCHED AND NONSWITCHED MODEMS

|		
Clocking	☑ Provided by modem	☐ Provided by system (1200 bps only)
Continuous Carrier (Constant Request to Send/Clear to Send [RTS/CTS])	☐ Yes	☐ No
Grounding to modem frame	☐ Yes	☑ No
Duplex (required for X.25)	☐ Yes	☐ No

    OPTIONS FOR SWITCHED MODEMS

Autoanswer control	DTR ONLY	
Autocall unit	☐ Yes	☑ No
Ring indicator	EIA level required	

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N Communications Line Ordering Information
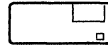
System/36 PC Line Number ___

Line Speed _____ **bps**

System/36 PC Line Interface Type ___EIA/CCITT_____

Homologation Numbers
(not used in US & Canada) _____

NONSWITCHED LINE INFORMATION

Line type _____

Line termination requirements _____

Line conditioning _____

SWITCHED LINE INFORMATION

Line type _____

Line termination requirements _____

Telephone set options _____

_____

_____

Modem information

Manufacturer _____

FCC Registration Number _____

Ringer Equivalence _____
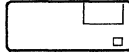
Coupler information

Manufacturer _____

Type _____

FCC Registration Number _____

Ringer Equivalence _____

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N1 Local Area Network Ordering Form

1. Network PC Adapter

Token-Ring Network PC Adapter II (Feature 5063)   How many?   _____

Token-Ring Network PC Adapter (Feature 9100)   How many?   _____

2. Adapter Cables

☐ Type 3 Media Filter   How many?   _____

☐ Token-Ring   How many?   _____

3. Network Cabling Components

Multistation Access Units   How many?   _____

Patch Cable(s)

2.4 m (8 ft) long   How many?   ————

9.1 m (30 ft) long   How many?   ————
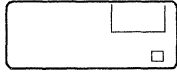
22.9 m (75 ft) long   How many?   ————

45.7 m (150 ft) long   How many?   ————

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R X.25 Configuration Form

X.25 Network Configuration

Network type (A, B, C, or D) ____
   Default is A

    A = Modulo 8 sequencing
    B = Modulo 128 sequencing
    C = SABM/DISC deviation
    D = Remote initiation deviation

Network packet size (128, 256, 512) ____
   Default is 128

Network packet window (2-15) ____
   Default is 2

Link level time-out in seconds (1.0-9.9) ____
   Default is 3.0

Local network address _____

Number of logical channels (1-16) ____
   Default is 1

X.25 Logical Channel Configuration

Reference number: _____→ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

1. Type (S-switched, P-permanent)
   Default is S

2. Group number (0-F)
   Default is 0

3. Channel number (00-FF)

4. Call direction (B-both, I-in only, O-out only)
   Default is B

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Appendix B. Realtime Interface Co-Processor (X.25/SDLC) Card Setup Instructions

The X.25/SDLC card can support two communications lines.
Port A on the card will always be line 3 on the System/36 PC;
Port B on the card will always be line 4 on the System/36 PC. An
RS-232-C electrical interface board (Feature 6051) must be installed
on the card for Port A if you want to run X.25 or SDLC on line 3.
Another RS-232-C electrical interface board (Feature 6051) must be
installed on the card for Port B if you want to run SDLC on line 4.

The X.25/SDLC card must be set up for your specific installation;
instructions are included below, telling you what to do. Before
attempting to perform these instructions, look through the manual
Realtime Interface Co-Processor Guide to Operations, 6523312
(shipped with Feature 6050). You will be using it as a guide when
performing the instructions given below. **DO NOT remove or
change the position of any switches, jumpers, or components
on the card at this time.** You do not have to fill out the
configuration tables in the back of that manual.

Use Chapter 1, "Hardware Installation" in the *Realtime Interface Co-Processor Guide to Operations* manual as a guide, and perform the following setup operations on the X.25/SDLC card. **DO NOT remove or change the position of any switches, jumpers, or components except as directed below:**

1. Set SW1, SW2, SW3, and SW4 to the On position. This sets up the X.25/SDLC card for physical designation 0.

2. Set the jumpers on JP4A and JP4B for Interrupt Level 4.

3. Set the jumpers on JRA, JRB, and JRC for the following:

   a. Set jumpers M1 and M2 to the positions as shown in the *Realtime Interface Co-Processor Guide to Operations* manual.

   b. Set jumper BW for an 8-bit bus.

   c. Set jumper ED for a one-edge expansion slot.

   d. Set jumper BN to the amount of memory on your card.

   e. Set jumpers L1, L2, and L4 for Interrupt Level 4.

4. Set the jumpers on JP8 and JP9 so that the external receive clock will be from the remote clock on the electrical interface board.

5. Set jumper J1 on the RS-232-C electrical interface board for Inbound Clock.

6. Install the RS-232-C electrical interface board(s) on the X.25/SDLC card.

   - Install in location A on the card if you want to use X.25 or SDLC on line 3.

   - Install in location B on the card if you want to use SDLC on line 4.

   - Install in both locations on the card if you want to use SDLC on both lines.

7. Before installing the card, verify that all the switches and jumpers are positioned correctly.

To install the X.25/SDLC card and configure your System/36 PC, do the following:

1. Install the X.25/SDLC card in your personal computer as directed in Chapter 1, "Hardware Installation" of the *Realtime Interface Co-Processor Guide to Operations.*

2. Run diagnostics as directed in Chapter 2, "Problem Determination Procedures" of the *Realtime Interface Co-Processor Guide to Operations.*

   When the diagnostics are running, the display IBM Realtime Interface Co-Processor will be shown. If your installation is correct, you will see the following:

   • Y in the PRESENT column

   • 02A0 in the CARD ADDR column

   • 04 in the LVL column

   • 8 in the BUS column

   If this information is not displayed, reverify all steps in the setup instructions, make sure the card is correctly installed (seated properly), and run the diagnostics again.

3. Install the cables as directed in Chapter 1, "Hardware Installation" of the *Realtime Interface Co-Processor Guide to Operations.*

4. Make sure that the power switch is set to On for the 5364 System Unit and the personal computer.

5. Go to "Task 4. Loading the System/36 Attachment Programs" in *Installing and Customizing Your System — 5364.* Follow the instructions in that manual to complete system configuration.

You do not have to install any software on the personal computer. The required programs are included in the System/36 PC Release 5, Modification Level 1 SSP (5727-SS6) and the Base Communications feature (5727-SS6). They will be downloaded to the personal computer by the system.

To resolve any displayed system reference codes (SRC) see the *5364 System Unit System Reference Codes (SRC),* the *System/36 PC System Problem Determination,* or the *Installing and Customizing Your System — 5364* manual.

Appendix C. IBM Token-Ring Network PC Adapter Special Considerations

When you install an IBM Token-Ring Network PC Adapter card according to the instructions in the *IBM Token-Ring Network PC Adapter Guide to Operations*, one of the things you do in Chapter 2 is set the read-only memory (ROM) switches to specified values.

If you use **ROM ADDRESS: DC000** (Setting #2), you may get an error with a system reference code (SRC) of **9A25** during the autoconfig process (it depends on what other features you have installed).

If this error occurs, change the switch settings on the adapter with **ROM ADDRESS: DC000** to one of the following memory location addresses, and try again.

Memory Location	Bits 19 to 14	Switches 1 to 6 (F=OFF N=ON)
CE000	1 0 0 1 1 1	F N N F F F
C4000	1 0 0 0 1 0	F N N N F N
C6000	1 0 0 0 1 1	F N N N F F
C8000	1 0 0 1 0 0	F N N F N N
CA000	1 0 0 1 0 1	F N N F N F

Appendix B in the *IBM Token-Ring Network PC Adapter Guide to Operations* explains this information.

See that manual also for instructions on removing and installing the adapter.

Glossary

access. To go to or reach; to get at.

advanced program-to-program communications (APPC). Communications support that allows System/36 to communicate with other systems having the same support. APPC is the way that System/36 puts the IBM SNA LU-6.2 protocol into effect.

APPC. See *advanced program-to-program communications (APPC)*.

asynchronous. (1) Not occurring in a regular or predictable pattern. (2) Without regular time relationship.

asynchronous transmission. In data communications, a method of transmission in which the bits included in a character or block of characters occur during a specific time interval. However, the start of each character or block of characters can occur at any time during this interval. Contrast with *synchronous transmission*.

attribute. A characteristic. For example, an attribute for a displayed field could be blinking. (BGU/36) A characteristic of a graph that you can change.

aural. Relating to the ear or to the sense of hearing.

autoanswer. In data communications, a line type that does not require operator action to receive a call over a switched line. Contrast with *manual answer*.

autocall. In data communications, the ability of a station to place a call over a switched line without operator action. Contrast with *manual call*.

automatic reconnect. An option specified during system configuration that allows a remote work station controller to be reconnected automatically on a switched or nonswitched line.

batch. Pertains to activity involving little or no operator action. Contrast with *interactive*.

binary. (1) Pertaining to a system of numbers to the base two; the binary digits are 0 and 1. (2) Involving a choice of two conditions, such as on-off or yes-no.

binary synchronous communications (BSC). A form of communications line control that uses transmission control characters to control the transfer of data over a communications line. Compare with *synchronous data link control (SDLC)*.

bps. Bits per second.

BSC. See *binary synchronous communications (BSC)*.

BSCEL (binary synchronous communications equivalence link) subsystem. The SSP-ICF subsystem that provides BSC communications with another System/36 and many other BSC computers and devices.

call. (1) To activate a program or procedure at its entry point. Compare with *load*. (2) In data communications, the action necessary in making a connection between two stations on a switched line.

CCITT. Consultative Committee on International Telegraphy and Telephone.

character. A letter, digit, or other symbol.

CICS subsystem. The SSP-ICF subsystem that allows binary synchronous communications with CICS/VS.

CICS/VS. Customer Information Control System, which operates on a host system such as a System/370, or a 30xx or 43xx processor.

clocking. In data communications, a method of controlling the number of data bits sent on a communications line in a given time.

command. A request to the system to perform an operation or a procedure.

common carrier. In data communications, any government-regulated company that provides communication services to the general public.

communications. See *data communications*.

communications adapter. A hardware feature that enables a computer or device to become a part of a data communications network.

communications link. See *data link*.

compatible. Characteristics designating devices, programs, products, or systems that can work together. Multiple units of one type would have equivalent functions and capabilities.

configuration. The group of machines, devices, and programs that make up a data processing system. See also *system configuration*.

configuration member. (1) A library member that describes the devices, programming, and characteristics of the system. (2) In data communications, a member that defines the attributes of a communications subsystem or line.

configure. (1) To describe (to the system) the devices, optional features, and program products installed on a system. (2) To describe to SSP-ICF both the communications facilities connected to System/36 and the attributes of the subsystem and remote system.

control station. The primary or controlling computer on a multipoint line. The control station controls the sending and receiving of data.

controller. Circuitry or a device used to coordinate and control the operation of one or more devices.

data communications. The transmission of data between computers and/or remote devices (usually over a long distance).

data link. The equipment and rules (protocols) used for sending and receiving data.

data mode. In data communications, a time during which BSC is sending or receiving characters on the communications line.

data stream. All information (data and control information) transmitted over a data link.

data terminal equipment (DTE). The data processing unit that uses communications lines.

decimal. (1) Pertaining to a system of numbers to the base ten; decimal digits range from 0 through 9. (2) A proper fraction in which the denominator is a power of 10.

decode. To interpret a code; for example, the number 0010 coded in binary can be decoded to the decimal number 2. Contrast with *encode*.

digit. Any of the numerals from 0 through 9.

digital data service adapter (DDSA). In data communications, a device used when transmitting data using a nonswitched digital data system. Compare with *modulator-demodulator (modem)*.

DSR. Data set ready.

DTE. See *data terminal equipment (DTE)*.

DTR. Data terminal ready.

duplex. Pertains to communications in which data can be sent and received at the same time. Same as full duplex. Contrast with *half duplex*.

EIA. Electronic Industries Association.

encode. To convert data into a code; for example, the decimal number 2 can be encoded to the binary number 0010. Contrast with *decode*.

FCC. Federal Communications Commission.

feature. A programming or hardware option, usually available at an extra cost. For example, Communications is a feature of the System Support Program Product.

field. One or more characters of related information (such as a name or an amount). Records are comprised of fields.

Finance subsystem. The SSP-ICF subsystem that allows System/36 to communicate with the 3601 and 4701 Finance Controllers and the 3694 Document Processor.

full duplex. See *duplex*.

half duplex. Pertains to communications in which data can be sent in only one direction at a time. Contrast with *duplex*.

handset. The part of a telephone used for talking and listening.

hardware. The equipment, as opposed to the programming, of a system.

host system. The primary or controlling computer in a communications network. See also *control station.*

IMS/IRSS (Information Management System/Intelligent Remote Station Support) subsystem. The SSP-ICF subsystem that provides synchronous communications with IMS/VS. IMS/VS operates on a host system such as a System/370, or a 30xx or 43xx processor.

interactive. Pertaining to activity involving requests and replies as, for example, between an operator and a program or between two programs. Contrast with *batch.*

interactive communications feature (SSP-ICF). A group of communications features of the System Support Program Product that allows a program to interactively communicate with another program or system.

interface. The means of interaction between two devices or systems that handle data in different ways, such as in different codes or formats.

LAN. See *local area network (LAN).*

licensed program. An IBM-written program that performs functions related to processing user data.

link. In data communications, the connection between two systems.

local. Pertaining to a device, file, or system that is accessed directly from your system, without the use of a communications line. Contrast with *remote.*

local area network (LAN). The physical connection among devices located on the same premises for information transfer.

location name. In interactive communications, the identifying name associated with a particular system or device.

logical unit (LU). The part of a system or device in an SNA network that allows a user or program to use the communications network.

manual answer. In data communications, a line type that requires operator actions to receive a call over a switched line. Contrast with *autoanswer.*

manual call. In data communications, a line type requiring operator actions to place a call over a switched line. Contrast with *autocall.*

mode. A method of operation. For an example, see *enter/update mode.*

modem. See *modulator-demodulator (modem).*

modulator-demodulator (modem). A device that converts data from the computer to a signal that can be transmitted on a communications line, and converts the signal received to data for the computer.

multiple. More than one.

multipoint. In data communications, pertains to a network that allows two or more stations to communicate with a single system on one line.

network. A collection of data processing products connected by communications lines for information exchange between stations.

non-return-to-zero inverted (NRZI). On System/36, a method of data transmission where the signal is changed to transmit a 0 bit. For the 1 bit the signal stays the same. This ensures that the signal does not stay the same for an extended period of time.

nonswitched line. A connection between computers or devices that does not have to be established by dialing. Contrast with *switched line.*

NRZI. See *non-return-to-zero inverted (NRZI).*

numeric. Pertaining to any of the digits 0 through 9.

operator. (1) A person who operates a device. (2) A symbol that represents an operation to be done.

patch cable. A signal cable that connects network products together and to the IBM Cabling System.

Peer subsystem. The SSP-ICF subsystem that allows System/36 to communicate with another System/36 or System/34 using SNA/SDLC.

point-to-point line. A communications line that connects a single remote station to a computer.

problem determination. The process of identifying why the system is not working. Often this process identifies programs, equipment, data communications facilities, or user errors as the source of the problem.

program. (1) A sequence of instructions for a computer. (2) To write a sequence of instructions for a computer. Same as *code.*

program product. A licensed program for which a fee is charged.

programmable. Designating a device whose operation can be controlled by a program.

protocol. A set of rules governing the communication and transfer of data between two or more devices in a communications system.

PTT. Public Telephone and Telegraph Administration.

remote. Pertaining to a device, file, or system that is accessed by your system through a communications line. Contrast with *local.*

remote controller. A device, attached to a communications line, that controls the operation of one or more remote display stations and printers.

SDLC. See *synchronous data link control (SDLC).*

session. (1) The logical connection by which a System/36 program or device can communicate with a program or device at a remote location. (2) The length of time that starts when an operator signs on the system and ends when the operator signs off the system.

signal. A detectable physical quantity or impulse (as a voltage, current, or magnetic field strength) by which messages or information can be transmitted.

SNA. See *systems network architecture (SNA).*

software. Programs, languages, and/or routines that control the operations of a computer in solving a given problem.

special character. A character other than an alphabetic or numeric character. For example; *, +, and % are special characters.

SSP-ICF. See *interactive communications feature (SSP-ICF).*

station. A computer or device that can send or receive data.

subsystem. The part of communications that handles the requirements of the remote system, isolating most system-dependent considerations from the application program.

switched line. In data communications, a connection between computers or devices that is established by dialing. Contrast with *nonswitched line.*

synchronous. Occurring in a regular or predictable sequence.

synchronous data link control (SDLC). A form of communications line control that uses commands to control the transfer of data over a communications line. Compare with *binary synchronous communications (BSC).*

synchronous transmission. In data communications, a method of transmission in which the sending and receiving of characters is controlled by timing signals. Contrast with *asynchronous transmission.*

system. The computer and its associated devices and programs.

system configuration. A process that specifies the machines, devices, and programs that form a particular data processing system.

system unit. The part of the system that contains the processing unit, the control panel, the disk drive and the disk, and either a diskette drive or a diskette magazine drive.

System/36 LAN communications. The hardware and microcode that allows System/36 to be connected to the Token-Ring Network.

systems network architecture (SNA). A set of rules for controlling the transfer of information in a data communications network.

terminal. In data communications, a device, usually equipped with a keyboard and a display device, capable of sending and receiving information over a communications line.

token-ring network. The local area network (LAN) designed to run on the IBM Cabling System.

transmission control characters. In data communications, special characters that are included in a message to control communication over a data link. For example, the sending station and the receiving station use transmission control characters to exchange information; the receiving station uses transmission control characters to indicate errors in data it receives.

tributary station. In data communications, a secondary device on a multipoint line.

unique. The only one.

voice-grade telephone line. A telephone line that
is normally used for transmission of voice
communications. The line requires a modem for
data communications.

work station. A device that lets people transmit
information to or receive information from a
computer; for example, a display station or printer.

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