# BLACK BOX

## NETWORK SERVICES

# LinkUp 5294
# DL5294 Firmware
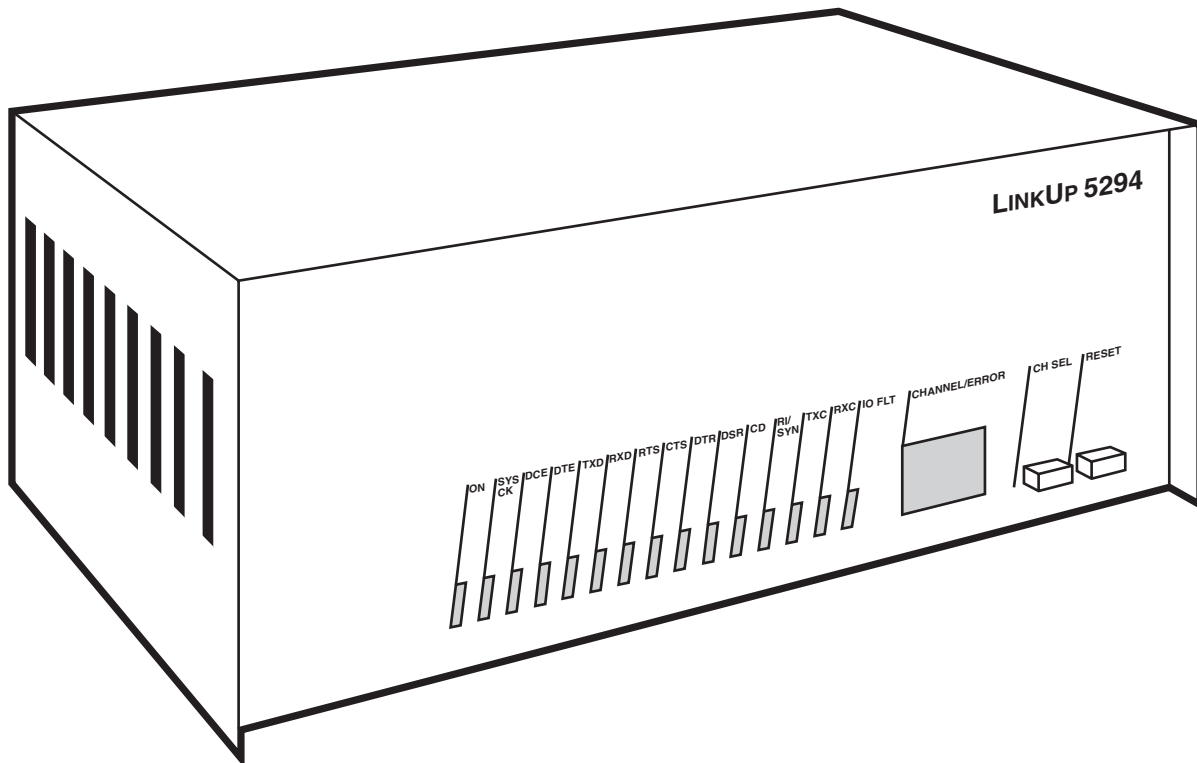


LINKUP 5294

ON SYS CK DCE DTE TXD RXD RTS CTS DTR DSR CD RI/SYN TXC RXC IO FLT CHANNEL/ERROR CH SEL RESET

**FEDERAL COMMUNICATIONS COMMISSION**

**AND**

**INDUSTRY CANADA**

**RADIO FREQUENCY INTERFERENCE STATEMENTS**

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

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

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

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

## INSTRUCCIONES DE SEGURIDAD (Normas Oficiales Mexicanas Electrical Safety Statement)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

18. Servicio por personal calificado deberá ser provisto cuando:

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

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

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

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

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

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# Contents

# Contents (continued)

# Contents (continued)

# Contents (continued)

# 1. Specifications

**Protocol —**     SNA/SDLC

**Speed —**     100 bps to 19.2 kbps; Autobaud (300–9600) standard

**Emulation —**     Controller: IBM® 5251 M12, 5294, and 5394

**Indicators —**     Channel/Error display; Power monitor; System OK LED;
Channel Status LEDs: DCE, DTE, TXD, RXD, CTS, DTR, CD, TXC, RI/SYN,
RXC I/O FAULT

**Interface —**     To host: synchronous RS-232C/V.24, DTE or DCE selectable;
To users: asynchronous RS-232C/V.24 or RS-530, DTE, DCE, or auto-selectable

**Connectors —**  Host: DB25 female to user's DB25 female or DB9 male

**Power —**     115 or 230 VAC, switch-selectable, 50 or 60 Hz, 50 watts

**Size —**     6"H x 16.8"W x 11"D (15.2 x 42.7 x 27.9 cm)

**Weight —**     17 lb. (7.7 kg)

# 2. Introduction

The LinkUp 5294 is one of the most feature-rich protocol converters on the market today. For example, it supports the following:

- IBM PC to System/3X file transfers

- Up to 19.2K baud rate, synchronously and asynchronously

- Dual System/3X hosts

- Packet Data Network Access

- Viral Device Addressing

- Auxiliary printing

- Advanced diagnostic and system information functions

Functionally, the LinkUp is designed to convert an IBM System/3X host's synchronous (SNA/SDLC) protocol to asynchronous (and vice versa). It also translates the IBM host's EBCDIC code to ASCII (and vice versa). To accomplish these tasks, it emulates an IBM 5251 Model 12 Remote Workstation Controller, a 5294 Remote Cluster Controller, or a 5394 Remote Cluster Controller. PU Type 1 is implemented by the LinkUp in all emulations.

The LinkUp attaches to the sync communications adapter on your System/34/36/38 or AS/400. It can be directly (with just an RS-232 cable) or remote (through synchronous modems).

Once you make the connections, the LinkUp enables almost any ASCII terminal or personal computer and word processor (with the appropriate terminal-emulation software installed) to appear to the IBM host as an actual 5251 Model 11, 5291, or 5292 Display Workstation, implemented as LU Type 7. It also lets almost any ASCII printer to appear to the IBM host as an actual 5224, 5225, or 5256 Printer Workstation, implemented as LU Type 4. Each of these ASCII devices can be directly or remotely connected through asynchronous modems.

Figure 2-1 shows a typical LinkUp 5294 application.
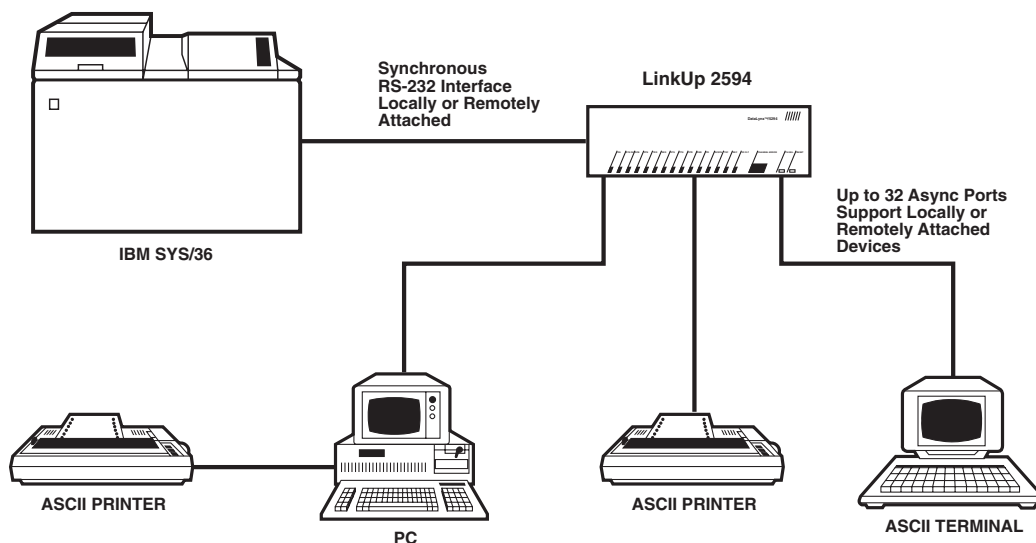


**Figure 2-1. A Typical Application of the LinkUp 5294.**

The base model is equipped with a minimum of two sync ports, and can be easily upgraded in increments of four or eight ports, until a maximum of 34 (numbered 0 through 33) are installed. Call your supplier to find out how to order this upgrade when you wish to expand the number of connectors on your LinkUp unit.

## NOTE

**Port 0 and Port 1 support synchronous transmissions. Ports 2 through 33 support asynchronous transmissions.**

The following manuals may prove useful during the installation and operation of the LinkUp 5294.

- IBM 5250 Information Display System Functions Reference

- IBM Synchronous Data Link Control General Information

- IBM Systems Network Architecture Concepts and Products

# 3. Features and Applications

This chapter covers the features and applications of the LinkUp 5294.

## 3.1 Display Emulation Support

The LinkUp 5294 enables almost any ASCII terminal or personal computer and word processor (with the appropriate terminal emulation software installed) to appear to your System/3X host as an actual 5251 Model 11, 5291, or 5292 Display Workstation. It accomplishes this through a variety of Terminal Modules.

A Terminal Module is a device driver which is designed after a specific ASCII terminal type, with some of the terminal type's unique features incorporated into the module in order to optimize its performance.

## NOTE

**Any terminal (or terminal emulation software) capable of simulating the terminal type of a specific module can also be supported by that module. See Appendix D for a complete list of the various terminals, personal computers, and word processors currently supported by the LinkUp 5294.**

Each Terminal Module has a full implementation of all of the 5250 screen handling facilities, such as attributes and cursor positioning, and most of the keyboard functions. The specific display attributes supported by the LinkUp include the following:

- Reverse Image

- Column Separator

- Non-display

- High-Intensity

- Blink

- Underscore

Any combination of these is also possible.

However, these facilities are supported only as well as the terminals in your application support them. In other words, if the terminal in your application does not support one of the listed attributes, the LinkUp 5294 cannot implement that attribute for the terminal.

Another feature is Screen Optimization. Instead of clearing and repainting a terminal's screen of data for every new update, the LinkUp simply repaints the terminal's screen with only the updated new characters, keeping the amount of screen painting to a minimum.

Each of the 5250 keyboard functions supported by the LinkUp Terminal Modules has been implemented in a manner most suited to the keyboard layout of the particular terminal that the module is designed after. The supported 5250 functions are listed below:

**CURSOR MOVEMENT**

- Character Backspace
- Cursor Up
- Cursor Down
- Cursor Left
- Cursor Right
- Field Advance
- Field Backspace
- New Line
- Fast Left
- Fast Right

**SPECIAL CONTROL**

- Error Reset
- Insert
- Delete
- Erase Input
- Home

**FIELD EXIT**

- Duplicate
- Field Minus
- Field Plus
- Field Exit

**SPECIAL HOST**

- System Request

**SIGNAL**

- Attention

**AID GENERATING**

- Enter
- Clear

- Help

- Print

- Roll Up

- Roll Down

- CMD 1
  CMD 2
  CMD 3
  CMD 4
  CMD 5
  CMD 6
  CMD 7
  CMD 8
  CMD 9
  CMD 10
  CMD 11
  CMD 12
  CMD 13
  CMD 14
  CMD 15
  CMD 16
  CMD 17
  CMD 18
  CMD 19
  CMD 20
  CMD 21
  CMD 22
  CMD 23
  CMD 24

# NOTE

**Appendix F lists all the currently supported terminal modules and the unique key sequences assigned for each of their supported 5250 functions.**

In addition to the standard 5250 keyboard functions supported by the LinkUp 5294, the following eight extended functions are provided:

- **Local Copy Print Request —** prints the contents of your screen to a printer configured and assigned to a terminal (or terminals) as a Local Copy printer.

- **Local Copy Form Feed —** sends a form-feed command to the printer configured and assigned to a terminal (or terminals) as a Local Copy printer.

- **Cancel Print —** cancels a print request sent to a printer configured and assigned to a terminal (or terminals) as a Local Copy Printer.

- **Refresh Screen —** redisplays the last transmitted CRT screen on the screen buffer stored within the LinkUp 5294. This key is useful when a terminal's display is garbled by line errors.

- **Toggle Status Line/Toggle Indicators —** toggles the display of the status indicators generated by the LinkUp to Row 24 of a terminal's screen.

- **Toggle Echoplex Enabled —** toggles the ability of the LinkUp 5294 to echo characters to a terminal's screen. This function will wait only if you configure it as such in the LinkUp Configurator Mode.

- **Initialize Terminal —** causes a terminal to reinitialize without resetting the LinkUp port to which the terminal is attached. You are exited from the System/3X host session (referred to as Emulation Mode) and returned to the LinkUp sign-on menu (called Connect Mode) even if the LinkUp 5294 has been configured to prevent access to this operating mode. When this function is invoked, the host is informed that the workstation's power has been turned off.

- **Request Disconnect —** similar to Initialize Terminal in that it exits you from the System/3X host session (Emulation Mode). However, unlike Initialize Terminal, it will reset the LinkUp port to which the terminal is attached. The LinkUp resets its port by dropping DTR if it is configured as a DTE interface or DSR if it is configured as a DCE interface. When a terminal is remotely connected to the LinkUp by asynchronous modems, this function will cause the modem to hang up. And like Initialize Terminal, this function informs the host that the workstation's power is off.

Another LinkUp feature is a Status Line of five indicators displayed on row 24 of an attached terminal while it is operating in Emulation Mode. The LinkUp displays this line the first time a terminal enters Emulation Mode; thereafter, you may toggle it on or off with the key sequence corresponding to the extended function of Toggle Status Line/Toggle Indicators. These indicators are listed below:

- **SYS AVAIL: —** System Available indicator is set (turned on) whenever the terminal is receiving polls from the System/3X host.

- **MSG WT: —** Message Waiting indicator, controlled by the host, is set whenever you have messages waiting to be read.

- **INS MODE: —** Insert Mode indicator is set whenever **[INSERT]** is pressed. Insert Mode can be reset (turned off) by pressing the **[ERROR RESET]** or one of the Aid Generating keys.

- **INPUT INH: —** Input Inhibited indicator is set after an Aid Generating key is pressed. This indicates the keyboard has been locked by the host and you should not type any data. The System/3X host will reset this indicator after is has completed the requested data processing. (Operator errors will also cause this to be set.) Only System Request and Attention keys are valid while input is inhibited.

- **AWFER: —** A Waiting Field Exit Required indicator is set when data is entered into the last position of a field the host has marked as requiring the function of Field Exit to be invoked. It is reset once the field is exited. (On an actual IBM workstation, the cursor blinks to indicate AWFER).

Support for a 25th line Status Line display is available for the following terminals: Hazeltine Esprit 10/51, Lear Siegler ADM-11, TeleVideo 925, Wyse 30, Cyberne XLB-5291, Rebus 3000, and FileLynx/5251. The status display is exactly the same as it had been on line 24, and the Toggle Status Indicators keystroke is accessed in the same manner.

Because of design characteristics of the Wyse 30 and the Cybernec XLB-5291, the ERROR nnnn-mmmm portion of the Status Line in columns 64 through 79 of the 25th line is sometimes unable to  display at the proper time. As this part of the Status Line is displayed only in the event of an error between the LinkUp and the System/3X, this limitation should be of little or no consequence to you.

## NOTE

**If the host or terminal  attempts to write data to Row 24 while the Status Line is on, the LinkUp automatically toggles the Status Line off and displays the data.**

## 3.2 Printer Emulation Support

The LinkUp 5294 enables almost any ASCII printer to emulate IBM 5224, 5225, or 5256 Printer Workstations via its 12 distinct Printer Modules. Eleven of the Printer Modules are designed for specific ASCII printer types. They Make use of particular features of the printers so as to optimize the module's performance. The twelfth module is a generic PRINT module.

# NOTE

**Any printer that can emulate a printer supported by one of the Printer Modules can also be supported by that module, but the support is only as good as the emulation. See Appendix C of this manual for a list of the various printers currently supported by the LinkUp.**

The LinkUp does not currently support all SCS commands. See the Table 3-1 for a description of which printer module supports which SCS commands.

**Table 3-1. Supported SCS Commands.**

| HEX SEQUENCE | SCS COMMAND NAME |
|---|---|
| 0C | Form Feed |
| 0D | Carriage Return |
| 15 | New Line |
| 1E | Inter Record Separator |
| 25 | Line Feed |
| 2B C1... | Set Horizontal Form |
| 2B C2... | Set Vertical Form |
| 2B C6... | Set Line Density |
| 2B D2... | Set Character Density |
| 34 4C... | Relative Vertical Move |
| 34 C0... | Absolute Horizontal Move |
| 34 C4... | Absolute Vertical Move |
| 34 C8... | Relative Horizontal Move |
| 35... | Transparent |

The following printer modules support the SCS commands listed above:

- CENTRN

- CI300

- DP8050

- EPSON

- GE3000

- GEN34

- GEN44

- HPDPL

- HPDPP

- HPGEN

- OKIM84

- PRINT

# NOTE

**Because of a design characteristic of the Genicom® and GE3000 printers, the LinkUp must select a character font at the same time it sets character density (10 cpi vs. 15 cpi). As character fonts are not otherwise selectable in LinkUp, whenever it receives a Set Character Density command from the System/3X host the LinkUp sets the GEN34, GEN44, or GE3000 printer to the DP (draft quality) font. If another font is desired, it must be selected manually and the LinkUp must not be sent an SCD command.**

**The PRINT printer module does not support Set Line Density or Set Character Density.**

**For those printer modules which support 15 characters per inch character density, the LinkUp can be set, through SCS commands, to support 198 column printing regardless of what line length is configured in the printer LU. The SCS commands can override the configuration.**

Once the appropriate configuration parameter values are defined, the LinkUp can support a printer by three different connections:

1. When the printer is directly connected to one of its asynchronous ports.

2. When the printer is remotely connected to one of its ports through asynchronous modems.

3. When the printer is sharing one of its ports with a directly or remotely connected terminal, personal computer, or word processor, through the terminal's auxiliary port.

Situation #3 is called the Auxiliary Printer facility of the LinkUp 5294. See Figure 3-1 for a diagram of this facility.
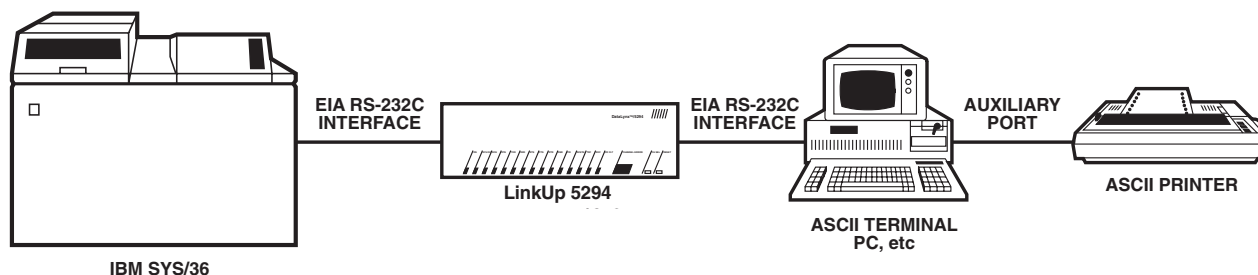


**Figure 3-1. Auxiliary Printer Facility.**

When this facility is activated, a printer attached to a terminal's auxiliary port is addressed by your System/3X host (and the LinkUp) as if it were attached by its own distinct line, with full System/3X printer emulation capabilities. The difference between a printer attached to its own LinkUp asynchronous port and one sharing a port with a terminal through the terminal's auxiliary port is the process of interleaved printing—two devices sharing a single port are operated concurrently and are instructed by the LinkUp to alternate, with the terminal having priority over the printer.

A choice of two distinct printer operating modes can be defined in the LinkUp Configurator Mode:

• System printing

• Local Copy printing

A System printer is one that accepts print jobs from the System/3X host. A Local Copy printer is one which accepts a command from you to print the contents of a terminal screen. To invoke a local copy print request, you must press the key sequence (appropriate for the selected Terminal Module) corresponding to the extended function of Local Copy Print Request.

# NOTE

**If the following conditions are not met, a Local Copy Print Request will be ignored and no error message will display.**

**The printer must be defined in Configurator Mode as LOC, indicating a Local Copy printer.**

**The printer must be associated, through Configurator or Connect Mode. to the terminal attempting to invoke the Local Copy Print Request function.**

**The printer must not be currently printing another terminal operator's screen (as it is possible to assign the same printer to more than one terminal operator).**

If transparent transmission of Escape sequences to ASCII devices is desired, the LinkUp will translate EBCDIC Hex BB to ASCII Hex IB (Escape) for this purpose when using the US character set.

The LinkUp supports the System/3X host's printer SIGNAL requests:

• printer intervention required

• printer component available

"Printer intervention required" is sent by the LinkUp when a Printer Workstation goes off-line; for example, if the power is turned off or paper runs out. When this SIGNAL is received by the host, the print job is halted. Once the printer is restored to an on-line state, the LinkUp sends "printer component available" to the host, which causes the host to start the interrupted print job from where it left off. This procedure assures you that no loss of data occurs.

When a printer is connected to the LinkUp by its own port and its connect mode parameter has been configured as dedicated, the device ready signal (specified in Configurator Mode) is used by the LinkUp to determine when to send the SIGNALs. However, when its connect mode parameter has been configured for automatic answering, the LinkUp is unable to implement this facility. This is because, when the device ready signal drops, the LinkUp disconnects the device from its coupled session.

# NOTE

**The printer attached to the LinkUp must be obtained so that its device ready signal matches the value configured in the LinkUp.**

The conditions under which the LinkUp implements printer SIGNALs for an auxiliary printer are different. Since an auxiliary printer is connected to the LinkUp by a terminal, it cannot directly communicate with the LinkUp—it must rely on the auxiliary port provided by the terminal it is attached to. Therefore, if the terminal cannot relay to the LinkUp the auxiliary attached printer's off-line and on-line states, the printer is restricted to following the off-line and on-line transmissions of the terminal.

## 3.3 Virtual Device Addressing

With "Virtual Device Addressing," the LinkUp is able to support as many as 32 distinct devices. Virtual device addressing allows the LinkUp to recognize each device that attaches to one of its ports through a logical address; or, in other words, logical unit or LU number.

A logical unit and a physical asynchronous port are said to be coupled after you complete signing on to the LinkUp during Connect Mode. However, being physically connected to Port 3 does not mean you have to specify LU 3 as your assigned logical unit. Instead, by virtual device addressing, the LinkUp allows you (and your terminal operators, providing you do not configure the asynchronous port's associated logical unit as non-overridable) to specify any one of the 32 supported LinkUp LUs (provided you have configured all of them as valid in your application).

Conversely, a logical unit and an asynchronous port are said to be decoupled when a physical or logical disconnection occurs between the attached ASCII device and the LinkUp. For example, the LU and port are decoupled when your communi-cation line drops, or when the LinkUp times out after the configured Inactivity Time Limit is reached. If a logical unit and an asynchronous port are decoupled, then the formerly coupled LU can be accessed from another physical port; or another LU can be coupled at the same physical port. In Figure 3-2, several diagrams a provided to show these various LU-port coupling options.

# NOTE

**Establishing a communication link with your System/3X host for each of these LUs means you must define a workstation identification number (also called a local session ID or LSID), recognized as viable by your host, to each LinkUp LU. This is done by entering your host's LSID to the LinkUp configuration parameter of Local Station Address.**
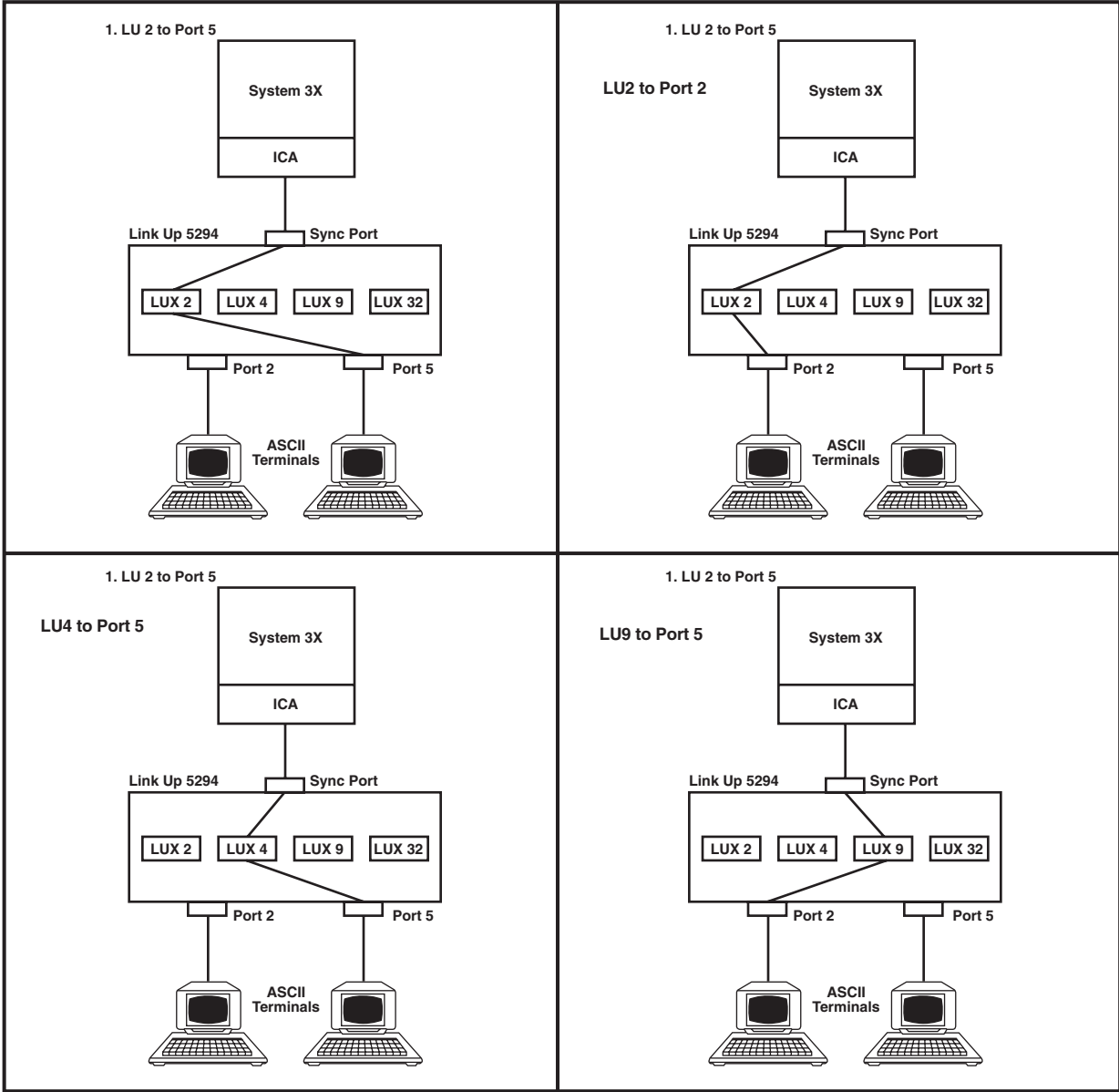
**Figure 3-2. Logical Unit to Physical Port Coupling Options.**

The virtual device addressing concept also enables the LinkUp to support its Auxiliary Printer facility. Once the appropriate configurations are made in the LinkUp, a terminal connected to an asynchronous port can sign on to the LinkUp (at Connect Mode), specify an LU associated with an auxiliary printer LU, and have both devices supported on that single port. See Figure 3-3 for a diagram of this feature.
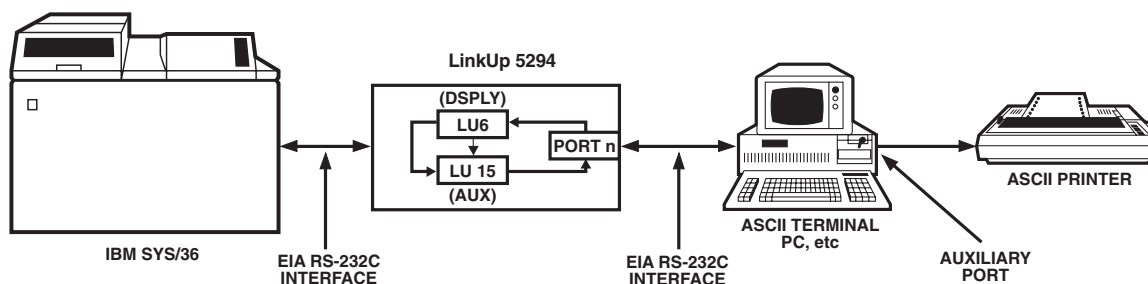


**Figure 3-3. Dual LU to Single Physical Port Coupling.**

## 3.4 User-Friendly Facilities

The LinkUp is designed to be user-friendly. You should have very little, if any, difficulty operating it. Here are some of the facilities that make the LinkUp 5294 easier to operate:

- A Menu-Driven Configurator Mode, enabling you to define a variety of operational parameters by menu selections. These define the operating characteristics of the LinkUp's synchronous and asynchronous ports, logical units, and attached devices.

- Help Messages are available at each of the LinkUp operating mode menu prompts (including Connect, Configurator, and Setup) whenever you type a <?> in response to the prompt.

- Non-volatile Electrically Erasable PROM (EEPROM) storage of every parameter value you define in Configurator Mode. This enables the LinkUp to retain your configured values even when its power is turned off.

- Password protection for Configurator Mode, preventing anyone from accessing it and redefining the LinkUp parameter values unless authorized with the correct password.

- Operating and Channel Status Indicators on the front panel of the LinkUp unit. These let you monitor your unit's overall system health and the crucial RS-232C line signals for any port.

- Self-testing performed continuously in the background throughout daily operations. This assures you that the LinkUp is effectively executing its operating programs.

- Automatic baud detection lets the LinkUp automatically detect the incoming baud (or bit) rate of the device you have attached to its asynchronous port.

- An Inactivity Time Limit can be set in Configurator Mode. This enables you to define a maximum amount of time for the LinkUp to maintain the coupling between your terminal, while it is inactive, and its associated LU session.

- A Reconnect Time Limit can also be set in Configurator Mode. This time limit enables the LinkUp to maintain the coupling between a disconnected terminal and its associated LU session. It lets you reconnect and pick up from where the session was interrupted.

- Two-level password protection can be defined for each LinkUp LU whenever you define a Connect Mode password in Configurator Mode. The first level allows the LinkUp to restrict access to an LU from everyone except the one authorized with the correct password. The second one limits access to an interrupted LU session from everyone except the one who initially established the session.

## 3.5 File-Transfer Support

The LinkUp can support file transfers between a System/3X host computer and an ASCII micro, mini, or instrumentation computer, providing the appropriate host and ASCII computer communication and transfer programs are installed. If the ASCII computer is an IBM Personal Computer (or compatible), four software package combinations currently available in the market can be used with the LinkUp:

- FileLynx®/5251 PC* and Emulator Transfer Utility by SSI

- TruLynx®/5251 PC and Emulator Transfer Utility by SSI

- TruLynx/5251 PC and Emulator Transfer Utility by IBM

- TruLynx/5251 PC and PC Support by IBM

*FileLynx/5251 PC can also transfer files without the assistance of a host package by a simple screen-by-screen process. Consult your supplier for more information on the various capabilities of this software package.

# NOTE
### PC Support/400 is not supported on the LinkUp 5294.

However, if the ASCII computer is not IBM compatible, you must provide your own communication and transfer programs for both your 3X host and the ASCII computer. In support of such an application, the LinkUp 5294 provides the COMPU Terminal Module. COMPU was designed especially for a computer-to-computer transfer, and as such differs from the other Terminal Modules in the following ways:

1. Data alone is transmitted; for example, no intensity or cursor-positioning sequences are ever sent, even if your 3X host requests them. This process enables the LinkUp 5294 to convert and pass on the transferred data in the same order it was received.

2. Screen optimization is not performed; instead, the LinkUp completely updates a screen full of data each time an update is required. (Usually, the LinkUp updates a screen of data by repainting only the new data and clearing any old data not similar to the new data.)

3. Transferred data is completely buffered by the LinkUp 5294, enabling a continuous transmission of data. Typically the 3X host inhibits transmission when it is processing received data by inhibiting your keyboard input; normally, the LinkUp 5294 adheres to this procedure and ignores any keyboard input you attempt.

# NOTE
**The COMPU module relies on the normal ASCII-to-EBCDIC and EBCDIC-to-ASCII translations of the data handled by the LinkUp. Additionally, the key sequences defined for its emulation keyboard functions are identical to those used for the ADM3A Terminal Module.**

## 3.6 Modify for 3174 Protocol

The DL5294 Firmware (PCM91) differs from the STD 3174 Firmware (PCM92) in the following aspects only:

- PROM cartridge (the installed firmware)

- Internal EEPROM format

- Amount of RAM installed

- Silkscreened name on front panel of unit

Your LinkUp 5294 with DL5294 Firmware can be modified to support the 3174 protocol by doing the following:

- Ordering the appropriate conversion kit from your supplier.

- Replacing and/or installing the respective parts (in accordance with the kit's provided instructions).

- Invoking Setup Mode (explained in **Section 7.7**).

## 3.7 Port Test and System Management Modes

These two modes perform a variety of valuable diagnostic and information functions. Port Test Mode consists of the following:

- Interface Signal Display (your port only)

- Character Display Test

- Character Echo Test

System Management Mode consists of the following:

- Interface Signal Display (any LinkUp 5294 port)

- Sync Port Address Trace

- Async Port Trace

- Product Configuration and Levels display

- Sync Port Trace

- Character Display Test (the same as in Port Test Mode)

- Character Echo Test (the same as in Port Test Mode)

- LU and Async Port Summary

- Remote Reset

- SNA/SDLC Counters

Port Test Mode is covered in **Section 7.3**. System Management Mode is covered in **Section 7.4**.

## 3.8 5251/5294/5394 Emulation

With 5251, 5294, and 5394 controller emulation, the LinkUp 5294 can be configured to emulate two different controllers concurrently on the LinkUp 5294's two synchronous ports. In other words, both ports can be configured to emulate either a 5251 Model 12 or a 5294 or 5394 controller, or one port can be configured to emulate a 5251 Model 12 while the other emulates either a 5294 or 5394.

## NOTE

**Some capabilities of an actual 5294 or 5394 controller are not fully supported by the LinkUp 5294. For example, Text Assist is not implemented; therefore, DisplayWrite is not supported. Consult your supplier for more information on those capabilities not supported.**

## 3.9 Additional Features

• The LinkUp 5294 can be programmed for up to four controller emulations on one synchronous port (or a maximum of four across the two synchronous ports).

• Five additional functions in System Management Mode (see **Section 3.7** above for a description).

• 5394 Controller emulation.

When the capability of Four Controller Emulations Per One Synchronous Port is implemented, the LinkUp 5294 appears to your host as if it were up to four distinct controllers (each with its own System/3X controller address) on a multipoint line. The LinkUp 5294 supports this facility by mapping each of the 3X controller addresses to the appropriate controller emulations by a logically defined Link Station Address (identified as Links 0, 1, 2, and 3). If so configured, the LinkUp 5294 can emulate as many as four distinct controllers across its two synchronous ports, in any combination (four addresses on one port and none on the other, or three on one port and one on the other, etc.). See **Section 7.5**.

Operating a single LinkUp 5294 as multiple controllers requires that you divide the virtual device addresses (logical units) among the controllers (identified as link station addresses). If your application uses this capability, keep the following limitations in mind:

1. An IBM System/3X will activate at most nine logical units when connected to a 5251 Model 12 controller, only eight logical units when connected to a 5294 controller, or as many as 16 logical units when connected to a 5394 controller.

2. The LinkUp 5294 can emulate up to four controllers simultaneously; those four may be a mix of 5251-12, 5294, and 5394 emulations.

3. Because it has a maximum of 32 logical units available, the LinkUp 5294 can have attached and active at most 32 of the 36 logical units (nine LUs per controller times four 5251-12 controllers) available to your host(s) if emulating 5251-12 controllers. Similarly, only 32 of the possible 64 logical units (sixteen LUs per controller times four 5394 controllers) may be active during 5394 emulation.

When emulating 5294 controllers, the LinkUp can have all 32 of the host's logical units attached and active.

# 4. Hardware Overview

This chapter discusses the LinkUp 5294's hardware components and capabilities.

## 4.1 Front Panel

The front panel of the LinkUp 5294 is shown in Figure 4-1. Status indicators monitor power and RS-232C line signals on the selected channel. Two user controls are provided for easy operation.
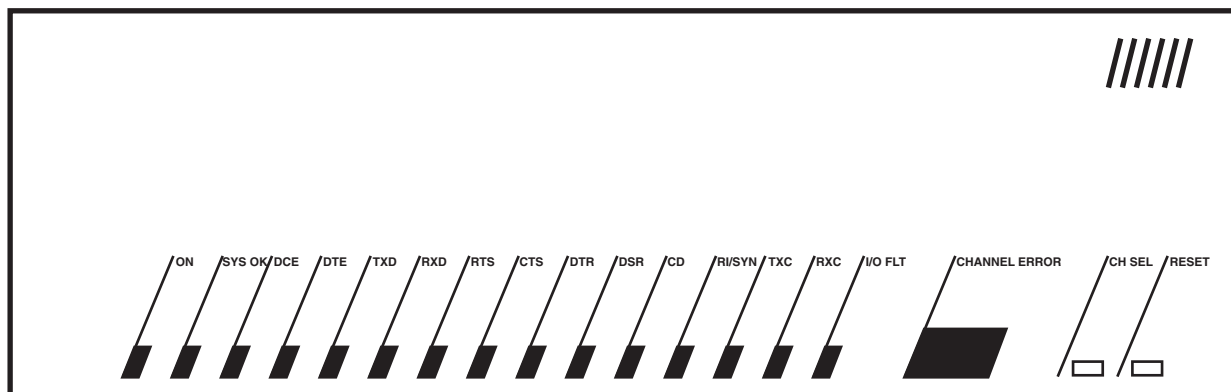


**Figure 4-1. LinkUp 5294 Front Panel.**

## 4.2 Front Panel Controls

Two front panel controls are provided on the LinkUp 5294: the CH SEL button and the RESET button. Each of these controls is discussed below.

- **CH SEL (Channel Select) Button —** The CH SEL button is used to select the channel to be monitored. When the button is pressed, the channel number increases. When held for a longer time, the channel number is incremented at a faster rate. The channel being currently monitored is indicated by the two-digit LED display.

   If the channel number is incremented past the highest channel available in the unit, 88 appears in the display and an LED integrity test is performed. All of the front panel lights are turned on to ensure proper operation. Pressing the CH SEL button again terminates the LED test.

- **The RESET Button —** The RESET button is used to clear error codes from the front panel display. Error codes are listed in of **Section 9.1**. When the first error occurs, pressing RESET clears the error and channel status display resumes. If there is more than one error, the RESET button clears the most recent error and displays the previous one. When all of the accumulated errors have been displayed and cleared, the status lights resume their normal function. Once cleared, errors cannot be redisplayed using the front panel. Therefore, you should write down any error codes that are displayed before you press RESET.

## 4.3 Channel Status Indicators

The LinkUp 5294 is equipped with a full RS-232C status display capable of monitoring the status of any selected port. Each of the indicators is briefly described below. ON indicates that the LinkUp 5294 is either transmitting or receiving the signal as appropriate.

- **DCE/DTE (Data Communications Equipment/Data Terminal Equipment) —** An LED lit for one of these indicates that the port selected has been software-optioned to communicate with either a modem (DTE) or directly to a terminal or printer (DCE).

- **TXD/RXD (Transmit Data/Receive Data) —** These are data signals that indicate transmission of data either to or from the LinkUp 5294.

- **RTS (Request to Send) —** The LinkUp 5294 provides this signal when optioned as DTE or when it expects to receive the signal when optioned as DCE.

- **CTS (Clear To Send) —** The LinkUp 5294 provides this signal when optioned as DCE and expects it from the modem when optioned as DTE.

- **DTR (Data Terminal Ready) —** The LinkUp 5294 provides this signal when optioned as DTE or expects to receive the signal when optioned as DCE. Additionally, when configured as DTE auto-answer, this signal will be provided only after receipt of the Rl (Ring Indicator) signal from the modem.

- **DSR (Data Set Ready) —** The LinkUp 5294 provides this signal when optioned as DCE or expects to receive it from the modem when optioned as DTE.

- **CD (Carrier Detect) —** This LED is lit when the LinkUp 5294 has detected a carrier signal from a remote modem. If no detectable carrier signal is present, or the remote modem hangs up, this LED is turned off.

- **RI/SYN (Ring Indicator/Data Sync) —** This is a dual-function LED. It displays Ring Indicate when the selected port is optioned as DTE/auto-answer in synchronous or asynchronous operation. On the sync port, this LED is always off.

- **TXC/RXC (Transmit Clock/Receive Clock) —** When on, this LED indicates the presence of synchronous clock signals which are required for the sync port. These must always be present for Port 0 and Port 1.

- **I/O FAULT —** On SYNC ports, this LED flashes if a framing error occurs. On asynchronous ports this LED indicates parity errors.

During normal operation in async DTE mode, the following should be on:

<div align="center">DTE, RTS, CTS, DSR and CD</div>

RI will be on during ringing, and DTR will come on after RI is detected.

During normal operation in async DCE mode, the following should be on:

<div align="center">DCE, RTS, CTS, DTR, DSR and CD</div>

In both DTE and DCE modes, the TXD and RXD lights will blink during data transfer.

## 4.4 System Status Indicators

The following system status indicators are provided on the front panel.

- **SYS OK —** This LED blinks to indicate that the system is functioning properly. The LED acts as a "heartbeat" indicator and is never turned off unless there is an unrecoverable error.

- **ON —** When on, this LED indicates that the power supply is functioning properly.

## 4.5 Error Code Display

When a program-detectable error occurs , all channel status indicators are turned off and a two-level error code is displayed using the two-digit channel display. The two error codes are flashed alternately.

## 4.6 Rear Panel
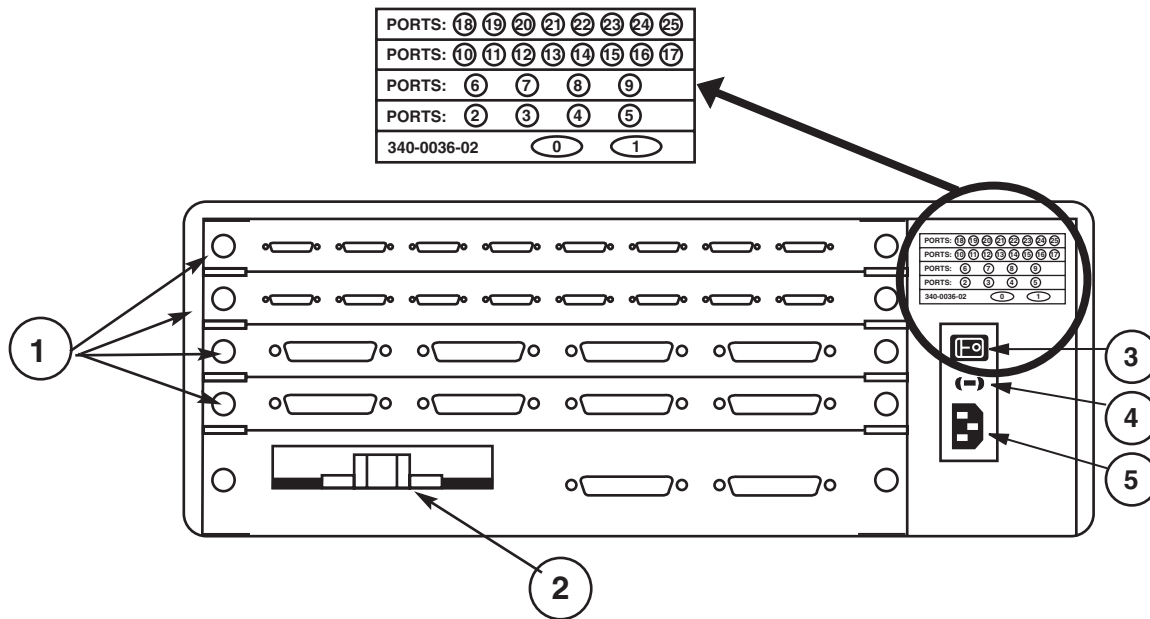


The rear panel of the LinkUp 5294 is equipped with the following:

1. Up to 34 serial (RS-232/V.24 compatible) Ports, numbered 0 through 33.

2. An A.19/.15, 50/60 Hz air flow fan.

3. A rocker-type on/off power switch.

4. A 1-amp, 250-volt fuse just below the power switch (which can be removed by sliding out the rubber fuse cartridge with a screwdriver).

5. A power cord receptacle (below the fuse).

# 5. Electrical Characteristics

This chapter covers the power specifications of the LinkUp 5294 and the requirements of the RS-232C interface for synchronous and asynchronous communications.

## 5.1 Power Specifications

The LinkUp 5294 power supply is rated at 50 watts and operates on 115 or 230 volts (plus or minus 15%) at 50 or 60 Hz (plus or minus 2 Hz). Its power connector is the international standard CEE-22.

## NOTE

**Units with 115 volts are shipped with a 7-foot NEMA 5-15P three-prong plug.**

The LinkUp 5294 is certified to operate in accordance with the following standards:

- **UL —** Underwriters Laboratory: Listed with EDP Equipment/Office (Standards 478), File No. E87479.

- **CSA —** Canadian Standards Association: Certified.

- **IEC —** International Electrotechnical Commission: Designed to meet IEC 380.

- **BPO —** British Post Office: Meets the requirements of Technical Guide #26.

- **FCC —** Federal Communications Commission: Complies with the requirements of U.S. 47CFR Part 15 Subpart J, Class B, assuming shielded RS-232C cables are used.

## 5.2 Cable Pin Requirements

All of the ports on the LinkUp 5294 support the standard EIA RS-232C interface signals. In the next three sections, the signals specific to synchronous and asynchronous communications are identified.

**Synchronous Port**

A minimum conductor synchronous cable that will work with Bell compatible sync modems and the LinkUp 5294 in Modem Eliminator mode requires the following pins: 1 through 8, 15, 17, and 20. If the LinkUp 5294 is to be dialed from the host, Pin 22 most also be supported.

| | | |
|---|---|---|
| 1 | Frame Ground | 1 |
| 2 | Transmit Data (TxD) | 2 |
| 3 | Receive Data (RxD) | 3 |
| 4 | Request To Send (RTS) | 4 |
| 5 | Clear To Send (CTS) | 5 |
| 6 | Data Set Ready (DSR) | 6 |
| 7 | Signal Ground | 7 |
| 8 | Data Carrier Detected (DCD) | 8 |
| 15 | Transmit Clock (TxC) | 15 |
| 17 | Receive Clock (RxC) | 17 |
| 20 | Data Terminal Ready (DTR) | 20 |
| 22 | Ring Indicator (RI) | 22 |

**Asynchronous Port with DB25 Connector**

The minimum requirements of an asynchronous RS-232C cable for use with dedicated terminals provide Pins 1 through 8 and 20. The minimum requirements for use with auto-answer modems provide Pins 1 through 8, 20, and 22.

For directly-connected printers, certain printer types may use Pin 11 to supply a Not Busy signal.

| 1 | Frame Ground | 1 |
|---|---|---|
| 2 | Transmit Data (TxD) | 2 |
| 3 | Receive Data (RxD) | 3 |
| 4 | Request To Send (RTS) | 4 |
| 5 | Clear To Send (CTS) | 5 |
| 6 | Data Set Ready (DSR) | 6 |
| 7 | Signal Ground | 7 |
| 8 | Data Carrier Detected (DCD) | 8 |
| 11 | Busy | 11 |
| 20 | Data Terminal Ready (DTR) | 20 |
| 22 | Ring Indicator (RI) | 22 |

**Asynchronous Port with DB9 Connector**

Cable pinouts for the RS-232C DB9 connector are shown below.

| 1 | Data Carrier Detected (DCD) | 1 |
|---|---|---|
| 2 | Receive Data (RxD) | 2 |
| 3 | Transmit Data (TxD) | 3 |
| 4 | Data Terminal Ready (DTR) | 4 |
| 5 | Signal Ground | 5 |
| 6 | Data Set Ready (DSR) | 6 |
| 7 | Request To Send (RTS) | 7 |
| 8 | Clear To Send (CTS) | 8 |
| 9 | Ring Indicator (RI) | 9 |

# 6. Installation

This chapter describes installation of the LinkUp 5294. A typical local installation to a single host is described. Attachment of local and remote (to the LinkUp 5294) terminals and printers is also included in **Sections 6.3**, **6.4**, and **6.5**. Special considerations for dual host and remote host environments are described in Section 6.6.

Information regarding the configuration of the communication and work station parameters for the System/36 and the System/38 is given in **Appendices E** and **F**, respectively, of this manual.

## 6.1 Installing the LinkUp 5294 and the Configuration Terminal

Configuration and installation of the LinkUp 5294 requires attachment of an asynchronous terminal to one of the asynchronous ports. The terminal is then used in conjunction with the Configurator menus to set the logical configuration parameters. The terminal used for this purpose is referred to as the Configuration Terminal throughout this section.

We recommend that a local terminal be used for initial installation and configuration. This will simplify problem isolation during the installation process. Therefore, the following sections assume that the configuration terminal will be locally attached to the LinkUp 5294. If a remote terminal must be used, see **Section 6.4**.

### 6.1.1 UNPACK THE LINKUP 5294

The LinkUp 5294 is carefully packed in a 25.5" x 15.8" x 11" box. A label on the outside of the box lists the model of the unit, serial number, firmware version number, date of manufacture, voltage setting of the power switch (115 or 230 VAC), and other electrical information. Inside you will find a  a release notice for the latest firmware version, a power cord, and the LinkUp 5294.

Carefully remove the contents of the box and check to see that the above items are present. If an item is missing or defective call your supplier.

## NOTE
**The power cord shipped with units set for 230-volt operation does not include an AC plug. You must supply the appropriate plug.**

### 6.1.2 INSTALL THE LINKUP 5294

The only additional equipment needed to install the LinkUp 5294 is an asynchronous terminal, or personal computer with terminal emulation software installed, and an appropriate length of RS-232C cable. You may also want a small for tightening the cable connection.

The LinkUp 5294 is shipped with all asynchronous RS-232C ports configured as follows:

- DCE

- Autobaud

- 8 bits/character

- No parity

- 1 stop bit

The location of the LinkUp 5294 is not critical as long as the maximum recommended cable lengths are not exceeded. Temperature and humidity are considerations; however, the LinkUp 5294 is no more sensitive than other computer or data-processing equipment. During initial installation and testing, it may be helpful to position the LinkUp 5294 so that the front-panel indicators are easily visible.

### 6.1.3 Set Up the Configuration Terminal

Refer to **Appendix G** for information on setting up your terminal for use with the LinkUp 5294. Ensure that the configuration terminal is set for initial operation with the following values:

• No parity

• 8 data bits

• 1 stop bit

Seven data bits and even parity is also allowed during initial configuration. This configuration allows use of virtually any asynchronous display terminal for configuration. These values are the initial default values for parameters that may be changed later to suit specific requirements.

### 6.1.4 Connect the Configuration Terminal

Connect the terminal to an asynchronous port of the LinkUp 5294 using a standard RS-232C cable. See **Section 5.2** for required cable pinouts. No other data cable connections are required now.

### 6.1.5 Establish Communication

Power on both the LinkUp 5294 and the terminal. Allow a short time, approximately 2 or 3 seconds, for the LinkUp 5294 to perform its internal power-on self tests. Once the selftests are completed and all systems are functioning normally, the SYS OK LED on the front panel begins blinking slowly and 02 appears in the CHANNEL/ERROR display. If this does not occur, see **Chapter 9**.

A banner message similar to the following is displayed on the screen:

```
***5294 CONTROLLER EMULATOR - V1.00U3***

(For Help, Type '?' after any Prompt. To Abort Connect Sequence, Type 'I')
(To Delete Response Characters, use 'Rubout'. To Cancel Response, 'ctrl x'.)
```

The connection is complete when the following prompt appears on the terminal screen:

**Enter Device Type (ADM3A):**

### 6.1.6 Select a Device Type

Determine the appropriate Terminal ID for your terminal and enter it in response to the Enter Device Type prompt.

Type a question mark <?> or refer to **A**ppendix **G** for a list of valid terminal types. If you are using a terminal that is not listed directly, but which emulates one of the supported terminals, use the Terminal ID for the emulated terminal.

## NOTE

**A question mark <?> followed by <Enter> is a valid response at any time during Connect and Configuration Modes. It displays a brief description of the response expected by the LinkUp 5294.**

## 6.2 Accessing the LinkUp 5294 Configurator

This section describes access to the Configurator Mode of the LinkUp 5294. Since logical configuration is unique for each installation, all system information pertinent to this control unit and its attached devices must be readily available and understood before proceeding.

To enter System Management Mode, follow these steps:

1. Establish the connection and enter the appropriate Device Type as described in **Section 6.1**. The prompt "Enter LU Number (0):" is displayed.

2. Enter Port Test Mode by typing 1 in response to the above prompt. The Port Test Mode Menu appears.

3. Select Option 1 from the Port Test Mode Menu to enter System Management Mode. The first entry into System Management Mode requires no password, but the prompt, "Specify New System Password:", appears. Enter a new password to protect against unauthorized access to System Management Mode.

## NOTE

**If the LinkUp 5294 has been previously configured, you may be prompted to enter a password before entry into System Management Mode is allowed. Get the correct password from the System Manager. (If the password is not known, see Section 7.7 of this manual.)**

After entry of a password (if required) and/or a new password (or Enter), the System Management Mode menu is displayed.

4. Select Option 1, Configurator Mode, fran the System Management Mode menu. The prompt "Enter Item to be Configured:" appears, indicating that you are in Configurator Mode. Refer to **Chapter 7** for compete details on use of the Configurator.

Configure the synchronous port, asynchronous port, and LU parameters as required for your installation. Save the changes by entering END at the Enter Change(s): prompt. Exit Configurator and System Management Modes using the same command.

## 6.3 Connecting Additional Local Terminals

Having specified port characteristics to the LinkUp 5294 with the Configurator, ensure that additional terminals you connect are configured correctly. For further information refer to **Appendix G**, which gives individual setup details for all supported terminal types, or consult the literature provided by the terminal manufacturer.

Connect each terminal to the appropriate asynchronous port of the LinkUp 5294 using a standard RS-232C cable.

## NOTE

**When attaching devices to those ports having DB9 connectors, DB9-to-DB25 converter cables may be required. Standard IBM AT serial cables, available from your local PC dealer, may be used.**

## 6.4 Connecting Remote Terminals

For remote terminals, full-duplex asynchronous modems are required. The modems attached to the LinkUp 5294 ports should be configured properly for switched or dedicated lines.

### 6.4.1 LINE CONFIGURATION

Modems on the LinkUp 5294 end of switched lines should permit the following:

- Auto-answer mode.

- Loss-of-Carrier disconnect (causes modem to drop DSR and return to auto-answer state if phone line becomes disconnected).

- External DTR control (causes modem to disconnect from phone line if the LinkUp 5294 drops DTR).

### 6.4.2 MODEM CONSIDERATIONS

Auto-answer modems must be optioned to pass Ring Indicator (Pin 22) to the LinkUp 5294 and for DTE control of DTR (Pin 20). In auto-answer mode, the LinkUp 5294 raises DTR in response to a positive going signal on Ring Indicator. The Ring Indicator signal must be set to be held low or negative except when ringing occurs. See the literature provided with the modem.

User-friendly messages which are generated by some modems (such as Connect) must be disabled. Such messages will interfere with the LinkUp 5294 autobaud detection, causing error during connection.

Connect the modem to the switched or dedicated communication line as appropriate. Connect the modem to an asynchronous port on the LinkUp 5294 using an RS-232C cable. (The LinkUp 5294 port must be configured for DTE operation.)

Connect the terminal to the other modem with an RS-232C cable. Then connect the modem to an appropriate communications line.

## 6.5 Connecting Printers

Printers may be connected to the LinkUp 5294 in one of two ways. Printers which use a serial interface (RS-232C cable) may be connected directly to the LinkUp 5294 using one of the asynchronous ports. The attachment may be either local, using only a cable, or remote, using a pair of modems. An alternative is to attach the printer through the auxiliary port of a terminal which is in turn attached to the LinkUp 5294. Special considerations for installation of printers are discussed in the following paragraphs.

### 6.5.1 LOCAL PRINTERS

The following information applies if a directly attached printer is used:

- The port to be used must be configured with no overridable parameters, since the printer cannot be used to answer Connect Mode prompts.

- Configure the LU associated with the port as a PRT (printer) LU.

- Connect the printer to one of the async ports on the rear of the LinkUp 5294. Make sure that the port interface parameters agree. The autobaud option cannot be used for printers.

Once the printer is turned on and put on line, it should be recognized by the LinkUp 5294. If the host is properly configured, there is no further action required.

### 6.5.2 REMOTE PRINTERS

In addition to the considerations listed above, the following applies to remote printers:

- Connect the printer to the modem as instructed by the modem manufacturer's literature. A telephone is required to dial the number unless the printer or modem provides an alternate dialing method.

- The LinkUp 5294 modem should be optioned for Auto Answer if the printer operator will be dialing into the port. Set the communications parameters of the printer, modems, and the LinkUp 5294 port to match. A fixed baud rate must be used.

At the LinkUp 5294 site, the operator can monitor the port and observe the Ring Indicator flashing during the dial-up. Once the LinkUp 5294 answers the call, the DTR and DSR lights will remain on. If this does not happen, refer to **Chapter 9** for help in correcting the problem.

### 6.5.3 AUXILIARY PRINTERS

The following considerations apply to auxiliary printers attached directly to remotely connected terminals.

- Verify that the auxiliary port of the chosen terminal is supported by the LinkUp 5294. Refer to the **Appendix G** for a list of terminals which support auxiliary printers.

- Connect the printer to the auxiliary or printer port of the terminal. Set the auxiliary port parameters to agree with the printer requirements.

- The LU associated with the terminal must be configured to support an auxiliary printer LU. The printer itself is defined through configuration of its own LU.

## 6.6 Connecting the LinkUp 5294 to the Host Computer

The LinkUp 5294 can be attached to the host front end in one of three ways as shown in
Figure 6-1.
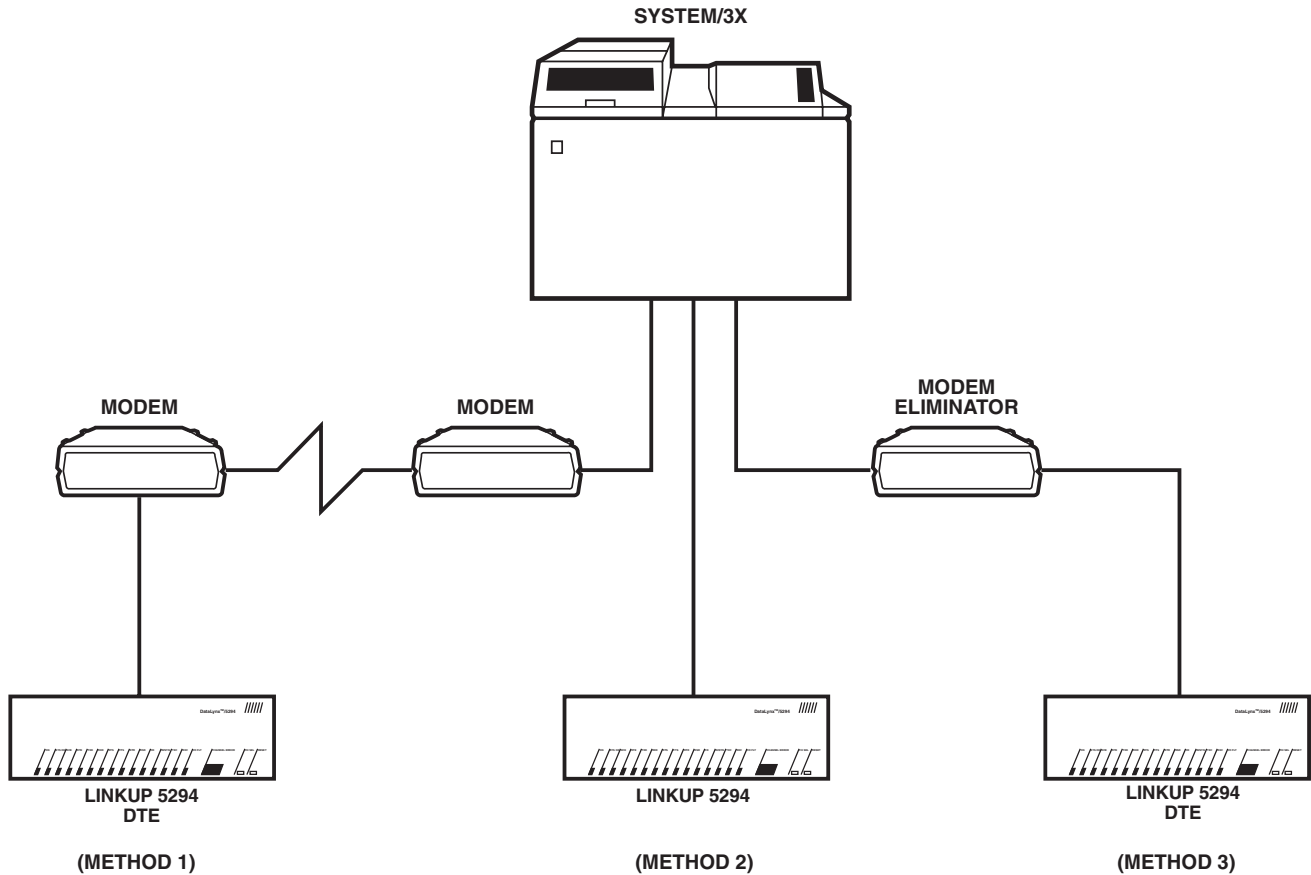


As shown in Figure 6-1, the DTE/DCE setting of the port depends on the type of connection used.

**Method 1:**

If the LinkUp 5294 is attached using a pair of synchronous modems, the sync port must be configured
as DTE. The two modems are connected through a dial-up or dedicated line. In such an installation,
clocking is typically provided by the modem; thus the LinkUp 5294 bit rate must be set for EXTERNAL
clocking. Refer to the modem manufacturer's literature for instructions on setting the modem for
Internal Clocking and Carrier Controlled by Request to Send.

**Method 2:**

This method is used when the LinkUp 5294 is installed in close proximity to the S/3X. The connection
consists of a single cable with no other communications equipment. In this case, the LinkUp 5294 sync
port must be configured as DCE. The bit rate is controlled by the LinkUp 5294 and is set during
configuration of the sync port. The LinkUp 5294 uses an internal modem eliminator which provides the
necessary clocking signals.

**Method 3:**

This method is similar to Method 1 except that a modem eliminator is used in place of the pair of modems and the intervening line. The LinkUp 5294 port is set as DTE and the bit rate is controlled externally.

A special case of such an installation is an X.25 network environment. The Modem Eliminator depicted in Figure 6-1 could be a very complex network which connects a variety of devices in addition to the LinkUp 5294 and the host.

### 6.6.1 REQUIREMENTS

Before connecting to the host, get the following information so that you can configure the synchronous ports correctly.

- Link Station address. (If both ports 0 and 1 are used, they may have the same Link Station number.)

- Bit Rate. Use external clocking if the LinkUp 5294 is set for DTE, or specify a bit rate if the LinkUp 5294 is DCE.

- Whether NRZI (Non-Return to Zero Inverted) encoding is used.

- Line configuration half or full duple). If a half- duplex line is used, the LinkUp 5294 will wait for CTS from the modem before sending data.

### 6.6.2 DUAL HOST INSTALLATIONS

By using the LinkUp 5294's two synchronous ports, you can enable the LinkUp 5294 to emulate up to four controllers. These controllers can be defined to communicate with different host computers. For example, a System/34 host can be attached to one of the synchronous ports, while a System/38 host can be connected to the other port. Under this application, you can select which host you want to access by specifying the appropriately associated logical unit during Connect Mode.

Figure 6-2 shows a dual host application with the LinkUp 5294 remotely connected to two different host computers. In this example, the 32 logical units have been divided between the two synchronous ports as follows:

- LU 0 and 2 through 16 - Port 0

- LU 17 through 32 - Port 1

System/34          System/38

Synchronous
RS-232C Interface
LINKUP 5294

| Port 0 | | Port 1 |

| LU 0 | LU 9 | LU 16 | | LU30 | LU 31 | LU 32 |

| Port 2 | • • • | Port 5 | • • • | Port 8 |

**ASCII Terminals, PCs, Printers**
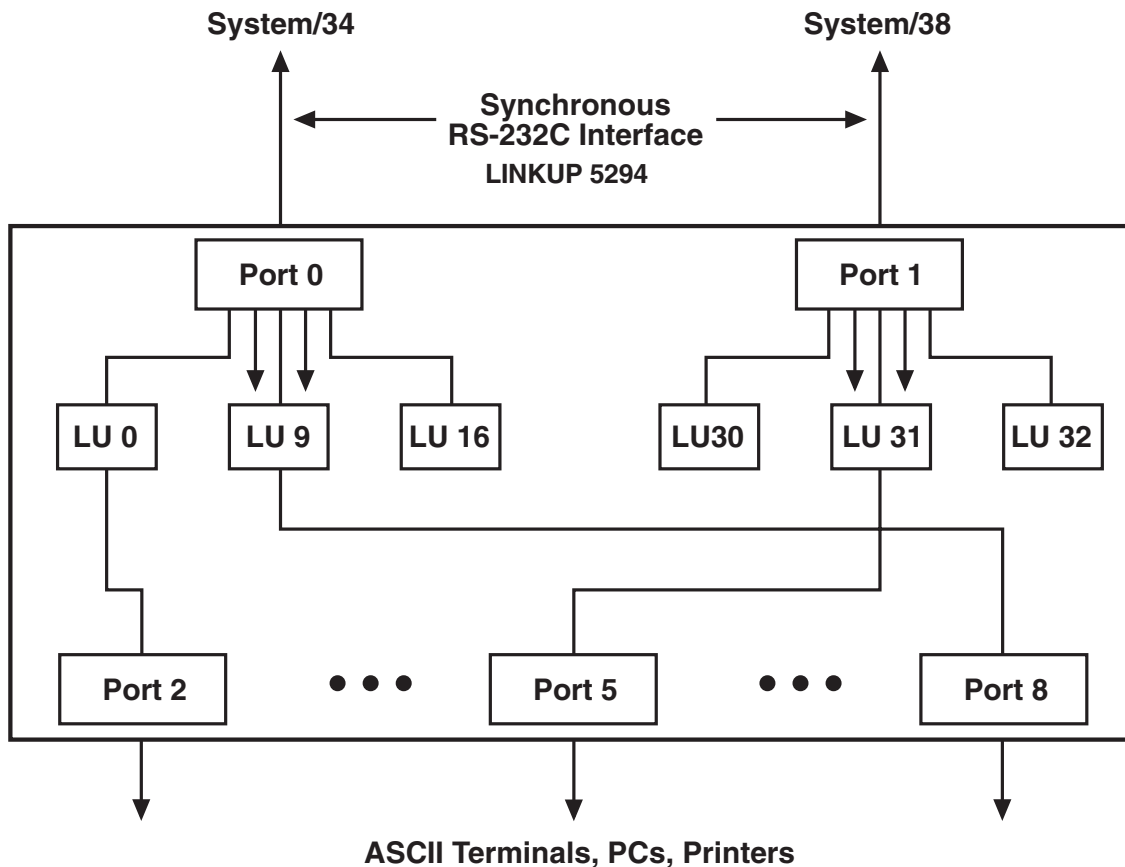
**6.6.3 ESTABLISH COMMUNICATION WITH THE HOST**

**If the LinkUp 5294 is configured as DTE:**

The DTE and DTR indicators should come on when all of the equipment is connected and powered on. After the modem is powered on, the TXC and RXC lights will indicate the clocking signals. After the host connection is completed, CTS, RTS, CD, TXD, and RXD should also be present.

**If the LinkUp 5294 is configured as DCE:**

When all of the equipment is connected and powered on, the DCE, CTS (if full-duplex), DSR, TXC, and RXC lights should come on. After the host connection is completed, RTS, CD, TXD, and RXD should also be present.

If the correct front panel signals are not present, refer to **Chapter 9**. If neither the TXD nor RXD light is flashing, there is no synchronous line between the LinkUp 5294 and the host computer. Contact the host operator and make sure that the line has been activated.

# 7. Operation

The LinkUp 5294 operates in six different modes:

1. **Connect Mode —** typically the operating session encountered prior to accessing the others; allows you to sign on to the LinkUp 5294.

2. **Port Test Mode —** allows you to perform several diagnostic and information functions: Interface Signal Display, Character Display Test, and Character Echo Test.

3. **System Management Mode —** allows you to perform the following diagnostic and information functions:

• Interface Signal Display (similar to the function in Port Test Mode)

• Sync Port Address Trace

• Async Port Trace

• Product Configuration and Levels Display

• Sync Port Trace

• Character Display Test (also provided in Port Test Mode)

• Character Echo Test (also provided in Port Test Mode)

• LU and Async Port Summary

• Remote Reset

• SNA/SDLC Counters

4. **Configurator Mode —** enables you to define the operating and environmental characteristics in which the LinkUp 5294 will function.

5. **Emulation Mode —** the standard operating session encountered by a terminal operator communicating with the System/3X host.

6. **Setup Mode —** lets you restore the factory default configuration parameter values defined in the LinkUp 5294.

## 7.1 Operating Requirements

To establish an operating session with the LinkUp 5294 the following hardware and software requirements must be met:

### 7.1.1 CABLES AND CONNECTIONS

As discussed in **Chapter 5**, all LinkUp 5294 connectors (ports) support a standard RS-232C interface. Each device or 3X host Integrated Communications Adapter (ICA) must be connected to the LinkUp 5294 by a shielded RS-232C cable.

When a terminal, printer, personal computer, or 3X host is attached directly to a LinkUp 5294 port, it is called a Local connection; when they are attached by modems, it is called a Remote connection. (Remote connections can be through switched or dedicated lines.)

### 7.1.2 SYSTEM/3X HOST

On the synchronous side, the LinkUp 5294 must be attached either directly (by its integrated modem eliminator) or remotely (by synchronous modems) to your System/3X host's ICA. As previously discussed, the adapter can be any of the following:

- A single-line communications adapter

- A multi-line (equal to four lines) communications adapter

- An eight-line communications adapter

## CAUTION:

**Your 3X host's communication line must be configured comparably to the parameters of the LinkUp 5294.**

### 7.1.3 ASCII TERMINAL

Virtually any ASCII terminal can be used to operate the LinkUp 5294; however, it must be compatible with one of the Terminal Modules supported by the LinkUp 5294. See **Appendix D** for a list of those terminals currently supported.

Your selected terminal must also be set up according to the following general terminal configuration or switch settings:

- Character Mode = ON (as opposed to Block or Line Mode)

- Full Duplex = ON

- Auto New Line = OFF (if switch-selected)

- Auto Line Feed = OFF

- Cursor addressing = ON

- Auto Scroll = OFF (if switch-selected)

- DTR and DCD = ON, DSR = OFF (if switch-selected)

- Baud Rate = LinkUp 5294 configured settings

- Word Length (composed of Data Bits, Parity, and Stop Bits) = LinkUp 5294 configured settings (most commonly implemented as 8 data bits, no parity, and 1 stop bit)

- Keyboard must be decoupled from the display (if switch selected). See note below.

## NOTE

**The LinkUp 5294 must handle any and all screen changes to the terminal. This means the terminal must be set so that whenever a key is pressed on the keyboard, its character is transmitted directly to the LinkUp 5294 rather than to the terminal's display. This setup is commonly called Conversational Mode. If your terminal's keyboard cannot be decoupled from its display (Conversational Mode = ON), you should avoid using those keys which locally affect the display. If they are not avoided, the result will be a garbled display, requiring you to invoke the LinkUp 5294 Refresh Screen extended keyboard function.**

### 7.1.4 PERSONAL COMPUTERS AND TERMINAL EMULATION SOFTWARE

In order for the LinkUp 5294 to operate with a personal computer or word processor, a terminal-emulation software package must be installed on the PC or word processor and must be compatible with one of the Terminal Module IDs provided by the LinkUp 5294. See **Appendix D** of this manual for a list of those personal computers and word processors currently supported, as well as suggested terminal-emulation software packages.

### 7.1.5 ASCII PRINTER

When using an ASCII printer, be sure to confirm that its switch-selected parameters match those configured in the LinkUp 5294. For example, the RS-232C line signals for physical flow control (equivalent to the printer's Not Busy signal) and device ready (the printer's Off-line signal) or the printer's logical flow control code.

### 7.1.6 MODEMS

When you are remotely located from the LinkUp 5294, you must communicate with the LinkUp 5294 over switched or dedicated lines in full -duplex mode with asynchronous modems. When a switched line is used, be sure to confirm that the modems are optioned as follows:

- The modem automatically answers an incoming call

- The DCD line state must not be held artificially high

- The modem should hang up when DTR drops

- The modem (attached to the LinkUp 5294) must not echo commands or characters.

When the LinkUp 5294 is remotely located from your System/3X host, it must communicate with your host over switched or dedicated lines in half- or full-duplex mode with synchronous modems. To assure that this remote connection is operating optimally, be sure to confirm that your modems are optioned as follows:

- The modem provides clocking (internal)

- The modem allows the LinkUp 5294 to control CD by RTS


### 7.1.7 PACKET NETWORK TERMINAL NODE

The LinkUp 5294 can be configured to operate in an asynchronous data packet network in one of two generic ways:

- The LinkUp 5294 recognizes that the terminal PAD echoes all hex values, which means the PAD performs all cursor-positioning functions.

- The LinkUp 5294 recognizes that the terminal PAD echoes only certain hex values.

In the second situation, the PAD (or terminal node) might be set up to echo only displayable characters: those including hexadecimal values 20 to 7E. When a PAD is set up in this way, the LinkUp 5294 is not able to suppress your input to a non-display field, such as during a password entry. This means that your input will display even though it should not.

Another PAD option might include setting it to echo some of the ASCII control codes within the range of 00 through 1F hex as well. This setting combined with one or both of the following PAD options would give the LinkUp 5294 limited control over the terminal's cursor positioning.

- Setting the node to forward packets of data to the LinkUp 5294 after receipt of a control code hex value of 00 through 1F and 7F from the he terminal.

- Setting the node to forward packets of data to the LinkUp 5294 after a specified time (in milliseconds) of terminal inactivity has transpired.

For example, in this PAD-configured environment, the LinkUp 5294 could support the System/3X field auto-exit capability. When a PAD echoes characters, the LinkUp 5294 is unable to move the cursor according to this standard 3X facility unless it is notified in some way to do so. Setting the PAD with either of these options will succeed in notifying the LinkUp 5294.

## 7.2 Connect Mode

As shipped from the factory, Connect Mode is the first operating session you will establish with the LinkUp 5294. Once established, you can select which mode you want to access next.

# NOTE

**Depending on your operating criteria, you may restrict your terminal operators from ever encountering this mode. If restriction is desired, then you must define the LinkUp 5294 configuration parameter values (found in Configurator Mode) as non-overridable.**

### 7.2.1 SIGN-ON MENU

The Connect Mode sign-on menu consists of a display of the firmware version number (represented as V1.*xxxx*, where *x* is any integer from 0 to 9) installed in the LinkUp 5294, followed by the first of as many as 15 menu prompts. A sample screen is shown below.

> **\*\*\*5294 CONTROLLER EMULATOR -V1.00U3\*\*\***
>
> **Enter Device Type (ADM3A):**
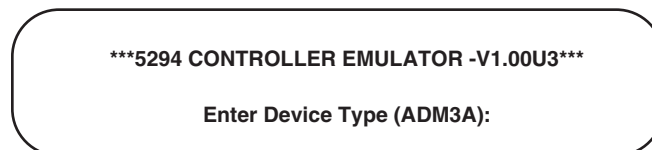
As the LinkUp 5294 is shipped from the factory, this menu will appear immediately after you press your selected ASCII terminal's <Enter> key twice. This procedure lets the LinkUp 5294 automatically detect the incoming baud rate of your terminal and match it.

**7.2.2 MENU PROMPTS AND PARAMETERS**

As previously mentioned, when the Connect Mode Sign-On screen displays, a sequence of menu prompts follows. In general, the format of these prompts is: ENTER "parameter name" (default value):.

Each prompt allows you to confirm the default value for a specific LinkUp 5294 configuration parameter, or enter a new value. The number of menu prompts which ultimately display depends on which of the following parameters (if any) are defined as overridable during Configurator Mode:

- Device type

- Logical Unit Number

- Password protection (at two levels)

- Inactivity Time Limit

- Reconnect Time Limit

- Local Copy Printer LU Number

- Auxiliary Printer LU Number

- Setup parameters for Auxiliary Printer (page length, line density, etc.)

As the LinkUp is shipped from the factory, your initial Connect Mode Sign-On screen will display only two menu prompts:

**Enter Device Type (ADM3A):**

**Enter LU Number (0):**

A sample Connect Mode session where all of the possible configuration parameters have been defined as overridable is shown in Figure 7-1. Items underlined are those keyed in by a terminal operator.

Enter Device Type (ADM3A): <Enter>

↓

Enter LU Number (3): <u>5</u> <Enter>

↓

Enter Password: <u>MYLU</u> <Enter>

↓

Specify Reconnect Password: <u>RECON</u> <Enter>

↓

Enter Inactivity Time Limit (10): <u>NONE</u> <Enter>

↓

Enter Reconnect Time Limit (30): <u>20</u> <Enter>

↓

Echoplex Enable (YES): <Enter>

↓

Echoplex Toggle Enable (NO): <Enter>

↓

Enter LU Number of Local Copy Printer (17): <Enter>

↓

Enter LU Copy of Auxiliary Printer (NONE): <u>9</u> <Enter>

↓

Auxiliary Printer Device Type (PRINT): <Enter>

↓

Enter Page Length (11.00): <Enter>

↓

Enter Lines Per Inch (6): <Enter>

↓

Enter Single/Dual Case (D): <Enter>

↓

Enter Single/Double Spacing (S): <Enter>

↓

Emulate Form Feed with Line Feeds (NO): <u>AUTO</u>

Refer to **Section 7.5.7** for the definition and values appropriate to the following menu prompt parameters:

- Device Type
- LU Number

# NOTE

**Entering 1 at the LU Number prompt during Connect Mode will advance you to Port Test Mode if the internal RUN/SETUP switch is on RUN. It will advance you to Setup Mode if the internal switch is on SETUP. (See Section 7.7).**

Refer to **Section 7.5.8** for the definitions and values corresponding to the following parameters:

1. Password
2. Reconnect Password
3. Inactivity Time Limit
4. Reconnect Time Limit
5. Echoplex Enable
6. Echoplex Toggle Enabled
7. LU Number of Local Copy Printer
8. LU Number of Auxiliary Printer

Refer to **Section 7.5.9** for the definitions and values corresponding to the following parameters:

1. Auxiliary Printer Device Type
2. Page Length
3. Lines Per Inch
4. Single/Dual Case
5. Single/Double Spacing
6. Emulate Form Feed with Line Feeds

# NOTE

**Although the parameters 2 through 5 above are displayed and allow you to enter valid values, they are not used or supported by the LinkUp 5294 at this time.**

A secondary Connect Mode sign-on screen is shown below.

```
****5294 CONTROLLER EMULATOR - V1.00U3***
        Enter Device Type (ADM3A):
        Enter LU Number (3): 5
        Enter Reconnect Password:
```

This screen displays only if a Reconnect Time Limit is defined and the connection established with the LinkUp 5294 is either physically or logically disconnected. An example of a physical disconnection would be if a remotely established communication line hung up. An example of a logical disconnection would be if an Inactivity Time Limit was defined in the LinkUp 5294 by Configurator Mode and the LinkUp 5294 timed out after the specified time limit was reached.

# NOTE

**The menu prompt requesting a Reconnect Password only displays if a password was specified in the LinkUp 5294 through the Configurator Mode.**

**Refer to Section 7.5 of this manual for further information about the LinkUp 5294 facilities supporting this secondary sign-on screen.**

### 7.2.3 EDITING INSTRUCTIONS

The following key sequences are valid to edit the Connect Mode menu prompts:

- **RETURN or ENTER (<Enter>) —** Enters the typed response. If no response is typed at the prompt prior to pressing <Enter>, the default value is assumed for the prompt and the next prompt in the connect sequence is displayed.

- **<BACKSPACE> or <DELETE> —** Deletes the last character typed.

- **<CTRL/X> —** (Press these keys simultaneously.) Deletes all characters typed at the current prompt.

# NOTE

**Remote connections require you to answer each prompt within five minutes. If this time limit is exceeded, the LinkUp 5294 will abort your Connect Mode attempt and drop the line.**

The following three entries are valid responses for each of the Connect Mode menu prompts:

- <!> — Restarts Connect Mode beginning with the first prompt.

- **parameter value —** Any one of those defined as appropriate for each prompt. (If an invalid parameter is entered, or a valid one incorrectly typed, then an error message will display.)

- **<?> —** Displays a help message which includes the range of valid values for the current parameter. If you get lost or confused, <?> will usually give enough help to allow you to find your bearings. Certain help messages cause the screen to be cleared before display. The screen will also be cleared when full.

### 7.2.4 ERROR MESSAGES

If invalid entries are made during Connect Mode, one of the following self-explanatory messages will display on your screen.

**Value Errors:**

SYNTAX ERROR.
UNRECOGNIZED RESPONSE.
ILLEGAL CHARACTER.
MAXIMUM STRING LENGTH EXCEEDED.
MAXIMUM LINE LENGTH EXCEEDED.
VALUE OUT OF RANGE.
INVALID.
TRAILING CHARACTERS IGNORED.
NOT SUPPORTED IN THIS RELEASE.

**Compatibility Errors:**

LU# NOT AVAILABLE.
LU# NOT COMPATIBLE WITH DEVICE TYPE.
LU# NOT PRINTER TYPE.
LU# NOT AUX PRINTER TYPE.
DISPLAY DOES NOT SUPPORT AUXILIARY PRINTER
**CAUTION** (PAGE LENGTH X LINES PER INCH) HAS NON-INTEGER
RESULT; LINE COUNT PER PAGE NOT UPDATED.

**Operational Error:**

INACTIVITY TIME LIMIT EXCEEDED.
CONNECT REQUEST FAILED.
UNABLE TO READ EEPROM. DEFAULT CHARACTERISTICS ASSUMED.

## 7.3 Port Test Mode

Port Test Mode uses various port tests and traces which use the following conventions:

• Data from the LinkUp 5294 to the terminal or host is enclosed in square brackets ([ ]).

• Data from the terminal or host to the LinkUp 5294 is displayed without brackets.

• Complete messages, which could consist of only a single character, are separated by a space.

• Data is displayed on the first 23 lines of the screen, with line 24 reserved for messages. If the terminal supports dual intensity, the first set of 23 data lines are displayed in low intensity. When 23 lines have been displayed, the second set of 23 lines overwrites the first data in high intensity. By alternating between high and low intensity, the most recent data is easily located. If the terminal used does not support dual intensity, all wrapped data is displayed in the same intensity.

• The <SPACE> bar is a toggle which freezes and restarts the display. When the display is frozen, data is buffered by the LinkUp 5294. If this buffer overflows, a string of asterisks (***) will appear in the trace data.

• The <Enter> key ends the trace and returns to the Options menu.

• To clear stored trace data, type an asterisk (*).

To access Port Test Mode, establish the connection to the LinkUp 5294 either by direct connection or by a dial-up line. Answer the **Enter Device Type** prompt with the appropriate response for your terminal type.

When the LinkUp 5294 prompts for entry of an LU (Logical Unit) number, type 1 followed by <Enter>. The Port Test Mode menu will appear on the terminal screen.

```
              ***PORT TEST MODE***

   Options:

   1. System Management Mode
   2. Interface Signal Display
   3. Character Display Test
   4. Character Echo Test

   Enter Choice:
```

### 7.3.1 PORT TEST MODE MENU AND FUNCTIONS

At the Port Test Mode menu, type the number which corresponds to the function to be performed. Other accepted responses are <?>, END, and QUIT. All responses must be followed by <Enter>.

Port Test functions can only be performed on your own port. This allows any number of operators to access Port Test Mode at the same time. Each option is described below.

# NOTE
**If a port is configured for Option 3, Port Test Mode is not available.**

- **System Management Mode (Option 1) —**This provides access to System Management Mode functions which are described in **Section 7.4**.

- **Interface Signal Display (Option 2) —** The Interface Signal Display is a remote representation of the front panel RS-232C status indicators. When selected from the Port Test Mode menu, this feature is used to monitor your own asynchronous port. A typical display is shown at the top of the next column.

```
                INTERFACE SIGNALS
                     PORT n

        T  R  R  C  D  D  D  R  T  R
        X  X  T  T  T  S  C  /  X  X
        D  D  S  S  R  R  D  S  C  C

        0  0  1  1  1  1  1  0  0  0

   CR - Options Menu;     SPACE — Freeze/Start Display
```

One (1) indicates that the signal is logically true or on. A zero (0) indicates that the signal is not present. This display allows eight refreshes per second on a 2400-baud terminal. Refer to **Section 4.2** for an explanation of the individual signals.

- **Character Display Test (Option 3) —** This function is used to test the terminal screen for proper display of the alphanumeric characters. The Character Display Test generates a continuous output of the Alphabet Test message to the terminal.

```
+/0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ{\}^`abcdefghijklmnopq
rstuvwxyz+/0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ{\}^`abcdefg
hijklmnopqrstuvwxyz+/0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ{\
}^`abcdefghijklmnopqrstuvwxyz+/0123456789:;<=>?@ABCDEFGHIJKLMNOPQRST
UVWXYZ{\}^`abcdefghijklmnopqrstuvwxyz+/0123456789:;<=>?@ABCDEFGHIJKLM
NOPQRSTUVWXYZ{\}^`abcdefghijklmnopqrstuvwxyz+/0123456789:;<=>?@ABCDE
FGHIJKLMNOPQRSTUVWXYZ{\}^`abcdefghijklmnopqrstuvwxyz+/0123456789:;<=>?
@ABCDEFGHIJKLMNOPQRSTUVWXYZ{\}^`abcdefghijklmnopqrstuvwxyz+/0123456
789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ{\}^`abcdefghijklmnopqrstuvwxyz
+/0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ{\}^`abcdefghijklmnopq
rstuvwxyz+/0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ{\}^`abcdefg
hijklmnopqrstuvwxyz+/0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ{\
}^`abcdefghijklmnopqrstuvwxyz+/0123456789:;<=>?@ABCDEFGHIJKLMNOPQRST
UVWXYZ{\}^`abcdefghijklmnopqrstuvwxyz+/0123456789:;<=>?@ABCDEFGHIJKLM
NOPQRSTUVWXYZ{\}^`abcdefghijklmnopqrstuvwxyz+/0123456789:;<=>?@ABCDE
FGHIJKLMNOPQRSTUVWXYZ{\}^`abcdefghijklmnopqrstuvwxyz
```

- **Character Echo Test (Option 4) —** The Character Echo Test causes the LinkUp 5294 to echo each key typed from the keyboard. This includes Attention Keys and Escape (ESC) sequences. Care should be taken in using this test. Typing other than the displayable ASCII character set (Hex 20 through Hex 7E) may cause unpredictable results. Type two <Enter>s to return to the options menu.

## 7.4 System Management Mode

```
Two Consecutive CR's - Options Menu
```

System Management Mode utilizes various port tests and traces which use the following conventions (identical to Port Test Mode):

- Data from the LinkUp 5294 to the terminal or host is enclosed in square brackets ([ ]).

- Data from the terminal or host to the LinkUp 5294 is displayed without brackets.

- Complete messages, which could consist of only a single character, are separated by a space.

- Data is displayed on the first 23 lines of the screen, with line 24 reserved for messages. If the terminal supports dual intensity, the first set of 23 data lines is displayed in low intensity. When 23 lines have been displayed, the second set of 23 lines overwrites the first data in high intensity.The alternation between high and low density makes the most recent data easy to locate. If the terminal being used does not support dual intensity, all wrapped data is displayed in the same intensity.

- The <SPACE> bar is a toggle which freezes and restarts the display. When the display is frozen, data is buffered by the LinkUp 5294. If this buffer overflows, a string of asterisks (*) will appear in the trace data.

- The <Enter> key ends the trace and returns to the Options menu.

- To clear stored trace data, type (*).

To access System Management Mode, establish the connection to the LinkUp 5294 either by direct connection or by a dial-up line. Answer the Enter Device Type prompt with the appropriate response for your terminal type.

When the LinkUp 5294 prompts for entry of an LU (Logical Unit) number, type 1 followed by <Enter>. The Port test mode menu will appear on the screen. Type 1 <Enter> at the Enter Choice prompt to access System Management Mode.

System Management Mode may be accessed by only one operator (port) at a time. If you select Option 1 of Port Test Mode when System Management Mode is already in use, the following message is displayed and you are returned to Connect Mode:

**System Management Mode already in use.**

Unlike Port Test Mode, System Management Mode can be password-protected. When System Management Mode is selected, the LinkUp 5294 will prompt for entry of the system password if one is required. A new password may then be specified after successful entry of the old one. After the correct password has been entered, the System Management Mode Option Menu is displayed.

**7.4.1 SYSTEM MANAGEMENT MODE MENU AND FUNCTIONS**

```
        ***SYSTEM MANAGEMENT MODE***

    Options:
      1.  Configurator Mode
      2.   Interface Signal Display
      3.  Sync Port Address Trace
      4.  Async Port Trace
      5.  Product Configuration and Levels
     20.  Sync Port Trace
     21.  Character Display Test
     22.  Character Echo Test
     23.  LU and Async Port Summary
     24.  Remote Reset
     25.  SNA/SDLC Counters

    Enter Choice:
```
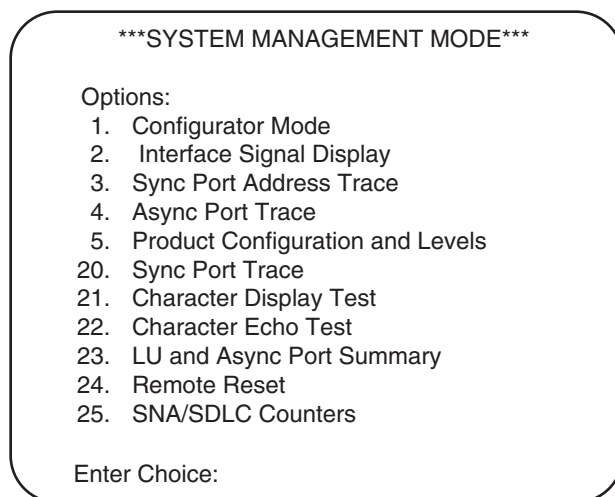
# NOTE

**The LinkUp 5294 is shipped from the factory with no password defined. Therefore, when you select System Management Mode for the first time, you are prompted to enter a new System password. You may specify a password at this time or you may default to no password by entering <Enter>. As long as the system remains without a password, you will be prompted only for a new one.**

If you wish to clear a System password and return to the no-password condition, enter the current password at the **Enter System Password** prompt. Then enter NONE at the **Specify New System Password** prompt.

To avoid unauthorized access, use of a password is highly recommended.

If the System password is forgotten, the default condition of no password may be restored by executing a SETUP procedure. See **Section 7.7** for this procedure.

Options numbered 1 through 5 are available on both Standard and Deluxe models. Those options numbered 20 and above are only available with Deluxe firmware. Deluxe options will not appear on the menu if Standard firmware is installed.

All of the menu options are explained in the following paragraphs. To exit System Management Mode and return to Connect Mode, type either END or QUIT, followed by <Enter> in response to the Enter Choice prompt. Exit from each of the function screens is discussed below.

- **Configurator Mode (Option 1) —** When Item 1 is selected from the menu, the LinkUp 5294 enters Configurator Mode and the following prompt is displayed:

<div align="center">

**Enter Item to be Configured:**

</div>

This allows configuration of Port and LU parameters. Configurator Mode is discussed in depth in **Section 7.5**. To exit Configurator Mode and return to System Management Mode, type END or QUIT <Enter>.

- **Interface Signal Display (Option 2) —** The Interface Signal Display is a remote representation of the front panel RS-232C signal indicators. This option is also available from Port Test Mode to monitor your own port only. (See **Section 7.3**.) When selected from System Management Mode, this test can be used to monitor any installed port on the LinkUp 5294.

  When the option is selected, the LinkUp 5294 prompts you to enter the port to be monitored. After the port number is entered, the interface signal information is displayed. A typical display is shown below. Refer to **Section 4.2** for an explanation of the individual signals.

- **Sync Port Address Trace (Option 3) —** This option displays each control unit address as it appears in the synchronous data stream. Each address is displayed as a two-character hex value followed by two blanks. This can be used on a multipoint line to display all active Control Unit addresses.

```
                    INTERFACE SIGNALS
                         PORT n

        T  R  R  C  D  D  D  R  T  R
        X  X  T  T  T  S  C  /  X  X
        D  D  S  S  R  R  D  S  C  C

        0  0  1  1  1  1  1  0  0  0

   CR - Options Menu;      SPACE — Freeze/Start Display
```

When the option is selected, the LinkUp 5294 prompts you to enter the port to be monitored. After the port number is entered, the sync port address trace is displayed.

- **Async Port Trace (Option 4) —** This function monitors both the input and the output data stream for the selected async port. When the option is selected, the LinkUp 5294 prompts you to enter the port to be monitored. After the port number is entered, the async port trace is displayed.

```
   **** 03   03   03   03   03   03   03   03   03   03
        03   03   03   03   03   03   03   03   03   03   03
        03   03   03   03   03   03   03   03   03   03   03

   CR - Options Menu;        SPACE Freeze/Start Display
```

- **Product Configuration and Levels (Option 5)** — This option displays the total number of ports, amount of RAM and EEPROM, firmware version number and calculated CRC. The Product Configuration and Levels screen is shown below.

```
***0D[110D0A2020202A2A2A03331373420434F4E54524F4C20554E495420454D554C41544F
52202D205632E3037000055003300000000000000202A2A2A0D0A0D0A28466F722048656C70
2C205479706520273F272061667465722061E792050726F6D742E20546F2041626F72742043
6F6E6E65637420536571756E566E6E63652C2054797065205202721272E20290D0A28546F204456C6574
6520526573706F6E73652043686E7261637466572732C20757365207527526F757527526F757574272E20546F
657669636365205479706520280041444D334100293A20]  77[57]  79[59]  35[35]  30[30]  70
[50] 0D [0D0A456E746572204C55204C55204E756D6265722209283900293A29]
```

CR- Options Menu;    SPACE - Freeze/Start Display;  * - Reset Trace

Possible values for the above hardware components are as follows:

- Available EEPROM: 16K bytes

- Available RAM: 256K to 768K bytes

```
Product Configuration

Available EEPROM          16K bytes

Available RAM             768K bytes

Available PORTS           34 Total

Firmware Version          1.00U3

Calculated CRC            F667H

CR - Options Menu
```

- Available Ports: from 6 to 34 (includes sync ports) by multiples of four

The firmware version and calculated CRC will vary. Please record the values shown; your supplier will need to know them if you have to report a problem.

- **Sync Port Trace (Option 20)** — This function monitors both the input and output data stream of the selected sync port (and Sync Link Number, if so configured). Data is displayed as hex data, using the display formats and conventions described earlier, as well as the following:

  A dash is introduced after the first row and after the first four hex values of a message, to mark the end of the link and transmission headers.

  The two byte CRC is included in inbound messages to the LinkUp 5294.

  The screen below illustrates a sync port trace, with explanation of trace format.

- **Character Display Test (Option 21) —** This option generates a continuous output of the alphabet test message on your async port. The character display test is shown below. This option is also available in Port Test Mode.

```
****]  C193-27E8 [C173-] C100 - 2D0000000001 - 6B8001...[

Loss of data      Link        LinkUp                      SNA
continuity        Header      response                    information
indicating                                                unit
the beginning         2 byte          Link
of the trace.          CRC            Header      Transmission
                                                  Header

CR - Options Menu;    SPACE Freeze/Start Display; * - Reset Trace
```

- **Character Echo Test (Option 22) —** The Character Echo Test causes the LinkUp 5294 to echo each key typed from the keyboard. This includes Attention Keys and Escape (ESC) sequences. Care should be taken in using this test. Typing other than the displayable ASCII character set (Hex 20 through Hex 7E) may cause unpredictable results. This option is also available in Port Test Mode. Type <Enter> twice to return to the options menu.

```
+/0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ{\}^`abcdefghijk
lmnopqrstuvwxyz+/0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWX
YZ{\}^`abcdefghijklmnopqrstuvwxyz+/0123456789:;<=>?@ABCDEFGHIJKLM
NOPQRSTUVWXYZ{\}^`abcdefghijklmnopqrstuvwxyz+/0123456789:;<=>?@A
BCDEFGHIJKLMNOPQRSTUVWXYZ{\}^`abcdefghijklmnopqrstuvwxyz+/0123
456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ{\}^`abcdefghijklmnop
qrstuvwxyz+/0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ{\}^`
abcdefghijklmnopqrstuvwxyz+/0123456789:;<=>?@ABCDEFGHIJKLMNOPQ
RSTUVWXYZ{\}^`abcdefghijklmnopqrstuvwxyz+/0123456789:;<=>?@ABCDE
FGHIJKLMNOPQRSTUVWXYZ{\}^`abcdefghijklmnopqrstuvwxyz+/012345678
9:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ{\}^`abcdefghijklmnopqrstuv
wxyz+/0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ{\}^`abcde
fghijklmnopqrstuvwxyz+/0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTU
VWXYZ{\}^`abcdefghijklmnopqrstuvwxyz+/0123456789:;<=>?@ABCDEFGHIJ
KLMNOPQRSTUVWXYZ{\}^`abcdefghijklmnopqrstuvwxyz+/0123456789:;<=>
?@ABCDEFGHIJKLMNOPQRSTUVWXYZ{\}^`abcdefghijklmnopqrstuvwxyz+/
0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ{\}^`abcdefghijkl
mnopqrstuvwxyz
```

- **LU and Async Port Summary (Option 23) —** This function displays certain configuration parameters for each Logical Unit, along with information about the state of the LU and the keyboard. Async port configuration parameters are also displayed. This display requires two pages for the LU Summary, and up to four pages for the Async Port Summary.

```
Two Consecutive CRs - Options Menu
```

Two Keys are active during this test:

Press <N> (for next) to display the next page of data.

Press <Enter> to return to the options menu.

The LU Summary screen is shown below. The Async Port Summary is shown on top of the next page.

- **Remote Reset (Option 24)** —This function is equivalent to a hardware reset (power off/power on). This causes sync port changes and printer port changes to take effect. When the reset screen is displayed, you must enter YES before the reset takes place. An answer of N, NO, or <Enter> will abort the command and the reset will not occur. Any other response will elicit an error message, and the Remote Reset caution message will be redisplayed. If a Remote Reset is aborted, you will be returned to the System Management Mode menu. If the reset is executed, you must begin again at the Connect Mode screen. The Remote Reset warning screen is shown below.

| LU Number | 0 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LU type | Dsp | Dsp | Dsp | Dsp | Dsp | Dsp | Dsp | Dsp | Dsp | Dsp | Dsp | Dsp | Dsp | Dsp | Dsp | Dsp |
| LU State | Dis | Dis | Dis | Dis | Dis | Dis | Dis | Dis | Dis | Dis | Dis | Dis | Dis | Dis | Dis | Dis |
| Input Inhib | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No |
| Echo | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Insert Mode | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No |
| Printer Pacing | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| LSID No. | 0 | 2 | 3 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Sync Port | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sync Link No. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Async Port | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

| Port Number | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| Device Type | ADM3A | ADM3A | ADM3A | ADM3A | ADM3A | ADM3A | ADM3A | ADM3A |
| DTE/DCE | DCE | DCE | DCE | DCE | DCE | DCE | DCE | DCE |
| Bit Rate | Auto | Auto | Auto | Auto | Auto | Auto | Auto | Auto |
| No. of Bits | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| Parity | None | None | None | None | None | None | None | None |
| Stop Bits | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Connect Mode | DED | DED | DED | DED | DED | DED | DED | DED |
| FC From Conv. | XON | XON | XON | XON | XON | XON | XON | XON |
| FC From Device | XON | XON | XON | XON | XON | XON | XON | XON |
| Dev Rdy Signal | DTR | DTR | DTR | DTR | DTR | DTR | DTR | DTR |

- **SNA/SDLC Counters (Option 25)** — This function displays statistical information for the selected synchronous port. Entering the port number in response to the LinkUp 5294 prompt causes the screen shown below to be displayed.

```
**CAUTION**

The Remote Reset Breaks All LU Activity
in a Non-Recoverable Way.

Are you CERTAIN that you want to
Reset the Controller (YES OR NO)?



CR - Options Menu
```

These counters have the following meanings:

- **CRC Errors —** Cyclic Redundancy Check errors. This is the total number of blocks with errors that have been received from the host.

```
            SNA SDLC Counters for Port 0

                        SEND         RECEIVE

CRC Errors              N/A          1
Retransmissions         0            N/A
SNRMs                   N/A          1

Frame Counters
    I Frames            666          1667
    U Frames            2            2
    Total               668          1669
```

- **Retransmissions —** This is the total number of blocks resent to the host.

- **SNRMs —** Set Normal Response Mode commands. This is the number of SNRMs received by the LinkUp 5294.

- **I-Frames —** Information Frames. This is the number of data frames sent and received.

- **U-Frames —** Unnumbered Frames. This is the number of unnumbered frames, such as SNRM, XID and DISC commands, sent and received.

- **Total —** The total number of I-Frames and U-Frames.

Values for the first 5 items are displayed as decimal numbers between 0 and 65535. The last item (Total) is counted to 131070.  If these maximum displayable values are reached, the counters are not automatically reset.

All counts are reset to zero when the LinkUp is turned off, or when Remote Reset is issued. These counts are not affected by a host-generate REQMS with Reset request.

The following keys are active during this operation.

> **<R>** resets the counters. (This does not reset RECFMS totals.)

> **<D>** is used to refresh the display.

> **<Enter>** is used to return to System Management Mode menu.

- **Set Date/Time (Option 26) —** Current date: yy/mm/dd; Current time: hh:mm:ss; Clock correct? (y/n):

## 7.5 Configurator Mode

Configurator Mode may only be accessed from one terminal at a time. To access it, you must first be in System Management Mode. Select Option 1 from the System Management Mode options menu. The LinkUp 5294 will enter Configurator Mode and the following prompt will be displayed:

<p align="center"><b>Enter Item to be Configured:</b></p>

As previously mentioned, Configurator Mode enables you to define the operating and environmental characteristics in which the LinkUp 5294 will function. The following menus are employed to accomplish this task:

1. Synchronous port(s)

2. Asynchronous port(s)

3. Logical Unit (displays)

4. Logical Unit (printers)

5. Logical Unit (auxiliary printers)

### 7.5.1 HELP MESSAGES DURING CONFIGURATION

Help messages are available at any time during configuration. These messages are displayed on the terminal screen and provide information on valid responses and available options. If you need a brief reminder of acceptable responses during the configuration process, simply type <?> <Enter> and an appropriate help message will be displayed on the screen.

The Help Screen for the **Enter Item to be Configured**: prompt is shown below:

```
Enter one of the following items:

PORT              -To configure First/Next Physical Port.
PORT n            -To configure Physical Port n,
                   where n is in the range 0 to 33.
LU                -To configure the First/Next Logical Unit.
LU n              -To configure Logical Unit n, where n
                   is 0 or 2 to 32.
<RETURN>          -To configure the next item in the standard
                   system sequence, which is Sync Port(s),
                   Async Ports, Logical Units.
STATUS            -To display LU numbers and Ports.
END               -To terminate Configurator Mode.

NOTE: Port and Logical Unit ranges depend on system setup.

TO CONTINUE PRESS <RETURN> KEY:
```

### 7.5.2 CONSISTENCY CHECKING

The Configurator validates individual parameter values as they are entered. This includes checking for parameter interdependencies. In some cases the Configurator will change multiple parameter values as the result of a single change by the operator. For example, when an async port Communications Interface is changed from DTE to DCE, the Flow Control from Device and Device Ready pin numbers are forced to Pins 5 and 6 (CTS and DSR), respectively.

If a new parameter value is entered which is not compatible with another existing parameter, the message Incompatible with Parameter (n) is displayed, where (n) is the number of the existing parameter. You are then prompted again to enter parameter changes.

If your response is invalid or mistyped, an error message is displayed.

### 7.5.3 OVERRIDABLE PARAMETERS

Certain parameter values in the asynchronous port and LU menus are followed by a plus (+) or minus (-) sign. The plus sign allows the parameter to be changed at connect time, while the minus sign does not allow change. If no sign is present, the parameter is not overridable at connect time. These flags may be entered independently of the actual parameter value. Thus, the following three examples are all valid change entries for the Device Type parameter (Asynchronous Port Menu):

<div align="center">

1 = ADM3A     1 = -      1 = ADM3A +

</div>

At connect time, the value for a non-overridable parameter is the default value specified by the Configurator. However, for an overridable parameter the Connect processor will display a prompt followed by the default, to allow entry of a different value if necessary.

For example, if an installation only uses Televideo 925 terminals, all directly coupled to the LinkUp 5294, then the default Device Type (TV925) should be set by the Configurator as non-overridable. An operator performing a normal connect to the LinkUp 5294 would not then be asked to enter the Device Type.

Parameters for Printer and Auxiliary Printer LUs cannot be set as overridable. Since these LUs are controlled by the host, their parameters cannot be changed at connect time.

If a port and its associated default LU are configured with no overridable parameters, a connecting terminal will immediately enter Emulation Mode with no prompts being displayed. If configuration is necessary, execute the INITIALIZE TERMINAL sequence (usually [ESC <]) to exit Emulation Mode and enter Connect Mode. Configurator Mode may then be accessed from System Management Mode.

### 7.5.4 CONFIGURATOR MODE COMMANDS

Configuration commands are entered from the terminal keyboard. The LinkUp 5294 always provides a prompt whenever a response is required. The general format of a configuration menu is:

**[n] [Parameter Name] [current setting]          [overridable]**

**[n][Parameter Name] [current setting]**

**Enter Change(s):**

The response format is: [n] = [New Value]

where:     [n] is the number shown on the menu, and [New Value] is a valid setting

As an example, a typical configuration menu is shown below:

```
Current Parameter Values for Port 0 (SYNC):

 1. Communications Interface     DTE
 2. Bit Rate                     EXT
 3. Connect Mode                 DED
 4. Half/Full Duplex Line        FULL
 5. NRZI Encoding                NO
 6. Emulation Mode               5294
 7. Number of Link Stations      02
 8. Link 0 Station Address       CF
 9. Link 1 Station Address       CE
10. Link 2 Station Address       00
11. Link 3 Station Address       00

Enter Change(s):
```

More than one parameter may be changed on a single line; however, parameters must be entered in ascending sequence. For example:

Enter Change(s): 2=EXT, 5=YES, 7=04 <Enter>

Spaces between configuration entries and characters are optional and are ignored. For multiple changes on a single line, use a comma to separate entries.

Unless otherwise stated, all commands are followed by the <Enter> key.

During configuration, help messages are available at two levels. To illustrate this, assume you typed PORT 2 <Enter> in response to the Enter Item(s) to be Configured: prompt. The following screen appears:

At this point, typing <?> <Enter> will display a list of acceptable responses, valid formats, editing keys, etc. The general format for a response is also shown.

```
Current Parameter Values for Port 2:

 1. Device Type                            ADM3A +
 2. Associated Logical Unit                0 +
 3. Communications Interface               DCE
 4. Bit Rate                               AUTO
 5. Number of Bits/Char (Excluding Parity)    8
 6. Parity                                 NONE
 7. Number of Stop Bits                    1
 8. Connect Mode                           DED
 9. Flow Control from Converter            XON
10. Flow Control from Device               XON
11. Device Ready Signal                    DTR
12.Packet Network Access                   N
13. Auto Exit Enabled                      YES

Enter Change(s):
```

A second level of help exists for each specific parameter. For instance, to see the available responses for parameter #1, type: 1 = ? <Enter>. This will show all of the available settings for parameter 1 on the current menu.

**The <CR> (Redisplay) Command**

After a valid change line has been entered, the menu is not automatically redisplayed. Press <Enter> at the next Enter Change(s): prompt to redisplay the menu with the new values included.

**<BACKSPACE> or <RUBOUT>**

Backspace or Delete keys can be used during configuration to correct typing mistakes. The command deletes the last character of the current entry.

**The <CTRL/X> (Delete Entry) Command**

This command deletes the current entry. This may be more convenient than the single character Backspace or Delete key for correcting typing errors. This command does not require <Enter>.

**The <!> (Restore Previous Values) Command**

During a configuration session, it is sometimes desirable to reset all of the changes to the previously held values. This can be done by typing an exclamation point <!> followed by <Enter> in response to the Enter Change(s) prompt. This command only resets the parameters changed since the last END command. In other words, the parameters changed on other menus or previous edits to the current menu are not reset.

# NOTE

**If it becomes desirable to reset all configuration parameters to their factory default values, the SETUP procedure may be used. Refer to Section 7.7 for this procedure.**

**The END Command**

To exit from a configuration menu, type END followed by <Enter> in response to the Enter Change(s): prompt. This stores the new parameter settings and in most cases returns you to the Enter Item(s) to be Configured: prompt. There is one Exception. When you type END to exit the Asynchronous Port configuration menu after configuring the port to which your terminal is connected, the LinkUp 5294 takes you out of Configurator Mode and displays the following message on your screen:

**\*\*Connect/Port Test Cancelled - Port Reconfigured.\*\***

When you see this message, press Enter to return to Connect Mode. If you are connected to the LinkUp 5294 by modems, you will have to redial.

The END command is also used in response to the Enter Item(s) to Be Configured prompt to exit from Configurator Mode and return to the System Management Mode menu. Note that changes made while in Configurator Mode are saved when END is typed in response to the Enter Change(s): prompt.

On exit from a specific menu level in Configurator Mode, all modified parameters will be saved in EEPROM. If not currently in use, the item will be immediately reinitialized with its new parameters. Otherwise, reinitialization will occur when the item becomes idle—for example, when you disconnect from the LU.

# NOTE

**A hardware reset must be performed after you have reconfigured a synchronous port or assigned an LU to a new or modified synchronous port, SDLC Link Number or Local Station Address. A hardware reset is performed by powering the LinkUp off and back on, or by activating the Remote Reset command from System Management Mode.**

**The <CR> Next Item Command**

Configurable items may be automatically configured in the following sequence:

Synchronous Ports (0, 1)

Asynchronous Ports (2 through 33, depending on the number and type of async boards installed)

Logical Units (0, 2 through 32)

When the Enter Item(s) To Be Configured: prompt is displayed, the <Enter> key alone will increment to the next item in the above sequence. This is particularly useful the first time the LinkUp 5294 must be configured, as it eliminates the need to type in each item separately.

**The STATUS Command**

Enter this in answer to the Enter Item To Be Configured prompt to display a table of all the LinkUp 5294 ports and LUs and their respective operating states and device types. (Refer to **Section 8.2** for further information about this table.)

The Status Screen is shown on the top of the next page.

**The PORT n Command**

Enter this at the **Enter Item To Be Configured:** prompt, where n is the number of a LinkUp 5294 physical port (either synchronous [0 or 1] or asynchronous [2 through 33]). If PORT is entered by itself, the LinkUp 5294 displays the next incremented PORT number, based on the one you last configured.

```
Logical Unit Status          (P= Pending Disconnect; D = Disconnected; )
                             (I = In-Use; R = Reconnectable; U = Undefined)

LU No.        0    2    3    4    5    6    7    8    9    10   11   12   13   14   15   16
LU Type       7    7    7    7    7    7    7    7    7    7    7    7    7    7    7    7
Status        D    D    D    D    D    D    D    D    D    D    D    D    D    D    D    D
Sync Port     0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
Sync Link #   0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
LSID #
Async Port
_____

LU No.        17   18   19   20   21   22   23   24   25   26   27   28   29   30   31   32
LU Type       7    7    7    7    7    7    7    7    7    7    7    7    7    7    7    7
Status        D    D    D    D    D    D    D    D    D    D    D    D    D    D    D    D
Sync Port     0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
Sync Link #   0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
LSID #
Async Port

TO CONTINUE PRESS <RETURN> KEY:_
```

**The LU n Command**

Enter this at the **Enter Item To Be Configured:** prompt, where n is the number of a LinkUp 5294 Logical Unit (numbered 0 or 2 through 32). If LU is entered by itself, the LinkUp 5294 displays the next incremented LU menu, based on the one you last configured.

**The DSPLY, PRT, AUX Commands**

Enter one of these at the Enter Logical Unit Type: prompt to define the LU as a display, printer (connected to its own port), or an auxiliary printer.

### 7.5.5 CONFIGURATION PROCEDURES

To configure the LinkUp 5294 for use in an IBM or other synchronous host environment, it is recommended that the following steps be completed in the order listed:

1. Configure the synchronous port(s).

2. Configure all asynchronous ports that will be used except for the port to which your terminal is connected.

3. Configure all Logical Units that will be used.

4. Perform the Reset Sync Port command in order to effect sync port configuration changes.

5. Configure the async port to which your terminal is connected (if necessary).

### 7.5.6 SYNCHRONOUS PORT PARAMETERS

**1. Communications Interface**

Valid values are: DTE (Data Terminal Equipment) or DCE (Data Communications Equipment).

When connecting the LinkUp 5294 to the communications adapter on your System/3X by modems or line drivers (modem eliminators) on a point-to-point or multi-point communication line, this parameter must be set to DTE. However, when connecting the LinkUp 5294 directly to your host's adapter, the Communications Interface must be specified as DCE. This latter application is possible because of the LinkUp 5294's integrated modem eliminator.

**2. Bit Rate**

Valid values are: 1200, 2000, 2400, 3600, 4800, 7200, 9600,14400,19200, or EXT.

When the LinkUp 5294 is directly connected to your host's adapter (Communications Interface = DCE), the LinkUp 5294 must provide the clocking signals. Selecting a specific bit rate will enable the LinkUp 5294 to do this.

For connections through modems or line drivers (Communications Interface = DTE), the modem or line driver will provide the clocking signals. Set the bit rate to EXT (External) in this application.

**3. Connect Mode**

Valid values are: DED (Dedicated) or AUTO (Automatic Answer).

When the LinkUp 5294 is connected to your host through modems, specifying AUTO will enable the LinkUp 5294 to automatically answer an incoming call from your host. When this is not the application, DED should be specified.

**4. Half/Full Duplex Line**

Valid values are FULL or HALF.

The value defined for this parameter depends on whether the LinkUp 5294 port is configured for a DTE or DCE interface, and is as follows:

- **HALF-DUPLEX (DTE)** — Following data reception from the host, the LinkUp 5294 waits for the Carrier Detect signal to go low before raising the Request-To-Send signal.

- **HALF-DUPLEX (DCE) —** Following data reception from the host, the LinkUp 5294 waits for the Request-To-Send signal to go low before raising the Carrier.

- **FULL-DUPLEX (DTE) —** Following data reception from the host, the LinkUp 5294 immediately raises the Request-To-Send signal.

- **FULL-DUPLEX (DCE) —** Following data reception from the host, the LinkUp 5294 immediately raises the Carrier Detect signal and starts transmission.

## NOTE

**The LinkUp 5294 raises and lowers RTS under a DTE interface and CD under a DCE interface during Full Duplex operations because it is an essential procedure in multi-point applications; for example, a Control Unit on a multi-point line, which does not lower its RTS signal at the end of a transmission, prevents the other Control Unit(s) from ever using the line. The host's communication adapter should be set so its RTS signal is permanently raised.**

### 5. NRZI Encoding

Valid values are YES or NO.

The appropriate value here depends on your host's requirements. Normally, a System/3X is strapped for NRZI encoding (specify YES); if not, the LinkUp 5294 is able to support direct encoding (specify NO).

### 6. Emulation Mode

Valid values are: 5251 (IBM 5251 Model 12 Remote Workstation Controller), 5294 (IBM 5294 Remote Cluster Controller), or 5394 (IBM 5394 Remote Cluster Controller).

## NOTE

**The 5294 and 5394 emulation modes do not support all of the actual IBM 5294 or 5394 Controller functions. For example, Text Write Assist is not supported. Consult your supplier for further information on these limitations.**

### 7. Number of Link Stations

Valid values are: 0 through 4. This parameter dictates how many Link Station Addresses will be recognized by the LinkUp 5294 on this port; that is, how many controllers will be emulated by the LinkUp 5294 through this port. The addresses of these controllers are then specified in parameters 8 through 11, below. Values greater than one are valid on deluxe units only.

## NOTE

**A maximum of four Link Station Addresses may be specified on the two synchronous ports, in any combination. If a value for this parameter is specified so that this maximum is exceeded, the following error message is displayed:**

**7: VALUE OUT OF RANGE; TOTAL NUMBER OF LINK STATIONS FOR PORT 0 AND PORT I IS 4.**

**When the value of this parameter is lessened, Link Addresses (in parameters 8 through 11) which fall outside the valid range are automatically set to 0; for example, if parameter 7 is set to 0, parameters 8 through 11 will also be set to 0, and no controllers can be emulated on that port.**

**8-11. Link 0, Link 1, Link 2, and Link 3 Station Addresses**

Valid values are: 0 through FE Hex. If 0 is entered, the LinkUp 5294 assumes that the Link Station Address is not to be used; if a Hex value beginning with an alpha character (A through F) is entered, that Hex value must be entered with a leading 0 in this example: 0A9.

Link Station Address is the term used to identify one of the LinkUp 5294 emulated controllers. To establish a communication link with your 3X host, you must define a viable Controller Address from the host for each controller.

## NOTE

**On deluxe models only, more than one Link Station Address can be supported for each synchronous port. This enables the LinkUp 5294 to emulate as many as four IBM Remote Controllers on a single port from a single line ICA.**

## CAUTION

**If your unit is a deluxe model, note that each synchronous port configured to support two Link Station Addresses must have two distinct Controller Addresses, and must use the same emulation mode (5251, 5294, or 5394).**

## NOTE

**If more Station Addresses are specified in Parameters 8 through 11 than were specified in Parameter 7, the following error message is displayed:**

**n: INCOMPATIBLE WITH PARAMETER 7.**

**7.5.7 ASYNCHRONOUS PORT PARAMETERS**

The Asynchronous Port Menu is shown below:

**1. Device Type**

Valid values are:

```
Current Parameter Values For Port 4 (ASYNC):

1. Device Type                             ADM3A+
2. Associated Logical Unit                     4+
3. Communications Interface                   DCE
4. Bit Rate                                  AUTO
5. Number of Bits/Char (Excluding Parity)       8
6. Parity                                    NONE
7. Number of Stop Bits                          1
8. Connect Mode                               DED
9. Flow Control from Converter                XON
10. Flow Control from Device                  XON
11. Device Ready Signal                       DTR
12. Packet Network Access                       N
13. Auto Exit Enabled                         YES

Enter Change(s):
```

For a terminal or PC:

```
ACT5AADM11        ADM21
ADM3A       ADM3P       ANSI
COMPU       C7101       C7103
CY5291      DISPH       D200
HP45        HZ51        SCANS
TV910       TV910P      TV925
TV970       T5250       VIEWP
VP60        VT52        VT52X
VT100       VT220       WY30
WY60        WY60XWY100
XT100
```

For a printer:

```
CENTRN      C1300       DP8050      EPSON       GE3000      GEN34 GEN44 HPDPL
HPDPP       HPGEN       OKIM84      PRINT
```

A Terminal or Printer Module ID is the appropriate response at this parameter. The correct module to enter depends on the device (terminal, PC, or printer) attached to the port being configured. Each module is based on a brand name ASCII terminal or printer.

# NOTE

**This parameter can be defined as overridable (+) or non-overridable (-).**

**When a Printer Module ID is entered, the LinkUp 5294 forces this parameter and the next one (Associated Logical Unit) to be non-overridable.**

**2. Associated Logical Unit**

Valid values are: 0 and 2 through 32.

A Logical Unit is a virtual device address that is not tied to any one physical port. The LinkUp 5294 uses an LU as an identification number to keep track of your attached device; it is not the workstation address Local Station ID) defined on your System/3X.

# NOTE

**This parameter can be defined as overridable (+) or non-overridable (-).**

**One (1) is only a valid entry during Connect Mode at the Enter LU Number menu prompt, and is used only to access Configurator Mode.**

**3. Communications Interface**

Valid values are: DCE (Data Communications Equipment) or DTE (Data Terminal Equipment).

When connecting an asynchronous modem to a LinkUp 5294 asynchronous port, this value must be defined as DTE; but when connecting your terminal, PC, or printer directly to an asynchronous port, it must be set to DCE.

**4. Bit Rate**

Valid values are:

75      110     134     150     300     600     1200
2000    2400    4800    7200    9600    14400   19200
AUTO

AUTO enables the LinkUp 5294 to automatically detect the incoming baud rate of the device attached to its port. This is commonly called Autobaud detection. When AUTO is specified, the LinkUp 5294 is only able to determine the following bit rates:

19200   9600   4800   2400   1200   300 bps

# NOTE

**Any value received by a LinkUp 5294 port configured for AUTO, below 1200 bps, is treated as if it were 300 bps.**

**5. Number of Bits/Char (Excluding Parity)**

Valid values are: 8 or 7.

Asynchronously transmitted data is structured as below, beginning with the start bit:

Start bit     Character code bits     Parity bit     Stop bit(s)

# NOTE

**Set this value to match the character structure supported by your terminal, PC, or printer connected to the port you are configuring.**

**6. Parity**

Valid values are: ODD, EVEN, MARK, SPACE, or NONE.

Parity enables the LinkUp 5294 to perform asynchronous error checking on the communication line between itself and your attached device. For a true parity check, ODD or EVEN are the recommended settings. If NONE is defined, no parity error checking will occur.

# CAUTION

**MARK and SPACE are valid only when 7 is defined for Number of Bits/Char; while ODD and EVEN can be defined with 7 or 8.**

# NOTE

**Set this value to match the character structure supported by your terminal, PC, or printer connected to the port you are configuring.**

**7. Number of Stop Bits**

Valid values are: 1, l.5, or 2.

When defining this parameter take into account the bit rate of your attached device. Generally, for optimum bit rate performance, 1 stop bit is used; however, exceptions are: 2 stop bits at 110 bps and 1.5 stop bits at 134 bps.

# NOTE

**Set this value to match the character structure supported by your terminal, PC, or printer connected to the port you are configuring.**

**8. Connect Mode**

Valid values are: DED (for Dedicated) or AUTO (for Automatic Answer).

When the LinkUp 5294 is connected to your terminal, PC, or printer by an asynchronous modem, specifying AUTO will enable the LinkUp 5294 to automatically answer an incoming call from your device. For directly connected devices, DED should be specified.

# NOTE

**When Communications Interface and Connect Mode are defined as DTE and AUTO, respectively, the LinkUp 5294 waits for Ring Indicator from the asynchronous modem before raising DTR. With DTR raised, the modem (configured to automatically answer an incoming call) accepts the dial-up connection and then raises DSR to the LinkUp 5294. However, when DCE and AUTO are respectively defined and DTR drops, the LinkUp 5294 terminates the coupled user session.**

**9. 10. Flow Control from Converter/Flow Control from Device**

Valid values are: NONE, XON, CTS, RTS, DSR, DTR, or P11.

The values defined here let the LinkUp 5294 know what RS-232C line signals or XON/XOFF commands are being used to control the flow of data between itself and your attached device. See Table 7-1 before defining values for these parameters.

**11. Device Ready Signal**

Valid values are: NONE, CTS, RTS, DSR, or DTR.

The value defined here lets the LinkUp 5294 know which RS-232C signal to watch in order to determine when the device attached to its port is ready for operation. Consult Table 7-1 before defining a value for this parameter.

**Table 7-1. Communications Interface, Flow Control, and Ready Signals**

| COMM. INTERFACE | FLOW CONTROL from CONVERTER | FLOW CONTROL from DEVICE | DEVICE READY |
|---|---|---|---|
| DCE | NONE/XON/CTS/DSR | NONE/XON | NONE/RTS/DTR |
| DCE | NONE/XON/CTS/DSR | DTR | NONE/RTS |
| DCE | NONE/XON/CTS/DSR | RTS/P11 | NONE/DTR |
| DTE | NONE/XON/RTS/DTR | NONE/XON | NONE/CTS/DTR |
| DTE | NONE/XON/RTS/DTR | CTS | NONE/DSR |
| DTE | NONE/XON/RTS/DTR | DSR | NONE/CTS |

**12. Packet Network Access**

Valid values are: N (for None), 1, or 2, or 3.

Values 1 and 2 are generic supports for asynchronous data packet networks. If you choose one (l), the LinkUp 5294 to generates cursor positioning as it usually does. If you choose two (2), the LinkUp 5294 relies on the network's terminal node to perform cursor positioning by means of its local echo of escape sequences, except in the following situations:

• When a screen wrap is required. This occurs when the cursor moves from the bottom to the top of the screen, or from the right margin to the left margin.

• When fast cursor left and fast cursor right are invoked.

**13. Auto Exit Enabled**

Valid values are: YES or NO.

When YES is defined here, the LinkUp 5294 moves the cursor to the next System/3X input field after it reaches the end of the field it is currently in, providing the field has been defined for auto-exit on your 3X host. To disable Auto Exit, specify NO for this parameter.

# NOTE

**When Parameter 12, Packet Network Access, is defined as N for none, then Parameter 13 cannot be defined as NO.**

### 7.5.8 LOGICAL UNIT PARAMETERS FOR A DISPLAY

The Display Logical Unit Menu is shown below:

**1. Associated Sync Port**

Valid values are: 0 (for Port 0) or 1 (Port 1).

The value defined here lets the LinkUp 5294 know which physical synchronous port the LU under configuration is assigned to. The 32 LUs available on the LinkUp 5294 may be assigned in whatever way your application requires. For example, if you require only one synchronous port, then all the LUs can be defined to that single port; if you require two synchronous ports to emulate two remote controllers, you may divide the LUs between the two in any combination you wish.

```
Current Parameter Values For Logical Unit 2 (DSPLY):
1. Associated Sync Port                              0
2. Associated SDLC Link Number                       0
3. Local Station Address                          NONE
4. Buffer Size                                    1920
5. Number of Screen Rows                            24
6. Number of Screen Columns                         80
7. Password                                       NONE
8. Inactivity Time Limit                          NONE
9. Reconnect Time Limit                             30
10. Logical Unit Number of Local Copy Printer     NONE
11. Logical Unit Number of Auxiliary Printer      NONE
12. Echoplex Enable                                YES
13. Echoplex Toggle Enable                          NO
14. Display Status Line Initially                   NO
15. Character Set                                   US
Enter Change(s):
```

# CAUTION

**Whenever this parameter or either of the following two (Associated SDLC Link Number and Local Station Address) is reconfigured, a hardware reset must be performed on the LinkUp 5294.**

# NOTE

**If, during a two synchronous port operation, the host sends a request to Port 1 for an LU associated with Port 0, the LinkUp 5294 responds with an Unavailable LU error message.**

**2. Associated SDLC Link Number**

Valid value (for standard LinkUp 5294 units) is: 0 (for Link 0 Station Address).

Valid values (for deluxe units) are: 0 (for Link 0 Station Address), 1 (for Link 1 Station Address), 2 (for Link 2 Station Address), and 3 (for Link Station Address).

As previously mentioned, deluxe LinkUp 5294 units can logically emulate as many as four remote controllers per synchronous port. Therefore, not only must you define the LU (under configuration) to a specific synchronous port, you must also define it to a specific Link Station Address.

**3. Local Station Address**

Valid values are: Any hexadecimal value from 0 through 0F.

Local Station Address refers to the workstation identification number assigned to one of the devices (a display or printer) communicating with your System/3X host. It is also called a Local Session ID or LSID. The correct value for this parameter depends on what the designated LSID is on your System/3X host. Once this value is set, the LinkUp 5294 is able to establish a communications link between your 3X host and one or more of its LUs.

# NOTE

**Any LinkUp 5294 LU may be linked to any System/3X LSID at any Controller Address defined to one of the LinkUp 5294 Link Station Address; however, a one-to-one correspondence (one LSID to one LU) must be maintained.**

**An IBM 5251 Model 12 controller uses LSIDs numbered 0 and 2 through 9.**

**An IBM 5294 controller uses LSIDs numbered 0 through 9.**

**An IBM 5394 controller uses LSIDs numbered 0 through 0F.**

**4. Buffer Size**

Valid value is: 1920.

There is only one value possible for this parameter. This is because 1920 is the standard buffer size of a 5250 Display.

**5, 6. Number of Screen Rows/Number of Screen Columns**

Valid value is: 24 (rows) by 80 (columns).

There is only one value possible for these parameters. This is because 24 by 80 is the standard size of a 5250 Display.

**7. Password**

Valid values are: Any combination of 1 to 6 alphanumeric characters, or NONE.

Specifying a password enables the LinkUp 5294 to protect the configured LU from being accessed (during Connect Mode) by everyone but the terminal operator assigned to that LU (the one who knows the password). When NONE is specified no password is defined, and the LinkUp 5294 cannot restrict anyone from accessing the configured LU.

Whenever a password is defined at this parameter, the LinkUp 5294 can also offer you a second level of password protection, called a Reconnect Password. A Reconnect Password allows the LinkUp 5294 to restrict access to your LU (so that only you can re-access it, since you alone know the specified password) in the event the LU session is interrupted due to a physical or logical disconnection; for example, if your communication line drops or the LinkUp 5294 times out after reaching the specified Inactivity Time Limit.

# NOTE

**Valid values for the Reconnect Password are: Any combination of 1 to 6 alphanumeric characters or NONE. If NONE is specified, or if you simply skip over to the appropriate Connect Mode prompt (by pressing <Enter>), the Reconnect Password defaults to the first level password configured to the LU.**

**Once a password is defined, you cannot sign on to the LinkUp 5294 (during Connect Mode, either initially or at a reconnect operation) until you successfully enter that password. The LinkUp 5294 allows you three attempts before advising you that your CONNECT REQUEST FAILED. When this message displays, the LinkUp 5294 also reinitializes the affected asynchronous port. If you are remotely connected, your line will be dropped.**

**8. Inactivity Time Limit**

Valid values are: Any integer (representative of minutes) from 1 to 99, or NONE. When NONE is specified, it means no inactivity time-out will occur.

When an inactivity time limit is specified, it represents the maximum time that the LinkUp 5294 will maintain the coupling between an inactive terminal (one experiencing no keyboard input or host output) and an LU session. If an inactivity time limit is reached, the LinkUp 5294 responds by clearing your screen and displaying the following message before returning you to Connect Mode:

INACTIVITY TIME-OUT - DISCONNECTED

## NOTE

**This parameter can be defined as overridable (+) or non-overridable (-).**

### 9. Reconnect Time Limit

Valid values are: Any integer (representative of minutes) from 0 to 99, or NONE. When 0 is specified, the LinkUp 5294 terminates a disconnected LU session immediately; if NONE is specified, the LinkUp 5294 holds a disconnected LU session open for reconnect indefinitely.

When a reconnect time limit is specified, it defines the maximum time in minutes that the LinkUp 5294 will hold a disconnected LU session open, enabling you to reconnect to the last screen display. Disconnections can be either physical, as when the remote telephone line drops, or logical, as when the LinkUp 5294 Inactivity Time Limit is reached.

## NOTE

**During reconnect state, the LinkUp 5294 responds to the System/3X host for your disconnected LU session as if nothing were wrong. In other words, if the host outputs data to the LU, the LinkUp 5294 stores it. Then, when you reconnect within the configured time limit, the LinkUp 5294 automatically updates your screen to reflect the new data.**

**This parameter can be defined as overridable (+) or non-overridable (-).**

### 10. Logical Unit Number of Local Copy Printer

Valid values are: 0, 2 through 32, or NONE.

## CAUTION

**You may only specify an LU number configured as a printer. It must also be further defined as a Local Copy printer (LOC).**

When an appropriate LU number is defined to this parameter, the assigned terminal operator will be able to invoke the extended keyboard functions of LOCAL COPY PRINT REQUEST and LOCAL COPY FORM FEED.

## NOTE

**This parameter can be defined as overridable (+) or non-overridable (-).**

### 11. Logical Unit Number of Auxiliary Printer

Valid values are: 0, 2 through 32, or NONE.

## CAUTION

**You may only specify an LU number configured as an auxiliary printer (defined as AUX).**

When an appropriate LU number is defined to this parameter, the assigned terminal user will be able to operate their terminal and auxiliary attached printer with the LinkUp 5294 Auxiliary Printer facility, allowing shared use of a single LinkUp 5294 asynchronous port.

# NOTE

**This parameter can be defined as overridable (+) or non-overridable (-).**

**12. Echoplex Enable**

Valid values are: YES or NO.

If your application requires the LinkUp 5294 to echo characters and control codes back to your attached ASCII devices, specify YES at this parameter. If this is not the requirement, as when using the COMPU module, specify NO.

# NOTE

**This parameter can be defined as overridable (+) or non-overridable (-).**

**When the Packet Network Access parameter of the Asynchronous Port Configurator Menu is defined as 1 or 2, then the Echoplex Enable parameter is superseded.**

**13. Echoplex Toggle Enable**

Valid values are: NO or YES.

Specifying YES at this parameter enables the LinkUp 5294 to respond to the extended keyboard function of TOGGLE ECHOPLEX ENABLED whenever you press it. This function allows you to selectively toggle when you want the LinkUp 5294 to echo characters and control codes back to their terminals.

# NOTE

**This parameter can be defined as overridable (+) or non-overridable (-).**

**When the Packet Network Access parameter of the Asynchronous Port Configurator Menu is defined as 1 or 2, then the Echoplex Toggle Enable parameter is superseded.**

**14. Display Status Line Initially**

Valid values are: YES or NO.

This controls whether or not the Status Line is displayed after initial connection to the host. The default for this parameter is YES.

**15. Character Set**

Valid values are: US or MULTI.

US is the U.S. character translation currently available in versions of the LinkUp 5294 code before 1.15. MULTI is a multinational character translation based on IBM Multinational EBCDIC character set and an extended version of IBM Code Page 850 ASCII character set. The default value is US.

**7.5.9 PRINTER LOGICAL UNIT PARAMETERS FOR A PRINTER OR AUXILIARY PRINTER**

The Logical Unit Configuration menus for Printers and Auxiliary Printers are shown below. The default values are also shown. To access these menus, enter PRT or AUX at the **Enter Logical Unit Type (DSPLY)** prompt.

**1. Associated Sync Port**

Valid values are: 0 (for Port 0) or 1 (for Port 1)

The value defined here lets the LinkUp 5294 know which physical synchronous port the LU under configuration is assigned to. The 32 LUs available on the LinkUp 5294 may be assigned in whatever way your application requires. For example, if you require two synchronous ports to emulate two remote controllers, you may divide the LUs between the two in any combination you wish.

```
Current Parameter Values For Logical Unit 7 (PRT):
1. Associated Sync Port                      0
2. Associated SDLC Link Number               0
3. Local Station Address                  NONE
4. Operational Mode                        LOC
5. Line Length (Columns)                    132
6. Page Length (Inches)                   11.00
7. Lines Per Inch                            6
8. Single/Dual Case                          D
 9. Single/Double Spacing                    S
10. Emulate FF with LF                      NO
11. Character Set                           US

Enter Change(s):
```

```
Current Parameter Values For Logical Unit 9 (AUX):
1. Associated Sync Port                      0
2. Associated SDLC Link Number               0
3. Local Station Address                  NONE
4. Operational Mode                        LOC
5. Line Length (Columns)                    132
6. Page Length (Inches)                   11.00
7. Lines Per Inch                            6
8. Single/Dual Case                          D
9. Single/Double Spacing                     S
10. Emulate FF with LF                      NO
11. Character Set                           US

Enter Change(s):
```

# CAUTION

**Whenever this parameter or either of the following two (Associated SDLC Link Number and Local Station Address) are reconfigured, a hardware reset must be performed on the LinkUp 5294.**

# NOTE

**If, during a two synchronous port operation, the host sends a request to Port 1 for an LU associated with Port 0, the LinkUp 5294 responds with an unavailable LU error message.**

**2. Associated SDLC Link Number**

Valid value for standard LinkUp 5294 units: 0 (for Link 0 Station Address).

Valid values for deluxe units: 0 (for Link 0 Station Address), 1 (for Link 1 Station Address), 2 (for Link 2 Station Address), and 3 (for Link 3 Station Address).

As previously mentioned, deluxe LinkUp 5294 can logically emulate as many as four remote controllers per synchronous port. Therefore, not only must you define the LU under configuration to a specific synchronous port, but you must also define it to a specific Link Station Address.

**3. Local Station Address**

Valid values are: Any hexadecimal value from 0 to 0F.

Local Station Address refers to the workstation identification number assigned to one of the devices (a display or printer) communicating with your System/3X host. It is also called a Local Session ID or LSID. The correct value for this parameter depends on what the designated LSID is on your System/3X host. Once this value is set, the LinkUp 5294 is able to establish a communication link between your 3X host and one or more of its LUs.

# NOTE

**Any LinkUp 5294 LU may be linked to any System/3X LSID viable to any Controller Address defined to one of the LinkUp 5294 Link Station Addresses; however, a one-to-one correspondence (one LSID to one LU) must be maintained.**

**An IBM 5251 Model 12 controller uses LSIDs numbered 0 and 2 through 9.**

**An IBM 5294 controller uses LSIDs numbered 0 through 9.**

**An IBM 5394 controller uses LSIDs numbered 0 through 0F.**

**Operational Mode**

Valid values are: LOC (for Local Copy printer) or SYS (for System printer).

If you require the ability to print the contents of their terminal screens to a designated printer, you must select and define a printer LU for a local copy operational mode, or LOC. If your application necessitates being able to perform print jobs from your host, you must select and define a printer LU for a system operational mode, or SYS.

# CAUTION

**These two values are mutually exclusive. If one is defined to an LU, the other cannot be supported by the same LU.**

**Line Length (Columns)**

Valid values are: Any integer from 40 to 132.

The value specified at this parameter represents the maximum line length permitted. The actual line length depends on the format controls sent by your host. Therefore, when defining your desired maximum, make sure it corresponds to the actual carriage width of the ASCII printer(s) you will be attaching to the LinkUp 5294.

# NOTE

**Although the values of parameters 6 through 9 can be changed on the configuration menus, they are ultimately controlled by the System/3X host; they are not used or supported by the LinkUp 5294 at this time.**

**6. Page Length (Inches)**

Valid values are: Any number from 1 to 22, carried out to two decimal places. The entry format is nn.nn, representing decimal numbers from 01.00 to 22.00, inclusive.

**7. Lines Per Inch**

Valid values are: 6 or 8.

**8. Single/Dual Case**

Valid values are: D (for Dual case) or S (for Single case).

**9. Single/Double Spacing**

Valid values are: S (for Single spacing) or D (for Double spacing).

**10. Emulate Form Feed with Line Feeds**

Valid values are: NO, YES, or AUTO.

This parameter provides support for the SCS command Set Vertical Form.

If this parameter is set to NO, the LinkUp 5294 sends Form Feed when Form Feed is received from the host whether or not a standard or non-standard form length has been sent by the host through the SVF command, and whether or not an Escape sequence to specify form length exists for the printer. This is the default setting. It will be up to you to set proper forms length, etc., at the printer.

If the parameter is set to YES, the LinkUp 5294 sends the proper number of Line Feeds to the printer to emulate a Form Feed when Form Feed is received from the host, regardless of the forms length set by the SVF command or the capabilities of the printer.

If set to AUTO, the LinkUp 5294 sends an Escape sequence to the printer specifying the form length in lines per form (if there exists such a sequence) after receipt of a SVF command from the host. Form Feed will subsequently be sent to the terminal after receipt of Form Feed from the host. If no such Escape sequence exists (or if the length as specified by the SVF command is outside of the valid range of the Escape sequence), Form Feeds received from the host are emulated by the LinkUp 5294 with the proper number of Line Feeds.

**11. Character Set**

Valid values are: US and MULTI.

US is the U.S. character translation currently available in versions of the LinkUp 5294 code before 1.15. MULTI is a multinational character translation based on IBM Multinational EBCDIC character set and an extended version of IBM Code Page 850 ASCII character set. The default value is US.

**Auxiliary Printer Device Type (AUX Menu Only)**

Valid values are: CENTRN, CI300, DP8050, EPSON, GE3000, GEN34, GEN44, HPDPL, HPDPP, HPGEN, OKIM84, or PRINT.

A Printer Module ID is the appropriate response at this parameter. Each module is based on a brand name ASCII printer. To determine which module to select, the printer attached to your terminal users' auxiliary port must be:

- The actual printer type

- Its compatible

- Capable of emulating the actual printer type

**7.5.10 SYNTAX ERROR MESSAGES**

If invalid entries are made while editing in Configurator Mode, one of the following self-explanatory messages will be displayed on your screen:

SYNTAX ERROR.
UNRECOGNIZED RESPONSE.
ILLEGAL CHARACTER.
MAXIMUM STRING LENGTH EXCEEDED. MAXIMUM LINE LENGTH EXCEEDED. VALUE OUT OF RANGE.
INVALID.
TRAILING CHARACTERS IGNORED.
NOT SUPPORTED IN THIS RELEASE.

When the error corresponds to a specific parameter in one of the Configurator Mode menus, the respective message will be displayed in the following format:

**n: {message}**

where n is the number of the parameter in error and {message} is the appropriate error message. The brackets { } do not display; they are used here as markers only.

# NOTE

**Whenever you finish reconfiguring the parameters of the asynchronous port to which your terminal is connected, the LinkUp 5294 exits Configurator Mode, saves your changes, and displays the following message before returning you to Connect Mode:**

**\*\*Connect Attempt Cancelled Port Reconfigured \*\***

**7.5.11 PHYSICAL CONFIGURATION**

Whenever you reconfigure a synchronous port you must perform a hardware reset in order to reinitialize it. This may be accomplished by powering the LinkUp 5294 off and back on again, or by using the Remote Reset function in the System Management Mode options menu.

A hardware reset must also be done when you reassign an LU to another synchronous port, SDLC Link

Number, and Local Station Address.

## 7.6 Emulation Mode

Emulation Mode is the operating session enabling you to communicate with your System/3X host as though the terminal, PC, printer, or auxiliary printer you are using is an actual IBM 5251 model 11 or 529x Display Workstation or 52xx Printer. A terminal or PC is defined as in session when the Sign-On menu of your System/3X host is displayed on its screen. (Emulation Mode will appear as it does in the screen below, if you advance to it prior to configuring the LinkUp 5294 as required by your application, or you have not yet connected it to your System/3X host.)

```
SYS AVAIL: * MSG WT:  INS MODE:  INPUT INH: AWFER
```

Typically, you enter Emulation Mode by correctly responding to the last Connect Mode menu prompt. However, if you define the LinkUp 5294 configurator parameters as non-overridable (-), the Connect Mode menu and prompts will not display and you will immediately enter Emulation Mode. Once in Emulation Mode, you can sign on to your 3X host and perform typical 3X session activities as any normal 5250 Workstation would.

## NOTE

**If you have restricted access to Connect Mode by making all Connect Mode prompts non-overridable, and if the LinkUp 5294 parameter of Bit Rate is defined as AUTO, you and your terminal operators must press <Enter> twice to enter Emulation Mode.**

## 7.7 Setup Mode

Setup Mode resets all Configurator Mode parameters to their factory default values. Use Setup Mode when you are changing the number of asynchronous ports, or if you wish to convert a  LinkUp 5294 to a Link Up 3174 (or vice versa). When upgrading the LinkUp firmware PROM cartridge, it is only necessary to go through Setup Mode when the release notice accompanying the upgrade specifies that it must be done.

## NOTE

**To make sure the Configurator Mode parameters you choose are consistent with the ones you chose in Setup Mode, it is recommended that you keep a record of all your Setup Mode configuration choices.**

To enter Setup Mode, you must take the LinkUp apart and set an internal switch. Follow these

instructions carefully:

1. Turn off and unplug the LinkUp 5294.

2. Loosen the thumbscrews on either side of the main circuit board and slide the circuit board part way out. Move the two-position switch located near the PROM cartridge from the RUN position to the SETUP position. Carefully slide the main circuit board back into position, making sure that the CHANNEL SELECT and RESET buttons do not bind on the front panel.

3. Plug the LinkUp 5294 in and turn it on.

4. Connect a suitable display terminal (or PC with appropriate terminal emulation software installed) to Port 2 and power it on. The terminal must be set to operate with 8 bits and no parity. Its baud rate may be set for 300, 1200, 2400, 4800, 9600 or 19200.

5. Press <Enter> twice on your terminal to display the Connect Mode sign-on menu.

6. Proceed as though you wished to enter Configurator Mode: specify your terminal type, then answer <1> in response to the Enter LU number prompt.

7. Because of the setting of the internal RUN/SETUP switch, you will not enter Configurator Mode, but will instead enter Setup Mode. As shown in Figure 7-2, you must now enter the Setup Mode password; both DALYNX and SETUP are valid passwords, as shipped from the factory.

8. When the message appears telling you to reset the LinkUp 5294, all ports and LUs will have been set to their factory default parameters in EEPROM. Return the RUN/SETUP switch to the RUN position by taking the appropriate actions as described in Step 2.

9. Proceed to Configurator Mode to define the port and LU parameters as you desire.


Enter Device Type (HZ51): <Enter>


Enter LU Number (2): <u>1</u> <Enter>


****SETUP MODE****

ENTER SETUP PASSWORD <u>DALYNX</u> <Enter>


PARAMETER STORAGE IN PROGRESS.


SWITCH TO CONFIGURATOR MODE
AND RESET LINKUP 5294.


**Figure 7-2. Sample Setup Mode Session.**

# 8. Packet Network Access Applications

Packet Network Access support allows the LinkUp 5294 to be used in X.25 and other network environments facilitating transmission of asynchronous data. The LinkUp 5294 is located between the IBM host computer and the host PAD (Packet Assembler-Disassembler), as shown in Figure 8-1. The host PAD provides the interface between the LinkUp 5294 and the X.25 network. The terminal is connected to the Packet Data Network (PDN) through the terminal PAD. The terminal can be directly cabled to the PAD, or can dial into a public PAD port.
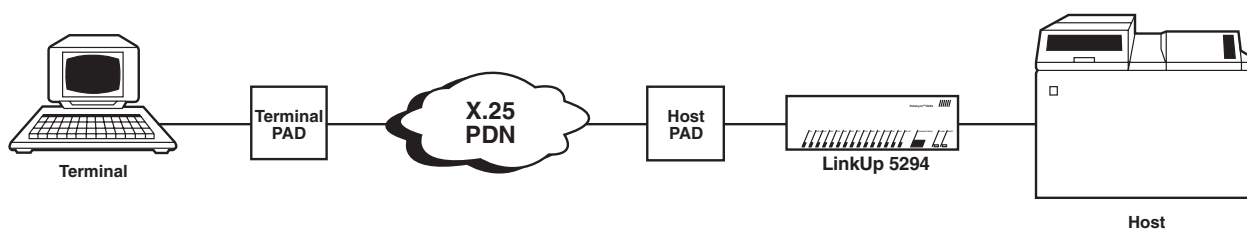


**Figure 8-1. A Packet Data Network Environment.**

The LinkUp 5294 will convert the host's synchronous data into an asynchronous data stream. The host PAD will bundle the asynchronous data into a packet and transmit it over the X.25 network to the terminal PAD. The terminal PAD will unbundle the asynchronous packet and send the data stream to the terminal. Conversely, the terminal's asynchronous data stream will be assembled into a packet and transmitted by the terminal PAD. The host PAD will receive the packet, unbundle it, and pass the asynchronous data stream to the LinkUp 5294. The LinkUp 5294 will now convert the asynchronous data into a synchronous data stream and send it to the host.

## 8.1 Terminology

The following abbreviations are used throughout this section

- **AID Keys —** Attention Identifiers. These are keys that require host processing. They are: <CLEAR>, <Enter>, Command keys, Roll keys, <HELP> and <PRINT>. When these keys are pressed, the LinkUp 5294 will normally lock the terminal's keyboard and send the information to the host. The host will generally return data for the display and signal the LinkUp 5294 to unlock the keyboard.

- **Auto Exit Field —** This is a type of field which is defined by the input field attributes of the IBM host application. After the operator has entered the last character of the field, the cursor will be positioned to the next input field automatically, without requiring the operator to press <TAB> or <FIELD EXIT>.

- **Character Echo —** This causes a character to appear on a terminal's display after a key on the keyboard has been pressed.

- **Cursor Movement Keys —** These are the Up Arrow, Down Arrow, Left Arrow, and Right Arrow keys.

They are generally handled by the LinkUp 5294, without requiring any information to go to the host.

• **Host PAD —** The PAD located at the host end of the network. In an X.25 network with minicomputers and asynchronous terminals, this is the PAD located at the minicomputer end of the network. In the LinkUp 5294 implementation where IBM hosts are used, this is the PAD located at the LinkUp 5294.

• **PAD —** Packet Assembler-Disassembler. This is a physical interface node with an asynchronous (RS-232C) port on one side and an X.25 protocol interface on the other side. A PAD is similar to an asynchronous modem in that both provide an interface to specialized communications lines.

• **PNA —** Packet Network Access. The LinkUp 5294 feature which allows connection of asynchronous terminals through an X.25 network.

• **PDN —** Packet Data Network. A network of private or public communications lines which use X.25 protocol.

• **Packet —** A collection of asynchronous data of varying length addressed for a specific destination.

• **Terminal PAD —** The PAD located at the asynchronous terminal end of the X.25 network.

## 8.2 Using the LinkUp 5294 with PDNs

In order to explain the way the LinkUp 5294 handles keystroke echo and cursor positioning with PDNs, it is necessary to explain how the LinkUp 5294 handles these with a directly connected terminal.

Figure 8-2 shows the flow of information between the keyboard, display, and the LinkUp 5294 when alphanumeric or cursor movement keys are pressed.

**A** = Press the Up Arrow key. Up Arrow keycode goes to the LinkUp 5294.

**B** = The LinkUp 5294 echoes the Up Arrow to the display (or in some cases sends a cursor address) and the cursor is repositioned.
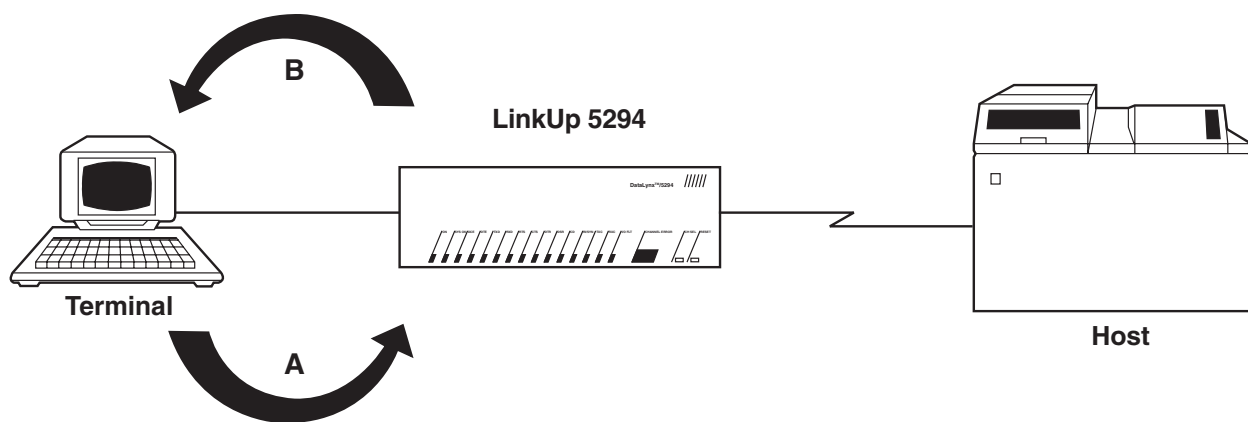


**Figure 8-2. Cursor Movement Echo.**

PADs are capable of echoing keycodes back to the terminal. If the PAD echoes the keycode and the LinkUp 5294 also echoes the keycode, the result will be duplicate characters, as you can see in Figure 8-3. Therefore, it is important to configure the PAD and the LinkUp 5294 properly.
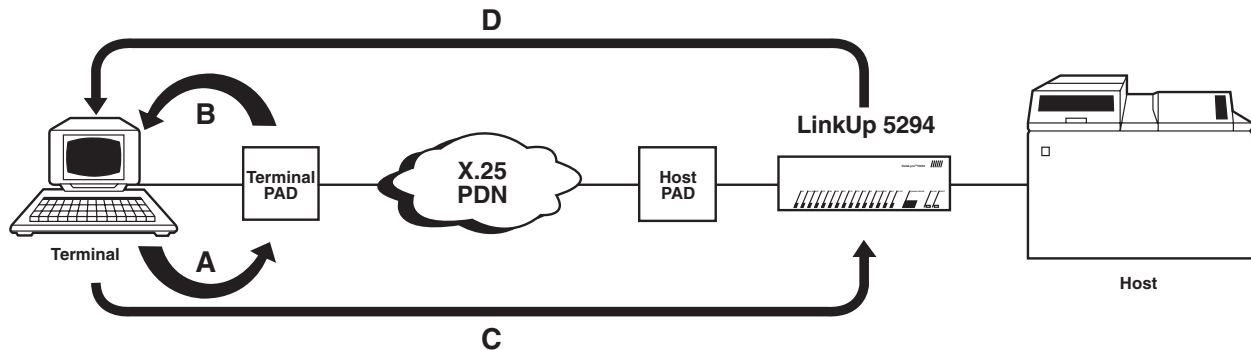


**Figure 8-3. Double Echo with PAD.**

Figure 8-4 shows the flow of information between the keyboard, display, and the LinkUp 5294 when AID keys are pressed.

**A** = Press the <CMD> key. The CMD 3 code goes to the LinkUp 5294.

**B** = Recognizing the AID key, the LinkUp 5294 locks the keyboard.

**C** = The CMD 3 code is sent to the host.

**D** = The host processes the command. Then appropriate data and an unlock keyboard command is sent to the LinkUp 5294.

**E** = The LinkUp 5294 sends the data and a cursor positioning command to the display, and then unlocks the keyboard.
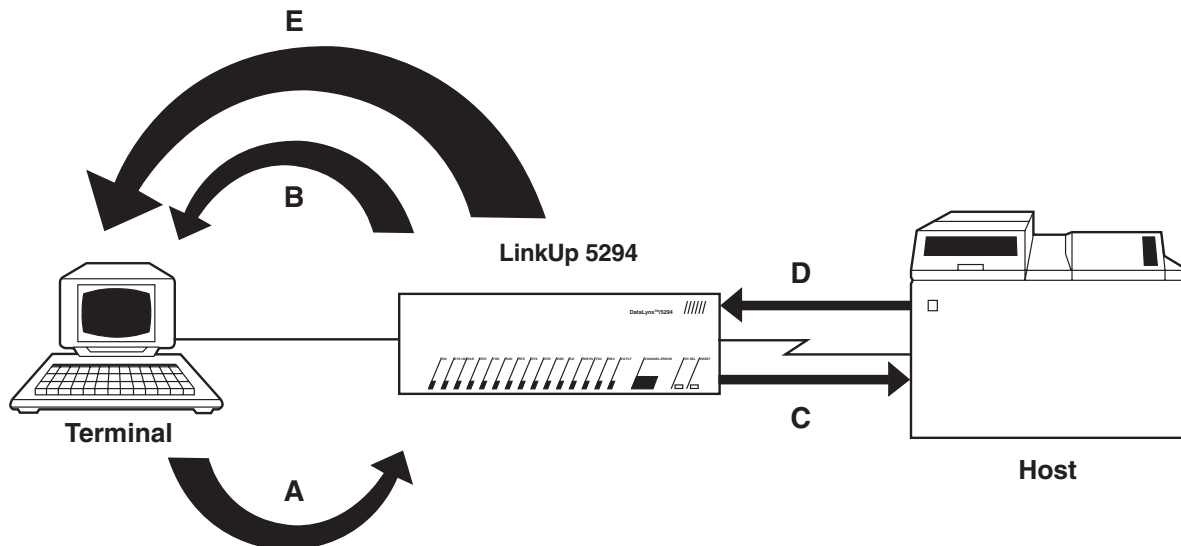


**Figure 8-4. AID Key Echo.**

When using PADs, a transmission delay can occur between the terminal and the LinkUp 5294. If there is a delay between the time you press the <CMD 3> key and the time the LinkUp 5294 locks the keyboard, it is possible for you to continue typing. You are ahead of the host computer, which is going to send cursor-positioning information. The cursor-positioning information goes to the terminal and moves the cursor to a location which is different from where you left it.

## 8.3 Installation Considerations

Packet Data Network support can be configured for any asynchronous port of the LinkUp 5294. To enable PDN support, set the value for Async Port parameter 12 to one of the following values as determined by the network type and function required.

- **12=1** Local PAD echo of characters with explicit cursor positioning sequences. This is generic PDN support. This ensures cursor synchronization at the expense of your having to wait for the LinkUp 5294 response after each press of the cursor key. Otherwise, data may be garbled.

- **12=2** Local echo with local cursor echo. This is the same generic support as Option 1, but without the LinkUp 5294 echo of cursor movement keys. The PAD itself will echo the cursor movement keys.

- **12=3** Local echo with local cursor echo. This is for use with the Telnet network because proprietary PAD control sequences are used.

The Async Port menu Option 13, Auto Exit Enabled, may be disabled (set to N) to avoid cursor positioning problems that may occur when typing beyond the end of a field.

The host PAD should be optioned for DCE and the LinkUp 5294 as DTE. The LinkUp 5294 expects to see ring indicate on Pin 22 for an incoming PDN call and will raise DTR on Pin 20 in response. The PAD should drop Pin 6 (DSR) to indicate the end of a connection so that the LinkUp 5294 will initiate session termination as configured. Ensure that the host PAD will provide these modem simulation functions.

When the LinkUp 5294 is used with X.25 networks, some screen display problems may result. If the initial port configuration is done while connected to the network, you will at first encounter locally echoed passwords and duplication of characters. However, once the port is configured and you have exited to Connect Mode, local character echo will cease. Double echo will not occur during subsequent configurations since the LinkUp 5294 will turn off its own echoplex during reconfiguration.

**8.3.1 PAD PARAMETERS**

The X.25 host PAD should be optioned for no character echo, editing not used, and data forwarding after 20 milliseconds of inactivity. Option codes and their subscriptions are as follows:

| | |
|---|---|
| 1:0 | No escape to PAD mode |
| 2:0 | No local echo |
| 3:0 | No character forwarding |
| 4:2 | Packet forwarding after 20 ms |
| 5:1 | LinkUp 5294 accepts X-ON/X-OFF from PAD |
| 6:0 | Suppress PAD messages |
| 7:0 | Ignore break from LinkUp 5294 |
| 8:0 | Normal data delivery |
| 9:0 | No padding after CR |
| 10:0 | No line folding |
| 11:x | Baud rate (x corresponds to LinkUp 5294 port) |
| 12:1 | PAD accepts X-ON/X-OFF from LinkUp 5294 |
| 13:0 | No LF insertion |
| 14:0 | No padding after LF |
| 15:0 | No editing |
| 16-22:0 | No editing |

Setup options for the remote terminal PAD include local echo, no line editing, data forward on <Enter>, and data forwarding after 20 milliseconds of keyboard inactivity.

For a dedicated PAD these options are normally fixed at the time of installation. If a public network is used, a subscriber profile is generally created by the network to set the remote PAD options at the time the user requests connection. These options should be communicated to the PDN carrier at the time of subscription. Option codes and their descriptions are as follows:

| | |
|---|---|
| 1:1 | Terminal can escape to PAD mode |
| 2:1 | Echo input |
| 3:2 | Forward on CR |
| 4:2 | Packet forwarding after 20 ms |
| 5:1 | Accept X-ON/X-OFF from PAD |
| 6:1 | Send PAD messages to terminal |
| 7:0 | Ignore break from terminal |
| 8:0 | Normal data delivery |
| 9:0 | No padding after CR |
| 10:0 | No line folding |
| 12:1 | PAD accepts X-ON/X-OFF from terminal |
| 13:0 | No LF insertion |
| 14:0 | No padding after LF |
| 15-24:0 | No editing |

## 8.4 Special Operational Considerations

During operation of a terminal through a PDN to the host computer, some characters and commands are echoed locally and are reflected on the terminal screen quickly. Others must be sent through the network to the host, processed, and sent back through the network before they are observed. In general, alphanumeric characters will echo immediately. The following functions must be processed by the host or the LinkUp 5294 and will take one to three seconds:

- Field Advance using <TAB>, <BACKTAB>, <FIELD EXIT>, <FIELD +>, or<FIELD -> Keys

- Cursor <HOME> and <NEW LINE>

- <CLEAR>

- Reset (usually <CTRL/R>)

- <DEL>, <ERASE INPUT> and those alphanumeric characters typed while in insert mode

- <Enter>, <ROLL UP>, <ROLL DOWN>, and <DUP>

- <SYS REQ> and <ATTN>

- <CMD> key sequences

- <SCREEN REFRESH> is useful if you suspect that the screen data may have been corrupted.

Also, when using one of the generic PNA options (1 or 2), nondisplay fields such as passwords will display due to local echo by the PAD. <SCREEN REFRESH> should be entered immediately after keying data in a non-display field, causing the LinkUp 5294 to remove it from the display. Other fields may then be completed as needed.

## 8.5 Other Special Considerations

### 8.5.1 SCREEN DISPLAY ERRORS

Because of local PAD echo, the terminal display may become garbled at times. To correct this condition, should it occur, use the <SCREEN REFRESH> sequence for your terminal. For most terminal types, this is accomplished by a <CTRL/W> or an <ESC W>. Refer to the Terminal User's Handbook for the correct key sequence for your terminal type.

If the initial LinkUp 5294 port configuration is done while connected to the network, you will encounter locally echoed passwords and duplication of characters since the LinkUp 5294 default for PNA access is N (None). Once the port is configured, exit to Connect Mode, complete the connect sequence, and screen data should appear normally thereafter.

You should not observe double echo during subsequent configurations since the LinkUp 5294 will turn off its own echoplex during reconfiguration.

### 8.5.2 DATA FORWARDING TO THE PAD

Customers using PADs at remote locations to connect terminals to the PDN should check to see if the PAD supports escape forwarding. This capability recognizes an escape sequence from a terminal, does not echo it, and forwards the packet to the LinkUp 5294 after a specified time period. If possible, this method of data forwarding should be used to lessen the conflict of PAD echo and LinkUp 5294 echo of control sequences.

# 9. Diagnostics

The first two section of this chapter review the on-line and off-line diagnostic capabilities of the LinkUp 5294. The third section will help you find and solve common problems you may encounter when you use the LinkUp 5294.

## 9.1 On-Line Diagnostics

The on-line diagnostic capabilities of the LinkUp 5294 include:

- Watchdog Timer

- Error Code displays

- Communication Line Status Indicators

- Remote Interface Signal Display

- Sync Port Address Trace

- Async Port Trace

- Sync Port Trace (deluxe model only)

The Watchdog Timer enables the LinkUp 5294 to monitor its own program execution continuously in the background of daily operations, assuring you of its overall system integrity. If a program execution fails, the LinkUp 5294 alerts you with an Error Code display. Error Code displays and Communication Line Status indicators are the LinkUp 5294 front panel LEDs. Each one of these will be discussed in the next two sections.

### 9.1.1 FRONT-PANEL ERROR CODES

If a program-detectable error occurs, all channel status indicators on the front panel are turned off and a two-level error code is displayed by the two-digit channel display. The two error codes are flashed alternately. Table 9-1 describes the error code assignments currently implemented in the LinkUp 5294.

When an error code is displayed, pressing the RESET button will clear the error code and cause channel status display to resume. However, if more than one error has occurred, pressing RESET will clear the most recent error code and display the previous one. Preceding error codes can then be viewed by pressing RESET repeatedly until the channel status indicators resume their normal operation. This marks the end of accumulated errors. Once error codes are cleared, they cannot be redisplayed on the front panel.

### 9.1.2 FRONT-PANEL STATUS INDICATORS

The LinkUp 5294 front panel lets you monitor a total of 13 different communication line status indicators for any port. If a problem occurs on one of the communication lines established on one of the LinkUp 5294 ports, you can troubleshoot that problem by scrolling to the affected port number (using the CHannel SELect control button) and then examining the displayed status indicators. If the appropriate status indicators are not lit, you will be able to target the line's problem by trial and error.

Check the lights on the LinkUp's front panel when you have a communication-line problem. By comparing which signals are lit to which signals should be lit, you may be able to isolate the problem. For your reference, Table 9-2 lists the front-panel signals, their definitions, and a brief explanation of when each should be lit.

**Table 9-1. Front Panel Error Codes**

| CLASS | FIRST CODE | SECOND CODE | DEFINITION |
|---|---|---|---|
| Hardware Deficiency | HA | 00 | Insufficient EEPROM for this configuration. |
| | HA | 01 | Insufficient RAM for this configuration. |
| System Errors | Sy | 00 | CPU failure: watchdog timer timeout |
| | SY | 01 | ROM failure: bad ROM cartridge. |
| EEPROM Chip Error | EE | 01 through 04 | EEPROM chip defective. Chip number is identified by the second code. |
| System Parameter Error in EEPROM | SP | 00 | EEPROM Header Error. Some or all parameters stored in EEPROM may be restored to default values. This error occurs when unformatted EEPROM chips are encountered when the LinkUp 5294 is turned on. |
| | SP | 01 | EEPROM failure in System section. Default values are loaded. |
| Port Parameter Error in EEPROM | Po | 00 through 33 | EEPROM failure in Port Parameters. Second code indicates port number. Default values are loaded for the defective port. |
| Logical Unit Parameter Error in EEPROM | LU | 02 through 33 | EEPROM failure in LU parameters. Second code indicates LU number. Default values are loaded for the defective item. |
| Stack Overflow | LS | 02 through 33 | Logical Unit Stack overflow. Second code indicates the LU number. |

### Table 9-2. Front Panel Communication Line Indicators.

| INDICATOR | DESCRIPTION |
|---|---|
| DCE | Data Communications Equipment. Lit when the LinkUp 5294 has been logically configured (in Configuration Mode) to implement a DCE device. |
| DTE | Data Terminal Equipment. Lit when the LinkUp 5294 has been logically configured (in Configurator Mode) to implement a DTE device. |
| TxD | Transmit Data. Lit when a DTE device (or configured port) is transmitting data to an attached DCE device (or configured port). |
| RxD | Receive Data. Lit when a DCE device (or configured port) is transmitting data to an attached DTE device (or configured port). |
| RTS | Request To Send. An RS-232C signal. Lit when a DTE device (or configured port) is sending this signal to a DCE device (or configured port). |
| CTS | Clear To Send. An RS-232C signal. Lit when a DCE device (or configured port) is sending this signal to a DTE device (or configured port). |
| DTR | Data Terminal Ready. An RS-232C signal. Lit when a DTE device (or configured port) is sending this signal to a DCE device (or configured port). |
| DSR | Data Set Ready. An RS-232C signal. Lit when a DCE device (or configured port) is sending this signal to a DTE device (or configured port). |
| CD | Carrier Detect. An RS-232C signal. Lit when a DCE device (or configured port) is sending this signal to a DTE device (or configured port). |
| RI/SYN | Ring Indicate/Synchronized. A dual-function indicator: (1) An RS-232C signal. Lit when a DCE device (or configured port) receives a ringing signal and notifies the attached DTE device (or configured port) of this; or (2) lit during a synchronous operation when the transmitted data is synchronized. |
| TxC | Transmit Clock. Lit when synchronous transmit clock signals are detected by a DCE device (or configured port). |
| RxC | Receive Clock. Lit when synchronous receive clock signals are detected by a DCE device (or configured port). |
| I/O FAULT | Input/Output Faults. Flashes whenever the LinkUp 5294 detects framing, overrun, or parity errors. |

## 9.2 Off-Line Diagnostics

The Off-line diagnostic capabilities of the LinkUp 5294 include:

- Self diagnostics at power up

- Monitoring of LU and Port Assignment Status

- Character Display Test

- Character Echo Test

- Product Configuration and Levels display

- LU and Async Port Summary (deluxe model only)

- SNA/SDLC Counters (deluxe model only)

### 9.2.1 SELF DIAGNOSTICS

Prior to the execution of the continuous background testing by the LinkUp 5294 Watchdog Timer, a series of preliminary self-tests is performed every time your LinkUp 5294 unit is powered on. These tests enable the LinkUp 5294 to assure you that its vital parts (ports, memory, programs, etc.) are in working order.

During the power-on self-tests all the front panel LEDs are off and **dr** is displayed on the CHANNEL/ERROR LEDs. The LinkUp 5294 usually remains in this condition for approximately three seconds; it then returns to its normal front-panel LED displays, ready for operation. (The default port number displayed on the CHANNEL/ERROR LEDs is always 02.) If one or more of the internal tests fails, **dr** will remain in the CHANNEL/ERROR display and the front panel LEDs will indicate the nature of the failure. The coding is depicted in the list below.

- DCE LED Off — Watchdog Timer Error

- DTE LED Off — ROM Test Failure

- TXD LED Off — Data Bus Failure

- RXD LED Off — Address Bus Failure

- RTS LED Off — RAM Test Failure

- CTS LED On — At least 512K of RAM

- DTR LED Off — Sync 8530 Failure

- DSR LED Off — Async 8530 Failure

- DCD LED Off — Insufficient EEPROM

### 9.2.2 LU AND PORT ASSIGNMENT STATUS

When you type STATUS at the Enter Item To Be Configured prompt while in Configurator Mode, the LinkUp 5294 responds by displaying a table containing the current operating status and port assignments of all 32 Logical Units. The information provided in this table enables you to isolate, at a glance, most interface problems you may encounter while operating the LinkUp 5294.

# NOTE

**A similar table is accessible during Connect Mode by typing <?> in response to the Enter LU Number prompt.**

To interpret the information contained in this table, refer to the following definitions:

- **LU Type —** Corresponds to the system LU Type 7 (display) or 4 (SCS printer).

- **Status —** The operating state of each LinkUp 5294 LU; for example, P for an LU which is pending disconnection, D for an LU which is disconnected, I for one being used, R for one that has been disconnected but can be reconnected, and U for an undefined LU.

- **Sync Port —** Refers to the synchronous port each LU is assigned to, such as Port 0 or 1.

- **Sync Link # —** The SDLC Link Number each LU has been associated to within its assigned synchronous port; for example, Link 0 or 1.

- **LSID —** The System/3X Local Station ID number associated with the LinkUp 5294 LU; for example, any value from 0 to 9, 0A to 0F.

- **Async Port —** The asynchronous port which the LU is coupled with; Port 2 through Port 33.

## 9.3 Finding and Identifying Problems

For assistance in troubleshooting the LinkUp 5294, see the list below. Common problems are listed in bold, followed by possible solutions.

**A directly attached terminal does not communicate with the LinkUp 5294:**

1. Verify that the terminal in question is optioned compatibly with the settings of the LinkUp 5294 port it is attached to. That is, set the terminal's bit rate, parity, on-line mode, char. mode, full duplex, DTR on, DSR off, etc., to match the settings specified for the LinkUp 5294.

2. Make sure the RS-232C cable is connected to the proper port of the terminal, usually labeled as COM or MODEM.

3. Check the front-panel signal LEDs on the LinkUp 5294 to be sure RTS, CTS, DTR, DSR and CD are on. If this is not true:

   A. Confirm that the attaching cable supports at least Pins 1–8 and 20.

   B. Verify that the cable is not a crossover or modem cable.

   C. Swap the cable in use with one known to be in working order.

4. Make sure the asynchronous port is optioned for DCE; that is, that it is a direct connection. Verify that the flat reversible cable of the I/O card is also installed for a DCE interface (the DCE label should be visible).

**A remotely attached terminal or printer does not communicate with the LinkUp 5294.**

1. Ensure that the terminal/printer, the LinkUp 5294, and modems are all configured to support the same baud rates.

2. Make sure the modem attached to the LinkUp 5294 is configured as follows:

   A.   To ignore modem commands.

   B.   Not to echo received characters.

For switched lines, the modem must also be configured as follows:

   C. An auto-answer modem must pass RI (Ring Indicator, Pin 22) to the LinkUp 5294, and allow the LinkUp 5294 to raise DTR in response to RI.

   D. Loss of Carrier Detect must be enable. (causes modem to drop DSR if line becomes disconnected).

   E. External DTR must be enabled, (Data Terminal Ready, Pin 20) control. Causes modem to disconnect from phone line if the LinkUp 5294 drops DTR.

3. The LinkUp 5294 requires RI (Ring Indicator) when used with auto-answer modems.

4. Make sure the asynchronous port of the LinkUp 5294 is configured as DTE (a remote connection).

**The Host does not poll the LinkUp 5294.**

1. Confirm that the host is on-line.

2. REMOTE CONNECT: Make sure the Sync port is configured for DTE. Also make sure that the BIT RATE is set for EXT.

3. DIRECT CONNECT: Make sure the Sync port is configured for DCE. Also make sure the BIT RATE is set for a specific rate (in keeping with the host configuration).

4. Review the LinkUp 5294 Sync port configuration with that of the Host systems. Pay particular attention to Control Unit Address, HALF/FULL DUPLEX, NRZI, and CLOCKING.

5. Ensure that the RS-232C cable for the Sync port has, at a minimum, the following Pins: 1 through 8, l5, 17, 20, and 22.

6. Ensure that a hardware reset has been performed since the last synchronous port changes were made.

**The Host is polling the LinkUp 5294, but the terminal does not receive a sign-on screen. Or instead, a 0099 error occurs.**

1. Confirm that the host is indeed on-line. If yours is a remote connection, this necessitates calling the host and the LinkUp 5294 site.

2. Normally this means the LU (Logical Unit) you are trying to access the Host through has not been assigned to a valid Host Workstation ID. This may be because:

   A. The valid Host address (LSID) has not been assigned to the LinkUp 5294 Logical Unit (LU) through the LinkUp 5294 Configurator Mode.

   B. The Host address (LSID) assigned to the LinkUp 5294 Logical Unit (LU) has not been assigned on the host system (meaning it is an invalid LSID).

    C. The LinkUp 5294 Logical Unit was assigned to the incorrect Control Unit emulation (that is, to SDLC Link Address).

    D. A hardware reset has not been performed since the last synchronous port changes were made.

**Once host sign-on screen appears and sign-on is entered, the host does not respond.**

1. Make sure the correct key sequence for <Enter> is pressed.

**The data displayed on the terminal screen is garbled or unintelligible.**

1. Make sure the Terminal Module ID you entered at the Device Type prompt (or in Configurator Mode, if this port parameter is defined as overridable) is the correct module ID for your terminal or terminal emulator.

2. Ensure that every device on the suspect communication line has compatible settings for character and parity bits.

# 10. Emulation Capabilities

The LinkUp 5294 emulates an IBM 525l model 12 Remote Workstation Controller, 5294 or 5394 Remote Cluster Controller. It is designed with a variety of Terminal and Printer Modules to let virtually any ASCII terminal or printer communicate with an AS/400 host computer as if it were actual IBM 5251 model 11 or 529x Workstation or 52xx Printers.

## 10.1 5250 Display Emulation

Each of the Terminal Modules supports all of the 5250 screen handling facilities of an actual 5251 model 11 or 529x workstation. This includes cursor-positioning and display attributes such as:

- Reverse Image

- Nondisplay

- Blink

- Column Separator

- High-intensity

- Underscore

The above attributes are supported only to the extent that your ASCII terminal can support them.

The LinkUp 5294 also uses many special techniques to optimize the emulation provided to your ASCII terminal:

- **Screen Optimization —** Instead of clearing and repainting your screen's data for every update, the LinkUp 5294 updates your screen by clearing and repainting only for new character changes, keeping the amount of screen updating to a minimum.

- **Terminal's Unique Features —** These are incorporated into the corresponding Terminal Module if they are proven advantageous. If not, the LinkUp 5294 compensates. To prevent those ASCII terminals with automatic scrolling capabilities from automatically scrolling, since an actual IBM workstation does not support this, the LinkUp 5294 restricts data from being entered to the last character position (row 24, column 80) on the terminal's screen.

- **Status Line —** Five indicators are displayed on row 24 of your terminal's screen while you are in session with the System/3X host (Emulation Mode). The LinkUp 5294 displays this line the first time your terminal enters Emulation Mode; afterwards, you may toggle it on (or off) using the appropriate key sequence (corresponding to the function of Toggle Status Line/Toggle Indicators.) These five indicators are listed below:

  **SYS AVAIL —** System Available indicator is set (turned on) whenever the terminal is receiving polls from the System/3X host.

  **MSG WT —** Message Waiting indicator, controlled by the host, is set (turned on) whenever you have messages waiting to be read.

  **INS MODE —** Insert Mode indicator is set (turned on) whenever the INSERT key has been pressed. Insert Mode can be reset (turned off) by pressing the ERROR RESET or one of the Aid Generating keys.

  **INPUT INH —** Input Inhibited indicator is set (turned on) after an Aid Generating key is pressed. This indicates the keyboard has been locked by the host and the operator should not type any data.

The System/3X host will reset (turn off) this indicator after it has completed the requested data processing. (Operator errors will also set this indicator.) Only SYS REQ and ATTN are valid while input is inhibited.

**AWFER —** Awaiting Field Exit Required indicator is set (turned on) when data is entered into the last position of a field that the host has marked as requiring the function of Field Exit to be invoked. It is reset once the field is exited. (On an actual Model 11 workstation the cursor blinks to indicate AWFER.)

• Support for a 25th-line Status Line display is available for the following terminals: Hazeltine® Esprit™ 10/51, Lear Siegler® ADM-ii, TeleVideo® 925, Wyse® 30, Cybernex XLB-5291, Rebus 3000, and FileLynx®/5251. The status display is exactly the same as it had been on Line 24, and the Toggle Status Indicators keystroke is accessed in the same manner.

Because of design characteristics of the Wyse 30 and the Cybernex XLB-5291, the ERROR nnnn-mmmm portion of the Status Line in columns 64 through 79 of the 25th line is sometimes unable to display at the proper times. As this part of the Status Line is displayed only in the event of an error between the LinkUp 5294 and the System/3X this limitation should be of little or no consequence to you.

## NOTE

**Although the Status Line displays on Row 24, the LinkUp 5294 does not cause normal data to be lost at its expense. Instead, whenever the host or terminal operator attempts to write data to that row, the LinkUp 5294 automatically turns the Status Line off and displays the normal data.**

## 10.2 5250 Keyboard Functions

Most of the 5250 keyboard functions are implemented by the LinkUp 5294 modules in a manner most suited to the keyboard layout of the particular terminal the module is designed for. See **Appendix G** for the module-specific key sequences of each function.

These are the 5250 keyboard functions supported by the LinkUp 5294:

**Cursor Movement Keys**

• **Character Backspace** moves the cursor left one position, while always keeping the cursor in a non-bypass field. If the cursor is at the beginning of a field, pressing this key moves the cursor to the last position of the previous non-bypass field.

• **Cursor Up/Down** moves the cursor vertically one line, wrapping around the screen if necessary.

• **Cursor Left/Right** moves the cursor horizontally one space, wrapping to the next or previous row if necessary.

• **Cursor Fast Left/Fast Right** causes the cursor to move horizontally three spaces, wrapping to the next or previous row if necessary.

• **Field Advance** positions the cursor at the start of the next unprotected field, wrapping around the screen if necessary.

• **Field Backspace** moves the cursor to the start of the previous non-bypass field.

• **New Line** positions the cursor at the start of the first non-bypass field on the next line.

**Special Control Keys**

- **Delete** deletes the character over the cursor and moves all remaining characters in the field one position to the left.

- **Erase Input** clears all non-bypass fields you have modified.

- **Error Reset** clears your terminal of the following conditions: (1) insert mode, (2) error messages, usually displayed on row 24, or (3) a system request state, as when SYS REQ is pressed.

- **Home** moves the cursor to the position defined by the host as home. Usually, this is the start of the first field on the screen. If the cursor is already at this position, the key performs a Record Backspace function, which requests a display of the previous record in a file or database.

- **Insert** sets the insert mode for the current field. Insert must be reset before you can exit the field.

**Field Exit Keys**

- **Duplicate** causes duplicate characters (displayed as asterisks on ASCII terminals) to be written from the cursor position to the end of the field.

- **Field Exit and Field Plus** perform the same function; they erase all characters to the end of a field, then move the cursor to the next non-bypass field. If invoked on a signed-numeric field, they also write a null to the sign position of the field, creating a positive number, and when invoked in right-adjust fields they align the data entered to the field to the right.

# NOTE
## Most of the Terminal Modules support only EXIT.

- **Field Minus** is only valid in signed-numeric and numeric-only fields. It generates a negative number by writing a hyphen to the sign position in the case of a signed-numeric field; for a numeric-only field, the last character of the field is changed from a digit to an alpha character (D-zoned) to signify a negative number.

**Aid Generating Keys**

- **Clear** is application-specific, but is usually used to clear the screen.

- **Enter Rec/Adv** transmits the data entered on the screen to the host.

- **Help.** When used while an error (0005, etc.) is displayed, this key requests information on the error that occurred; otherwise, its actions depend on the application you are in.

- **Command Function Keys 1-24** are entirely application-specific, but usually CMD 7 cancels the current application and CMD 3 displays the previous screen (except on a System/34).

- **Print** prints the contents of your screen to the console's default printer.

- **Roll Up/Down** is also application specific, but is usually used to roll the data up or down; that is, to select the previous or next page of text.

**Special Host Keys**

- **System Request** allows you to sign onto a System/34 host only, or to toggle between Console and Subconsole Modes for each of the System/3X hosts, providing the workstation is so configured.

**Signal Key**

- **Attention** is often used to terminate the currently running program.

## 10.3 LinkUp 5294 Extended Keyboard Functions

The following eight extended keyboard functions are specific to the LinkUp 5294. See **Appendix G** for the module-specific key sequences of each function.

- **Local Copy Print Request** prints the contents of your screen to a printer configured and assigned to your terminal (in the LinkUp 5294) as a Local Copy printer.

- **Local Copy Form Feed** sends a form feed command to the printer configured and assigned to your terminal (in the LinkUp 5294) as a Local Copy printer.

- **Cancel Print** cancels a print request sent to a printer configured and assigned to your terminal (in LinkUp 5294) as a Local Copy printer.

- **Refresh Screen** redisplays the last transmitted CRT screen from the screen buffer stored within the LinkUp 5294. This key is useful when your terminal's display is garbled due to line errors.

- **Toggle Status Line**/**Toggle Indicators** toggles the display of the LinkUp 5294 status line of five indicators (discussed in **Section 1.1**).

- **Toggle Echoplex Enabled** toggles the ability of the LinkUp 5294 to echo characters to your terminal's screen, providing this toggle has been configured in the LinkUp 5294.

- **Initialize Terminal** causes the terminal to reinitialize without resetting the LinkUp 5294 port your terminal is attached to. In other words, you are exited from the System/3X host session (referred to as Emulation Mode) and returned to the LinkUp 5294 sign-on menu (referred to as Connect Mode) even if the LinkUp 5294 has been configured to suppress this screen. When this function is invoked, the host is informed that the workstation's power has been turned off.

- **Request Disconnect** is similar to Initialize Terminal in that it exits you from the AS/400® host session (Emulation Mode). However, unlike Initialize Terminal it resets the LinkUp 5294 port your terminal is connected to. When your terminal is connected to the LinkUp 5294 by a modem, this function will cause the modem to hang up, disconnecting your terminal. Again, when this function is invoked the host is informed that the terminal has been powered off.

## 10.4 Printer Support: System vs. Local Copy

As previously mentioned, each of the Printer Modules enables ASCII printers to appear to the System/3X or AS/400® host as though they were actual IBM 5224, 5225, or 5256 Printers. The operational mode of these modules can be defined as a System printer or as a Local Copy printer.

A System printer is one that accepts print jobs from the System/3X or AS/400 host. A Local Copy printer is one which accepts a command from you to print the contents of your terminal screen. To invoke a local copy print request, you must press the special key sequence (appropriate to your selected Terminal Module) corresponding to the extended function of Local Copy Print Request.

If the following conditions are not met, a Local Copy Print Request will be ignored and no error message will display:

- The printer must be defined in the LinkUp 5294 as a Local Copy printer.

- The defined Local Copy printer must be associated to your terminal (either by your system operator or by your sign on to the LinkUp 5294 during Connect Mode).

- The printer must not be currently printing another terminal operator's screen (if the same printer is assigned to more than one terminal).

# 11. Hardware and Software Requirements

This chapter describes the various ASCII terminal and printer types supported by the LinkUp 5294 and recommends which Terminal and Printer Module to use with each. General switch or configuration settings for your terminal, printer, or modem (if a remote connection must be established with the LinkUp 5294 ) are also reviewed.

## 11.1 ASCII Terminals

The following list identifies the ASCII terminals currently supported by the LinkUp 5294.  Additionally referenced are the Terminal Module IDs recommended for use with each terminal listed.

Once you have identified the Terminal Module appropriate for your terminal, see **Appendix G** for that module's list of key sequences for invoking the 5250 and extended keyboard functions. If the terminal you wish to use is not listed, please call your supplier to verify whether it is supported, and if it is, how.

| Manufacturer | Terminal | Module ID |
|---|---|---|
| ADDS® | Regent® and Viewpoint | VIEWP |
| | Viewpoint 60 | VP60 |
| AMPEX® | 210/230 | TV925 |
| | 219 | VT100 |
| Anderson Jacobson® | AJ-520 | VT52 or VT100 |
| ANSI Standard 3.64 | Any ANSI Standard | |
| | 3.64 compliant terminal | ANSI |
| Beehive® | ATL-008 | VT100 |
| C-Itoh® | 101 | VT100 |
| | C7101 | C7101 |
| | C7103 | C7103 |
| Colorgraphic | MVI-100 | VT100 |
| Cybernex | XLB-5291 | CY5291 |
| Data General | DASHER® D100/D200 | D200 |
| Datamedia | DT80/1,DT80/2 | VT100 |
| | DT80/3 | TV925 |
| | DT80/5 | VT100 |
| | Colorscan 10 | VT100 |

| Manufacturer | Terminal | Module ID |
| --- | --- | --- |
| DEC™ | VT52™ | VT52 or VT52X |
| | VT100™/VT101™ | VT100 |
| | VT102™/VT125™/VT131™ | |
| | VT220™/VT240™ | VT220 |
| Direct | VP800C | VT100 |
| Falco | TS-l | VT52 |
| | Fame-100 | VT100 |
| | Fame-II | ANSI |
| Hazeltine | Esprit | ADM3A |
| | Esprit III | TV925 |
| | Esprit 10-51 | HZSl |
| Hewlett-Packard | HP®-2621AJ2645 | HP45 |
| IBM | 3101 | I3101 |
| | 3151 | I3151 |
| | 316V3163 | I3161 |
| | 3164 | I3164 |
| Informer | 30V401 | VT52 or I3101 |
| KDE | 802 | VT52 |
| Lear Siegler | ADM-3A | ADM3A |
| | ADM-5 | ADM3P |
| | ADM-ll | ADMll |
| | ADM-21/22/23/24 | ADM21 |
| | ADM-36 | VT100 |
| | ADM-42 | ADM3P |
| Liberty Electronics | Freedom® 100 | TV925 |
| MicroTerm | ACT-SA | ACTSA |
| | MIME-2A | VT52 |
| | MIME-740/Ergo 4000 | VT100 |
| | Ergo 201 | VT52 or TV925 |
| | Ergo 301 | VT52 or VT100 |
| MVI | 7 | VT100 |
| NCR® | 7901 | VIEWP |
| Northern Telecom | Displayphone | DISPH |
| QUME® | QVT-102 | ADM3A |
| Radio Shack® | DT-1 | TV910 |
| Rebus | 3000 | REBUS |
| Scanset | Scanset | SCANS |
| Soroc™ | IQ120 | IQ120 |

| Manufacturer | Terminal | Module ID |
| --- | --- | --- |
| TAB | 132<br>132/15 | VT52<br>VT100 |
| TELERAY® | VT52 | |
| TeleVideo | 910<br>910 + /912<br>920/925/950<br>970<br>Personal Terminal | TV910<br>TV9lOP<br>TV925<br>TV970<br>TV910 |
| Telex | 310 | I3101 |
| Visual | 100/300/400<br>110<br>50/200 | VT100<br>D200<br>ADM3A or VT52 |
| Wyse | WY-100<br>WY-30<br>WY-60<br>WY-60 w/extended keyboard | WY100<br>WY30<br>WY60<br>WY60X |
| Xpoint | Remote 91 | HZSl |
| Zenith® | Z-l9<br>ZT-l | VT52 or VT100<br>VT52 |
| Zentec | Zephyr | TV925 |

For those terminals whose switch settings are not explicitly detailed in **Appendix G**, the following general terminal settings are recommended:

- Character Mode = ON (as opposed to Block or Line Mode)

- Full Duplex = ON

- Auto New Line = OFF (if switch-selected)

- Auto Line Feed = OFF

- Cursor addressing = ON

- Auto Scroll = OFF (if switch-selected)

- DTR and DCD = ON, DSR = OFF (if switch- selected)

- Baud Rate = LinkUp 5294 configured settings

- Word Length (i.e., Data Bits, Parity, and Stop Bits) = LinkUp 5294 configured settings
  (most commonly implemented as 8 data bits, no parity, and 1 stop bit)

- Keyboard must be decoupled from the display (if switch-selected)

# NOTE

**The LinkUp 5294 must handle all screen changes to your terminal. Set your terminal so that whenever you press a key on your keyboard its character is transmitted directly to the LinkUp 5294, rather than to the terminal's display. This setup is called Conversational Mode. If your terminal's keyboard cannot be decoupled from its display (Conversational Mode = ON), then avoid using those keys which locally affect the display. If you do not, the result is a garbled display, requiring you to invoke the LinkUp 5294's extended keyboard function for Refresh Screen.**

## 11.2 Personal Computers and Word Processors

The LinkUp 5294 also enables Personal Computers (PCs) and Word Processors (WPs) to emulate 5250 display workstations. However, in order for the LinkUp 5294 to accomplish this, the PCs and WPs must be equipped with software enabling them to emulate one of the ASCII terminals supported by the LinkUp 5294.

The following list identifies a variety of PCs and WPs currently supported by the LinkUp 5294, plus suggested terminal emulation software packages for each. Also listed are the Terminal Module IDs recommended for use with each of the suggested software packages.

Once you have identified the Terminal Module appropriate for your PC or WP, see Appendix G for the corresponding list of key sequences specified for that Module, enabling you to invoke the 5250 and extended keyboard functions. If the PC or WP you wish to use is not referenced, please check with your supplier to verify whether it is supported and, if it is, how.

| Computer | Software Package | Module ID |
| --- | --- | --- |
| Apple® IIe/IIc | Softerm Package | ADM3P |
| Apple III | Apple Access III | ADM3P |
| Apple Lisa | Included with Lisa | VT100 |
| AT&T 6300 | Andrew Corporation IBM PC Program | IBMPC or T5250 |
| Columbia | Andrew Corporation IBM PC Program | IBMPC or T5250 |
| COMMODORE® 64 | VIP Terminal Emulator Softlaw Corp | VT52 |
| COMPAQ® | Andrew Corporation IBM PC Program | IBMPC or T5250 |
| CPT | CPT VT52 Package | VT52 |
| DEC Rainbow™ VT180 | Comm. Package from DEC | VT100 |
| Direct | Included in computer | VT100 |
| EXXON® | EXXON TV925 package | TV925 |
| Fortune | ITE package | TV925 |

HP-200 series                         HP Terminal Emulator program             HP45

| Computer | Software Package | Module ID |
|---|---|---|
| IBM PC | IBM PC Program | T5250 |
| IBM AT® | IBM PC Program | T5250 |

| Computer | Software Package | Module ID |
|---|---|---|
| IBM PC Convertible | IBM PC Program | T5250 |
| IBM PC Jr. | IBM PC Program | T5250 |
| Kaypro® | Superterm Package | ADM3P |
| Leading Edge® PC | IBM PC Program | T5250 |
| Radio Shack Model-II | Radio Shack ADM3A Emulator | ADM3P |
| Sperry PC | IBM PC Program | T5250 |
| TIProf. Comp. | Octacomm/PCHouston | VT100 |
| Toshiba® 3100 | IBM PC Program | T5250 |
| Vector Graphic | Gulf Data ADM3A Package | ADM3P |
| Victor® 9000 | ASCOM Async Package | ADM3A |
| Xerox® 820 | ASCOM Async Package | ADM3P |
| Xerox 820-II | Included vith computer | ADM3P |
| Zenith Z-89/90/100 | Zenith Terminal Package | VT52 |
| Zenith Z-150 | IBM PC Program | T5250 |

## 11.3 Auxiliary Attached ASCII Printers

Some terminals and PCs are equipped with an auxiliary port (serial or parallel) to which you may attach an ASCII printer. The LinkUp 5294 supports this application through a special Auxiliary Printer facility. This facility enables your terminal or PC and its attached auxiliary printer to share a single port on the LinkUp 5294 and still be separately addressed by the System/3X host. This is accomplished by interleaving the data between both devices, with the terminal or PC having priority over the printer.

As far as the LinkUp 5294 or the System/3X host is concerned, an auxiliary printer is no different from a printer which is actually directly connected. With the help of the LinkUp 5294, the auxiliary printer can also emulate one of the IBM 52xx Printers as either a System or Local Copy printer.

The following ASCII terminals and PCs will support an auxiliary printer:

ADDS Viewpoint and Viewpoint 60
Beehive DM-20
C. Itoh 7101 and 7103
Cybernex XLB-5291
DEC VT52, VT52X, VT100 (VT102),VT220
Hazeltine 10/51
IBM 315l, 3161, 3163, 3164
IBM Personal Computer
Lear-Siegler ADM-3A, ADM-21, ADM-l 1
Microterm ACT-5A
Rebus 3000
Soroc® IQ120
TeleVideo 910, 910 Plus, 925, 970
Tymshare Scanset
Wyse 30, 6S), 100

The following list identifies the ASCII printers currently supported by the LinkUp 5294. In the right-hand column, you will find the printer module recomended for each printer.

| Manufacturer | Model | Module ID |
|---|---|---|
| Centronics® | 351 or 359 | CENTRN |
| C. Itoh | 300 or 600 | CI300 |
| Data Products | SPG8050 | DP8050 |
| General Electric | GE3000 | GE3000 |
| Genicom | 3410<br>4410, 4440 | GEN34<br>GEN44 |
| Epson | RX/FX/MX/JX/80/100 | EPSON |
| Hewlett-Packard | LaserJet series | HPGEN<br>HPDPL<br>HPDPP |
| OKIDATA® | MicroLine 8V83/84/9V93 | OKIM84 |
| Most others | (Generic Support) | PRINT |

Three printer drivers have been included to support the Hewlett-Packard LaserJet® printers. The printer IDs for the three are:

- HPDPL - HP Data Processing Landscape mode

- HPDPP - HP Data Processing Portrait mode

- HPGEN - HP Generic

These drivers provide all the functionality of the PRINT driver and, in addition, support the SCS commands Set Line Density and Set Character Density. The need for these drivers arises from the LaserJet characteristic of not allowing any data in a border margin of approximately V4 of an inch. This means that the usable space within the 8½" x 11" form is actually only about 8" x 10½". To provide a full 66 lines per page capability, therefore, the data must actually be compressed further than the normal six (6) lines per inch.

The HPDPL driver provides 66 or 88 lines per page and 132 or 198 characters per line in Line Printer font.

The HPDPP driver provides 66 or 88 lines per page and 80 characters per line in Courier font or 132 characters per line in Line Printer font.

The HPGEN driver provides true 6 or 8 lines per inch and true 10 or 15 characters per inch. It should not affect the prior font or data orientation: that is, if your LaserJet was previously in Landscape and Courier, this driver will leave your printer at that state.

Not all LaserJet printers support the Line Printer font. The compression of data as performed by these drivers may yield less than the desired result. If this is the case, either Line Printer font should be made available on your LaserJet or data compression should be avoided.

If you are using an ASCII printer, be sure to confirm that the switch settings of the printer match those defined in the LinkUp 5294; for example, the RS-232C line signals for physical flow control (Not Busy Signal) and device ready (online signal), or the printer's logical flow control code.

## 11.4 Asynchronous Modems

When your terminal or PC (and auxiliary printer, if appropriate) are remotely located from the LinkUp 5294, they must communicate with the LinkUp 5294 over switched or dedicated lines in full-duplex mode with asynchronous modems. To assure that this remote connection is operating optimally, be sure to confirm that your modems are set up as follows:

- The DCD line state should not be held artificially high

- The modem should hang up when DTR drops.

# Appendix A: EBCDIC/ASCII Translation Tables

The LinkUp 5294 automatically translates ASCII characters to EBCDIC for all communications data received from a terminal and performs EBCDIC to ASCII translation for all output to a keyboard/CRT or printer.

For keyboard input, the ASCII 0 to 1F hex values are implemented by the LinkUp 5294 as valid for 5250 keyboard function sequences only; this means they are used in a string of characters only to emulate 5250 keyboard functions, such as ENTER, CMD 1 through 24, etc.

## NOTE

**Sequences appropriate to these keyboard functions depend on the terminal module. See Appendix G for the sequences for your terminal.**

The EBCDIC to ASCII code translations (and vice versa) are based as far as possible on character equivalence. However, in certain cases this is not possible. Accordingly, the following special translations are applicable:

| EBCDIC | ASCII |
|--------|-------|
| ¢ (4A) | [ (5B) |
| \| (6A) | ] (5D) |
| ¬ (5F) | ^ (5E) |
| \| (4F) | \| (7C) |

## NOTE

**EBCDIC values which do not have possible ASCII equivalents (other than those listed above) are translated to the ASCII question mark (3F hex).**

### U.S. EBCDIC to ASCCII Data Translation Table

| EBCDIC | | ASCII | |
|--------|--|-------|--|
| 40 | SP | 20 | SP |
| 41 | | 3F | ? |
| 42 | | 3F | ? |
| 43 | | 3F | ? |
| 44 | | 3F | ? |
| 45 | | 3F | ? |
| 46 | | 3F | ? |
| 47 | | 3F | ? |
| 48 | | 3F | ? |
| 49 | | 3F | ? |
| 4A | ¢ | 5B | [ |
| 4B | . | 2E | . |
| 4C | < | 3C | < |
| 4D | ( | 28 | ( |

**U.S. EBCDIC to ASCII Data Translation Table (Continued)**

| EBCDIC | | ASCII | |
|---|---|---|---|
| 4E | + | 2B | + |
| 4F | \| | 7C | \| |
| 50 | & | 26 | & |
| 51 | | 3F | ? |
| 52 | | 3F | ? |
| 53 | | 3F | ? |
| 54 | | 3F | ? |
| 55 | | 3F | ? |
| 56 | | 3F | ? |
| 57 | | 3F | ? |
| 58 | | 3F | ? |
| 59 | | 3F | ? |
| 5A | ! | 21 | ! |
| 5B | $ | 24 | $ |
| 5C | * | 2A | * |
| 5D | ) | 29 | ) |
| 5E | ; | 3B | ; |
| 5F | ¬ | 5E | ^ |
| 60 | - | 2D | ___ |
| 61 | / | 2F | / |
| 62 | | 3F | ? |
| 63 | | 3F | ? |
| 64 | | 3F | ? |
| 65 | | 3F | ? |
| 66 | | 3F | ? |
| 67 | | 3F | ? |
| 68 | | 3F | ? |
| 69 | | 3F | ? |
| 6A | \| | 5D | ] |
| 6B | , | 2C | , |
| 6C | % | 25 | % |
| 6D | _ | 5F | _ |
| 6E | > | 3E | > |
| 6F | ? | 3F | ? |
| 70 | | 3F | ? |
| 71 | | 3F | ? |
| 72 | | 3F | ? |
| 73 | | 3F | ? |
| 74 | | 3F | ? |
| 75 | | 3F | ? |
| 76 | | 3F | ? |
| 77 | | 3F | ? |
| 78 | | 3F | ? |
| 79 | ` | 60 | ` |
| 7A | : | 3A | : |
| 7B | # | 23 | # |
| 7C | @ | 40 | @ |
| 7D | ' | 27 | ' |
| 7E | = | 3D | = |
| 7F | " | 22 | " |

**U.S. EBCDIC to ASCII Data Translation Table (Continued)**

| EBCDIC | | ASCII | |
|---|---|---|---|
| 80 | | 3F | ? |
| 81 | a | 61 | a |
| 82 | b | 62 | b |
| 83 | c | 63 | c |
| 84 | d | 64 | d |
| 85 | e | 65 | e |
| 86 | f | 66 | f |
| 87 | g | 67 | g |
| 88 | h | 68 | h |
| 89 | i | 69 | i |
| 8A | | 3F | ? |
| 8B | | 3F | ? |
| 8C | | 3F | ? |
| 8D | | 3F | ? |
| 8E | | 3F | ? |
| 8F | | 3F | ? |
| 90 | | 3F | ? |
| 91 | j | 6A | j |
| 92 | k | 6B | k |
| 93 | l | 6C | l |
| 94 | m | 6D | m |
| 95 | n | 6E | n |
| 96 | o | 6F | o |
| 97 | p | 70 | p |
| 98 | q | 71 | q |
| 99 | r | 72 | r |
| 9A | | 3F | ? |
| 9B | | 3F | ? |
| 9C | | 3F | ? |
| 9D | | 3F | ? |
| 9E | | 3F | ? |
| 9F | | 3F | ? |
| A0 | | 3F | ? |
| A1 | ~ | 7E | ~ |
| A2 | s | 73 | s |
| A3 | t | 74 | t |
| A4 | u | 75 | u |
| A5 | v | 76 | v |
| A6 | w | 77 | w |
| A7 | x | 78 | x |
| A8 | y | 79 | y |
| A9 | z | 7A | z |
| AA | | 3F | ? |
| AB | | 3F | ? |
| AC | | 3F | ? |
| AD | | 3F | ? |
| AE | | 3F | ? |
| AF | | 3F | ? |
| B0 | | 3F | ? |
| B1 | | 3F | ? |

**U.S. EBCDIC to ASCII Data Translation Table (Continued)**

| EBCDIC | | ASCII | | |
|--------|---|-------|---|---|
| B2 | | 3F | ? | |
| B3 | | 3F | ? | |
| B4 | | 3F | ? | |
| B5 | | 3F | ? | |
| B6 | | 3F | ? | |
| B7 | | 3F | ? | |
| B8 | | 3F | ? | |
| B9 | | 3F | ? | |
| BA | | 3F | ? | |
| BB | | 1B | ? | |
| BC | | 3F | ? | |
| BD | | 3F | ? | |
| BE | | 3F | ? | |
| BF | | 3F | ? | |
| C0 | { | 7B | { | |
| C1 | A | 41 | A | |
| C2 | B | 42 | B | |
| C3 | C | 43 | C | |
| C4 | D | 44 | D | |
| C5 | E | 45 | E | |
| C6 | F | 46 | F | |
| C7 | G | 47 | G | |
| C8 | H | 48 | H | |
| C9 | I | 49 | I | |
| CA | | 3F | ? | |
| CB | | 3F | ? | |
| CC | | 3F | ? | |
| CD | | 3F | ? | |
| CE | | 3F | ? | |
| CF | | 3F | ? | |
| D0 | } | 7D | } | |
| D1 | J | 4A | J | |
| D2 | K | 4B | K | |
| D3 | L | 4C | L | |
| D4 | M | 4D | M | |
| D5 | N | 4E | N | |
| D6 | O | 4F | O | |
| D7 | P | 50 | P | |
| D8 | Q | 51 | Q | |
| D9 | R | 52 | R | |
| DA | | 3F | ? | |
| DB | | 3F | ? | |
| DC | | 3F | ? | |
| DD | | 3F | ? | |
| DE | | 3F | ? | |
| DF | | 3F | ? | |
| E0 | \ | 5C | \ | |
| E1 | | 3F | ? | |
| E2 | S | 53 | S | |
| E3 | T | 54 | T | |

**U.S. EBCDIC to ASCII Data Translation Table (Continued)**

| EBCDIC | | ASCII | | |
|---|---|---|---|---|
| E4 | U | 55 | | U |
| E5 | V | 56 | | V |
| E6 | W | 57 | | W |
| E7 | X | 58 | | X |
| E8 | Y | 59 | | Y |
| E9 | Z | 5A | | Z |
| EA | | 3F | | ? |
| EB | | 3F | | ? |
| EC | | 3F | | ? |
| ED | | 3F | | ? |
| EE | | 3F | | ? |
| EF | | 3F | | ? |
| F0 | 0 | 30 | | 0 |
| F1 | 1 | 31 | 1 | |
| F2 | 2 | 32 | | 2 |
| F3 | 3 | 33 | | 3 |
| F4 | 4 | 34 | | 4 |
| F5 | 5 | 35 | | 5 |
| F6 | 6 | 36 | | 6 |
| F7 | 7 | 37 | | 7 |
| F8 | 8 | 38 | | 8 |
| F9 | 9 | 39 | | 9 |
| FA | | 3F | | ? |
| FB | | 3F | | ? |
| FC | | 3F | | ? |
| FD | | 3F | | ? |
| FE | | 3F | | ? |
| FF | | 3F | | ? |
| 20 | SP | 40 | | SP |
| 21 | ! | 5A | | ! |
| 22 | " | 7B | | " |
| 23 | # | 7B | | # |
| 24 | $ | 5B | | $ |
| 25 | % | 6C | | % |
| 26 | & | 50 | | % |
| 27 | ' | 7D | | ' |
| 28 | ( | 4D | | ( |
| 29 | ) | 5D | | ) |
| 2A | * | 5C | | * |
| 2B | + | 4E | | + |
| 2C | , | 6B | | , |
| 2D | - | 60 | | - |
| 2E | . | 4B | | . |
| 2F | / | 61 | | / |
| 30 | 0 | F0 | | 0 |
| 31 | 1 | F1 | | 1 |
| 32 | 2 | F2 | | 2 |
| 33 | 3 | F3 | | 3 |
| 34 | 4 | F4 | | 4 |
| 35 | 5 | F5 | | 5 |

**U.S. EBCDIC to ASCII Data Translation Table (Continued)**

| EBCDIC | | ASCII | | |
|---|---|---|---|---|
| 36 | 6 | F6 | | 6 |
| 37 | 7 | F7 | | 7 |
| 38 | 8 | F8 | | 8 |
| 39 | 9 | F9 | | 9 |
| 3A | : | 7A | | : |
| 3B | ; | 5E | | ; |
| 3C | < | 4C | | < |
| 3D | = | 7E | | = |
| 3E | > | 6E | | > |
| 3F | ? | 6F | | ? |
| 40 | @ | 7C | | @ |
| 41 | A | C1 | | A |
| 42 | B | C2 | | B |
| 43 | C | C3 | | C |
| 44 | D | C4 | | D |
| 45 | E | C5 | | E |
| 46 | F | C6 | | F |
| 47 | G | C7 | | G |
| 48 | H | C8 | | H |
| 49 | I | C9 | | I |
| 4A | J | D1 | | J |
| 4B | K | D2 | | K |
| 4C | L | D3 | | L |
| 4D | M | D4 | | M |
| 4E | N | D5 | | N |
| 4F | 0 | D6 | | 0 |
| 50 | P | D7 | | P |
| 51 | Q | D8 | | Q |
| 52 | R | D9 | R | |
| 53 | S | E2 | | S |
| 54 | T | E3 | | T |
| 55 | U | E4 | | U |
| 56 | V | E5 | | V |
| 57 | W | E6 | | W |
| 58 | X | E7 | | X |
| 59 | Y | E8 | | Y |
| 5A | Z | E9 | | Z |
| 5B | [ | 4A | | ¢ |
| 5C | \ | E0 | | \ |
| 5D | ] | 6A | | \| |
| 5E | ^ | 5F | | ¬ |
| 5F | _ | 6D | | _ |
| 60 | . | 79 | | . |
| 61 | a | 81 | | a |
| 62 | b | 82 | | b |
| 63 | c | 83 | | c |
| 64 | d | 84 | | d |
| 65 | e | 85 | | e |
| 66 | f | 86 | | f |
| 67 | g | 87 | | g |

**U.S. EBCDIC to ASCII Data Translation Table (Continued)**

| EBCDIC | | ASCII | | |
|---|---|---|---|---|
| 68 | h | 88 | | h |
| 69 | i | 89 | | i |
| 6A | j | 91 | | j |
| 6B | k | 92 | | k |
| 6C | l | 93 | | l |
| 6D | m | 94 | | m |
| 6E | n | 95 | | n |
| 6F | o | 96 | | o |
| 70 | p | 97 | | p |
| 71 | q | 98 | | q |
| 72 | r | 99 | | r |
| 73 | s | A2 | | s |
| 74 | t | A3 | | t |
| 75 | u | A4 | | u |
| 76 | v | A5 | | v |
| 77 | w | A6 | | w |
| 78 | x | A7 | | x |
| 79 | y | A8 | | y |
| 7A | z | A9 | | z |
| 7B | { | C0 | | { |
| 7C | \| | 4F | | \| |
| 7D | } | D0 | | } |
| 7E | ~ | A1 | | ~ |

**Multinational ASCII to EBCDIC Data Translation Table**

| ASCII | EBCDIC |
|---|---|
| 00 | 00 |
| 01 | 6f |
| 02 | 6f |
| 03 | 6f |
| 04 | 6f |
| 05 | 6f |
| 06 | 6f |
| 07 | 6f |
| 08 | 6f |
| 09 | 6f |
| 0a | 6f |
| 0b | 6f |
| 0c | 6f |
| 0d | 6f |
| 0e | 6f |
| 0f | 6f |
| 10 | 6f |
| 11 | 6f |
| 12 | 6f |
| 13 | 6f |
| 14 | be |

**Multinational ASCII to EBCDIC Data Translation Table (Continued)**

| ASCII | EBCDIC |
|-------|--------|
| 15 | bd |
| 16 | 6f |
| 17 | 6f |
| 18 | 6f |
| 19 | 6f |
| 1a | 6f |
| 1b | 6f |
| 1c | 1c |
| 1d | 6f |
| 1e | 6f |
| 1f | 6f |
| 20 | 40 |
| 21 | 4f |
| 22 | 7f |
| 23 | 7b |
| 24 | 5b |
| 25 | 6c |
| 26 | 50 |
| 27 | 7d |
| 28 | 4d |
| 29 | 5d |
| 2a | 5c |
| 2b | 4e |
| 2c | 6b |
| 2d | 60 |
| 2e | 4b |
| 2f | 61 |
| 30 | f0 |
| 31 | f1 |
| 32 | f2 |
| 33 | f3 |
| 34 | f4 |
| 35 | f5 |
| 36 | f6 |
| 37 | f7 |
| 38 | f8 |
| 39 | f9 |
| 3a | 7a |
| 3b | 5e |
| 3c | 4c |
| 3d | 7e |
| 3e | 6e |
| 3f | 6f |
| 40 | 7c |
| 41 | c1 |
| 42 | c2 |
| 43 | c3 |
| 44 | c4 |
| 45 | c5 |
| 46 | c6 |

**Multinational ASCII to EBCDIC Data Translation Table (Continued)**

| ASCII | EBCDIC |
|:---:|:---:|
| 47 | c7 |
| 48 | c8 |
| 49 | c9 |
| 4a | d1 |
| 4b | d2 |
| 4c | d3 |
| 4d | d4 |
| 4e | d5 |
| 4f | d6 |
| 50 | d7 |
| 51 | d8 |
| 52 | d9 |
| 53 | e2 |
| 54 | e3 |
| 55 | e4 |
| 56 | e5 |
| 57 | e6 |
| 58 | e7 |
| 59 | e8 |
| 5a | e9 |
| 5b | 4a |
| 5c | 30 |
| 5d | 5a |
| 5e | 5f |
| 5f | 6d |
| 60 | 79 |
| 61 | 81 |
| 62 | 82 |
| 63 | 83 |
| 64 | 84 |
| 65 | 85 |
| 66 | 86 |
| 67 | 87 |
| 68 | 88 |
| 69 | 89 |
| 6a | 91 |
| 6b | 92 |
| 6c | 93 |
| 6d | 94 |
| 6e | 95 |
| 6f | 96 |
| 70 | 97 |
| 71 | 98 |
| 72 | 99 |
| 73 | a2 |
| 74 | a3 |
| 75 | a4 |
| 76 | a5 |
| 77 | a6 |
| 78 | a7 |

**Multinational ASCII to EBCDIC Data Translation Table (Continued)**

| ASCII | EBCDIC |
|-------|--------|
| 79 | a8 |
| 7a | a9 |
| 7b | c0 |
| 7c | 6a |
| 7d | d0 |
| 7e | a1 |
| 7f | 6f |
| 80 | 68 |
| 81 | dc |
| 82 | 51 |
| 83 | 42 |
| 84 | 43 |
| 85 | 44 |
| 86 | 47 |
| 87 | 48 |
| 88 | 52 |
| 89 | 53 |
| 8a | 54 |
| 8b | 57 |
| 8c | 56 |
| 8d | 58 |
| 8e | 63 |
| 8f | 67 |
| 90 | 71 |
| 91 | 9c |
| 92 | 9e |
| 93 | cb |
| 94 | cc |
| 95 | cd |
| 96 | db |
| 97 | dd |
| 98 | df |
| 99 | ec |
| 9a | fc |
| 9b | 70 |
| 9c | b1 |
| 9d | 80 |
| 9e | b3 |
| 9f | b4 |
| a0 | 45 |
| a1 | 55 |
| a2 | ce |
| a3 | de |
| a4 | 49 |
| a5 | 69 |
| a6 | 9a |
| a7 | 9b |
| a8 | ab |
| a9 | af |
| aa | ba |

**Multinational ASCII to EBCDIC Data Translation Table (Continued)**

| ASCII | EBCDIC |
|-------|--------|
| ab | b8 |
| ac | b7 |
| ad | aa |
| ae | 8a |
| af | 8b |
| b0 | 6f |
| b1 | 6f |
| b2 | 6f |
| b3 | bb |
| b4 | 6f |
| b5 | 65 |
| b6 | 62 |
| b7 | 64 |
| b8 | 83 |
| b9 | 6f |
| ba | 6f |
| bb | 6f |
| bc | 6f |
| bd | b0 |
| be | b2 |
| bf | 6f |
| c0 | 89 |
| c1 | e3 |
| c2 | 6f |
| c3 | 6f |
| c4 | 6f |
| c5 | 8d |
| c6 | 46 |
| c7 | 66 |
| c8 | e8 |
| c9 | d6 |
| ca | 96 |
| cb | e2 |
| cc | a2 |
| cd | bf |
| ce | 6f |
| cf | 9f |
| d0 | 8c |
| d1 | ac |
| d2 | 72 |
| d3 | 73 |
| d4 | 74 |
| d5 | da |
| d6 | 75 |
| d7 | 76 |
| d8 | 77 |
| d9 | 6f |
| da | c9 |
| db | c7 |
| dc | 87 |

**Multinational ASCII to EBCDIC Data Translation Table (Continued)**

| ASCII | EBCDIC |
|-------|--------|
| dd | 6a |
| de | 78 |
| df | 93 |
| e0 | ee |
| e1 | 59 |
| e2 | eb |
| e3 | ed |
| e4 | cf |
| e5 | ef |
| e6 | a0 |
| e7 | 8e |
| e8 | ae |
| e9 | fe |
| ea | fb |
| eb | fd |
| ec | a8 |
| ed | e8 |
| ee | bc |
| ef | be |
| f0 | 60 |
| f1 | 8f |
| f2 | bf |
| f3 | b9 |
| f4 | b6 |
| f5 | b5 |
| f6 | 61 |
| f7 | 9d |
| f8 | 90 |
| f9 | bd |
| fa | 4b |
| fb | da |
| fc | fa |
| fd | ea |
| fe | 6f |
| ff | 6f |

**Multinational EBCDIC to ASCII Data Translation Table**

| EBCDIC | ASCII |
|--------|-------|
| 00 | 00 |
| 01 | 20 |
| 02 | 20 |
| 03 | 20 |
| 04 | 20 |
| 05 | 20 |
| 06 | 20 |
| 07 | 20 |
| 08 | 20 |

**Multinational EBCDIC to ASCII Data Translation Table (Continued)**

| EBCDIC | ASCII |
|--------|-------|
| 09 | 20 |
| 0a | 20 |
| 0b | 20 |
| 0c | 0c |
| 0d | 0d |
| 0e | 20 |
| 0f | 20 |
| 10 | 3f |
| 11 | 3f |
| 12 | 3f |
| 13 | 3f |
| 14 | 3f |
| 15 | 0a |
| 16 | 3f |
| 17 | 3f |
| 18 | 3f |
| 19 | 19 |
| 1a | 20 |
| 1b | 20 |
| 1c | 2a |
| 1d | 20 |
| 1e | 3f |
| 1f | fe |
| 20 | 20 |
| 21 | 21 |
| 22 | 22 |
| 23 | 23 |
| 24 | 24 |
| 25 | 25 |
| 26 | 26 |
| 27 | 27 |
| 28 | 28 |
| 29 | 29 |
| 2a | 2a |
| 2b | 2b |
| 2c | 2c |
| 2d | 2d |
| 2e | 2e |
| 2f | 2f |
| 30 | 30 |
| 31 | 31 |
| 32 | 32 |
| 33 | 33 |
| 34 | 34 |
| 35 | 35 |
| 36 | 36 |
| 37 | 37 |
| 38 | 38 |
| 39 | 39 |
| 3a | 3a |

**Multinational EBCDIC to ASCII Data Translation Table (Continued)**

| EBCDIC | ASCII |
|--------|-------|
| 3b | 3b |
| 3c | 3c |
| 3d | 3d |
| 3e | 3e |
| 3f | 3f |
| 40 | 20 |
| 41 | 20 |
| 42 | 83 |
| 43 | 84 |
| 44 | 85 |
| 45 | a0 |
| 46 | c6 |
| 47 | 86 |
| 48 | 87 |
| 49 | a4 |
| 4a | 5b |
| 4b | 2e |
| 4c | 3c |
| 4d | 28 |
| 4e | 2b |
| 4f | 21 |
| 50 | 26 |
| 51 | 82 |
| 52 | 88 |
| 53 | 89 |
| 54 | 8a |
| 55 | a1 |
| 56 | 8c |
| 57 | 8b |
| 58 | 8d |
| 59 | e1 |
| 5a | 5d |
| 5b | 24 |
| 5c | 2a |
| 5d | 29 |
| 5e | 3b |
| 5f | 5e |
| 60 | 2d |
| 61 | 2f |
| 62 | b6 |
| 63 | 8e |
| 64 | b7 |
| 65 | b5 |
| 66 | c7 |
| 67 | 8f |
| 68 | 80 |
| 69 | a5 |
| 6a | 7c |
| 6b | 2c |
| 6c | 25 |

**Multinational EBCDIC to ASCII Data Translation Table (Continued)**

| EBCDIC | ASCII |
|--------|-------|
| 6d | 5f |
| 6e | 3e |
| 6f | 3f |
| 70 | 9b |
| 71 | 90 |
| 72 | d2 |
| 73 | d3 |
| 74 | d4 |
| 75 | d6 |
| 76 | d7 |
| 77 | d8 |
| 78 | de |
| 79 | 60 |
| 7a | 3a |
| 7b | 23 |
| 7c | 40 |
| 7d | 27 |
| 7e | 3d |
| 7f | 22 |
| 80 | 9d |
| 81 | 61 |
| 82 | 62 |
| 83 | 63 |
| 84 | 64 |
| 85 | 65 |
| 86 | 66 |
| 87 | 67 |
| 88 | 68 |
| 89 | 69 |
| 8a | ae |
| 8b | af |
| 8c | d0 |
| 8d | c5 |
| 8e | e7 |
| 8f | f1 |
| 90 | f8 |
| 91 | 6a |
| 92 | 6b |
| 93 | 6c |
| 94 | 6d |
| 95 | 6e |
| 96 | 6f |
| 97 | 70 |
| 98 | 71 |
| 99 | 72 |
| 9a | a6 |
| 9b | a7 |
| 9c | 91 |
| 9d | f7 |
| 9e | 92 |

**Multinational EBCDIC to ASCII Data Translation Table (Continued)**

| EBCDIC | ASCII |
|--------|-------|
| 9f | cf |
| a0 | e6 |
| a1 | 7e |
| a2 | 73 |
| a3 | 74 |
| a4 | 75 |
| a5 | 76 |
| a6 | 77 |
| a7 | 78 |
| a8 | 79 |
| a9 | 7a |
| aa | ad |
| ab | a8 |
| ac | d1 |
| ad | ed |
| ae | e8 |
| af | a9 |
| b0 | bd |
| b1 | 9c |
| b2 | be |
| b3 | 93e |
| b4 | 9f |
| b5 | f5 |
| b6 | f4 |
| b7 | ac |
| b8 | ab |
| b9 | f3 |
| ba | aa |
| bb | b3 |
| bc | ee |
| bd | f9 |
| be | ef |
| bf | cd |
| c0 | 7b |
| c1 | 41 |
| c2 | 42 |
| c3 | 43 |
| c4 | 44 |
| c5 | 45 |
| c6 | 46 |
| c7 | 47 |
| c8 | 48 |
| c9 | 49 |
| ca | 2d |
| cb | 93 |
| cc | 94 |
| cd | 95 |
| ce | a2 |
| cf | e4 |
| d0 | 7d |

**Multinational EBCDIC to ASCII Data Translation Table (Continued)**

| EBCDIC | ASCII |
|--------|-------|
| d1 | 4a |
| d2 | 4b |
| d3 | 4c |
| d4 | 4d |
| d5 | 4e |
| d6 | 4f |
| d7 | 50 |
| d8 | 51 |
| d9 | 52 |
| da | fb |
| db | 96 |
| dc | 81 |
| dd | 97 |
| de | a3 |
| df | 98 |
| e0 | 5c |
| e1 | 20 |
| e2 | 53 |
| e3 | 54 |
| e4 | 55 |
| e5 | 56 |
| e6 | 57 |
| e7 | 58 |
| e8 | 59 |
| e9 | 5a |
| ea | fd |
| eb | e2 |
| ec | 99 |
| ed | e3 |
| ee | e0 |
| ef | e5 |
| f0 | 30 |
| f1 | 31 |
| f2 | 32 |
| f3 | 33 |
| f4 | 34 |
| f5 | 35 |
| f6 | 36 |
| f7 | 37 |
| f8 | 38 |
| f9 | 39 |
| fa | fc |
| fb | ea |
| fc | 9a |
| fd | eb |
| fe | e9 |
| ff | 20 |

# Appendix B: IBM EBCDIC To ISO ASCII Translation Table

The following chart documents the seven-bit ASCII hexadecimal codes which can be implemented in the LinkUp 5294 for the various character sets listed below.

| EBCDIC CODE | 4A | 5A | 6A | 79 | 5B | 7B | 7C | 5F | A1 | C0 | D0 | E0 | 4F | 7F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Austria Germany | Ä 5B | Ü 5D | ∂ 7C | ' 60 | $ 24 | # 23 | 40 | ^ 5E | ß 7E | ä 7B | ü 7D | Ö 5C | ! 21 | " 22 |
| Belgium | [ 5B | ] 5D | ú 7C | ' 60 | $ 24 | # 23 | à 40 | ^ 5E | ¨ 7E | é 7B | è 7D | ç 5C | ! 21 | " 22 |
| Denmark Norway | # 23 | · 24 | ø 7C | ' 60 | Å 5D | Œ 5B | Ø 5C | ^ 5E | ü 7E | œ 7B | å 7D | \ 40 | ! 21 | " 22 |
| Italy | • 5B | é 5D | ò 7C | ù 60 | $ 24 | £ 23 | 40 | ^ 5E | `1 7E | à 7B | è 7D | ç 5C | ! 21 | " 22 |
| Portugal | [ 23 | ] 21 | ò 7D | ' 60 | $ 24 | À 5B | Ò 5D | ^ 5E | ç 7C | à 7B | ' 40 | Ç 5C | \| 7E | " 22 |
| Spain | [ 5B | ] 5D | ñ 7C | ' 60 | £ 23 | Ñ 5C | @ 40 | ¬ 5E | ¨ 7E | { 7B | } 7D | \ 24 | \| 21 | " 22 |
| United Kingdom | $ 24 | ! 21 | \| 7C | ' 60 | £ 23 | # 5D | @ 40 | ¬ 5E | _ 7E | { 7B | } 7D | \ 5C | \| 5B | " 22 |
| United States | [ 5B | ! 21 | ] 5D | ' 60 | $ 24 | # 23 | @ 40 | ^ 5E | ~ 7E | { 7B | } 7D | \ 5C | / 7C | " 22 |

# Appendix C: Supported ASCII Devices

This appendix identifies the various ASCII terminals, PCs, word processors, and printers currently supported by the LinkUp 5294. The right-hand column shows the Terminal or Printer Module IDs that should work bets with each device listed.

**ASCII TERMINALS**

| Manufacturer | Terminal | Module ID |
|---|---|---|
| ADDS | Regent and Viewpoint | VEWP |
| | Viewpoint 60 | VP60 |
| AMPEX | 210/230 | TV925 |
| | 219 | VT100 |
| Anderson Jacobson | AJ-520 | VT52 or VT100 |
| ANSI Standard 3.64 | Any ANSI Standard | |
| | 3.64-compliant terminal | ANSI |
| Beehive | ATL 008 | VT100 |
| C.Itoh | 101 | VT100 |
| | 7101 | C7101 |
| | 7103 | C7103 |
| Colorgraphic | MVI-100 | VT100 |
| Cybernex | XLB-5291 | CY5291 |
| Data General | Dasher Dl00/D200 | D200 |
| Datamedia | DT80/1,DT80/2 | VT100 |
| | DT80/3 | TV925 |
| | DT80/S | VT100 |
| | Colorscan 10 | VT100 |
| DEC | VT-52 | VT52 or VT52X |
| | VT-l00/VT-101 | VT100 |
| | VT-102/VT-12S/VT-131/ | |
| | VT-220/VT-240 | VT220 |
| Direct | VP800C | VT100 |
| Falco | TS-I | VT52 |
| | Fame-100 | VT100 |
| | Fame-U | ANSI |
| Hazeltine | Esprit | ADM3A |
| | Esprit III | TV925 |
| | Esprit 10-51 | HZSl |
| Hewlett-Packard | HP-2621A/2645 | HP45 |

| Manufacturer | Terminal | Module ID |
|---|---|---|
| lBM | 3101 | I3101 |
| | 3151 | I3151 |
| | 3161/3163 | I3161 |
| | 3164 | I3 164 |
| Informer | 301/401 | VT52 or I3101 |
| KDE | 802 | VT52 |
| Lear Siegler | ADM-3A | ADM3A |
| | ADM-S | ADM3P |
| | ADM-11 | ADMl 1 |
| | ADM-21/22/23/24 | ADM21 |
| | ADM-36 | VT100 |
| | ADM 12 | ADM3P |
| Liberty Electronics | Freedom 100 | TV925 |
| MicroTerm | ACT-SA | ACTSA |
| | MIME-2A | VT52 |
| | MIME-740/Ergo 4000 | VT100 |
| | Ergo 201 | VT52 or TV925 |
| | Ergo 301 | VT52 or VT100 |
| MVI | 7 | VT100 |
| NCR | 7901 | VIEWP |
| Northern Telecom | Displayphone | DISPH |
| QUME | QVT-102 | ADM3A |
| Radio Shack | DT-l | TV910 |
| REBUS | 3000 | REBUS |
| Soroc | IQ120 | IQ120 |
| TAB | 132 | VT52 |
| | 13V15 | VT100 |
| TELERAY | | VT52 |
| TeleVideo | 910 | TV910 |
| | 910-/912 | TV9l0P |
| | 920/925/950 | TV925 |
| | 970 | TV970 |
| | Personal Terminal | TV910 |
| Telex | 310 | I3101 |
| Tymshare | Scanset | SCANS |

| | | |
|---|---|---|
| Visual | 100/300/400 | VT100 |
| | 110 | D200 |
| | 50/200 | ADM3A or VT52 |
| | | |
| Wyse | WY-100 | WY100 |
| | WY-30 | WY30 |
| | WY-60 | WY60 |
| | WY-60 w/extended keyboard | WY60X |
| | | |
| Xpoint | Remote 91 | HZ51 |
| | | |
| Zenith | Z-19 | VT52 or VT100 |
| | ZT-1 | VT52 |
| | | |
| Zentec | Zephyr | TV925 |

## PERSONAL COMPUTERS AND WORD PROCESSORS

| Computer | Recommended Software | Module ID |
|---|---|---|
| Apple IIe/IIc | Softerm Package | ADM3P |
| Apple III | Apple Access III | ADM3P |
| Apple Lisa | Included with Lisa | VT100 |
| AT&T 6300 | IBM PC Program | T5250 |
| Columbia | IBM PC Program | T5250 |
| COMMODORE 64 | VIP Terminal Emulator | VT52 |
| COMPAQ | IBM PC Program | T5250 |
| CPT | CPT VT-52 Paclkage | VT52 |
| DEC Rainbow VT180 | Comm. Package fmm DEC | VT100 |
| Direct | Included in Computer | VT100 |
| EXXON | EXXON TV925 paclcage | TV925 |
| Fortune | ITE package | TV925 |
| HP-200 series | HP Terminal Emulator program | HP4S |

| Computer | Software Package | Module ID |
|---|---|---|
| IBM PC | IBM PC Program | T5250 |
| IBM AT | IBM PC Program | T5250 |

| | | |
|---|---|---|
| IBM PC Convertible | IBM PC Program | T5250 |
| IBM PC Jr. | IBM PC Program | TS250 |
| Kaypro | Superterm Paclcage | ADM3P |
| Leading Edge PC | IBM PC Program | T5250 |
| Radio Shack Model-lI | Radio Shack ADM3A Emulator | ADM3P |
| Sperry PC | IBM PC Program | T5250 |
| TIProf. Comp. | Octacomm/PC | VT100 |
| Toshiba 3100 | IBM PC Program | T5250 |
| Vector Graphic | Gulf Data ADM3A Package | ADM3P |
| Victor 9000 | ASCOM Async Package | ADM3A |
| Xerox 820 | ASCOM Async Paclcage | ADM3P |
| Xerox 820-II | Included with computer | ADM3P |
| Zenith Z-89/90/100 | Zenith Terminal Package | VT52 |
| Zenith Z-150 | IBM PC Program | T5250 |

**ASCII PRINTERS**

| Manufacturer | Model | Module ID |
|---|---|---|
| Centronics | 351 a 359 | CENTRN |
| C. Itoh | 300 or 600 | CI300 |
| Dataproducts® | SPG8050 | DP8050 |
| General Electric® | GE 3000 | GE3000 |
| Genicom | 3410 | GEN34 |
| | 4410, 4440 | GEN44 |
| EPSON® | RX/FX/MX/JX/80/100 | EPSON |
| Hewlett Packard | LaserJet series | HPDPL |
| | | HPDPP |
| | | HPGEN |
| Okidata | MicroLine 82/83/84/92/93 | OKIM84 |
| Most Others | (Generic Support) | PRINT |

# Appendix D: System/36 Configuration Guide

## NOTE

**Before you change the configuration of the System/36, the LinkUp 5294 must be configured according to the instructions in Section 7.5.**

After completing configuration of the LinkUp 5294, configure the System/36.

System configuration is a process that specifies the machines and devices within a particular data-processing system. The information you supply during the system-configuration process is stored in a library member called a "configuration member."

After the configuration member has been cleared or changed, you need to load the configuration information within this member to the master configuration record. The load process must be completed before the system can use this information to recognize new or changed devices and communications lines. You can create a configuration member or change the information in an existing configuration member by using the CNFIGSSP procedure.

## NOTE

**If you have data security on your system, you must have update access to the library that contains the configuration member in order to change or delete a configuration member (Option 2 in the Main Menu). To change or rebuild the master configuration record (Options 12 and 13, in the Main Menu), you must have service aid authority. Options 12 and 13 are not displayed if you do not have service aid authority.**

The following step-by-step instructions show you how to use the CNFIGSSP procedure to create or change a configuration member. The instructions also show you how to apply the configuration member to the master record.

This appendix describes the steps necessary for configuration of the communication line, control unit, and devices shown in Figure E-l. The configuration in Figure E-l is only an example. The possible configuration combinations are too numerous to represent here.
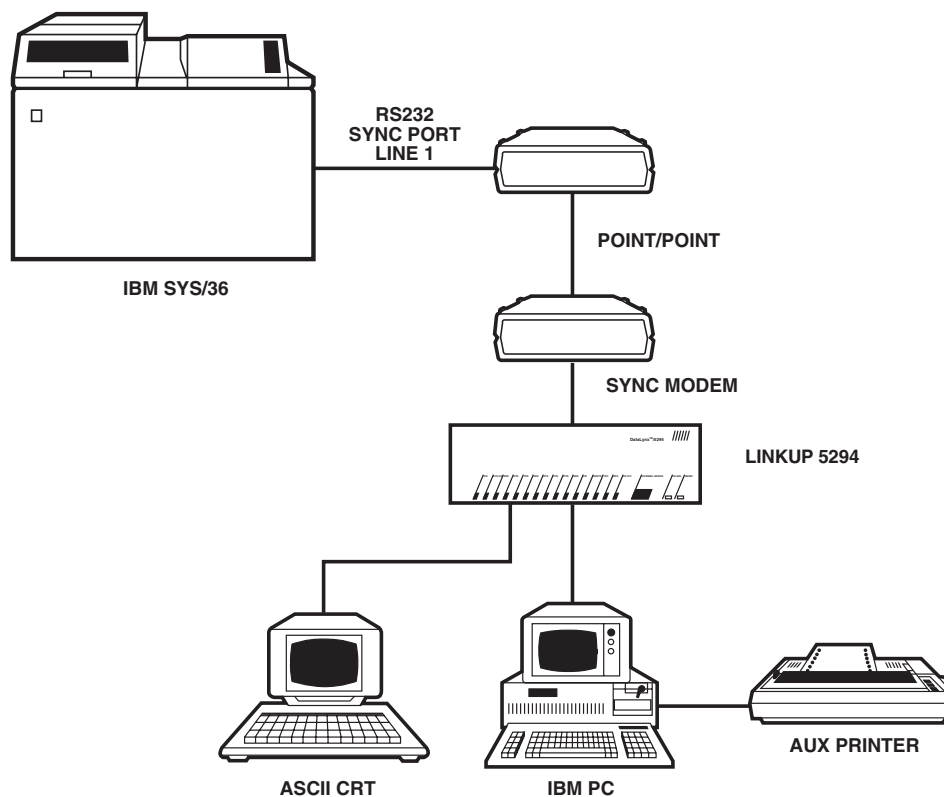
**Figure E-1. Sample Configuration.**

## D.1 Communications Line

An overview of the displays shown by System/36 for line configuration is listed below. If you intend to connect the LinkUp 5294 to an existing communications line, go to **Section E.2**.

- STEP 1 — Run CNFIGSSP Procedure

- STEP 2 — 1.0 Main Menu Option 2

- STEP 3 — 3.0 Member Definition

- STEP 4 — 4.0 Member Definition New

- STEP 5 — 6.0 Member Description

- STEP 6 — 5.0 Member Menu Option 1

- STEP 7 — 27.0 Display/Printer Menu Option 2

- STEP 8 — 9.0 Remote Workstation <Enter>

- STEP 9 — 10.0 Remote Line Definition

- STEP 10 — 27.0 Display/Printer Menu

- STEP 11 — 1.0 Main Menu Option 14

**STEP 1**

In order to access the System/36 configuration main menu, enter the command procedure CNFIGSSP on the main System/36 help menu, shown below. The CNFIGSSP procedure command is requested rather than selecting an option on the Sys/36 Main Menu.

```
                        MAIN

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


 Cmd3-Previous menu  Cmd7-End  Cmd-12-How to use help
 Home-Sign on menu
 Ready for option number of command
         CNFIGSSP
```

**STEP 2**

Enter Option 2 at the CNFIGSSP Main Menu, shown below.

```
 1.0 CONFIGSSP - MAIN MENU

 Select one of the following:
          1.How to use CNFIGSSP
          2.Create, change, or delete a configuration number
          3.Review a configuration
          4.Print a configuration

          10.Configuration report side

          12.Apply change to the master configuration record
          13.Rebuild the master configuration record (update
             to next release)
          14. End CNFIGSSP

 Option: 2

 Cmd3-Previous menu

 Help text is available throughout the CONFIGSSP
 Procedure by pressing the help key
```

**STEP 3**

To change an existing configuration member, select Option 1 at Menu 3.0, shown at the top of the next column. If a configuration member does not exist, select Option 2 (Create, change, or delete a configuration member).

**Option A:** Type the name of the configuration member to contain the line configuration, or use the member name already displayed, which is the name of the last configuration member applied to the master configuration record.

**Option B:** Type the name of the library where the configuration member is stored. The example at the top of the next column uses #CNFGLIB as the configuration library. The #CNFGLIB is a system library, denoted by the # preceding the library name. It is suggested you use this library for all configuration members on the System/36 in order to maintain consistency and accountability.

```
3.0 CONFIGURATION MEMBER DEFINITION


Select one of the following:
        1.How to use CNFIGSSP
        2.Create, change, or delete a configuration member
        3.Review a configuration


Option                              1
Member name                         SYSCNFIG
Library Name                        #CNGBLIB


Cmd3-Previous menu
```

**STEP 4**

To change an existing configuration member (Option 1 in Step 3) go to Step 5. If you create a new configuration member because one does not currently exist (Option 2 in Step 3) menu 4.0 will be shown (see below). Select Option 2 (the configuration is in the master configuration record). This option makes an exact duplicate of the master configuration record for modification.

# NOTE

**Do not select Option 1 (Standard System/36 configuration (with base default values)). This option is used only when you are creating a configuration member that you want to use for a different system.**

```
4.0 CONFIGURATION MEMBER DEFINITION - NEW

The new configuration member is based on:
1. Standard System/36 configuration (with base default values)
2.The configuration in the master configuration record
3.Previously created configuration member

Option                              2
```

**STEP 5**

The following display describes information that was used as a basis for the new member (Option 2 from Step 4), or the configuration member you specified (Option 1 from Step 4).

Make any changes to the the description of the configuration member and press <Enter>.

6.0 CONFIGURATION MEMBER DESCRIPTION
1. Describe the configuration member (up to 60 characters)
2.Specify main storage size in K-bytes.....0128-1024   0256
3.Specify disk storage size in M-bytes.....030-800     200

Cmd3-previous menu

**STEP 6**

The intention is to change only the configuration of devices attached to the System/36; therefore, select Option 1 (Work with display stations and printers) on Menu 5.0.

5.0 CONFIGURATION MEMBER MENU
Select one of the following

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

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

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

Option: 1

Cmd3 - previous menu                Cmd19-Cancel

**STEP 7**

Select Option 2 in Menu 27.0 to add a remote line characteristic.

27.0 CONFIGURATION - DISPLAY STATION AND PRINTER MENU

Select one of the following:

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

Option 2:

Cmd3-Previous menu                Cmd19-Cancel

**STEP 8**

The following provides for X.25 line configuration. The System/36 feature allows the System/36 to connect to an X.25 network. For more information on X.25 configuration procedures, see *Using System/36 Communications,* IBM publication number SC21-9082. To continue to the next screen, press <Enter>.

```
9.0 CNFIGSSP - REMOTE WORKSTATION

1.For a system with X.25 specify an X.25 configuration member........

Cmd3-Previous menu            Cmd 19-Cancel
```

**STEP 9**

Display 10.0 (CNFIGSSP - Communications Line Definition For Remote Work Stations) allows selection of communications lines for additions, changes, or deletions. In this example, we will be adding communication line 2 to the System/36. The System/36 allows a maximum of eight communications lines.

Prompt 1: Enter the line number you want to add or change.

Prompt 2: Specify whether the line being defined is to be used in an X.25 network.

# NOTE
**Prompt 2 will be displayed only if you have specified an X.25 configuration member in Step 8.**

Prompt 3: If the line is nonswitched, specify 1. If the line is switched, specify one of the following switch types:

**2** Switched manual call. The System/36 operator must place the call to the remote system to establish the communications connection.

**3** Switched auto answer. The System/36 will automatically answer an incoming call to establish the connection.

**4** Switched manual answer. The System/36 operator must answer an incoming call and place the modem in data mode to establish the communications connection.

# NOTE
**If you answer YES to prompt 2 for an X.25 network, then you must specify either 1 (nonswitched) or 3 (switched auto answer). No manual types are allowed in an X.25 network.**

Prompt 4: Automatic reconnect provides recovery on a switched or nonswitched line for remote workstation controllers that are signed on to the System/36. If automatic reconnect is specified for a switched line, the system will automatically try to reestablish its connection with the remote controller. If automatic reconnect is specified for a nonswitched line, and a line error or station error occurs, the system will periodically try to reestablish communications with the control unit.

```
10.0 CNFIGSSP - COMMUNICATIONS LINE DEFINITION
      FOR REMOTE WORKSTATIONS

The following lines have been defined          1
1. Which line is being defined?               1-8 2
2.Is line to be used in an X.25 network?      Y-N N
3.What type of line is it                      1
1 - Non switched         3 - Switched autoanswer
2 - Switched manual call  4 - Switched manual answer
4.Automatic reconnect for the line             N


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

**STEP 10**

After answering all prompts for the communications line, press <Enter> to return to Display 27 (see display in Step 7).

## D.2 Remote Controller, Display Stations, and Printers

The list below gives an overview of the displays shown for configuring the remote controller, display stations, and printers. Notice that Step 6, Display 27.0, is the display you were left at after configuration of communications line 2. We can begin our configuration of the remote devices on Display 27.0 rather than returning to the Main Menu in Step 1.

- STEP 1 — Run CNFIGSSP Procedure

- STEP 2 — 1.0 Main Menu Option 2

- STEP 3 — 3.0 Member Definition

- STEP 4 — 6.0 Member Description

- STEP 5 — 5.0 Member Menu Option 1

- STEP 6 — 27.0 Workstation Menu Option 3

- STEP 7 — 13.0 Remote Controller

- STEP 8 — 14.0 Remote Cluster Definition

- STEP 9 — 12.0 Workstation Definition

- STEP 10 — 27.0 Workstation Menu Option 6

- STEP 11 — 40.0 Workstation Assignment

- STEP 12 — 27.0 Workstation Menu Option 11

- STEP 13 — 5.0 Member Menu Option 5

- STEP 14 — 1.0 CNFIGSSP Main Menu

- STEP 15 — 3.0 Configuration Member Definition

- STEP 16 — 7.0 Change Master Configuration Option 3

# NOTE

**Before configuring the remote controller, display stations, and printers you must configure the communications line (see D.1).**

**STEP 6**

Select Option 3 on Display 27.0.

**STEP 7 Remote Controller Definition**

The remote controller is a device that is accessed by the System/36 through the communications line. It controls the operation of one or more remote display stations and printers. The LinkUp 5294 emulates IBM 5251 Model 12 and 5294 cluster controllers and is classified as a remote controller.

If you have previously defined workstation controllers, Display 13.0 will show the word EDIT at the top of the display. If you are adding a new remote workstation controller, the word ADD must be at the top of the display. Press Command Key 5 to enable you to define a new remote controller.

Prompt 1 (Remote controller ID): You may specify any ID of your choice, provided it has not been used previously. In this example we will use C02.

Prompt 2 (Describe the remote controller): This 40-character field can be used to help identify controller information, such as the location of the controller.

Prompt 3 (Controller type): You must specify the model of the unit which controls your remote work stations. Since the LinkUp 5294 emulates an IBM 5251 model 12 controller in this example, enter 1 for this controller model type.

Prompt 4 (Controller station address): The controller station address is used to identify the controller to the System/36. The controller unit station address must match the address given internally to the LinkUp 5294 for the control unit number (this is further described in **Section 7.5** of this manual). Each control unit on the System/36 must have a unique address. In this example, enter 02.

Prompt 5 (Communication line): This is the remote line number the LinkUp 5294 is attached to. For this example, enter a 2.

# NOTE

**This line must have been previously defined in this configuration member.**

Prompt 6 (For a switched line, optionally specify 1-3 alternative lines): If the line number you specified in Prompt 5 is a switched line, you can specify alternative lines to which the LinkUp 5294 can be attached. The alternative lines you specify must also be switched lines with the same switch type. For example, if Line 2 has a switch type of manual answer and Line 3 is selected as an alternative line, then Line 3 must have a switch type of manual answer. You can specify up to 3 alternative lines. If you have only one line or if you specified a non-switched line at prompt 5, have this field blank. In this example Line 2 entered in Prompt 5 is a non-switched line, therefore, the field for prompt 6 is left blank.

13.0 CNFIGSSP - REMOTE CONTROLLER DEFINITION

1. Remote Controller ID                                C02

2. Describe the remote controller
                    LinkUp 5294 Remote Controller

3. Controller type                                     1
1. 5251 model 12          2. 5294

4. Controller station address          01-FD          02

5. Communications line          1-8                   2

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

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

**STEP 8**

Display 14.0 (CNFIGSSP - Remote Cluster Definition) is shown below. Use this display to add display stations and printers to a new remote controller (the LinkUp 5294). Enter the number of devices attached to each port of the LinkUp 5294. Configure the ports according to a dual -cluster feature. The LinkUp 5294 can accommodate up to 8 different units (one to each cluster port or any combination of display units and auxiliary printers per port up to 8 devices). For our example, one device is added for Ports 1, 2, and 3.

# NOTE
**You must have one device on the previous port before using another port on the same cluster. For example, you cannot specify a device on Port 3 if one is not specified on Port 2.**

14.0 CNFIGSSP-REMOTE CLUSTER DEFINITION

Specify up to four display stations or printers attached to each cluster feature below:

SINGLE CLUSTER FEATURE

Port number                    1 2 3 4

Number of display
stations and printers          1 1 1 0

DUAL CLUSTER FEATURE

Port number                    5 6 7 8

Number of display
stations and printers          0 0 0 0

Cmd 19 - Cancel

**STEP 9**

Display 12.0 (CNFIGSSP - Workstation Definition), shown below, allows you to specify the arrangement of the display stations and printers on the LinkUp 5294. Notice that in the example all devices are configured on address 0, ports 1-3. The remote controller (device code 02) is always displayed at address 0 on port 0. Each device has a two-character code or ID that identifies it by function (display station or printer) and by type. A list of device codes is shown after the display. You can also press Command Key 5 for a display of all valid device codes.

When all changes have been made to Display 12.0, press Command Key 3 to return to Display 27.0.

```
12.0 CNFIGSSP-WORKSTATION DEFINITION

Specify the arrangement of your display stations and printers.
Printers correspond to the work station address:

Displays: 00. Single color display station.

0  1  2  3  4  5  6  7

02                                          0 — P
01                                          1 — 0
PB                                          2 — R
01                                          3 — T
                                            4 — S
                                            5 —
                                            6 —
                                            7 —
                                            8 —
```

Displays:

Code 00 — Single Color Display Station
Code 01 — 5251 Model 11
Code 02 — 5251 Model 12
Code 10 — 5291
Code 11 — 3180
Code 20 — Multiple color display station
Code 21 — 5294 Model 1
Code 22 — 5294 Model 2

Printers:

Code PA — 3262 Printer
Code PB — 5256 Printer
Code AA — 5256 Model 1
Code AB — 5256 Model 2
Code AC — 5256 Model 3
Code PC — 5224 or 5225 Printer
Code BA — 5224 Model 1
Code BB — 5224 Model 2
Code CA — 5225 Model 1
Code CB — 5225 Model 2
Code CC — 5225 Model 3

Code CD — 5225 Model 4
Code PD — 5219 Printer
Code DA — 5219 Model D01
Code DB — 5219 Model D02

When you defined the display stations and printer, default values were assigned for certain characteristics of each device (see the list below). Before a printer can print any output, it must be assigned to a display station. The System/36 allows you to define printer assignments through the CNFIGSSP process.

| Display Station | Default Value |
|---|---|
| | |
| Default Printer | ID System printer |
| Display Type | C (command) |
| Stripe reader | No |
| Print Key heading lines | No |
| Automatic Vary on | |
| Local display stations | Yes |
| Remote display stations | No |
| Plotter Type | None |
| Plotter address | |
| IGC keyboard | No |

**STEP 10**

From Display 27.0, enter Option 6.

**STEP 11**

Display 40.0 (CNFIGSSP - Work Station ID Assignments).

The first display will show the 3262 System Printer, if you have one. If you do not have a 3262 Printer, the first display will show the system console. By pressing <Enter>, you can display each controller and attached display stations and printers. Press <Enter> until the LinkUp 5294 cluster controller added in Part B appears. Following the LinkUp 5294 will be the attached devices for each port. In this example, assign the printer ID P1 to device 01 on port 1. Press <Enter> until the next display station on Port 0 appears and assign the same printer. You have now assigned the remote printer to both workstations (ports 1 and 3). Pressing <Enter> will store the assignment changes and display the next port.

```
40.0 CNFIG - WORKSTATION ID ASSIGNMENTS

Change the workstation ID, assigned printer, or subconsole
assignment.

Port number                    1
Work station address           0  1  2  3  4  5  6
Device code                    01

1. Workstation ID              W2
2. Assigned printer ID         P1
3. Subconsole ID               W1


Cmd3 Previous menu             Cmd 19-Cancel
```

If you have no more changes to make regarding your display stations and printers, press Command Key 3 to return to Display 27.0.

**STEP 12**

Display 27.0. Enter Option 11.

**STEP 13**

Display 5.0 (Configuration Member Menu) is shown below. If you have no more changes, enter Option 5 to save the configuration member and return to Display 1.0.

SETCOMM Procedure

It may be necessary to change certain characteristics of the communications line before loading the communications configuration member. You can use the SETCOMM procedure to change certain items. To use SETCOMM, go to the main help menu of Step 1. Enter SETCOMM at the Ready for option number or command prompt, and the available parameters will be displayed. If changes are made, you must reboot the system before these changes become effective. Each parameter is optional; if not specified, the preset system values remain unchanged.

```
5.0 CONFIGURATION MEMBER MENU
Select one of the following:

1.Work with display stations and printers
2.Add or delete program products, optional SSP, and SSP
   features
3.Define base SSP values
4.Specify sizes for disk VTOC, history file, and task work
   area
If no more changes are to be made to your configuration
member, select the following option:
5.Save configuration member and return to main menu for
   CNFIGSSP
Option: 5
```

## D.3 Changing the Master Configuration Record

**STEP 14**

# NOTE

**Changing the Master Configuration Record requires a dedicated system. No other programs can be running on the system. Use the STATUS command to check for any system activity. Use the STOP WORKSTN command at the system console to ensure that any operators currently signed on to the system cannot start jobs or put jobs on the job queue. Make sure all local and remote devices are off-line (signed off).**

At Display 1.0 (CONFIGSSP - Main Menu), enter Option 12 (Apply change to the master configuration record). See below.

```
1.0 CONFIGSSP - MAIN MENU

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

Option: 12

Cmd3-Previous menu

Help text is available throughout the CONFIGSSP Procedure
by pressing the help key
```

**STEP 15**

Display 3.0.

Prompt 1: Enter the configuration member added in Section A (SYSCNFIG).

Prompt 2: Enter the library name where the configuration member is stored (#CNFGLIB).

Press <Enter>.

```
3.0 CONFIGURATION MEMBER DEFINITION

Member name                    SYSCNFIG
Library name                   #CNFGLIB
```

**STEP 16**

# WARNING

**Be sure to select Option 3 for displays and printer. Any other option could crash the system.**

Display 7.0

Select Option 3. This option allows you to update only the display station and printer portion of the master configuration record.

After all changes have been copied to the Master Configuration Record, you will be asked if you want a printout of this configuration. Specify YES. After the configuration has been printed, press <Enter>. The system will automatically perform an IPL, and the new line with remote devices will be recognized by the System/36.

Verify that the devices you configured are optional. Make sure display stations are powered on and that there is a sign-on display.

Make sure your printers are turned on and ready to print. Press the print key at that display station. Observe which printer id printing. The printer assigned to that particular display should print.

If you have problems, compare a configuration printout with what should be defined. Verify that the communication line is defined properly. If not, use the SETCOMM procedure described in Step 13.

If there are any problems associated with the CNFIGSSP procedure, consult your IBM System/36 Operations Manual.

# Appendix E: System/38 Configuration Guide

System configuration is a process that specifies the machines and devices within a particular data processing system (see Figure E-l). The Control Program Facility (CPF) is the System/38 system support program which, in addition to providing work management and batch job functions, coordinates all interactive processing.

Interactive processing on the System/38 takes place within the subsystem QINTER or a user-created subsystem. QINTER (an environment supplied by IBM) supports interactive processing through all the workstations attached to the system. All workstation devices, excluding the system console, are attached to this subsystem. If you want the new configurations to be in effect as soon as possible, you have two choices:

1.You may terminate the QINTER subsystem by using the TRMSBS command, and vary offline the appropriate control unit (VRYCTLU command and any attached devices (if they previously exist). Reverse this procedure after completing the new configuration.

2.You may power down the system using the PWRDWNSYS command, then power on the system, setting switch 1 to 4 (IPL ABBR) and switch 2 to 0 (NORMAL) on the operator/ service panel, and pressing the power-on switch. After signing on with the SECURITY OFFICER password, request the configuration menu from the start control program facility prompt 2. When you are finished configuring devices, press the CFI KEY to exit from the configuration menu.

With either of the choices (1 or 2) all interactive processing within the subsystem (exclusive of the system console) must be terminated for the configuration process.

To avoid the necessity of shutting off the system, we will use Choice 1.

## NOTE

**You may change the configuration of the System/38 before or after configuration of the LinkUp 5294. Refer to the instructions in Section 7.5 of this manual for the configuration requirements of the LinkUp 5294.**

**IBM SYS/36**

**MODEM**

**LINE
DESCRIPTION**

**MODEM**

**LinkUp 5294**

DataLynx™5294

**CONTROL UNIT
DESCRIPTION**

**DEVICE
DESCRIPTION**

**DISPLAY STATION**

**MATRIX PRINTER**
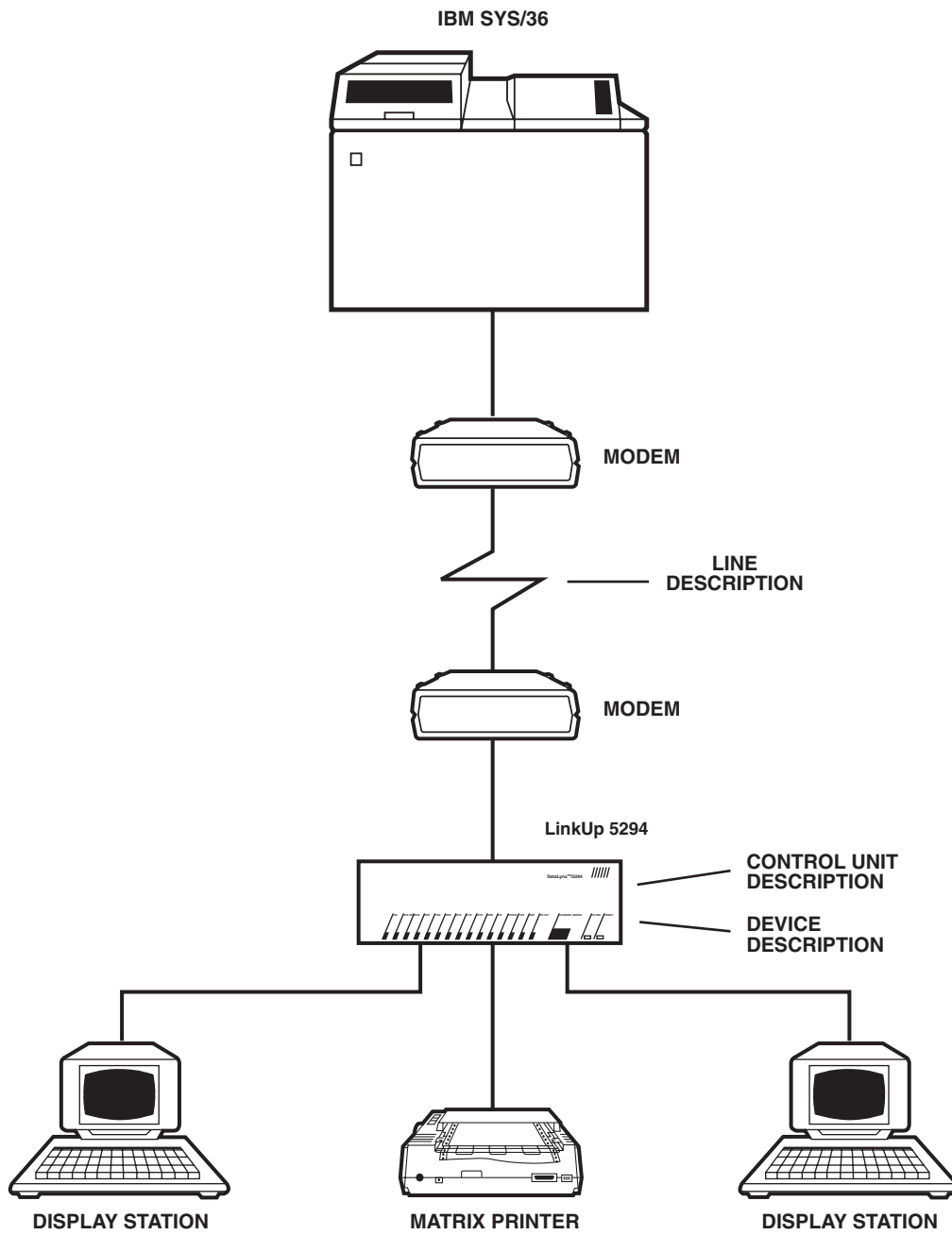
**DISPLAY STATION**

**Figure E-1. Sample Data-Processing System.**

Figure E-1 shows the Remote Configuration Setup, consisting of one point-to-point/leased line, two display stations, and a matrix printer. The LinkUp 5294 emulates IBM Model 12 and/or IBM 5294 Cluster Controllers.

Signing on to the System/38 console with the Security Officer Password displays the command- entry screen. The command-entry screen allows entry of System/38 Control Language commands to perform functions of the system's Control Program Facility (CPF).

A sample Remote Workstation configuration is listed below:

     1.Terminate Subsystem (QINTER)
     2.Create Line Description
     3.Create Control Unit Description
     4.Create Device Description
     5.Add Work Station Entries For Subsystem
     6.Vary Communication Line On
     7.Vary Control Unit On Line
     8.Vary Devices On Line
     9.Start Subsystem (QINTER)

STEP 1. Terminate Subsystem QINTER

Prior to terminating the subsystem QINTER, check that all workstations are signed off. Enter the terminate subsystem command TRMSBS. Press the Command 4 key. Pressing this provides a prompt screen for entering parameters for the TRMSBS command. The command example below cancels all interactive jobs in the QINTER subsystem and terminates the subsystem.

**::TRMSBS SBS (QINTER) OPTION(*CNTRLD) DELAY(60)**

## NOTE

**In this example, we are using the subsystem QINTER, an interactive subsystem supplied by IBM. Verify that this is the appropriate subsystem for creating or modifying your system devices. Do not assume that QINTER is the only interactive subsystem. To determine if other interactive subsystems exist, enter DSPSBS SBS(*ALL).**

**STEP 2. Create Line Description**

Entering the Create Line Description Command CRTLIND (see below) creates a line description for the specified communications line. The line command describes line features to the system; this includes the description of the modem (and its features) connected to the line. In Figure E-l, the remote line consists of a point-to-point/leased line with non-IBM modems attached. This line is configured as a Primary Synchronous Data Link Control (SDLC) at 9600 baud rate with a 4-wire connection.

Many of the prompts in this example are not included in the command example below. If a value is not included in the command statement the default value is assumed by the system. Before using this command, you should refer to the IBM Guide To Product Installation and Device Configuration and the IBM System/38 Control Language Reference Manual for considerations relating to communications lines interfaces and to modem characteristics, types, and features.

::CTRLIND LIND (LINKUP1) LINNBR (20) TYPE (*SDLCP) CNN(*PP)+

RATE (9600) SELECT(*NO) NONRTZN(*YES) CLOCK (*NO) WIRE(4)+

OEMMDM(*YES) TEXT (POINT TO POINT LINKUP INE 1')

# NOTE

**This command should be used to create a line description before the associated Control Unit Descriptions and device descriptions are created for the control unit and devices attached to the line. If the descriptions are created out of sequence, any commands referring to names of descriptions not yet created are rejected by the system.**

## STEP 3. Create Control Unit Description

The Create Control Unit Command (CRTCUD) identifies the LinkUp 5294 control unit to the System/38 (see below). This command should be used to create the control-unit description only after the associated line description has been created for the line attached to the LinkUp 5294 The attached device descriptions should not be created until after the line description and the LinkUp control unit description are created.

"525l" is entered for the Control Unit Type parameter (TYPE). The Control Unit Description (CUD) specifies the name of the Control Unit Description that is being created. This name should be unique to all existing control units. The LinkUp 5294 emulates the IBM 5251 Model 12 and IBM 5294 cluster controllers. In this example, "12" should be entered for the (MODEL) parameter. Refer to the explanations in the IBM Control Language Reference Manual for entering a value for the Control Unit Address (CTLADR) parameter and the remaining parameters for the CRTCUD command.

::CRTWD CUD(DL5lCU) TYPE(5251 MODEL (12) CTLADR(0120) +

LINE(LINKUPLl) EXCHID(02000001) TEXT('POINT TO POINT+ LINKUP CONTROL UNIT')

# NOTE

**Do not enter the device names in the CRTCUD command. When you create the device descriptions later on (in Step 4) and reference the LinkUp 5294 control unit through the (CTLU) parameter, those devices are automatically included in the (DEV) parameter for the associated control -unit description.**

## STEP 4. Create Device Description

The Create Device Description command CRTDEVD creates a device description for the specified devices which describes all of the features for a particular device to the System/38. This command should be used to create each device description only after the associated line description and control description are created.

The (DEVD) parameter specifies the name of the device description that is being created. The name of an existing device description cannot be used. See the explanations in the IBM Control Language Reference Manual for entering values for the Device Address DEVADR values and the remaining parameters for the CRTDEVD command. In the remote setup example, both display stations emulate the IBM 5251 display station. Enter 5251 for the device type ( TYPE) parameter.

The PRINTER parameter specifies the name of the 5224/5225/5256 printer to be associated with the display device. The device description of the workstation printer named in this parameter must have been previously created in another CRTDEVD command.

The printer in the remote setup emulates an IBM 5256 printer.

# NOTE
**If you plan to have print output sent by specific workstations to a specific remote printer, you must use the Create Print File CRTPF command. Enter the printer device description in the DEV parameter and the particular OUTQ for spooling. Make sure the Print File exists prior to including it in the PRTFILE parameter for creating the printer description.**

CRTDEVD Command — Example 1:

::CRTDEVD DEVD (LINK2S1) DEVADR(000120) DEVTYPE (5251) + MODEL (11) CTLU(DL51CU) ONLINE(*YES) DROP (*NO) WSCADR(*NONE) + TEXT('LINKUP TERMINAL A1')

::CRTDEVD DEVD(LINKWS2) DEVADR(020120) DEVTYPE(5251) + MODEL(11) CTLU(DL51CU) ONLINE(*YES) DROP(*NO) PRINTER + (LINKP1)WSCADR(*NONE) TEXT(;LINKUP TERMINAL A2')

CRTDEVD Command — Example 2

::CRTDEVD DEVD(LINKP1) DEVADR(030120) DEVTYPE(5256) + MODEL(0002) CTLU(DL51CU) ONLINE(*YES) DROP(*NO) WSCADR(*NONE) + TEXT('LINKUP PRINTER P1')

**STEP 5. Add Workstation Entries for Subsystem**

After the appropriate device descriptions are generated, the workstations must be assigned to a particular subsystem. Workstation job entries are added to the specified subsystem description through the ADDWSE command. Each entry describes one or more workstations that are to be controlled by the system. The workstations identified in the workstation entries are allowed to sign on to or enter the subsystem and execute jobs.

If every workstation of a particular type is to be included in a particular subsystem, only that workstation type should be entered in the WRKSTNTYPE command parameter. When you enter a workstation type, such as 5251, as opposed to a specific workstation description (which would be entered for the WRKSTN parameter), the system assigns all workstations of that type to the same interactive subsystem and not on an individual basis. The WRKSTN parameter specifies to the subsystem which device description will be included (by the DEVTYPE parameter of the CRTDEVD command).

# NOTE
**A value must be specified for either the WRKSTN or the WRKSTNTYPE parameter, but not both.**

::ADDWSE SBSD(QINTER) WRKSTNTYPE(5251) JOBD(*SBSD) + MAXACT(*NOMAX) AT(*SIGNON)

**STEP 6. Vary Communication Line ON**

Before the control unit and its attached devices can be varied active, the communication line to which they will be attached must be varied on. The VRYLIN command varies the specified line active or inactive depending on the STATUS Parameter.

::VRYLIN LINE(LINKUPL1) STATUS(*ON)

**STEP 7. Vary Control Unit ON**

The Vary Control Unit VRYCTLU command is used to vary one or more control units online or offline with the system. This command should be executed after the communications line it is attached to has first been varied online.

::VRYCTLU CTLU(DL51CU) STATUS(*ON)

**STEP 8. Vary Devices Online**

The Vary Device VRYDEV command is used to vary one or more devices online or offline with the system. A device cannot be varied online if:

- Its power is turned off

- The control unit to which it is attached is varied off line

# NOTE

**Although the VRYDEV command can be executed before a switched connection is made, the device is not actually online until the connection is made.**

::VRYDEV DEV(LINKWSl) STATUS(*ON)
VRYDEV DEV(LINKWS2) STATUS(*ON)
VRYDEV DEV(LINKPl) STATUS(*ON)

**STEP 9. Start Interactive Subsystem**

The Start Subsystem STRSBS command starts a subsystem based on the subsystem description specified in the command. When the subsystem is started, CPF allocates the available workstations that were specified in the subsystem description. Each workstation whose name (or type, if not specified by name) is contained in one of the subsystem descriptions workstation entries, and whose entry specifies AT(*SIGNON), is allocated to this subsystem unless it is currently signed on to another subsystem. The sign-on prompt is displayed on each workstation that is allocated to an available workstation address.

::STRSBS SBS(QINTER)

**Problem Determination**

Verify that the devices you configured are operational. Make sure that display stations are powered on and that there is a sign-on display.

Make sure your printers are turned on and ready to print. Press the print key at that display station. Observe which printer is printing. The printer assigned to that particular display should print.

If you have problems, compare a configuration printout with what should be defined. Verify that the communication line is defined properly. Make sure the synchronous port cable is positioned properly (DCE or DTE, whichever is applicable) on the LinkUp 5294.

If there are any problems associated with the configuration procedure, consult your *IBM System/38 Guide to Program Product Installation and Device Configuration, GC21-7775,* or the *IBM System/38 Control Language Reference Manual, SC21-7731.*

# Appendix F: Terminal Modules and ASCII Terminal Setups

This appendix identifies the Emulation Mode key sequences designed for each of the Terminal Modules currently supported in the LinkUp 5294. You will also find information on recommended switch or configuration setups for some of the specific ASCII Terminal types which the modules have been designed after.

The following chart lists each of the Terminal Modules, the ASCII terminal manufacturers and models (if appropriate), and where to find them in this appendix.

| Module ID | Manufacturer | Model | Section |
|---|---|---|---|
| ACT5A | Microcom | ACT-5A Terminal | F.1 |
| ADM11 | Lear Siegler | ADM-11 Terminal | F.2 |
| ADM21 | Lear Siegler | ADM-21 Terminal | F.3 |
| ADM3A | Lear Siegler | ADM-3A Terminal | F.4 |
| ADM3P[1] | | ADM-3A Terminal | F.5 |
| ANSI | ANSI Standard | 3.64 Terminal Type | F.6 |
| COMPU[2] | | | F.7 |
| C7101 | C. Itoh | CIE 7101 Terminal | F.8 |
| C7103 | C. Itoh | CIE 7103 Terminal | F.9 |
| CY5291 | Cybernex | XLB-5291 | F.10 |
| DISPH | Northern Telecom | Displayphone Terminal | F.11 |
| D200 | Data General | DASHER 200 Terminal | F.12 |
| HP45 | Hewlett Packard | HP-2645 Terminal | F.13 |
| HZ51 | Hazeltine | 10/51 Terminal | F.14 |
| IQ120 | Soroq | IQ-120 Terminal | F.15 |
| I3101 | IBM | 3101 Terminal | F.16 |
| I3151 | IBM | 3151 Terminal | F.17 |
| I3161 | IBM | 316V3163 Terminals | F.18 |
| I3164 | IBM | 3164 Terminal | F.19 |
| REBUS | REBUS | 3000 Terminal | F.20 |
| SCANS | Tymshare | Scanset Terminal | F.21 |
| TV910 | Televideo | 910 Terminal | F.22 |
| TV910P | Televideo | 910 Plus/912 Terminals | F.23 |
| TV925 | Televideo | 920/925/950 Terminals | F.24 |
| TV970 | Televideo | TV-970 Terminal | F.25 |

[1]Especially designed Terminal Module for software packages emulating the identified terminal type.

[2]Especially designed Terminal Module for computer-to-computer applications.

[3]IBM or true compatible.

| Module ID | Manufacturer | Model | Section |
|---|---|---|---|
| VIEWP | ADDS | Viewpoint/ | |
| | | Regent Terminals | F.26 |
| VP60 | ADDS | Viewpoint 60 Terminal | F.27 |
| VT52 | DEC | VT52 Terminal | F.28 |
| VT52X[1] | | VT52 Terminal | F.29 |
| VT100 | DEC | VT100 Terminal | F.30 |
| VT220 | DEC | VT220 Terminal | F.31 |
| WY30 | Wyse | WY-30 Terminal | F.32 |
| WY60 | Wyse | WY-60 Terminal | F.33 |
| WY60X | Wyse | WY-60 w/extended keyboard | F.34 |
| WY100 | Wyse | WY-100 Terminal | F.35 |
| XT100[4] | | | F.36 |

[1]Especially designed Terminal Module for software packages emulating the identified terminal type.

[3]IBM or true compatible.

[4]Specially designed Terminal Module, based on VT100, for use with the IBM PC.

## F.1 ACT5A Terminal Module - Microcom ACT-5A

The following list identifies the key sequences defined for the ACTSA Terminal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

3. The last position of the screen (row 24, column 80) is designed not to display a character. This prevents automatic scrolling.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movement* | | |
| Character Backspace | (left arrow) BACKSPACE | 03H |
| Cursor Up | up arrow | lAH |
| Cursor Down | down arrow | 0BH |
| Cursor Left | left arrow | 08H |
| Cursor Right | right arrow | 18H |
| Field Advance | TAB | 09H |
| Field Backspace | CTRL/B | 02H |
| New Line | LINE FEED | 0EH |
| Fast Left | N.A. | N.A. |
| Fast Right | N.A. | N.A. |

| 5250 Function | Key Sequence | Hex Value Generated |
| --- | --- | --- |

*Special Control*

| | | |
| --- | --- | --- |
| Error Reset | CTRL/R | 12H |
| Insert Mode | CTRL/U | 15H |
| Delete | DEL | 7FH |
| Erase Input | CTRL/E | 05H |
| Home | CTRL/^ | lEH |

*Field Exit*

| | | |
| --- | --- | --- |
| Duplicate | CTRL/D | 04H |
| Field Minus | CTRL/F | 06H |
| Field Plus | N.A. | N.A. |
| Field Exit | CTRL/T | 14H |

*Aid Generating*

| | | |
| --- | --- | --- |
| Enter | RETURN | 0DH |
| Clear | PAGE ERASE | 0CH |
| Help | ESC H | 1BH 48H |
| Print | CTRL/P | 10H |
| Roll Up | ESC U | 1BH 55H |
| Roll Down | ESC D | 1BH 44H |
| CMD 1 | ESC 1 | 1BH 31H |
| CMD 2 | ESC 2 | 1BH 32H |
| CMD 3 | ESC 3 | 1BH 33H |
| CMD 4 | ESC 4 | 1BH 34H |
| CMD 5 | ESC 5 | 1BH 35H |
| CMD 6 | ESC 6 | 1BH 36H |
| CMD 7 | ESC 7 | 1BH 37H |
| CMD 8 | ESC 8 | 1BH 38H |
| CMD 9 | ESC 9 | 1BH 39H |
| CMD 10 | ESC 0 | 1BH 30H |
| CMD 11 | ESC - | 1BH 2DH |
| CMD 12 | ESC = | 1BH 3DH |
| CMD 13 | ESC ! | 1BH 21H |
| CMD 14 | ESC @ | 1BH 40H |
| CMD 15 | ESC # | 1BH 23H |
| CMD 16 | ESC $ | 1BH 24H |
| CMD 17 | ESC % | 1BH 25H |
| CMD 18 | ESC ^ | 1BH 5EH |
| CMD 19 | ESC & | 1BH 26H |
| CMD 20 | ESC * | 1BH 2AH |
| CMD 21 | ESC ( | 1BH 28H |
| CMD 22 | ESC ) | 1BH 29H |
| CMD 23 | ESC _ | 1BH 5FH |
| CMD 24 | ESC + | 1BH 2BH |

*Special Host*

| | | |
| --- | --- | --- |
| System Request | ESC S | 1BH 53H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|

*Signal:*

| | | |
|---|---|---|
| Attn | ESC A | 1BH 41H |

*Extended Function:*

| | | |
|---|---|---|
| Local Copy Print Req. | ESC P | 1BH 50H |
| Local Copy Form Feed | ESC F | 1BH 46H |
| Cancel Print | ESC C | 1BH 43H |
| Refresh Screen | CTRL/W | 17H |
| Toggle Status Line/ | | |
| Toggle Indicators | ESC T | 1BH 54H |
| Toggle Echoplex Enabled | CTRL/V | 16H |
| Initialize Terminal | ESC | 1BH 3CH |
| Request Disconnect | ESC | 1BH 3EH |

**Microterm: ACT.5A Terminal Setup**

# NOTE
**The auxiliary port on the ACT-5A can be used with the LinkUp 5294 Auxiliary Printer facility.**

1. Set the Full/Half-Duplex switch at the rear of the cabinet to Full-Duplex operation.

2. To set the terminal and printer baud rates, set thc switch corresponding to the desired baud rate. If a baud rate of 110 is selected, be sure the number of Stop bits specified is 2. The baud-rate switches are found on the main logic board.

| I/O | | Printer Baud Rate |
|---|---|---|
| 1 | 8 | 19200 |
| 2 | 7 | 9600 |
| 3 | 6 | 4800 |
| 4 | 5 | 2400 |
| 5 | 4 | 1200 |
| 6 | 3 | 600 |
| 7 | 2 | 300 |
| 8 | 1 | 110 |

3. There are six switches located on the logic board at the rear of the cabinet which control the terminal's parity, word length, and number of stop bits. Set these switches to the following values:

| Switch/Option | Value | Comments |
|---|---|---|
| 5/8th bit transmit | ? | OFF = Mark, ON = Space to be transmitted |
| 6 and 7/Word Length | Length =8 | 6=OFF 7=OFF |
| | =7 | 6=OFF 7=ON |
| | =6 | 6=ON 7=OFF |
| | =5 | 6=ON 7=ON |
| 8/Odd or Even Parity | ? | OFF = Even, ON = Odd |
| 9/Number of Stop Bits | ON | Sets the number of stop bits at one. If a baud rate of less than or equal to 110 is being used, set this bit to OFF = 2 stop bits. |
| l0/Parity | ? | OFF = No parity, ON = parity selected = switch #8 |

4. Connect the terminal to the converter with a modem or direct-connect cable, as appropriate.

## F.2 ADM11 Terminal Module - Lear Siegler ADM-11

The following list identifies the keyboard sequences defined for the ADM11 Terminal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

3. The last position of the screen (row 24, column 80) is designed not to display a character. This prevents an automatic scrolling.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movement* | | |
| Character Backspace | CTRL/C | 03H |
| Cursor Up | up arrow | 0BH |
| Cursor Down | down arrow | 0AH |
| Cursor Left | left arrow or BACKSPACE | 08H |
| Cursor Right | right arrow | 0CH |
| Field Advance | TAB | 09H |
| Field Backspace | CTRL/B | 02H |
| New Line | CTRL/N | 0EH |
| Fast Left | N.A. | N.A. |
| Fast Right | N.A. | N.A. |
| *Special Control:* | | |
| Error Reset | CTRL/R | 12H |
| Insert Mode | CTRL/U | 15H |
| Delete | DEL | 7FH |
| Erase Input | CTRL/E | 05H |
| | or ESC Y | 1BH 59H |
| Home | HOME | 1EH |
| *Field Exit* | | |
| Duplicate | CTRL/D | 04H |
| Field Minus | CTRL/F | 06H |
| Field Plus | N A. | N A. |
| Field Exit | CTRL/X | 18H |
| *Aid Generating* | | |
| Enter | RETURN/ENTER | 0DH |
| Clear | ESC Z | IBH SAH |
| Help | ESC H | IBH 48H |
| Print | CTRL/P | 10H |
| Roll Up | ESC U | 1BH SSH |
| Roll Down | ESCD | 1BH 44H |
| CMD 1 | ESC 1 | 1BH 31H |
| CMD 2 | ESC 2 | 1BH 32H |
| CMD 3 | ESC 3 | 1BH 33H |
| CMD 4 | ESC 4 | 1BH 34H |
| CMD 5 | ESC 5 | 1BH 35H |
| CMD 6 | ESC 6 | 1BH 36H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| CMD 7 | ESC 7 | 1BH 37H |
| CMD 8 | ESC 8 | 1BH 38H |
| CMD 9 | ESC 9 | 1BH 39H |
| CMD 10 | ESC 0 | 1BH 30H |
| CMD 11 | ESC - | 1BH 2DH |
| CMD 12 | ESC = | 1BH 3DH |
| CMD 13 | ESC ! | 1BH 21H |
| CMD 14 | ESC @ | 1BH 40H |
| CMD 15 | ESC # | 1BH 23H |
| CMD 16 | ESC $ | 1BH 24H |
| CMD 17 | ESC % | 1BH 25H |
| CMD 18 | ESC ^ | 1BH 5EH |
| CMD 19 | ESC & | 1BH 26H |
| CMD 20 | ESC * | 1BH 2AH |
| CMD 21 | ESC ( | 1BH 28H |
| CMD 22 | ESC ) | 1BH 29H |
| CMD 23 | ESC _ | 1BH SFH |
| CMD 24 | ESC + | 1BH 2BH |

*Special Host:*

| | | |
|---|---|---|
| System Request | ESC S | 1BH 53H |

*Signal:*

| | | |
|---|---|---|
| Attn | ESC A | 1BH 41H |

*Extended Function:*

| | | |
|---|---|---|
| Local Copy Print Req. | ESC P | 1BH 50H |
| Local Copy Form Feed | ESC F | 1BH 46H |
| Cancel Print | ESC C | 1BH 43H |
| Refresh Display | CTRL/W | 17H |
| Toggle Status Line/ | | |
|   Toggle Indicators | ESC T | 1BH 54H |
| Toggle Echoplex Enabled | CTRL/V | 16H |
| Initialize Terminal | ESC < | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 3EH |

**Lear Siegler: ADM-11 Terminal Setup**

Information on the Lear Siegler ADM-11 terminal switch settings was not available at the time that this document was published. Please refer to the ADM-11 user's manual, or contact your supplier.

# NOTE

**The auxiliary port on the ADM-11 terminal can be used with the LinkUp 5294 Auxiliary Printer facility.**

## F.3 ADM21 Terminal Module - Lear Siegler ADM-21

The following list identifies the key sequences defined for the ADM21 Terminal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

3. NK denotes that the indicated key is found in the Numeric Keypad at the lower right of the keyboard (the LinkUp 5294 sets the keypad to Alternate Keypad mode).

4. The last position of the screen (row 24, column 80) is designed not to display a character. This prevents an automatic scrolling.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movement:* | | |
| Backspace Cursor | CTRL/C | 03H |
| Cursor Down | down arrow | 0AH |
| Cursor Up | up arrow | 0BH |
| Cursor Right | right arrow | 0CH |
| Cursor Left | left arrow | 08H |
| Field Advance | CTRL/I | 09H |
| | or TAB | 09H |
| Field Backspace | CTRL/B | 02H |
| Newline | CTRL/N | 0EH |
| Fast Left | N.A. | N.A. |
| Fast Right | N.A. | N.A. |
| *Special Control:* | | |
| Error Reset | CTRL/R | 12H |
| Insert Mode | CHAR INSERT (F5) | 01H 44H 0DH |
| | or LINE INSERT | 01H 42H 0DH |
| Delete Char | DEL | 7FH |
| Erase Input | CTRL/E | 05H |
| Home Cursor | HOME | 1EH |
| *Field Exit:* | | |
| Duplicate | CTRL/D | 04H |
| Field Minus | CTRL/F | 06H |
| Field Plus | N.A. | N.A. |
| Field Exit | CTRL/X | 18H |
| *Aid Generating:* | | |
| Enter | ENTER | 0DH |
| Char | PAGE ERASE | 01H41HODH |
| Help | ESC H | 1BH48H |
| Print | CTRL/P | 10H |
| Roll Up | ESC U | 1BH 55H |
| Roll Down | ESC D | 1BH 44H |
| CMD 1 | ESC 1 | 1BH 31H |
| CMD 2 | ESC 2 | 1BH 32H |
| CMD 3 | ESC 3 | 1BH 33H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| CMD 4 | ESC 4 | 1BH 34H |
| CMD 5 | ESC 5 | 1BH 35H |
| CMD 6 | ESC 6 | 1BH 36H |
| CMD 7 | ESC 7 | 1BH 37H |
| CMD 8 | ESC 8 | 1BH 38H |
| CMD 9 | ESC 9 | 1BH 39H |
| CMD 10 | ESC 0 | 1BH 30H |
| CMD 11 | ESC - | 1BH 2DH |
| CMD 12 | ESC = | 1BH 3DH |
| CMD 13 | ESC ! | 1BH 21H |
| CMD 14 | ESC @ | 1BH 40H |
| CMD 15 | ESC # | 1BH 23H |
| CMD 16 | ESC $ | 1BH 24H |
| CMD 17 | ESC % | 1BH 25H |
| CMD 18 | ESC ^ | 1BH 5EH |
| CMD 19 | ESC & | 1BH 26H |
| CMD 20 | ESC * | 1BH 2AH |
| CMD 21 | ESC ( | 1BH 28H |
| CMD 22 | ESC ) | 1BH 29H |
| CMD 23 | ESC _ | 1BH SFH |
| CMD 24 | ESC + | 1BH 2BH |

*Special Host:*

| | | |
|---|---|---|
| System Request | ESC S | 1BH 50H |

*Signal:*

| | | |
|---|---|---|
| Attention | ESC A | 1BH 41H |

*Extended Function:*

| | | |
|---|---|---|
| Local Copy Print Req. | ESC P | 1BH 50H |
| Local Copy Form Feed | ESC F | 1BH 46H |
| Cancel Print | ESC C | 1BH 43H |
| Refresh Display | SEND PAGE | 01H 47H 0DH |
| | or CTRL/W | 17H |
| Toggle Status Line/ | | |
| Toggle Indicators | ESC T | 1BH 54H |
| Toggle Echoplex Enabled | ESC V | 1BH 7C |
| Initialize Terminal | ESC < | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 3EH |

**Lear Sieglar: ADM-21 Terminal Setup**

# NOTE

The auxiliary port on the ADM-21 terminal can be used with the LinkUp 5294 Auxiliary Printer facility.

## LINKUP 5294 WITH DL5294 FIRMWARE

1. There are 10 toggle-type switches on the terminal's back panel labeled as S1 switches. These switches are used to specify terminal operating characteristics. Set these switches in the following manner:

| Switch | Set To: | Comments |
|---|---|---|
| EDIT-FUNC | FUNC | Sets Alternate mode with edit keys |
| CURSOR BLINK-<br> CURSOR STEADY | ? | Set as desired |
| CARRIAGE RETURN-CARR RETURN | | Disables automatic New Line<br>NEW LINE function |
| PARITY (Sw. 4 and 5) | ODD | Sw4 = Down, Sw5 = Down |
| | EVEN | Sw4 = Down, Sw5 = Up |
| | MARK | Sw4 = Up, Sw5 = Down |
| | SPACE | Sw4 = Up, Sw5 = Up |
| HALF DUPLEX/<br> FULL DUPLEX | FULL DUPLEX | Full Duplex operation enabled |
| 60 HZ-50 HZ | ? | To match input power frequency |
| AT4 | Switch UP | AT4 not used |
| CGS1 | Switch UP | CGS1 not used |
| CGS2 | Switch DOWN | CGS2 char select option enabled |

2. There are 10 toggle-type switches on the terminal's Back panel labeled as S2 switches. These switches set the baud rate and specify functional terminal operating characteristics. Set these switches in the following manner;

| S2 Switch | Set To: | Comments |
|---|---|---|
| BAUD RATE (SW: 1-7) | | See #3 below for switch settings |
| BUSY DIS-BUSY EN | Busy DIS | Disable BUSY control function |
| REV VIDEO ON/<br>REV VIDEO OFF | ? | Set Reverse Video function as<br>desired |

3. The remaining switches on the back panel are used to set the baud rate for communications to the converter. To set the baud rate, set the switch next to the desired baud rate to the UP position as specified on the ADM-21 back panel (S2) switch group. All other switches must be set to the DOWN position. Note that only one switch is enabled for the desired baud rate unless 110 is to be selected. To set a baud rate of 110, set Switches 1, 3, 5, 6, 7, and 8 to the UP position and Switches 2 and 4 to the DOWN position.

## NOTE
**If a baud rate of 110 is selected, be sure the number of stop bits specified is 2.**

4. Connect the terminal to the LinkUp 5294 with a modem or direct connect cable, as appropriate.

## F.4 ADM3A Terminal Module - Lear Siegler ADM-3A

The following list identifies the key sequences defined for the ADM3A Terminal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movement:* | | |
| Character Backspace | CTRL/C | 03H |
| Cursor Up | CTRL/K | 0BH |
| Cursor Down | LINE FEED | 0AH |
| | or CTRL/J | 09H |
| Cursor Left | CTRL/H | 08H |
| Cursor Right | CTRL/L | 0CH |
| Field Advance | CTRL/I | 09H |
| | or TAB | 09H |
| Field Backspace | CTRL/B | 02H |
| New Line | CTRL/N | 0EH |
| Fast Left | N A. | N.A. |
| Fast Right | N.A. | N.A. |
| *Special Control* | | |
| Error Reset | CTRL/R | 12H |
| Insert Mode | CTRL/U | 15H |
| Delete | RUB | 7FH |
| Erase Input | CTRL/E | 05H |
| Home | HOME | 01H |
| *Field Exit* | | |
| Duplicate | CTRL/D | 04H |
| Field Minus | CTRL./F | 06H |
| Field Plus | N A. | N.A. |
| Field Exit | CTRL/X | 18H |
| *Aid Generation* | | |
| Enter | RETURN | 0DH |
| Clear | ESC Z | 1BH 5AH |
| Help | ESC H | 1BH 48H |
| Print | CTRL/P | 10H |
| Roll Up | ESC U | 1BH 55H |
| Roll Down | ESC D | 1BH 44H |
| CMD 1 | ESC 1 | 1BH 31H |
| CMD 2 | ESC 2 | 1BH 32H |
| CMD 3 | ESC 3 | 1BH 33H |
| CMD 4 | ESC 4 | 1BH 34H |
| CMD 5 | ESC 5 | 1BH 35H |
| CMD 6 | ESC 6 | 1BH 36H |
| CMD 7 | ESC 7 | 1BH 37H |
| CMD 8 | ESC 8 | 1BH 38H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| CMD 9 | ESC 9 | 1BH 39H |
| CMD 10 | ESC 0 | 1BH 30H |
| CMD 11 | ESC - | 1BH 2DH |
| CMD 12 | ESC = | 1BH 3DH |
| CMD 13 | ESC ! | 1BH 21H |
| CMD 14 | ESC @ | 1BH 40H |
| CMD 15 | ESC # | 1BH 23H |
| CMD 16 | ESC $ | 1BH 24H |
| CMD 17 | ESC % | 1BH 25H |
| CMD 18 | ESC ^ | 1BH 5EH |
| CMD 19 | ESC & | 1BH 26H |
| CMD 20 | ESC * | 1BH 2AH |
| CMD 21 | ESC ( | 1BH 28H |
| CMD 22 | ESC ) | 1BH 29H |
| CMD 23 | ESC _ | 1BH 51H |
| CMD 24 | ESC + | 1BH 2BH |

*Special Host*

| System Request | ESC S | 1BH 52H |
|---|---|---|

*Signal*

| Attn | ESC A | 1BH 41H |
|---|---|---|

*Extended Function*

| Local Copy Print Req. | ESC P | 1BH 50H |
|---|---|---|
| Local Copy Form Feed | ESC F | 1BH 46H |
| Cancel Print | ESC C | 1BH 43H |
| Refresh Screen | CTRL/V | 17H |
| Toggle Status Line/ | | |
| Toggle Indicators | ESC T | 1BH 54H |
| Toggle Echoplex Enabled | CTRL/V | 16H |
| Initialize Terminal | ESC < | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 7EH |

**Lear Siegler: ADM-3A Terminal Setup**

**1.** Disconnect the AC power cord from the outlet before opening the ADM-3A case.

**2.** There are 13 toggle-type switches on the termninal's circuit board. These switches are used to specify terminal operating characteristics. Set these switches in the following manner

| Switch | Set To: | Comments |
|---|---|---|
| SPACE-ADV | SPACE | Destructive cursor |
| UC DISP-U/L DISP | U/L DISP | Allows display of upper- and lower-case characters (if terminal has this option) |
| DISABLE-KB LOCK | KB LOCK | Allows keyboard lock |
| DISABLE CLR SCRN | CLR SCRN | Clear Screen position |
| 50 HZ - 60 HZ | ? | To match input power frequency |
| 12 LINE-24 LINE | 24 LINE | 24-line display |

| Switch | Set To: | Comments |
|--------|---------|----------|
| CUR CTL-OFF | CUR CTL | Specify cursor control |
| LOCAL-OFF | ? | Set as appropriate |
| 103-0FF | ? | Set as appropriate |
| 202-OFF | OFF | Half-duplex I/O not allowed |
| CODE-SEC | | Active only if 202 is on |
| ETX-OFF | OFF | Off since 202 is off |
| EOT-OFF | OFF | Off since 202 is off |

**3.** There are 20 toggle-type switches on the ADM-3A's front panel. These switches are used to specify the terminal's primary operating characteristics and may be accessed by removing (unscrewing) the identification plate on the keyboard. Set these switches in the following manner:

| Switch | Set To: | Comments |
|--------|---------|----------|
| BIT 8 - 0/1 | 0 | Forces Bit 8 to zero. Set this switch only if parity is not set; this switch and a PARITY switch are mutually exclusive. |
| PARlTY-INH | ? | If parity is to be set, set Parity; otherwise, set to INH. Parity is set to match parity for the converter port. If no parity, set Bit 8 (see above). |
| STOP 1-2 | ? | Set as appropriate |
| DATA 7-8 | 8 | 8-bit data word length |
| PAR-ODD-EVEN | ? | This switch has effect only with the PARITY-INH switch in thc PARITY position. If PARITY is on, selcct parity to match the parity on the LinkUp 5294's port for this CRT. |
| LC EN-UC | EN | Allows lower and upper case |
| AUTO NL-OFF | OFF | Disables auto NEW LINE |
| RS232-CL | RS232 | Selects RS-232C communications at the modem connector on the rear panel |
| HDX-FDX | FDX | Full-duplex operation |

**4.** The remaining switches on the front panel are used to set tbe baud rate for communications to the LinkUp 5294. To do this, set the switch next to the desired baud rate to the left-hand position. All other baud switches must be set on the right-hand side; that is, set one switch only. The baud rate specified here must match the baud rate specified for the LinkUp 5294's port to which this terminal is to be connected. If a baud rate of 110 is selected, be sure the number of Stop bits specified is 2.

**5.** Replace the cover, reconnect the AC power cord, and connect the terminal to the LinkUp 5294 with a modem or direct-connect cable, as appropriate.

## F.5 ADM3P Terminal Module - Lear Siegler ADM-3A Emulators

The following list identifies the key sequences defined for the ADM3P Tenninal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

3. The last position of the screen (Row 24, Column 80) is designed not to display a character. This prevents an automatic scrolling.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movenent* | | |
| Character Backspace | CTRL/C | 03H |
| Cursor Up | CTRL/K | 0BH |
| Cursor Down | LINE FEED | 0AH |
| | or CTRL/J | 09H |
| Cursor Left | CTRL/H | 08H |
| Cursor Right | CTRL/L | 0CH |
| Field Advance | CTRL/I | 09H |
| | or TAB | 09H |
| Field Backspace | CTRL/B | 02H |
| New Line | CTRL/N | 0EH |
| Fast Left | N.A. | N.A. |
| Fast Right | N.A. | N.A. |
| *Special Control:* | | |
| Error Reset | CTRL/R | 12H |
| Insert Mode | CTRL/U | 15H |
| Delete | RUB | 7FH |
| Erase Input | CTRL/E | 05H |
| Home | HOME | 01H |
| *Field Exit* | | |
| Duplicate | CTRL/D | 04H |
| Field Minus | CTRL/F | 06H |
| Field Plus | N.A. | N A. |
| Field Exit | CTRL/X | 18H |
| *Aid Generating:* | | |
| Enter | RETURN | 0DH |
| Clear | ESC Z | 1BH 5AH |
| Help | ESC H | 1BH 48H |
| Print | CTRL/P | 10H |
| Roll Up | ESC U | 1BH 55H |
| Roll Down | ESC D | 1BH 44H |
| CMD 1 | ESC 1 | 1BH 31H |
| CMD 2 | ESC 2 | 1BH 32H |
| CMD 3 | ESC 3 | 1BH 33H |
| CMD 4 | ESC 4 | 1BH 34H |
| CMD 5 | ESC 5 | 1BH 35H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| CMD 6 | ESC 6 | 1BH 36H |
| CMD 7 | ESC 7 | 1BH 37H |
| CMD 8 | ESC 8 | 1BH 38H |
| CMD 9 | ESC 9 | 1BH 39H |
| CMD 10 | ESC 0 | 1BH 30H |
| CMD 11 | ESC - | 1BH 2DH |
| CMD 12 | ESC = | 1BH 3DH |
| CMD 13 | ESC ! | 1BH 21H |
| CMD 14 | ESC@ | 1BH 40H |
| CMD 15 | ESC # | 1BH 23H |
| CMD 16 | ESC $ | 1BH 24H |
| CMD 17 | ESC % | 1BH 25H |
| CMD 18 | ESC ^ | 1BH SEH |
| CMD 19 | ESC & | 1BH 26H |
| CMD 20 | ESC * | 1BH 2AH |
| CMD 21 | ESC ( | 1BH 28H |
| CMD 22 | ESC ) | 1BH 29H |
| CMD 23 | ESC _ | 1BH SFH |
| CMD 24 | ESC + | 1BH 2BH |

*Special Host:*

| | | |
|---|---|---|
| System Request | ESC S | 1BH 52H |

*Signal:*

| | | |
|---|---|---|
| Attn | ESC A | 1BH 41H |

*Extended Function:*

| | | |
|---|---|---|
| Local Copy Print Req. | ESC P | 1BH 50H |
| Local Copy Form Feed | ESC F | 1BH 46H |
| Cancel/Print | ESC C | 1BH 43H |
| Refresh Screen | CTRL/W | 17H |
| Toggle Status Line/ | | |
|   Toggle Indicators | ESC T | 1BH 54H |
| Toggle Echoplex Enabled | CTRL/V | 16H |
| Initialize Terminal | ESC < | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 7EH |

**ADM-3A Emulation Terminal Setup**

The ADM3P Terminal Module was designed to support those terminals and software packages providing emulation of an ADM-3A terminal, the ADM3P Terminal Module was designed. It is different from the standard ADM3P Terminal module because in many cases the emulation provided by software emulators is only partial.

The ADM3P Module differs from the ADM3A in the following respects:

1. On the ADM3A, the LinkUp 5294 allows display of a character in the last position on the screen (row 24, column 80) since it is possible to defeat the ADM3A auto-scroll capability with a switch setting. Most ADM3A emulators scroll when a character is displayed in the last position, so the ADM3P driver prevents display of data at Row 24, Column 80.

2. The ADM3A provides no support for high/low intensity. The ADM3P will select high and low intensity with ESC ) and ESC (, respectively.

3. The ADM3A does not provide an auxiliary part, so it cannot work with the LinkUp 5294 Auxiliary Printer facility. The ADM3P module, however, allows you to select and deselect an auxiliary port with CTRL/N and CTRL/O, respectively. These sequences are adapted from the Lear Siegler ADM3A Plus and ADM5 terminals and also function as keyboard unlock and lock, respectively, unless the appropriate switch has been optioned, as follows:

• S4 on the ADM5 terminal is in the GT position, or

• AUX/KB switch on the QUME 102 set to AUX

However, since most of the ADM3A emulations do not support transparent operation of an auxiliary port, the screen will also receive the printer output. Therefore, do not use the auxiliary printer facility unless you are sure that your emulator will accept the port-select commands.

In all other respects, the ADM3A and ADM3P modules are the same. For information on setting up a terminal or PC emulating an ADM3A terminal, refer to the following:

• The ADM3A entry in this manual

• The terminal or PC manufacturer's documentation

## F.6 ANSI Terminal Module - ANSI Standard 3.64

The following list identifies the key sequences defined for the ANSI Terminal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movement:* | | |
| Character Backspace | BACKSPACE | 03H |
| CursorUp | up arrow | 1BH 5BH 41H |
| Cursor Down | down arrow | 1BH 5BH 42H |
| Cursor Left | left arrow | 1BH 5BH 44H |
| CursorRight | right arrow | 1BH 5BH 43H |
| Field Advance | TAB | 09H |
| Field Backspace | CTRL/B | 02H |
| New Line | CTRL/N | 0EH |
| Fast Left | N.A. | N.A. |
| Fast Right | N.A. | N.A. |
| *Special Control:* | | |
| Error Reset | CTRL/R | 12H |
| Insert Mode | CTRL/UU | 15H |
| Delete | DEL | 7FH |
| Erase Input | CTRL/E | 05H |
| Home | CTRL/H | 08H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Field Exit:* | | |
| Duplicate | CTRL/D | 04H |
| Field Minus | CTRL/F | 06H |
| Field Plus | N A. | N A. |
| Field Exit | CTRL/X | 18H |
| *Aid Generating:* | | |
| Enter | ENTER | 0DH |
| Clear | CTRL/Z | 1AH |
| Help | ESC H | 1BH 48H |
| Print | CTRL/P | 10H |
| Roll Up | ESC U | 1BH 55H |
| Roll Down | ESC D | 1BH 44H |
| CMD 1 | ESC 1 | 1BH 31H |
| CMD 2 | ESC 2 | 1BH 32H |
| CMD 3 | ESC 3 | 1BH 33H |
| CMD 4 | ESC 4 | 1BH 34H |
| CMD 5 | ESC 5 | 1BH 35H |
| CMD 6 | ESC 6 | 1BH 36H |
| CMD 7 | ESC 7 | 1BH 37H |
| CMD 8 | ESC 8 | 1BH 38H |
| CMD 9 | ESC 9 | 1BH 39H |
| CMD 10 | ESC 0 | 1BH 30H |
| CMD 11 | ESC - | 1BH 2DH |
| CMD 12 | ESC = | 1BH 3DH |
| CMD 13 | ESC ! | 1BH 21H |
| CMD 14 | ESC @ | 1BH 40H |
| CMD 15 | ESC # | 1BH 23H |
| CMD 16 | ESC $ | 1BH 24H |
| CMD 17 | ESC % | 1BH 25H |
| CMD 18 | ESC ^ | 1BH 5EH |
| CMD 19 | ESC & | 1BH 26H |
| CMD 20 | ESC * | 1BH 2AH |
| CMD 21 | ESC ( | 1BH 28H |
| CMD 22 | ESC ) | 1BH 29H |
| CMD 23 | ESC _ | 1BH 5FH |
| CMD 24 | ESC + | 1BH 2BH |
| *Special Host:* | | |
| System Request | ESC 5 | 1BH 53H |
| *Signal:* | | |
| Attn | ESC A | 1BH 41H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Extended Function:* | | |
| Local Copy Print Req. | ESC P | 1BH 50H |
| Local Copy Form Feed | ESC F | 1BH 46H |
| Cancel Print | ESC C | 1BH 43H |
| Refresh Screen | CTRL/W | 17H |
| Toggle Status Line/ Toggle Indicators | ESC T | 1BH 54H |
| Toggle Echoplex Enab1ed | CTRL/V | 16H |
| Initialize Tenninal | ESC < | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 3EH |

**ANSI Standard: 3.64 Terminal Setup**

# NOTE

**The ANSI module may be used with terminals and PCs emulating VT100 terminals without numeric keypad support; for those which do support a numeric keypad, the VT100 module may be used.**

Information on the setup of any terminal complying with the ANSI Standard 3.64 will depend on the particular terminal being used. Please refer to the manufacturer's user's manual or contact your supplier.

## F.7 COMPU Terminal Module

COMPU is designed to support communication programs written especially for mini, micro, or instrumentation computers (those other than the IBM PC and compatibles, which the IBMPC and T5250 modules support) to enable them to transfer data to and from the System/3X host through the LinkUp 5294. A comparable program on the System/3X host must also be written in order to let the host know what is going on.

The COMPU module ensures that only data is sent to your computer; that is, no intensity or cursor-positioning sequences are ever sent, even if the host requests them. This enables the data sent from the System/3X host to the LinkUp 5294 to be converted and sent out the LinkUp 5294 asynchronous port to your computer in the same order the LinkUp 5294 received it and vice versa. The LinkUp 5294 does not perform any screen optimization when updating your screen of data (normally, the LinkUp 5294 updates your screen with only new data); instead it simply retransmits your entire screen every time.

When using one of the other terminal modules, the LinkUp 5294 discards any data received from your terminal or PC when the System/3X host inhibits your keyboard input. However, with COMPU, the LinkUp 5294 buffers the data until the host uninhibits your keyboard input, then sends the buffered data to the host. This permits a computer (using COMPU) to continuously send data to the LinkUp 5294 without regard to whether keyboard input is inhibited or not. (With this capability, the LinkUp 5294 exercises flow control to your computer as necessary to avoid overrunning its buffers.)

# NOTE

**The COMPU module performs the normal ASCII-to-EBCDIC and EBCDIC-to-ASCII translations of the data handled by the LinkUp 5294. Additionally, the key sequences defined for its emulation keyboard functions are identical to those used for the ADM3A Terminal Module.**

## F.8 C7101 Terminal Module - C. Itoh CIE 7101

The following list identifies the key sequence defined for the C7101 Terminal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movements:* | | |
| Character Backspace | BACKSPACE | 08H |
| Cursor Up | up arrow | 1BH 5BH 41H |
| | or F7 | 1BH 5BH 3 1H 37H 7EH |
| Cursor Down | down arrow | 1BH 5BH 42H |
| | or F8 | 1BH 5BH 31H 38H 7EH |
| Cursor Left | left arrow | 1BH 5BH 44H |
| | or F9 | 1BH 5BH 31H 39H 7EH |
| Cursor Right | right arrow | 1BH 5BH 43H |
| | or F10 | 1BH 5BH 32H 30H 7EH |
| Field Advance | TAB | 09H |
| Field Backspace | SHIFT/TAB | 1BH 5BH 5AH |
| New Line | HOME | 1BH 5BH 48H |
| Fast Left | SHIFT/F9 | 1BH 5BH 31H 39H 3BH 31H 7EH |
| Fast Right | SHIFT/F10 | 1BH 5BH 32H 30H 3BH 31H 7EH |
| *Special Control:* | | |
| Error Reset | CTRL/R | 12H |
| | or PF1 | 1BH 4FH 50H |
| Insert Mode | F3 | 1BH 5BH 31H 33H 7EH |
| | or INS | 1BH 5BH 32H 7EH |
| Delete | DEL | 7FH |
| | or SHIFT/F3 | 1BH 5BH 31H 33H 3BH 31H 7EH |
| | or DEL/BREAK | 1BH 5BH 33H 7EH |
| Erase Input | SHIFT/F4 | 1BH 5BH 31H 34H 3BH 31H 7EH |
| Home | F4 | 1BH 5BH 31H 34H 7EH |
| *Field Exit:* | | |
| Duplicate | PF2 | 1BH 4FH  51H |
| Field Minus | PF4 | 1BH 4FH 53H |
| Field Plus | PF3 | 1BH 4FH 52H |
| Field Exit | RETURN | 0DH |
| *Aid Generating:* | | |
| Enter | LINE FEED | 0AH |
| Clear | ESC BACKSPACE | 1BH 08H |
| Help | F6 | 1BH 5BH 31H 36H 7EH |
| | or SHIFT/F6 | 1BH 5BH 31H 36H 3BH 31H 7EH |
| Print | F5 | 1BH 5BH 31H 35H 7EH |
| Roll Up | SHIFT/F7 | 1BH 5BH 31H 37H 3BH 31H 7EH |
| | or PGUP | 1BH 5BH 35H 7EH |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| Roll Down | SHIFT/F8 | 1BH 5BH 31H 38H 3BH 31H 7EH |
| | or PG DOWN | 1BH 5BH 36H 7EH |
| CMD | F2 | 1BH 5BH 31H 32H 7E |
| | or SHIFT/F2 | 1BH 5BH 31H 32H 3BH 31H 7EH |
| CMD 1 | PFl | 1BH 5BH 32H 31H 7EH |
| CMD 2 | PF2 | 1BH 5BH 32H 32H 7EH |
| CMD 3 | PF3 | 1BH 5BH 32H 33H 7EH |
| CMD 4 | PF4 | 1BH 5BH 32H 34H 7EH |
| CMD 5 | PF5 | 1BH 5BH 32H 35H 7EH |
| CMD 6 | PF6 | 1BH 5BH 32H 36H 7EH |
| CMD 7 | PF7 | 1BH 5BH 32H 37H 7EH |
| CMD 8 | PF8 | 1BH 5BH 32H 38H 7EH |
| CMD 9 | PF9 | 1BH 5BH 32H 39H 7EH |
| CMD 10 | PF10 | 1BH 5BH 33H 30H 7EH |
| CMD 11 | PF11 | 1BH 5BH 33H 31H 7EH |
| CMD 12 | PF12 | 1BH 5BH 33H 32H 7EH |
| CMD 13 | PF13 | 1BH 5BH 33H 33H 7EH |
| CMD 14 | PF14 | 1BH 5BH 33H 34H 7EH |
| CMD 15 | PF15 | 1BH 5BH 33H 35H 7EH |
| CMD 16 | PF16 | 1BH 5BH 33H 36H 7EH |
| CMD 17 | PF17 | 1BH 5BH 33H 37H 7EH |
| CMD 18 | PF18 | 1BH 5BH 33H 38H 7EH |
| CMD 19 | PFl9 | 1BH 5BH 33H 39H 7EH |
| CMD 20 | PF20 | 1BH 5BH 34H 30H 7EH |
| CMD 21 | PF21 | 1BH 5BH 34H 31H 7EH |
| CMD 22 | PF22 | 1BH 5BH 34H 32H 7EH |
| CMD 23 | PF23 | 1BH 5BH 34H 33H 7EH |
| CMD 24 | PF24 | 1BH 5BH 34H 34H 7EH |

*Special Host:*

| | | |
|---|---|---|
| System Request | SHIFT/F1 | 1BH 5BH 31H 31H 3BH 31H 7EH |

*Signal:*

| | | |
|---|---|---|
| Attn | F1 | 1BH 5BH 31H 31H 7EH |

*Extended Function:*

| | | |
|---|---|---|
| Local Copy Print Req. | CTRL/P | 10H |
| Local Copy Form Feed | CTRL/F | 06H |
| Cancel Print | SHIFT/F5 | 1BH 5BH 31H 35H 3BH 31H 7EH |
| Refresh Display | CTRL/V | 17H |
| Toggle Status Line/ Toggle Indicator | ESC T | 1BH 54H |
| Toggle Echoplex Enabled | CTRL/V | 16H |
| Initialize Terminal | ESC < | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 7EH |

**CITOH: CIE 7101 Terminal Setup**

To enter Setup mode on the C. Itoh 7101 terminal, power on the terminal, then press SHIFT and SETUP simultaneously. Parameter options and features are displayed along the bottom of the screen. Then select the following settings for each of the Setup options:

| Group | Feature | Setting |
|---|---|---|
| COMMS | Main | Online |
| | Keyboard to | Main |
| | Aux Port | To Comms |
| KEYBOARD | Auto Rpt | As desired |
| | Keyclick | As desired |
| | Keyboard Lang. | U.S. (or as desired) |
| | Keyboard | VT-100 |
| | Controls | 7-bit |
| DISPLAY | Cursor | As desired |
| | Background | As desired |
| | Frequency | As required |
| | Insert Line | Blank |
| | Terminal Mode | VT-100 |
| | Form Feed | As desired |
| | Scroll | As desired |
| | New Line | OFF |
| | Margin Bell | OFF |
| | No. of Columns | 80 |
| | Auto Wrap | OFF |
| | CRT Saver | As desired |
| | Status Line | OFF |
| | G0 Selection | U.S. |
| | Gl Selection | U.S. |
| | Number of Data Lines | 24 |
| MAIN PORT | TX, RX (baud rate) | To match LinkUp 5294 |
| | Stop Bits | To match LinkUp 5294 |
| | Parity | To match LinkUP 5294 |
| | RS-422/232C | 23C |
| | Tx Rate Limited | OFF |
| | Auto X-ON/X-OFF | ON |
| | Process Rx'd X-OFF | ON |
| | Display Controls | OFF |
| AUX. PORT | Baud Rate | As printer requires |
| | Stop Bits | As printer requires |
| | Parity | As printer requires |
| | Printer Modes | NONE |
| SETUP | Terminal Type | ANSI |

1. When setting the Parity option in the terminal configurator, note that 8 bits is allowed even though the keyboard is set for 7-bit controls.

2. The AUX port on the CI7101 can be used with the LinkUp 5294 Auxiliary Printer facility.

## F.9 C7103 Terminal Module - C. Itoh CIE 7103

The following list identifies the key sequences defined far the C7103 Tenninal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movement:* | | |
| Character Backspace | BACKSPACE | 08H |
| Cursor Up | up arrow | 1BH 5BH 41H |
| | or ESC A | 1BH 41H |
| Cursor Down | down arrow | 1BH 5BH 42H |
| | or ESC B | 1BH 42H |
| Cursor Left | left arrow | 1BH 5BH 44H |
| | or ESC D | 1BH 44H |
| Cursor Right | right arrow | 1BH 5BH 43H |
| | or ESC C | 1BH 43H |
| Field Advance | TAB | 09H |
| Field Backspace | BACKTAB | 1BH 31H |
| | ESC I | 1BH 49H |
| New Line | ESC 4 | 1BH 34H |
| Fast Left | SHIFT/left arrow | 1CH 44H |
| Fast Right | SHIFT/right arrow | 1CH 43H |
| *Special Control:* | | |
| Error Reset | RESET/CANCEL | 1BH 51H |
| Insert Mode | INS | 1BH 3SH |
| Delete | DEL | 1BH 36H |
| Erase Input | ERASE INPUT | 1BH 56H |
| Home | HOME SYMBOL | 1BH 48H |
| *Field Exit:* | | |
| Duplicate | DUP | 1BH 32H |
| Field Minus | FIELD - | 1BH 52H |
| Field Plus | FIELD + | 1BH 4FH |
| Field Exit | (RETURN) | 0DH |
| *Aid Generating:* | | |
| Enter | LINE FEED | 0AH |
| Clear | SHIFT/CLEAR | 1CH 74H |
| Help | HELP | 1BH 46H |
| Print | PRINT | 1BH 45H |
| Roll Up | ROLL | 1CH 41H |
| Roll Down | ROLL | 1CH 42 |
| CMD | (TOP ROW) | 1BH 19H |
| | or ALT | 18H |
| CMD 1 | CMD 1 | 1BH 19H 31H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| CMD 2 | CMD 2 | 1BH 19H 32H |
| CMD 3 | CMD 3 | 1BH 19H 33H |
| CMD 4 | CMD 4 | 1BH 19H 34H |
| CMD 5 | CMD 5 | 1BH 19H 35H |
| CMD 6 | CMD 6 | 1BH 19H 36H |
| CMD 7 | CMD 7 | 1BH 19H 37H |
| CMD 8 | CMD 8 | 1BH 19H 38H |
| CMD 9 | CMD 9 | 1BH 19H 39H |
| CMD 10 | CMD 10 | 1BH 19H 30H |
| CMD 11 | CMD 11 | 1BH 19H 2DH |
| CMD 12 | CMD 12 | 1BH 19H 3DH |
| CMD 13 | CMD 13 | 1BH 19H 5DH |
| CMD 14 | CMD 14 | 1BH 19H 40H |
| CMD l5 | CMD 15 | 1BH 19H 23H |
| CMD 16 | CMD 16 | 1BH 19H 24H |
| CMD 17 | CMD 17 | 1BH 19H 25H |
| CMD 18 | CMD 18 | 1BH 19H 5EH |
| CMD 19 | CMD 19 | 1BH 19H 26H |
| CMD 20 | CMD 20 | 1BH 19H 2AH |
| CMD 21 | CMD 21 | 1BH 19H 28H |
| CMD 22 | CMD 22 | 1BH 19H 29H |
| CMD 23 | CMD 23 | 1BH 19H 5FH |
| CMD 24 | CMD 24 | 1BH 19H 2BH |

*Special Host:*

| | | |
|---|---|---|
| Systan Request | SYS REQ | 1CH 53H |

*Signal:*

| | | |
|---|---|---|
| Attn | ATTN | 1BH 53H |

*Extended Function:*

| | | |
|---|---|---|
| Local Copy Print Req. | N.A. | N.A. |
| Local Copy Form Feed | N.A. | N.A. |
| Cancel Print | SHIFT/PRINT | 1CH 45H |
| Refresh Saeen | ESC W | 1BH 57H |
| Toggle Status Line/ Toggle Indicators | ESC T | 1BH 54H |
| Toggle Echoplex Enabled | CTRL/V | 16H |
| Initialize Terminal | ESC < | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 3EH |

**CITOH: CIE 7103 Terminal Setup**

To enter Setup mode on the C. Itoh 7103 terminal, power on the terminal, then press SHIFT and SETUP simultaneously, release, and press TAB. Parameter options and features are displayed along the bottom of the screen. (Refer to the terminal operator's guide for details on use of SETUP mode.) Select the following settings for each of the Setup options:

# LINKUP 5294 WITH DL5294 FIRMWARE

| Group | Feature | Setting |
|---|---|---|
| COMMS | Main | Online |
| | Keyboard to | Main |
| | Aux Port | Input Disabled |
| KEYBOARD | Auto Rpt | As desired |
| | Keyclick | As desired |
| | Keyboard Lang. | U.S. (or as desired) |
| | Keyboard | 3180-2 |
| | Controls | 7-bit |
| | PF function keys | Unshifted |
| | | |
| DISPLAY | Cursor | As desired |
| | Background | As desired |
| | Frequency | As required |
| | Insert Line | Blank |
| | PC AT CG | OFF |
| | Form Feed | As desired |
| | Scroll | As desired |
| | New Line | OFF |
| | Margin Bell | OFF |
| | No. of Columns | 80 |
| | Auto Wrap | OFF |
| | CRT Saver | As desired |
| | G0 Selection | U.S. |
| | Gl Selection | U.S. |
| | Number of Data Lines | 24 |
| | Erase extent | Page |
| | | |
| MAIN PORT | TX, RX (baud rate) | To match LinkUp 5294 |
| | Stop Bits | To match LinkUp 5294 |
| | Parity | To match LinkUp 5294 |
| | RS-422/232C | 232C |
| | Tx Rate Limited | OFF |
| | RTS/CTS Handshake | OFF |
| | Main Port Protocol | X-ON/X-OFF |
| | Process Rx'd X-OFF | ON |
| | Display Controls | OFF |
| AUX. PORT | Baud Rate | As printer requires |
| | Stop Bits | As printer requires |
| | Parity | As printer requires |
| | Printer Modes | Ready |

1. When setting the Parity option in the terminal configurator, note that 8 bits is allowed even though the keyboard is set for 7-bit controls.

2. The AUX port on the CE 7103 terminal can be used with the LinkUp 5294 Auxiliary Printer facility.

3. The CE 7103 terminal is the only one in the industry which supports unique auxiliary printer handshaking. This means if the CE 7103 detects an X-OFF command or DTR dropping, it will redirect the data (directed to the auxiliary printer) to an auxiliary printer buffer. When the auxiliary printer buffer is almost full, the terminal will send an auxiliary print-inhibit sequence to the LinkUp 5294, which is distinguishable from the flow control of the display, enabling you to continue with your display session uninterrupted. This CE 7103 feature operates successfully up to 9600 baud.

## F.10 CY5291 Terminal Module - Cybernex XLB-5291

The following list identifies the key sequences defined for the CY5291 Terminal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

3. The last position of the screen (row 24, column 80) is designed not to display a character. This prevents an automatic scrolling.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movement:* | | |
| Character Backspace | BACKSPACE | 1BH 4FH 50H |
| CursorUp | up arrow | 1BH 5BH 41H |
| Cursor Down | down arrow | 1BH 5BH 42H |
| Cursor Left | left arrow | 1BH 5BH 44H |
| Cursor Right | right arrow | 1BH 5BH 43H |
| Field Advance | TAB | 09H |
| Field Backspace | BACKTAB | 1BH 4FH 52H |
| New Line | LINE FEED | 0AH |
| Fast Left | N A. | N.A. |
| Fast Right | N A. | N.A. |
| *Special Control:* | | |
| Error Reset | ERROR RESET | 12H |
| Insert Mode | INS | 1BH 4FH 79H |
| Delete | DEL | 7FH |
| Erase Input | ERASE INPT | 1BH 4FH 74H |
| Home | HOME | 1BH 4FH 75H |
| *Field Exit:* | | |
| Duplicate | DUP | 1BH 4FH 53H |
| Field Minus | FIELD - | 1BH 4FH 6DH |
| Field Plus | FIELD + | 1BH 4FH 6CH |
| Field Exit | FIELD EXIT | 0DH |
| *Aid Generating:* | | |
| Enter | ENTER | 1BH 4FH 4DH |
| Clear | CMD SHIFT/BACKSPACE | 1BH 4FH 72H |
| Help | HELP | 1BH 4FH 71H |
| Print | PRINT | 1BH 4FH 76H |
| Roll Up | ROLL UP | 1BH 4FH 70H |
| Roll Down | ROLL DOWN | 1BH 4FH 6EH |
| CMD 1 | CMD 1 | 1BH 31H |
| CMD 2 | CMD 2 | 1BH 32H |
| CMD 3 | CMD 3 | 1BH 33H |
| CMD 4 | CMD 4 | 1BH 34H |
| CMD 5 | CMD 5 | 1BH 35H |
| CMD 6 | CMD 6 | 1BH 36H |
| CMD 7 | CMD 7 | 1BH 37H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| CMD 8 | CMD 8 | 1BH 38H |
| CMD 9 | CMD 9 | 1BH 39H |
| CMD 10 | CMD 0 | 1BH 30H |
| CMD 11 | CMD - | 1BH 2DH |
| CMD 12 | CMD = | 1BH 3DH |
| CMD 13 | CMD ! | 1BH 21H |
| CMD 14 | CMD @ | 1BH 40H |
| CMD l5 | CMD # | 1BH 23H |
| CMD 16 | CMD $ | 1BH 24H |
| CMD 17 | CMD % | 1BH 2SH |
| CMD 18 | CMD ^ | 1BH SEH |
| CMD 19 | CMD & | 1BH 26H |
| CMD 20 | CMD * | 1BH 2AH |
| CMD 21 | CMD ( | 1BH 28H |
| CMD 22 | CMD ) | 1BH 29H |
| CMD 23 | CMD _ | 1BH SFH |
| CMD 24 | CMD + | 1BH 2BH |

*Special Host:*

| System Request | SYS REQ | 1BH 4FH 77H |
|---|---|---|

*Signal:*

| Attn | ATTN | 1BH 4FH 78H |
|---|---|---|

*Extended Function:*

| Local Copy Print Req. | CMD PRINT | 10H |
|---|---|---|
| Local Copy Form Peed | CMD F | 06H |
| Cancel Print | CMD ERROR RESET | 03H |
| Refresh Screen | CMD HOME | 17H |
| Toggle Status Line/ Toggle Indicators | CMD CURSOR UP | 1BH 4FH 73H |
| Toggle Echoplex Enabled | CMD CURSOR DOWN | 16H |
| Initialize Terminal | CMD SYS REQ | 1BH 3CH |
| Request Disconnect | CMD ATTN | 1BH 3EH |

### DEC: Cybernex XLB-S291 Terminal Setup

1. Turn on the Power Switch and enable the Software option switches through the keyboard (SETUP A procedure). SETUP A mode is accomplished by pressing CMD HELP. This mode contains a series of software keys that tailor the terminal to your operating environment. The following values are recommended for interfacing with the LinkUp 5294.

| Byte 1 Switches | Set To: | Comments |
|---|---|---|
| 1 (ECHOPLEX) | Off | LinkUp 5294 handles character echo |
| 2 (FLOW CONTROL) | On | Enable flow control |
| 3 (MARGIN BELL) | ? | |
| 4 (AUTO REPEAT) | ? | |
| 5 (AUTO WRAP) | Off | Disable auto wrap at Column 80 |
| 6,7 (MA~ PARrIY) | ? | Set Main port parity to agree with the LinkUp 5294 |

| Byte 1 Switches | Set To: | Comments |
|---|---|---|
| 8, 9 (AUX PARITY) | ? | Set Aux port parity to agree with printer |
| 10 (NEWLINE) | Off | RETURN key is CR, not (CR, LF) |
| 11 (CURSOR KEY) | Off | Disable CURSOR APPLICATION mode |
| 12 (APPL KEYS) | APPL | Enable APPLICATION KEYPAD mode |

| Byyte 2 Switches | Set To: | Comments |
|---|---|---|
| 1 (ANSI 3.64) | On | Enable ANSI 3.64 command mode |
| 2 (LOCK) | ? | CAPS LOCK or SHIFT LOCK |
| 3 (PRINT) | REMOTE | PRINT key transmits sequence to the LinkUp 5294 |
| 4 (CLM SEPS) | On | Enable Column Separator attribute |
| 5, 6 (CURSOR) | ? | Set type of cursor desired |
| 7 (MAIN) | RS-232 | Set main port to RS-232 operation |
| 8 (LIGHT PEN) | Off | Disable light-pen operation |
| 9 (COORD SEND) | - | Not applicable if light pen is disabled |
| 10 (STOP BITS) | ? | Set to agree with the LinkUp 5294 (usually set to 1) |
| 11 (TRANSPARENCY) | Off | Disable transparency |

The SETUP A mode screen gives the facility for setting the appropriate terminal baud rate. Available baud rates are: 300, 600, 1200, 2400, 4800, 9600, 19.2, and 38.4 kbps. Both the main port and the aux. printer port baud rates are set at this menu. The baud rate specified here must match the baud rate for the LinkUp 5294 port to which this terminal is connected.

SETUP A mode screen also provides a setting to customize the terminal operation to particular brands of protocol converter. This PROT setting must be LC DAT to ensure the above keyboard operation.

2. Connect the terminal to the LinkUp 5294 with a modem or direct-connect cable, as appropriate.

## F.11 DISPH Terminal Module - Northern Telecom Displayphone

The following list identifies the key sequences defined for the DISPH Terminal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movement:* | | |
| Character Backspace | CTRL/C | 03H |
| Cursor Up | up arrow | 0BH |
| Cursor Down | down arrow | 0AH |
| Cursor Left | left arrow | 08H |
| Cursor Right | right arrow | 09H |
| Field Advance | CTRL/A | 01H |
| Field Backspace | CTRL/B | 02H |
| New Line | CTRL/N | 0EH |
| Fast Left | N A. | N.A. |
| Fast Right | N.A. | N A. |

## LINKUP 5294 WITH DL5294 FIRMWARE

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Special Control:* | | |
| Error Reset | CTRL/R | 12H |
| Insert Mode | CTRL/U | 15H |
| Delete | DEL | 7FH |
| Erase Input | CTRL/E | 05H |
| Home | CTRL/^ | 1EH |
| *Field Exit:* | | |
| Duplicate | CTRL/D | 04H |
| Field Minus | CTRL/F | 06H |
| Field Plus | N.A. | N.A. |
| Field Exit | CTRL/X | 18H |
| *Aid Generating:* | | |
| Enter | ENTER | 0DH |
| Clear | ESC L | 1BH 4CH |
| Help | ESC H | 1BH 48H |
| Print | CTRL/P | 10H |
| Roll Up | ESC U | 1BH 55H |
| Roll Down | ESC D | 1BH 44H |
| CMD 1 | ESC 1 | 1BH 31H |
| CMD 2 | ESC 2 | 1BH 32H |
| CMD 3 | ESC 3 | 1BH 33H |
| CMD 4 | ESC 4 | 1BH 34H |
| CMD 5 | ESC 5 | 1BH 35H |
| CMD 6 | ESC 6 | 1BH 36H |
| CMD 7 | ESC 7 | 1BH 37H |
| CMD 8 | ESC 8 | 1BH 38H |
| CMD 9 | ESC 9 | 1BH 39H |
| CMD 10 | ESC 0 | 1BH 30H |
| CMD 11 | ESC - | 1BH 2DH |
| CMD 12 | ESC = | 1BH 3DH |
| CMD 13 | ESC ! | 1BH 21H |
| CMD 14 | ESC @ | 1BH 40H |
| CMD 15 | ESC # | 1BH 23H |
| CMD 16 | ESC $ | 1BH 24H |
| CMD 17 | ESC % | 1BH 25H |
| CMD 18 | ESC ^ | 1BH 5EH |
| CMD 19 | ESC & | 1BH 26H |
| CMD 20 | ESC * | 1BH 2AH |
| CMD 21 | ESC ( | 1BH 28H |
| CMD 22 | ESC ) | 1BH 29H |
| CMD 23 | ESC _ | 1BH 5FH |
| CMD 24 | ESC + | 1BH 2BH |
| *Special Host:* | | |
| System Request | ESC 5 | 1BH 53H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|

*Signal:*

| | | |
|---|---|---|
| Attn | ESC A | 1BH 41H |

*Extended Function:*

| | | |
|---|---|---|
| Local Copy Print Req. | ESC P | 1BH 50H |
| Local Copy Form Feed | ESC F | 1BH 46H |
| Cancel Print | ESC C | 1BH 43H |
| Refresh Screen | CTRL/W | 17H |
| | or ESC G | 1BH 47H |
| Toggle Status Line/ | | |
|   Toggle Indicator | ESC T | 1BH 54H |
| Toggle Echoplex Enabled | CTRL/V | 16H |
| Initialize Terminal | ESC < | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 3EH |

**Northern Telecom: Displayphone Terminal Setup**

The Displayphone does not use DIP switches for options. Instead, options are selected through the keyboard.

**Dial-up Connection**

1. A telephone jack must be plugged into Line 2 (on back of the Displayphone).

2. Turn terminal on.

3. Press Services key.

4. Select 4 (DISPLAYPHONE UTILITIES).

5. Select 2 (MANUAL DATA CALL PROFILE).

| WIDTH | MODE | DUPLEX | PARITY |
|---|---|---|---|
| 80 | P | F | (set to match the converter) |

6. Press Exit to store data.

7. Press Services again.

8. Press Line 2 and manually dial the telephone number.

9. Press Data Soft key for connection.

10. To hang up, press Line 2 and then press Release.

# NOTE

1. **Use Line 2 for data calls.**
2. **Maximum baud rate for dial-up is 1200 baud.**

**Direct Connection:**

1. Connect the RS-232 cable to the back of the Displayphone at the port marked RS-232.

2. Turn the terminal on.

3. Press Service.

4. Select 3 - Local Data Port.

Local RS-232 Data Port should be ON.

> Set baud rates
>
> Press Exit
>
> WIDTH  MODE        DUPLEX      PARITY
>   80          P            F              (set to match converter)
>
> Press Exit to store data.

5. Press Screen key.

# NOTE
**The maximum baud rate for the Displayphone when directly connected is 9600.**

6.Connect the terminal to the LinkUp 5294 with a modem or direct connect cable, as appropriate.

## F.12 D200 Terminal Module - Data General Dasher 200

The following list identifies the key sequences defined for the D200 Terminal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movement:* | | |
| Character Backspace | CTRL/C | 03H |
| Cursor Up | up arrow | 17H |
| Cursor Down | down arrow | 1AH |
| Cursor Left | left arrow | 19H |
| Cursor Right | right arrow | 18H |
| Field Advance | TAB | 09H |
| Field Backspace | F14 | 1EH 7EH |
| New Line | NEW LINE | 0AH |
| Fast Left | SHIFT  left arrow | 1EH 18H |
| Fast Right | SHIFTright arrow | 1EH 19H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|

*Special Control:*

| | | |
|---|---|---|
| Error Resct | CTRL/R | 12H |
| | or F5 | 1EH 75H |
| Insert Mode | F2 | 1EH 72H |
| | or C1 | 1EH 5CH |
| Delete | DEL | 7FH |
| | or SHIFT C1 | 1EH 58H |
| | or SHIFT F2 | 1EH 62H |
| Erase Input | ERASE EOL | 0BH |
| | or SHIFT F3 | 1EH 63H |
| Home | HOME | 08H |
| | or F3 | 1EH 73H |

*Field Exit:*

| | | |
|---|---|---|
| Duplicate | F15 | 1EH 70H |
| Field Menus | C2 | 1EH SDH |
| Field Plus | C4 | 1EH 5FH |
| Field Exit | CR | 0DH |

*Aid Generating:*

| | | |
|---|---|---|
| Enter | C3 | 1EH 5EH |
| Clear | PAGE ERASE | 0CH |
| Help | F6 | 1EH 76H |
| Print | F4 | 1EH 74H |
| Roll Up | SHIFT up arrow | 1EH 17H |
| Roll Down | SHIFT down arrow | 1EH 1AH |
| CMD 1 | ESC 1 | 1BH 31H |
| CMD 2 | ESC 2 | 1BH 32H |
| CMD 3 | ESC 3 | 1BH 33H |
| CMD 4 | ESC 4 | 1BH 34H |
| CMD 5 | ESC 5 | 1BH 35H |
| CMD 6 | ESC 6 | 1BH 36H |
| CMD 7 | ESC 7 | 1BH 37H |
| CMD 8 | ESC 8 | 1BH 38H |
| CMD 9 | ESC 9 | 1BH 39H |
| CMD 10 | ESC 0 | 1BH 30H |
| CMD 11 | ESC - | 1BH 2DH |
| CMD 12 | ESC = | 1BH 3DH |
| CMD 13 | ESC ! | 1BH 21H |
| CMD 14 | ESC @ | 1BH 40H |
| CMD 15 | ESC # | 1BH 23H |
| CMD 16 | ESC $ | 1BH 24H |
| CMD 17 | ESC % | 1BH 25H |
| CMD 18 | ESC ^ | 1BH 5EH |
| CMD 19 | ESC & | 1BH 26H |
| CMD 20 | ESC * | 1BH 2AH |
| CMD 21 | ESC ( | 1BH 28H |
| CMD 22 | ESC ) | 1BH 29H |
| CMD 23 | ESC _ | 1BH 5FH |
| CMD 24 | ESC + | 1BH 2BH |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|

*Special Host:*

| | | |
|---|---|---|
| System Request | ESC S | 1BH 53H |
| or SHIFT F1 | | 1EH 61H |

*Signal:*

| | | |
|---|---|---|
| Attn: | ESCA | 1BH 41H |
| | or F1 | 1EH 71H |

*Extendcd Function:*

| | | |
|---|---|---|
| Local Copy Print Req. | F9 | 1EH 79H |
| Lacal Copy Form Feed | F10 | 1EH 7AH |
| Cancel Print | SHIFT F4 | 1EH 64H |
| Refresh Screen | F7 | 1EH 77H |
| Toggle Status Line/ | | |
|   Toggle Indicators | F8 | 1EH 78H |
| Toggle Echoplex Enabled | F11 | 1EH 7BH |
| Initialize Terminal | ESC < | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 3EH |

**Data Ceneral: DASHER 200 Terminal Setup**

1. Disconnect the AC power cord fran the outlet before opening the Dasher 200 case.

2. Use the 8 toggle-type switches on the back to set the parity and baud rate as shown on the next page. (Switches 7 and 8 are unused.)

| BAUD RATE | SWITCHES | | | | PARITY | SWITCHES | |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | | 5 | 6 |
| 19200 | 1 | 1 | 1 | 1 | Even | 1 | 1 |
| 9600 | 1 | 1 | 1 | 0 | Mark | 1 | 0 |
| 7200 | 1 | 1 | 0 | 1 | Odd | 0 | 1 |
| 4800 | 1 | 1 | 0 | 0 | None | 0 | 0 |
| 3600 | 1 | 0 | 1 | 1 | | | |
| 2400 | 1 | 0 | 1 | 0 | | | |
| 1800 | 1 | 0 | 0 | 1 | | | |
| 1200 | 1 | 0 | 0 | 0 | | | |
| 600 | 0 | 1 | 1 | 1 | | | |
| 300 | 0 | 1 | 1 | 0 | | | |
| 150 | 0 | 1 | 0 | 1 | | | |
| 134.5 | 0 | 1 | 0 | 0 | | | |
| 110 | 0 | 0 | 1 | 1 | | | |
| 75 | 0 | 0 | 1 | 0 | | | |
| 50 | 0 | 0 | 0 | 1 | | | |
| 50 | 0 | 0 | 0 | 0 | | | |

3. There are 4 switches inside the terminal case which control the printer interface characteristics. These settings are irrelevant, as the the auxiliary printer feature is not supported on this terminal.

4. Replace the cover, reconnect the AC power cord, and connect the terminal to the LinkUp 5294 with a modem or direct-connect cable, as appropriate.

# NOTE

**Data General terminals do not use industry-standard sequences for character backspace and cursor control. Consequently, to use the LinkUp 5294 configurator with this terminal ryou must make no mistakes in typing, since an attempt to backspace the cursor to correct a mistake will send the cursor home instead.**

## F.13 HP45 Terminal Module - Hewlett Packard HP-2645

The following list identifies the key sequences defined for the HP45 Terminal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressung the indicated alpha key.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movement:* | | |
| Character Backspace | CTRL/C | 03H |
| | or BACKSPACE | 08H |
| Cursor Up | up arrow | 1BH 41H |
| Cursor Down | down arrow | 1BH 42H |
| Cursor Left | left arrow | 1BH 44H |
| Cursor Right | right arrow | 1BH 43H |
| Field Advance | TAB | 09H |
| Field Baclcspaoe | CTRL/TAB | 1BH 0H |
| New Line | NEW LINE | 0EH |
| Fast Left | N A. | N A. |
| Fast Right | N.A. | N.A. |
| *Special Control:* | | |
| Error Reset | CTRL/R | 12H |
| Insert Mode | INSERTCHAR | 1BH 51H |
| | or INSERT LINE | 1BH 4CH |
| Delete | DELETE CHAR | 1BH 50H |
| | or DELETE | 7FH |
| Erase Input | DELETE LINE | 1BH 4DH |
| | or CTRL/E | 05H |
| Home | HOME | 1BH 68H |
| *Field Exit:* | | |
| Duplicate | PF8 | 1BH 77H |
| Field Minus | PF7 | 1BH 76 |
| Field Plus | PF5 | 1BH 74 |
| Field Exit | PF6 | 1BH 75H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|

*Aid Generating:*

| | | |
|---|---|---|
| Enter | RETURN | 0DH |
| Clear | ESC Z | 1BH 5AH |
| Help | PF4 | 1BH 73H |
| Print | PF3 | 1BH 72H |
| Roll Up | ROLL UP | 1BH 53H |
| Roll Down | ROLL DOWN | 1BH 54H |
| CMD 1 | ESC 1 | 1BH 31H |
| CMD 2 | ESC 2 | 1BH 32H |
| CMD 3 | ESC 3 | 1BH 33H |
| CMD 4 | ESC 4 | 1BH 34H |
| CMD 5 | ESC 5 | 1BH 35H |
| CMD 6 | ESC 6 | 1BH 36H |
| CMD 7 | ESC 7 | 1BH 37H |
| CMD 8 | ESC 8 | 1BH 38H |
| CMD 9 | ESC 9 | 1BH 39H |
| CMD 10 | ESC 0 | 1BH 30H |
| CMD 11 | ESC - | 1BH 2DH |
| CMD 12 | ESC = | 1BH 3DH |
| CMD 13 | ESC ! | 1BH 21H |
| CMD 14 | ESC @ | 1BH 40H |
| CMD 15 | ESC # | 1BH 23H |
| CMD 16 | ESC $ | 1BH 24H |
| CMD 17 | ESC % | 1BH 25H |
| CMD 18 | ESC ^ | 1BH 5EH |
| CMD 19 | ESC & | 1BH 26H |
| CMD 20 | ESC * | 1BH 2AH |
| CMD 21 | ESC ( | 1BH 28H |
| CMD 22 | ESC ) | 1BH 29H |
| CMD 23 | ESC _ | 1BH 5FH |
| CMD 24 | ESC + | 1BH 2BH |

*Special Host:*

| | | |
|---|---|---|
| System Request | PF1 | 1BH 70H |

*Signal:*

| | | |
|---|---|---|
| Attn | PF2 | 1BH 71H |

*Extended Function:*

| | | |
|---|---|---|
| Local Copy Print Req. | CTRL/P | 10H |
| Local Copy Form Feed | ESC F | 1BH 46H |
| Cancel Print | CTRL/K | 0BH |
| Refresh Display | CTRL/W | 17H |
| Toggle Status Line/ Toggle Indicators | CTRL/T | 14H |
| Toggle Echoplex Enabled | CTRL/V | 16H |
| Initialize Terminal | ESC < | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 7EH |

**Hewlett Packard: HP-2645 Terminal Setup**

1. Disconnect the AC power cord from the outlet before setting up the configuration switches.

2. There are three switches located at the upper left of the keyboard. These control the duplex, parity, and baud rate data communication options. Set the Duplex switch to FULL, and set the parity and baud as desired.

3. There are three groups of switches, with eight switches in each group, found on the 13260A Standard Asynchronous Communications PCA board within the terminal. Set these switches to the following values.

| Switch | Set To: | Comments |
|---|---|---|
| A | OPEN | Transmit ESCAPE codes |
| B | CLOSED | Typed spaces will overwrite existing characters |
| C | OPEN | Auto wraparound disabled |
| D | N.A. | Applicable only in Block Mode |
| E | N.A. | Applicable only with paper-tape reading |
| F | CLOSED | Terminal Baud is determined by the switch on the keyboard |
| G, H, J, K | N.A. | Applicable only in Block Mode |
| L | CLOSED | No effect on Self-Test |
| M | CLOSED | INSERT CHAR and DELETE CHAR keys operate in normal sense |
| N | CLOSED | No effect on printer ESCAPE code transfer |
| P, Q | ? | APL printing pairing codes |
| R | OPEN | Transition from receive state to transmit occurs after CB (Clear to Send) goes on. |
| S, T | CLOSED | Non-main channel protocol. |
| U, V | OPEN | Terminal ignores all transitions of SB (Secondary Receive Data) and CF (Carrier Detect) |
| W | ? | Disable/Enable Data Comm. Self Test |
| X | ? | Data Speed signal low or high (CH = 0 or 1) |
| Y | ? | Transmit LED lit for CB (Send to Clear) or for CC (Data Set Ready) |
| Z | ? | If Parity switch is set to No Parity, this switch forces Bit 8 to zero (CLOSED) or one (OPEN). If Parity switch is set to Even or Odd, this switch chooses Check for parity error (CLOSED) or No check for parity error (OPEN). |

4. Replace the terminal cover, reconnect the AC power cord, and connect the terminal to the LinkUp 5294 with a modem or direct-connect cable, as appropriate.

## F.14 HZ51 Terminal Module - Hazeltine 10/51

The following list identifies the key sequences defined for the HZSl Terminal Module.

1. Press <CTRL> concurrently with the indicated alpha key. CTRL is labeled as such on newer models of the terminal; on older models it is labeled PRINT, but it is still CTRL.

2. Press <ESC> prior to pressing the indicated alpha key.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movement:* | | |
| Character Backspace | BACKSPACE | 08H |
| Cursor Up | up arrow | 1BH 0CH |
| Cursor Down | down arrow | 1BH 0BH |
| Cursor Left | left arrow | 1CH |
| Cursor Right | right arrow | 10H |
| Field Advance | right arrow| | 09H |
| Field Backspace | left arrow| | 0FH |
| New Line | return key | 0AH |
| Fast Left | N.A. | N.A. |
| Fast Right | N.A. | N.A. |
| *Special Control:* | | |
| Error Reset | ERROR RESET | 03H |
| Insert Mode | INS | 19H |
| Delete | DEL | 7FH |
| Erase Input | ERASE INPUT | 12H |
| Horne | HOME | 1BH 12H |
| *Field Exit:* | | |
| Duplicate | DUP | 0EH |
| Field Minus | FIELD - | 17H |
| Field Plus | FIELD + | 1DH |
| Field Exit | FIELD EXIT | 18H |
| *Aid Generating:* | | |
| Enter | ENTER | 0DH |
| Clear | CMD SHIFT/ | 1BH 4DH |
| Help | HELP | 1BH 7AH |
| Print | CTRL/HELP | 1BH 56H |
| Roll Up | ROLL UP | 1BH 55H |
| Roll Down | ROLL DOWN | 1BH 52H |
| CMD 1 | CMD 1 | 1BH 31H |
| CMD 2 | CMD 2 | 1BH 32H |
| CMD 3 | CMD 3 | 1BH 33H |
| CMD 4 | CMD 4 | 1BH 34H |
| CMD 5 | CMD 5 | 1BH 35H |
| CMD 6 | CMD 6 | 1BH 36H |
| CMD 7 | CMD 7 | 1BH 37H |
| CMD 8 | CMD 8 | 1BH 38H |
| CMD 9 | CMD 9 | 1BH 39H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| CMD 10 | CMD  0 | 1BH 30H |
| CMD 11 | CMD- | 1BH 2DH |
| CMD 12 | CMD = | 1BH 3DH |
| CMD 13 | CMD ] | 1BH 5DH |
| CMD 14 | CMD @ | 1BH 40H |
| CMD 15 | CMD # | 1BH 23H |
| CMD 16 | CMD $ | 1BH 24H |
| CMD 17 | CMD % | 1BH 25H |
| CMD 18 | CMD ^ | 1BH 5EH |
| CMD 19 | CMD & | 1BH 26H |
| CMD 20 | CMD * | 1BH 2AH |
| CMD 21 | CMD ( | 1BH 28H |
| CMD 22 | CMD ) | 1BH 29H |
| CMD 23 | CMD _ | 1BH 5FH |
| CMD 24 | CMD + | 1BH 2BH |

*Special Host:*

| | | |
|---|---|---|
| System Request | SYS REQ | 1BH 3BH |

*Signal:*

| | | |
|---|---|---|
| Attn | CMDA | 1BH 41H |
| | or ATTN | 00H |

*Extended Function:*

| | | |
|---|---|---|
| Local Copy Print Req. | ESC P | 1BH 50H |
| Local Copy Form Feed | ESC F | 1BH 46H |
| Cancel Print | CMD C | 1BH 43H |
| Refresh Screen | CMD W | 1BH 57H |
| Toggle Status Line/ | | |
| Toggle Indicators | CMD T | 1BH 54H |
| Toggle Echoplex Enabled | PRINT/V | 16H |
| Initialize Tenninal | CMD < | 1BH 3CH |
| Request Disconnect | CMD > | 1BH 3EH |

**Hazeltine: 10/51 Terminal Setup**

# NOTE

**The auxiliary port on the 10/51 terminal can be used with the LinkUp 5294 Auxilary Printer feature.**

All operator-selected options are input from the keyboard into the Setup Mode Configuration screen; there are no external switches.

1. Call up the Configuration screen by pressing CTRL and CMD simultaneously. Set the option values as follows:

| Option | Value/Comments |
|---|---|
| 0 | 5251 Keyboard |
| 1 | CMD option on Altemate Keypad |
| 2 | ESC as lead-in character |
| 3 | Full Duplex |
| 4 | Character oriented attributcs |
| 5 | NO/Disable Auto Scroll |
| 6 | NO/Disable Auto New Line |
| 7 | ?/Diagnostic Test |
| 8 | ?/Cursor Block or Underline |
| 9 | ?/50 Hz or 60Hz |
| A | ?/Main Port Baud Rate |
| B | ?/Auxiliary Port Baud Rate |
| C | ?/Main Parity - EVEN, ODD, MARK, SPACE |
| D | ?/Auxiliary Parity - EVEN, ODD, MARK, SPACE |

## F.15 IQ120 Terminal Module - Soroq IQ-120

The following list identifies the key sequences defined for the IQ120 Terminal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movement:* | | |
| Character Backspace | CTRL/C | 03H |
| Cursor Up | CTRL/K | 0BH |
| Cursor Down | LINE FEED | 0AH |
| | or CTRL/J | 09H |
| Cursor Left | CTRL/H | 08H |
| Cursor Right | CTRL/L | 0CH |
| Field Advance | CTRL/I | 09H |
| | or TAB | 09H |
| Field Baclcspace | CTRL/B | 02H |
| New Line | CTRL/N | 0EH |
| Fast Left | N.A. | N.A. |
| Fast Right | N.A. | N.A. |
| *Special Control:* | | |
| Error Reset | CTRL/R | 12H |
| Insert Mode | CTRL/U | 15H |
| Delete | RUB | 7FH |
| Erase Input | CTRL/E | 05H |
| Home | HOME | 1EH |

| 5250 Function | Key Sequence | Hex Value Generated |
| --- | --- | --- |
| *Field Exit:* | | |
| Duplicate | CTRL/D | 04H |
| Field Minus | CTRL/F | 06H |
| Field Plus | N.A. | N.A. |
| Field Exit | CTRL/X | 18H |
| *Aid Generating:* | | |
| Enter | RETURN | 0DH |
| Clear | ESC Z | 1BH 5AH |
| Help | ESCH | 1BH 48H |
| Print | CTRL/P | 10H |
| Roll Up | ESC U | 1BH 55H |
| Roll Down | ESC D | 1BH 44H |
| CMD 1 | ESC 1 | 1BH 31H |
| CMD 2 | ESC 2 | 1BH 32H |
| CMD 3 | ESC 3 | 1BH 33H |
| CMD 4 | ESC 4 | 1BH 34H |
| CMD 5 | ESC 5 | 1BH 35H |
| CMD 6 | ESC 6 | 1BH 36H |
| CMD 7 | ESC 7 | 1BH 37H |
| CMD 8 | ESC 8 | 1BH 38H |
| CMD 9 | ESC 9 | 1BH 39H |
| CMD 10 | ESC 0 | 1BH 30H |
| CMD 11 | ESC - | 1BH 2DH |
| CMD 12 | ESC = | 1BH 3DH |
| CMD 13 | ESC ! | 1BH 21H |
| CMD 14 | ESC @ | 1BH 40H |
| CMD 15 | ESC # | 1BH 23H |
| CMD 16 | ESC $ | 1BH 24H |
| CMD 17 | ESC % | 1BH 25H |
| CMD 18 | ESC ^ | 1BH 5EH |
| CMD 19 | ESC & | 1BH 26H |
| CMD 20 | ESC * | 1BH 2AH |
| CMD 21 | ESC ( | 1BH 28H |
| CMD 22 | ESC ) | 1BH 29H |
| CMD 23 | ESC _ | 1BH 5FH |
| CMD24 | ESC + | 1BH 2BH |
| *Special Host:* | | |
| System Request | ESC S | 1BH 52H |
| *Signal:* | | |
| Attn | ESC A | 1BH 41H |

| **5250 Function** | **Key Sequence** | **Hex Value Generated** |
|---|---|---|

*Extended Function:*

| | | |
|---|---|---|
| Local Copy Print Req. | ESC P | 1BH 50H |
| Local Copy Form Feed | ESC F | 1BH 46H |
| Cancel Print | ESC C | 1BH 43H |
| Refresh Screen | CTRL/W | 17H |
| Toggle Status Line/ | | |
|   Toggle Indicator | ESC T | 1BH 54H |
| Toggle Echoplex Enabled | CTRL/V | 16H |
| Initialize Terminal | ESC < | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 7EH |

**Soroc: IQ-120 Terminal Setup**

1. Disconnect the AC power cord from the outlet before opening the IQ-120 case.

2. Manual controls are located on the rear of the IQ-120. Set the Block/Full/Half switch to FULL and the baud rate switch to the desired rate compatible with the LinkUp 5294.

3. Locate Switch C13 on the logic board of the terminal. These switches are used to specify the transmitted character format. Set these switches to correspond to the configuration parameters as follows:

| SWITCH | DESCRIPTIONS | PORT | ON | OFF |
|---|---|---|---|---|
| 1 | Stop Bits | Printer | 1 | 2 |
| 2 | Parity | Printer | Yes | No |
| 3 | Parity | Printer | Odd | Even |
| 4 | Stop Bits | Main | 1 | 2 |
| 5 | Parity | Main | Yes | No |
| 6 | Bit Word | Main | 7 | 8 |
| 7 | Parity | Main | Odd | Evcn |
| 8 | Bit 8 | Main | Low | High |

When using auxiliary print, it is important to set the options for all devices and ports consistently.

4. Replace the cover on the terminal. Connect the terminal to the LinkUp 5294 with a modem or direct- connect cable, as appropriate.

# NOTE
**The auxiliary port of the IQ-120 terminal can be used with the LinkUp 5294 Auxiliary Printer facility.**

## F.16 I3101 Terminal Module - IBM 3101

The following list identifies the key sequences defined for the I3101 Terminal Module.

1. Press <ALT> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movement:* | | |
| Character Backspace | ALT/C | 03H |
| Cursor Up | up arrow | 1BH 41H |
| Cursor Down | down arrow | 1BH 42H |
| Cursor Left | left arrow | 1BH 44H |
| Cursor Right | right arrow | 1BH 43H |
| Field Advance | right arrow\| | 09H |
| Field Backspace | left arrow\| | 08H |
| New Line | ALT/N | 0EH |
| Fast Left | N.A. | N.A. |
| Fast Right | N.A. | N.A. |
| *Special Control:* | | |
| Error Reset | ALT/R | 12H |
| Insert Mode | ALT/U | 15H |
| Delete | DEL | 7FH |
| Erase Input | ERASE INPUT | 1BH 4BH |
| Home | HOME SYMBOL | 1BH 48H |
| *Field Exit:* | | |
| Duplicate | PF8 | 1BH 68H 0DH |
| Field Minus | PF6 | 1BH 66H 0DH |
| Field Plus | PF3 | 1BH 63H 0DH |
| Field Exit | PF7 | 1BH 67H 0DH |
| *Aid Generating:* | | |
| Enter | left arrow | 0DH |
| Clear | CLEAR | 1BH 4CH |
| Help | PF5 | 1BH 65H 0DH |
| Print | PF4 | 1BH 64H 0DH |
| Roll Up | PFl | 1BH 61H 0DH |
| Roll Down | PF2 | 1BH 62H 0DH |
| CMD 1 | ESC 1 | 1BH 31H |
| CMD 2 | ESC 2 | 1BH 32H |
| CMD 3 | ESC 3 | 1BH 33H |
| CMD 4 | ESC 4 | 1BH 34H |
| CMD 5 | ESC 5 | 1BH 35H |
| CMD 6 | ESC 6 | 1BH 36H |
| CMD 7 | ESC 7 | 1BH 37H |
| CMD 8 | ESC 8 | 1BH 38H |
| CMD 9 | ESC 9 | 1BH 39H |
| CMD 10 | ESC 0 | 1BH 30H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| CMD 11 | ESC - | lBH 2DH |
| CMD 12 | ESC = | lBH 3DH |
| CMD 13 | ESC ! | lBH 21H |
| CMD 14 | ESC @ | lBH 40H |
| CMD 15 | ESC # | lBH 23H |
| CMD 16 | ESC $ | lBH 24H |
| CMD 17 | ESC % | lBH 25H |
| CMD 18 | ESC ^ | lBH 5EH |
| CMD 19 | ESC & | lBH 26H |
| CMD 20 | ESC * | lBH 2AH |
| CMD 21 | ESC ( | lBH 28H |
| CMD 22 | ESC ) | lBH 29H |
| CMD 23 | ESC _ | lBH 5FH |
| CMD 24 | ESC + | lBH 2BH |

*Special Host:*

| | | |
|---|---|---|
| System Request | ERASE EOL/EOF | 1BH 49H |

*Signal:*

| | | |
|---|---|---|
| Attn | ERASE EOS | 1BH 4AH |

*Extended Function:*

| | | |
|---|---|---|
| Local Copy Print Req. | ESC P | 1BH 50H |
| Local Copy Form Feed | ESC F | 1BH 46H |
| Cancel Print | ALT/K | 08H |
| Refresh Display | ALT/ V | 17H |
| Toggle Status Line/ Toggle Indicators | ESC T | 1BH 54H |
| Toggle Echoplex Enabled | ALT/V | 16H |
| Initialize Terminal | ESC < | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 3EH |

IBM: 3101 Terminal Setup

# NOTE

**The auxiliary port on the 3101 terminal cannot be used with the LinkUp 5294 Auxiliary Printer facility.**

1. Disconnect the AC Power cord from the outlet before starting the setup process.

2. There are 8 toggle-type switches located on the keyboard as Group 1 switches. These switches control the communications connect options and are set to the following values:

| Group 1 Switches | Set To: | Comments |
|---|---|---|
| CHAR-BLOCK | CHAR | Selects TTY-compatible character interfaces |
| FDX-HDX | FDX | Full-duplex operations enabled |
| CL422-232C | 232C | Sets EIA RS-232 option |
| CRTS-PRTS | PRTS | RTS held continuously high |
| REV CHAN | REV CHAN | Operations enabled without reverse channel |
| ON-OFF | OFF | |

| Group 1 Switches | Set To: | Comments |
|---|---|---|
| LINE TURN AROUND CHARS (Sw 6 - 7) | CR | Set Sw 6 = 0, Sw 7 = 1 |
| MONO-DUAL | DUAL | Sets dual-case character set |

3. There are 8 toggle switches located on the keyboard element as GROUP 2 switches. These switches describe the terminal opetating characteristics and are set to the following values:

| Group 2 Switches | Set To: | Comments |
|---|---|---|
| STOP1-STOP2, STOP 1 | | Set to 1 stop bit unless 110-baud rate is desired. For 110 baud, use STOP2. |
| PARITY | SPACE | Sw2 = 0, Sw3 = 0 |
| | MARK | Sw2 = 0, Sw3 = 1 |
| | ODD | Sw2 = 1, Sw3 = 0 |
| | EVEN | Sw2 = 1, Sw3 = 1 |
| | | Set switches to desired parity |
| SEND LINE OPTION | OFF | Sets normal send function |
| NULL SUPPRESSION | OFF | All nulls are not suppressed |
| TIME FILL CHARS | 0 | No time fill characters; set Sw7 (Sw 7-8) = 0, Sw8 = 0 |

4. There are 8 toggle switches located on the keyboard element as GROUP 3 switches. These switches describe the functional tenninal operating characteristics and are set to the following values:

| Group 3 Switches | Set To: | Comments |
|---|---|---|
| AUTO NL ON-OFF | OFF | Automatic generation of New Line disabled |
| AUTO LF ON-OFF | OFF | Automatic generation of line feed disabled |
| CR/CR-LF | CR | Disable automatic generation of a line-feed character every time a carriage return is keyed |
| SCROLL ON-OFF | OFF | Scrolling disabled |
| REVERSE VIDEO ON-OFF | ? | Video capability is set as is desired |
| BLINK CURSOR ON-OFF | ? | Cursor is set as desired |

5. There are 8 toggle-type switches located on the keyboard element as GROUP 4 switches. These switches describe the baud rates needed for both primary and auxiliary conununication interfaces. The list on the next page describes how to set the desired baud rate.

| I/O BAUD RATE | SWITCHES | | | |
|---|---|---|---|---|
| | **1** | **2** | **3** | **4** |
| 110 | OFF | OFF | OFF | OFF |
| 150 | OFF | OFF | OFF | ON |
| 200 | OFF | OFF | ON | OFF |
| 300 | OFF | OFF | ON | ON |
| 600 | OFF | ON | OFF | OFF |
| 1200 | OFF | ON | OFF | ON |
| 1800 | OFF | ON | ON | OFF |
| 2400 | OFF | ON | ON | ON |
| 4800 | ON | OFF | OFF | OFF |
| 9600 | ON | OFF | OFF | ON |

The baud rate set into the above switches must match the baud rate specified for the converter port to which this terminal is to be connected. If a baud rate of 110 is selected, be sure the number of stop bits is 2. (See STOP 2 switch specified in the GROUP 2 Switches.)

6. Reconnect the AC power cord and connect the terminal to the converter with a modem or direct - connect cable, as appropriate.

## F.17 I3151 Terminal Module — IBM 3151

The following list identifies the key sequences defined for the I3151 Terminal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press the <ESC> key prior to pressing the indicated alpha key.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movement:* | | |
| Character Backspace | BACKSPACE | 08H |
| Cursor Up | up arrow | 1BH 41H |
| Cursor Down | down arrow | 1BH 42H |
| Cursor Left | left arrow | 1BH 44H |
| Cursar Right | right arrow | 1BH 43H |
| Field Advance | TAB | 09H |
| Field Backspace | BACKTAB | 1BH 32H |
| | or SHIFT/TAB | 1BH 32H |
| New Line | CTRL/DELTE | 1BH 4FH |
| Fast Left | CTRL/Z | 1AH |
| | or CTRL/NK 1 | 1BH 21H 6DH 0DH |
| FastRight | CTRL/X | 18H |
| | or CTRL/NK 2 | 1BH 21H 6EH 0DH |
| *Special Control:* | | |
| Error Resct | CTRL/R | 12H |
| | or NK JUMP | 1BH 22H 41H |
| Insert Mode | INSERT | 1BH 50H 20H 08H |
| Delete | DELETE | 1BH 51H |
| Erase I nput | CTRL/CLEAR | 1BH 4BH |
| Home | HOME | 1BH 48H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Field Exit:* | | |
| Duplicate | CTRL/SHIFT/F2 | 1BH 22H 62H 0DH |
| Field Minus | NK SEND LINE | 1BH 21H 38H 0DH |
| Field Plus | RETURN | 0DH |
| | or NK ENTER | 0DH |
| Field Exit | CTRL/RETURN | 0AH |
| *Aid* | | |
| Enter | SEND | 1BH 38H 0DH |
| Clear | CTRL/ERASE EOT | 1BH 4AH |
| Help | CTRL/SHIFT/F5 | 1BH 22H 65H 0DH |
| Print | CTRL/SHIFT/F10 | 1BH 22H 6AH 0DH |
| Roll Up | CLEAR | 1BH 4BH 0DH |
| Roll Down | ERASE EOT | 1BH 49H |
| CMD 1 | Fl | 1BH 61H 0DH |
| CMD 2 | F2 | 1BH 62H 0DH |
| CMD3 | F3 | 1BH 63H 0DH |
| CMD 4 | F4 | 1BH 64H 0DH |
| CMD 5 | F5 | 1BH 65H 0DH |
| CMD 6 | F6 | 1BH 66H 0DH |
| CMD 7 | F7 | 1BH 67H 0DH |
| CMD 8 | F8 | 1BH 68H 0DH |
| CMD 9 | F9 | 1BH 69H 0DH |
| CMD 10 | F10 | 1BH 6AH 0DH |
| CMD 11 | F11 | 1BH 6BH 0DH |
| CMD 12 | F12 | 1BH 6CH 0DH |
| CMD 13 | SHIFT/F1 | 1BH 22H 61H 0DH |
| CMD 14 | SHIFT/F2 | 1BH 22H 62H 0DH |
| CMD 15 | SHIFT/F3 | 1BH 22H 63H 0DH |
| CMD 16 | SHIFT/F4 | 1BH 22H 64H 0DH |
| CMD 17 | SHIFT/F5 | 1BH 22H 65H 0DH |
| CMD 18 | SHIFT/F6 | 1BH 22H 66H 0DH |
| CMD 19 | SHIFT/F7 | 1BH 22H 67H 0DH |
| CMD 20 | SHIFT/F8 | 1BH 22H 68H 0DH |
| CMD 21 | SHIFT/F9 | 1BH 22H 69H 0DH |
| CMD 22 | SHIFT/F10 | 1BH 22H 6AH 0DH |
| CMD 23 | SHIFT/F11 | 1BH 22H 6BH 0DH |
| CMD 24 | SHlFT/F12 | 1BH 22H 6CH 0DH |
| *Special Host* | | |
| System Request | CTRL/SHIFT/F8 | 1BH 22H 68H 0DH |
| *Signal:* | | |
| Attn | CTRL/SHIFT/F1 | 1BH 22H 61H 0DH |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|

*Special Function:*

| | | |
|---|---|---|
| Cancel Print | CTRL/SHIFT/F11 | 1BH 22H 6BH 0DH |
| Refresh Display | CTRL/W | 17H |
| | or CTRL/SHIFT/F6 | 1BH 22H 46H 0DH |
| Initialize Terminal | ESC < | 1BH 3CH |
| Toggle Indicators | ESC T | 1BH 54H |
| | or CTRL/SHIFT/F7 | 1BH 22H 47H 0DH |
| Request Disconnect | ESC > | 1BH 3EH |

**IBM 3151 Terminal Setup**

All operator-selectable options are input from the keyboard into the Setup and Select menus. There are no external switches.

1. Enter the Setup Menu by depressing the Setup key (CTRL and SELECT). Change menus with the SEND key. Options marked with (*) will be automatically set/overridden after entry into emulation mode. Set the options as follows:

**General Menu**

| Parameter | Set To: | Comments |
|---|---|---|
| Machine Mode | IBM 315l | For 3151 operation |
| Screen | As desired | NORMAL (*) or REVERSE |
| Row and Column | 24 x 80 (*) | |
| Scroll | NO (*) | Auto scroll is disabled |
| Auto LF | OFF (*) | Upon receipt of a CR, only a carriage return (and not a carriage return, line feed) is performed by the terminal |
| CRT Saver | ON (*) | |
| Line Wrap | OFF (*) | Auto Line Wrap is disabled |
| Forcing Insert | OFF (*) | |
| Tab | As desired | Field or Column. Overridden by the converter. |

**Communicstion Menu**

| Parameter | Set To: | Comments |
|---|---|---|
| Operating Mode | ECHO | ECHO (conversational) mode, with the converter handling the echo of the keyboard input |
| Line Speed | As desired | Main/Aux. port baud rates (110-19200 bits per sec.) |
| Word Length | As desired | Main/Aux. ports (7 or 8 bits) |
| Parity | As desired | Main/Aux. ports (Space, Mark, Odd, Even, or None) |
| Stop Bit | As desired | Main/Aux. ports (1 or 2 bits) |
| Turnaround Character | CR | Line turnaround character to be sent at the end of a Send or Function key sequence or upon reception of a "read type" command |
| Interface | RS-232C | EIA RS-232C interface |
| Line Control | As desired | PRTS-permanent RTS (*) |
| | (see note 3) | CRTS-controlled RT IPRTS-induced permanent RTS |
| Break Signal | As desired | 170 or 500 msec (*) |
| Set Null Suppress | As desired | ON or OFF (*) |

**Keyboard/Printer Menu**

| Parameter | Set to: | Comments |
|---|---|---|
| Enter | As desired | When set to RETURN (*) will cause numeric keypad ENTER to work as Field+ key. When set to SEND, numeric keypad key will work as Enter/Record Advance has to be done every time after entering emulation key. |
| Return | NEW LINE (*) | |
| New Line | CR | Return/Enter keys generate CR character (*) |
| Send | PAGE | Selects code for Send key |
| Insert Character | SPACE (*) | MODE setting disabled INSERT key |

Printer options should be set as appropriate for an auxiliary printer.

1. The port on the rear of the IBM 3151 farthest from the powa cord is the standard EIA interface (main port).

2. The other port on the rear of the IBM 3151 is used for the Auxiliary Printer feature. For a description of this feature, see the appropriate User's Guide.

3. The pacing function (flow contol) on the IBM 3151 main port is performed only when the communication parameter, Line Control, is set to either PRTS or IPRTS. The flow control options on the LinkUp 5294 should be set to XON.

## F.18 I3161 Terminal Module - IBM 3161/3163

The following list identifies the key sequences defined for the I3161 Terminal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movement:* | | |
| Character Backspace | BACKSPACE | 08H |
| Cursor Up | up arrow | 1BH 41H |
| Cursor Down | down arrow | 1BH 42H |
| Cursor Left | left arrow | 1BH 44H |
| Cursor Right | right arrow | 1BH 43H |
| Field Advance | TAB | 09H |
| Field Backspace | BACKTAB | 1BH 32H |
| New Line | LINE FEED | 0AH |
| Fast Left | N.A. | N.A. |
| Fast Right | N.A. | N.A. |
| *Special Control:* | | |
| Error Reset | CTRL/R | 12H |
| | or F12 | 1BH 6CH 0DH |
| | or SHIFT/F12 | 1BH 21H 6CH 0DH |
| Insert Mode | INS LN | 1BH 4EH |
| | or F3 | 1BH 63H 0DH |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| Delete | DEL | 7FH |
| | or SHIFT/F3 | 1BH 21H 63H 0DH |
| | or DELETE | 1BH 51H |
| Erase Input | SHIFT/F4 | 1BH 21H 64H 0DH |
| | or ER NP | 1BH 4BH |
| Home | F4 | 1BH 64H 0DH |
| | or HOME | 1BH 48H |

*Field Exit:*

| | | |
|---|---|---|
| Duplicate | F11 | 1BH 6BH 0DH |
| | or SHIFT/F11 | 1BH 21H 6BH 0DH |
| Field Minus | F10 | 1BH 6AH 0DH |
| | or SHlFT/F10 | 1BH 21H 6A 0DH |
| Field Plus | F9 | 1BH 69H 0DH |
| | or SHIFT/F9 | 1BH 21H 69H 0DH |
| Field Exit | RETURN | 0DH |

*Aid Generating:*

| | | |
|---|---|---|
| Enter | NK ENTER or SEND | 1BH 38H 0DH |
| Clear | CLEAR | 1BH 4CH 0DH |
| Help | F6 | 1BH 66H 0DH |
| Print | F5 | 1BH 65H 0DH |
| Roll Up | F7 | 1BH 67H 0DH |
| | or SHIFT/F7 | 1BH 21H 67H 0DH |
| Roll Down | F8 | 1BH 68H 0DH |
| | or SHIFT/F8 | 1BH 21H 68H 0DH |
| CMD | F2 | 1BH 62H 0DH |
| | or SHIFT F2 | 1BH 21H 62H 0DH |
| CMD 1 | F2 1 | 1BH 62H 0DH 31H |
| CMD 2 | F2 2 | 1BH 62H 0DH 32H |
| CMD 3 | F2 3 | 1BH 62H 0DH 33H |
| CMD 4 | F2 4 | 1BH 62H 0DH 34H |
| CMD 5 | F2 5 | 1BH 62H 0DH 35H |
| CMD 6 | F2 6 | 1BH 62H 0DH 36H |
| CMD 7 | F2 7 | 1BH 62H 0DH 37H |
| CMD 8 | F2 8 | 1BH 62H 0DH 38H |
| CMD 9 | F2 9 | 1BH 62H 0DH 39H |
| CMD 10 | F2 0 | 1BH 62H 0DH 30H |
| CMD 11 | F2 - | 1BH 62H 0DH 2DH |
| CMD 12 | F2 = | 1BH 62H 0DH 3DH |
| CMD 13 | F2 ! | 1BH 62H 0DH 21H |
| CMD 14 | F2 @ | 1BH 62H 0DH 40H |
| CMD 15 | F2 # | 1BH 62H 0DH 23H |
| CMD 16 | F2 $ | 1BH 62H 0DH 24H |
| CMD 17 | F2 % | 1BH 62H 0DH 25H |
| CMD 18 | F2 ^ | 1BH 62H 0DH SEH |
| CMD 19 | F2 & | 1BH 62H 0DH 26H |
| CMD 20 | F2 * | 1BH 62H 0DH 2AH |
| CMD 21 | F2 ( | 1BH 62H 0DH 28H |
| CMD 22 | F2 ) | 1BH 62H 0DH 29H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| CMD 23 | F2_ (underline) | 1BH 62H 0DH 5FH |
| CMD 24 | F2 + | 1BH 62H 0DH 2BH |

*Special Host:*

| | | |
|---|---|---|
| System Request | SHIFT/F1 | 1BH 21H 61H 0DH |

*Signal:*

| | | |
|---|---|---|
| Attn | F1 | 1BH 61H 0DH |

*Extended Function:*

| | | |
|---|---|---|
| Local Copy Print Req. CTRL/P | | 10H |
| Local Copy Form Feed | ESC I | 1BH 7CH |
| Cancel Print | SHIFT/F5 | 1BH 21H 65H 0DH |
| Refresh Display | CTRL/W | 17H |
| Toggle Status Line/ | | |
|   Toggle Indicators | ESC T | 1BH 54H |
| Toggle Echoplex Enabled | CTRL/V | 16H |
| Initialize Terminal | ESC < | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 7EH |

## IBM: 3161 and 3163 Terminal Setups

All operator-selected options are input from the keyboard into the Setup and Select menus. There are no external switches.

1. Enter the Setup Menu by pressing <CTRL> and  <SELECT>. Set the options as follows:

| Parameter Menu | Set To: | Comments |
|---|---|---|
| Machine Mode | IBM 3161/3163 | For 3161/3163 operation |
| Operating Mode | ECHO | ECHO (conversational) mode, with LinkUp 5294 handling the echo of the keyboard input |
| Interface | RS-232C | EIA RS-232 interface |
| Line Control | As desired | PRTS-permanent RTS<br>  CRTS-controlled RTS<br>IPRTS-induced permanent RTS |
| Line Speed | As desired | Main/Aux. port baud rates (110–19200 bits per sec.) |
| Parity | As desired | Main/Aux ports (Space, Mark Odd, Even, or None) |
| Turnaround Character | CR | Line turnaround character to be sent at the end of a read-type command |
| Stop Bit | As desired | Main/Aux ports (1 or 2 bits) |
| Word Length | As desired | Main/Aux ports (7 or 8 bits) |
| Response Delay | As desired | 0 or 100 msec. |
| Break Signal | As desired | 170 or 500 msec. |

2. Enter the Select Menu by pressing <SELECT>. Set the options as follows:

| Parameter Menu | Set To: | Comments |
|---|---|---|
| Enter | SEND | Enter key acts as a "Send" key |
| Return | NEW LINE | New Line occurs when the Return Key is pressed |
| New Line | CR | Return/Enter keys generate CR character |
| Tab | As desired | Field or Column. Overridden by the LinkUp 5294 |
| Line Wrap | OFF | Auto Line Wrap is disabled |
| Auto LF | OFF | After receiving a <CR>, only a carriage return (and not a carriage return, line feed) is performed by the terminal |
| Send | N.A. | Not applicable in Echo Mode |
| Send Null | N.A. | Not applicable in Echo Mode |
| Insert | N A. | Not applicable; the Insert key is not used |
| Trace | N.A. | Not applicable; as it does not affect communication to the LinkUp 5294 |
| CRT Saver | N.A. | Overridden by the LinkUp 5294 |
| Scroll | OFF | Auto scroll is disabled |
| Print | N.A. | Not applicable; the Print key is not used |
| Print EOL | OFF | No end-of-line character sent to the printer by the terminal |
| Line End | N.A. | Not applicable; the Print EOL option is disabled. |

1. The port labeled 2 on the rear of the IBM 3161 is the standard EIA interface (main port).

2. The port labeled 1 on the rear of the 3161 can be used with the LinkUp Auxiliary Printer facility.

## F.19 I3164 Terminal Module - IBM 3164

The following list identifies the key sequences defined for the B164 Terminal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movement:* | | |
| Character Backspace | BACKSPACE | 08H |
| CursorUp | up arrow | 1BH 41H |
| Cursor Down | down arrow | 1BH 42H |
| Cursor Left | left arrow | 1BH 44H |
| Cursor Right | right arrow | 1BH 43H |
| Field Advance | TAB | 09H |
| Field Backspace | BACKTAB | 1BH 32H |
| New Line | CTRL/DELETE | 1BH 4FH |
| Fast Left | CTRL/left arrow | 1BH 20H 44H |
| Fast Right | CTRL/right arrow | 1BH 20H 43H |
| *Special Control:* | | |
| Error Reset | CTRL/R | 12H |
| | or NK JUMP | 1BH 22H 41H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| Insert Mode | INSERT | 1BH 50H 20H 08H |
| Delete | DELETE | 1BH 51H |
| Erase Input | CTRL/CLEAR | 1BH 4BH |
| Home | HOME | 1BH 48H |

*Field Exit:*

| | | |
|---|---|---|
| Duplicate | CTRL/D | 04H |
| Field Minus | NK SEND KEY | 1BH 21H 38H 0DH |
| Field Plus | RETURN or NK ENTER | 0DH |
| Field Exit | CTRL/RETURN | 0AH |

*Aid Generating:*

| | | |
|---|---|---|
| Enter | SEND | 1BH 38H 0DH |
| Clear | CTRL/ERASE EOF | 1BH 4AH |
| Help | PAGE | 1BH 21H 41H |
| Print | PRINT | 7FH |
| Roll Up | CLEAR | 1BH 4CH 0DH |
| Roll Down | ERASE EOF | 1BH 49H |
| CMD 1 | F1 | 1BH 61H 0DH |
| CMD 2 | F2 | 1BH 62H 0DH |
| CMD 3 | F3 | 1BH 63H 0DH |
| CMD 4 | F4 | 1BH 64H 0DH |
| CMD 5 | F5 | 1BH 65H 0DH |
| CMD 6 | F6 | 1BH 66H 0DH |
| CMD 7 | F7 | 1BH 67H 0DH |
| CMD 8 | F8 | 1BH 68H 0DH |
| CMD 9 | F9 | 1BH 69H 0DH |
| CMD 10 | F10 | 1BH 6AH 0DH |
| CMD 11 | F11 | 1BH 6BH 0DH |
| CMD 12 | F12 | 1BH 6CH 0DH |
| CMD 13 | SHIFT/Fl | 1BH 21H 61H 0DH |
| CMD 14 | SHIPT/F2 | 1BH 21H 62H 0DH |
| CMD 15 | SHIPT/F3 | 1BH 21H 63H 0DH |
| CMD 16 | SHIFT/F4 | 1BH 21H 64H 0DH |
| CMD 17 | SHIFT/F5 | 1BH 21H 65H 0DH |
| CMD 18 | SHIFT/F6 | 1BH 21H 66H 0DH |
| CMD 19 | SHIFT/F7 | 1BH 21H 67H 0DH |
| CMD 20 | SHIFT/F8 | 1BH 21H 68H 0DH |
| CMD 21 | SHIFT/F9 | 1BH 21H 69H 0DH |
| CMD 22 | SHIFT/F10 | 1BH 21H 6AH 0DH |
| CMD 23 | SHIFT/F11 | 1BH 21H 6BH 0DH |
| CMD 24 | SHIFT/F12 | 1BH 21H 6CH 0DH |

*Special Host:*

| | | |
|---|---|---|
| System Request | CTRL/SEND LINE | 1BH 20H 38H 0DH |

*Signal:*

| | | |
|---|---|---|
| Attn | CTRL/A | 01H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|

*Extended Function:*

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| Local Copy Print Req. | CTRL/P | 10H |
| Local Copy Form Feed | ESC ! | 1BH 7CH |
| Cancel Print | ESC Z | 1BH 5AH |
| Refresh Display | CTRL/W | 17H |
| Toggle Status Line/<br>  Toggle Indicators | ESC T | 1BH 54H |
| Toggle Echoplex Enabled | CTRL/V | 16H |
| Initialize Terminal | ESC < | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 7EH |

**IBM: 3164 Terminal Setups**

1. Enter the Setup Menu by pressing <CTRL> and <SELECT>. Set the options as follows:

| Parameter Menu | Set To: | Comments |
|---|---|---|
| Machine Mode | IBM 3164 | For 3164 operation |
| Operating Mode | ECHO | ECHO (conversational) mode, with LinkUp 5294<br>  handling the echo of the keyboard input |
| Interface | RS-232C | EIA RS-232 interface |
| Line Control | As desired | PRTS-permanent RTS<br>  CRTS-controlled RTS<br>  IPRTS-induced permanent RTS |
| Line Speed | As desired | Main/Aux. port baud rates (110-19200 bits per sec.) |
| Parity | As desired | Main/Aux. ports (Space, Mark Odd, Even, or None) |
| Turnaround Character | CR | Line turnaround character to be sent at the end of a<br>  read-type command |
| Stop Bit | As desired | Main/Aux ports (1 or 2 bits) |
| Word Length | As desired | Main/Aux ports (7 or 8 bits) |
| Response Delay | As desired | 0 or 100 msec. |
| Break Signal | As desired | 170 or 500 msec. |

2. Enter the Select Menu by pressing <SELECT>. Set the options as follows:

| Parameter Menu | Set To: | Comments |
|---|---|---|
| Enter | SEND | Enter key acts as a "Send" key |
| Return | NEW LINE | New Line occurs when the Return Key is pressed |
| New Line | CR | Return/Enter keys generate CR character |
| Tab | As desired | Field or Column. Overridden by the LinkUp 5294 |
| Line Wrap | OFF | Auto Line Wrap is disabled |
| Auto LF | OFF | After receiving a <CR>, only a carriage return (and<br>  not a carriage return, line feed) is performed by the<br>  terminal |
| Send | N.A. | Not applicable in Echo Mode |
| Send Null | N.A. | Not applicable in Echo Mode |
| Insert | N A. | Not applicable; the Insert key is not used |
| Trace | N.A. | Not applicable; as it does not affect communication to<br>  the LinkUp 5294 |
| CRT Saver | N.A. | Overridden by the LinkUp 5294 |
| Scroll | OFF | Auto scroll is disabled |

| Parameter Name: | Set To: | Comments |
|---|---|---|
| Print | N.A. | Not applicable; the Print key is not used |
| Print EOL | OFF | No end-of-line character sent to the printer by the terminal |
| Line End | N.A. | Not applicable; the Print EOL option is disabled. |

1.The port labeled 2 on the rear of the IBM 3161 is the standard EIA interface (main port).

2. The port labeled 1 on the rear of the 3161 can be used with the LinkUp Auxiliary Printer facility.

## F.20 REBUS 3000 Terminal Module - Rebus 3000

The following list identifies the key sequences defined for the REBUS 3000 Terminal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movement:* | | |
| Character Backspace | BACKSPACE | 08H |
| Cursor Up | up arrow | 1BH 5BH 41H |
| | or ESC A | 1BH 41H |
| Cursor Down | down arrow | 1BH 5BH 42H |
| | or ESC B | 1BH 42H |
| Cursor Left | left arrow | 1BH 5BH 44H |
| | or ESC D | 1BH 44H |
| Cursor Right | right arrow | 1BH 5BH 43H |
| | or ESC C | 1BH 43H |
| Field Advance | TAB | 09H |
| Field Backspace | BACKTAB | 1BH 31H |
| | ESC I | 1BH 49H |
| New Line | NEW LINE | 1BH 34H |
| Fast Left | ALT/left arrow | 18H 1BH 44H |
| Fast Right | ALT/right arrow | 18H 1BH 43H |
| *Special Control:* | | |
| Error Reset | RESET/CANCEL | 1BH 51H |
| Insert Mode | INS | 1BH 35H |
| Delete | DEL | 1BH 36H |
| Erase Input | ERASE INPUT | 1BH 56H |
| Home | HOME SYMBOL | 1BH 48H |
| *Field Exit* | | |
| Duplicate | DUP | 1BH 32H |
| Field Minus | FIELD - | 1BH 52H |
| Field Plus | FIELD+ | 1BH 4FH |
| Field Exit | (RETURN) | 0DH |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Aid Generating:* | | |
| Enter | LINE FEED | 0AH |
| Clear | ALT/CLEAR | 18H 7FH |
| Help | HELP | 1BH 46H |
| Print | PRINT | 1BH 45H |
| Roll Up | ROLL up arrow | 1CH 41H |
| Roll Down | ROLL down arrow | 1CH 42H |
| CMD 1 | CMD 1 | 1BH 19H 31H |
| CMD 2 | CMD 2 | 1BH 19H 32H |
| CMD 3 | CMD 3 | 1BH 19H 33H |
| CMD 4 | CMD 4 | 1BH 19H 34H |
| CMD 5 | CMD 5 | 1BH 19H 35H |
| CMD 6 | CMD 6 | 1BH 19H 36H |
| CMD 7 | CMD 7 | 1BH 19H 37H |
| CMD 8 | CMD 8 | 1BH 19H 38H |
| CMD 9 | CMD 9 | 1BH 19H 39H |
| CMD 10 | CMD 10 | 1BH 19H 30H |
| CMD 11 | CMD 11 | 1BH 19H 2DH |
| CMD 12 | CMD 12 | 1BH 19H 3DH |
| CMD 13 | CMD 13 | 1BH 19H 5DH |
| CMD 14 | CMD 14 | 1BH 19H 40H |
| CMD 15 | CMD 15 | 1BH 19H 23H |
| CMD 16 | CMD 16 | 1BH 19H 24H |
| CMD 17 | CMD 17 | 1BH 19H 25H |
| CMD 18 | CMD 18 | 1BH 19H SEH |
| CMD 19 | CMD 19 | 1BH 19H 26H |
| CMD 20 | CMD 20 | 1BH 19H 2AH |
| CMD 21 | CMD 21 | 1BH 19H 28H |
| CMD 22 | CMD 22 | 1BH 19H 29H |
| CMD 23 | CMD 23 | 1BH 19H 5FH |
| CMD 24 | CMD 24 | 1BH 19H 2BH |
| *Special Host:* | | |
| System Request | SYS REQ | 1CH 53H |
| *Signal:* | | |
| Attn | ATTN | 1BH 53H |
| *Extended Function:* | | |
| Local Copy Print Req. | N.A. | N.A. |
| Local Copy Form Feed | N.A. | N.A. |
| Cancel Print | SHIFT/PRINT | 1CH 45H |
| Refresh Screen | ESC W | 1BH 57H |
| Toggle Status Line/ Toggle Indicators | ESC T | 1BH 54H |
| Toggle Echoplex Enabled | CTRL/V | 16H |
| Initialize Terminal | ESC < | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 3EH |

**REBUS: REBUS 3000 Terminal Setup**

To enter Setup mode on the Rebus 3000 terminal, power on the terminal, then press SHIFT and SET UP simultaneously, release, and press TAB. Parameter options and features are displayed along the bottom of the screen. (Refer to the terminal operator's guide for details on use of SETUP mode.) Select the following settings for each of the Setup options:

| Group | Setting |
|---|---|
| DISPLAY | |
| | |
| 80 Columns | |
| Interpreter Controls | |
| CRT-Saver | As desired |
| Cursor | As desired |
| Light Text, Dark Screen | |
| No Autowrap | |
| | |
| GENERAL | |
| | |
| VT200, 7-bit Controls | |
| User-defined Keys Unlocked | |
| User Features Unlocked | |
| Clear User defined Keys | |
| No New Line | |
| Multinational | |
| | |
| COMMUNICATIONS | |
| | |
| Speed | User (as desired) |
| XOFF/DTR | User (as desired) |
| Bits, Parity | User (as desired) |
| Stop Bit | User (as desired) |
| No Local Echo | |
| Main Port Data Leads Only | |
| Disconnect Delay | User (as desired) |
| Limited/Unlimited Transmit | User (as desired) |
| | |
| PRINTER | |
| | |
| Speed | User (as desired) |
| Print Mode | User (as desired) |
| Bits, Parity | User (as desired) |
| Stop Bit | User (as desired) |
| Print Full Page | User (as desired) |
| Print (Multi) National | User (as desired) |
| No Terminator | User (as desired) |
| | |
| KEYBOARD | |
| | |
| Auto Repeat | User (as desired) |
| Key Click | User (as desired) |
| Margin Bell | User (as desired) |
| Warning Bell | User (as desired) |
| No Auto-Answerback | |
| Answerback Message | N.A. |
| Answerback Concealed | N.A. |

| Group | Setting |
|---|---|
| TABS | N A. |

ENHANCEMENTS

| | |
|---|---|
| Main Received XON | User (as desired) |
| Rapid Mode: Disabled | |
| Space Suppression | N.A. |
| Transmit Area | N.A. |
| Transmit Execution | N.A. |

DISPLAY FORMAT

Setup Directory

| | |
|---|---|
| Main Online | N.A. |
| Clear Display | N.A. |
| Clear Comm | N.A. |
| Reset Terminal | N.A. |
| Recall | N.A. |
| Save | N.A. |
| Language | N.A. |
| Keyboard | User (as desired) |
| Default | N.A. |
| Program Keys | User (as desired) |
| 80 Columns | |
| Refresh Rate | User (as desired) |
| 24 Data & Information Line | |

## F.21 SCANS Terminal Module - Tymshare Scanset

The following list identifies the key sequences defined for the SCANS Terminal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

3. The last position of the screen (Row 24, Column 80) is designed not to display a character. This prevents automatic scrolling.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movement* | | |
| Character Backspace | CTRL/C | 03H |
| Cursor Up | up arrow | 1BH 41H |
| Cursor Down | down arrow | 1BH 42H |
| Cursor Left | left arrow | 1BH 44H |
| Cursor Right | right arrow | 1BH 43H |
| Field Advance | CTRL/A | 01H |
| Field Backspace | CTRL/B | 02H |
| New Line | CTRL/J | 0AH |
| Fast Left | N A. | N.A. |
| Fast Right | N.A. | N.A. |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Special Control:* | | |
| Error Reset | CTRL/R | 12H |
| Insert Mode | CTRL/U | 15H |
| Delete | DEL | 7FH |
| Erase Input | CTRL/E | 05H |
| Home | CTRL/^ | 1EH |
| *Field Exit:* | | |
| Duplicate | CTRL/D | 04H |
| Field Minus | CTRL./F | 06H |
| Field Plus | N.A. | N.A. |
| Field Exit | CTRL/X | 18H |
| *Aid Generating:* | | |
| Enter | ENTER | 0DH |
| Clear | ESC J | 1BH 4AH |
| Help | ESC H | 1BH 48H |
| Print | CTRL/P | 10H |
| Roll Up | ESC U | 1BH 55H |
| Roll Down | ESC R | 1BH 52H |
| CMD 1 | ESC 1 | 1BH 31H |
| CMD 2 | ESC 2 | 1BH 32H |
| CMD 3 | ESC 3 | 1BH 33H |
| CMD 4 | ESC 4 | 1BH 34H |
| CMD 5 | ESC 5 | 1BH 35H |
| CMD 6 | ESC 6 | 1BH 36H |
| CMD 7 | ESC 7 | 1BH 37H |
| CMD 8 | ESC 8 | 1BH 38H |
| CMD 9 | ESC 9 | 1BH 39H |
| CMD 10 | ESC 0 | 1BH 30H |
| CMD 11 | ESC - | 1BH 2DH |
| CMD 12 | ESC = | 1BH 3DH |
| CMD 13 | ESC ! | 1BH 21H |
| CMD 14 | ESC @ | 1BH 40H |
| CMD 15 | ESC # | 1BH 23H |
| CMD 16 | ESC $ | 1BH 24H |
| CMD 17 | ESC % | 1BH 25H |
| CMD 18 | ESC ^ | 1BH 5EH |
| CMD 19 | ESC & | 1BH 26H |
| CMD 20 | ESC * | 1BH 2AH |
| CMD 21 | ESC ( | 1BH 28H |
| CMD 22 | ESC ) | 1BH 29H |
| CMD 23 | ESC _ | 1BH 5FH |
| CMD 24 | ESC + | 1BH 2BH |
| *Special Host* | | |
| System Request | ESC S | 1BH 53H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|

*Signal:*

| | | |
|---|---|---|
| Attn | ESC E | 1BH 45H |

*Extended Function:*

| | | |
|---|---|---|
| Local Copy Print Req. | ESC P | 1BH 50H |
| Local Copy Form Feed | ESC F | 1BH 46H |
| Cancel Print | ESC X | 1BH 58H |
| Refresh Screen | CTRL/W | 17H |
| Toggle Status Line/ Toggle Indicators | ESC T | 1BH 54H |
| Toggle Echoplex Enabled | CTRL/V | 16H |
| Initialize Terminal | ESC < | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 3EH |

**TYMSHARE: Scanset Terminal Setup**

All parameters of the SCANSET terminal are set on the keyboard while in Status Mode. For details as to how to access Status Mode and enter values, please refer to the SCANSET user's manual. Set the parameters to the following values:

| Parameter | Value | Comments |
|---|---|---|
| Baud TX | ? | Transmission Baud Rate |
| Baud RX | ? | Reception Baud Rate |
| Baud Print | ? | Printer Baud Rate |
| Dial - Pulse/Tone | ? | Set to Pulse if terminal is connected to a rotary dial phone line. Set to Tone if it is connectc=ed to a touch-tone line. |
| Bit TX/RX | ? | Number of data bits transmitted to the connected printer |
| PAR Print | ? | Type of parity - ODD, EVEN or NONE |
| Brightness | ? | Brightness of display - 0 = minimum, 3 = maximum |
| Beep Col | ? | YES causes a beep at the 72nd character entered in a line. NO disables the beep. |
| Beep Tone | ? | Volume of the beep - 0 = minimum, 3 = maximum |
| Cursor | ESC | Cause an ESC sequence to be transmitted when a cursor key is pressed |
| Return Key | CR | Transmits a CR upon depression of RETURN |
| Screen Sizc | 80 | 80-column screen |
| Duplex | FULL | Full-Duplex Transmission |
| Scroll | NO | Disables Scrolling |
| X-ON/X-OFF | ? | Set to match logical flow-control selection configured for converter port |

# NOTE

**The auxiliary port on the Scanset terminal can be used with the LinkUp 5294 Auxiliary Printer facility.**

## F.22 TV910 Terminal Module - Televideo 910

The following list identifies the key sequences defined for the TV910 Terminal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

3. The last position of the screen (Row 24, Column 80) is designed not to display a character. This prevents automatic scrolling.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movement:* | | |
| Character Backspace | CTRL/C | 03H |
| Cursor Up | up arrow | 0BH |
| Cursor Down | down arrow | 0AH |
| Cursor Left | left arrow | 08H |
| Cursor Right | right arrow | 0CH |
| Field Advance | TAB | 09H |
| Field Backspace | BACKTAB | 1BH 49H |
| New Line | CTRL/N | 0EH |
| Fast Left | N. A. | N. A. |
| Fast Right | N. A. | N. A. |
| *Special Control:* | | |
| Error Reset | CTRL/R | 12H |
| Insert Mode | CTRL/U | 15H |
| Delete | DEL | 7FH |
| Erase Input | CTRL/E | 05H |
| Home | HOME | 1EH |
| *Field Exit:* | | |
| Duplicate | CTRL/D | 04H |
| Field Minus | CTRL/F | 06H |
| Field Plus | N. A. | N. A. |
| Field Exit | CTRL/X | 18H |
| *Aid Generating:* | | |
| Enter | ENTER | 0DH |
| Clear | CLEAR | 1AH |
| Help | ESC H | 1BH 48H |
| Print | CTRL/P | 10H |
| Roll Up | ESC U | 1BH 55H |
| Roll Down | ESC D | 1BH 44H |
| CMD 1 | ESC 1 | 1BH 31H |
| CMD 2 | ESC 2 | 1BH 32H |
| CMD 3 | ESC 3 | 1BH 33H |
| CMD 4 | ESC 4 | 1BH 34H |
| CMD 5 | ESC 5 | 1BH 35H |
| CMD 6 | ESC 6 | 1BH 36H |
| CMD 7 | ESC 7 | 1BH 37H |
| CMD 8 | ESC 8 | 1BH 38H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| CMD 9 | ESC 9 | 1BH 39H |
| CMD 10 | ESC 0 | 1BH 30H |
| CMD 11 | ESC - | 1BH 2DH |
| CMD 12 | ESC = | 1BH 3DH |
| CMD 13 | ESC ! | 1BH 21H |
| CMD 14 | ESC @ | 1BH 40H |
| CMD I5 | ESC # | 1BH 23H |
| CMD 16 | ESC $ | 1BH 24H |
| CMD 17 | ESC % | 1BH 25H |
| CMD 18 | ESC ^ | 1BH 5EH |
| CMD 19 | ESC & | 1BH 26H |
| CMD 20 | ESC * | 1BH 2AH |
| CMD 21 | ESC ( | 1BH 28H |
| CMD 22 | ESC ) | 1BH 29H |
| CMD 23 | ESC _ | 1BH 5FH |
| CMD 24 | ESC + | 1BH 2BH |

*Special Host:*

| System Request | ESC S | 1BH 53H |
|---|---|---|

*Signal*

| Attn | ESC A | 1BH 41H |
|---|---|---|

*Extended Function:*

| Local Copy Print Req. | ESC P | 1BH 50H |
|---|---|---|
| Local Copy Form Feed | ESC F | 1BH 46H |
| Cancel Print | ESC C | 1BH 43H |
| Refresh Screen | CTRL/W | 17H |
| Toggle Status Line/ Toggle Indicators | ESC T | 1BH 54H |
| Toggle Echoplex Enabled | CTRL/V | 16H |
| Initialize Terminal | ESC < | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 3EH |

TeleVideo: 910 Terminal Setup

1. Disconnect the AC power cord from the outlet before opening the TeleVideo terminal case.

2. There are two sets of 10 switches on the TeleVideo 910, labeled S1 and S2. Set these switches in the following manner.

| S1 (Right Rear) | Set To: | Comments |
|---|---|---|
| 1–4 | — | Baud Rate (see list) |
| 5 | DOWN | 8 data bits |
| 6 | ? | Send parity - UP, No parity - DOWN (set to match LinkUp) |
| 7 | ? | Even parity - UP; Odd parity - DOWN (set to match LinkUp) |
| 8 | DOWN | 1 stop bit (if baud rate is 110, set UP for 2 stop bits) |
| 9 | DOWN | Auto wrap off |
| 10 | DOWN | Auto Linefeed off |

| BAUD RATE | SWITCHES | | | |
| --- | --- | --- | --- | --- |
| | 1 | 2 | 3 | 4 |
| 9600 | DOWN | DOWN | DOWN | DOWN |
| 50 | DOWN | DOWN | DOWN | UP |
| 75 | DOWN | DOWN | UP | DOWN |
| 110 | DOWN | DOWN | UP | UP |
| 135 | DOWN | UP | DOWN | DOWN |
| 150 | DOWN | UP | DOWN | UP |
| 300 | DOWN | UP | UP | DOWN |
| 600 | DOWN | UP | UP | UP |
| 1200 | UP | DOWN | DOWN | DOWN |
| 1800 | UP | DOWN | DOWN | UP |
| 2400 | UP | DOWN | UP | DOWN |
| 3600 | UP | DOWN | UP | UP |
| 4800 | UP | UP | DOWN | DOWN |
| 7200 | UP | UP | DOWN | UP |
| 9600 | UP | UP | UP | DOWN |
| 19200 | UP | UP | UP | UP |

| S1(Left Rear) | Set To: | Comments |
| --- | --- | --- |
| 1, 2 | DOWN | Setting Switches 1 and 2 to the down position sets to standard TV910 emulation |
| 3 | ? | 50 Hz - DOWN (foreign); 60 Hz - UP (U.S.) |
| 4 | ? | DOWN = Blinking cursor; UP = Steady cursor |
| 5 | ? | DOWN = Block cursor; UP = Underline cursor |
| 6 | UP | Full Duplex |
| 7 | ? | UP = White on black; DOWN = Black on white |
| 8 | UP | No DSR |
| 9 | DOWN | DCD connected |
| 10 | DOWN | DTR on with terminal |

3. Replace the cover, reconnect the AC power cord, and connect the terminal to the LinkUp 5294 with a modem or direct-connect cable, as appropriate.

# NOTE

**The auxiliary port on the 910 terminal can be used with the LinkUp 5294 Auxiliary Printer facility. However, be aware that the 910 terminal does not operate its auxiliary printer capability in an industry-standard manner. In other words, the port select/deselect sequences (CTRL/T and ESC/A) the LinkUp 5294 sends to the terminal (to determine if this facility is to be used) are incorrectly passed through to the terminal's auxiliary port (where the printer is connected). If the attached printer interprets them as a command, these sequences will cause printer operation errors.**

## F.23 TV910P Terminal Module - TeleVideo 910 Plus/912

The following list identifies the key sequences defined for the TV910P Terminal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

3. The last position of the screen (Row 24, Column 80) is designed to not display a character. This prevents an auto-scroll capability.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|

*Cursor Movement:*

| | | |
|---|---|---|
| Character Backspace | CTRL/ | 03H |
| Cursor Up | up arrow | 0BH |
| Cursor Down | down arrow | 0AH |
| Cursor Left | left arrow | 08H |
| Cursor Right | right arrow | 0CH |
| Field Advance | CTRL/I | 09H |
| | or TAB | 09H |
| Field Backspace | ESC/I | 1BH 49H |
| | or BACKTAB | 1BH 49H |
| New Line | CTRL/J | 0AH |
| | LINE FEED | 0AH |
| Fast Left | N.A. | N.A. |
| Fast Right | N A. | N.A. |

*Special C ontrol*

| | | |
|---|---|---|
| Error Reset | CTRL/R | 12H |
| Insert Mode | CTRL/U | 15H |
| Delete | DEL | 7_FH |
| Erase Input | CTRL/E | 05H |
| Home | HOME | 1EH |

*Field Exit:*

| | | |
|---|---|---|
| Duplicate: | CTRL/D | 04H |
| Field Minus/Plus | CTRL/F | 06H |
| Field Exit | CTRL/X | 18H |

*Aid Generating:*

| | | |
|---|---|---|
| Enter | ENTER | 0DH |
| Clear | ESC Z | 1BH 5AH |
| Help | ESC H | 1BH 48H |
| Print | CTRL/P | 10H |
| Roll Up | ESC U | 1BH 55H |
| Roll Down | ESC D | 1BH 4DH |
| CMD 1 | ESC 1 | 1BH 31H |
| CMD 2 | ESC 2 | 1BH 32H |
| CMD 3 | ESC 3 | 1BH 33H |
| CMD 4 | ESC 4 | 1BH 34H |
| CMD 5 | ESC 5 | 1BH 35H |
| CMD 6 | ESC 6 | 1BH 36H |
| CMD 7 | ESC 7 | 1BH 37H |
| CMD 8 | ESC 8 | 1BH 38H |
| CMD 9 | ESC 9 | 1BH 39H |
| CMD 10 | ESC 0 | 1BH 30H |
| CMD 11 | ESC - | 1BH 2DH |
| CMD 12 | ESC = | 1BH 3DH |
| CMD 13 | ESC ! | 1BH 21H |
| CMD 14 | ESC @ | 1BH 40H |
| CMD 15 | ESC # | 1BH 23H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| CMD 16 | ESC  $ | 1BH 24H |
| CMD 17 | ESC  % | 1BH 25H |
| CMD 18 | ESC ^ | 1BH 5EH |
| CMD 19 | ESC & | 1BH 26H |
| CMD 20           _ | ESC * | 1BH 2AH |
| CMD 21 | ESC ( | 1BH 28H |
| CMD 22 | ESC ) | 1BH 29H |
| CMD 23 | ESC _ | 1BH 5FH |
| CMD 24 | ESC + | 1BH 2BH |

*Special Host:*

| | | |
|---|---|---|
| System Request | ESC S | 1BH 53H |

*Signal:*

| | | |
|---|---|---|
| Attn | ESC A | 1BH 41H |

*Extended Function:*

| | | |
|---|---|---|
| Local Copy Print Req. | ESC P | 1BH 50H |
| Local Copy Form Feed | ESC F | 1BH 46H |
| Cancel Print | ESC C | 1BH 43H |
| Refresh Screen | CTRL/W | 17H |
| Toggle Status Line/ |  |  |
|   Toggle Indicators | ESC T | 1BH 54H |
| Toggle Echoplex Enabled | ESC V | 1BH 56H |
| Initialize Terminal | ESC< | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 7EH |

**TeleVideo: 910+ and 912 Terminal Setups**

1. Disconnect the AC power cord from the outlet before opening the TeleVideo terminal case.

2. This section describes how to set the terminal switches on the Televideo 910+ and 912 terminals. Although these two terminals use the same terminal module, their switch settings vary. Therefore, the 910+ switch settings will be covered first, followed by the settings of the 912.

| 910+ S1 (Right Rear) | Set To: | Comments |
|---|---|---|
| 1–4 | — | Baud rate - see chart |
| 5 | DOWN | 8 data bits |
| 6 | ? | UP - Send parity; DOWN - No parity (set to match the converter) |
| 7 | ? | UP - EVEN parity; DOWN - ODD parity (set to match the converter) |
| 8 | DOWN | 1 stop bit (if baud rate is 110, set UP for 2 stop bits) |
| 9 | DOWN | Auto wrap off |
| 10 | DOWN | Auto Linefeed off |

**910+ BAUD RATE**          **SWITCHES**

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 9600 | DOWN | DOWN | DOWN | DOWN |
| 50 | DOWN | DOWN | DOWN | UP |
| 75 | DOWN | DOWN | UP | DOWN |
| 110 | DOWN | DOWN | UP | UP |
| 135 | DOWN | UP | DOWN | DOWN |
| 150 | DOWN | UP | DOWN | UP |
| 300 | DOWN | UP | UP | DOWN |
| 600 | DOWN | UP | UP | UP |
| 1200 | UP | DOWN | DOWN | DOWN |
| 1800 | UP | DOWN | DOWN | UP |
| 2400 | UP | DOWN | UP | DOWN |
| 3600 | UP | DOWN | UP | UP |
| 4800 | UP | UP | DOWN | DOWN |
| 7200 | UP | UP | DOWN | UP |
| 9600 | UP | UP | UP | DOWN |
| 19200 | UP | UP | UP | UP |

**910+ S1 (Left Rear)  Set To:**      **Comments**

| | | |
|---|---|---|
| 1 | DOWN | Sets Conversational Mode |
| 2 | DOWN | Sets Full Duplex |
| 3 | ? 50 Hz - DOWN (foreign); 60 Hz - UP (U.S.) | |
| 4 | DOWN | Sets Edit Mode to Duplex |
| 5 | ? UP - Underline cursor; DOWN - Block cursor | |
| 6 | UP | Sets 91 V 920 compatible |
| 7 | ? UP - Green on black; DOWN - Black on green | |
| 8 | UP | No DSR |
| 9 | DOWN | DCD connected |

**910+ S2 (left Resr)**      **Set To:**      **Comments**

| | | |
|---|---|---|
| 10 | DOWN | DTR on with terminal |

The S1 switches on the back panel are used to set the baud rate for communications to the LinkUp 5294. The S3 switches are used to set the Printer Port baud rate. Set one of the following S1 and S3 group switches DOWN for the desired terminal baud rate:

**912 S1/S3 Switches**      **Desired Baud Rate**

| | |
|---|---|
| 2 | 9600 |
| 3 | 4800 |
| 4 | 2400 |
| 5 | 1200 |
| 6 | 600 |
| 7 | 300 |
| 8 | 150 |
| 9 | 75 |
| 10 | 110 |

| 912 S2 (Left Rear) | Set To: | Comments |
|---|---|---|
| 1 | UP | Not used |
| 2 | DOWN | Set Standard Chuacter Set |
| 3 | UP | Full Duplex |
| 4 | ? | 50 Hz - UP (foreign); 60 Hz - DOWN (U.S.) |
| 5 | ? | UP - No Parity; DOWN - Send Parity |
| 6 | DOWN | Send 1 Stop Bit—Note that the terrninal will automatically send 2 Stop Bits if the baud rate is set to 110 bps. |
| 7 | UP | 8 Data bits are defined |
| 8 | UP | Only necessary for Rev. E and lower |
| 9 | ? | UP - EVEN parity; DOWN - ODD parity |
| 10 | ? | UP - Steady cursor; DOWN - Blinking cursor (Rev. E and lowcr usc Jumper W25) |

# NOTE

**To set the S5 switches, you must remove the terminal cover. The S5 group is near the back edge of the circuit board and is labeled S.**

| 912 S5 | Set To: | Comments |
|---|---|---|
| 1 | UP | DSR disconnected |
| 2 | DOWN | DCD connected |
| 3 | OPEN | Used in conjunction with Switch 4 |
| 4 | DOWN | DTR connected |
| 5 | NOT USED | No auxiliary printer support |
| 6-7 | DOWN | RS-232 |

# NOTE

**Jumper (S4/W33) must be installed on the main circuit board to DISABLE the Auto - New Line at column 80.**

3. Replace the cover. Reconnect the AC power cord and connect the terminal to the LinkUp 5294 with a modem or direct-connect cable, as appropriate.

# NOTE:

**The auxiliary port on the 910 Plus and 912 terminals can be used with the LinkUp 5294 Auxiliary Printer facility.**

## F.24 TV925 Terminal Module - TeleVideo 920/925/950

The following list identifies the key sequences defined for the TV925 Terminal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

3. CURSOR DOWN for a 920 terminal is CTRL V.

4. The last position of the screen (Row 24, Column 80) is designed not to display a character. This prevents automatic scrolling.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movement:* | | |
| Character Backspace | CTRL/C | 03H |
| Cursor Up | up arrow | 0BH |
| Cursor Down | down arrow | 16H |
| Cursor Left | left arrow or BACKSPACE | 08H |
| Cursor Right | right arrow | 0CH |
| Field Advance | TAB | 09H |
| Field Baclcspace | BACKTAB | 1BH 49H |
| New Line | LINE FEED | 0AH |
| Fast Left | N.A. | N.A. |
| Fast Right | N.A. | N.A. |
| *Special Control:* | | |
| Error Reset | CTRL/R | 12H |
| Insert Mode | F3 | 01H 42H 0DH |
| | or CHAR INSERT | 1BH 51H |
| Delete  DEL | 7FH | |
| | or CHAR DELETE | 1BH 57H |
| Erase Input | F4 | 01H 43H 0DH |
| Home | HOME | 1EH |
| *Field Exit:* | | |
| Duplicate | F11 | 01H 4AH 0DH |
| Field Minus | F10 | 01H 49H 0DH |
| Field Plus | N.A. | N.A. |
| Field Exit | F9 | 01H 48H 0DH |
| *Aid Generating:* | | |
| Enter | RETURN or ENTER | 0DH |
| Clear | CLEAR SPACE | 1AH |
| Help | F6 | 01H 45H 0DH |
| Print | F5 | 01H 44H 0DH |
| Roll Up | F7 | 01H 46H 0DH |
| Roll Down | F8 | 01H 47H 0DH |
| CMD 1 | ESC 1 | 1BH 31H |
| CMD 2 | ESC 2 | 1BH 32H |
| CMD 3 | ESC 3 | 1BH 33H |
| CMD 4 | ESC 4 | 1BH 34H |
| CMD 5 | ESC 5 | 1BH 35H |
| CMD 6 | ESC 6 | 1BH 36H |
| CMD 7 | ESC 7 | 1BH 37H |
| CMD 8 | ESC 8 | 1BH 38H |
| CMD 9 | ESC 9 | 1BH 39H |
| CMD 10 | ESC 0 | 1BH 30H |
| CMD 11 | ESC - | 1BH 2DH |
| CMD 12 | ESC = | 1BH 3DH |
| CMD 13 | ESC ! | 1BH 21H |
| CMD 14 | ESC @ | 1BH 40H |
| CMD 15 | ESC  # | 1BH 23H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| CMD 16 | ESC $ | IBH24H |
| CMD 17 | ESC % | 1BH 25H |
| CMD 18 | ESC ^ | 1BH 5EH |
| CMD 19 | ESC & | 1BH 26H |
| CMD 20 | ESC * | 1BH 2AH |
| CMD 21 | ESC ( | 1BH 28H |
| CMD 22 | ESC ) | 1BH 29H |
| CMD 23 | ESC _ | 1BH 5FH |
| CMD 24 | ESC + | 1BH 2BH |

*Special Host:*

| | | |
|---|---|---|
| System Request | F1 | 01H 40H 0DH |

*Signal:*

| | | |
|---|---|---|
| Attn | F2 | 01H 41H 0DH |

*Extended Function:*

| | | |
|---|---|---|
| Local Device Print | ESC P | 1BH 50H |
| Local Printer Form Feed | ESC F | 1BH 46H |
| Cancel Print | ESC C | 1BH 43H |
| Refresh Display | CTRL/W | 17H |
| Toggle Status Line/ Toggle Indicators | ESC T | 1BH 54H |
| Toggle Echoplex Enabled | ESC \| | 1BH 7CH |
| Initialize Terminal | ESC < | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 7EH |

**TeleVideo: 920, 925, snd 950 Terminal Setups**

1. Disconnect the AC power cord from the outlet before opening the TeleVideo 925 case.

2. This section describes how to set the terminal switches on the TeleVideo 920, 925, and 950 terminals. Although these three terminals use the same module, their switch settings vary. Thereforc, the 920 settings will be covered first, followed by the 925 and 950 settings.

   The switches on the 920 terminal are identical to those of the 912 terminal.

   Both the 92S and 9SO terminals have a Setup Mode available to you for the setting of some of the terminals' options. All of their options can be set by each of the terminal's switches or by the initialization procedure of the LinkUp 5294.

# CAUTION

**You must be very careful when using Setup Mode. It could be detrimental to the terminal's operation with the LinkUp 5294.**

| Sl (Right Rear) | Set To: | Comments |
|---|---|---|
| 1-4 | — | Sets the baud rate of the main port (see the baud rates list). |
| 5 | DOWN | Sets 8-bit word. |
| 6 | DOWN | Sets 1 stop bit. For all baud rates less than or equal to 110 bps 2 stop bits are recommended. |
| 7-10 | | This sets the baud rate of the printer port. See the following table on setting baud rates. |

| 925+ BAUD RATE | SWITCHES | | | | 950+ BAUD RATE |
|---|---|---|---|---|---|
| | 1/7 | 2/8 | 3/9 | 4/10 | |
| 9600 | DOWN | DOWN | DOWN | DOWN | 9600 |
| 50 | DOWN | DOWN | DOWN | UP | 1200 |
| 75 | DOWN | DOWN | UP | DOWN | 135 |
| 110 | DOWN | DOWN | UP | UP | 4800 |
| 135 | DOWN | UP | DOWN | DOWN | 75 |
| 150 | DOWN | UP | DOWN | UP | 2400 |
| 300 | DOWN | UP | UP | DOWN | 300 |
| 600 | DOWN | UP | UP | UP | 9600 |
| 1200 | UP | DOWN | DOWN | DOWN | 50 |
| 1800 | UP | DOWN | DOWN | UP | 1800 |
| 2400 | UP | DOWN | UP | DOWN | 150 |
| 3600 | UP | DOWN | UP | UP | 7200 |
| 4800 | UP | UP | DOWN | DOWN | 110 |
| 7200 | UP | UP | DOWN | UP | 3600 |
| 9600 | UP | UP | UP | DOWN | 600 |
| 19200 | UP | UP | UP | UP | 19200 |

| Sl (Left Rear) | Set To: | Comment s |
|---|---|---|
| 1 | 925 - DOWN;950-UP | Sct to Duplex edit mode |
| 2 | DOWN | 925 - Non-912/920 emulation<br>950 - Cursor display steady |
| 3, 4, 5 | No Parity<br>Odd Parity<br>Even Parity<br>Mark Parity<br>Space Parity | 3=DOWN, 4=DOWN, 5=DOWN<br>3=DOWN, 4=DOWN, 5 UP<br>3=DOWN, 4=UP, 5=UP<br>3=UP, 4=DOWN, 5=UP<br>3=UP, 4=UP, 5=UP |
| 6 | UP | Set normal block character on a black screen |
| 7, 8 | 925<br>UP, DOWN<br>950<br>DOWN, UP | Full-duplex transmission |
| 9 | ? | DOWN = 50 Hz, UP= 60 Hz |
| 10 | 925 = DOWN<br>950 - ? | No auto linefeed<br>UP = Key click OFF<br>DOWN = Key click ON |

On the 925 only, there are 10 toggle-type switches that are only accessible by removing the terminal cover. They are labeled as S3 switches and should be set to the following values:

| 935 S3 Switches | Set To: | Comments |
|---|---|---|
| 1 | ? | UP = Keyclick OFF |
| | | DOWN = Key click ON |
| 2, 3 | DOWN | Set the language to ENGLISH |
| | DOWN | |
| 4 | ? | DOWN = blinking cursor |
| | | UP = steady cursor |
| 5 | ? | DOWN = block cursor |
| | | UP = underline cursor |
| 6 | DOWN | Time-out blank option disabled |
| 7 | UP | Page attributes function enabled, Line attributes function disabled |
| 8 | DOWND | CD connected |
| 9 | UP | DSR disconnected |
| 10 | DOWN | DTR connected |

3. Replace the cover, reconnect the AC power cord, and connect the terminal to the converter with a modem or direct-connect cable, as appropriate.

## NOTE

**The auxiliary port on the 920, 925, and 950 terminals can be used with the LinkUp 5294 Auxiliary Printer facility. However, be aware that the 925 terminal passes the select/deselect sequence (CTRL/T and ESC/A) transmitted by the LinkUp 5294 to determine whether the auxiliary printer facility will be used, through its auxiliary port, to the attached printer. If the printer interprets this sequence as a command, the printer's operation will be adversely affected.**

## F.25 TV970 Terminal Module - TeleVideo TV-970

The following list identifies the key sequences defined for the TV970 Terminal Module.

1. Press <CTRL> concurrently with indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movement:* | | |
| Character Backspace | CTRL/H | 08H |
| Cursor Up | up arrow | 1BH 5BH 41H |
| Cursor Down | down arrow | 1BH 5BH 42H |
| Cursor Left | left arrow | 1BH 5BH 44H |
| Cursor Right | right arrow | 1BH 5BH 43H |
| Field Advance | TAB | 09H |
| Field Backspace | BACKTAB | 1BH 5BH 5AH |
| New Line | LINE INSERT | 1BH 5BH 4CH |
| | or LINEFEED | 0AH |
| Fast Left | N.A. | N.A. |
| Fast Right | N.A. | N.A. |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|

*Special Control:*

| | | |
|---|---|---|
| Error Reset | CTRL/R | 12H |
| | or F5 | 1BH 3FH 6FH |
| Insert Mode | CHARACTER INSERT | 1BH 5BH 40H |
| | or F2 | 1BH 3FH 62H |
| Delete | DEL | 7FH |
| | or SHIFT/F2 | 1BH 3FH 42H |
| Erase Input | PAGE INSERT | 1BH 5BH 4AH |
| | or SHIFT/F3 | 1BH 3FH 43H |
| Home | HOME | 1BH 5BH 48H |
| | or F3 | 1BH 3FH 63H |

*Field Exit:*

| | | |
|---|---|---|
| Duplicate | CTRL/D | 04H |
| | or F16 | 1BH 3FH 70H |
| Field Minus | CTRL/F | 06H |
| Field Plus | N.A. | N.A. |
| Field Exit | CTRL/X | 18H |

*Aid Generating:*

| | | |
|---|---|---|
| Enter | RETURN | 0DH |
| Clear | PAGE ERASE | 1BH 5BH 4DH |
| Help | ESC  H | 1BH 48H |
| | or F6 | 1BH 3FH 66H |
| Print | CTRL/P | 10H |
| | or F4 | 1BH 3FH 64H |
| Roll Up | ESC M | 1BH 4DH |
| Roll Down | ESC D | 1BH 44H |
| CMD 1 | ESC 1 | 1BH 31H |
| CMD 2 | ESC 2 | 1BH 32H |
| CMD 3 | ESC 3 | 1BH 33H |
| CMD 4 | ESC 4 | 1BH 34H |
| CMD 5 | ESC 5 | 1BH 35H |
| CMD 6 | ESC 6 | 1BH 36H |
| CMD 7 | ESC 7 | 1BH 37H |
| CMD 8 | ESC 8 | 1BH 38H |
| CMD 9 | ESC 9 | 1BH 39H |
| CMD 10 | ESC 0 | 1BH 30H |
| CMD 11 | ESC - | 1BH 2DH |
| CMD 12 | ESC = | 1BH 3DH |
| CMD 13 | ESC ! | 1BH 21H |
| CMD 14 | ESC @ | 1BH 40H |
| CMD 15 | ESC # | 1BH 23H |
| CMD 16 | ESC $ | 1BH 24H |
| CMD 17 | ESC % | 1BH 25H |
| CMD 18 | ESC ^ | 1BH 5EH |
| CMD 19 | ESC & | 1BH 26H |
| CMD 20 | ESC * | 1BH 2AH |
| CMD 21 | ESC ( | 1BH 28H |
| CMD 22 | ESC ) | 1BH 29H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| CMD 23 | ESC _ | 1BH 5FH |
| CMD 24 | ESC + | 1BH 2BH |

*Special Host:*

| | | |
|---|---|---|
| System Request | ESC S | 1BH 53H |
| | or SHIFT/Fl | 1BH 3FH 41H |

*Signal:*

| | | |
|---|---|---|
| Attn | ESC A | 1BH 41H |
| | or Fl | 1BH 3FH 61H |

*Extended Function:*

| | | |
|---|---|---|
| Local Copy Print Req. | F9 | 1BH 3FH 69H |
| Local Copy Form Feed | F10 | 1BH 3FH 6AH |
| Cancel Print | SHIFT/F4 | 1BH 3FH 44H |
| Refresh Screen | F7 | 1BH 3FH 67H |
| Toggle Status Line/ Toggle Indicators | F8 | 1BH 3FH 68H |
| Toggle Echoplex Enabled | F11 | 1BH 3FH 6BH |
| Initialize Terminal | ESC < | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 3EH |

**TeleVideo: TV970 Terminal Setup**

All operator-selected parameters are input from the keyboard through the TV-970 setup mode; there are no external switches.

1. To enter Setup mode, press  SETUP. A Setup Menu will appear on the terminal's screen. To exit Setup mode, press SETUP a second time. To save the reset parameter values permanently (as opposed to allowing them to revert to previous values following the current session), press CTRL and S before exiting Setup mode. Set the terminal's parameters as follows:

| Identifier | Value | Comments |
|---|---|---|
| COMM | CNV | Conversational mode |
| DUPLX | FDX | Full-Duplex communication |
| SEND/RCV | NO ECHO | Local terminal echo turned off |
| BAUD (MAIN) | ? | Main port baud rate |
| PARITY (MAIN) | ? | Main port parity |
| DATA BITS (MAIN) | ? | Main port word size |
| STOP BIT (MAlN) | ? | Main port stop bit(s) |
| RCV CTRL | ? | Set to match flow control on the LinkUp 5294. |
| XMIT CTRL (MAIN) | ? | Set to match flow control on the LinkUp 5294. |
| BAUD (PRINT) | ? | Printer port baud rate |
| PARlTY (PRIN'TER ) | ? | Printer port parity |
| DATA BITS (PRINTER) | ? | Printer port word size |
| STOP BIT (PRINTER) | ? | Printer port stop bit(s) |
| XMIT CTRL (PRINTER) | ? | Set to match flow control on printer being used |
| PRINT STAT | BUF | Buffered transparent print selected |

| Identifier | Value | Comments |
|---|---|---|
| INS CHAR | N A. | The character which replaces erased data on the screen (three-character decimal value) |
| INS/RPL | N.A | Insert ovcrwrites/moves current data |
| CTRL REP | PROC | Terminal processes commands received from the host |
| AUTOPG | N A. | Screen pages/scrolls when cursor goes beyond 24th line |
| AUTOWRAP | NO WRAP | Autowrap disabled |
| EDIT BOUND | N.A | Screen/page editing capability |
| EDlTING EXT | DSPL | Permits insert/delete to affect full screen |
| HORZ EDIT | N A. | Insert/delete comrnands affect data to right/left of cursor |
| VERT EDIT | N.A | Insert/delete commaods affect data above/below cursor line |
| AUTOTAB | N.A. | Cursor moves/does not move into a "guarded area" |
| GUARDED XFER | ALL | All areas are transmitted and printed as they are displayed |
| MULTI-AREA XFER | ALL | Allows an unguarded field to be transmitted |
| XFER TERM | FULL | Defines the data to be transferred as entire page of memory |
| LN XFER | PG | Transmits through cursor or end-of-page |
| XFER EXEC | DEFER | SEND key transmit sequence |
| PG XFER | PG | Allows the entire page to be transmitted |
| CHAR/LN | 132 | Allows terminal to display lines of length 132 characters |
| LN/PG | 24 | Defines terminal page length as 24 lines |
| SCRN BACK | ? | Displays light on dark or dark on light |
| SCRN SAVER | ? | Screen turns off after n minutes if idle |
| SCROLL | ? | Rate of terminal data display |
| 25TH LINE | ? | Use of 25th line; blank, status, or message |
| 1ST CHAR SET | U.S. | U.S. ASCII (only setting) |
| 2ND CHAR SET | U.K. | U.K. ASCII (only setting) |
| LF/NEW LN | LN FEED | LINE FEED key generates only LF (=0AH), RETURN generates only CR(=0DH) |
| CURSOR STYLE | ? | Manner of cursor display |
| NORMAL ATTR | HIGH | Normal intensity is defined to be the higher of the two intensities |
| LN ATTR | NOR | Single-height, single-width character display |
| POWER/HZ | ? | 50 Hz or 60 Hz |
| KEYCLICK | ? | Audible or Inaudible |
| BREAK KEY | IGNORE | BREAK key is ignored when pressed |

## F.26 VIEWP Terminal Module - ADDS Viewpoint/Regent

The following list identifies the key sequences defined for the VIEWP Terminal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

3. The last position of the screen (Row 24, Column 80) is designed to not display a character. This prevents automatic scrolling.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|

*Cursor Movement:*

| | | |
|---|---|---|
| Character Backspace | BACKSPACE | 08H |
| Cursor Up | up arrow | AH |
| Cursor Down | down arrow | 0AH |
| Cursor Left | left arrow | 15H |
| Cursor Right | right arrow | 06H |
| Field Advance | TAB | 09H |
| Field Backspace | CTRL/X | 18H |
| | or F5 | 02H 35H |
| New Line | F3 | 02H 33H |
| Fast Left | N.A. | N.A. |
| Fast Right | N.A. | N.A. |

*Special Control:*

| | | |
|---|---|---|
| Error Reset | CTRL/R | 12H |
| Insert Mode | ESC I | 1BH 49H |
| | or F4 | 02H 34H |
| Delete | DEL | 7FH |
| Erase Input | CTRL/E | 05H |
| Home | HOME | 1EH |

*Field Exit:*

| | | |
|---|---|---|
| Duplicate | CTRL/D | 04H |
| | or F6 | 02H 36H |
| Field Minus | F2 | 02H 32H |
| Field Plus | N.A. | N.A. |
| Field Exit | F1 | 02H31H |

*Aid Generating:*

| | | |
|---|---|---|
| Enter | ENTER | ODH |
| Clear | ESC BACKSPACE | lBH 08H |
| Help | ESC H | lBH48H |
| Print | CTRL/P | lOH |
| Roll Up | ESC U | lBH SSH |
| | or F7 | 02H 37H |
| Roll Down | ESC D | lBH44H |
| | or F8 | 02H 38H |
| CMD 1 | ESC 1 | 1BH 31H |
| CMD 2 | ESC 2 | 1BH 32H |
| CMD 3 | ESC 3 | 1BH 33H |
| CMD 4 | ESC 4 | 1BH 34H |
| CMD 5 | ESC 5 | 1BH 35H |
| CMD 6 | ESC 6 | 1BH 36H |
| CMD 7 | ESC 7 | 1BH 37H |
| CMD 8 | ESC 8 • | 1BH 38H |
| CMD 9 | ESC 9 | 1BH 39H |
| CMD 1 | ESC 0 | 1BH 30H |
| CMD 11 | ESC - | 1BH 2DH |
| CMD 12 | ESC = | 1BH 3DH |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| CMD 13 | ESC ! | 1BH 21H |
| CMD 14 | ESC@ | 1BH 40H |
| CMD l5 | ESC # | 1BH 23H |
| CMD 16 | ESC $ | 1BH 24H |
| CMD 17 | ESC % | 1BH 25H |
| CMD 18 | ESC ^ | 1BH 5EH |
| CMD 19 | ESC & | 1BH 26H |
| CMD 20 | ESC * | 1BH 2AH |
| CMD 21 | ESC ( | 1BH 28H |
| CMD 22 | ESC ) | 1BH 29H |
| CMD 23 | ESC_ | 1BH 5FH |
| CMD 24 | ESC + | 1BH 2BH |

*Special Host:*

| | | |
|---|---|---|
| System Request | ESC S | 1BH 53H |

*Signal:*

| | | |
|---|---|---|
| Attn | ESC A | 1BH 41H |

*Extended Function:*

| | | |
|---|---|---|
| Local Copy Print Req. | ESC P | 1BH 50H |
| Local Printer Form Feed | ESC F | 1BH 46H |
| Cancel Print | ESC C | 1BH 43H |
| Refresh Display | CTRL/W | 17H |
| Toggle Status Line/<br>  Toggle Indicators | ESC T | 1BH 54H |
| Toggle Echoplex Enabled | CTRL/V | 16H |
| Initialize Terminal | ESC < | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 7EH |

**ADDS: Viewpoint and Regent Terminal Setups**

Information on the Regent terminal switch settings was not available at the time this document was published. Please refer to the manufacturer's user's manual or contact your supplier.

To set up the Viewpoint terminal for connection to the LinkUp 5294, proceed as follows:

1. Disconnect the AC power cord before removing the cover of the terminal.

2. There are 8 option switches on the right rear of the terminal. Set them as follows:

| Sl (Right Rear) | Set To: | Comments |
|---|---|---|
| 1–3 | ? | See baud rate list |
| 4 | 0 | Auto scroll disabled |
| 5 | 0 | Auto line feed disabled |
| 6 | 1 | Full duplex |
| 7, 8 | ? | Parity  7     8 |
| | | ODD    0     0 |
| | | EVEN  0     1 |
| | | MARK 1     0 |
| | | SPACE 1     1 |

| BAUD RATE | Sl-l | SWITCHES S1-2 | S1-3 |
|-----------|------|------|------|
| 110 | 0 | 0 | 0 |
| 150 | 0 | 0 | 1 |
| 300 | 0 | 1 | 0 |
| 1200 | 0 | 1 | 1 |
| 2400 | 1 | 0 | 0 |
| 4800 | 1 | 0 | 1 |
| 9600 | 1 | 1 | 0 |
| 19200 | 1 | 1 | 1 |

3. There are 8 option switches located inside the Viewpoint on the main printed circuit board. The cover must be removed to set them. The switch group is labeled as S2 and is a few inches up from and to the right of the RS-232 connectors.

| S2 (Internal) | Set To: | Comments |
|---------------|---------|----------|
| 1 | ? | 0 = White on black |
|   |   | 1 = Black on white |
| 2 | 0 | Disable parity error display |
| 3 | ? | 0 = 60 Hz, 1= 50 Hz |
| 4, 5, 6 | 0 | U. S. character set |
| 7 | ? | 0 = Steady cursor |
|   |   | 1 = Blinking cursor |
| 8 | ? | 0 = Block cursor |
|   |   | 1 = Underline cursor |

4. Replace the cover, reconnect the AC power cord, and connect the terminal to the LinkUp 5294 with a modem or direct-connect cable, as appropriate.

# NOTE

**The auxiliary port on the Viewpoint terminal can be used with the LinkUp 5294 Auxiliary Printer facility.**

**Use of X-ON as the flow control from the LinkUp 5294 may cause garbled screens doing large insert or delete operations on this terminal. For this reason, we recommend that you select NONE as the flow control from the LinkUp 5294 ports uisng this terminal.**

**The function keys available on some Regent terminals are not currently supported.**

## F.27 VP60 Terminal Module - ADDS Viewpoint 60

The following list identifies the key sequences defined for the VP60 Terminal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

| 5250 Function | Key Sequence | Hex Value Generated |
|---------------|--------------|---------------------|
| *Cursor Movement* | | |
| Character Backspace | BACKSPACE | 08H |
| Cursor Up | up arrow | 1AH |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| Cursor Down | down arrow | 0AH |
| Cursor Left | left arrow | 15H |
| Cursor Right | right arrow | 06H |
| Field Advance | CTRL/I | 09H |
|  | or TAB | 09H |
| Field Backspace | CTRL/X | 18H |
| New Line | F3 | 02H 33H |
| Fast Left | N.A. | N.A. |
| Fast Right | N.A. | N.A. |

*Special Control:*

| | | |
|---|---|---|
| Error Reset | CTRL/R | 12H |
| Insert Mode | ESC I | 1BH 49H |
| Delete | DEL | 7FH |
| Erase Input | CTRL/E | 05H |
| Home | HOME | 1EH |

*Field Exit:*

| | | |
|---|---|---|
| Duplicate | CTRL/D | 04H |
| Field Minus | F2 | 02H 32H |
| Field Plus | N.A. | N. A. |
| Field Exit | F1 | 02H 31H |

*Aid Generating:*

| | | |
|---|---|---|
| Enter | ENTER | 0DH |
| Clear | ESC BACKSPACE | 1BH 08H |
| Help | ESC H | 1BH 48H |
| Print | CTRL/P | 10H |
| Roll Up | ESC U | 1BH 55H |
| Roll Down | ESC D | 1BH 44H |
| CMD 1 | ESC 1 | 1BH 31H |
| CMD 2 | ESC 2 | 1BH 32H |
| CMD 3 | ESC 3 | 1BH 33H |
| CMD 4 | ESC 4 | 1BH 34H |
| CMD 5 | ESC 5 | 1BH 35H |
| CMD 6 | ESC 6 | 1BH 36H |
| CMD 7 | ESC 7 | 1BH 37H |
| CMD 8 | ESC 8 | 1BH 38H |
| CMD 9 | ESC 9 | 1BH 39H |
| CMD 10 | ESC 0 | 1BH 30H |
| CMD 11 | ESC - | 1BH 2DH |
| CMD 12 | ESC = | 1BH 3DH |
| CMD 13 | ESC ! | 1BH 21H |
| CMD 14 | ESC@ | 1BH 40H |
| CMD 15 | ESC # | 1BH 23H |
| CMD 16 | ESC $ | 1BH 24H |
| CMD 17 | ESC % | 1BH 2SH |
| CMD 18 | ESC ^ | 1BH 5EH |
| CMD 19 | ESC & | 1BH 26H |
| CMD 20 | ESC * | 1BH 2AH |

| **5250 Function** | **Key Sequence** | **Hex Value Generated** |
|---|---|---|
| CMD 21 | ESC ( | 1BH 28H |
| CMD 22 | ESC ) | 1BH 29H |
| CMD 23 | ESC _ | 1BH 5FH |
| CMD 24 | ESC + | 1BH 2BH |

*Special Host:*

| System Request | ESC S | 1BH 53H |
|---|---|---|

*Signal:*

| Attn | ESC A | 1BH 41H |
|---|---|---|

*Extended Function:*

| Local Copy Print Req. | ESC P | 1BH 50H |
|---|---|---|
| Local Copy Form Feed | ESC F | 1BH 46H |
| Cancel Print | ESC C | 1BH 43H |
| Refresh Screen | CTRL/W | 17H |
| Toggle Status Line/ Toggle Indicators | ESC T | 1BH 54H |
| Toggle Echoplex Enabled | CTRL/V | 16H |
| Initialize Terminal | ESC < | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 7EH |

**ADDS: VIEWPOINT/60 Terminal Setup**

All operator-selected options are input from the keyboard into the Setup Mode Status Line; there are no external switches.

1. Call up the Status Line by pressing <SHIFT> and <HOME> simultaneously. A line containing four option banks of eight bits each will appear on the screen. Set the option values as follows:

| **Option Bank 1 Value** | | **Comments** |
|---|---|---|
| 1–4 | ? | Main Port Baud Rate (see list below) |
| 5–8 | ? | Auxiliary Port Baud Rate (see list below) |

| **BAUD RATE** | **BIT SETTINGS** 1/5 | 2/6 | 3/7 | 4/8 |
|---|---|---|---|---|
| 110 | 0 | 0 | 0 | 0 |
| 150 | 0 | 0 | 0 | 1 |
| 300 | 0 | 0 | 1 | 0 |
| 1200 | 0 | 0 | 1 | 1 |
| 1800 | 0 | 1 | 0 | 0 |
| 2400 | 0 | 1 | 0 | 1 |
| 4800 | 0 | 1 | 1 | 0 |
| 9600 | 0 | 1 | 1 | 1 |
| 19200 | 1 | 0 | 0 | 0 |

| Option Bank 2 Value | | Comments |
|---|---|---|
| 1 | 1 | Full Duplex |
| 2 | ? | 0 - Dark Char. on Light Screen |
| | | 1 - Light Char. on Dark Screen |
| 3 | 1 | Video highlight at full intensity |
| 4 | 0 | Auto Scroll disabled |
| 5 | 0 | Auto Linefeed disabled |
| 6 | 0 | Disable Parity Error Display |
| 7, 8 | ? | Parity  7        8 |
| | | ODD    0        0 |
| | | EVEN   0        1 |
| | | MARK   1        0 |
| | | SPACE  1        1 |

| Option Bank 3 Value | | Comments |
|---|---|---|
| 1 | ? | 0 = 60 Hz, 1 = 50 Hz |
| 2 | 0 | Cursor visible |
| 3 | ? | 0 = Block, 1 = Underline Cursor |
| 4 | ? | 0 = Blink, 1 = Steady Cursor |
| 5, 6 | 0, 0 | Upper/Lower case characters |
| 7, 8 | 0, 0 | Line terminator character = CR |

| Option Bank 4 Value | | Comments |
|---|---|---|
| 1 | Reserved | |
| 2 | 1 | Cursor home at upper left enabled |
| 3 | ? | 0 = Keyclick disabled |
| | | 1 = enabled |
| 4-6 | Reserved | |

| Option Bank 4 Value | | Comments |
|---|---|---|
| 7 | 0 | Regent 40 mode disabled |
| 8 | Reserved | |

2. Connect the terminal to the LinkUp 5294 with a modem or direct-connect cable, as appropriate.

# NOTE

**The auxiliary port on the Viewpoint/60 terminal can be used with the LinkUP 5294 Auxiliary Printer facility.**

## F.28 VT52 Terminal Module - DEC VT52

The following list identifies the key sequences defined for the VT52 Terminal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

3. NK indicates the indicated key is found in the Numeric Keypad at the lower right of the keyboard. The LinkUp 5294 sets this keypad to Alternate Keypad Mode. (Refer to the VT52X Module if you are using terminals emulating the VT52 terminal but without a numeric keypad.)

4. The last position of the screen (Row 24, Column 80) is designed not to display a character. This prevents automatic scrolling.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|

*Cursor Movement:*

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| Character Backspace | BACKSPACE | 08H |
| Cursor Up | up arrow | 1BH 41H |
| Cursor Down | down arrow | 1BH 42H |
| Cursor Left | left arrow | 1BH 44H |
| Cursor Right | right arrow | 1BH 43H |
| Field Advance | TAB | 09H |
| Field Backspace | PF3 | 1BH 52H |
| New Line | LINE FEED | 0AH |
| Fast Left | N A. | N.A. |
| Fast Right | N.A. | N.A. |

*Special Control:*

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| Error Reset | CTRL/R | 12H |
| Insert Mode | NK 7 | 1BH 3FH 77H |
| Delete | DELETE | 7FH |
| Erase Input | NK 6 | 1BH 3FH 76H |
| Home | NK 8 | 1BH 3FH 78H |

*Field Exit:*

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| Duplicate | NK . | 1BH 3FH 6EH |
| Field Minus | NK 0 | 1BH 3FH 70H |
| Field Plus | NK, | 1BH 3FH 6CH |
| Field Exit | RETURN | 0DH |

*Aid Generating:*

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| Enter | NK ENTER | 1BH 3FH 4DH |
| Clear | NK 3 | 1BH 3FH 73H |
| Help | NK 5 | 1BH 3FH 75H |
| Print | NK 4 | 1BH 3FH 74H |
| Roll Up | NK 1 | 1BH 3FH 71H |
| Roll Down | NK 2 | 1BH 3FH 72H |
| CMD 1 | ESC 1 | 1BH 31H |
| CMD 2 | ESC 2 | 1BH 32H |
| CMD 3 | ESC 3 | 1BH 33H |
| CMD 4 | ESC 4 | 1BH 34H |
| CMD 5 | ESC 5 | 1BH 35H |
| CMD 6 | ESC 6 | 1BH 36H |
| CMD 7 | ESC 7 | 1BH 37H |
| CMD 8 | ESC 8 | 1BH 38H |
| CMD 9 | ESC 9 | 1BH 39H |
| CMD 10 | ESC 0 | 1BH 30H |
| CMD 11 | ESC - | 1BH 2DH |
| CMD 12 | ESC = | 1BH 3DH |
| CMD 13 | ESC ! | 1BH 21H |
| CMD 14 | ESC~ | 1BH 40H |
| CMD 15 | ESC # | 1BH 23H |
| CMD 16 | ESC $ | 1BH 24H |
| CMD 17 | ESC % | 1BH 25H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| CMD 18 | ESC ^ | 1BH 5EH |
| CMD 19 | ESC & | 1BH 26H |
| CMD 20 | ESC * | 1BH 2AH |
| CMD 21 | ESC ( | 1BH 28H |
| CMD 22 | ESC ) | 1BH 29H |
| CMD 23 | ESC _ | 1BH 5FH |
| CMD 24 | ESC + | 1BH 2BH |

*Special Host:*

| | | |
|---|---|---|
| System Request | PF1 | 1BH 50H |

*Signal:*

| | | |
|---|---|---|
| Attn | PF2 | 1BH 51H |

*Extended Function:*

| | | |
|---|---|---|
| Local Copy Print Req. | CTRL/P | 10H |
| Local Printer Form Feed | CTRL/F | 06H |
| Cancel Print | CTRL/K | 0BH |
| Refresh Display | CTRL/W | 17H |
| Toggle Status Line/ Toggle lndicators | CTRL/T | 14H |
| Toggle Echoplex Enabled | CTRL/V | 16H |
| Initialize Terminal | ESC < | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 3EH |

**DEC VT52 Terminal Setup**

Information on the VT52 terminal switch settings was not available at the time this document was published. Please refer to the VT52 user's manual or contact your supplier.

## F.29 VT52X Terminal Module - DEC VT-52 Emulators

The following list identifies the key sequences defined for the VT52X Terminal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated a1pha key.

3. The last position of the screen (Row 24, Column 80) is designed not to display a character. This prevents an auto-saoll capability.

4. Refer to the VT52 Terminal Module for terminals emulating a VT52, but equipped with a numeric keypad.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|

*Cursor Movement:*

| | | |
|---|---|---|
| Character Backspace | BACKSPACE | 08H |
| Cursor Up | up arrow | 1BH 41H |
| Cursor Down | down arrow | 1BH 42H |
| Cursor Left | left arrow | 1BH 44H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| Cursor Right | right arrow | 1BH 43H |
| Field Advance | TAB | 09H |
| Field Backspace | CTRL/B | 02H |
| New Line | CTRL/N | 0EH |
| Fast Left | N.A. | N.A. |
| Fast Right | N.A. | N.A. |

*Special Control:*

| | | |
|---|---|---|
| Error Reset | CTRL/R | 12H |
| Insert Mode | CTRL/J | 15H |
| Delete | DEL | 7FH |
| Erase Input | CTRL/E | 05H |
| Home | ESC H | 1BH 48H |

*Field Exit:*

| | | |
|---|---|---|
| Duplicate | CTRL/D | 04H |
| Field Minus | CTRL/F | 06H |
| Field Plus | N.A. | N.A. |
| Field Exit | CTRL/X | 18H |

*Aid Generating:*

| | | |
|---|---|---|
| Enter | ENTER | 0DH |
| Clear | CTRL/Z | 1AH |
| Help | ESC L | 1BH 4CH |
| Print | CTRL/P | 10H |
| Roll Up | ESC U | 1BH 55H |
| Roll Down | ESC R | 1BH 52H |
| CMD 1 | ESC 1 | 1BH 31H |
| CMD 2 | ESC 2 | 1BH 32H |
| CMD 3 | ESC 3 | 1BH 33H |
| CMD 4 | ESC 4 | 1BH 34H |
| CMD 5 | ESC 5 | 1BH 35H |
| CMD 6 | ESC 6 | 1BH 36H |
| CMD 7 | ESC 7 | 1BH 37H |
| CMD 8 | ESC 8 | 1BH 38H |
| CMD 9 | ESC 9 | 1BH 39H |
| CMD 10 | ESC 0 | 1BH 30H |
| CMD 11 | ESC - | 1BH 2DH |
| CMD 12 | ESC = | 1BH 3DH |
| CMD 13 | ESC ! | 1BH 21H |
| CMD 14 | ESC@ | 1BH 40H |
| CMD 15 | ESC # | 1BH 23H |
| CMD 16 | ESC $ | 1BH 24H |
| CMD 17 | ESC % | 1BH 25H |
| CMD 18 | ESC ^ | 1BH 5EH |
| CMD 19 | ESC & | 1BH 26H |
| CMD 20 | ESC * | 1BH 2AH |
| CMD 21 | ESC ( | 1BH 28H |
| CMD 22 | ESC ) | 1BH 29H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| CMD 23 | ESC _ | 1BH 5FH |
| CMD 24 | ESC + | 1BH 2BH |

*Special Host*

| | | |
|---|---|---|
| System Request | ESC S | 1BH 53H |

*Signal:*

| | | |
|---|---|---|
| Attn | ESC E | 1BH 45H |

*Extended Function:*

| | | |
|---|---|---|
| Local Copy Print Req. | ESC P | 1BH 50H |
| Local Copy Form Feed | ESC F | 1BH 46H |
| Cancel Print | ESC X | 1BH 58H |
| Refresh Screen | CTRL/W | 17H |
| Toggle Status Line/ | | |
| Toggle Indicators | ESC T | 1BH 54H |
| Toggle Echoplex Enabled | CTRL/V | 16H |
| Initialize Terminal | ESC < | 1BH 3CH |
| Request Disconnect | ESC> | 1BH 3EH |

**VT52 Emulation (w/o Numeric Keypad) Terminal Setup**

To support those terminals and software packages providing emulation of a VT52 terminal without a numeric keypad, the VT52X Terminal Module was designed. The setup of any such terminal depends on the particular terminal being used. Please refer to the manufacturer's user's manual or contact your supplier.

## F.30 VT100 Terminal Module - DEC VT100

The following list identifies the key sequences defined for the VT100 Terminal Module.        .

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

3. NK indicates the indicated key is found in the Numeric Keypad at the lower right of the keyboard. The LinkUp 5294 sets this keypad to Alternate Keypad Mode. (Refer to the ANSI Terminal Module for VT100 terminals and compatibles complying with the ANSI Standard 3.64, but without a numeric keypad.)

4. The last position of the screen (Row 24, Column 80) is designed not to display a character. This prevents automatic scrolling.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|

*Cursor Movement*

| | | |
|---|---|---|
| Character Backspace | PF1 | 1BH 4FH 50H |
| | or BACKSPACE | 08 |
| Cursor Up | up arrow | 1BH 5BH 41H |
| Cursor Down | down arrow | 1BH 5BH 42H |
| Cursor Left | left arrow | 1BH 5BH 44H |
| Cursor Right | right arrow | 1BH 5BH 43H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| Field Advance | TAB | 09H |
| Field Backspace | PF3 | 1BH 4FH 52H |
| New Line | LINE FEED | 0AH |
| Fast Left | N.A. | N A. |
| Fast Right | N.A. | N.A. |

*Special Control:*

| | | |
|---|---|---|
| Error Reset | CTRL/R | 12H |
| Insert Mode | NK 9 | 1BH 4FH 79H |
| Delete | DELETE | 7FH |
| Erase Input | NK 4 | 1BH 4FH 74H |
| Home | NK 5 | 1BH 4FH  75H |

*Field Exit:*

| | | |
|---|---|---|
| Duplicate | PF4 | 1BH 4FH 53H |
| Field Minus | NK - | 1BH 4FH 6DH |
| Field Plus | NK, | 1BH 4FH 6CH |
| Field Exit | RETURN | 0DH |

*Aid Generating:*

| | | |
|---|---|---|
| Enter | NK ENTER | 1BH 4FH 4DH |
| Clear | NK 2 | 1BH 4FH 72H |
| Help | NK 1 | 1BH 4FH 71H |
| Print | NK6 | 1BH 4FH 76H |
| Roll Up | NK 0 | 1BH 4FH 70H |
| Roll Down | NK . | 1BH 4FH 6EH |
| CMD 1 | ESC 1 | 1BH 31H |
| CMD 2 | ESC 2 | 1BH 32H |
| CMD 3 | ESC 3 | 1BH 33H |
| CMD 4 | ESC 4 | 1BH 34H |
| CMD 5 | ESC 5 | 1BH 35H |
| CMD 6 | ESC 6 | 1BH 36H |
| CMD 7 | ESC 7 | 1BH 37H |
| CMD 8 | ESC 8 | 1BH 38H |
| CMD 9 | ESC 9 | 1BH 39H |
| CMD 10 | ESC 0 | 1BH 30H |
| CMD 11 | ESC - | 1BH 2DH |
| CMD 12 | ESC = | 1BH 3DH |
| CMD 13 | ESC ! | 1BH 21H |
| CMD 14 | ESC @ | 1BH 40H |
| CMD 15 | ESC # | 1BH 23H |
| CMD 16 | ESC $ | 1BH 24H |
| CMD 17 | ESC % | 1BH 25H |
| CMD 18 | ESC ^ | 1BH 5EH |
| CMD 19 | ESC & | 1BH 26H |
| CMD 20 | ESC * | 1BH 2AH |
| CMD 21 | ESC ( | 1BH 28H |
| CMD 22 | ESC ) | 1BH 29H |
| CMD 23 | ESC _ | 1BH 5FH |
| CMD 24 | ESC + | 1BH 2BH |

## LINKUP 5294 WITH DL5294 FIRMWARE

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Special Host:* | | |
| System Request | NK 7 | 1BH 4FH 77H |
| *Signal:* | | |
| Attn | NK 8 | 1BH 4FH 78H |
| *Extended Function:* | | |
| Local Copy Print Req. | CTRL/P | 10H |
| Local Copy Form Feed | CTRL/F | 06H |
| Cancel Print | CTRL/C | 03H |
| Refresh Screen | CTRLW | 17H |
| Toggle Status Line/ | | |
| Toggle Indicators | NK 3 | 1BH 4FH 73H |
| Toggle Echoplex Enabled | CTRL/V | 16H |
| Initialize Terminal | ESC < | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 3EH |

**DEC: VT100 Terminal Setup**

1. Set power selector switch to 125 V.

2. Turn on the Power Switch and enable the Software option switches through the keyboard (SETUP B procedure). SETUP B mode may only be entered from SETUP A mode by pressing SETUP twice. This mode contains a series of software keys that tailor the terminal to your operating environment. The following values are recommended to interface with the LinkUp 5294.

| Byte 1 Switches (Bit def. from left to right) | Set To: | Comments |
|---|---|---|
| 1 (SCROLL) | ? | Jump or Smooth Scroll |
| 2 (AUTO REPEAT) | 1 | Set auto-repeat function enabled |
| 3 (SCREEN) | ? | 0 = Dark background |
| | | 1 = Light background |

| Byte 2 Switches (Bit def. from left to right) | Set To: | Comments |
|---|---|---|
| 4 (CURSOR) | ? | 0 = Underline cursor |
| | | 1 = Block Cursor |
| 1 (MARGIN BELL) | — | Enable this option if desired (OFF=0, ON=1) |
| 2 (KEYCLICK) | — | Enable this option if desired (OFF=0, ON=1) |
| 3 (ANSI/VT52) | 0 | Disable VT52 compatible mode |
| 4 (AUTO X-ON/X-OFF) | 0 | Should be disabled |

**Byte 3 Switches
(Bit def. from
left to right)**               **Set To:**          **Comments**

| | | |
|---|---|---|
| 1 (# SWITCH) | 0 | Set to # character |
| 2 (WRAP AROUND) | 0 | Disable automatic wrap-around function |
| 3 (NEW LINE) | 0 | Disable New Line function |
| 4 INTERFACE | 0 | Should be disabled |

**Byte 4 Switches
(Bit def. from
left to right)**               **Set To:**          **Comments**

| | | |
|---|---|---|
| 1 (PARITY SENSE) | — | This switch is only appropriate if Bit 2 is set. If so, ODD PARITY = 0 and EVEN PARITY = 1. |
| 2 (PARITY) | — | Set as desired (OFF = 0, ON = 1). If ON = 1 is set, then Bit 1 must also be set to ODD or EVEN parity. |
| 3 (BITS PER CHAR) | ? | 7 or 8 bits per character. |
| 4 (POWER) | ? | 0 = 60Hz; 1 = 50Hz |

The SETUP B mode screen lets you set the appropriate terminal baud rate. Available baud rates are 50, 75, 110, 134.5, 150, 200, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 9600 and 19.2 kbps. Both the transrnit baud rate and receive baud rate must be set to the same value. The baud rate specified here must match the baud rate for the LinkUp 5294 port to which this terminal is connected. For all baud rates lower than 150 bps (that is, 50, 75, 110, 134.5), the number of stop bits must be 2.

   3. Connect the terminal to the LinkUp 5294 with a modem or direct-connect cable, as appropriate.

## F.31 VT220 Terminal Module

The following list shows how the DEC VT220 keyboard is used in emulation of the 5251 keyboard.

1. Press <CTRL> with the indicated alpha key.
2. Press <ESC> prior to pressing the indicated alpha key.

| **5250 Function** | **Key Sequence** | **Hex Value Generated** |
|---|---|---|
| *Cursor Movement* | | |
| Character Backspace | BACKSPACE | 08H |
| | or RUBOUT | 07H |
| Cursor Up | up arrow | 1BH 5BH 41H |
| Cursor Down | down arrow | 1BH 5BH 42H |
| Cursor Left | left arrow | 1BH 5BH 44H |
| Cursor Right | right arrow | 1BH 5BH 43H |
| Field Advance | TAB | 09H |
| Field Backspace | F12 | 1BH 5BH 32HY 34H 7EH |
| New Line | FIND | 1BH 5BH 31H 7EH |
| Fast Left | CTRL/Z | 1AH |
| Fast Right | CTRL/X | 18H |

## LINKUP 5294 WITH DL5294 FIRMWARE

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|

*Special Control*

| | | |
|---|---|---|
| Error Reset | F17 | 1BH 5BH 33H 31H 7EH |
| | or CTRL/R | 12H |
| Insert Mode | F8 | 1BH 5BH 31H 39H 7EH |
| | or INSERT HERE | 1BH 5BH 32H 7EH |
| Delete | SHIFT/F8 | 1BH 5BH 33H 39H 7EH |
| | or REMOVE | 1BH 5BH 33H 7EH |
| Erase Input | SHIFT/F9 | 1BH 5BH 34H 30H 7EH |
| Home | F9 | 1BH 5BH 32H 30H 7EH |

*Field Exit:*

| | | |
|---|---|---|
| Duplicate | F20 | 1BH SBH 33H 34H 7EH |
| Field Minus | PF4 | 1BH 4FH 53H |
| | or F19 | 1BH 5BH 33H 33H 7EH |
| Field Plus | PF3 | 1BH 4FH 52H |
| Field Exit | RETURN | 0DH |
| | or NK ENTER | 0DH |

*Aid Generating:*

| | | |
|---|---|---|
| Enter | SELECT | 1BH 5BH 34H 7EH |
| | or LINE FEED | 0AH |
| | or F14 | 1BH 5BH 32H 36H 7EH |
| | or DO | 1BH 5BH 32H 39H 7EH |
| Clear | F13 | 1BH 5BH 32H 35H 7EH |
| Help | HELP | 1BH 5BH 32H 38H 7EH |
| Print | F10 | 1BH 5BH 32H 31H 7EH |
| Roll Up | NEXT SCREEN | 1BH 5BH 36H 7EH |
| Roll Down | PREV SCREEN | 1BH 5BH 35H 7EH |
| CMD | F7 | 1BH 5BH 31H 38H 7EH |
| CMD 1 | F7 1 | 1BH 5BH 31H 38H 7EH 31H |
| CMD 2 | F7 2 | 1BH 5BH 31H 38H 7EH 32H |
| CMD 3 | F7 3 | 1BH 5BH 31H38H 7EH 33H |
| CMD 4 | F7 4 | 1BH 5BH 3 lH 38H 7EH 34H |
| CMD 5 | F7 5 | 1BH 5BH 31H 38H 7EH 35H |
| CMD 6 | F7 6 | 1BH 5BH 31H 38H 7EH 36H |
| CMD 7 | F7 7 | 1BH 5BH 31H 38H 7EH 37H |
| CMD 8 | F7 8 | 1BH 5BH 31H 38H 7EH 38H |
| CMD 9 | F7 9 | 1BH 5BH 3 lH 38H 7EH 39H |
| CMD 10 | F7 0 | 1BH 5BH 31H 38H 7EH 30H |
| CMD 11 | F7- | 1BH 5BH 31H38H 7EH 2DH |
| CMD 12 | F7 = | 1BH 5BH 31H 38H 7EH 3DH |
| CMD 13 | F7 ! | 1BH 5BH 31H 38H 7EH 21H |
| CMD 14 | F7 @ | 1BH 5BH 31H 38H 7EH 40H |
| CMD 15 | F7# | 1BH 5BH 31H 38H 7EH 23H |
| CMD 16 | F7 $ | 1BH 5BH 31H 38H 7EH 24H |
| CMD 17 | F7 % | 1BH 5BH 31H 38H 7EH 25H |
| CMD 18 | F7 ^ | 1BH 5BH 31H 38H 7EH 5EH |
| CMD 19 | F7 & | 1BH 5BH 31H 38H 7EH 26H |
| CMD 20 | F7 * | 1BH 5BH 31H 38H 7EH 2AH |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| CMD 21 | F7 ( | 1BH 5BH 31H 38H 7EH 28H |
| CMD 22 | F7 ) | 1BH 5BH 3 lH 38H 7EH 29H |
| CMD 23 | F7 (underline) | 1BH 5BH 31H 38H 7EH 5FH |
| CMD 24 | F7 + | 1BH 5BH 31H 38H 7EH 2BH |

*Special Host:*

| | | |
|---|---|---|
| System Request | NK 7 | 1BH 4FH 77H |

*Signal:*

| | | |
|---|---|---|
| Attn | NK 8 | 1BH 4FH 78H |

*Extended Function:*

| | | |
|---|---|---|
| Cancel Print | SHIFT/F10 | 1BH 5BH 34H 31H 7EH |
| | or ESC Z | 1BH 5AH |
| | F11Z | 1BH 5BH 32H 33H 7EH 5AH |
| Refresh Screen | CTRL/W | 17H |
| | or F18 | 1BH 5BH 33H 32H 7EH |
| Initialize Terminal | ESC < | 1BH 3CH |
| | or F11 < | IBH 5BH 32H 33H 7EH 3CH |
| Toggle Indicators | ESC T | 1BH 54H |
| | or F11 T | 1BH 5BH 32H 33H 7EH 54 |
| Request Disconnect | ESC > | 1BH 3EH |
| | or F11> | 1BH 5BH 32H 33H 7EH 3EH |

## VT220 Terminal Setup

The VT220 terminal uses a series of Setup screens for the selection of operating characteristics. Use of these screens is discussed in detail in the VT220 terminal owner's manual. Each Setup screen contains a number of fields which in turn are used to establish parameter settings. The following parameter settings are suggested for use with the LinkUp 5294

| Setup Screen | Field | Setting/Comments |
|---|---|---|
| DISPLAY | Columns | 80 colums |
| | Interpret/Display Controls | Interpret |
| | Auto Wrap | No Auto Wrap |
| | Scrolling | No effect |
| | Text Screen | As desired (Selects text and background intensity) |
| | Text Cursor | As desired (display or non-display of cursor) |
| | Cursor Style | As desired (block cursor is better with underscore fields) |
| GENERAL | Mode | VT200 7-bit controls |
| | User-defined keys | Unlocked |
| | User Features | Unlocked |
| | Keypad | Will be overridden |
| | Cursor Keys | Will be overridden |
| | New Line/No New Line | No New Line |

| Setup Screen | Field | Setting/Comments |
|---|---|---|
| COMM | Transmit = (baud rate) | Set to match converter |
| | Receive = (baud rate) | Transmit |
| | XOFF | 128 |
| | Bits, Parity (main port) | Set to match converter |
| | Stop Bits | Set to match converter |
| | Local Echo | No Local Echo |
| | Port Type | EIA Port, Data Leads only |
| | Disconnect Delay | Two-second Delay |
| PRINTER | Speed = (baud) | As required by printer |
| | Mode | Normal Print |
| | Bits, Parity (aux port) | As required by printer |
| | Stop Bits | As required by printer |
| | Print Full Page/Scroll Reg. | Scroll region |
| | Printed Data Type | Determined by type of printer attached |
| | Print Terminator | No Terminator |
| KEYBOARD | Key Types | As determined by your application and country |
| | Caps/Shift Lock | As desired |
| | Auto Repeat | As desired |
| | Keyclick | As desired |
| | Margin Bell | As desired |
| | Warning Bell | As desired |
| | Break/No break | No Break |
| | Auto Answerback | Off |

# NOTE

**The PR port on the VT220 is used for the Auxiliary Printer feature. For a description of this feature, see the appropriate user's guide. This port requires a male DB9 connector on the interface cable.**

## F.32 WY30 Terminal Module - Wyse WY30

The following list identifies the key sequences defined for the WY30 Terminal Module.

1. Press the <CTRL> key concurrently with the indicated alpha key.

2. Press the <ESC> key prior to pressing the indicated alpha key.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movement* | | |
| Character Backspace | left arrow | 03H |
| Cursor Up | up arrow | 0BH |
| Cursor Down | down arrow | 0AH |
| Cursor Left | left arrow | 08H |
| Cursor Right | right arrow | 0CH |
| Field Advance | right arrow| | 09H |
| Field Backspace | left arrow| | 01H 40H 0DH |
| New Line | NEW LINE symbol | 0EH |
| Fast Left | N.A. | N.A. |
| Fast Right | N.A. | N.A. |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Special Control* | | |
| Error Reset | ERROR RESET | 7FH |
| Insert Mode | INS | 01H 42H 0DH |
| Delete | DEL | 1BH 71H |
| Erase Input | ERASE INPUT | 01H 44H 0DH |
| Home | HOME | 1EH |
| *Field Exit* | | |
| Duplicate | DUP | 01H 43H 0DH |
| Field Minus | FIELD - | 1BH 72H |
| Field Plus | N.A. | N A. |
| Field Exit | FIELD EXIT | 0DH |
| *Aid Generating* | | |
| Enter | NK ENTER | 1BH 0DH |
| Clear | CLEAR | 01H 41H 0DH |
| Help | HELP | 01H 61H 0DH |
| Print | PRINT | 01H 60H 0DH |
| Roll Up | ROLL^ | 01H 62H 0DH |
| Roll Down | ROLL | 01H 63H 0DH |
| CMD 1 | CMD 1 | 1BH 31H |
| CMD 2 | CMD 2 | 1BH 32H |
| CMD 3 | CMD 3 | 1BH 33H |
| CMD 4 | CMD 4 | 1BH 34H |
| CMD 5 | CMD 5 | 1BH 35H |
| CMD 6 | CMD 6 | 1BH 36H |
| CMD 7 | CMD 7 | 1BH 37H |
| CMD 8 | CMD 8 | 1BH 38H |
| CMD 9 | CMD 9 | 1BH 39H |
| CMD 10 | CMD 0 | 1BH 30H |
| CMD 11 | CMD- | 1BH 2DH |
| CMD 12 | CMD = | 1BH 3DH |
| CMD 13 | CMD ! | 1BH 21H |
| CMD 14 | CMD @ | 1BH 40H |
| CMD 15 | CMD# | 1BH 23H |
| CMD 16 | CMD $ | 1BH 24H |
| CMD 17 | CMD % | 1BH 25H |
| CMD 18 | CMD ^ | 1BH 5EH |
| CMD 19 | CMD & | 1BH 26H |
| CMD 20 | CMD * | 1BH 2AH |
| CMD 21 | CMD ( | 1BH 28H |
| CMD 22 | CMD ) | 1BH 29H |
| CMD 23 | CMD _ | 1BH 5FH |
| CMD 24 | CMD + | 1BH 2BH |
| *Special Host* | | |
| System Request | SYS REQ | 01H 45H 0DH |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Signal* | | |
| Attn | ATTN | 01H 46H 0DH |
| *Special Function* | | |
| Cancel Print | ESC C | 1BH 43H |
| Refresh Display | CTRL/W | 17H |
| Initialize Terminal | ESC < | 1BH 3CH |
| Toggle Indicators | ESC T | 1BH 54H |
| Request Disconnect | ESC > | 1BH 3EH |
| Local Copy Print Req. | ESC P | 1BH 50H |
| Local Copy Form Feed | ESC F | 1BH 46H |
| Toggle Echo | CTRL/V | 16H |

## F.33 WY60 Terminal Module - Wyse WY60

The following list identifies the key sequences defined for the WY60 Terminal Module.

1. Press the <CTRL> key concurrently with the indicated alpha key.

2. Press the <ESC> key prior to pressing the indicated alpha key.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| Cursor Movement | | |
| Character Backspace | left arrow | 08H |
| CursorUp | F7 | 01H 46H 0DH |
| Cursor Down | F8 | 01H 47H 0DH |
| Cursor Left | F9 | 01H 48H 0DH |
| Cursor Right | F10 | 01H49H 0DH |
| Field Advance | TAB | 09H |
| Field Backspace | BACKTAB | 1BH 49H |
| New Line | SHIFT/ENTER | 1BH 4EH |
| Fast Left | SHIFT/F9 | 01H 68H 0DH |
| Fast Right | SHIFT/F10 | 01H 69H 0DH |
| *Special Control* | | |
| Error Reset | */PRTSCR | 1BH 50H |
| Insert Mode | F3 | 01H 42H 0DH |
| Delete | SHIFT/F3 | 01H 62H 0DH |
| Erase Input | SHlFT/F4 | 01H 63H 0DH |
| Home | F4 | 01H 43H 0DH |
| *Field Exit* | | |
| Duplicate | SHlFT/NK - | 1BH 44H |
| Field Minus | NEC - | 01H 2DH |
| Field Plus | NK + | 01H 2BH |
| Field Exit | ENTER | 0DH |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|

*Aid*

| | | |
|---|---|---|
| Enter | ESC ENTER | 1BH 0DH |
| Clear | CTRL/C | 03H |
| Help | F6 | 01H 45H 0DH |
| Print | F5 | 01H 44H 0DH |
| Roll Up | SHIFT/F7 | 01H 66H 0DH |
| Roll Down | SHIFT/F8 | 01H 67H 0DH |
| CMD 1 | ESC 1 | 1BH 31H |
| CMD 2 | ESC 2 | 1BH 32H |
| CMD 3 | ESC 3 | 1BH 33H |
| CMD 4 | ESC 4 | 1BH 34H |
| CMD 5 | ESC 5 | 1BH 35H |
| CMD 6 | ESC 6 | 1BH 36H |
| CMD 7 | ESC 7 | 1BH 37H |
| CMD 8 | ESC 8 | 1BH 38H |
| CMD 9 | ESC 9 | 1BH 39H |
| CMD 10 | ESC 0 | 1BH 30H |
| CMD 11 | ESC - | 1BH 2DH |
| CMD 12 | ESC = | 1BH 3DH |
| CMD 13 | ESC ! | 1BH 21H |
| CMD 14 | ESC @ | 1BH 40H |
| CMD 15 | ESC # | 1BH 23H |
| CMD 16 | ESC $ | 1BH 24H |
| CMD 17 | ESC % | 1BH 25H |
| CMD 18 | ESC ^ | 1BH 5EH |
| CMD 19 | ESC & | 1BH 26H |
| CMD 20 | ESC * | 1BH 2AH |
| CMD 21 | ESC ( | 1BH 28H |
| CMD 22 | ESC ) | 1BH 29H |
| CMD 23 | ESC _ | 1BH 5FH |
| CMD 24 | ESC + | 1BH 2BH |

*Special Host*

| | | |
|---|---|---|
| System Request | SHIFT/F1 | 01H 60H 0DH |

Signal

| | | |
|---|---|---|
| Attn | F1 | 01H 40H 0DH |

*Special Function*

| | | |
|---|---|---|
| Cancel Print | ESC Z | 1BH 5AH |
| Refresh Display | CTRL/W | 17H |
| Init Terminal | ESC < | 1BH 3CH |
| Toggle Indicators | ESC T | 1BH 54H |
| Request Disconnect | ESC > | 1BH 3EH |
| Local Copy Print Req. | CTRL/P | 10H |
| Local Copy Form Feed | CTRL/F | 06H |
| Toggle Echo | CTRL/V | 16H |

## F.34 WY60X Terminal Module - Wyse WY60 with Extended Keyboard

The following list identifies the key sequences defined for the WY60X Terminal Module.

    1. Press the < CTRL > key concurrently with the indicated alpha key.

    2. Press the < ESC > key prior to pressing the indicated alpha key.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movement* | | |
| Character Backspace | left arrow | 08H |
| Cursor Up | up arrow | 0BH |
| Cursor Down | down arrow | 0AH |
| Cursor Left | left arrow | 04H |
| Cursor Right | right arrow | 0CH |
| Field Advance | TAB | 09H |
| Field Backspace | SHIFT/TAB | 1BH 49H |
| New Line | SHIFT/ENTER | 1BH 4EH |
| Fast Left | SHIFT/left arrow | 1BH 04H |
| Fast Right | SHIFT/right arrow | 1BH 0CH |
| *Special Control* | | |
| Error Reset | END | 1BH 54H |
| | or CTRL/R | 12H |
| Insert Mode | INSERT | 1BH 72H |
| Delete | DELETE CHAR | 1BH 57H |
| | or NK DELETE | 7FH |
| Erase Input | SHIFT/DELETE | 1BH 52H |
| Home | HOME | 1EH |
| *Field Exit* | | |
| Duplicate | SHIFT/INSERT | lBH 71H |
| Field Minus | CTRL/F | 06H |
| Field Plus | CTRL/P | 10H |
| Field Exit | RETURN | 0DH |
| *Aid* | | |
| Enter | NK ENTER | 1BH 0DH |
| Clear | SHIFT/HOME | 1BH 7BH |
| Help | SHIFT/END | 1BH 59H |
| Print | PRINT SCREEN | 1BH 50H |
| Roll Up | PAGE DOWN | 1BH 4BH |
| Roll Down | PAGE UP | 1BH 4AH |
| CMD 1 | F1 | 01H 40H 0DH |
| CMD 2 | F2 | 01H 41H 0DH |
| CMD 3 | F3 | 01H 42H 0DH |
| CMD 4 | F4 | 01H 43H 0DH |
| CMD 5 | F5 | 01H 44H 0DH |
| CMD 6 | F6 | 01H 45H 0DH |
| CMD 7 | F7 | 01H 46H 0DH |
| CMD 8 | F8 | 01H 47H 0DH |

| **5250 Function** | **Key Sequence** | **Hex Value Generated** |
| --- | --- | --- |
| CMD 9 | F9 | 01H 48H 0DH |
| CMD 10 | F10 | 01H 49H 0DH |
| CMD 11 | F11 | 01H 4AH 0DH |
| CMD 12 | F12 | 01H 4BH 0DH |
| CMD 13 | SHIFT/Fl | 01H 60H 0DH |
| CMD 14 | SHIFT/F2 | 01H 61H 0DH\ |
| CMD 15 | SHIFT/F3 | 01H 62H 0DH |
| CMD 16 | SHIFT/F4 | 01H 63H 0DH |
| CMD 17 | SHIFT/F5 | 01H 64H 0DH |
| CMD 18 | SHIFT/F6 | 01H 65H 0DH |
| CMD 19 | SHIFT/F7 | 01H 66H 0DH |
| CMD 20 | SHIFT/F8 | 01H 67H 0DH |
| CMD 21 | SHIFT/F9 | 01H 68H 0DH |
| CMD 22 | SHIFT/F10 | 01H 69H 0DH |
| CMD 23 | SHIFT/F11 | 01H 6AH 0DH |
| CMD 24 | SHIFT/F12 | 01H 6BH 0DH |

*Special Host*

| | | |
| --- | --- | --- |
| System Request | SHIFT/PRINT SCREEN | 1BH 53H |

*Signal*

| | | |
| --- | --- | --- |
| Attn | SHIFT/ESC | 1BH 41H |

*Special Function*

| | | |
| --- | --- | --- |
| Cancel Print | ESC Z | 1BH 5AH |
| Refresh Display | CTRL/W | 17H |
| Initialize Terminal | ESC < | 1BH 3CH |
| Toggle Indicators | CTRL/T | 14H |
| Request Disconnect | ESC > | 1BH 3EH |
| Local Copy Print Req. | CTRL/P | 10H |
| Local Copy Form Feed | CTRL/F | 06H |
| Toggle Echo | CTRL/V | 16H |

## F.35 WY100 Terminal Module - Wyse WY100

The following list identifies the key sequence defined for the WY100 Terminal Module.

1. Press <CTRL> concurrently with the indicated alpha key.

2. Press <ESC> prior to pressing the indicated alpha key.

| **5250 Function** | **Key Sequence** | **Hex Value Generated** |
| --- | --- | --- |
| *Cursor Movement* | | |
| Character Backspace | CTRL/C | 03H |
| Cursor Up | up arrow | 0BH |
| Cursor Down | down arrow | 0AH |
| Cursor Left | left arrow | 08H |
| Cursor Right | right arrow | 0CH |
| Field Advance | TAB | 09H |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| Field Backspace | SHIFTED TAB | 1BH 49H |
| New Line | NEW LINE | 1FH |
| Fast Left | N.A. | N.A. |
| Fast Right | N.A. | N.A. |

*Special Control*

| | | |
|---|---|---|
| Error Reset | CTRL/R | 12H |
| Insert Mode | LINE INSERT | 1BH 45H |
| Delete | RUBOUT | 7FH |
| Erase Input | CTRL/E | 05H |
| Home | HOME | 1EH |

*Field Exit*

| | | |
|---|---|---|
| Duplicate | CTRL/D | 04H |
| Field Minus | CTRL/F | 06H |
| Filed Plus | N.A. | N.A. |
| Field Exit | CTRL/X | 18H |

*Aid Generating*

| | | |
|---|---|---|
| Enter | RETURN | 0DH |
| Clear | PAGE ERASE | 1BH 59H |
| Help | ESC H | 1BH 48H |
| Print | CTRL/P | 10H |
| Roll Up | ESC U | 1BH 55H |
| Roll Down | ESC D | 1BH 44H |
| CMD 1 | ESC 1 | 1BH 31H |
| CMD 2 | ESC 2 | 1BH 32H |
| CMD 3 | ESC 3 | 1BH 33H |
| CMD 4 | ESC 4 | 1BH 34H |
| CMD 5 | ESC 5 | 1BH 35H |
| CMD 6 | ESC 6 | 1BH 36H |
| CMD 7 | ESC 7 | 1BH 37H |
| CMD 8 | ESC 8 | 1BH 38H |
| CMD 9 | ESC 9 | 1BH 39H |
| CMD 1 0 | ESC 0 | 1BH 30H |
| CMD 11 | ESC - | 1BH 2DH |
| CMD 12 | ESC = | 1BH 3DH |
| CMD 13 | ESC! | 1BH 21H |
| CMD 14 | ESC @ | 1BH 40H |
| CMD 15 | ESC # | 1BH 23H |
| CMD 16 | ESC $ | 1BH 24H |
| CMD 17 | ESC % | 1BH 25H |
| CMD 18 | ESC ^ | 1BH 5EH |
| CMD 19 | ESC & | 1BH 26H |
| CMD 20 | ESC * | 1BH 2AH |
| CMD 21 | ESC ( | 1BH 28H |
| CMD 22 | ESC) | 1BH 29H |
| CMD 23 | ESC _ | 1BH 5FH |
| CMD 24 | ESC+ | 1BH 2BH |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|

*Special Host*

| | | |
|---|---|---|
| System Request | ESC S | 1BH 53H |

*Signal*

| | | |
|---|---|---|
| Attn | ESC A | 1BH 41H |

*Extended Function*

| | | |
|---|---|---|
| Local Copy Print Req. | PRINT | 1BH 40 H |
| Local Copy Form Feed | ESC F | 1BH 46H |
| Cancel Print | ESC C | 1BH 43H |
| Refresh Screen | CTRL/W | 17H |
| Toggle Status Line/ | | |
| Toggle Indicators | ESC T | 1BH 54H |
| Toggle Echoplex Enabled | CTRL/V | 16H |
| Initialize Terminal | ESC < | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 3EH |

**WYSE: WY-100 Terminal Setup**

1. Disconnect the AC power cord from the outlet before setting the option switches.

2. There are three banks of toggle-type switches, each with 8 switches, located on the keyboard. These switches should be set to the following values.

| SW1 | Set To: | Comments |
|---|---|---|
| 1 | ON | Edit keys are set up as duplex keys (host-controllable) |
| 2 | OFF | End of line = US |
| | | End of transmission + CR |
| 3 | ON | Disable auto-new-line |
| 4 | ON | ENTER and RETURN both generate CR character |
| 5-8 | ? | Sets the printer port baud rate |

| SW2 | Set To: | Comments |
|---|---|---|
| 1 | ON | 8-bit data |
| 2 | ? | ON = even parity |
| | | OFF = odd parity |
| 3 | OFF | 1 stop bit. If a baud rate 100 or less is selected, set to ON = 2 stop bits. |
| 4 | OFF | Parity disabled |
| 5–8 | ? | Sets the modem-port baud rate |

| BAUD RATE | SWITCHES 5 | 6 | 7 | 8 |
|---|---|---|---|---|
| 9600 | OFF | OFF | OFF | ON |
| 7200 | OFF | OFF | ON | OFF |
| 4800 | OFF | OFF | ON | ON |
| 3600 | OFF | ON | OFF | OFF |
| 2400 | OFF | ON | OFF | ON |
| 2000 | OFF | ON | ON | OFF |
| 1800 | OFF | ON | ON | ON |
| 1200 | ON | OFF | OFF | OFF |
| 600 | ON | OFF | OFF | ON |
| 300 | ON | OFF | ON | OFF |
| 150 | ON | OFF | ON | ON |
| 134.5 | ON | ON | OFF | OFF |
| 110 | ON | ON | OFF | ON |
| 75 | ON | ON | ON | OFF |
| 50 | ON | ON | ON | ON |

| SW3 | Set To: | Comments |
|---|---|---|
| 1 | OFF | 1 page (1920 character) memory |
| 2 | ? | OFF = 60 Hz power source |
| | | ON = 50 Hz power source |
| 3 and 4 | OFF | Normal display mode |
| 5 | ? | OFF = black screen |
| | | ON = white screen |
| 6 | ? | OFF = blinking curosr |
| | | ON = Non-blinking cursor |
| 7 | OFF | Full duplex |
| 8 | OFF | Conversation |

3. Reconnect the AC power cord and connect the terminal to the LinkUp 5294 with a modem or direct connect cable, as appropriate.

## F.36 XT100 Terminal Module

The following list identifies the key sequences defined for the XT100 Terminal Module.

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Cursor Movement:* | | |
| Character Backspace | PF1 | 1BH 4FH 50H |
| | or BACKSPACE | 08H |
| Curosr Up | up arrow | 1BH 5BH 41H |
| Cursor Down | down arrow | 1BH 5BH 42H |
| Cursor Left | left arrow | 1BH 5BH 44H |
| Cursor Right | right arrow | 1BH 5BH 43H |
| Field Advance | TAB | 09H |
| Field Backspace | CTRL/A A | 01H 41H |
| New Line | LINE FEED | 0AH |
| Fast Left | N.A. | N.A. |
| Fast Right | N.A. | N.A. |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Special Control* | | |
| Error Reset | CTRL/R | 12H |
| Insert Mode | CTRL/A B | 01H 42H |
| Delete | DELETE | 7FH |
| Erase Input | CTRL/A C | 01H 43H |
| Home | CTRL/A D | 01H 44H |
| *Field Exit:* | | |
| Duplicate | CTRL/A E | 01H 45H |
| Field Minus | CTRL/A F | 01H 46H |
| Field Plus | CTRL/A G | 01H 47H |
| Field Exit | RETURN | 0DH |
| *Aid Generating* | | |
| Enter | CTRL/A H | 01H 48H |
| Clear | CTRL/A I | 01H 49H |
| Help | CTRL/A J | 01H 4AH |
| Print | CTRL/A K | 01H 4BH |
| Roll Up | CTRL/A L | 01H 4CH |
| Roll Down | CTRL/A M | 01H 4DH |
| CMD 1 | CTRL/A 1 | 01H 31H |
| CMD 2 | CTRL/A 2 | 01H 32H |
| CMD 3 | CTRL/A 3 | 01H 33H |
| CMD 4 | CTRL/A 4 | 01H 34H |
| CMD 5 | CTRL/A 5 | 01H 35H |
| CMD 6 | CTRL/A 6 | 01H 36H |
| CMD 7 | CTRL/A 7 | 01H 37H |
| CMD 8 | CTRL/A 8 | 01H 38H |
| CMD 9 | CTRL/A 9 | 01H 39H |
| CMD 1 0 | CTRL/A 10 | 01H 30H |
| CMD 11 | CTRL/A - | 01H 2DH |
| CMD 12 | CTRL/A = | 01H 3DH |
| CMD 13 | CTRL/A ! | 01H 21H |
| CMD 14 | CTRL/A @ | 01H 40H |
| CMD 15 | CTRL/A # | 01H 23H |
| CMD 16 | CTRL/A $ | 01H 24H |
| CMD 17 | CTRL/A % | 01H 25H |
| CMD 18 | CTRL/A ^ | 01H 5EH |
| CMD 19 | CTRL/A & | 01H 26H |
| CMD 20 | CTRL/A * | 01H 2AH |
| CMD 21 | CTRL/A ( | 01H 28H |
| CMD 22 | CTRL/A ) | 01H 29H |
| CMD 23 | CTRL/A _ | 01H 5FH |
| CMD 24 | CTRL/A + | 01H 2BH |
| *Special Host* | | |
| System Request | CTRL/A N | 01H 4EH |

| 5250 Function | Key Sequence | Hex Value Generated |
|---|---|---|
| *Signal* | | |
| Attn | CTRL/A O | 01H 4FH |
| *Extended Function* | | |
| Local Copy Print Req. | CTRL/P | 10H |
| Local Copy Form Feed | CTRL/F | 06H |
| Cancel Print | CTRL/C | 03H |
| Refresh Screen | CTRL/W | 17H |
| Toggle Status Line/ Toggle Indicators | NK 3 | 1BH 4FH 73H |
| Toggle Echoplex Enabled | CTRL/V | 16H |
| Initialize Terminal | ESC < | 1BH 3CH |
| Request Disconnect | ESC > | 1BH 3EH |

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