Whisper Writer Communications Terminal

System Reference Manual

3M

Whisper Writer System
Reference Manual

3M

Table of Contents

Introduction

Appendixes

Introduction

The Whisper Writer Communication System allows the operator to send and receive messages or data over standard telephone lines and Western Union Telegraphic lines. Messages can be sent to, or received from, other teleprinters, computers, or from various commercial electronic information services.

The Whisper Writer Teleprinter Model 1980 or 1981 is the core of the system. The addition of the Model 1945 Keyboard accessory allows you to send requests for information and instructions to the same systems from which you can receive. The keyboard looks like a small typewriter. It also has text editing features to compose, review, and correct messages or other information before transmission to the remote unit.

The optional Model 1441 Automatic Line Selector accessory can connect the teleprinter to both the standard telephone lines and the Western Union telegraph lines allowing you to send or receive with the touch of a button.

The optional Model 1490 Acoustic Adapter accessory can be used when a direct modular telephone cable connection is not available, allowing use of the Whisper Writer wherever there is a telephone and an AC power outlet.

This manual provides a logical organization for convenient reference. The first section, "General Information", shows unpacking and inspection and standard telephone and telegraphic connections. Installation and replacing the paper roll instructions are provided in Sections 2 and 3.

After a brief overview of the Whisper Writer System capabilities and applications in Section 4, the controls and indicators are explained in Section 5. The Speed/Format Setting is covered in Section 6, and the Automatic Line Selector in Section 7.

Programmable function settings, log-on directory programming and the Answerback message are explained in Sections 8 through 10.

Sections 11 and 12 provide the references for preparing, sending, and receiving messages or data over the standard telephone and telegraphic lines.

The appendixes include the following:

> Specifications
> Data Flow Control
> Graphics Mode
> ASCII Character and Control Codes
> Calling for Service
> FCC Information

Applicability

The installation and operational procedures in this manual apply only to the Whisper Writer System using the Model 1980 Teleprinter and one or more of the following accessories:

- Keyboard Model 1945

- Automatic Line Selector Model 1441

- Acoustic Adapter Model 1490

1
General Information

This section describes the unpacking and inspection procedures and explains the standard telephone and telegraphic connections.

Unpacking and Inspection

1. Remove the teleprinter and any accessories from the carton(s). Keep each cable with the associated component. Check the table below to be sure you received all the appropriate cables.

2. Carefully inspect the shipping container and exterior of each component for any damage.

3. Contact the shipper or your sales representative if you do find any shipping damage. Save all packing materials.

Component	Model	Cable	Length	Quantity
Teleprinter	1980	Power Cable 4-Wire RJ11 Modular Cable	8' 14'	1 1
	1981	Power Cable	7'	1
Keyboard	1945	8-Wire Modular Cable	24"	1
Automatic Line Selector	1441	Cables attached	—	—
Acoustic Coupler	1490	none	—	—
Carrying Case		4-Wire RJ11 Modular Cable 4-Wire RJ11 Modular Cable (female to male)	14' 8"	1 1
Stand		none	—	—

Standard Telephone and Western Union Telegraphic Network Connections

Your Whisper Writer System connects to the standard telephone network and to the Western Union telegraphic network using the USOC RJ11C modular jack. The following illustration shows this type of modular jack.
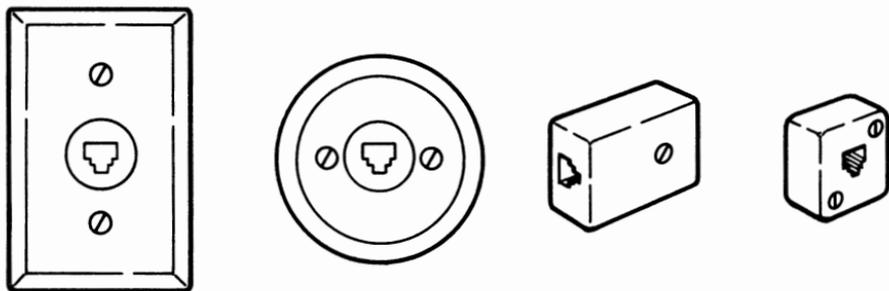
Standard Modular Jacks

Your system will also operate on the Western Union Telegraphic Network with a USOC RJ45S jack, which you may have already installed.

1. If you do not have a modular jack(s), contact your local telephone company or Western Union, depending on which network you intend to use. You do not need a modular jack if you are using the Whisper Writer Acoustic Adapter to connect your Whisper Writer System to the telephone network.

2. FCC regulations require you to notify your local telephone company that you will be connecting your system to the telephone network. You must give the telephone company the FCC Registration Number and Ringer Equivalence. Appendix F, provides information in compliance with FCC regulations.

    If you are connecting your system to a Western Union Network, you should notify them that you will be connecting an FCC-registered device.

    If you are using a Whisper Writer Acoustic Adapter to connect your system to the telephone network, it is not necessary to notify the telephone company.

Telephone Types and Use

Your system will operate with either a tone-dial (called Touch-Tone by the Bell Telephone System) or a pulse-dial (rotary) telephone, however, the telephone must have the modular jack to connect to the network wall outlet, unless your system includes the Whisper Writer Acoustic Adapter. The auto-dial feature in the Model 1980 will only operate with a pulse-dialing telephone system.

You do not need a telephone: 1) if you have a Model 1980 that is connected to a pulse dialing telephone system; 2) for receive only installations when you do not need to speak with the message sender; or 3) for send/receive installations when you never need to originate the telephone connection.

Teleprinter Setup Procedures

1. Check the position of the Speed/Format Switch located in the paper well of the teleprinter. Set to the position appropriate for your application. Refer to Section 6, "Speed/Format Setting".

2. Load the roll of paper inside the paper well. Refer to the loading instructions in Section 3, "Replacing the Paper Roll".

3. Connect the teleprinter power cable between the power jack on the back of the teleprinter and the wall power outlet. Refer to the illustration below.

4. Place the power switch on the rear of your teleprinter to the ON position. The teleprinter begins the "power on" sequence described below.

5. Place the keyboard LINE LENGTH switch in the 80 or 136 column position to match your format. The switch is located on the bottom of the keyboard. The LINE LENGTH switch setting of 80 or 136 only affects the keyboard format, and not the print format.

Self-Testing

Each time the Whisper Writer is powered on, the teleprinter tests itself and the following "power on" sequence occurs:

• The mode pushbutton glows dimly.

• The teleprinter beeps.

• The pointer moves to the left margin, and the teleprinter prints one or two of the following messages:

Ctrl Mem Clear	The keyboard Ctrl Memory is clear and contains no messages or data.
Memory Clear	The keyboard Memory is clear and contains no messages or data.
Power Restored	One or both parts of the keyboard memory contains messages or data.

• The pointer moves back to the left margin and the paper advances.

Note: If your teleprinter prints "Mem Error" or doesn't print at all, refer to "Troubleshooting" in Appendix E.

The following illustration shows the rear panel connections and power switch.
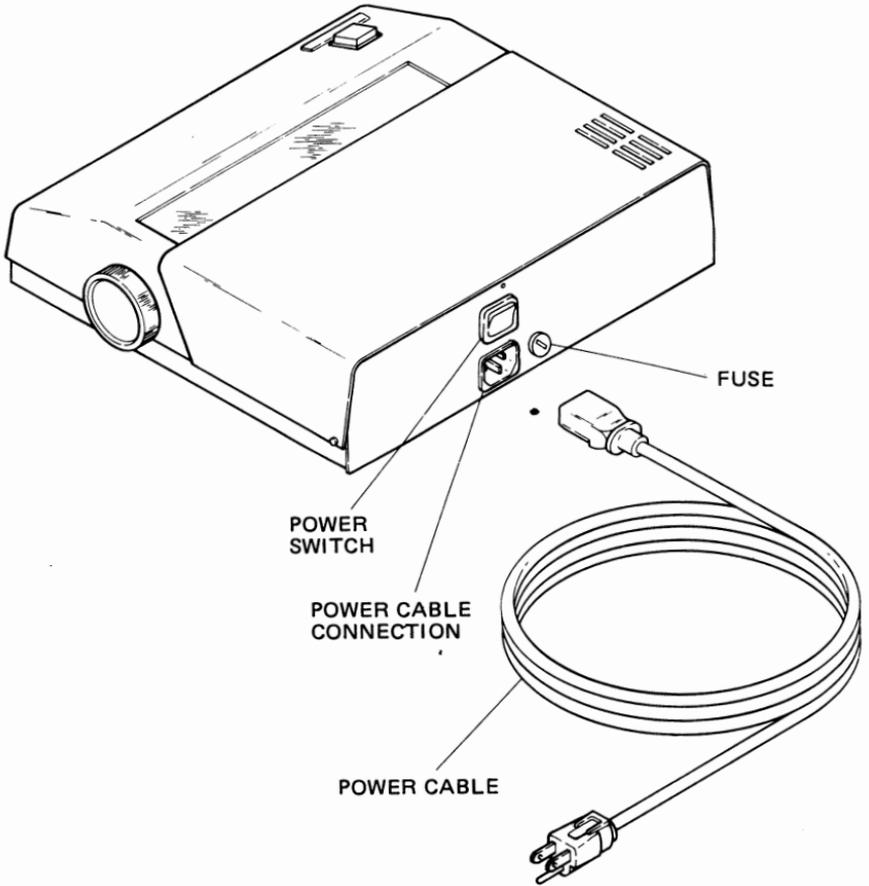
Rear Panel Connections and Power Switch

2
Installation

This section describes the procedures and includes illustrations for the installation of the Whisper Writer System using the Model 1980 Teleprinter and one or more of the following accessories:

- Keyboard Model 1945

- Automatic Line Selector 1441

- Acoustic Adapter Model 1490

Whisper Writer System with a Keyboard

Accessories: Keyboard Model 1945

Connection: Standard Telephone Network or Western Union
                       Telegraphic Network
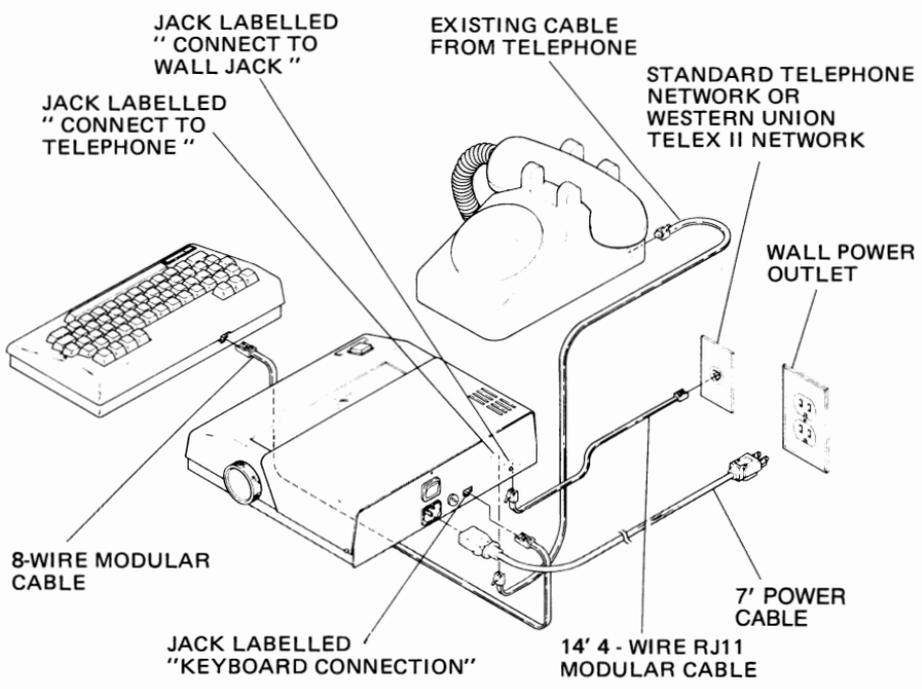
Teleprinter and Telephone Connections

Procedures:

1. Connect the cables as shown in the illustration above.

2. If you are connecting your system to the standard telephone network and have a modular telephone, use the existing cable from the telephone to connect your telephone to the teleprinter.

3. If you did not do so in step 1 of the "Teleprinter Setup Procedure", place the teleprinter Speed/Format Switch in the appropriate position. Refer to Section 6, "Speed/Format Setting".

4. Place the keyboard LINE LENGTH switch in the 80 or 136 column position to match your format. The switch is located on the bottom of the keyboard. The LINE LENGTH switch setting of 80 or 136 only affects the keyboard format, and not the print format.

5. Press and hold SHIFT and then press WHO ARE YOU to print the current settings of the programmable functions in your system. These functions are: transmit baud rate, return key transmits, received DC1/3 control, number of rings, and log-on directory. Refer to Sections 8 and 9, "Programmable Function Settings", and "Log-On Directory Programming".

6. Call the 3M National Service Center to register your system for service. Refer to "Calling for Service", for the appropriate telephone number.

* A telephone is optional for a Western Union Telex II application.

Your system is now ready for use.

Whisper Writer System Using an Automatic Line Selector

Accessories: Keyboard Model 1945
Automatic Line Selector Model 1441

Connection: Standard Telephone Network or Western Union
Telegraphic Network

JACK LABELLED "CONNECT
TO TELEPHONE"

JACK LABELLED "CONNECT
TO TWX"

WESTERN UNION
TELEX II NETWORK

CUSTOMER SUPPLIED
4-WIRE RJ11
MODULAR CABLE

TELEPHONE
STANDARD
NETWORK

8-WIRE MODULAR
CABLE

14' 4-WIRE RJ11
MODULAR CABLE

JACK LABELLED
" CONNECT TO
WALLJACK "

7' POWER
CABLE

JACK LABELLED
" CONNECT TO
TELEPHONE "

8-WIRE AND 4-WIRE
MODULAR CABLES
ATTACHED TO THE
AUTOMATIC LINE
SELECTOR

EXISTING CABLE
FROM TELEPHONE

JACK LABELLED
" KEYBOARD
CONNECTION "

Teleprinter and Automatic Line Selector Connections

Procedures:

1. Connect the cables as shown in the illustration above.

2. If you are connecting your system to the standard telephone network and have a modular telephone, use the existing cable from the telephone to connect your telephone to the teleprinter.

3. If you did not do so in step 1 of the "Teleprinter Setup Procedures", place the Teleprinter Speed/Format Switch in Position 4. Refer to Section 6, "Speed/Format Setting".

4. If you will be receiving Telex messages from an International Record Carrier over the standard telephone network, refer to Section 7, "Automatic Line Selector".

5. Place the keyboard LINE LENGTH switch in the 80 or 136 column position to match your format. The switch is located on the bottom of the keyboard.

6. Press and hold SHIFT and then press WHO ARE YOU to print the current settings of the programmable functions in your system. These functions are: transmit baud rate, return key transmits, received DC1/3 control, number of rings, and log-on directory. Refer to Sections 8 and 9, "Programmable Function Settings", and "Log-on Directory Programming", for information on how to change these settings.

7. Call the 3M National Service Center to register your system for service. Refer to "Calling for Service", for the appropriate telephone number.

Your system is now ready for use.

Whisper Writer System Using an Acoustic Adapter

Accessories: Keyboard Model 1945
                               Acoustic Adapter Model 1490

Connection: Standard Telephone Network
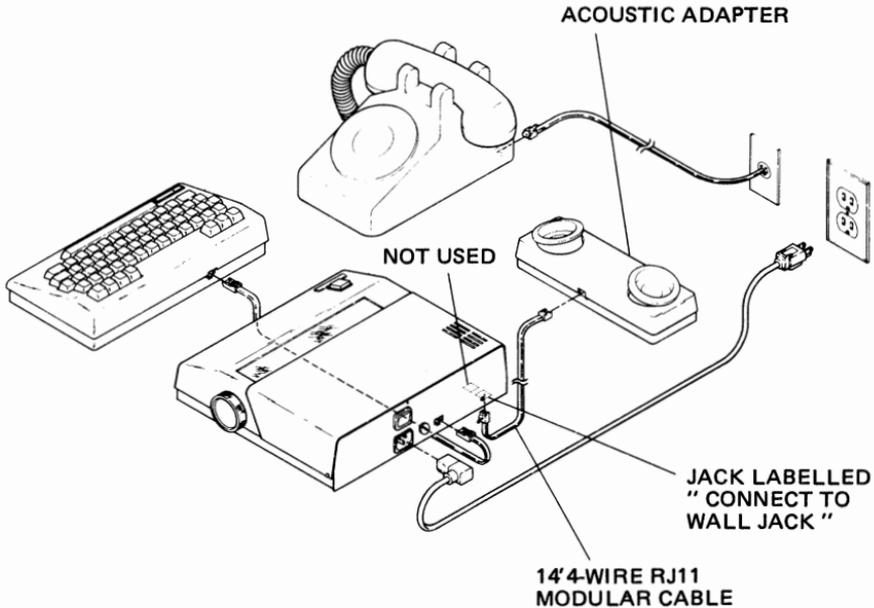
Teleprinter, Telephone and Acoustic Adapter Connections

Procedures:

1.   Connect the cables as shown in the illustration above.

2.   If you did not do so in step 1 of the "Teleprinter Setup Procedures", place the Teleprinter Speed/Format Switch in the appropriate position. Refer to Section 6, "Speed/Format Setting".

3.   Place the keyboard LINE LENGTH switch in the 80 or 136 column position to match your format. The switch is located on the bottom of the keyboard.

4.   Call the 3M National Service Center to register your system for service. Refer to "Calling for Service", for the appropriate telephone number.

Your system is now ready for use.

Whisper Writer Portable System

Accessories: Model 1945 Keyboard Model
                     1490 Acoustic Adapter
                     (optional) Carrying Case

Connection: Standard Telephone Network
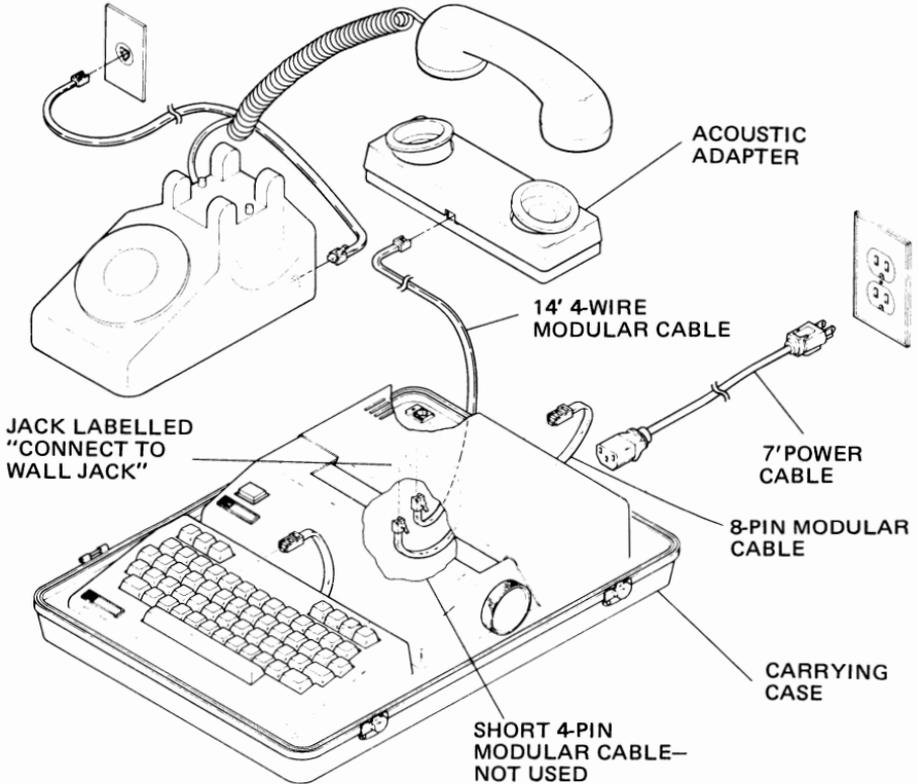
Portable System Connections

Procedure:

1. Lay the case on a flat surface so the arrow on the label points up.

2. Release the latches and open the case flat.

3. Insert the 8-wire modular plug of the keyboard cable into the jack on the rear of the keyboard.

4. Place the keyboard into the smaller of the two cut-outs in the foam pad so that the free end of the 8-wire modular cable is positioned in a notch as shown in the illustration below.

4-WIRE MODULAR CABLE, PART OF CARRYING CASE

NOTCH

FOAM PAD
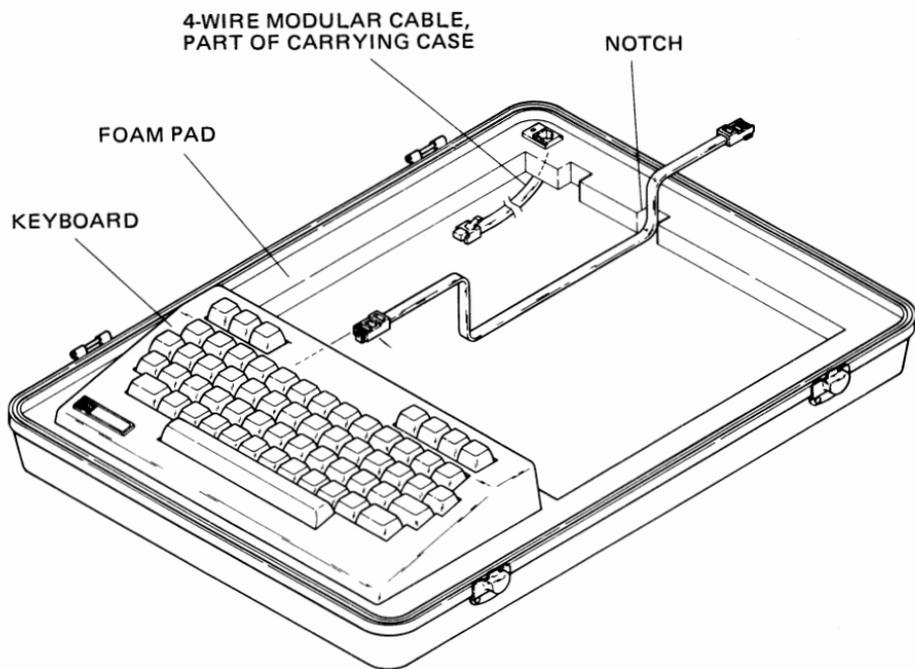
KEYBOARD

Portable System Keyboard Connections

5. Insert the 4-wire modular plug on the free end of the short cable into the modular jack on the underside of the teleprinter labeled "Connected to Telephone". The other end of this cable terminates in a modular jack which was inserted into the foam pad at the factory.

6. Connect one end of the 14' modular cable provided with the case into the jack on the underside of the teleprinter labeled "Connect to Wall Jack".

7. Place the teleprinter into the remaining cut-out in the foam pad so that it covers the modular cables. Arrange the cables so that the 14' modular cable and the 8-wire modular keyboard cable exit from beneath the teleprinter through the notch as shown above.

8. If you are using an acoustic adapter, install the acoustic adapter using the hook-and-loop fastening strips on the adapter.

9. Insert the power cable supplied with the case into the power socket on the teleprinter rear panel. The cord holder has been designed so that the power cord can remain plugged into the teleprinter when the case is closed, providing you have allowed sufficient slack in the power cord when winding it onto the cord holder.

10. Connect the cables as shown in the diagram on the preceding page.

11. If you did not do so in step 1 of the "Teleprinter Setup Procedures", place the Teleprinter Speed/Format Switch in the appropriate position. Refer to Section 6, "Speed/Format Setting".

12. Call the 3M National Service Center to register your system for service. Refer to "Calling for Service", for the appropriate telephone number.

Your system is now ready to use.

3
Replacing the Paper Roll

To replace either the standard 80-foot or the special 300-foot paper roll, set the power switch in the OFF position, and open the top cover of the teleprinter.

1. Lift the paper roll with the attached bearings out of the unit.

2. Remove the paper roll bearings from the old roll and insert them into the ends of the new roll. If you have the optional 300-foot paper roll, remove the empty paper core and insert the paper holder shaft from the core into the new roll.

3. Cut the adhesive tabs loose from the paper roll. Cut off the first six inches of paper to get an even edge and to prevent adhesive from getting into the unit.

4. Set the paper roll against the opened top cover with the paper coming off the bottom of the roll. Gently lift the Paper-Out Sensor (which pivots up and down on the paper drive shaft) and feed the paper toward you, under the rollers, while turning the paper advance knob until the paper appears on the platen.

Caution

Stop feeding the paper if the platen begins to lift. Turn the paper advance knob counterclockwise to remove the paper and repeat the procedure beginning with step 4.

5. Depress the roll bearings while pressing the paper roll into the roll slots.

6. Close the cover and turn the paper advance knob clockwise until the paper clears the plastic tear strip.

The following illustration shows the paper roll replacement.

PAPER
ROLL

Ⓐ INSTALL PAPER
ROLL BEARINGS
(EACH SIDE)

ROLL
SLOT

TOP COVER
(OPEN)

PAPER
ROLL

Ⓒ DEPRESS ROLL BEARINGS
(BOTH SIDES) AND SET
INTO ROLL SLOTS

Ⓑ INSERT PAPER
AND TURN PAPER
ADVANCE SLOT
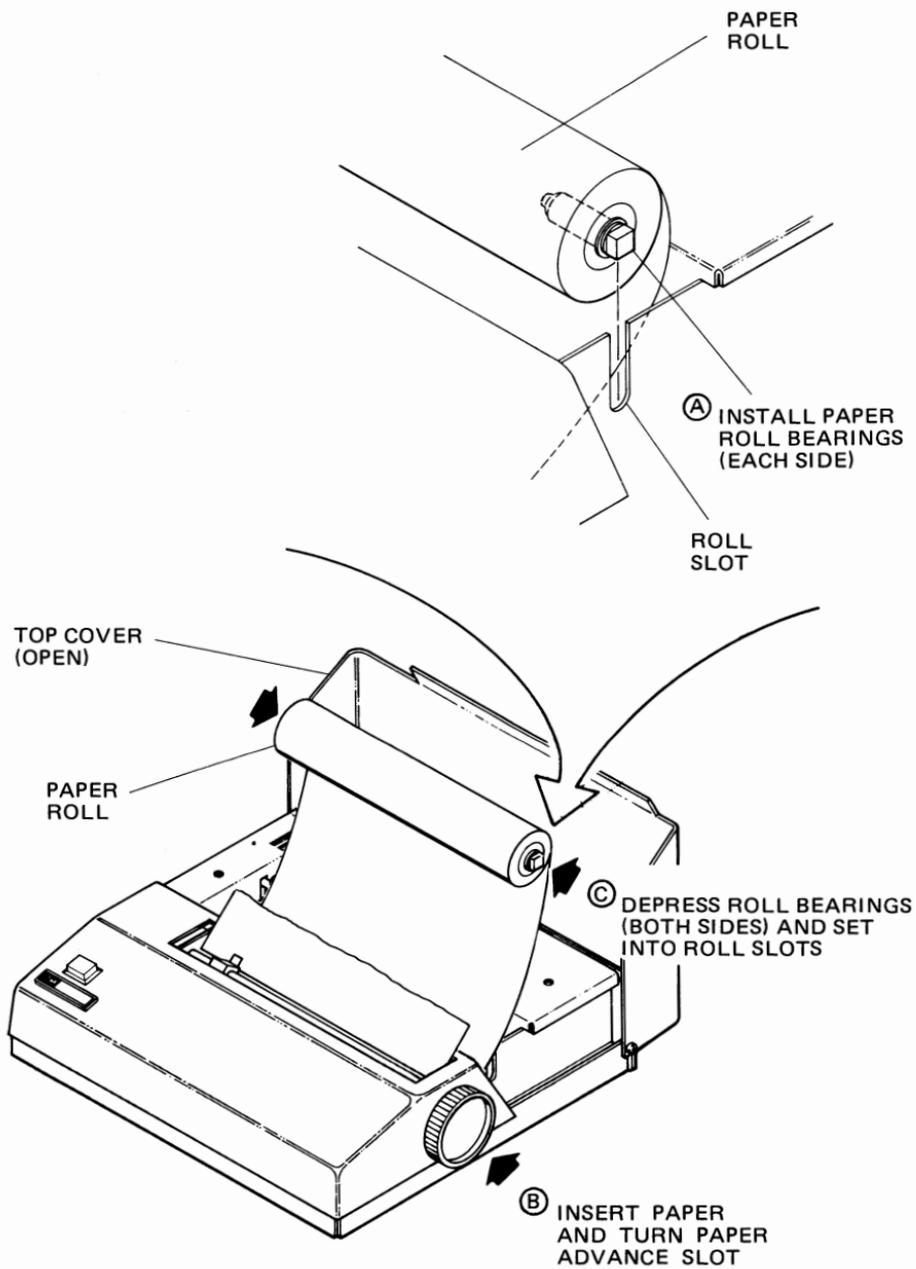
Inserting the Paper Roll

Ordering Paper

The only supply you need for your teleprinter is copy paper. For optimum copy quality, use only 3M Type 459 Thermographic paper in this unit. Using other types of paper may damage this unit, and nullify the warranty and/or service contract.

Contact your nearest 3M Business Products Center or 3M Dealer to order.

Stock Number	Teleprinter Models 1980, 1981
standard roll	78–6145–9001–2
optional long roll	78–6145–9006–1

Roll Size

width-inches (mm)	8-1/2 (216)
length-feet (m)	80 (24)
length-optional long roll	300 (91.4)

Packaging (rolls per carton)

standard roll	10
optional long roll	4

Store your copy paper in a cool, dry place.

Replacement Parts

Teleprinter Paper Bearings

Order replacement paper roll bearings (end pieces which fit in paper roll) from your nearest 3M Business Products Center or 3M Dealer.

Stock Number	Description	Quantity
78–8034–3262–0	Paper Roll Bearings	1 each

Acoustic Adapter Battery Model 1490

A 9-volt battery provides power to the acoustic adapter. When the battery needs replacement and the adapter is connected to the teleprinter, the adapter emits a continuous alarm tone. Purchase a standard 9-volt transistor battery from any store. To replace the battery:

1. Disconnect the adapter from the teleprinter.
2. Place the adapter upside down and slide open the battery compartment cover.
3. Remove the weak battery.
4. Install the replacement battery.
5. Slide the cover closed.
6. Connect the adapter to the teleprinter.

4

Overview of Whisper Writer System

The Whisper Writer Communications Terminal allows you to receive information from a variety of sources. Your Whisper Writer keyboard allows you to send messages, requests for information, and data to the same systems you can receive information from. Your system has the unique combination of features described below. Adding other optional accessories not only gives your system extra features, it also allows you to use your Whisper Writer System in a variety of ways.

Features

Automatic Answering

Your Whisper Writer Teleprinter is an unattended answer unit. Before, during, or after business hours, it automatically answers a call and prints any incoming messages without the presence of an operator.

Automatic Identification

When your teleprinter answers a call, it automatically sends a unique identification, or Answerback, message to the caller. This Answerback message assures callers that they have reached the correct number and that the unit is connected. The Answerback message is programmable - you select the message to identify your unit. When you are sending a message, you can request the identification message of the other unit by pressing one key, and the remote unit will send the message if it has this optional feature.

Auto Dial, Auto Log-on

The Whisper Writer Teleprinter is provided with automatic pulse dialing, including automatic log-on to allow you to store and automatically dial phone numbers. The log-on directory is user-programmable with up to four phone numbers and log-on sequences. This feature provides the user a simplified and convenient access to any computer-based information system or electronic mail service. Once the log-on directory is programmed, calling a service network or another terminal becomes a single keystroke task. With automatic dialing, a telephone may not be necessary as long as the teleprinter is connected to a pulse dialing telephone system. Any phone number can be dialed from the keyboard. The auto-dial feature is not provided in some models.

Typewriter-Style Keyboard

The keys on the keyboard operate, and are arranged, like those of an ordinary office typewriter. If you press down and hold any typing or editing key (except INSERT), that character is automatically repeated.

Even with its full editing capabilities, your keyboard is still simple to operate since all of the function keys are clearly labeled.

Keyboard Response

A two-key lockout feature prevents errors if you press two keys simultaneously, and a 32-character type ahead feature prevents errors during rapid typing.

Message Editing and Storing

You can send a message or data as you type it. However, you can also prepare a message and then store it in the keyboard memory to be sent later. The message can be stored indefinitely if the teleprinter is left on, or for up to 24 hours after the power is turned off. Special codes can be inserted in between messages to allow you to send different versions of the same message to different locations.

Your keyboard electronic memory allows you to store up to 8184 characters in your message. You can divide the memory to store two different messages or sets of data and send them separately.

Message Polling

Polling allows another compatible teleprinter or computer to call your system and receive a stored message. Your system can also poll a remote Whisper Writer System to receive a stored message.

To set up your unit to be polled, all you have to do is prepare your message off-line in the normal manner. Then you simply press two keys to prepare your unit to be polled. When a remote operator wants to receive your stored message, the remote unit sends you a command, and your system transmits its message. You may poll a remote Whisper Writer System that is set up for polling by merely sending the same command.

A typical application of polling would be calling a location in another time zone. You can call to receive messages from a location during your working hours, which are before or after working hours at the other location. Or, another location may call your unit to receive messages during their working hours.

Polling is most convenient when a regular system is set up between the units. The local operator has the responsibility to store the message and to set up the unit to be polled.

Voice Communications

You can share your desk telephone with a teleprinter, using it as you normally do except when the teleprinter is actually receiving a message.

The teleprinter can be set to answer a call after from one to nine rings or not to auto-answer at all. Set it to ring a few times and you can talk to the caller by picking up the telephone handset before the teleprinter answers the call.

Quiet Printing

While your teleprinter is printing, all you will hear is an end-of-line tone and the quiet rustle of the paper advancing. The noiseless thermal printhead produces crisp, black characters on a continuous roll of white thermal paper. The thermal printhead and gearless motors are not only silent, they are engineered for reliability and durability.

Message Readability

Your Whisper Writer System prints the 128 characters of the ASCII character set when it is off-line. When on-line, it prints the standard 95 printable ASCII characters. Received messages are easier to read since the printing includes both upper and lower case characters, appearing more like a normal typed message. Refer to Appendix D, "ASCII Character and Control Codes", for a complete listing of the characters printed both on-line and off-line.

Simple Installation and Operation

Although there are three different ways to install Whisper Writer Systems with a keyboard, all three are simple. Each arrangement depends on the application. Because your teleprinter receives automatically, there is very little that you have to do. There is only one control on the teleprinter, which indicates when it is actually sending or receiving a message.

Portability

With the optional Whisper Writer carrying case and acoustic adapter accessories, you can take your system anywhere there is an AC power outlet and a telephone.

The inside of the carrying case has high-density foam pads shaped to protect the teleprinter, keyboard, and acoustic adapter. You may leave the teleprinter and keyboard in the case while you use them. The case, which has a detachable cover and an AC power cord holder, is designed to qualify as carry-on luggage for most airlines.

Dual Network Compatibility

You can connect the Whisper Writer Teleprinter Model 1980 to either the standard telephone lines (Public Switched Telephone Network) or the Western Union Telegraph lines (Telex II Network). The optional automatic line selector accessory automatically connects the teleprinter to the line a message is coming in on, and matches the speed of the sending unit. Pressing one button selects one of the two networks when you are sending a message.

Self-Testing

Every time you turn on your Whisper Writer System, the unit tests itself, beeps, prints its identification message (Answerback), and prints either "Ctrl Mem Clear", "Memory Clear", or "Power Restored". This lets you know that your unit is working properly. A problem will cause the teleprinter to print a different message, or none at all.

5
Controls and Indicators

You control the operation and features of the Whisper Writer Communications Terminal through controls located on the components of the system.

Teleprinter

POWER ON/OFF

The power switch is located on the rear panel of the teleprinter. Press the upper half of the switch to turn the unit ON.

Mode pushbutton

A lighted pushbutton, on the top left panel of the teleprinter, functions as both a switch and an indicator.

As a Switch

Press to select teleprinter or telephone. Press this control during an operation to stop the operation.

As an Indicator

The light in the mode pushbutton shows the current operation mode.

Model 1980:

- dim when unit is ready to receive a call
- bright whenever telephone handset is lifted or while waiting for a remote unit to answer
- flashing rapidly during dialing process
- flashing at a steady rate when teleprinter connection is established

SPEED/FORMAT

The Speed/Format Switch, located in the well underneath the paper roll, sets the appropriate speed and format to match a received message.

Position to change the speed and format to match the received message, or to select a

particular speed and format for sending your message. Refer to Section 6, "Speed/Format Setting".

Position 1 International Telex
Position 2 Telex II (TWX)
Position 3 300 WPM Computers
Position 4 300 WPM Messages

Normally you do not need to change the Speed/Format Switch setting after initial installation. However, if someone sends you a message at the wrong speed, a series of vertical lines will be printed. If you find it necessary to communicate with a unit which does not operate at your normal speed, you should select the required position before receiving messages. Be sure to return the switch to your normal position when finished.

Tones

Power On

A single beep during the power-on sequence.

Bell Character

A single beep when the teleprinter receives a Bell character in a message. The other operator sends this to call your attention to a message your teleprinter is printing.

Keyboard Memory Full

A single beep whenever you enter more data from the keyboard when the message preparation memory is full.

End-of-Line

When you enter data from the keyboard, a single beep occurs eight spaces before the end of the line. Once the end of the line is reached, the tone sounds every time you press a key.

While you program your Answerback message, a single beep sounds every time you press a key following the entry of the 46th character in your Answerback. The additional characters are not entered in your Answerback.

Insert

A repetitive clicking sound occurs after you press the keyboard INSERT key during off-line editing. It indicates that typed characters will be inserted into the message at the location of the pointer.

Printed Messages

Mem Error	A problem has been detected in the teleprinter memory during the self-test sequence that occurs when you turn on the unit.
SELECT 1-4, A, or D:	Prompts the user to select one of the 4 log-ons in the directory, to use an acoustic adapter, or to dial from the keyboard manually.
SELECT 1-4:	Prompts the user to select from the 4 log-ons in the directory.
DIAL:	Prompts the user to dial the number on the keyboard.
DIAL or R for 5551212	Prompts the user to dial a new number or redial the last number dialed.
NO ANSWER-TRY AGAIN	The teleprinter automatically disconnects if a call is not answered within 30 seconds.
Done	Programming is complete and teleprinter is off programming mode.
Error	Incorrect data was entered and teleprinter is off programming mode.
Change (Y/N):	Prompts the user to change contents of the directory.

Keyboard

Your keyboard contains four types of keys which are grouped by general function.

Standard Typewriter Keys

These keys perform the same functions as standard typewriter keys, except that they repeat automatically when you hold them down. You use them to enter messages, including letters, numbers, and special characters. Special attention needs to be given to the following keys.

Hyphen/Underline	Press to insert a hyphen; Press this key and SHIFT to underline only blank spaces.

SHIFT	Press SHIFT to shift from lower case to upper case or to access the upper function on other keys. The keyboard does not contain a shiftlock.
CAPS LOCK	Press and engage CAPS LOCK to type letters continuously in upper case; press the key a second time to release. This key does not affect number or special character keys.
RETURN	Press RETURN to return the pointer to the left margin on the next line. Refer to Section 8, "Programmable Function Settings".

Editing Keys

This group of keys allows you to prepare and correct your message before sending it. Entire messages can also be reformatted before sending.

END/HOME	Press END/HOME to start at the beginning of the keyboard Memory. This is the Home position.
CTRL END/HOME	Press CTRL and END/HOME to start at the beginning of the keyboard Ctrl Memory. This is the Ctrl Memory Home position.
SHIFT END/HOME	Press SHIFT and END/HOME to print the last line in your message and move the pointer to the end of your message.
Backspace	Press the left arrow key (Backspace) to move the pointer under a character to be changed. When the pointer is at the left margin and the left arrow key is pressed, the previous line will print.
SHIFT Backspace	Press SHIFT and the left arrow key (Backspace) to print the first five characters in the previous line. This keystroke combination also moves the pointer to the beginning of the previous line.
CTRL Backspace	Press CTRL and left arrow key (Backspace) to move the pointer back five lines. The first five characters of the fifth line above the current position of the pointer will print.
Forward	Press the right arrow key (Forward) to print the next character.

SHIFT Forward	Press SHIFT and the right arrow key (Forward) to print the first five characters in the next line.
CTRL Forward	Press CTRL and the right arrow key (Forward) to move forward 5 lines. The first five characters of the fifth line below the current position of the pointer will print.
INSERT	Press INSERT to enter the insert mode. While the insert mode is on, a clicking sound indicates that what is typed next will be inserted into the message. You may notice that you must type more slowly in this mode, to allow the terminal to insert the characters into memory. Press INSERT again to exit the insert mode and the remainder of the line with the inserted text will print. The paper advances and the pointer moves under the first character following the inserted text.
X-out	Press the arrow key with the "X" to delete the character above the pointer. The X-out symbol will print. When printed, the character to the right of the X-out symbol will move left. A single letter or an entire sentence can be deleted using this procedure.
	When the X-out key is pressed at the end of a line, the carriage return will be deleted, the X-out symbol will print, and the following line will move up.
SHIFT X-out	Press SHIFT and the arrow key with the "X" to delete all characters from the position of the pointer to the end of the line. The carriage return at the end of the line will not be deleted and can only be deleted using the X-out key.
CTRL X-out	Press CTRL and the arrow key with the "X" to clear current memory. The teleprinter prints:

    Memory Clear? (Y/N)
or:
    Ctrl Mem Clear? (Y/N)

The following table shows the key combinations used to move the pointer in a message.

KEY	PRESSING *KEY* ALONE GIVES:	PRESSING *KEY* + SHIFT GIVES:	PRESSING *KEY* + CTRL GIVES:
END / HOME	Top of Memory	End of Current Memory	Top of Ctrl Memory
←	Move Back a Character	Move Back a Line	Move Back 5 Lines
→	Move Forward a Character	Move Forward a Line	Move Forward 5 Lines
⊠	Delete a Character	Delete to End-of-Line	Clear Current Memory

Moving the Pointer

Transmission Control Keys

These keys allow you to send a message, print a local copy of the message, transmit your identification (Answerback), request the identification of the remote unit, and when communicating with a computer, interrupt a message being sent.

LOCAL COPY — Press and engage the LOCAL COPY to print a copy of your message or data transmission on your teleprinter while sending. When your system is on-line with a computer system, that system may echo back each character in your local copy, making characters print twice. Releasing LOCAL COPY eliminates the double printing.

PGM/BREAK — When receiving data on-line from a computer system, press PGM/BREAK to signal the computer to stop sending. This signal repeats itself as long as the key is held down.

When off-line, press PGM/BREAK to enter Log-on programming mode.

RUN MSG

OFF-LINE

Press RUN MSG to print your stored message from the location of the pointer to the end of the message, or until you press the RUN MSG key again to stop.

ON-LINE

Press to send your stored message from the location of the pointer to the end of the message, or until you press the RUN MSG key again, or until a stored stop character is found in the message.

If the pointer is at the end of Ctrl Memory, press RUN MSG to automatically move the pointer to the beginning of memory, and send a stored message. If the pointer is at the end of memory, pressing the RUN MSG key will have no effect.

SHIFT RUN MSG

Press SHIFT and RUN MSG to enter polling mode. See Section 11.

WHO ARE YOU

Press WHO ARE YOU to request a remote unit to send an Answerback (identification) to your unit.

SHIFT WHO ARE YOU

Press SHIFT and WHO ARE YOU to print "Status Report". See Section 8, "Programmable Function Settings".

SHIFT RETURN

Press SHIFT and RETURN to change the function between transmission of CR.LF or CR Only. See Section 8, "Programmable Function Settings".

HERE IS

Press HERE IS to send an Answerback (identification) to a remote unit.

Line Length Switch

LINE LENGTH 80/136

Place in the 80 position to select a maximum of 80 characters per line from the keyboard.

Place in the 136 position to select a maximum of 136 characters per line from the keyboard. The LINE LENGTH switch setting of 80 or 136 only affects the keyboard format, and not the print format.

Special Function Keys

These keys allow you to send special-purpose control characters which command the remote unit to do certain things such as returning the teleprinter pointer to the left margin, or ringing a bell to call the operator's attention. These keys also allow you to change your Answerback (identification) message, set the number of rings for automatic answering, and adjust the line spacing in your message.

CTRL (Control)

OFF-LINE   Press and hold CTRL while pressing another key to produce a special function control character. The character symbol is printed by your teleprinter and the code is embedded in the message you store.

ON-LINE   Press and hold this key while pressing another key to send a special function control character.

                            Refer to Appendix B, for a listing of control codes.

ESC (Escape)   Press ESC, followed by one or more keys in sequence, to initiate special functions such as setting vertical line spacing, entering and exiting from text or graphics mode, setting the auto-answer feature, changing the Answerback (identification) message, and changing the printing mode to accomodate 80 or 136 characters per line.

Printed Messages

Memory Clear   Indicates that the keyboard Memory is clear and ready to accept data.

Ctrl Mem Clear   Indicates that the keyboard Ctrl Memory is clear and ready to accept data.

Memory Bad   A problem has been detected in the keyboard during the self-test sequence that occurs when you turn on the unit.

Power Restored   There is data stored in the keyboard Memory and/or Ctrl Memory.

Buffer Full   The keyboard memory is full.

Memory Clear? (Y/N)   Prompts the user whether or not to clear Memory.

Ctrl Mem Clear? (Y/N)	Prompts the user whether or not to clear Control Memory.
Home	Indicates that the keyboard memory is at the beginning of Memory.
Ctrl Mem Home	Indicates that the keyboard memory is at the beginning of Control Memory.
Polling Ready	Indicates that keyboard memory is ready to be polled.
Polling Off	Indicates that the system is back to normal operation.

Automatic Line Selector Model 1441

You select one of four settings when originating calls and the switch/indicator glows telling you which setting you have selected:

TO ANY 300 WPM DESTINATION VIA TELEPHONE NETWORK	Press to call another teleprinter or compatible device on the standard telephone line.
TO INTERNATIONAL TELEX 66 WPM TELEPRINTER VIA TELEPHONE NETWORK	Press to send and receive international Telex messages through an International Record Carrier (IRC) on the standard telephone line.
TO INTERNATIONAL TELEX 66 WPM TELEPRINTER VIA TWX NETWORK	Press to send and receive international Telex messages through an international Record Carrier (IRC) on the Telex II (TWX)* network.
TO TWX 100 WPM TELEPRINTER VIA TWX NETWORK	Press to send and receive Telex II (TWX) messages on the Telex II (TWX) network.

Your automatic line selector automatically answers calls on the telephone and Telex II lines. When one of the following lights glows on your automatic line selector, it tells you that you are receiving a call on that line.

TO ANY 300 WPM DESTINATION VIA TELEPHONE NETWORK	This light glows while the teleprinter is turned on, and when a call is received on the telephone line. It goes out when you receive a Telex II call.
TO INTERNATIONAL TELEX 66 WPM TELEPRINTER VIA TWX NETWORK	This light glows when a call is received on the Telex II (TWX) line.

* TWX is a registered trademark of the Western Union Company

Acoustic Adapter Model 1490

There are no controls on the acoustic adapter. A 9-volt battery provides power to the acoustic adapter. When the battery needs replacement and the adapter is connected to the teleprinter, the adapter emits a continuous alarm tone. Purchase a standard 9-volt transistor battery from any store. To replace the battery, refer to Section 3.

6
Speed/Format Setting

Your Whisper Writer System can send messages or data in any one of four selectable speed and format combinations as selected by the teleprinter Speed/Format Switch. This switch is located in the teleprinter paper well, beneath and slightly to the rear of the paper roll as shown below.
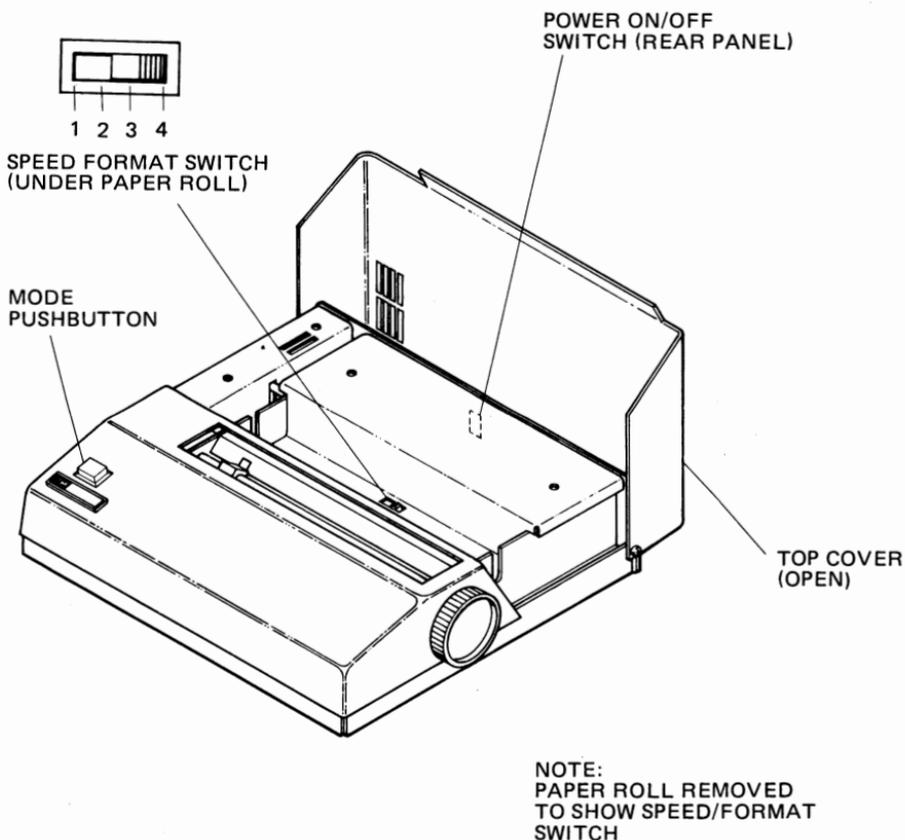
Speed/Format Switch Location

Setting the Speed/Format Switch

You set this switch at installation and you normally would not need to change it. However, if you require a specific speed and format for your message that differs from your normal setting, change the switch as required. Be sure to return the switch to your normal setting when finished.

The following table lists the four positions of the switch and the characteristics of each position. The switch positions are described in the paragraphs following the table.

| Destination | Switch Position | ASCII Format | | | | Baud Rate | Words Per Minute | Return Key Function | Characters Per Line③ |
		Start Bits	Data Bits	Parity Bits①	Stop Bits				80 Column
International Telex	1	1 Space	7	1	2 Mark	110	66②	CR-LF↵	69
Domestic TWX	2	1 Space	7	1	2 Mark	110	100	CR-LF↵	72
300 Wpm Computers	3	1 Space	7	1	1 Mark	300	300	CR ←	80/136
300 Wpm Messages	4	1 Space	7	1	1 Mark	300	300	CR or CR-LF↵	80/136

Notes:

① The transmitted vertical parity bit is even. The received vertical parity bit is ignored by the Whisper Writer Teleprinter.

② Auto-Restrain* allows real-time international or domestic Telex transmission at 66 words per minute via the International Record Carriers using the standard telephone or the Western Union Telegraphic Networks. Messages may be received at up to 100 words per minute.

③ Received messages will continue on the next line if the line length is exceeded.

* Auto-Restrain is 3M's proprietary technique for transmitting 110 Baud messages at a Telex-compatible speed of approximately 66 words per minute. Western Union Telex I and international Telex systems cannot receive faster than 66 words per minute. To assure real-time compatibility with these systems, all calls answered on the Telex II line will print out at the transmitting rate of the remote teleprinter or computer. This rate is usually 66 or 100 words per minute. Messages which are sent back to the caller from the keyboard will be internally restrained to the 66 words per minute rate.

Position 1

Use position 1 to send international or domestic Telex messages over either the standard telephone network or the Western Union Telex II (formerly called TWX) Network. The characteristics of this position are:

• Data rate of 110 Baud.

• Character rate of approximately 66 words per minute.

- No transmission of any character which is not recognized by a Telex machine.

- Automatic line feed is sent with each RETURN code.

- Line length of 69 characters.

Position 2

Use position 2 to communicate over the Western Union Telex II (TWX) Network with Telex II machines. The characteristics of of this position are:

- Data rate of 110 Baud.

- Character rate of 100 words per minute.

- Automatic line feed is sent with each RETURN code.

- Line length of 72 characters.

Position 3

Use position 3 to communicate with remote computers over the standard telephone network, and with computers which do not accept a line feed after a RETURN code. The characteristics of this position are:

- Data rate of 300 Baud.

- Character rate of 300 words per minute.

- No automatic line feed after each RETURN code.

- Line length of 80/136 characters.

Note: DO NOT use this setting to send a message to another Whisper Writer. You will not be sending a Line Feed at the end of each line and the message will be garbled.

Position 4

If your system includes the Model 1441 Automatic Line Selector, use position 4 to send to other 300 word-per-minute terminals as well as to computers. You may select whether or not to send a line feed with each RETURN code. The characteristics of this position are:

- Data rate of 300 Baud.

- Character rate of 300 words per minute.

- Operator-selectable line feed sent after each RETURN code. Refer to Section 8, "Programmable Function Settings", for procedures on selecting this feature.

- Line length of 80/136 characters.

Automatic Line Selector

300/110 Baud Switch Setting

The Automatic Line Selector (ALS) has the four switch/indicators shown below.

Automatic Line Selector

Switch/Indicator 1

Selects 300 Baud, 300 WPM (unrestrained) and Telephone Line

Switch/Indicator 2

Selects 110 Baud, 66 WPM Auto-Restrain feature, and Telephone Line

Switch/Indicator 3

Selects 110 Baud, 66 WPM Auto-Restrain feature, and TWX (Telex II) Line

Switch/Indicator 4

Selects 110 Baud, 100 WPM (unrestrained), and TWX (Telex II) Line

VIA TELEPHONE NETWORK

TO ANY 300 WPM DESTINATION

TO INTERNATIONAL TELEX 66 WPM TELEPRINTER

TO TWX 100 WPM TELEPRINTER

VIA TWX NETWORK
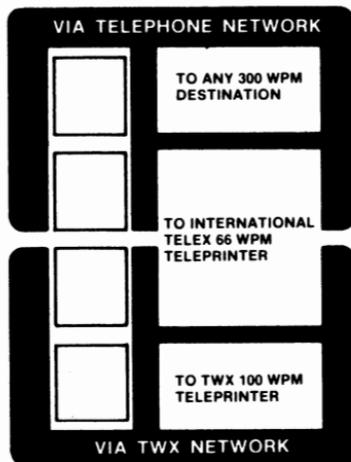
You actually press one of the four switches only when you are sending (i.e., sending is a manual operation). When the ALS receives, it causes the teleprinter to receive automatically at only one of two settings (not four) — either at 300 words per minute over the standard telephone network, or at 66/100 words per minute over the Western Union Telex II Network. This means that the first switch/indicator would light when you are receiving a message over the standard telephone network, or the third switch/indicator would light when you are receiving over the Western Union Telex II Network. The second and fourth switch/indicators would never light during receiving.

Some International Record Carriers require that the receiving unit receive at 110 Baud (100/66 words per minute) over the standard telephone network. If you need to receive messages from one of these IRC's you will need to reset the 300/110 Baud switch inside your ALS to the 110 Baud position. This

setting then allows your ALS to receive these IRC messages automatically at 100 or 66 words per minute. This means that when one of these IRC's sends you a message, the second switch/indicator on your ALS will light and you will receive at the required speed limit automatically.

Note: Remember that once you have set this switch to 110 Baud, your teleprinter will be limited to automatically receiving all messages over the standard telephone network at 100/66 words per minute.

When your system has finished receiving, the first (top) switch/indicator lights, regardless of whether or not you changed the internal 300/110 Baud ALS switch. The ALS automatically returns to this top position, because you probably send most of your messages at 300 words per minute.

Selecting the 110 Baud Setting

Refer to the following illustration to locate the 300/110 Baud ALS switch, and move it from the factory setting of 300 Baud to the 110 Baud position.
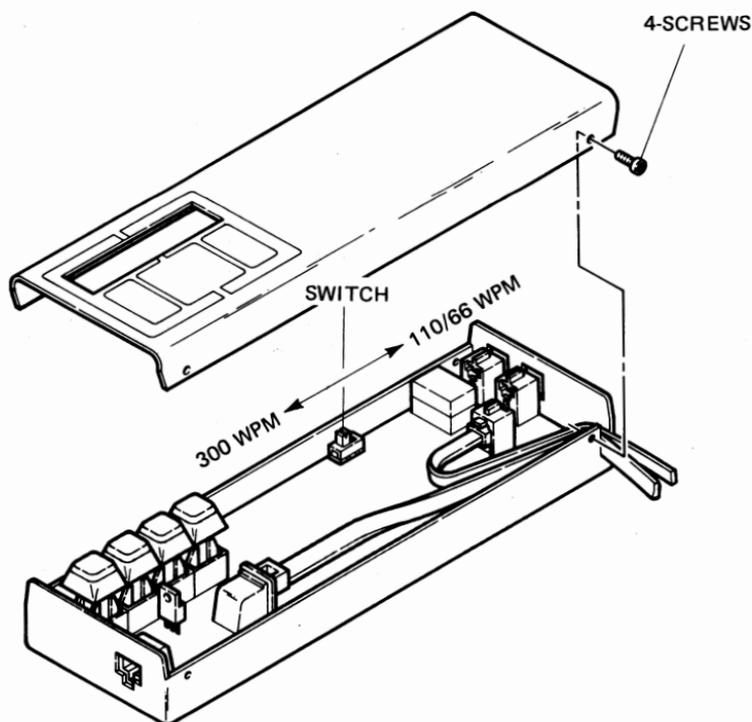
300/110 Baud ALS Switch

Programmable Function Settings

If you have a Whisper Writer System with a keyboard, you may print the status, or setting, of the programmable functions of your system. You may change the settings of these functions to suit your particular system application.

Printing the Status Message

Press SHIFT and WHO ARE YOU, off-line, to print out the current settings of the programmable functions. The teleprinter prints the following status message:

Sample Status   Range of Values


```
Status
  Xmit Baud Rate - 300            (110/66, 110/100, or 300)
  Return Key Xmits - CR.LF        (CR Only or CR.LF)
  Rcvd DC1/3 Ctrl - OFF           (ON or OFF)
  Rings - 6                       (0 through 9)


Log-on 1 = * NEWSNET VIA ** TELENET
Log-on 2 =***DOW JONES VIA TELENET
Log-on 3 =
Log-on 4 =
```


* NEWSNET is a registered trademark of NEWSNET, INC.
** TELENET is a registered trademark of GTE Telecommunications Corp.
*** DOW JONES is a registered trademark of DOW JONES & CO., INC.

Changing the Selectable Features

The selectable features are defined as follows:

Xmit Baud Rate

This indicates the setting of the Speed/Format Switch. This switch selects the speed at which your message or data is transmitted and the format of the

data. Refer to Section 6, "Speed Format Settings" for more information. The switch settings and corresponding status printout are as follows:

Switch Setting	Status Message
1	110/66
2	110/100
3	300
4	300

To change this setting, move the Speed/Format Switch located in the paper well of your teleprinter.

Return Key Xmits

This status message indicates whether the RETURN key will transmit a Carriage Return (CR) or a Carriage Return and Line Feed (CR-LF) with each keystroke. When the Speed/Format Switch is in position 4, you can select what the RETURN key transmits. Normally, the unit is set to send both a CR and an LF in position 4.

To change this setting, press SHIFT and RETURN.

To change back, press SHIFT and RETURN again.

You can change this setting either off-line or on-line. If you change it off-line, the teleprinter prints:

Return Key Xmits - CR Only

or:

Return Key Xmits - CR.LF

and the current line in memory.

Rcvd—DC1/3 Ctrl

This status message indicates whether the Whisper Writer System will respond to a received DC1 (X-On) or a DC3 (X-Off) flow control command from a remote device. If this feature is turned on, the teleprinter will stop the transmission of data from the keyboard or memory whenever it receives a DC3 (X-Off) command from the remote device. It will resume the transmission of data whenever it receives a DC1 (X-On) command from the remote device. If this feature is turned Off, any received DC1 and DC3 commands will be ignored by your teleprinter.

To turn this feature on or off: (OFF-LINE ONLY)

1. Press and release ESC.
2. Simultaneously press CTRL and Z. You may turn it off by repeating the same keystroke sequence. The teleprinter prints:

Rcvd DC1/3 Ctrl - ON

or:

Rcvd DC1/3 Ctrl - OFF

Rings

Your Whisper Writer Teleprinter is normally set at the factory to answer the phone automatically after 6 rings. You may change your system to answer between 1 and 9 rings or none at all, in OFF- LINE mode only. The status message tells you the current setting for the number of rings.

1. To change the number of rings before automatic answering:

    a. Press and release ESC

    b. Press CTRL and hyphen

    c. Press HERE IS.

    •   The pointer moves to the left margin and the paper advances.

    •   The teleprinter prints the Control-E symbol ë indicating you have accessed the Answerback message.

2. To enter the number of rings, press a number key from 1 to 9, or 0 for no auto-answer.

    •   The teleprinter prints the number entered.

3. Press HERE IS again to register your new setting.

    •   The teleprinter prints a second Control-E symbol ë following the number you entered.

    •   The pointer moves to the left margin and the paper advances.

4. To verify the setting of the Automatic Answer feature, print the status message by pressing SHIFT and WHO ARE YOU.

Line Length

The teleprinter is factory-preset to print 80 characters/line. The following ESC sequences allow you to select between 80 or 136 characters/line. When the teleprinter is turned off, the teleprinter will go back to the factory setting when it is turned on again.

1. Press and release the ESC key, then press 7 to change to 136 characters per line (compressed mode).

2. Press and release the ESC key, then press 6 to change to 80 characters per line.

Line Spacing

The keyboard is factory-preset to single line spacing each time power is turned on. The following ESC sequences allow you to change the line spacing to one and a half or double spacing.

1. Press and release the ESC key, then press 1 to change line spacing to one and a half spacing.

2. Press and release the ESC key, then press 2 to change line spacing to double spacing.

3. Press and release the ESC key, then press 0 to change line spacing back to single spacing.

9

Log-on Directory Programming

The directories on the Whisper Writer can be down-loaded by a remote host. These directories can be changed from the keyboard using special key combinations. You will need a printed sample of the actual log-on sequence before starting to load a directory. This can be obtained from the instruction manual provided from the service, or the printout from a recent log-on session with the computer. To program a sequence, you will need to know EXACTLY what the computer sends and the EXACT order in which it is sent.

The log-on sequences should be prepared, edited, and stored in the keyboard memory before entering the programming mode. It is usually convenient to use Ctrl Memory to store the log-on sequence so that Memory is available for message preparation.

Log-on Control Codes

CTRL and = pressed simultaneously is used as a log-on field terminator in programming mode. These keystrokes will print as ⁺, that is a plus sign with three dots above it.

The following special characters have special meaning in programming phone numbers and text fields.

KEYS TYPED	PRINTED OFFLINE	CORRESPONDING CODE
CTRL 7	~	Time Delay
		This time delay code is used to bracket a number which indicates the length of a pause. The maximum delay is 99 seconds.
SHIFT 1	!	Suppress the following characters.
		Substitutes a period (.) for every character typed between exclamation points. For example, this code can suppress a password, but only if it is the FIRST CHARACTER typed for the password. The code also must be the LAST CHARACTER typed after the password.

CTRL 1	{	Respond after receipt of ANY character.
		Generates a code for the teleprinter to wait for ANY character from the host computer before sending the next characters in the log-on sequence.
CTRL 2	}	Respond after receipt of a specified character.
		Generates a code for the teleprinter to wait for the character typed immediately after this control code from the host computer before sending the next character in a log-on sequence.

Preparing Log-on Sequences

During log-on preparation, the RETURN key may be used to store either a CR only or a CR.LF. However, when programming mode is entered, the RETURN key should be set to the required status because the teleprinter stores the status of the current RETURN key setting. So, if a CR only is required, set the RETURN key to transmit CR only and if a CR.LF is required, set the RETURN key to transmit CR.LF before loading the prepared log-on sequences into memory. This may not be a problem to systems that accept both CR only and CR.LF.

The following is the procedure to prepare the log-on sequences for the directory label, phone number, and text.

LABEL

1. Simultaneously press CTRL and = .
2. Type the desired label using up to 48 letters, numbers, or symbols.
3. Terminate the field by simultaneously pressing CTRL and = , then press RETURN.
4. A typical label might look like this:

<div align="center">

＋NEWSNET VIA TELENET＋

</div>

PHONE NUMBER

1. Simultaneously press CTRL and = .
2. Type the phone number using up to 48 letters, numbers, or symbols. Use the "time delay" character as necessary, as in PBX systems or carrier services.
3. Simultaneously press CTRL and = .

4. A typical telephone number might look like this:

$$\text{+5551212 TELENET Sunnyvale+}$$

Note: Non-numeric characters in the phone number field are ignored during auto-dialing.

TEXT

1. Simultaneously press CTRL and = .
2. Type the desired text using up to 48 letters, numbers, or symbols, making use of the characters " ~ ", "!", "{ ", "}", as necessary.
3. Simultaneously press CTRL and = to terminate the field, then press RETURN.
4. A typical prepared text might look like this:

+~1~	Wait one second (see Note below), then send two **CR**'s
}=D1	Wait for " = " character, then send "D1 **CR**"
}@MAIL	Wait for " @ " character, then send "MAIL **CR**"
}?NAME	Wait for "?" character, then send "NAME **CR**"
}?PASSWORD +	Wait for "?" character, then send "PASSWORD **CR**"

Note: The 1 second delay at the beginning of the text is often necessary because the two CR's are sent so quickly, TELENET may only see the first one.

While the ESC (Escape) key can be used in the directory text, as the character to send or to "wait for", the Escape symbol (the letters E and C compressed) does not print until the next key is pressed.

The Alphabetic Control Characters (CTRL A through CTRL Z) are printed as the lower case letter equivalent with three dots above. The Null Control Character is printed as a space with three dots above. The five other Control Characters are printed as two compressed letters. Refer to Appendix C, "ASCII Character and Control Codes", for the table of printed characters generated by specific keys.

Manually Loading the Directory

After the log-on sequences have been prepared and stored in Memory or CTRL Memory, proceed as follows:

1. Press PGM/BREAK to enter programming mode. The teleprinter will prompt:

   SELECT 1-4:

   The teleprinter will beep if a key other than 1,2,3, or 4 is pressed. Press RETURN to exit programming mode at this point.

2. After one of the four directories has been selected, the teleprinter will print the number of the directory, the currently stored information, and then print:

<div align="center">Change (Y/N):</div>

3. If a change is not necessary, press N. When Y is pressed, the teleprinter will wait for a response. Press END/HOME (or CTRL and END/HOME simultaneously), then press RUN MSG to load the stored log-on sequence in the directory.

4. One of the following messages will print:

Done   Programming is complete. The teleprinter automatically exits programming mode.

Error   The data entered was incorrect; such as exceeding the maximum number of characters allowed in a field, or omitting one of the log-on field terminators. The teleprinter automatically exits programming mode.

If one of these messages is not printed, press PGM/BREAK. The teleprinter prints "Error" and exits programming mode.

5. To change one or two fields of a log-on sequence, precede and terminate the field(s) with the correct number of field terminators. If you want to change one field only, it would look like this:

+NEW LABEL+++++   (label field only)

+++NEW PHONE NUMBER+++   (phone field only)

+++++NEW TEXT+   (text field only)

If you want to change two fields only, it would look like this:

+NEW LABEL+
+NEW PHONE NUMBER+++   (label and phone fields only)

+NEW LABEL+
+++NEW TEXT+   (label and text fields only)

+++NEW PHONE NUMBER+
+NEW TEXT+   (phone and text fields only)

6. To erase contents of the entire directory, enter the following:

+ ++ ++ +

10
Answerback Message

The ability of a teleprinter to store and send an Answerback message is optional in most communication systems, but it is standard in the Whisper Writer. An Answerback message can be entered using the Model 1945 Keyboard and stored permanently in the teleprinter memory. This information is stored for the life of the factory-installed lithium battery, or approximately five years.

Answerback Message

The Answerback message is used in communication systems as a method of identifying units within the system. Storing a unique Answerback message allows your Whisper Writer System to send that message:

• automatically upon answering a call

• when the operator presses the HERE IS key

• automatically upon receiving the WHO ARE YOU command from a remote device

Selecting Your Answerback Message

The Answerback message you select may have special requirements, either determined by your telecommunications management and/or by the remote system with which you will be communicating. It is important to check this before entering your message.

Stops, pauses, Control-E, and the following single keys or combination of keys, are not available for use in the Answerback message:

Single Keys:

RETURN	WHO ARE YOU	left arrow (BACKSPACE)
INSERT	END/HOME	right arrow (FORWARD)
RUN MSG	PGM/BREAK	X-OUT

Two-key Combinations:

CTRL and +
CTRL and ;

Changing Your Answerback Message

You may change your Answerback message or suppress the Answerback feature entirely. If you suppress it, your teleprinter will not print or send an Answerback message. Suppressing the Answerback feature does not affect the automatic answer feature. To change or suppress your Answerback message:

1. a. Press and release ESC

   b. Press CTRL and hyphen

   c. Press HERE IS

   • The pointer moves to the left margin and the paper advances.

   • The teleprinter prints the Control-E symbol ë indicating you can change the Answerback message.

2. Type your Answerback message, up to a maximum of 46 characters including prefix and suffix characters. Refer to Appendix D, Table 4, to enter the ASCII Control Codes which make up the Answerback message prefix and suffix. For example, to enter the CR (carriage return) for the prefix, Table 4 indicates you would type CTRL and M. If you want to suppress your Answerback message feature, proceed to step 3 without entering any message.

   If you will be sending to or receiving from message services such as international Telex or domestic Telex I or II (formerly called TWX), we recommend the format shown below.

Character Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Enter:	C R	L F	D E L			Company Mnemonic							S P		City Mnemonic			C R	L F	A C K

Note: If the first character in your Answerback message is a number (0-9), the teleprinter will interpret this number as the number of rings for the automatic answer feature and that number will not become part of your Answerback message. Refer to "Number of Rings" above for specific details. In order to enter a number as the first character in your Answerback message, you must first enter the number for the number of rings and then enter your number. For example, if you wanted to begin your Answerback with the "4" and the number of rings is set for "6", you would first type the number "6" followed by the number "4". Then, you would type the remaining characters in your Answerback message.

3. Press HERE IS to execute the change.

   - The teleprinter prints the Control-E symbol ̈e indicating the Answerback message is changed.

   - The pointer moves to the left margin and the paper advances.

4. Press HERE IS to verify your Answerback message.

   - The teleprinter prints your Answerback message.

11
Preparing a Message or Data Off-line

Keyboard Memory

Whisper Writer electronic memory allows you to prepare, review, and correct a message before sending it. Most messages will be prepared, off-line, in memory to insure error-free transmission. The maximum storage capacity is 8,184 characters, spaces, and codes.

The memory capacity can be divided so that a portion of it can be set aside as a second memory. In this way, a message or set of data can be prepared, sent, or erased independently of the contents of the other memory. The second portion of memory, called Ctrl Memory because it is accessed with the CTRL key, is carved out of the total memory. Therefore, the combined memory capacity is still 8K. When the system is powered up, the teleprinter will indicate the memory status. If both memories are clear, the following will print:

        Memory Clear
        Ctrl Mem Clear

If a message has been stored in either memory, the following will print:

        Power Restored

The keyboard memory remains undivided, and automatically powers up as Memory, until it is split by pressing the CTRL and END/HOME keys. If the memory had been divided and data was stored in either or both portions before the system was turned off, it would be necessary to check each memory to see what had been stored.

Checking Memory

Before you enter data, you must determine:

1. Is data stored in memory and do you want to erase it?
2. Do you want to split the memory?

If, when you turn on your system the teleprinter prints Power Restored, it means there is data stored in Memory and/or Ctrl Memory. Also, if you did not just turn on your system, you will not know if or where there is data stored. You can check to see if data is stored by trying to print the contents of the memories.

Printing Data Stored in Memory:

1. Press END/HOME.
   - The teleprinter prints Home.
   - The pointer moves to the left margin and the paper advances.
2. Press RUN MSG.
   - If there is data stored in Memory, the teleprinter will print it. If the teleprinter does nothing, there is no stored message in Memory.
3. To stop printing, press RUN MSG again.

If that data stored in Memory can be erased, refer to "Erasing a Message". If you must save it, enter your new message or data in Ctrl Memory. Remember, if you have a message stored in Memory the combined capacity of Memory and Ctrl Memory is up to 8,184 characters.

Printing Data Stored in Ctrl Memory:

1. Press CTRL and END/HOME.
   - The teleprinter prints Ctrl Mem Home.
   - The pointer moves to the left margin and the paper advances.
2. Press RUN MSG.
   - If there is data stored in Ctrl memory, the teleprinter will print it. If nothing happens, there is no data stored in Ctrl Memory.
3. To stop printing, press RUN MSG again.

If the data stored in Ctrl Memory may be erased, refer to "Erasing a Message". If you must save it, enter your message or data in Memory.

Entering Data in Memory:

The message or data you prepare off-line and store in Memory must be in a format compatible with the unit to which you are sending data. For example, the message formats for International Telex, Telex II messages, and 300 word per minute computer and message terminals have different line lengths. You select the format that is compatible using the Speed/Format Switch. This switch also controls other telecommunication characteristics, such as speed. Refer to Section 7, "Speed/Format Setting", for more information.

1. Press END/HOME to enter data in Memory. If you want to enter data in Ctrl Memory, press CTRL and END/HOME.
   - The teleprinter prints either Home or Ctrl Mem Home.
   - The pointer moves to the left margin, and the paper advances.
2. Type your message or enter data as you would with a standard typewriter. For information about formatting a Telex II message, refer to your Western Union Telex Network Directory and Buyer's Guide.
   - The teleprinter beeps 8 spaces before the end of a line and again at the last character.

You can correct single character errors as you type your message by pressing the backspace to move to the error. Type over the incorrect character and continue typing your message. Refer to "Revising Data" in this section to correct other errors or change your message.

Adding to a Message:

There are two ways to add data to the end of a previously entered message. You can either print the entire message, or move to the end of the message (without printing it) to save time. You can then type in the additional data.

To Print the Message and Then Add Data:

1. If your message is stored in Memory, press END/HOME to return to the home position of Memory. Then press RUN MSG to print your message.

   If your message is stored in Ctrl Memory, press CTRL and END/HOME to return to the home position of Ctrl Memory. Then press RUN MSG to print your message.

   • The teleprinter prints the stored message.

   • The pointer stops at the end of the message.

2. Type the additional message or data as you would with a standard typewriter.

3. Repeat step 1 to print a revised copy of your message.

To Add Data Without Printing:

1. If your message is stored in Memory, press END/HOME to return to the home position of Memory.

   If your message is stored in Ctrl Memory, press CTRL and END/HOME to return to the home position of Ctrl Memory.

2. Press SHIFT and END/HOME.

   • The memory location pointer goes to the end of the portion of memory it is in.

3. Type the additional message or data as you would with a standard typewriter.

4. To print a revised copy of your message, if your message is stored in Memory, press END/HOME to return to the home position of Memory. Then press RUN MSG to print your message.

   If your message is stored in Ctrl memory, press CTRL and END/HOME to return to the home position of Ctrl memory. Then press RUN MSG to print your message.

Revising Data

Searching for a Location in Your Message...

There are four ways to locate a particular place in your message. You may 1) proceed through the memory line-by-line as your teleprinter prints only the first five printable characters of each line; 2) move back or foward 5 lines and teleprinter prints only the first five characters of the previous or next 5th line; 3) start printing your entire message and stop when the teleprinter reaches the location you want; 4) proceed immediately to the end of your message and then either begin entering data where your message ended, scroll backwards line-by-line from the end of your message to the correct location.

Using the Line-by-Line Function

To scroll forward:

1. Locate the beginning of the memory that contains the message you want to revise, or scroll forward from your present location in the message as explained below.
2. Press SHIFT and the right arrow key once for each line you wish to advance.
   - The teleprinter prints the first five printable characters in each line.
3. Once you locate the appropriate line, press the right arrow key and the backspace key to position the pointer under the first letter in the word you want to change.

To scroll backward:

1. Locate the end of the memory that contains the message or data you are going to revise, or scroll backward from your present location as explained below.
2. Press SHIFT and the backspace key.
   - The pointer moves to the left margin and the paper advances.
   - The teleprinter prints the first five printable characters of the previous line.
3. Hold down both SHIFT and the backspace key until the first five characters in the line you wish to change are printed.
   - The first five printable characters in each previous line are printed with a double space between lines (to indicate you are scrolling backwards).
4. Once you locate the line, press the right arrow key and the backspace key to position the pointer under the first letter in the word you want to change.

Using the Back or Forward 5 Lines Function

Forward 5 lines

1. Locate the beginning of the memory that contains the message you want to revise or scroll forward from your present location in the message as explained below.

2. Press CTRL and the right arrow key to advance 5 lines.

- The teleprinter prints the first five printable characters of the 5th line.

3. Once you locate the appropriate line, press the right arrow key and the backspace key to position the pointer under the first letter in the word you want to change.

Back 5 lines

1. Locate the end of the memory that contains the message or data you are going to revise, or scroll backward from your present location as explained below.

2. Press CTRL and the backspace key.

- The pointer moves to the left margin and the paper advances.
- The teleprinter prints the first five printable characters of the 5th line from the position of the pointer.

3. Hold down both CTRL and the backspace key until the first five characters in the line you wish to change are printed.

- The first five printable characters in each 5th line are printed with a double space between lines (to indicate you are scrolling backwards).

4. Once you locate the line, press the right arrow key and the backspace key to position the pointer under the first letter in the word you want to change.

Using the Printing Function

1. Locate the beginning of the memory that contains the message you want to revise.

2. Press RUN MSG.

- The teleprinter begins printing your message.

3. When the teleprinter reaches the location in your message you are searching for, press RUN MSG again.

- The teleprinter stops printing your message.

4. If you stop the printing too soon or too late, press the right arrow key or the backspace key to locate the correct position, or press RUN MSG again to continue printing.

Using the Fast Forward Function

1. Locate the beginning of the memory that contains the message you want to revise.

2. Press SHIFT and END/HOME.

- The pointer moves to the left margin and the paper advances.
- The teleprinter prints the entire last line of your message unless the last character was a carriage return.

3. You can now continue entering data where your message ended, or begin scrolling backward line-by-line or 5 lines through your message as explained above.

Substituting

To replace text or data with the same number of words, characters, spaces, or digits:

1. Position the teleprinter pointer under the appropriate location where you wish to begin substituting.
2. Type in the substitution.
3. If you wish to review your entire message with all the corrections included, locate the beginning of the memory containing your message and then press RUN MSG.

Deleting

To erase a character(s):

1. Position the pointer under the appropriate location where you wish to begin deleting.
2. Delete any incorrect characters remaining or spaces by pressing the X-out key once for each remaining character or space.
   - The delete symbol is printed for each deleted character.
3. If you wish to review your entire message with all the corrections, locate the beginning of the memory containing your message and then press RUN MSG.

To erase text or data from the current position of the pointer to end-of-line:

1. Position the pointer under the appropriate location where you want to begin deleting.
2. Press SHIFT and the X-out key.
   - The delete symbol is printed from the current position of the pointer to end-of-line.
   - Use the X-out key to delete the carriage return.

Adding

To insert text or data:

1. Position the pointer under the appropriate location where you want to begin adding.
2. Press INSERT.
   - You will hear a continuous clicking sound from the teleprinter, indicating that you are inserting characters, not typing over existing characters.
3. Type the characters you want to insert.

Note: If you make a mistake while inserting characters, press the backspace to back up, positioning the pointer under the character to be corrected, and type as necessary. If additional characters are to be inserted following the correction, press INSERT again to reenter the insert mode, and continue typing.

4. If you have more changes to make at another location, press INSERT to stop inserting. Refer back to Step 1.
   • The clicking sound stops, indicating you are no longer inserting.
   • The teleprinter prints the remaining characters in the line.
   • The pointer returns to the position it occupied before you pressed INSERT.

5. If you have no more changes to make, press RUN MSG, or press any of the editing keys to exit insert mode.
   • The clicking sounds stops, indicating you are no longer inserting.
   • The teleprinter prints the remaining characters in your message.
   • Press any of the edit mode keys to exit insert mode.

Reformatting Lines

After you have deleted characters, or inserted extra characters in a message, you may wish to change the appearance (format) of your revised message. To revise the line format of a message, follow the procedures below.

Dividing Lines:

1. Locate the line you wish to re-format.
2. Position the teleprinter pointer under the space between the words you wish to divide using the backspace.
3. Press RETURN.
   • The paper advances and the pointer returns to the left margin.
   • The line is now divided. Refer to the revise procedures to complete your change.

You may review your changed message by moving the pointer to the home position of the memory you are using and pressing RUN MSG. Your entire message is then printed.

Combining Lines :

You may combine any line with the line below it by deleting the return command between the two lines:

1. Position the teleprinter pointer anywhere along the second line of the two you want to combine.
2. Press and hold the backspace key until the teleprinter pointer moves to the left of the left margin and begins to print the preceding line.
3. Release the backspace key before the entire first line is printed.
   • The teleprinter continues printing up to the end of the first line and stops.

4. Press the space bar.

- This inserts a space between the two combined lines.

5. Press the X-out key.

- The teleprinter prints the delete symbol and the second line, indicating that it has deleted the return command.

- The pointer moves under the first character following the delete symbol.

You may review your changed message by moving the memory location pointer to the home position of the memory you are using and pressing RUN MSG. Your entire message is printed.

Erasing a Message

To erase a message in Memory:

1. Press END/HOME to position the memory location pointer at the beginning of Memory.

- The teleprinter prints "Home".

2. Press CTRL and the X-out key.

- The teleprinter prints Memory Clear? (Y/N)

- The memory location pointer moves to the beginning of Memory, if you answered Y.

- The teleprinter prints entire first line in memory and the memory location pointer moves to the beginning of Memory, if you answered N.

To erase a message in Ctrl Memory.

1. Press CTRL and END/HOME to position the memory location pointer at the beginning of Ctrl Memory.

- The teleprinter prints "Ctrl Mem Home".

2. Press CTRL and the X-out key.

- The teleprinter prints "Ctrl Mem Clear? (Y/N)".

- The memory location pointer moves to the beginning of Ctrl Memory, if you answered Y.

- The teleprinter prints entire first line in memory and the memory location pointer moves to the beginning of Memory, if you answered N.

Special Operating Features

. . . Inserting Pauses in Your Message

You may place a pause(s) in your stored message by embedding a control code, CTRL plus/equal (+/=), in one or more places in your message. This code produces a delay in the transmission of your stored message. This allows the remote device time to respond to a queston or to send an

identification message. Your teleprinter automatically resumes transmitting at the end of the pause.

Each control code delays the transmission for one second. You may place as many codes as you need in succession to produce a specific time delay. For example, you may store a complete computer log-on procedure in one part of your keyboard memory with sufficient pauses to allow the computer to respond.

Then by a single press of RUN MSG, you may log-on to the computer system.

To insert pauses in your message:

1. Determine where you want to insert a pause in your message, and how many seconds long the pause should be.

2. Type your message text as usual. However, stop at the location where you want to enter a pause.

3. Press CTRL and the plus/equal key once for each one-second of delay required in your pause. For example, if you required a 10-second pause then press the equal key 10 times while holding down CTRL.

   • The teleprinter prints the delay symbol ⁺⁺ once for each press of the equal key: During message transmission on-line, the delay symbol ⁺⁺ is not printed when printing the local copy.

   However, it is always printed when printing your message off-line, and no pause occurs.

4. Continue typing your message text.

If your message is to contain more than one pause within the text, repeat steps 2, 3, and 4 above for each pause.

To review your completed message and verify the position of the pause(s), locate the beginning of your message and press RUN MSG.

. . . Inserting Stops in Your Message

You may automatically stop the transmission of your stored message by embedding a stop code, CTRL and colon/semicolon (:/;), at one or more locations in your message. This allows you to type variable data into your message while on-line. You may automatically resume your transmission by pressing RUN MSG.

To insert stops in your message:

1. Determine where you want to insert stop(s) in your message.

2. Type your message as usual, stopping at the location of your stop.

3. Press CTRL and the colon/semicolon key.

   • The teleprinter prints the stop symbol: ∅

   During message transmission on-line, your message transmission stops at each stop command but the symbol (∅) is not printed when printing a local copy. However, it is always printed when printing your message off-line, but the stop command itself is not executed locally.

4. Continue typing your message text.

If your message is to contain more than one stop, repeat steps 2, 3, and 4 above for each additional stop.

To review your completed message and verify the position of the stops, locate the beginning of your message and press RUN MSG.

. . . Inserting Variable Data

You may transmit variable data to a remote device on-line from your keyboard wherever you inserted a stop command in your message off-line. For example, you may prepare a form message for transmission to different locations. By inserting stops at specific places within your message off-line, your teleprinter automatically stops during the on-line transmission, so you can type in the variable data (such as name and location) and then resume your transmission. This allows you to send the same message to several places without typing the entire message again.

To insert variable data:

1. Determine what and where variable data is required in your message.
2. Prepare your message text with appropriate stop commands. Refer to the preceding section, "Inserting Stops in Your Message".
3. Transmit your message. When your teleprinter encounters a stop code, it stops transmitting. Type your variable data.
4. Press RUN MSG to resume the transmission.

If your message contains more than one stop, repeat steps 3 and 4 above for each stop code.

. . . Send Answerback

You may place a "Send Answerback" character in your stored message by embedding a control code, CTRL HERE IS, in one or more places. This keystroke combination places a corresponding code in memory to automatically send the Answerback. This allows multiple sending of the Answerback without pressing the HERE IS key.

To insert the "Send Answerback" in your message:

1. Determine where in the message you want to send your Answerback.
2. Type your message text as usual. Stop at the location where you want to send your Answerback.
3. Press CTRL and HERE IS simultaneously.

   The teleprinter prints the "Send Answerback" symbol, $\overset{\cdots}{=}$, equal sign with three dots above.

   During on-line message transmission, the teleprinter will send the Answerback each time it sees the "Send Answerback" code. It will delay 3 seconds to allow Answerback to be transmitted before continuing message transmission. When off-line, this code will be printed out, but not executed.
4. Continue typing your message.

5. Locate the beginning of your message and press RUN MSG to review your completed message and verify the positions of the send Answerback code(s).

. . . Polling

Polling allows another compatible teleprinter or computer to call your Whisper Writer Terminal and receive a stored message. Your system can also poll a remote Whisper Writer unit that has this feature to receive a stored message by sending one command.

A typical application of polling would be calling a location in another time zone. You can call to receive messages from a location during your working hours, which are before or after working hours at the other location. Or, another location may call your unit to receive messages during their working hours. Polling is most convenient when a regular system is set up between the units. The local operator has the responsibility to store the message and to set up the unit to be polled.

To set up your unit to be polled, all you have to do is prepare your message off-line in the normal manner and store it in the Memory portion of keyboard memory. Then you simply press two keys to prepare your unit to be polled. If you want your message to be polled more than once, you include a special control code three times at the end of your message. This triple code prepares your Whisper Writer Terminal for repetitive polling. When a remote operator wants to receive your stored message, the remote unit sends you a command, and your unit transmits its message.

If your system loses electrical power while it is set up to be polled, it automatically returns itself to polling status when power is restored. To indicate that it is again ready, your teleprinter prints its Answerback message and "Polling Ready". If the telephone connection is broken during polling, before your system has transmitted the entire message, it automatically restores itself to polling status, and prints "Polling Ready".

To avoid disruption of a polling operation, your system will not send data once you have set it up for polling. Your keyboard will not operate until you restore your system to normal operation by pressing one key. The teleprinter then prints "Polling Off" and "Home".

Preparing Your Whisper Writer System To Be Polled

1. Press END/HOME. You must enter your message in the Memory part of the keyboard memory to be polled.
   - The pointer moves to the left margin and the paper advances.
   - The teleprinter prints "Home".
2. Press CTRL and S to set up your message to be polled.
   - Your teleprinter prints the Control-S symbol.
3. Type your message as usual.

Note: If you want your message to be polled more than once, add three Control-S codes at the end of your message by pressing CTRL and S three times. Then, press and engage LOCAL COPY.

4. To set up your Whisper Writer System to be polled, press SHIFT and RUN MSG.

   - The teleprinter prints "Polling Ready".

   The transmission of your polled messages stops if one of the following conditions exist:

   a. Your system receives a Control-S code from the polling device if LOCAL COPY is off.

   b. The last character in your message is transmitted.

   c. A Stop Code is detected in your message.

   d. You press RUN MSG or END/HOME.

5. When your system is polled:

   - Your teleprinter automatically answers the telephone and and sends the Answerback message.

   - When the remote terminal sends your system two Control-Q codes, your system sends the stored message.

   - If you set-up your system for repetitive polling, your teleprinter prints your stored message each time it is polled.

Restoring Your System To Normal Operation

To restore your unit to normal operation:

1. Press END/HOME.

   - The pointer returns to the left margin and the paper advances.

   - If your system was not polled or if you set it up for repetitive polling, your teleprinter prints "Polling Off".

   - The pointer returns to the left margin and the paper advances.

   - Your teleprinter prints "Home".

Polling Another Whisper Writer Terminal

1. Establish a connection with the remote Whisper Writer System. Refer to "Sending a Message or Data . . . To an Unattended Unit".

2. Press CTRL and Q twice.

   - The teleprinter prints the polled message.

3. After you receive the message, press mode pushbutton.

   - The switch/indicator glows dimly.

Note: If the remote Whisper Writer System is set up for repetitive polling, your teleprinter will receive a Control-S code as the last character in the message. This code may lock-up your keyboard preventing its use. To return your keyboard to normal operation, simply press CTRL and Q after terminating the call.

12
Sending and Receiving Messages

Sending a Message or Data

1. The mode pushbutton must be lit. If it is not lit, place the power switch in the ON position. The "power on" sequence as described in Section 1, under "self-testing" must occur.

    *   The mode pushbutton glows dimly.

2. If you want to send an error-free message and save telephone line cost, refer to Section 11, "Preparing a Message or Data Off-Line". If you want the other unit to receive the message as you are typing it, proceed to step 3.

3. If you have an automatic line selector:

    a. To call another teleprinter, computer, or computer-type device, press the "TO ANY 300 WPM DESTINATION VIA TELEPHONE NETWORK" switch/indicator.

        *   The switch/indicator glows.

        *   Then follow procedures below for appropriate calling method - directory dialing, keyboard dialing, or desk phone dialing.

    b. To call an International Record Carrier, press the "TO INTERNATIONAL TELEX 66 WPM TELEPRINTER VIA TELEPHONE NETWORK" switch/indicator.

        *   The switch/indicator glows.

4. To print your own copy of your message as you send it, press and engage LOCAL COPY.

Note: If you are sending data to a computer, your printed message may have double characters. This is normal; the computer is simply echoing back the data. Press and disengage LOCAL COPY to print normally.

Directory Dialing

I. Press the mode pushbutton. The following will print:

    SELECT 1-4, A, or D:

2. Select the number, 1-4, that corresponds to the phone number and log-on sequence desired. "A", used with the acoustic adapter, and "D", used with keyboard dialing, are discussed below. During the dialing process, there will be a series of rapid clicks synchronized with flashes from the mode pushbutton on the teleprinter, followed by a steady glow while waiting for the remote unit to answer.

3. When the mode pushbutton flashes, the teleprinter will send the programmed log-on sequence. When this is complete, you may send your message or data. If you are sending a previously prepared message, locate the home position of the applicable memory, and press RUN MSG.

    •   Your teleprinter automatically prints a copy of the message as it is sent.

Keyboard Dialing

Telephone numbers other than those stored in the log-on directory can be dialed using the numbers keys on the keyboard.

1. Press the mode pushbutton. The teleprinter will print:

    SELECT 1-4, A, or D:

2. Press D. One of the following messages will print:

    DIAL:

    or:

    DIAL or R for 5551212

3. When

    DIAL:

    prints, dial any desired phone number by pressing the numbers in sequence on the keyboard (including pauses that may be necessary as in PBX systems or carrier services) followed by a RETURN. If

    DIAL or R (and a number)

    prints, either dial any desired number, or press R to redial the number displayed. The number displayed is the last number dialed the last time the teleprinter was turned on.

4. During the dialing process, there will be a series of rapid clicks synchronized with flashes from the mode pushbutton on the teleprinter, followed by a steady glow while waiting for the remote unit to answer.

5. When the mode pushbutton flashes, the connection is complete and you can type your message. If you are sending a previously prepared message, locate the home position of the applicable memory, and press RUN MSG.

    •   Your teleprinter automatically prints a copy of the message as it is sent.

Desk Phone Dialing

When a telephone is connected to the teleprinter, the phone can also be used to dial another teleprinter or service network.

1. Remove the handset from the telephone, press the mode pushbutton. When the teleprinter prompts,

    SELECT 1-4:

    dial the telephone number.

2. If someone answers the phone, proceed to "To an Attended Unit" below. If you hear a high-pitched tone in the handset, proceed to "To an Unattended Unit".

. . . To an Attended Unit

1. Explain that you will send a message. The attended unit operator will then prepare to receive your message.

Note: If you want to talk to the remote operator after the message using the same telephone line connection, you will need to arrange a cue for the other operator to pick up the phone. For example, you could send several bell characters, (CTRL G), at the end of your message. This could be a permanent cue to the remote operator that you want to talk after the message. When ready to talk, the remote operator can send a bell character.

2. When you hear a high-pitched tone in the telephone handset, select one of the 4 log-on sequences in the log-on directory by pressing 1-4 or press RETURN if you don't want to use the directory. Replace the telephone handset.

3. If you pressed 1-4, the mode pushbutton flashes, and the teleprinter will send the programmed log-on response. When this is complete, you can type your message or data. If you pressed RETURN, then when the mode pushbutton flashes, the connection is complete and you can type your message or data. If you are sending a previously prepared message, locate the home position of the applicable memory, and press RUN MSG.

    • The teleprinter automatically prints a copy of your message as it is sent.

4. If you told the remote operator that you wanted to talk after sending the message, you should now cue the other operator. For example:

    a. Lift your telephone handset and press CTRL and G several times.

    b. The remote operator picks up the telephone handset and sends the Control-G bell character.

    c. Press your lighted mode pushbutton.

    • The mode pushbutton glows brightly.

    d. The telephones are ready for a normal conversation.

5. Terminate the operation by pressing the mode pushbutton, or if you were talking to the remote operator hang up the telephone handset.

   • The mode pushbutton returns to a dim glow.

. . . To an Unattended Unit

1. Select one of the four sequences in the log-on directory by pressing 1-4, or press RETURN if you don't want to use the directory. Replace the telephone handset.

2. If you pressed 1-4, the mode pushbutton flashes and the teleprinter will send the programmed log-on response. When this is complete, you can type your message or data. If you pressed RETURN, then when the mode pushbutton flashes, the connection is complete, and you can type your message or data. If you are sending a previously prepared message, locate the home position of the applicable memory and press RUN MSG.

   • Your teleprinter automatically prints a copy of the message as it is sent.

3. Terminate the operation by pressing the mode pushbutton.

   • The mode pushbutton returns to a dim glow.

Acoustic Adapter

If a modular phone line is not connected directly to the teleprinter, any available telephone set can be used with an acoustic adapter to send a message.

1. Press the mode pushbutton. The following will print:

   SELECT 1-4, A, or D:

2. Press A to indicate that you are using the acoustic adapter. The following will print:

   SELECT 1-4:

3. Remove the telephone handset and dial the telephone number of the remote unit.

4. Someone will answer the phone, or you will hear a high-pitched tone indicating that the remote unit is an automatic-answer unit.

   a. If someone answers the phone, explain that you want to send a message. Then, the remote operator prepares to receive your message.

   b. If the unit automatically answers, you will hear a high-pitched tone in the telephone handset. Proceed to step 5, below.

5. When you hear the high-pitched tone in the telephone handset, place the telephone handset in the acoustic adapter cups as shown below.

HANDSET
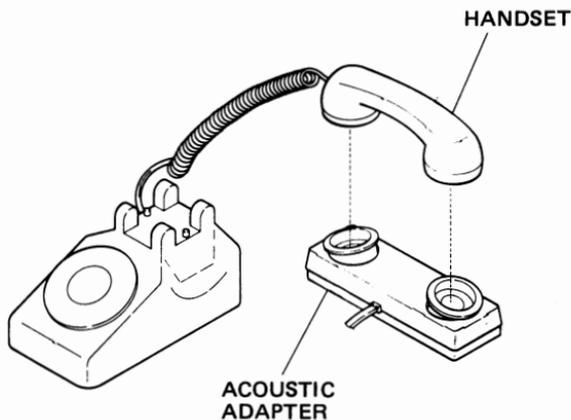
ACOUSTIC
ADAPTER

Acoustic Adapter

    a.   Press 1, 2, 3, or 4 to select a log-on sequence stored in the directory.

    b.   Press RETURN if you don't want to use the directory.

6.   When the mode pushbutton starts flashing, you may type your message. If you are sending a previously prepared message, locate the home position of the applicable memory, and press RUN MSG.

    •   Your teleprinter automatically prints a copy of the message as it is sent.

7.   When the transmission is complete, press the lighted mode pushbutton, remove the telephone handset from the acoustic adapter, and hang it up.

    •   The mode pushbutton returns to a dim glow.

Disconnecting

The teleprinter automatically disconnects if a connection is not made after 30 seconds and will print:

    NO ANSWER - TRY AGAIN

1.   To disconnect or cancel a call, press the mode pushbutton.

2.   If the remote unit disconnects, the mode pushbutton will flash and return to dim.

Receiving a Message or Data

. . . Automatically

Your Whisper Writer Teleprinter automatically receives and prints incoming messages over the standard telephone network. All you have to do is leave your teleprinter turned on and periodically check the following:

12-5

1. The mode pushbutton must be lit. If it is not lit, place the power switch in the ON position. The "power on" sequence as described in Section 1, under "self-testing" must occur.
   - The mode pushbutton glows dimly.

2. There must be enough paper loaded. If you are going to be away from the unit for a period of time, check the supply of paper. Lift the paper well cover. An end-of-roll marking is printed on the last few feet of the paper. To load a new roll of paper, refer to Section 3, "Replacing the Paper Roll".

When the teleprinter receives a call over the standard telephone network:

- If your unit has a telephone, it will ring from one to nine times.
- If you have a Whisper Writer Automatic Line Selector, the "TO ANY 300 WPM DESTINATION VIA TELEPHONE NETWORK" switch/indicator lights.
- The mode pushbutton flashes.
- Your teleprinter begins printing the message, and the paper advances.

When the teleprinter has received the message and the remote unit terminates the connection:

- The mode pushbutton returns to a dim glow.

Turn the paper advance knob until the message is clear of the plastic tear strip. Tear off the message.

. . . Manually

You can leave your Whisper Writer Teleprinter turned off and turn it on when you need to receive a message. In applications where the telephone is shared with your teleprinter and many of the calls are for you personally, you may prefer to leave your teleprinter off. To receive messages, you can easily transfer the message calls to the teleprinter.

1. When you receive a telephone call and determine it is a message call, place the power switch in the ON position. Refer to "Sending a Message or Data . . . To an Attended Unit", if you want to talk to the remote operator after receiving the message.
   - The mode pushbutton glows brightly.
   - The teleprinter beeps.
   - The teleprinter pointer moves to the left margin and prints your Answerback message.
   - If there is a message stored in the keyboard memory, the teleprinter prints POWER RESTORED. The teleprinter prints Ctrl Mem Clear and Memory Clear if there are no messages stored in the keyboard memory.

2. Press the lighted mode pushbutton and the teleprinter will print:

> SELECT 1-4:

Press RETURN and hang up the telephone handset. If you are using an acoustic adapter, place the handset in the cups and the teleprinter will print:

> SELECT 1-4, A, or D:

Press RETURN.
- The mode pushbutton will flash to indicate that your system is on-line.
- Your teleprinter prints the message from the remote unit and the paper advances.

3. When your teleprinter has received the message and the remote operator terminates the connection: If you are using the acoustic adapter, remove the handset from the cups and hang it up.
- The mode pushbutton returns to a dim glow.

4. Turn the paper advance knob until the message is clear of the plastic tear strip. Tear off the message.

5. Place the power switch in the OFF position until you are again ready to receive a message.

Using the Telephone

. . . To Place a Voice Call

You can place normal voice phone calls on a telephone shared with your Whisper Writer Teleprinter. Remember that while you are using your telephone for voice communication, your teleprinter cannot receive messages from another unit.

. . . To Receive a Voice Call

You can accept telephone calls on the telephone shared with your Whisper Writer Teleprinter if you have programmed it to answer after several rings and you pick up the telephone handset before the teleprinter answers, or if it is turned off. Remember that when your telephone rings, it may be another unit calling your teleprinter.

If an operator of another teleprinter wants to send a message to your teleprinter, follow the procedure in "Receiving a Message...Manually".

Operating your Whisper Writer System Over the Western Union Telegraphic Network

Sending a Message

Your system can send messages to another Whisper Writer Teleprinter (or similar device) that is accessible over the Telex II (formerly called TWX) Network. To send a message:

1. The mode pushbutton must be lit. If it is not lit, place the power switch in the ON position.
   - The mode pushbutton glows dimly.
2. Press and engage LOCAL COPY if you want your teleprinter to print a copy of your message as you send it.
3. If you want to send an error-free message and reduce Telex II line cost, refer to Section 11, "Preparing a Message or Data Off-Line" for instructions. If you want the other unit to receive the message while you are typing it, proceed to step 4.
4. If you have a Whisper Writer Automatic Line Selector:
   a. To call a Telex II Teleprinter, press the TO TWX 100 WPM TELEPRINTER VIA TWX NETWORK switch/indicator.
      - The switch/indicator glows.
   b. To send an international Telex message via an International Record Carrier, press the TO INTERNATIONAL TELEX 66 WPM TELEPRINTER VIA TWX NETWORK switch/indicator.
      - The switch/indicator glows.
   c. To send a domestic Telex message via an International Record Carrier or Western Union Direct Dial Service, press the TO INTERNATIONAL TELEX 66 WPM TELEPRINTER VIA THE TWX NETWORK switch/indicator.
      - The switch/indicator glows.
5. Remove the telephone handset and dial the number of the remote unit. When you hear the high-pitched tone in the telephone handset, press the lighted mode pushbutton and the teleprinter will print:

   SELECT 1-4:

6. If a telephone is not connected to the teleprinter, press the mode pushbutton and the teleprinter will print:

   SELECT 1-4, A, or D:

   Press RETURN and hang up the telephone handset.
7. If your Whisper Writer is connected to an ASCII dialing TWX network line;
   a. Remove the telephone handset and when you hear a high-pitched tone, press the mode pushbutton and the teleprinter will print:

   SELECT 1-4:

   Press RETURN.
   b. When the mode pushbutton flashes, hang up the telephone handset and dial the number on the keyboard followed by a RETURN.

c. If a telephone is not connected to the teleprinter, press the mode pushbutton and the teleprinter will print:

SELECT 1-4, A, or D:

Press RETURN.

- The mode pushbutton flashes to indicate that your system is on-line.

8. You may type your message now. If you are sending a previously prepared message, locate the home position of the memory your message is in, and press RUN MSG.

For information about formatting a Telex message, refer to your Western Union's Telex Network Directory and Buyer's Guide.

- Your teleprinter automatically prints a copy of your message as it is sent.

9. Terminate the operation by pressing the teleprinter mode pushbutton.

- The mode pushbutton returns to a dim glow.

Receiving a Message

Your system automatically receives and prints incoming messages over the Western Union Telegraphic Network. All you have to do is leave your teleprinter turned on and periodically check the following:

1. The mode pushbutton must be lit. If it is not lit, place the power switch in the ON position. The "power on" sequence as described in Section 1, under "self-testing" must occur.

- The mode pushbutton glows dimly.

2. There must be enough paper loaded. If you are going to be away from the unit for a period of time, check the supply of paper. Lift the paper well cover. An end-of-roll marking is printed on the last few feet of the paper. To load a new roll of paper, refer to "Replacing the Paper Roll".

When the teleprinter receives a call:

- If you have a Whisper Writer Automatic Line Selector, the TO INTERNATIONAL TELEX 66 WPM TELEPRINTER VIA TWX NETWORK switch/indicator lights.

- The mode pushbutton flashes.

- Your teleprinter begins printing the message and the paper advances.

When the teleprinter has received the message:

- The mode pushbutton returns to a dim glow.

3. Turn the paper advance knob until the message is clear of the plastic tear strip. Tear off the message.

Teleprinter

Physical

Models	1980 Series	
Height	3.1 in.	(79 mm)
Depth	10.6 in.	(269 mm)
Width	12.2 in.	(311 mm)
Weight	8.75 lbs.	(3.9 kg)

Environmental

Models	Power Requirements
U.S. Models	115 VAC 10% 47–63 Hz 50 Watts Maximum
International Models	220 VAC, 240 VAC 50–60 Hz 45 Watts Maximum

Condition	Temperature in °F (°C)	Humidity (Non-condensing)
Operating	41 to 104 (5 to 40)	10% to 80%
Storage	-22 to 122 (-30 to 50)	5% to 95%

Input

Character Set: 95 printable ASCII characters

Speed/Format

	ASCII FORMAT							
Switch Position	Start Bits	Data Bits	Parity Bits①	Stop Bits	Baud Rate	Words Per Minute	Return Key Function	Characters Per Line
1	1 Space	7	1	2 Mark	110	66	⏎ CR-LF	69
2	1 Space	7	1	2 Mark	110	100	⏎ CR-LF	72
3	1 Space	7	1	1 Mark	300	300	CR ⏎	80/136
4	1 Space	7	1	1 Mark	300	300	CR or CR-LF	80/136

① Teleprinter transmits even parity. Receive odd or even parity.

Receive Buffer: 1407 Characters

*All specifications are approximate.

Output

Text Mode

Print Method: Thermal, bi-directional

Print Rate: 35 characters per second, maximum

Character Set: 128 character ASCII set

Character Format: 5 x 7 dot matrix

Line Length:
1980 Series—80 or 136 characters per line, 7.32 in. (186 mm)

Line Spacing: 6 lines per inch. Alterable to 3 or 4 l.p.i. via keyboard.

Paper Feed: Friction

Graphics Mode

Print Rate: 30 columns of 7 dots each per second, maximum

Line Length: 1980 Series— 480/960 dots

Horizontal Resolution: 66/131 dots per inch nominal

Vertical Resolution: 65 dots per inch nominal

Modems— Models 1980 and 1981

Communication Method: Full or Half Duplex
Asynchronous

Modulation Technique: Phase Coherent Frequency Shift
Keying .

Data Rate: 0-300 Bits Per Second

Compatibility:

1980	1981
Bell 103/113	CCITT V.21/V.25
Standard Telephone Network (DDD)	Standard Telephone Network (DDD)
Telex II (TWX)	

Transmitter:

	1980	1981
Carrier Frequency (Hz)		
Originate Mode		
F1 Mark	1270 ± 0.2%	980 ± 0.2%
F1 Space	1070 ± 0.2%	1180 ± 0.2%
Answer Mode		
F2 Mark	2225 ± 0.2%	1650 ± 0.2%
F2 Space	2025 ± 0.2%	1850 ± 0.2%
Level (dbm)	−11 ± 2.0	−14 ± 1.0

Receiver:

	1980	1981
Carrier Frequencies: (Hz)		
Originate Mode		
F2 Mark	2225 ± 0.7%	1650 ± 0.7%
F2 Space	2025 ± 0.7%	1850 ± 0.7%
Answer Mode		
F1 Mark	1270 ± 0.7%	980 ± 0.7%
F1 Space	1070 ± 0.7%	1180 ± 0.7%
Carrier Detect Threshold		
(dbm Min.-Max.)	−43 to −52	−43 to −52
Peak Distortion (%)	12 Max.	12 Max.
Hysteresis (dbm)	2 Min.	2 Min.
Line Impedance (Ohms)	600	600

Keyboard—Model 1945

Physical

Height:	2.6 in.	(66 mm)
Depth:	6 in.	(152 mm)
Width:	11.5 in.	(292 mm)
Weight:	2.6 lbs.	(1.2 kg)

Keys: Auto repeat, two-key lockout, 32 character type-ahead buffer

Environmental

Power Requirements: Supplied by Teleprinter

Condition	Temperature in °F (°C)	Humidity (Non-condensing)
Operating	41 to 104 (5 to 40)	10% to 80%
Storage	−22 to 122 (−30 to 50)	5% to 95%

Input/Output

Code: 8-level ASCII (7 bits plus even parity)
128 ASCII character set
Send Buffer Size: **8184** Characters
Line Length: **80/136 characters (switch selectable)**

*All specifications are approximate

Automatic Line Selector—Model 1441

Dual Line, Shared Modem, Line Contention, Dual Ring Detect Circuit with Automatic Speed and Line Selection on Received Calls.

Physical

Height:	2.125 in.	(54 mm)
Depth:	10.5 in.	(267 mm)
Width:	3.25 in.	(83 mm)
Weight:	2 lbs.	(0.9 kg)

Environmental

Power Requirements: +9 VDC unregulated from Teleprinter

Condition	Temperature in °F (°C)	Humidity (Non-condensing)
Operating	41 to 104 (5 to 40)	10% to 80%
Storage	-22 to 122 (-30 to 50)	5% to 95%

Input/Output

Receiving. Automatic Selection of Line:
Telephone Line (DDD)—300 Baud, 300 WPM
        —Optional, 110 Baud, 110/66 WPM. Switch selectable
Telex II Line (TWX)—110 Baud, 66 WPM. Auto-Restrain

Transmitting. Manually selectable. Four Switch/Indicators:

	ASCII FORMAT				Baud Rate	Words Per Minute	Return Key Function	Characters Per Line 80 Column
	Start Bits	Data Bits	Parity Bits	Stop Bits				
Switch 1	1 Space	7	1	1 Mark	300	300	CR or CR-LF	80
Switch 2	1 Space	7	1	2 Mark	110	66	CR-LF	69
Switch 3	1 Space	7	1	2 Mark	110	66	CR-LF	69
Switch 4	1 Space	7	1	2 Mark	110	100	CR-LF	72

Connections

To Telephone Line (DDD): RJ-11C Jack

To Telex II Line (TWX): RJ-11C Jack

To Teleprinter: 8-Wire Modular Cable
        Keyboard Jack
        4-Wire Modular Cable
        Telephone Wall Jack

To Keyboard: 8-Pin Modular Jack

Modem Interface

Via (USOC) RJ-11C Jack: A. A1—Control Power Switching
Signal Lines—Tip. Ring

*All specifications are approximate

Acoustic Adapter—Model 1490

Acoustic transducer via Western Electric 500 Handset, or equivalent

Physical

Height:	2.5 in.	(64 mm)
Depth:	9.5 in.	(241 mm)
Width:	3 in.	(76 mm)
Weight:	1 lb.	(0.45 kg)

Environmental

Power Requirements: +9 VDC

Power Source: 9-Volt Battery NEDA 1604 or equivalent (Model 1490)
Power Source: 9-VOLTS from connected Teleprinter (Model 1491)
Power On/Off Control: Via A to A1 connection when Teleprinter Modem is switched to Data Mode (Model 1490 only)

NOTE:
MODEL 1490 - for Model 1980 Series
MODEL 1491 - for Model 1981 Series

Appendix B
Data Flow Control

Introduction

Your Whisper Writer System contains two special operational features that enable you to control the flow of data between your system and a remote device.

When receiving data, your teleprinter automatically sends a signal to the remote device requesting it to halt the transmission if the remote device is sending data faster than your teleprinter can print. When your teleprinter catches up, it sends another signal requesting the remote device to resume the transmission. This feature is referred to as "Transmitted DC1/DC3 Flow Control".

When your teleprinter sends data faster than a remote device can receive it, the remote device may send a signal to your teleprinter requesting it to stop the transmission. When the remote device catches up, it may send another signal requesting your teleprinter to resume the transmission. This feature is referred to as "Received DC1/DC3 Flow Control". You may enable or disable this feature if you have the Model 1945 Keyboard. If you disable it, your teleprinter will ignore any signals from a remote device to stop or resume your data transmission.

Transmitted DC1/DC3 Flow Control

Teleprinter Models 1980 and 1981

Your teleprinter contains an input buffer (memory) which temporarily stores up to 1407 characters. It is a first-in, first-out device which compensates for differences in speed between the incoming message and the teleprinter printing speed. Normally the operation of this automatic feature is invisible to the operator. However, if the buffer fills to more than 85% of its capacity, the printing format of the incoming message will be altered to allow maximum printing speed until the teleprinter catches up to the incoming message.

Technical Operation

When the buffer reaches 85% of its capacity (or approximately 1200 characters), the teleprinter sends an ASCII Control-S (DC3, or X-off) to the remote device requesting the transmission to halt. Meanwhile, the teleprinter continues to print the characters contained in the buffer on a first-in, first-out basis. When the buffer empties to 36% of its capacity (or approximately 512 characters), the teleprinter sends an ASCII Control-Q (DCI, or X-on) to the remote device requesting a resumption in the data transmission. This operation continues automatically.

If the remote device does not recognize, or respond to, the ASCII Control-S, the teleprinter will re-format the incoming message to prevent the loss of input data, and to allow the teleprinter time to catch up. When the buffer exceeds 90% of its capacity (or approximately 1260 characters), the teleprinter substitutes a backslash (\) for each carriage return it encounters

in the message printed from the input buffer. It prints each line with the maximum number of characters (80 or 136) and replaces each carriage return with a backslash. Since the teleprinter is then printing at its maximum speed, the input buffer empties faster than it fills. When it drops below 90% of its capacity, the teleprinter resumes the normal message format. You will notice backslashes in your message in place of carriage returns, but you will not have lost any of the data.

Received DC1/DC3 Flow Control

A remote device may send your system an ASCII Control-S (DC3, or X-off) if you are sending your message faster than it can receive, or if the remote device wants your system to stop transmitting temporarily. If the received DC1/DC3 flow control feature is enabled, your teleprinter responds to the DC3 by locking up the keyboard and preventing any transmission until a Control-Q (DC1, or X-on) is received. When the keyboard is locked, you cannot transmit from either the keyboard memory or the keys (except the BREAK key). If this feature is disabled, your teleprinter will ignore the Control-S from the remote device.

Enabling or Disabling the Received DC1/DC3 Flow Control

Your teleprinter is shipped from the factory with this feature disabled. To enable this feature, proceed as follows:

1. The mode pushbutton must be lit. If it is not, place the ON/OFF switch in the ON position.
2. Press and release LOCAL COPY.

Note: When the received DC1/DC3 flow control feature is enabled, you must be sure that the local copy switch is disengaged. This prevents losing the DC3 signal from the remote device while printing the local copy.

3. Press and release ESC. Press CTRL and Z.
   - The teleprinter prints:

   Rcvd DC1/3 Ctrl - ON

Note: Alternately pressing the keystroke sequence ESC, CTRL, and Z turns this feature on and off.

Unlocking Your Keyboard

There are two situations when your keyboard may become locked up, or disabled, due to the received DC1/DC3 signal.

1. The remote unit sends you a DC3 signal and does not follow it with a DC1.
2. You transmit a DC3 signal to a remote unit while you have the local copy switch ON; this is when your system is set up for repetitive polling.

If your keyboard is locked up, simply press CTRL and Q. This unlocks your keyboard regardless of whether your system is on-line or off-line, or whether or not the LOCAL COPY switch is engaged.

Appendix C
Graphics Mode

Introduction

Your Whisper Writer Teleprinter is capable of printing graphic images received from a remote device in the form of ASCII Character Codes. All you have to do is place your teleprinter on-line and the remote device does the rest.

The remote device sends your teleprinter a command setting it to the graphics mode. This is the only way a Whisper Writer Teleprinter can enter the Graphics Mode. Then, the remote device sends graphic images in the form of ASCII Character Codes. Your teleprinter prints a unique image for each code received.

Since your teleprinter is used only to receive graphics in this mode, this appendix describes the basic operation, techniques, and precautions involved in receiving graphics with your teleprinter. It is intended primarily for those who are familiar with computer graphics, and contains information about how your teleprinter operates in this mode to help the operator of the transmitting device. Refer to specifications for characteristics concerning the graphics mode, such as resolution and printing speed.

Imaging Process

The teleprinter uses a type of dot-addressable graphics which means that each ASCII Character Code received from the remote device is translated into a vertical pattern seven dots long, one dot wide. These dots correspond to the seven resistive elements in the Teleprinter Print Head Assembly as shown in the following figure:
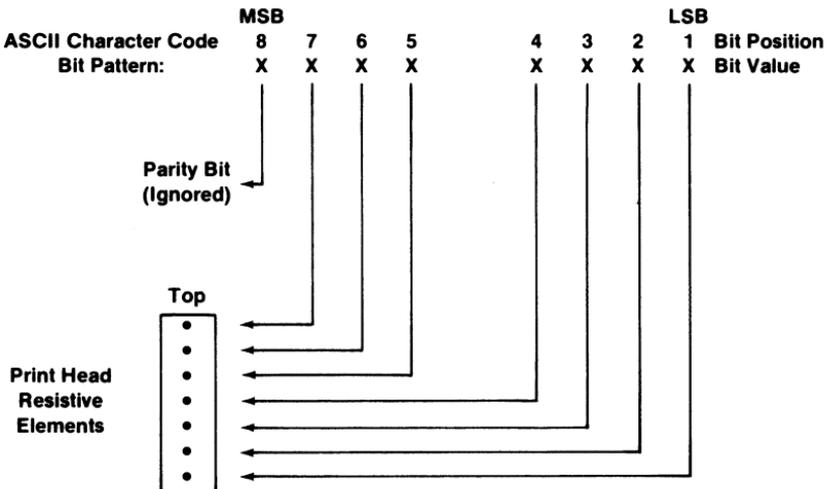
By energizing the elements in the same pattern as the bits of the character code, a unique vertical image is printed for each code received.

For example, the following figure shows the printed image for the capital letter "A". The parity bit sent by the remote device is ignored by the teleprinter. This is the most significant bit (MSB) in the character code. Bit 7 is a "1" causing the top element in the print head to be turned ON. The next five bits are all "0's". Therefore, the corresponding elements in the print head are all turned OFF. The least significant bit (LSB) in the character code is a "1". Therefore the bottom element in the print head is turned ON. The corresponding printed image for the capital letter "A" is the two vertical dots serparated by five dot spaces. Appendix D, "ASCII Character and Control Codes" lists the bit code for each of the ASCII Character Codes.

	MSB							LSB	
	8	7	6	5	4	3	2	1	Bit Position
ASCII "A" =	X	1	0	0	0	0	0	1	Bit Value

Printed Image:

●	ON
○	OFF
○	OFF
○	OFF
○	OFF
○	OFF
○	
●	ON
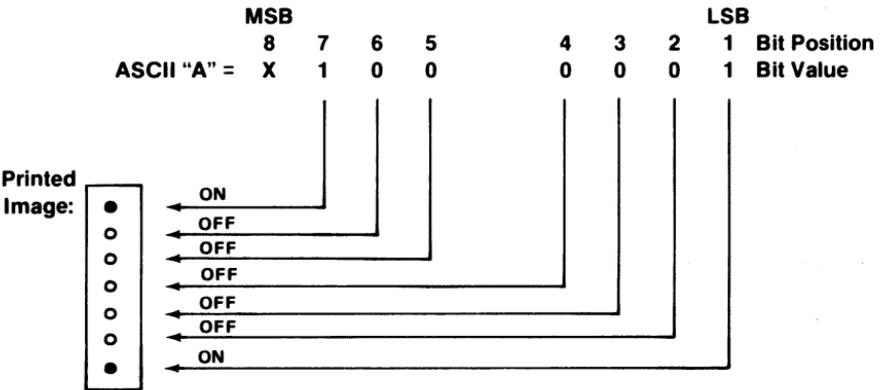
Both you and the remote operator must be aware of the following two operational notes.

1. To print the image corresponding to the ASCII Escape (ESC) Code, your teleprinter must receive two escape codes in succession. Since the escape code is used to redefine the code(s) that follow it, your teleprinter normally will not print the image of the code that follows an escape code unless it is another escape code.

2. The operator of the remote device must not use a Control-E as a graphics symbol unless you have suppressed your Answerback message. Refer to Section 10. This code causes the teleprinter to send its Answerback message to the remote device. While sending its Answerback message, the teleprinter ignores incoming character codes which could result in the loss of graphic data.

The maximum number of graphic images which may be printed on a single line is 480 for the 80-column teleprinter. When the print head reaches the right margin, the pointer drops down to the right margin of the next line and prints from right to left. The remote device may avoid this bi-directional printing by sending the teleprinter a command to exit the graphics mode before the pointer reaches the right margin, return the marker to the left margin, reset the graphics mode, and then continue printing left to right.

Entering and Exiting the Graphics Mode

Your Whisper Writer Teleprinter enters the graphics mode when it receives an Escape-9 code sequence from a remote device while it is on-line. The pointer moves to the left margin and the paper advances one "graphics line feed". Then, the teleprinter prints the graphic image of each ASCII character code received.

Your Whisper Writer Teleprinter exits the graphics mode and enters the text mode when it receives and Escape-8 code sequence from the remote device. The teleprinter pointer moves to the left margin, but the paper does not advance.

Note: Your teleprinter automatically exits the Graphics Mode and enters the text mode if the electrical power is momentarily interrupted, or if the communications link to the remote device is broken.

Entering the text mode from the graphics mode automatically moves the pointer to the left margin without advancing the paper. This is useful for creating legends on bar graphs, and other text headings.

Appendix D
ASCII Character and Control Codes

Introduction

This appendix contains tables of the ASCII codes which represent the characters - letters, numbers, symbols - and commands used by the Whisper Writer Teleprinter and Keyboard. Table 1 lists the defintions of the ASCII Control Codes.

The Whisper Writer Teleprinter sends, receives, and prints 95 characters of the ASCII character set. The keyboard can send the entire 128 character set on-line and store them off-line in the keyboard memory. It is your responsibility to be sure that no illogical sequences are stored in memory for transmission to a remote device. For example, entering a Control-E (Enquiry) code in the middle of your message may cause a remote device to send its Answerback while you are still sending your message. This will cause a collision between the messages, producing garbled or lost data.

The teleprinter prints the 128 character set off-line except the carriage return, line feed, and bell which involve motion and sound functions.

Teleprinter ASCII Character Codes

Table 2 lists the characters - letters, numbers, and symbols - printed by the teleprinter for each ASCII code received during on-line operation. The actual 7-bit ASCII code is shown for each character. An eighth bit representing parity is sent by the remote device and is shown in the column labeled "Even Parity Hex Code". The Whisper Writer Teleprinter ignores the parity bit in all characters that it receives.

Teleprinter ASCII Control Codes

Table 3 lists the ASCII Control Codes that produce an observable action on the teleprinter when received during on-line operation. As an example, if a Control-J is received by your teleprinter while on-line, the paper will advance and the pointer will not move. If a Control-G is received, your teleprinter beeper will sound to call your attention to the message being printed.

This table contains only those control codes which produce a local action. The remaining control codes are ignored by your teleprinter when received on-line.

Keyboard ASCII Character Set

Table 4 lists the ASCII character set used by the keyboard. The 7-bit ASCII code for each key is listed, as well as the character which is produced by the code and transmitted on-line. The characters listed under "Printed Locally" will be printed on your teleprinter during off-line operation. Your keyboard adds an even parity bit to each 7-bit code as it is transmitted. The hexadecimal equivalent for this 8-bit code is listed for each character under "Even Parity Hex Code".

Table 1. ASCII Control Code Definitions

Mnemonic	Definition
NUL (Null)	No character. Used for filling in time or filling space on tape when there is no data.
SOH (Start of Heading)	Used to indicate the start of a heading which may contain address or routing information.
STX (Start of Text)	Used to indicate the start of the text and so also indicates the end of the heading.
ETX (End of Text)	Used to terminate the text which was started with STX.
EOT (End of Transmission)	Indicates the end of a transmission, which may have included one or more "texts" with their headings.
ENQ (Enquiry)	A request for a response from a remote station. It may be used as a "WHO ARE YOU?" request for a station to identify itself.
ACK (Acknowledge)	A character transmitted by a receiving device as an affirmative response to a sender. It is used as a positive response to polling messages.
BEL (Bell)	Used when there is need to call human attention. It may control alarm or attention devices.
BS (Backspace)	Indicates movement of the printing mechanism or display cursor backwards one position.
HT (Horizontal Tab)	Indicates movement of the printing mechanism or display cursor forward to the next preassigned "tab" or stopping position.
LF (Line Feed)	Indicates movement of the printing mechanism or display cursor to the start of the next line.
VT (Vertical Tab)	Indicates movement of the printing mechanism or display cursor to the next of a series of preassigned printing lines.
FF (Form Feed)	Indicates movement of the printing mechanism or display cursor to the starting position of the next page, form, or screen.

Mnemonic	Definition
CR (Carriage Return)	Indicates movement of the printing mechanism or display cursor to the starting position of the same line.
SO (Shift Out)	Indicates that the code combinations which follow shall be interpreted as *outside* of the standard character set until a SHIFT IN character is reached.
SI (Shift In)	Indicates that the code combinations which follow shall be interpreted according to the standard character set.
DLE (Data Link Escape)	A character which shall change the meaning of one or more contiguously following characters. It can provide supplementary controls, or permits the sending of data characters having any bit combination.
DC1, DC2, DC3 and DC4 (Device Controls)	Characters for the control of ancillary devices or special terminal features.
NAK (Negative Acknowledgement)	A character transmitted by a receiving device as a negative response to a sender. It is used as a negative response to polling messages.
SYN (Synchronous/Idle)	Used in a synchronous transmission system to achieve synchronization. When no data is being sent, a synchronous transmission system may send SYN characters continuously.
ETB (End of Transmission Block)	Indicates the end of a block of data for communication purposes. It is used for blocking data where the block structure is not necessarily related to the processing format.
CAN (Cancel)	Indicates that the data which precedes it in a message or block should be disregarded (usually because an error has been detected).
EM (End of Medium)	Indicates the physical end of a card, tape or other medium, or the end of the required or used portion of the medium.
SUB (Substitute)	Substituted for a character that is found to be erroneous or invalid.

Mnemonic	Definition
ESC (Escape)	A character intended to provide code extension in that it gives a specified number of contiguously following characters an alternate meaning.
FS (File Separator) **GS** (Group Separator) **RS** (Record Separator) **US** (United Separator)	Information separators to be used optionally except that their hierarchy shall be FS (the most inclusive) to US (the least inclusive).
SP (Space)	A nonprinting character used to separate words, or to move the printing mechanism or display cursor forward one position.
DEL (Delete)	Used to obliterate unwanted characters (for example, on paper tape by punching a hole in *every* bit position). Also referred to as "Rub Out."

Table 2. Teleprinter ASCII Character Codes

7-Bit ASCII Code Received On-Line	Even Parity Hex Code	ASCII Character Printed	7-Bit ASCII Code Received On-Line	Even Parity Hex Code	ASCII Character Printed
1 000 001	41	A	1 100 001	E1	a
1 000 010	42	B	1 100 010	E2	b
1 000 011	C3	C	1 100 011	63	c
1 000 100	44	D	1 100 100	E4	d
1 000 101	C5	E	1 100 101	65	e
1 000 110	C6	F	1 100 110	66	f
1 000 111	47	G	1 100 111	E7	g
1 001 000	48	H	1 101 000	E8	h
1 001 001	C9	I	1 101 001	69	i
1 001 010	CA	J	1 101 010	6A	j
1 001 011	4B	K	1 101 011	EB	k
1 001 100	CC	L	1 101 100	6C	l
1 001 101	4D	M	1 101 101	ED	m
1 001 110	4E	N	1 101 110	EE	n
1 001 111	CF	O	1 101 111	6F	o
1 010 000	50	P	1 110 000	F0	p
1 010 001	D1	Q	1 110 001	71	q
1 010 010	D2	R	1 110 010	72	r
1 010 011	53	S	1 110 011	F3	s
1 010 100	D4	T	1 110 100	74	t
1 010 101	55	U	1 110 101	F5	u
1 010 110	56	V	1 110 110	F6	v
1 010 111	D7	W	1 110 111	77	w
1 011 000	D8	X	1 111 000	78	x
1 011 001	59	Y	1 111 001	F9	y
1 011 010	5A	Z	1 111 010	FA	z
0 100 001	21	!	0 110 001	B1	1
1 000 000	C0	@	0 110 010	B2	2
0 100 011	A3	#	0 110 011	33	3
0 100 100	24	$	0 110 100	B4	4
0 100 101	A5	%	0 110 101	35	5
1 011 110	DE	∧	0 110 110	36	6
0 100 110	A6	&	0 110 111	B7	7
0 101 010	AA	*	0 111 000	B8	8
0 101 000	28	(	0 111 001	39	9
0 101 001	A9	)	0 110 000	30	0
1 011 111	5F	—	0 101 101	2D	-
0 101 011	2B	+	0 111 101	BD	=
0 111 010	3A	:	0 111 011	BB	;
0 100 010	22	"	0 100 111	27	'
0 111 100	3C	<	0 101 100	AC	,
0 111 110	BE	>	0 101 110	2E	.
0 111 111	3F	?	0 101 111	AF	/
1 111 011	7B	{	1 011 011	DB	[
1 111 101	7D	}	1 011 101	DD	]
1 111 100	FC			1 011 100	5C	\
1 111 110	7E	~	1 100 000	60	`

Table 3. Teleprinter ASCII Control Codes

7-Bit ASCII Code Received On-Line	Even Parity Hex Code	ASCII Control Character*	Standard Abbre-viation	Local Action
0 000 101	05	Ctrl E	ENQ	Enquiry: Teleprinter transmits the Answerback message.
0 000 111	87	Ctrl G	BEL	Bell: 250 msec "beep" sounds for each code received.
0 001 000	88	Ctrl H	BS	Backspace: The Character Position Marker moves to the left one space for each code received, stopping at the left margin.
0 001 010	0A	Ctrl J	LF	Line Feed: The paper advances one line for each code received. The Character Position Marker does not move.
0 001 101	8D	Ctrl M	CR	Carriage Return: The Character Position Marker moves to the left margin. The paper does not advance.
0 010 001	11	Ctrl Q	DC1	Device Control 1: When Received Flow Control is enabled and a Ctrl S (DC3) has locked the Keyboard, this code unlocks the Keyboard.
0 010 011	93	Ctrl S	DC3	Device Control 3: When Received Flow Control is enabled, this code locks the Keyboard.

*All other ASCII Control Codes received on-line are ignored by the Teleprinter.

Table 4. Keyboard ASCII Character Set

Key(s) Typed	Printed Locally Off-Line	Character Transmitted On-Line	7-Bit ASCII Code Transmitted On-Line	Even Parity Hex Code
A	a	a	1 100 001	E1
B	b	b	1 100 010	E2
C	c	c	1 100 011	63
D	d	d	1 100 100	E4
E	e	e	1 100 101	65
F	f	f	1 100 110	66
G	g	g	1 100 111	E7
H	h	h	1 101 000	E8
I	i	i	1 101 001	69
J	j	j	1 101 010	6A
K	k	k	1 101 011	EB
L	l	l	1 101 100	6C
M	m	m	1 101 101	ED
N	n	n	1 101 110	EE
O	o	o	1 101 111	6F
P	p	p	1 110 000	F0
Q	q	q	1 110 001	71
R	r	r	1 110 010	72
S	s	s	1 110 011	F3
T	t	t	1 110 100	74
U	u	u	1 110 101	F5
V	v	v	1 110 110	F6
W	w	w	1 110 111	77
X	x	x	1 111 000	78
Y	y	y	1 111 001	F9
Z	z	z	1 111 010	FA
1	1	1	0 110 001	B1
2	2	2	0 110 010	B2
3	3	3	0 110 011	33
4	4	4	0 110 100	B4
5	5	5	0 110 101	35
6	6	6	0 110 110	36
7	7	7	0 110 111	B7
8	8	8	0 111 000	B8
9	9	9	0 111 001	39
0	0	0	0 110 000	30
.	.	.	0 101 101	2D
=	=	=	0 111 101	BD
;	;	;	0 111 011	BB
'	'	'	0 100 111	27
,	,	,	0 101 100	AC
.	.	.	0 101 110	2E
/	/	/	0 101 111	AF
Shift A	A	A	1 000 001	41
Shift B	B	B	1 000 010	42
Shift C	C	C	1 000 011	C3
Shift D	D	D	1 000 100	44
Shift E	E	E	1 000 101	C5
Shift F	F	F	1 000 110	C6
Shift G	G	G	1 000 111	47
Shift H	H	H	1 001 000	48
Shift I	I	I	1 001 001	C9
Shift J	J	J	1 001 010	CA
Shift K	K	K	1 001 011	4B
Shift L	L	L	1 001 100	CC
Shift M	M	M	1 001 101	4D
Shift N	N	N	1 001 110	4E
Shift O	O	O	1 001 111	CF
Shift P	P	P	1 010 000	50
Shift Q	Q	Q	1 010 001	D1
Shift R	R	R	1 010 010	D2
Shift S	S	S	1 010 011	53
Shift T	T	T	1 010 100	D4
Shift U	U	U	1 010 101	55
Shift V	V	V	1 010 110	56
Shift W	W	W	1 010 111	D7
Shift X	X	X	1 011 000	D8

† These codes are excluded in Speed/Format Switch position 1.

D-7

Table 4. (Continued)

Key(s) Typed	Printed Locally Off-Line	Character Transmitted On-Line	7-Bit ASCII Code Transmitted On-Line	Even Parity Hex Code
Shift Y	Y	Y	1 011 001	59
Shift Z	Z	Z	1 011 010	5A
Shift 1	! †	!	0 100 001 †	21
Shift 2	@ †	@	1 000 000 †	C0
Shift 3	#	#	0 100 011	A3
Shift 4	$	$	0 100 100	24
Shift 5	% †	%	0 100 101 †	A5
Shift 6	∧ †	∧	1 011 110 †	DE
Shift 7	&	&	0 100 110	A6
Shift 8	* †	*	0 101 010 †	AA
Shift 9	(	(	0 101 000	28
Shift 0	)	)	0 101 001	A9
Shift -	— †	—	1 011 111 †	5F
Shift =	+	+	0 101 011	2B
Shift ;	:	:	0 111 010	3A
Shift '	" †	. "	0 100 010 †	22
Shift ,	< †	<	0 111 100 †	3C
Shift .	> †	>	0 111 110 †	BE
Shift /	?	?	0 111 111	3F
Ctrl A	a	SOH	0 000 001	81
Ctrl B	b	STX	0 000 010	82
Ctrl C	c	ETX	0 000 011	03
Ctrl D	d	EOT	0 000 100	84
Ctrl E	e	ENQ	0 000 101	05
Ctrl F	f	ACK	0 000 110	06
Ctrl G	BEL	BEL	0 000 111	87
Ctrl H	h	BS	0 001 000	88
Ctrl I	i	HT	0 001 001	09
Ctrl J	LF	LF	0 001 010	0A
Ctrl K	k	VT	0 001 011	8B
Ctrl L	l	FF	0 001 100	0C
Ctrl M	CR	CR	0 001 101	8D
Ctrl N	n	SO	0 001 110	8E
Ctrl O	o	SI	0 001 111	0F
Ctrl P	p	DLE	0 010 000	90
Ctrl Q	q	DC1	0 010 001	11
Ctrl R	r	DC2	0 010 010	12
Ctrl S	s	DC3	0 010 011	93
Ctrl T	t	DC4	0 010 100	14
Ctrl U	u	NAK	0 010 101	95
Ctrl V	v	SYN	0 010 110	96
Ctrl W	w	ETB	0 010 111	17
Ctrl X	x	CAN	0 011 000	18
Ctrl Y	y	EM	0 011 001	99
Ctrl Z	z	SUB	0 011 010	9A
Ctrl 1	{ †	{	1 111 011 †	7B
Ctrl 2	} †	}	1 111 101 †	7D
Ctrl 3	[†	[	1 011 011 †	DB
Ctrl 4	] †	]	1 011 101 †	DD
Ctrl 5	¦ †	¦	1 111 100 †	FC
Ctrl 6	\ †	\	1 011 100 †	5C
Ctrl 7	~ †	~	1 111 110 †	7E
Ctrl 8	· †	·	1 100 000 †	60
Ctrl 9	D_T	DEL	1 111 111	FF
Ctrl 0	· · ·	NUL	0 000 000	00
Ctrl -	G_S	GS	0011101	1D
Ctrl =	+ ⑤			
Ctrl ;	① Φ			
Ctrl '	·	·	0 100 111	27
Ctrl ,	F_S	FS	0011100	9C
Ctrl .	R_S	RS	0011110	1E
Ctrl /	U_S	US	0011111	9F
Ctrl Here Is	⑥			
RETURN	CR·LF	CR·LF ②	0 001 101	8D
SPACE	SP	SP	0 100 000	A0
�	③ BS	BS	0 001 000	88
ESC	E_C ④	ESC	0 011 011	1B
WHO ARE YOU		ENQ	0 000 101	05

† These codes are excluded in Speed/Format Switch position 1.

Notes:

(1) Off-line, Ctrl-Semicolon is printed as $\emptyset$. On-line, buffer transmission stops at the 0, which is neither printed nor transmitted.

(2) After the combination CR-LF is transmitted on-line, the Keyboard pauses for the time it takes to send one character before sending the next character, to allow time for a physical carriage return to occur in older mechanical teleprinters. The LF is not automatically sent after the CR when the Speed/Format Switch is set to position 3. When the Speed/Format Switch is set in position 4, the programmed setting of the RETURN key determines whether or not your Teleprinter sends an LF.

(3) Off-line, advances the paper, backspaces the printhead, and decrements the pointer in the message preparation buffer; allowing you to backspace and make a correction with the correct character visible beneath the character it replaced in the buffer.

(4) On-line, the ESC code is sent but no local action takes place. The ESC symbol is printed off-line only, when the ESC key is pressed twice in succession. This embeds an ESC code in the Keyboard Memory.

(5) Off-line, Ctrl = is printed as $\ddot{+}$. On-line, buffer transmission pauses for 1 second at the , which is neither printed nor transmitted.

(6) Off-line, Ctrl Here Is is printed as $\cong$. On-line, buffer transmits the Answerback at the =.

Appendix E
Calling For Service

Troubleshooting

Many operational problems have simple solutions. To save yourself time, check through the following list before calling for service:

Symptom	Possible Cause
Teleprinter does not operate after placing the power switch in the ON position	1. Is the teleprinter plugged in? 2. Is there power to the wall outlet?
When receiving, teleprinter prints garbled data and/or vertical lines.	1. Check the position of the Speed/Format Switch. The speed/format of your teleprinter must match the speed/format of the transmitting unit.
Teleprinter keeps printing on the same line.	1. Paper does not advance because an obstacle is blocking the paper advance knob. 2. Paper does not advance because the return key function is not programmed for a line feed. Refer to Section 8, "Programmable Function Settings".
Backslashes (\) appear in received message where carriage return and line feed functions should have taken place.	1. In some cases, the remote unit sends data faster than the Whisper Writer can print it. When this happens, your teleprinter automatically ignores any carriage returns or line feeds and prints backslashes. This allows the teleprinter to print at maximum speed to prevent garbled or lost data.
Teleprinter/keyboard system operates properly off-line, but does not operate on-line.	1. Check that the telephone handset cable and the telephone network cable are connected to the proper jacks on the bottom of the teleprinter.
Teleprinter does not print data from keyboard in off line mode.	1. Check the cable connection between the teleprinter and the keyboard.
Teleprinter/keyboard system transmits message properly on-line, but teleprinter does not print a local copy.	1. Press and engage LOCAL COPY.

Teleprinter/keyboard system transmits message properly on-line, but teleprinter prints double characters on the local copy.	1. Press and release LOCAL COPY.
Keyboard lock-up. Teleprinter does not respond to the pressing of keyboard keys.	1. Keyboard may be in the "transmit off" condition. Press CTRL and Q.

Error Messages

Most problems in the teleprinter memory system or the keyboard memory system will cause the teleprinter to print one of the following error messages when you turn it on:

Mem Error	This message prints when there is a problem in the teleprinter memory system.
Memory Bad	This message prints when there is a problem in the keyboard memory system.

If the teleprinter prints an error message:

1. Place the power switch in the OFF position.
2. Wait a few seconds and place the power switch in the ON position.
3. If the teleprinter prints the error message again, call for service.

Calling the 3M National Service Center

If you have checked through the above list and the problem persists, call for service. The telephone numbers are listed below.

When you call for service, be prepared to answer the following questions:

1. Model number on the bottom of your teleprinter: _____
2. Serial number on the bottom of your teleprinter: _____
3. Is your unit having a problem transmitting or receiving, or both?
4. What type and brand of unit are you trying to communicate with?
5. Does the same problem occur when communicating with any other unit?

Call the 3M National Service Center. The center is available to you 24 hours a day, seven days a week to take care of a machine problem in a minimum amount of time. With your help, a service center representative will either solve the problem, or dispatch a service technician in your area.

If your system has an associated telephone, use it to call the center on their toll-free WATS line:

1–800–328–5690

Inside Minnesota call collect:

(612)–738–6530

In Canada, from area codes:

519, 416, and 705 call toll-free 1–800–265–4628

613, 514, and 819 call toll-free 1–800–265–4636

Rest of Canada call toll-free 1–800–265–6027

Appendix F
FCC Information

The following information is provided in compliance with FCC regulations.

Whisper Writer Teleprinter Models 1980/1981

Exhibit G

The Federal Communications Commission (FCC) has approved the 3M Whisper Writer Communications Terminal for direct connection to the telephone network. Under the FCC program, no customer is authorized to repair the terminal. This applies to the terminal both in and out of warranty. If the customer performs such unauthorized repair, the approval of the equipment for direct connection to the telephone network will be null and void. If the terminal is still in warranty, the remainder of the warranty period will also be null and void.

In the event that the terminal malfunctions, all repairs will be performed by 3M Equipment Service and Support Division (ESSD) Field Service, or an authorized agent of ESSD Field Service. It is the responsibility of the customer to report the need for service to the 3M National Service Center (800) 328-1360, or in Minnesota (612) 733-3555.

In the event ESSD Field Service, or an authorized agent determines the terminal must be returned for repair, they will furnish instructions for return of the terminal. If the terminal is out of warranty, they will charge a reasonable fee for repair.

Exhibit J

This 3M Whisper Writer Communications Terminal is approved by the Federal Communications Commission (FCC) as not being harmful to the telephone network when connected directly to telephone lines.

Read the following instructions carefully to comply with the FCC rules.

1. Your terminal must be connected to the telephone line via standard plugs and jacks.

2. Prior to connecting the terminal to the telephone lines, notify your local telephone company that you have a registered device that you wish to connect to their lines. Give them the 14 digit FCC registration number, the ring equivalence number, and the jack required to connect the terminal to the telephone.

   FCC Registration Number — BDG9FW-69213-DM-N
   Ringer Equivalence Number — 0.7B
   Jacks:

        Telephone Network — RJ11C
        Telex II Network — RJ11C

3. Connect the teleprinter to the telephone lines by placing the connector in the jack provided by the telephone company.

4. If the terminal appears to be malfunctioning, contact the 3M National Service Center for verification. If the center determines that the terminal is malfunctioning, disconnect it from the telephone jack.

5. There is no reason why the terminal should ever cause harm to the telephone network. If such harm does occur, the telephone company will try to give you time to correct the situation without interrupting your service. If it is not feasible to give prior notice, the telephone company can temporarily disrupt service, but they must do three things: (1) promptly notify you of the temporary interruption of service, (2) give you time to correct the problem, and (3) inform you of your right to file a complaint with the FCC. You can obtain the procedures for filing such complaints from your local dealer, or if necessary, by writing directly to the manufacturer.

6. Before making changes (consistent with FCC regulations) to its communications facilities, equipment, operations, or procedures, the telephone company must provide you with written notice so that you can alter your equipment accordingly in order to receive uninterrupted service.

Subpart J of Part 15 — RFI Statement

Warning

This equipment generates, uses, and can radiate radio frequency energy. If this equipment is not installed and used in accordance with this operator's guide it may cause interference with radio communications. It has been tested and found to comply with the specification for a Class A computing device pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when 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 required to correct the interference.

Automatic Line Selector Model 1441

This device has been granted a registration number by the Federal Communications Commission, under Part 68 Rules and Regulations for direct connection to the telephone lines. In order to comply with these FCC rules, read the following instructions carefully and follow the applicable portions completely:

1. Direct connection to the telephone lines may be made only through the standard plug-ended cord furnished to the utility-installed jack. No connection may be made to party or coin phone lines. Prior to connecting the device to the telephone lines you must:

   a. Call your telephone company and inform them you have an FCC-registered device you desire to connect to their telephone lines.

b. Give them the number(s) of the line(s) to be used, the make and model of the device, the FCC Registration Number and Ringer Equivalence, as well as the jack suitable for your device. This information is on the device and below:

Registration number:
BDG9FW-68135-OT-E

Ringer equivalence:
0.8B
Jack (USOC):
Telephone line (DDD) — RJ-11C
Telex II line (TWX) — RJ-11C

2. After the telephone company has been advised of the above you may connect your device if the jack is available, or have the telephone company make the installation.

3. Repairs to the device may be made only by the manufacturer or his authorized service agency. This applies at any time during or after warranty. If such unauthorized repair is performed, registration, connection to the telephone lines, and remainder of warranty period all become null and void.

4. If, through abnormal circumstances, harm to the telephone lines is caused, the device should be unplugged until it can be determined if your device or the telephone line is the source. If your device is the source, it should not be reconnected until necessary repairs are effected.

5. Should the telephone company notify you that your device is causing harm, the device should be unplugged. The telephone company will, where practicable, notify you that temporary discontinuance of service may be required. However, where prior notice is not practicable, the telephone company may temporarily discontinue service, if such action is reasonably necessary. In such cases the telephone company must (a) promptly notify you of such temporary discontinuance, (b) inform you of your rights to bring a complaint to the FCC under their rules.

6. The telephone company may make changes in its communications facilities, equipment, operations, or procedures where such action is reasonably required in the operation of its business and is not inconsistent with FCC rules. If such changes can be reasonably expected to render any customer's devices incompatible with telephone company facilities, or require modification or alteration, or otherwise materially affect its performance, written notification must be given to the user, to allow uninterrupted service.

INDEX

3M