MODEL MT-95
RS-232 HiCo/LoCo ENCODER/READER
INSTALLATION AND OPERATION MANUAL

Manual Part Number 99875075 Rev 6

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REVISIONS

Rev Number	Date	Notes
1	6 Jun 97	Initial Release
2	8 Jan 98	Name change from MT-310232 to MT-95; Updated to new firmware Revision; Changed Main Menu and subordinate menus; Changed titles and content of Sections 3 and 4 and added 5; added Appendix A.
3	23 Sep 99	Sec 1: Added 4777 emulation mode to features and requirements, LCD to Spec, Sec 5: Added new response to "Change Configuration; Added Sec 6 4777 emulation mode; Appendix A: Added Connector illustration, editorial .
4	24 Jul 00	Section 1 and 2, added IntelliCoder, features, and related hardware and instructions; Section 5, removed one PC encoded example.
5	05 Jun 01	Editorial throughout. Updated dialog boxes to latest engineering revision J07.
6	31 Jul 01	Front Matter, Agency Approvals: Added CE, Class A approval.

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Mag-Tek, Inc. (hereinafter "Mag-Tek") warrants this Mag-Tek product IN ITS ENTIRETY, to be in good working order for a period of one year from the date of purchase from Mag-Tek. Should this product fail to be in good working order at any time during this warranty period, Mag-Tek will, at its option, repair or replace this product at no additional charge except as set forth below. Repair parts and replacement products will be furnished on an exchange basis and will be either reconditioned or new. All replaced parts and products become the property of Mag-Tek. This limited warranty does not include service to repair damage to the product resulting from accident, disaster, misuse, abuse, or non-Mag-Tek modification of the product.

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This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC COMPLIANCE STATEMENT

This device complies with Part 15 of the FCC Rules. Operation of this device is subject to the following two conditions: (1) This device may not cause harmful interference. And (2) This device must accept any interference received, including interference that may cause undesired operation.

CANADIAN DOC STATEMENT

This digital apparatus does not exceed the Class A limits for radio noise for digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de las classe A prescrites dans le Réglement sur le brouillage radioélectrique édicté par les ministère des Communications du Canada.

CE STANDARDS

Testing for compliance to CE and FCC requirements was performed by an independent laboratory. The unit under test was found compliant to Class A.

UL/CSA

This product is recognized per Underwriter Laboratories and Canadian Underwriter Laboratories 1950.

TABLE OF CONTENTS

SECTION 1. FEATURES AND SPECIFICATIONS 1
FEATURES 1
Standard Mode 1
IntelliCoder 1
4777 Emulation Mode 1
REQUIREMENTS 2
Standard Mode 2
IntelliCoder 2
4777 Emulation Mode 2
SPECIFICATIONS 3
SECTION 2. INSTALLATION AND SETUP 5
PARTS REQUIRED 5
Standard MT-95 5
IntelliCoder 5
4777 Emulation MT-95 5
HARDWARE INSTALLATION 5
SETUP - STANDARD MODE 8
Normal Mode 11
Secure Mode 11
Setup - IntelliCoder 13
SECTION 3. STANDALONE OPERATION 15
CARD READING AND ENCODING FUNDAMENTALS 15
CARD READING 18
CARD COPYING 19
CARD ENCODING 20
Free Format Encoding 20
Fixed Format Encoding 22
Create Format Card 24
SECTION 4. ONLINE CARD OPERATION 27
CARD READING 27
CARD ENCODING 27
SECTION 5. ONLINE PROGRAMMING 29
ENCODED MESSAGE FORMAT 29
PC ENCODED EXAMPLE 30
ONLINE COMMANDS 30
Change Encode Coercivity Mode 31
Change Online Encode Mode 31
Change Configuration 31
Abort 31
Operation 31
ONLINE ENCODE FORMATS 32
ONLINE MODES 33
Normal Mode 33
Secure Mode 34
TRACK CHARACTER SETS 34
SECTION 6. 4777 EMULATION MODE 37
INSTALLATION OF 4777 EMULATION MODE 37
MT-95 SETUP FOR ENCODE ENERGY 37
MODIFYING IDLE MESSAGE ON MT-95 38
MODIFYING ENCODE TIMEOUT 39
MT-95 USER MESSAGES 40

APPENDIX A. PIN LISTS **43**
INDEX **45**

FIGURES

Figure 1-1. MT-95 Encoder/Reader viii
Figure 1-2. Encoder Parts and Card Orientation 4
Figure 2-1. Rear Panel 6
Figure 2-2. Encoder to Keyboard Connection 7
Figure 2-3. Encoder to PC Connection 7
Figure A-1. DE-9 Connector 43

TABLES

Table 1-1. Specifications 3
Table 2-1. Default Parameters 10
Table 4-1. Track 1/3 7-Bit Character Set 35
Track 4-2. Track 2/3 5-Bit Character Set 35
Table A-1. Cable DE-9P to DE-9S (21015823) 43
Table A-2. Cable DE-9P to DB-25S (21015821) 43

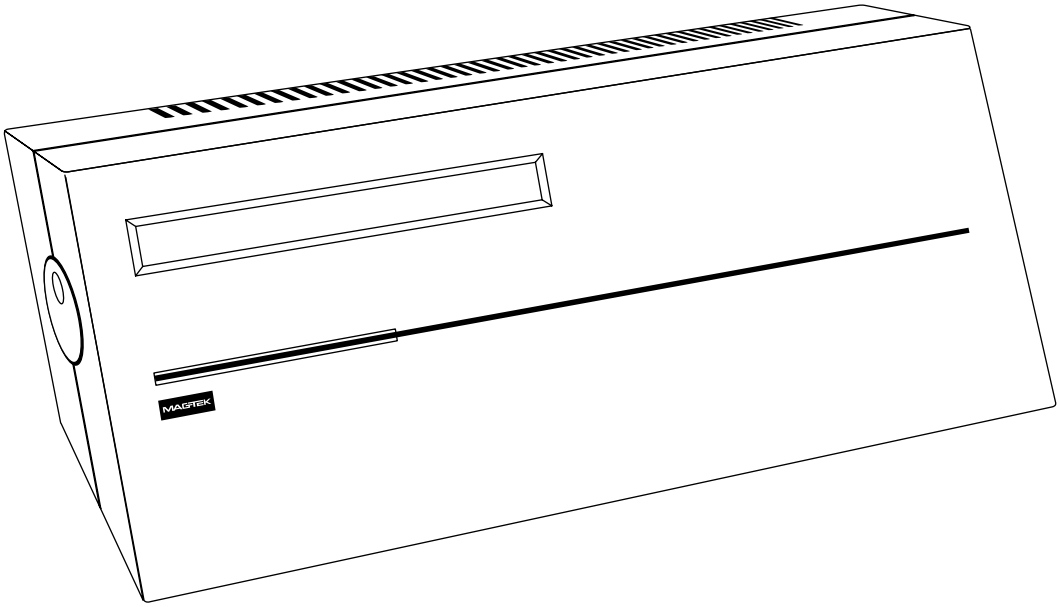

Figure 1-1. MT-95 Encoder/Reader

SECTION 1. FEATURES AND SPECIFICATIONS

The Model MT-95 RS-232 HiCo/LoCo Encoder/Reader encodes (or writes) and reads on 3-track magnetic stripes which comply with ISO standards 7810, 7811-2, -4, -5, -6, and 7813. The Encoder can read or write on all three tracks of the magnetic stripe on LoCo (low coercivity or low energy) or HiCo (high coercivity or high energy) cards. HiCo cards are more difficult to erase, but LoCo cards can be erased by a small magnet.

A liquid crystal display (LCD) prompts the operator for encoding, reading, clearing tracks, communication setup, and some errors (such as, "Could not read track"). A circular knob with a finger hold on the left side of the unit permits an intensity adjustment (which is actually the viewing angle) of the LCD.

FEATURES

The features listed below are for the various versions of the MT-95. The IntelliCoder is a version of the MT-95 that operates with the IntelliCAT Software Suite.

Standard Mode

- Encodes and reads in standalone mode with a keyboard or in online mode with PC
- Fixed or constant data can be programmed requiring only variable data to be entered by the operator
- Encodes on one, two, or all three tracks
- Supports HiCo or LoCo in one unit
- New or existing cards can be encoded and verified in a matter of seconds
- Easy to operate with operator prompts, preprogrammed repetitive data, display screens that instruct the operator on encoding sequence
- When online, database file management easily built and maintained, which generates audit reports on demand
- Maximum security with passwords, software counters, and encrypted numbers for the counters when using optional PC software

IntelliCoder

- Especially configured to operate with IntelliCAT Software Suite
- Supports HiCo or LoCo in one unit

4777 Emulation Mode

- Encodes on one, two, or all three tracks

- Supports HiCo or LoCo in one unit
- Easy to operate with operator prompts, preprogrammed repetitive data, display screens that instruct the operator on encoding sequence
- Any existing 4777-3 can be replaced with the MT-95 HiCo Card Encoder
- Existing applications that encode LoCo cards on the 4777 can use the MT-95 in Auto mode to encode HiCo or LoCo cards
- Easy-to-understand prompts at each step of the read and encode operation with operator-friendly 80-character messages with an idle prompt that can be customized
- With Mag-Tek cable (P/N 21015846), operates seamlessly with IBM 4778 PIN-Pad - no retrofits required
- Easy installation - after power is applied, the unit operates without any changes to the PC software - no drivers to install, no configurations to modify, no new software to learn

REQUIREMENTS

The requirements listed below are for the three versions of the MT-95.

Standard Mode

- Model MT-95 RS-232 HiCo/LoCo Encoder/Reader P/N 31010019
- Mag-Tek Keyboard, P/N 93600047, or equivalent AT style keyboard (optional)
- PC or Terminal with software to operate the serial port for sending and receiving data (Mag-Tek offers the MT-80 software program P/N 15030402, manual P/N 99815005.)
- PC Cable for DE9P Male Connector P/N 21015823; or PC Cable for DB25P Male Connector P/N 21015821 (must be ordered separately)
- Power Cord P/N 71100001 (included)

IntelliCoder

- Model IntelliCoder, RS-232, HiCo Encoder/Reader, P/N 31010021
- Cable, P/N 21015847 (9-pin to 9-pin) (included)
- Power Cord, P/N 71100001 (included)

4777 Emulation Mode

- Model MT-95 RS-232 HiCo/LoCo Encoder/Reader P/N 31010020
- Cable P/N 21015846 (MT-95 to IBM 4778 PIN-Pad) (included)
- Power Cord , P/N 71100001 (included)

SPECIFICATIONS

The specifications are listed in Table 1-1 and a diagram of parts and the card orientation are shown in Figure 1-2. The card is oriented with the magnetic stripe down for reading and encoding as shown in the illustration.

Table 1-1. Specifications

Power:	115/230 VAC, 50/60 Hz at 1A
LCD Characters	2 lines X 40 characters
Dimensions	
Height:	5.2 ”
Depth:	7.0”
Width:	13.6”
Weight:	6.8 lbs
Magnetic Read Capabilities	3 Tracks
Interface - serial - keyboard	RS-232 AT-style Keyboard (Mag-Tek P/N 93600047)
Read/Write Head Cycles	1,000,000 passes
Card Standards:	Magnetic Stripe Cards per ISO 7810, 7811, 7813
Card Thickness	0.027 inch to 0.033 inch
Operating Temperature	60° to 90 ° F (15 ° to 32 ° C)
Storage Temperature	32° to 122 ° F (0 ° to 50 ° C)
Operating Humidity	15%-90% (Noncondensing)
Storage Humidity	10%-100%(Noncondensing)

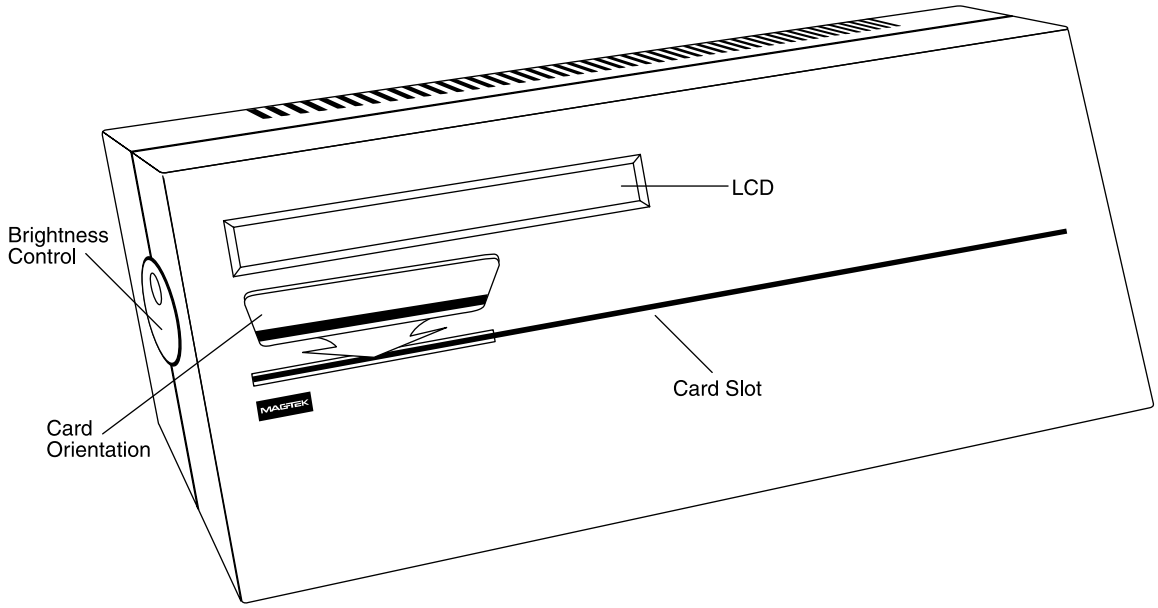

Figure 1-2. Encoder Parts and Card Orientation

SECTION 2. INSTALLATION AND SETUP

Before installing the Encoder, check the packing slip to ensure the order is correct and all parts are included. Check for the following:

PARTS REQUIRED

Standard MT-95

- Model MT-95 RS-232 HiCo Encoder/Reader P/N 31010019
- Power Cord P/N 71100001 (included)
- HiCo and LoCo test cards (1 each)
- Optional Mag-Tek Keyboard, P/N 93600047 (if a PC is to be used, the keyboard is not required)
- Optional PC Cable either for DE9P Male Connector P/N 21015823 or for DB25P Male Connector P/N 21015821 (pin lists are shown in Appendix A)

IntelliCoder

- Model IntelliCoder, RS-232, HiCo/LoCo Encoder Reader, P/N 31010021
- Power Cord, P/N 71100001 (included)
- PC Cable, 9-pin to 9-Pin, P/N21015847 (included)

4777 Emulation MT-95

- Model MT-95 RS-232 HiCo Encoder/Reader P/N 31010020
- Power Cord P/N 71100001 (included)
- HiCo and LoCo test cards (1 each)
- Cable P/N 21015846 (MT-95 to IBM 4778 PIN-Pad) (included)

HARDWARE INSTALLATION

To install the encoder, perform the following steps in the Standard mode as described below:

Note

See Section 6 for installing the 4777 emulation version.

1. The rear panel of the encoder is shown in Figure 2-1. If a keyboard is to be used, plug the cord from the keyboard to the rear panel of the encoder marked "KEYBOARD" as shown in Figure 2-2, and go to step 2.

   or

   If a PC is to be used, select either the 9- or 25-pin cable and plug the 9-pin connector on the encoder rear panel marked "MODEM" to the 9- or 25-pin connector on the PC as shown in Figure 2-3.

2. Plug the female end of the power cord into the rear panel of the encoder marked "POWER". Plug the other end into a power source.

3. Press "I" on the switch marked "ON" .

4. Ensure the proper Communication Port is selected on the PC, if applicable.

5. The default communication parameters on the encoder are shown in Table 2-1. The parameters may be changed as described in Setup. Ensure the parameters on the PC are the same as those on the encoder.

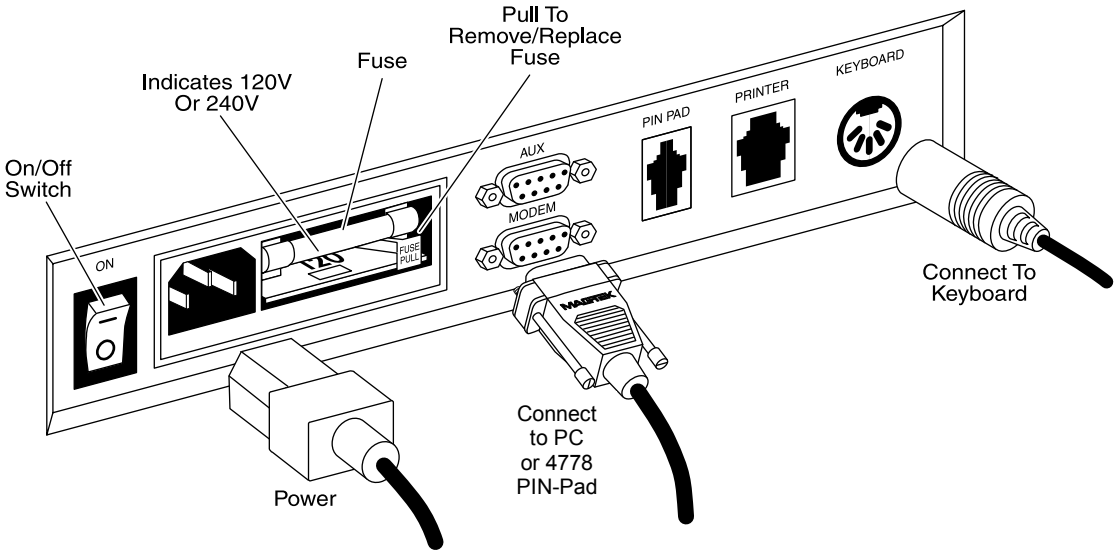

Figure 2-1. Rear Panel

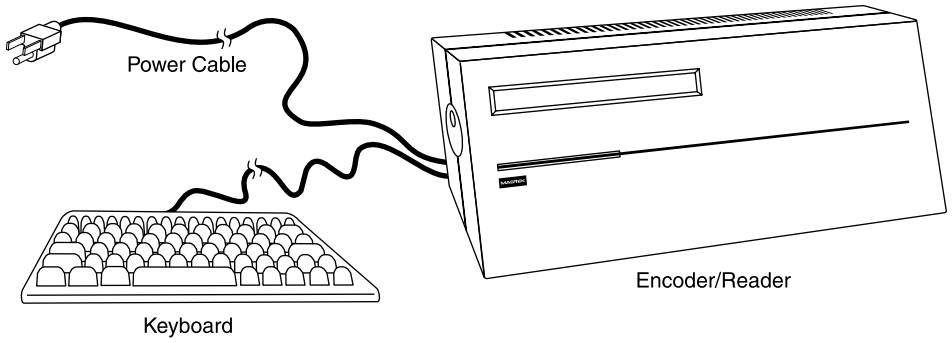

Figure 2-2. Encoder to Keyboard Connection

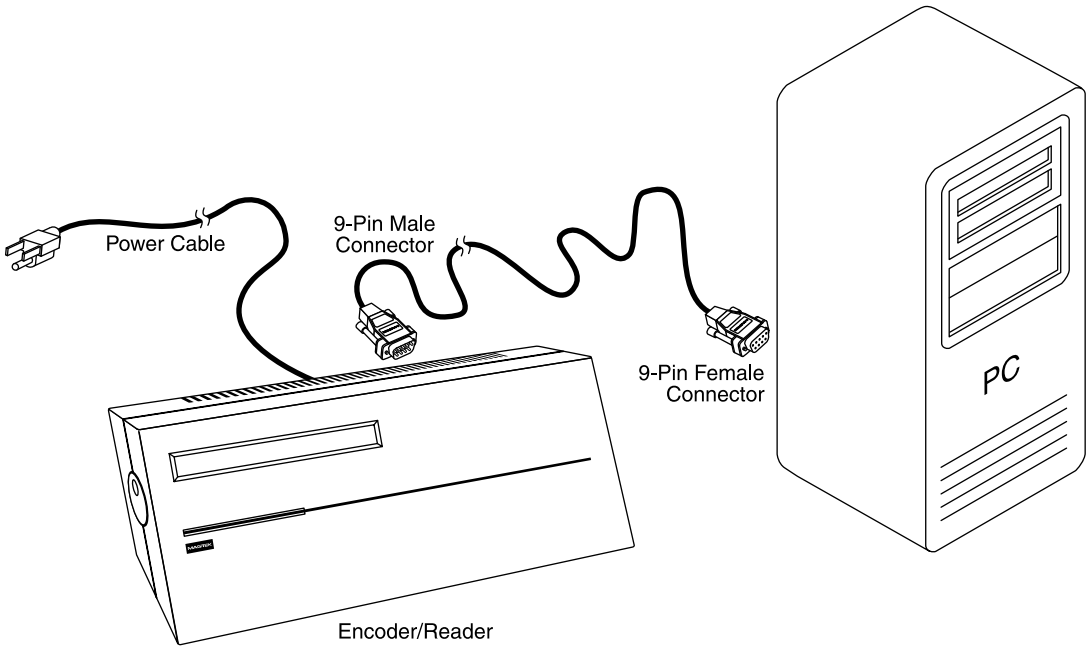

Figure 2-3. Encoder to PC Connection

SETUP - STANDARD MODE

Note

If operating in the 4777 Emulation Mode, refer to Section 6.

When power is applied to the Encoder, the following will be displayed on the LCD:

```
Please wait during system self test
```

After a short time, the following will appear (the revision number may be different):

```
Mag-Tek MT-95      P/N:30060819  Rev:J07
    Copyright (c) 2001 Mag-Tek, Inc.
```

Note

The revision number may be obtained by typing "V" or, when online, by sending the /V Command.

The part number and revision number are for the EPROM in the encoder.

In the Standalone Mode the main menu will appear:

```
          Select a card operation:
R)ead     C)opy      E)ncode      S)etup
```

Adjust the LCD intensity as follows: on the left side of the encoder, turn the circular knob by placing a finger in the depression, and turning the knob clockwise and counterclockwise to adjust the intensity of the LCD until it is comfortable to read.

For online operation only, if the unit is not properly connected to a PC, the following will appear:

```
Mag-Tek MT-95      P/N:30060819  Rev:J07
            *** OFFLINE ***
```

Note

In order to perform the setup operation, the unit must be offline or the keyboard will not be active. The unit is offline when the DTR signal is inactive (See Appendix A for DTR description).

Recheck the cabling and the serial port selected.

To setup the Encoder, perform the following steps:

1. On the keyboard, type **S**. The display will be:

```
Select option to change          Esc=exit
T)racks S)erial E)ncode M)ode C)ard Time
```

2. Type **T,** and the display will be:

```
Select tracks to enable        Enter=done
          Track: 1Y 2Y 3Y  A)ll
```

Type **1,2,** or **3** to toggle each track between **Y**es and **N**o. When **A** is selected, all three tracks will be set to on (Y). For example, the above display shows all three tracks enabled. If **1** and **3** are pressed, these two tracks will toggle off, and only Track 2 will be enabled. Select the tracks to enable and press **Enter**.

Note

This setup affects card encoding only. During a card read, any tracks with data will be displayed (and transmitted if online).

3. When **Enter** is pressed, the program will return to the following display:

```
Select option to change          Esc=exit
T)racks S)erial E)ncode M)ode C)ard Time
```

Type **S** and the next display will be:

```
Select online baud rate        Enter=done
 1=300 2=600 3=1200 4=2400 5=4800 6=9600
```

The current setting will be indicated by a flashing cursor on one of the numbers. Press 1, 2, 3, 4, 5, or 6 to highlight the baud rate and **Enter** to select it. The default is **9600**. The default parameters are listed in Table 2-1. To retain the **9600** baud rate, press **Enter** when **6** is highlighted. If **Esc** is pressed, the original baud rate will remain in effect.

Table 2-1. Default Parameters

Parameter	Description
Baud rate	9600
Parity	Even
Data Bits	7 (Even or Odd parity is always 7 bits; no parity is always 8 bits)
Stop Bits	1
Coercivity	Auto - When a card is encoded, the program automatically selects High or Low coercivity
Tracks	1, 2, and 3 are enabled

4. When **Enter** is pressed, the LCD will display:

```
Select online data parity     Enter=done
 N)one[8 bit] O)dd[7 bit] E)ven[7 bit]
```

Press **N**, **O**, or **E** to highlight the parity setting and **Enter** to select it. The default is odd. If **Esc** is pressed, the original parity value will remain in effect.

5. The next display is:

```
Select online stop bits       Enter=done
      1)Stop bit      2)Stop bits
```

Press **1** or **2** to highlight the stop bits setting and **Enter** to select. The default is 1. If **Esc** is pressed, the original stop bit setting will remain in effect.

6. When **Enter** is pressed, the program will return to the following display:

```
Select option to change         Esc=exit
T)racks S)erial E)ncode M)ode C)ard Time
```

Type **E** and the display will be:

```
Select encode coercivity      Enter=done
          H)igh   L)ow   A)uto
```

A HiCo card is harder to erase than a LoCo card, which can be erased by a small magnet. Auto is a Mag-Tek proprietary encoding technique that determines if the card is HiCo or LoCo.

When encoding a HiCo card in the Auto Mode, the card will always require two passes before it is encoded. If all cards to be encoded are HiCo, this parameter should be set to **H)igh**.

Press **H** or **L** to select high or low coercivity and **A** to select Auto. After selecting, press **Enter**. If **Esc** is pressed, the original encode setting will remain in effect.

7. When **Enter** is pressed, the program will return to the following display:

```
Select option to change          Esc=exit
T)racks S)erial E)ncode M)ode C)ard Time
```

Type **M** and the display will be:

```
Select online encode mode     Enter=done
                N)ormal S)ecure
```

Type **N** or **S** to highlight the Encode mode and press **Enter** to select it. Each mode allows reading and encoding cards.

Normal Mode

In the Normal Mode, the MT-95 operates as a simple card reader and card encoder. When a card is inserted and swiped, all track information will be transmitted via the RS-232 connection to the PC. After the card has been successfully read, the card should be removed from the slot. If a card is to be encoded, the PC will prepare the track data and transmit it to the Encoder. The unit will then beep and prompt for a card to be inserted into the slot for encoding.

This mode is selected from the PC by sending the "/N" command. This mode is compatible with the Mag-Tek MT-80 software.

Secure Mode

In some applications it may be necessary to ensure that the information that is encoded onto a card goes back onto the same card that it came from. This may occur in a financial institution when a customer's card is read and only a portion of the track data is modified, such as with a PIN change. In this case the MT-95 will ensure that the card is not removed from the unit between the read and encode operations. This will help to prevent *skimming* of cards.

If the card is removed before the encode operation, the unit will send an error message (M) indicating that the card has been moved and the operation has been aborted.

This mode is selected from the PC by sending the "/S" command.

8. When **Enter** is pressed, the Setup menu will be shown:

```
Select option to change          Esc=exit
T)racks S)erial E)ncode M)ode C)ard Time
```

Type **C** to define the card timeout. The following menu will be shown:

```
Type in Encode Timeout: [Ins] Enter=done
000 Seconds (Max=255, 0=Disable Timeout)
```

If the timeout value is zero, an encode function will never time out. If any other value (from 1 to 255) is selected, an encode operation will time out after the specified number of seconds. Additionally, if the value is non-zero, the encode operation will be aborted if a card is inserted and removed without completing the encode. If the timeout is set to zero (000), a card may be inserted and removed or an encode may be attempted for an unlimited number of attempts until successful.

After entering the desired value, press **Enter**. If you do not wish to change the value, press **Esc**.

9. From the Setup Menu, there is one hidden command. When the Setup Menu appears, press **6** and the following appears:

```
Select read status              Enter=done
  S)how status      D)on't show status
```

The default is **D)on't show status**. If **D** is selected and an error occurs, a normal display will be similar to the following:

```
**Did not encode properly. Try again.**
  --> Slide card right when ready -->
```

If **S** is selected and an error occurs during encoding, a display similar to the following will appear:

```
**Did not encode properly. Try again.*07
   --> Slide card right when ready -->
```

The 07 is the read-after-write status. The read status values are as follows:

Binary Number	Description
01	Error on Track 1
02	Error on Track 2
04	Error on Track 3
10	Blank Track 1
20	Blank Track 2
40	Blank Track 3

The resulting value is the sum of these binary numbers; for example, 43 indicates that Track 3 is blank (40) and errors were detected on Tracks 1 and 2 (01 + 02 =03). If Track 1 is blank and Tracks 2 and 3 contain errors, the number is 16.

Setup - IntelliCoder

The IntelliCoder is configured in the factory prior to shipment. There are no setup options required.

Refer to Section 4 for a description of the online operation.

SECTION 3. STANDALONE OPERATION

This section describes card reading, copying, and encoding which are basic to operating the Encoder with a keyboard. After the self test and version displays, the main menu will appear:

```
            Select a card operation
R)ead     C)opy      E)ncode      S)etup
```

Ensure the Setup operation, as described in Section 2, is completed before proceeding.

CARD READING AND ENCODING FUNDAMENTALS

To read a card, either just insert a card for reading or select **R** from the main menu shown above, and the following will appear:

```
Insert card for reading
  or press Esc to exit
```

Hold the card firmly in the middle with the magnetic stripe down (toward the bottom of the encoder). Insert the card into either end of the encoder slot. The display will indicate the direction the card should be moved; for example, if the card is inserted in the right side:

```
<-- Slide card left when ready <--
```

After the card has been moved to the other end of the slot (this is called “swiping the card”), the display will indicate whether the card was successfully read or not. If the read was bad, the card must be swiped again to reread the data. The card may be swiped as often as needed to get a good read. There is no limit on the number of retries.

If a card is to be encoded, there must be information in the buffer for each track to be encoded. Select **E** from the main menu, then select **1) Free Format** then **E**, and if there is no data in the buffer, the following will appear:

```
Select an operation              Esc=exit
          No data to encode.
```

To encode, either read a card as described above, or manually enter data with a keyboard. Then select **E** from the main menu. Then Select **1) Free Format** from the following:

```
Select encoding type             Esc=exit
 1) Free Format           2)Fixed Format
```

Then select **E)ncode** from the following:

```
Select an operation              Esc=exit
Tk:1* 2* 3*  E)ncode card  C)lear tracks
```

If all three tracks are encoded, the following display will appear:

```
   Encoding data on tracks 1 2 3
Insert card for encoding      (Auto)
```

Auto indicates that the Encoder will encode in either HiCo or LoCo (high coercivity or low coercivity). Auto is a Mag-Tek proprietary technique that determines if the card is HiCo or LoCo. Insert the card in the left side, and following will appear:

```
   Encoding data on tracks 1 2 3
-->>Slide card right when ready-->
```

After the card is swiped from left to right, the following sequence may occur:

1.
```
   Encoding data on tracks 1 2 3
<- Slide card left when ready (LoCo)<-
```

   The first attempt is to encode a LoCo card. If the card does not encode at LoCo, there will be an attempt at HiCo.

2.
```
This may be a HiCo card. Try again.
 -> Slide card right when ready ->
```

3.
```
   Encoding data on tracks 1 2 3
<- Slide card left when ready (HiCo)  <-
```

   If the card is HiCo and encodes properly, the following will appear:

```
*** CARD ENCODED CORRECTLY ***
       Remove the card
```

If, at any time during the sequence, the card did not encode properly, the display is as follows:

```
**Did not encode properly. Try again.**
  --> Slide card right when ready -->
```

If a card is swiped before the unit is ready to encode, the following will appear:

```
* Card was swiped before encoder ready *
    ->Slide card right when ready->
```

Other messages that may appear are as follows:

Cannot encode card (check orientation)
The card may be inserted upside down. Ensure the stripe is facing down and parallel to the slot.

No data to encode
At least one card must contain data before a card can be encoded.

Track 1 is too long.
Too much data has been entered on a track. This applies to Track 2 and 3 as well. This can only occur when operating online.

This is not a valid Format Card
Ensure Format Card is used. It must have variable data entries.

Only ISO encoded cards can be copied.
Cards in other formats cannot be copied (a driver license, for example).

Time elapsed. Remove card.
or
Timeout waiting for card to be swiped
A timeout occurred before the card was swiped.

CARD READING

To read a card, select **R** from the main menu or simply swipe a card from left to right. If there is data on all three cards, a display similar to the following will appear:

```
Press: 1 2 3 to view tracks    Esc-exit
      Card encoded in ISO format
```

If Track 3 is selected, a display similar to the following example will appear:

```
Tk3:001-039  Scrl→ Enter=next  Esc=exit
+011234567890123456=1234567890123456=123
```

The first entry, **Tk3:001-039**, indicates that positions 1 through 39 on the second line are shown on the LCD. The start sentinel and end sentinel are never included in the position indicator. The **Scrl** and the arrow indicate the direction of scroll. Press the arrow key to scroll in the direction of the arrow key on the screen. To view the beginning or end of the track, hold down the **Fn** key while pressing the **Home** or **End** key. **Enter=next** means press the **Enter** key to view the next track (Track 1 will follow Track 3). **Esc=exit** means press the **Esc** key to return to the previous LCD screen.

CARD COPYING

To copy cards, follow these steps:

1. When in the Main Menu, press **C** on the keyboard. The following display will appear:

```
Insert the original card
  or press Esc to exit
```

2. Insert the card from which the other cards will be copied. The display will be:

```
--> Slide card right when ready -->
```

3. Slide the card, and if the read is good, the following will appear:

```
ISO format data read on tracks  1 2 3
          Remove the card
```

4. Remove the card and the following will appear:

```
Insert next card to encode
  or press Esc to exit
```

5. Insert the card to be encoded and the display will be:

```
Encoding data on tracks 1 2 3
-> Slide card right when ready ->
```

6. After the card has been swiped from right to left to encode the card, a read-after-write operation is performed. If the card was correctly encoded, the display will be:

```
*** CARD ENCODED CORRECTLY ***
        Remove the Card
```

   Remove the card.

To copy a series of cards, repeat steps 4, 5, and 6.

CARD ENCODING

When a keyboard is used, data is keyed into the buffers for encoding, or data can be copied from another card. Encoding always takes place when the card is swiped from the right end of the slot to the left end. When **E** is selected from the main menu, the display will read:

```
Select encoding type              Esc=exit
 1) Free Format            2)Fixed Format
```

Free Format allows any legal data to be placed anywhere on the tracks. (Legal data, for example, may be any alphanumeric data on Track 1 but only numeric data on Tracks 2 and 3.) Fixed Format defines constant and variable data on one or more tracks. In Fixed Format the operator can create a Format (or template) card which, when used, allows the variable fields to be filled in.

Free Format Encoding

If **1** is pressed, a display similar to the following will appear:

```
Select an operation               Esc=exit
Tk:1* 2* 3*  E)ncode card  C)lear tracks
```

The asterisks after the track numbers indicate that there is data on that track. In the above there is data on all three tracks. To become familiar with Free Format Encoding, follow these steps:

1. To select Track 1, press **1** on the keyboard. An example of a Track 1 display is as follows:

```
TK1:001   F1=FS           Ins  Enter=done
  %A12345^JKL^SARAH SMITH^1234567890?
```

TK1:001 indicates the track and the position of the cursor. In this example the cursor is on the first character (**A**). To place the cursor at the end of the track, press the right arrow key to scroll to the end or press and hold **Fn** and press the **End** key. The cursor will then flash on the **?**, which is a symbol for the end of the track.

Note

Neither the start sentinel nor the end sentinel can be modified; they are automatically placed on the track.

F1=FS means press **F1** to insert a Field Separator. There are three in the above example. The **Ins** key is located in the top row of the keyboard next to the **Delete** key (at the extreme right). When the **Ins** key is pressed, the display toggles between **Ins** (Insert) and **Ovr** (Overstrike)**.** This key permits a character to be inserted or overstruck with another character. **Enter=done** means press **Enter** when the change to the track is complete. If anything else is pressed such as **Esc**, the change will not occur.

2. To change ^**JKL**^ in the example above to ^**MNOP**^, press the **Ins** key until **Ovr** is showing on the LCD. Position the cursor over the **J**. Type **MNO**. Press the **Ins** key until **Ins** shows on the LCD and type **P**. The result is **MNO** replaced **JKL** and the **P** has been added in the field. Press **Enter** to return to the Free Format display.

```
Select an operation              Esc=exit
Tk:1* 2* 3*  E)ncode card  C)lear tracks
```

3. If only one or two tracks are to be encoded, press **C** to clear tracks:

```
Select tracks to clear         Enter=done
Track: 1=no  2=no  3=no       A)ll  N)one
```

The selections of numbers and letters act as toggle switches. In this example tracks will clear separately by pressing **1**, **2**, or **3**. Pressing **A** will clear all tracks. No tracks will be cleared if **N** is pressed. Press **A** and the following appears:

```
Select tracks to clear         Enter=done
Track: 1=YES 2=YES 3=YES      A)ll  N)one
```

4. Press **Enter** and the following appears:

```
Press 'C' to clear tracks 1 2 3
   or any other key to cancel
```

Press **C** to complete the clear tracks operation.

5. When **Select an operation**, press **E** and if there is no data in the buffer, the display will be:

```
Select an operation              Esc=exit
           No data to encode.
```

Press **E** and if there is data in the buffer, the display will be:

```
      Encoding data on tracks 1 2 3
Insert the card for encoding      (Auto)
```

(Auto) is a reminder that the setup is for auto mode. Immediately after the card is encoded, it is read and verified with the data entered into the buffer from the keyboard. If the encode data and read data compare, the encoder will indicate a good encode by displaying:

```
*** CARD ENCODED CORRECTLY ***
        Remove the card
```

If the card did not encode correctly, the display may show:

```
**Did not encode properly. Try again.**
   -> Slide card right when ready ->
```

or if the card is HiCo:

```
This may be a HiCo card. Try again.
 -> Slide card right when ready ->
```

Swipe as required.

Fixed Format Encoding

From the Main Menu select **E)ncode**, or press Esc until the following menu appears:

```
Select encoding type            Esc=exit
 1) Free Format           2)Fixed Format
```

Fixed Format Encoding permits the user to create a format card from which a sequence of cards can be easily encoded. To become familiar with the Fixed Format, follow these steps:

1. From the Select encoding type menu, press **2** for Fixed Format options:

```
Select an operation             Esc=exit
  E)ncode cards    C)reate Format Card
```

If a Format Card exists, go to step 2. If a Format Card does not exist, go to Create Format Card, below.

2. Press **E**, and the display will be:

```
Please swipe a Format Card
   or press Esc to exit
```

Read a previously encoded Format Card and remove it. The following display appears:

```
Ready for data entry...
    Remove the card
```

When the card is removed, the following appears:

```
Enter track:1 Pos:007          Esc=exit
  %A12345---^SARAH SMITH^1234567890?
```

Track 1 is ready for encoding, and Position 7 is where the first variable character will be encoded. The cursor will remain on Position 7 until a character is typed.

3. Type **678** to fill in all variable locations. When all locations on all tracks have been filled, the following display will appear on the first line:

```
Insert card to encode       Enter=review
```

To verify the data that has been entered, press **Enter** and the following appears:

```
Insert card to encode       Enter=review
  1)%A12345678^SARAH SMITH^1234567890?
```

The **1)** indicates that on Track 1 **678** have been added.

4. Insert a card to encode on the left side, and the following will appear:

```
   Encoding data on track  1
->Slide card right when ready ->
```

5. Swipe the card and if encoding is successful, the following will appear:

```
*** CARD ENCODED CORRECTLY ***
    Remove the card
```

or if the card is HiCo:

```
This may be a HiCo card. Try again
--> Slide card right when ready -->
```

Swipe as required.

6. Remove the card, and encode other cards in the same manner.

Create Format Card

From the main menu press **E)ncode**, then **2)Fixed Format** or Press Esc until the following menu reappears:

```
Select an operation              Esc=exit
  E)ncode cards    C)reate Format card
```

To create a format card (as the one used above), proceed as follows:

1. Press **C** to create a Format Card, and the following appears:

```
Select an operation              Esc=exit
Tk:1* 2  3   E)ncode card  C)lear tracks
```

2. The asterisks in the above menu indicate that there is data in Track 1. To remove the data, press **C** and the following appears:

```
Select tracks to clear         Enter=done
 Track: 1=no  2=no  3=no     A)ll  N)one
```

The selections of numbers and letters toggle **Yes** and **no**. In this example tracks may be cleared separately by pressing **1**, **2**, or **3**. Pressing **A** will clear all tracks. No tracks will be cleared if **N** is pressed. Press **A** and the following appears:

```
Select tracks to clear         Enter=done
Track: 1=YES 2=YES 3=YES     A)ll  N)one
```

3. Press **Enter** for the following display:

```
Press 'C' to clear tracks 1 2 3
   or any other key to cancel
```

The purpose of this display is to reaffirm clearance of the correct tracks.

4. Press **C** and the following appears:

```
Select an operation              Esc=exit
Tk:1  2  3   E)ncode card  C)lear tracks
```

This display indicates that all three tracks are empty.

5. Press **1** for encoding Track 1 and the following appears:

```
Tk1:001   F1=FS  F3=Var  Ins  Enter=done
%?
```

The cursor will be flashing on the symbol for the end of track (**?**); this is position 001. **F1=FS** means press **F1** to insert a Field Separator. **F3=Var** means press **F3** to insert a blank for a variable character.

When the **Ins** key is pressed, the display toggles between **Ins** and **Ovr.** This key permits a character to be inserted or overstruck with another character. **Enter=done** means press **Enter** when the change to the track is complete.

6. Type the following (ignore the spaces except between the two names): **A12345 F3 F3 F3 F1 SARAH SMITH F1 1234567890**. **F1** and **F3** are function keys at the top of the keyboard. This should appear as:

```
%A12345---^SARAH SMITH^1234567890?
```

This information will be encoded on the Format Card.

7. Press **Enter**, and the following display will appear:

```
Select an operation              Esc=exit
Tk:1*  2  3   E)ncode card  C)lear tracks
```

To review the information, press **1**, and after the review press **Enter**.

8. To encode the Format Card, press **E** and follow the prompts. After the Format Card has been successfully encoded, mark it as a Format Card so it can be easily identified when encoding fixed format cards

SECTION 4. ONLINE CARD OPERATION

This section describes the online operation of reading and writing fundamentals, card data messages, and examples when the Encoder is used with a PC or terminal. Specific track information is also listed. The Encoder must be connected to a PC *and* the DTR line (see Appendix A) must be active to receive commands and data from the PC. (As an option, Mag-Tek offers the MT-80 Program P/N 15030402, Manual P/N 99815005.)

Ensure that the MT-95 and the PC are set to the same communication parameters. The settings on the MT-95 can only be changed with a keyboard attached (see Section 2, Installation and Setup). If the parameters do not correspond, the MT-95 may beep when a character is received. The default settings are 4800 baud, odd parity, 1 stop bit.

CARD READING

In the online mode, the display will show either **`Normal Mode`** or **`Secure Mode`** on the top line, followed by **`Insert card for reading`**. To read a card, hold the card firmly in the middle with the magnetic stripe down (toward the bottom of the encoder). Insert the card into either end of the encoder slot. The display will indicate the direction the card should be moved; for example, if the card is inserted in the right side:

```
<- Slide card left when ready <-
```

After the card has been moved to the other end of the slot (this is called "swiping the card"), the display will indicate whether the card was successfully read or not. If the read was bad, the card must be swiped again to reread the data. The card may be swiped as often as needed to get a good read. There is no limit on the number of retries.

CARD ENCODING

To encode a card on a PC system, the PC must first transmit the data to be encoded on the card to the Encoder. If all three tracks are to be encoded, the following display will appear:

```
  Encoding data on tracks 1 2 3
Insert card for encoding     (Auto)
```

`Auto` indicates that the Encoder will encode in either HiCo or LoCo (high coercivity or low coercivity). Auto is a Mag-Tek proprietary technique that determines if the card is HiCo or LoCo. Insert the card in the left side, and following will appear:

```
  Encoding data on tracks 1 2 3
-> Slide card right when ready ->
```

When the card is swiped from left to right, and it is a HiCo card, the following sequence may occur:

1.

```
Encoding data on tracks 1 2 3
-> Slide card right when ready ->
```

2.

```
Encoding data on tracks 1 2 3
<- Slide card left when ready (LoCo) -<
```

3.

```
** This may be a HiCo card, try again **
-> Slide card right when ready ->
```

4.

```
Encoding data on tracks 1 2 3
<- Slide card left when ready (HiCo) -<
```

5.

```
*** CARD ENCODED CORRECTLY ***
Remove the card
```

If a card is swiped before the unit is ready to encode, the following will appear:

```
* Card was swiped before encoder ready *
->Slide card right when ready->
```

After the card has been encoded, the MT-95 will transmit the data from the track(s) just encoded back to the PC. Thus, if all three tracks have valid data but only Track 2 is encoded in this operation, only Track 2 data will be returned to the PC. This provides an indication that the card has been encoded correctly.

SECTION 5. ONLINE PROGRAMMING

Refer to this section if user-developed software is to be used. If Mag-Tek Software is to be used, refer to *Model MT-80 RS-232 Magnetic Stripe Encoder Software Installation and Operation Manual*, P/N 99815005. This section contains encoded message formats, examples, online commands, online encoded track formats, online modes, and track character sets.

Note

In this section, the ASCII values from 0x00 to 0x1F (hex) are represented by their respective mnemonics enclosed in brackets (for example, the hex value 02, Start Of Text, has the mnemonic "STX" and is shown as <STX>).

ENCODED MESSAGE FORMAT

The format of the encoded data for three tracks is as follows:

<STX> <SS> track data <ES> <SS> track data <ES> <SS> track data <ES> <ETX>

where: **<STX>** is the Start of Text character (0x02, or control B on the keyboard). This character puts the encoder into the encode mode and prepares it to receive the track data.

<SS> is the Start Sentinel for each track to be encoded. Each track of card data must start with its identifying Start Sentinel and end with an End Sentinel (which is always a question mark (?)). You may encode any combination of the three tracks. The order that they are sent does not matter. For example, track three can be sent first, then track one or track one then track three. The Start Sentinels are as follows:

Track	SS	Symbol	Format
1	%	(percent sign)	7-bit format
2	;	(semicolon)	5-bit format
3	+	(plus sign)	5-bit format
3	#	(pound sign)	7-bit format

track data is the actual data to be encoded on each track. These must be legal characters for that track. That is, you cannot encode letters on Tracks 2 and 3 in 5-bit format, so these should not be sent.

<ES> is the End Sentinel for each track encoded. The End Sentinel is a question mark (?) for all three tracks. This must end each set of track data.

<ETX> is the End of Text character (0x03), or control C on the keyboard). When this character is received by the encoder, it will switch to the encode mode until either a successful encode or an abort character is received.

<CR> Carriage Return (0x0D)

<LF> Line Feed (0x0A)

<SP> Space (0x02)

PC ENCODED EXAMPLE

To encode "ABCDEFG" on Track 1 and "123456789=112233" on Track 2 and keep Track 3 the same, the data to the encoder is:

```
<STX>%ABCDEFG?;123456789=112233?<ETX>
```

The STX character shows on the computer's screen as a happy face (on some systems it might appear as $02). The ETX character shows on the computer's screen as a heart (on some systems it might appear as $03). It is not necessary to send a carriage return after the ETX. With this command, Tracks 1 and 2 will be encoded. Track 3 will be left as it is.

ONLINE COMMANDS

The following notes apply to Online Commands:

1. All commands begin with a forward slash "/" (0x2F) which is followed by one or more characters (case insensitive). The command is executed upon receipt of the last character.

2. The response to the messages is an ACK message. This message has the following format:

   <STX><ACK><ETX> (0x02 0x06 0x03.)

3. If an illegal command is sent, the response will be **<STX><NAK><ETX>** (0x02 0x15 0x03.)

The commands are as follows:

Note

All commands are case insensitive.

Change Encode Coercivity Mode

/L = switch to LoCo only mode
/H = switch to HiCo only mode
/A = switch to Automatic selection mode

Change Online Encode Mode

/S = Secure mode on (the Encoder must do a good read before it will accept an encode command)
/N = Normal mode - Secure mode off (the Encoder can do an encode at any time)

Change Configuration

/K = read/encode capability in standalone mode with a keyboard
/X = keyboard can be used only for setup – no read/encode capability is allowed
/V = request version – Response is:
<CR><LF>P/N:30060819<SP><SP>Rev.D01<CR><LF>
/Dn = where n=1, 2, or 3 – Disable a track
/En = where n=1, 2, or 3 – Enabler a track
/T = request current track setup. Format is "Enable Tracks: 1 2 3" where 1 2 3 are sent if the track is enabled or omitted if the track is disabled. A return/line feed pair is sent to terminate the response.
/C = request MT-95 configuration

Abort

/Q = Send to the MT-95 to abort from the encode mode.

Operation

/B = Sound the buzzer on the MT-95. This can be used to alert the user.
/P = Request card position. This can be used to see if a card is in the slot. The following table shows the position indications:

Value	Card Position
0	No card is in slot
1	Card is stopped on right side of slot
2	Card is stopped on left side of slot
3	Card is near right side of the slot
4	Card is near write head
5	Card is near left side of slot
6	Card is moving near read head
7	Two cards in slot

Examples of /**T** response:

```
Track 2 enabled only          "Enabled Tracks: 2"
Tracks 1 and 3 enabled        "Enabled Tracks: 1 3"
No tracks enabled             "Enabled Tracks:"
Track 3 enabled only          "Enabled Tracks: 3"
```

Example of /**C** response:

```
P/N: 30060819  Rev: J06
Enabled Tracks 1 2 3
Encode Mode:  Automatically switch coercivity
Read/Write Mode:  Normal (encode without first reading)
Serial data:  9600 Baud, 7 Data bits, Even parity, 1 Stop bit(s)
```

Each line ends with a carriage return/line feed pair (0x0D/0x0A).

ONLINE ENCODE FORMATS

If more than one track is to be encoded, the track information must be enclosed in an <STX>/<ETX> bracket (`<STX> data <ETX>`).

% data ?	=	Track 1 ISO data	(6 data bits, 1 odd parity bit)
; data ?	=	Track 2 ISO data	(4 data bits, 1 odd parity bit)
+ data ?	=	Track 3 ISO data	(4 data bits, 1 odd parity bit)
# data ?	=	Track 3 ISO data	(6 data bits, 1 odd parity bit)

These Start sentinel values ("**%**", "**;**", "**+**", "**#**") are used by the Encoder to determine which track to put the data on. The actual encoded start sentinels are as follows:

Track l: **%**
Track 2: **;**
Track 3: **;** (for 5-bit data) **%** (for 7-bit data)

Examples are as follows:

Example 1:

Encode track 3 only with “123456” in ISO format (tracks 1 and 2 will not be affected):

+123456?

(the hex values are 2b 31 32 33 34 35 36 3f)

No carriage return, line feed or any other character need be sent. The Encoder will switch to write mode when it receives the question mark.

Example 2:

Encode tracks 1 and 3 with “ABC” and “123” respectively (track 2 will not be affected):

<STX>%ABC?+123?<ETX>

The hex values are 02 25 41 42 43 3f 2b 31 32 33 3f 03

No carriage return, line feed or any other character need be sent. The Encoder will switch to write mode when it receives the <ETX>.

ONLINE MODES

There two modes of online operation are normal encode and secure encode. Each mode allows reading and encoding cards.

Normal Mode

In the Normal Mode, the MT-95 operates as a simple card reader and card encoder. When a card is inserted and swiped, all track information will be transmitted via the RS-232 connection to the PC. After the card has been successfully read, the card should be removed from the slot. If a card is to be encoded, the PC will prepare the track data and transmit it to the Encoder. The unit will then beep and prompt for a card to be inserted into the slot for encoding.

This mode is selected from the PC by sending the **/N** command. This mode is compatible with the Mag-Tek MT-80 software.

Secure Mode

In some applications it may be necessary to ensure that the information that is encoded onto a card goes back onto the same card that it came from. This may occur in a financial institution when a customer's card is read and only a portion of the track data is modified, such as with a PIN change. In this case the MT-95 will ensure that the card is not removed from the unit between the read and encode operations. This will help to prevent *skimming* of cards.

If the card is removed before the encode operation, the unit will send an error message indicating that the card has been moved and the operation has been aborted. The error message is: **<STX>M<ETX>**.

This mode is selected from the PC by sending the "/S" command.

TRACK CHARACTER SETS

Tables 4-1 and 4-2 show Track 1/3 and 2/3 character sets. In these tables the following mnemonics are used:

(SS) = Start Sentinel
(ES) = End Sentinel
(FS) = Field Separator

Table 4-1. Track 1/3 7-Bit Character Set

Character	Hex	Character	Hex	Character	Hex	Character	Hex
Space	20	0	30	@ at sign	40	P	50
! exclamation mark	21	1	31	A	41	Q	51
“ double quote	22	2	32	B	42	R	52
# pound sign	23	3	33	C	43	S	53
$ dollar sign	24	4	34	D	44	T	54
% (SS) per cent sign	25	5	35	E	45	U	55
& ampersand	26	6	36	F	46	V	56
‘ apostrophe	27	7	37	G	47	W	57
(left paren	28	8	38	H	48	X	58
) right paren	29	9	39	I	49	Y	59
* asterisk	2a	: colon	3a	J	4a	Z	5a
+ plus sign	2b	; semi-colon	3b	K	4b	[left square bracket	5b
, comma	2c	< left bracket	3c	L	4c	\ back slash	5c
- hyphen	2d	= equal sign	3d	M	4d	] right square bracket	5d
. period	2e	> right bracket	3e	N	4e	^ (FS) carat	5e
/ forward slash	2f	? (ES) question mark	3f	O	4f	_ underline	5f

Track 4-2. Track 2/3 5-Bit Character Set

Character	Hex	Character	Hex	Character	Hex	Character	Hex
0	30	4	34	8	38	< left bracket	3c
1	31	5	35	9	39	= (FS) equal sign	3d
2	32	6	36	: colon	3a	> right bracket	3e
3	33	7	37	; (SS) semi-colon	3b	? (ES) question mark	3f

SECTION 6. 4777 EMULATION MODE

This section contains information for the 4777 Emulation Mode.

INSTALLATION OF 4777 EMULATION MODE

The following equipment is required for installing the 4447 Emulation:

- Model MT-95 RS-232 HiCo Encoder/Reader P/N 31010020
- Power Cord P/N 71100001
- HiCo and LoCo test cards (1 each)
- Cable P/N 21015846 (MT-95 to IBM 4778 PIN-Pad)

Proceed as follows:

1. Disconnect the system Y-cable from the 4777. Do not disconnect the Y-cable from the IBM 4778 PIN-Pad.

2. Connect Mag-Tek cable 21015846 to the rear panel of the MT-95, as shown in Figure 2-1.

3. Connect the open end of the Y-cable to the open end of the Mag-Tek cable. The default parameters are automatically configured.

4. Plug the female end of the power cord into the rear panel of the encoder marked "POWER". Plug the other end into a power source.

5. Press "I" on the switch marked "ON".

The MT-95 4777 Emulation mode will be preset at the Mag-Tek factory. If the encode energy needs to be modified or the customer's idle message needs to be changed, follow the instructions below.

MT-95 SETUP FOR ENCODE ENERGY

1. Turn off power switch on MT-95.
2. Disconnect the communication cable.
3. Attach an AT-style keyboard.
4. Turn on the power switch.

The following will appear briefly on the LCD:

```
Please wait during system self test
```

Then the following will appear:

```
Mag-Tek MT-95       P/N: 30060819  Rev:J07
                  S)etup
```

5. Select **S**etup from the menu, and the following will appear:

```
Select option to change         Esc=exit
I)dle Display E)ncode Energy  C)ard Time
```

6. From the option menu, select **E**ncode to specify the encode energy level (**H**iCo, **L**oCo, or **A**uto detection). Press **Enter** when done.
7. Turn the power off.
8. Disconnect the keyboard.
9. Connect the communication cable.

MODIFYING IDLE MESSAGE ON MT-95

The 2-line idle message, i.e., the message that is shown when no command has been issued, can be specified by the user. Up to 40 characters can be placed on each line. Follow the directions below to change the idle message.

1. Turn off power switch on MT-95.
2. Disconnect the communication cable.
3. Attach an AT-style keyboard.
4. Turn on the power switch.

The following will appear briefly on the LCD:

```
Please wait during system self test
```

Then the following will appear:

```
Mag-Tek MT-95       P/N: 30060819  Rev:J07
                  S)etup
```

5. Select **S**etup from the menu, and the following will appear:

```
Select option to change          Esc=exit
I)dle Display E)ncode Energy  C)ard Time
```

6. Select the **I**dle Display messages and the following will appear:

```
Select line to edit              Esc=done
     Press  T)op line  B)ottom line
```

7. The top line and bottom lines can be independently modified. Select **T** for the top line or **B** for the bottom line.
8. Type any message you wish to appear when the unit is idle. The **Insert** key can be used to toggle between insert and overstrike modes. The message can be left-, right-, or center-justified by pressing **F3** on the keyboard. The other editing keys, e.g., home and arrows, can be used to move the cursor. When the message is satisfactory, press **Enter**. Edit the other line in the same manner.
9. The two-line message will be saved in battery-backed RAM until this process is used to modify the message.
10. Press **Esc** twice to return to the main menu.
11. Turn the power off.
12. Disconnect the keyboard.
13. Connect the communication cable.
14. Turn the power on.

MODIFYING ENCODE TIMEOUT

1. Turn off power switch on MT-95.
2. Disconnect the communication cable.
3. Attach an AT-style keyboard.
4. Turn on the power switch.

The following will appear briefly on the LCD:

```
Please wait during system self test
```

Then the following will appear:

```
Mag-Tek MT-95       P/N: 30060819  Rev:J07
                  S)etup
```

5. Select **S**etup from the menu and the following will appear:

```
Select option to change          Esc=exit
I)dle Display E)ncode Energy  C)ard Time
```

6. Select **C**ard Time and the following will appear:

```
Type in Encode Timeout: [Ins] Enter=done
030 Seconds (Max=255, 0=Disable Timeout)
```

7. Specify the number of seconds that will be allowed before the encode operation is automatically terminated. Press **Enter** when done.
8. Press **Esc.**
9. Turn the power off.
10. Disconnect the keyboard.
11. Connect the communication cable.
12. Turn the power on.

MT-95 USER MESSAGES

Here is a full set of conditions and messages (where <Idle Top> and <Idle Bottom> are the user-defined idle messages). Messages are centered in the line and other punctuation may be included:

Idle (with or without a card):
<Idle Top>
<Idle Bottom>

Read command issued, no card:
<Idle Top>
Insert card for reading

Read command issued and card in slot:
<Idle Top>
Slide card right when ready

After read (for at least 1 second):
ISO format data read on track 1 2
Waiting for Host Response

After read (and host has responded, even if card still in slot):
<Idle Top>
<Idle Bottom>

Encode command issued, no card:
Encoding data on track 1 2
Insert card for encoding (Auto)

Encode command issued and card in slot:

Encoding data on track 1 2
Slide card left when ready

After encode (for at least 4 seconds):
Card encoded correctly
Follow PC screen instructions

After encode (and host has responded, even if card still in slot):
<Idle Top>
<Idle Bottom>

After encode command issued with card at right side but card not swiped within 20 seconds:
Timeout waiting for card to be swiped
Remove the card

(In this case, the operation can continue when the card is inserted back into the slot.)

After a bad encode (continues forever until good encode or card removed):
Did not encode properly. Try again.
Slide card right when ready.

After an attempt to encode on a HiCo card when unit is set to Auto:
This may be a HiCo card. Try again.
Slide the card right when ready.

APPENDIX A. PIN LISTS

The pin list for Cable DE-9P to DE-9S is shown in Table A-1 and for DE-9P to DB-25S in Table A-2. A diagram for DE-9 connector on the rear of the unit (marked "MODEM") is shown in Figure A-1.

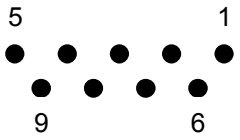

Figure A-1. DE-9 Connector

Table A-1. Cable DE-9P to DE-9S (21015823)

Encoder Pin Number	Computer Pin Number	Description
2 RXD	3 TXD	TXD - Transmit Data. Data *out* of a PC that goes to the input of an external device.
3 TXD	2 RXD	RXD - Receive Data. Data *into* a PC from an external device.
4 DTR	6 DSR	DSR- Data Set Ready - An input to the PC from the device. This is an RS-232 control line indicating that the device is ready to communicate with the PC.
5 Gnd	5 Gnd	Ground
6 DSR	4 DTR	Data Terminal Ready - An output from the PC that goes to the device. This is an RS-232 control line indicating that the PC is ready to communicate with the device.
7 RTS	8 CTS	Clear to Send (not used)
8 CTS	7 RTS	Request to Send (not used)

Table A-2. Cable DE-9P to DB-25S (21015821)

Encoder Pin Number	Computer Pin Number	Description
2 RXD	2 TXD	TXD - Transmit Data. Data *out* of a PC that goes to the input of an external device.
3 TXD	3 RXD	RXD - Receive Data. Data *into* a PC from an external device.
4 DTR	6 DSR	DSR- Data Set Ready - An input to the PC from the device. This is an RS-232 control line indicating that the device is ready to communicate with the PC.
5 Gnd	7 Gnd	Ground
6 DSR	20 DTR	Data Terminal Ready - An output from the PC that goes to the device. This is an RS-232 control line indicating that the PC is ready to communicate with the device.
7 RTS	5 CTS	Clear to Send (not used)
8 CTS	4 RTS	Request to Send (not used)

INDEX

4

4777 Emulation Installation 37

A

Auto mode 11, 16, 22, 27

B

Baud rate 9, 32

C

Cable, PC 2, 5
Card Copying 19
Card Encoding 20, 27
Card orientation 4
Card Reading 18, 27
Card Reading and Encoding Fundamentals 15
Character sets 34
Coercivity 1, 10
Coercivity Mode, Change Encode 31
Coercivity, select 10
Configuration, change 31
Connection, encoder to PC 7
Copy cards 19
CTS 43

D

Default parameters 10
DSR 43
DTR 27, 43

E

Emulation 4777 37–42
Encode Energy 37
Encode formats, online 32
Encode Mode, Change Online 31
Encode mode, select 11
Encode Timeout 39
Encoded message format 29
Encoder parts 4
End of Text (ETX) 30
End Sentinel 30, 34

F

Features
  4777 Emulation Mode 1
  Standard Mode 1
Features and Specifications 1–4
Field Separator 25, 34
Fixed Format Encoding 15, 22
Format Card, Create 24
Free Format Encoding 15, 20

H

Hardware installation 5
HiCo 1, 10, 16
Hidden commands 12

I

Idle Message 38
Installation and Setup 5–13
IntelliCAT 1
IntelliCoder 1, 2, 5
IntelliCoder Setup 13
ISO standards 1

K

Keyboard 2, 5

L

LCD intensity adjustment 1, 8
LCD, Liquid Crystal Display 1
LoCo 1, 3, 10, 16

M

MT-80 manual 2, 27
MT-80 program 2, 27

N

Normal Mode 11, 33

O

Online commands 30
Online encode formats 32

Online Modes 33
Online Operation 29–36
Online Programming 29–36

P

Parity, select 10
Parts Required
  Standard MT-95 5
PC encoded examples..... 30
Pin Lists..... 43
PROM number and version..... 8

R

Rear panel..... 6
Requirements..... 2
  4777 Emulation Mode..... 2
  4777 Emulation MT-95..... 5
  Standard Mode 2
Revision number, EPROM..... 8
RTS 43
RXD 43

S

Secure Mode..... 11, 34
Setup..... 8
Setup - IntelliCoder 13
Specifications 3
Standalone Operation 15–26
Start of Text (STX) 29
Start Sentinel 29, 34
Stop bits, select..... 10

T

Track Character Sets 34
Track data..... 29
TXD..... 43

U

User Messages..... 40