TM11-7010-200-10-3-3

TECHNICAL MANUAL

OPERATIONS MANUAL

OPTICAL CHARACTER READER, TYPE RP-238/GYX

HEADQUARTERS, DEPARTMENT OF THE ARMY

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" # A0049 (1)
" # SO392 (3)
" # JO861 (10)
" # CO214 (2)

NG: NONE

USAR: NONE

For explanation of abbreviations see, AR 310-50.

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INTRODUCTION

1. GENERAL. The information contained in this manual describes the operation of the Optical Character Reader RP238/GYX, manufactured under contract number MDA904-76-C-0246.

2. SCOPE AND PURPOSE OF MANUAL. This manual contains all information necessary to operate the equipment. The context of chapters 1 through 3 are described below.

Chapter 1.- Description of Equipment. - This chapter provides a general description of the equipment and its characteristics.

Chapter 2. This chapter contains information required to operate the equipment, including a description of the operating controls, indicators, error messages and operating instructions.

Chapter 3.- Preventive Maintenance. This chapter provides all the necessary preventive maintenance procedure that should be performed to prevent major equipment failures.

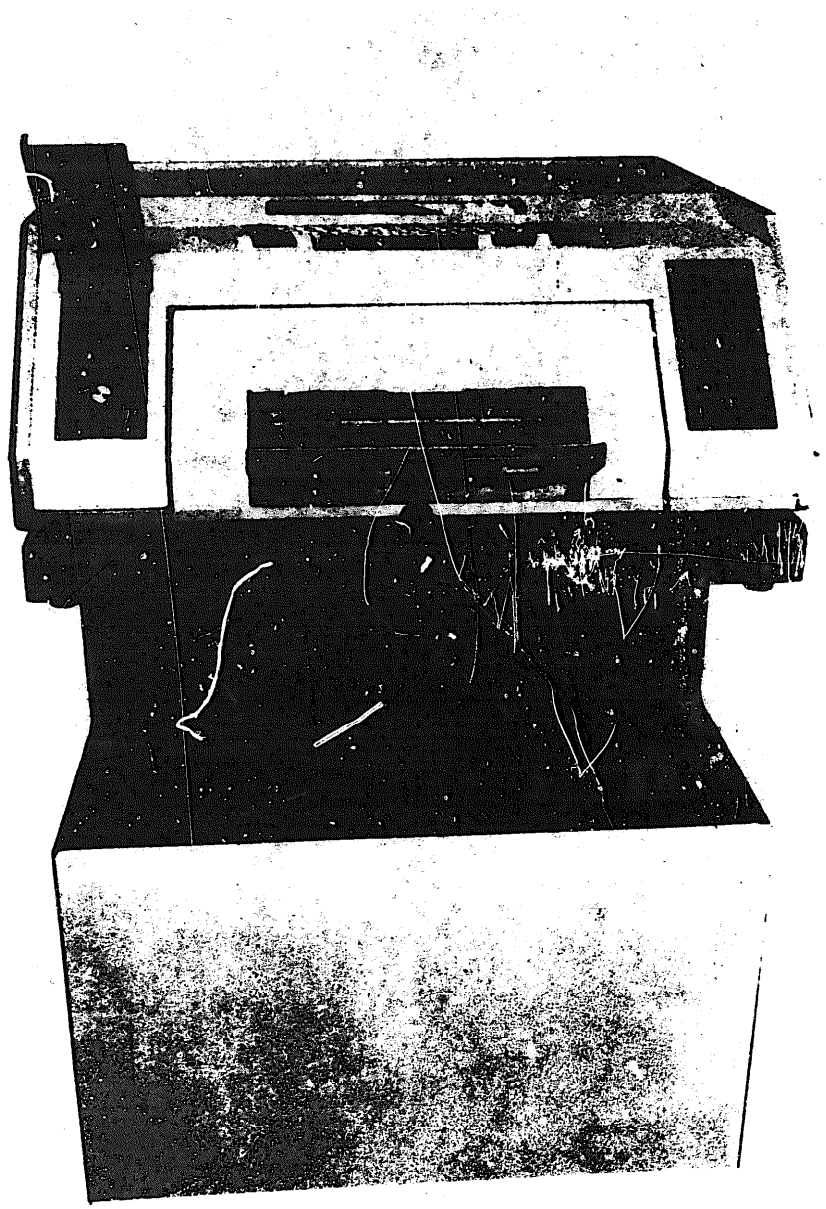

Figure 1-1 ALPHA RP-238/GYX Optical Character Reader

CHAPTER 1
DESCRIPTION OF EQUIPMENT

1-1. **DESCRIPTION OF EQUIPMENT.** The ALPHA (Figure 1-1) is a flexible, operator oriented, accurate optical character recognition system (page reader) which converts typewritten characters into machine language. The scanned text is output in the data codes required by the data base.

a. The ALPHA reads OCR forms (DD173) typed in OCR-B font. The maximum error rate is less than one in 25,000 characters, and can be much lower depending upon the character set used and the quality of the input material.

b. The ALPHA's major components consist of an integral micro-processor with core memory, a keyboard, read head assembly, page feeder, two control panels, and a signal output unit to drive the data base. The microprocessor controls the ALPHA operation and allows the user to quickly and easily store output code conversions through the use of HEADER SHEETS.

1-2. FUNCTIONAL DESCRIPTION. - The ALPHA accomplishes its task through the following steps:

a. The top form in the Page Feeder Tray is lifted by a vacuum assembly and forwarded to the Paper Handler section through a series of rollers and belts. During this time mechanical and electronic measures are employed to assure that only one sheet is fed at a time.

b. The Paper Handler section takes control of the paper movement and positions it such that the first line of the text is positioned under the scanning element (read head assembly).

c. The Read Head Assembly scans (reads) the first line of data character by character and recognition circuits identify them. The characters are then temporarily stored in a line buffer.

d. If there were any unrecognized or crossed out characters, the Read Head will be positioned such that the pointer attached to it points to the unrecognized or crossed out character, an LED (Light Emitting Diode) display will show the preceding, questionable, and following characters, and an alarm is sounded. The ALPHA waits for the operator to take corrective action through the keyboard. Once this action has been completed, ALPHA proceeds to the next step.

e. The completed line is then transferred to the core memory module where it is code converted and output is started to the data base in serial form.

f. The ALPHA then reads the next line by moving the paper up until the next line is under the scanning element and moving the Read Head across it, The process continues until end of page criteria has been met,

g. When the page has been completed, it is ejected into a paper hopper at the rear of the machine. The Page Feeder then picks up the top sheet from- the tray and forwards it

to the Paper Handler section where the above process is repeated.

h. When all the sheets have been processed which were in the Page Feeder Tray, the machine may be stopped by pressing STOP or RESET. If STOP or RESET is not pressed, the machine will automatically go into the STANDBY MODE if no pages are available for one minute,

1-3. MEMORIES DESCRIPTION. - The ALPHA has two different types of major memories each with a different purpose, These memories and their purposes are:

a. **PROM Program Memory.** - This memory contains the operating program that provides the instructions, to the microprocessor for controlling the machine sections. This non-volatile Programmable Read Only Memory is pre-programmed at the factory and is not alterable in the field.

b. **Core Memory Module.** - This non-volatile memory is used by the microprocessor to store the output code conversions that are loaded via Header Sheets. The information contained on the Header Sheets will be entered into the core memory and will dictate the type of code structure that is used to output the scanned characters.

1-4. PHYSICAL DESCRIPTION. The ALPHA is completely contained in a single cabinet, 46 inches in height, 28 inches wide, and 32 inches in depth. Total weight is approximately 400 pounds.

It is mounted on four casters which allow the cabinet to be easily moved. The unit has six major assemblies.

a. **Control Console.** - This assembly (top front) contains a keyboard assembly, LED display, viewing window, mirror adjusting lever, Control panel and Format panel.

b. **Automatic Page Feeder.** - This assembly (center front) provides the paper handler section with properly aligned single sheets of paper.

c. **Paper Handler.** - This assembly (top center internal3 moves the paper vertically and supports the read head assembly which scans the lines.

d. **Main Wire/Wrap Assembly.** - This assembly (inside. lower·rear panel) contains 95% of the control logic for the machine functions. This includes the PROM memories and microprocessor.

e. **Core Memory Module.** - This assembly (inside lower front panel) stores output code formats and scanning parameters.

f. **Power Supply.** - This assembly (Lower center internal) provides all the voltages required for operation of the ALPHA.

All cabling (power and data output) to the ALPHA is located at the lower rear section of the base. A convenience outlet is also located in this area. Fusing for main AC input and convenience outlets is located adjacent to these items.

1-5. TECHNICAL CHARACTERISTICS, - The technical characteristics of the Optical Character Reader RP238/GYX are listed on Table 1-1.

TABLE 1-1

Technical Characteristics

PHYSICAL CHARACTERISTICS	
Dimensions:	
Height.	46 inches (max.)
Width.	28 inches (max.)
Depth.	28 inches (max.)
Weight:	400 pounds
ELECTRICAL CHARACTERISTICS	
Power Requirements:	
Voltage.	115 + 23 vac. or 238 + 48 vac.
Current:	
Start.	7.5A @ 115 Vac.
	5.0A @ 230 Vac.
Operate.	4.0A @ 115 Vac.
	2.5A @ 230 Vac.
Power.	460 Watts
Frequency.	50 + 2.5 Hz or 60 + 3 Hz.
Phase.	Single
Signal Requirements (Inputs):	
Typewritten:	
Size.	5 in. wide X 7 in. long to 11 in. X 11 in., up to 50 sheets; 11 in. wide X 24 in. long, single sheets.

TABLE 1-1

Technical Characteristics

Weight	20 lb. bond to card stock
Font.	Upper case OCR-B (232).
Pitch.	10 or 12 characters per inch using OCR-B.
Ink.	Readable. Any carbon base ink of any color. Non-readable. Any non-carbon ink of any color.
Read rate.	80 characters per second, nominal.
Characters per line.	69/line on DD-173 Message forms.
Spacing	Single or double
Preprogrammed DD-173 values:	
Top margin.	00.6 inches from top of sheet.
Left margin.	00.4 inches from left edge.
Right margin.	07.6 inches from left edge.
Bottom margin.	07.9 inches from top edge.
Spacing.	6 lines per inch, single spaced.
End line.	68 blank spaces from last character
Null line.	3.0 blank inches from left margin
Page end.	2 blank lines from last line.

TABLE 1-1

Technical Characteristics (continued)

Variable values:	
Keyboard variable.	Values varied by use of keyboard.
Top margin.	00.5 inches from top of sheet to bottom margin minus 00.1 inches.
Left margin.	00.4 inches from left edge of sheet to right margin minus 00.1 inches.
Right margin.	Left margin plus 00.1 inches to 10.5 inches from left edge.
Bottom margin.	Top margin plus 00.1 inches to 25.1 inches from top of sheet.
@ Command variable:	Values varied by use of @ Command
End line.	1 to 120 blank spaces from last character.
Null line.	No character 00.1 to 6.3 inches from left margin.
Lines per inch.	6, 5, or 4.
Page end.	1 to 254 blank lines, after a non blank line at the spacing in use
Keyboard:	Modified American Communications teletype; upper case and symbols only.

TABLE 1-1

Technical Characteristics (continued)

Signal Requirements (Outputs):	
Interface Signals MIL-STD-188-100	
Clock:	
Amplitude.	+6 to -6 (+/ - 1 volt) as per MIL-STD-188-100.
Asynchronous rate.	75, 150, 300, 600, 1200, 1800, 2400, 7200, 9600 Baud.
Isochronous rate	Up to 128 Kilobit/Sec.
Data:	
Amplitude.	+6 to -6 (+/ - 1 volt).
Asynchronous.	75 to 9600 Baud.
Isochronous.	Up to 64 Kilobit/Sec.
Control One:	
Amplitude.	+6V to -6V (+/ - 1 volt).
Display:	Three 5 X 7 LED characters.
Tones:	800 Hz audible signal indicating a defective character in text and 400 Hz audible signal indicating a machine or text input error.

TABLE 1-1

Technical Characteristics (continued)

ENVIRONMENTAL CHARACTERISTICS

Temperature:	
Operating.	**10 to 26 degrees Centigrade.**
Air Shipment.	**-20 to +71 degrees Centigrade.**
Humidity.	**95% at +25 degrees Centigrade.**
Maximum Altitude.	**10,000 feet.**

CHAPTER 2

OPERATING INSTRUCTIONS

2-1. IDENTIFICATION OF CONTROLS AND INDICATORS. - ALL operating controls and indicators are located on the Control console of the OCR. The functions of the operating controls and indicators are described in Tables 2-1, 2-2, and 2-3 for the top of the Control Console, the Format Panel and the Control Panel, respectively. Figure 2-l shows the controls and indicators on top of the Control Console. Figures 2-2 and 2-3 shows the Format and Control Panels. Figure 2-4 shows the Stack Feeder Tray Assembly.

2-2. POWER UP PROCEDURE. - To power up the OCR, set POWER switch to ON; four paper viewer lamps, control console fan, and cabinet fan will come on'. After a brief delay, the main power supply will come on and the LED display will indicate three NUL characters (Figure 2-5).

2-3. LOADING HEADER SHEET SETS. - This step is necessary only when the Output Code Conversions are to be changed or when the output data is not being code converted correctly.

a. The Programming Manual explains how the user may program the ALPHA:

(1) To scan pages in accordance with desired rules.

(2) To output user defined codes for each character on the typing element.

(3) To output user defined codes for various functions such as Line Feed (LF) or Carriage Return (CR).

b. For instance the ALPHA may be programmed to read the DD173 Message forms and output an 8-level, odd or even parity ASCII code for each character. For back up use, it may be programmed to output S-level ITA-2 codes. The scanning rules and code conversion tables are defined on typed pages called Header Sheets.

c. The ALPHA Programming Manual explains the various programming options available to the user and how to change parameters or code conversion tables via Header Sheets, There will be two sets of Header Sheets supplied with every ALPHA:

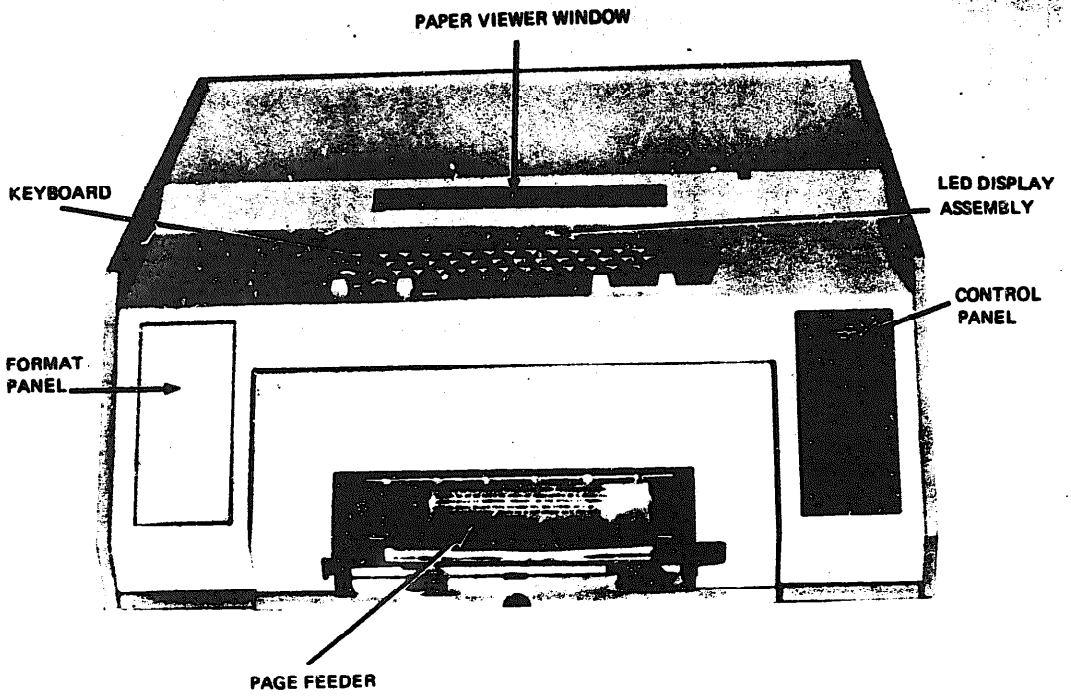

Figure 2-1 Control Console

TABLE 2-1

Control Console Controls and Indicators

(See Figure 2-1)

CONTROL OR INDICATORS	FUNCTION
Viewing Window	Used to view ALPHA reading operation and to check defective characters when an error is indicated.
Mirror Adjust	Adjusts mirror in viewing window.
Red Pointer	Attached to the Read Head assembly. Points to a defective character or the beginning of a crossout.
3-LED Display	During normal operation, displays first three characters of each line after it is scanned. It also displays error indications and, when mode selector is in a MARGIN position, indicates margin values.
Keyboard	Provides communication between operator and ALPHA to set margins and correct errors.

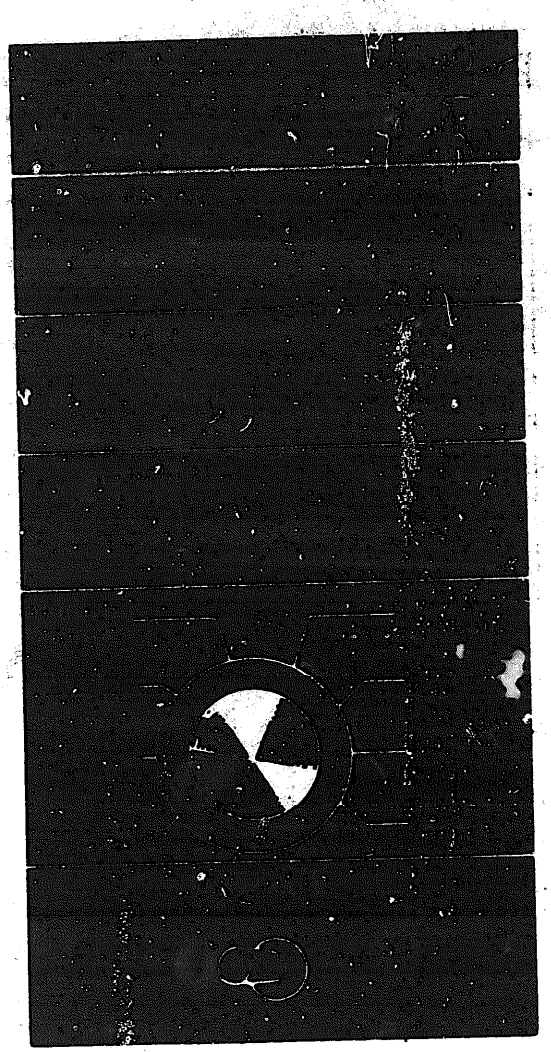

Figure 2-2. Format Panel

TABLE 2-2

Format Panel

(See Figure 2-2)

CONTROL	SWITCH POSITION	FUNCTION
Power	ON	Applies service power to ALPHA circuits.
	OFF	Disconnects service power from ALPHA circuits.
Pitch	10	Sets ALPHA to read 10 characters / inch type.
	12	Sets ALPHA to read 12 characters / inch type (for use with OCR-B font only).
Line Spacing	1	Sets ALPHA to read single-spaced, 4, 5 or 6 lines per inch type.
	2	Sets ALPHA to read double spaced, 2, 2-1/2, or 3 lines per inch type.
Output	ON	Normal Position for data output.
	OFF	Inhibits data output, must be held in this position to introduce Header Sheets.

TABLE 2-2

Format Panel Controls (continued)

(See Figure 2-2)

CONTROL	SWITCH POSITION	FUNCTION
Alphabet	1	Sets ALPHA to read primary font (OCR-B).
	2	Sets ALPHA to read a second font if installed. Normally disabled.
Mode Selector	Operate	Sets ALPHA to read text for output or for programming output codes.
	Top Margin	Places top margin value in LED Display when ALPHA is in Standby Mode and enables Keyboard A or S Keys.
	Left Margin	Places left margin value in LED Display when ALPHA is in Standby Mode and enables Keyboard A or S keys.
	Right Margin	Places right margin value in LED Mode and enables keyboard A or S Keys.
	Bottom Margin	Places bottom margin value in LED Display when ALPHA is in

TABLE 2-2

Format Panel Controls (continued)

(See Figure 2-2)

CONTROL	SWITCH POSITION	FUNCTION
		standby Mode and enables keyboard A or S Keys.
	Test A	Used for troubleshooting.
	Test B	Used for troubleshooting.
	Parameter	Selects default reading values when ALPHA is in Standby mode.

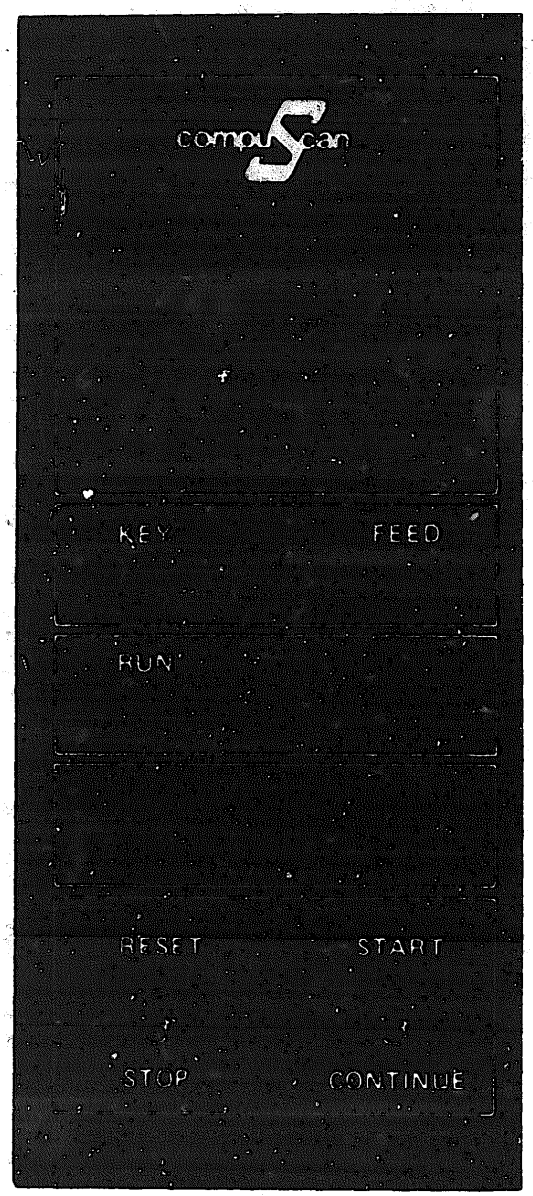

Figure 2-3. Control Panel

TABLE 2-3

Control Panel Controls and Indicators

(See Figure 2-3)

CONTROL OR INDICATOR	SWITCH POSITION	FUNCTION
Feed Lamp		When on continuously, indicates ALPHA page feeder is ready for more copy. Flashes as each sheet is ejected and next sheet is picked up.
Run Lamp		Indicates ALPHA scanning function is operating.
Key Lamp		Indicates ALPHA is waiting for a Keyboard input.
Reset/Stop Switch	Reset	Places ALPHA in standby mode. Used when scanning is to be resumed on new sheet.
	Stop	Places ALPHA in standby mode. Used when scanning is to be resumed on same sheet.

TABLE 2-3

Control Panel Controls and Indicators (Continued)

(See Figure 2-3)

CONTROL OR INDICATOR	SWITCH POSITION	FUNCTION
Start/Continue Switch	Start	Starts scanning on new sheet after Reset-Stop switch is toggled.
	Continue	Starts scanning again on same sheet after STOP is toggled.

(1) DD173/ASCII. - These Header Sheets program the ALPHA to read the DD173 (OCR) Message form and output an ASCII code for each character. These Header Sheets are designed for use of the ALPHA with STREAMLINER.

(2) DD173/ITA2. - These Header Sheets program ALPHA to read the DD173 (OCR) Message form and output ITA2 code fop each character. These Header Sheets are designed for use of the ALPHA with an off-tine device such as a paper tape punch. In addi t i on, certain message format requirements, such as the EOM, are included.

d. Header Sheet Sets are loaded the same as Message Pages with the exception that the Output Switch should be held in the OFF position for the first page. It may be released for subsequent pages.

e. Header Sheets are numbered on the top right-hand corner and must be inserted in order: top sheet - page 1; bottom sheet - last page. Failure to have the sheets in order may result in a Header Error (Table 2-4), *Care* should be taken to insure that ALL the sheets are loaded as a missing page will result in failure to perform the code conversions listed on that Header Page.

f. The only two responses possible to an error halt while processing Header Sheets are either pressing the "Continue" Switch or the "Start" switch. "Continue" will allow scanning to resume with the NEXT LINE on the page but all processing will have halted at the point in the line where the error was encountered. "Start" will eject the current page, cause a

Page Abort character to be processed for code conversions, and begin scanning of the next page.

Note- If for ANY reason an error is generated while scanning a Header Sheet, the user MAY continue scanning and finish the entire code conversion table. However, he will not be permitted to generate any output from a code conversion table stored this way. The only way to recover is to scan a macla command for the table and reload the Header Sheets. This is particularly useful in scanning Header Sheet sets which have been used many times to check whether they have become smudged from long use. If many stops occur while trying to input from an old set of Header Sheets, the set should be replaced with a new set. This feature allows a complete trial scanning of Header Sheets to check for errors, yet prevents accidental outputting from a table which had an error.

2-4. ESTABLISHING MARGINS

a. The Margin Values which are stored in the ALPHA determine the area of each Message form which will be scanned. Any data typed outside of the area established by the Margin values will not be scanned. It is important that the Margins be set to assure scanning of all data which is intended to be scanned or to exclude

all data which is not 'intended to be scanned.

b. The Margin Values are retained even when the POWER switch is placed in the OFF position. It is not necessary to check or change them unless one of the following situations exists.

(1) If it is suspected that the margin values are not correct, they may be checked as described in paragraph 2-4c.

(2) If the margins are not correct they may be reset to the Preprogrammed Values as described in paragraph 2-4d.

(3) If the documents being scanned are not correctly prepared, such that data at the margins is lost or data typed near the margins but not intended to be scanned is read, the margins may be adjusted accordingby. This adjustment is described in paragraph 2-4e.

c. Checking Margins.

(1) When the Mode Selector Switch is set to one of the Margin positions (Top, Left, Right, or Bottom) the value currently in use for that Margin will be displayed on the three digit display. The numerals are the Margin measurements in tenths of an inch from either the top or left edge of the paper. The absolute value displayed is divided by 10 to obtain the margin value in inches.

Example: The number 076 is displayed. Dividing by 10 gives 07.6 This margin is 07.6 inches from the edge of the paper.

(2) CARE SHOULD BE TAKEN to insure that the Mode Selector Switch is NOT rotated through the PARAMETER RESET position when checking Margins; this would cause the Margin values to be reset to preprogrammed values-

d. **Resetting Margins to Preprogrammed Values** - One set of scanning values is preprogrammed into the ALPHA. These values establish the correct parameters for processing the DD-173 (OCR) Message form. Table 1-1 (typewritten inputs) list the specified DD-173 values.

(1) To use the DD-173 values:

(a) When the ALPHA is in the STOP or RESET mode, rotate the Mode Selector Switch to the PARAMETER RESET position.

(b) Rotate the Node Switch Counter Clockwise through each of the Margin positions checking that the values shown on the LED display are the correct values as specified in Table 1-l-

(c) Return the Mode Selector Switch to OPERATE.

(2) This procedure also causes values to be established for:

(a) Line Spacing - 6 lines per. inch.

(b) End of Line criteria - 68 spaces from last scanned character on a line.

(c) Null End of Line criteria - 3" from Left Margin.

(d) End of Page criteria - 2 Null lines after last scanned line.

(3) These values may be changed through the use of @ Commands as described in the Programming Manual.

e. **Setting Margins.** - Margins may be set to values other than DD-173 through the Keyboard. The procedure is:

(1) While the ALPHA is in the STOP or RESET mode,

rotate the Mode Selector Switch clockwise to select the Margin which is to be changed.

(2) The display will show the value currently in use.

(3) Use the "A" keybutton to "ADD" to the value shown, and the "S" keybutton to "SUBTRACT" from the value. Tapping the keybuttons will cause the value to change by 1/10 inch. Holding the keybutton down will cause the value to change rapidly until the keybutton is released.

(4) Repeat the process for any other Margins which are to be changed.

(5) Rotate the Mode Selector Switch COUNTER-CLOCKWISE to OPERATE position.

2-5. LOADING MESSAGEFORMS

a. The ALPHA's Stack Feeder may be loaded with stacks of up to 50 sheets ranging in size from 11" X 11" down to 5" X 7"; the length in the direction of feed must be at least seven inches. Sheets of copy longer than 11", up to 11" X 24". must be Loaded one at a time with Page Feeder removed.

b. Copy is placed into the Feeder face up, top line towards the machine; with page numbers increasing from top to bottom. Load copy into the Feeder no further than the edge of the tray inside of the assembly; no force is required. Copy inserted too far into the feeder will cause a paper jam.

c. 'If the ALPHA is already operating and the FEED indicator is on, all that is required to load more copy of the same size *is to* place the copy neatly in the tray. When the copy is positioned correctly, the top page tends to float upwards lightly

and feed in. If the FEED light is off, START must be toggled to feed the copy,

g. Perform the following procedure to load the Stack Feeder after installation or when the page size is to be changed (see figure 2-4):

(1) Loosen the left & right guide locking screw underneath the tray.

(2) Position paper in the center of the tray between the guides.

(3) Slide guides up to paper edges allowing 1/16" clearance on either side. Guide position, within the entire horizontal space available, is not critical.

(4) Tighten paper guide hand screws.

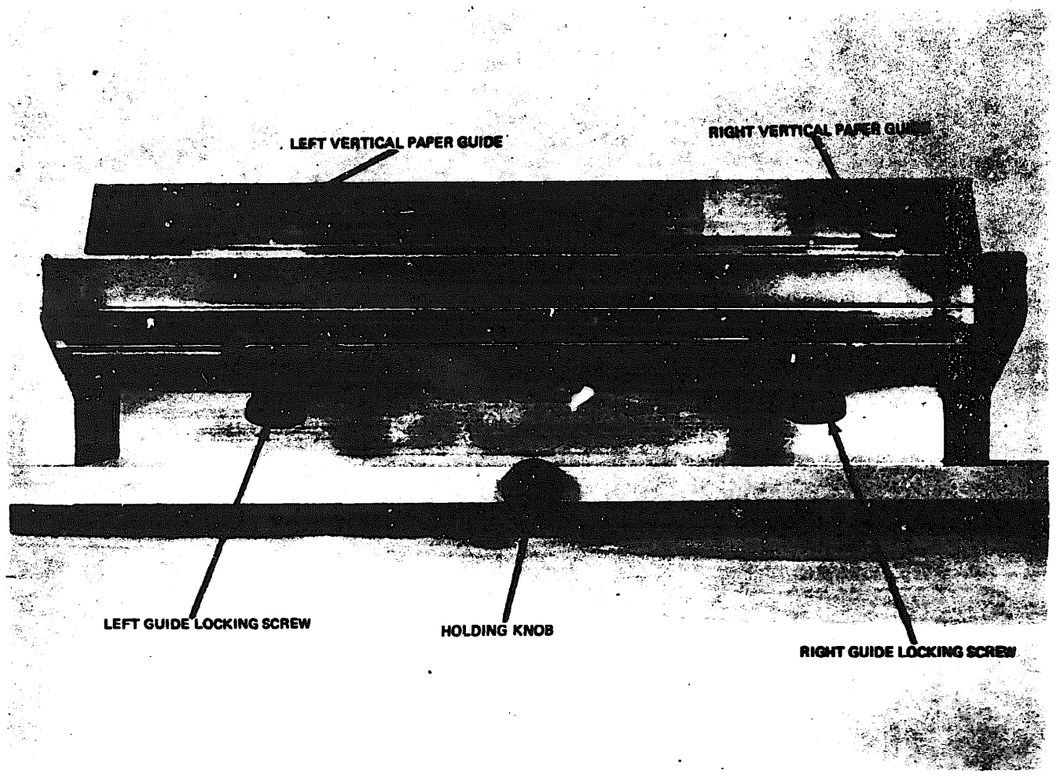

Figure 2-4. Stack Feeder, Tray Assembly

2-6. SCANNING MESSAGEFORMS

a. To initiate scanning, toggle the START switch. All scanning operations will start as described in the Functional Description (paragraph 1-2).

b. During normal scanning, the first three characters of a line are displayed in the LEDs after the line is read.

c. During normal operations, the ALPHA may stop and sound an alarm. This signifies that one of the following conditions has occurred:

(1) An Unrecognized Character has been scanned, in which case the read head will stop such that the red pointer in the viewing window points to the unrecognized character (refer to paragraph 2-7 for corrective action).

(2) A Crossout has been scanned in which case the read head stops with the pointer indicating the crossed out character or the first character if more than one was crossed out. (refer to paragraph 2-8 for corrective action).

(3) An error stop has occurred in which case operation stops and a 'BEL' Error Message is displayed on the LEDs. (refer to paragraph 2-7 for Error Message Meanings and corrective action).

2-7. HANDLING UNRECOGNIZED CHARACTERS

a. While scanning the messageforms, the ALPHA may encounter two different types of Unrecognized Characters:

(1) Those which are UNRECOGNIZABLE by the machine

(2) Those for which it can make a BEST GUESS, but is not sure enough of the guess to output it without asking the operator *to* confirm the guess.

b. In either case, the scanning operation will halt with

the read head positioned such that the red pointer in the viewing window points to the Unrecognized Character.

c. Unrecognizable. Where the character is unrecognizable, a "US" character (Figure 2-5) will appear in the center LED. The characters on either side of the unrecognized character in the text also appear on each side of the "US" character, (The Unrecognized Character may be a single crossed out character). The character may be handled by either:

(1) Key in the correct character(s) on the keyboard. The character(s) will appear on the display in the center position. Depress CR to resume operation.

(2) Depress CR only to delete the character and resume operation.

d. Best Guess. - If the ALPHA encounters a slightly disfigured or poorly typed character, it will stop the scan operation, display its best possible identification, and ask the operator to confirm. its Best Guess. The display will show the Best Guess character in the center position with the characters on each side of it. The Best Guess character may be handled one of three ways:

(1) Best Guess Correct. - If the character under the pointer and the Best Guess shown on the display are the same, press the CR key on the keyboard to accept the character. The tone will stop and scanning will resume,

(2) Best Guess Incorrect. - If the character under the pointer and the Best Guess are not the same-

(a) Key the correct character(s) on keyboard; the tone will stop and the correct character will appear at display center in place of best guess.

(b) Press the CR key on keyboard; scanning will resume.

(3) Best Guess Deletion. - If it is necessary to delete the Best Guess character without inserting a new character:

(a) Press the BACK SPACE key; tone will stop and BackSpace symbol (BS in Fig. 2-5) will appear at display center.

(b) Press CR key on keyboard; scanning resumes.

e. If during the preceeding steps an incorrect entry was made on the keyboard, perform the following procedure:

(1) Press BACK SPACE key on keyboard; previous keyed character or, if none, backspace symbol will appear at display center.

(2) Enter correct character on keyboard; correct character will appear at display center.

(3) Continue entries as required.

(4) Press CR key on keyboard; reading will resume.

2-8. HANDLING CROSSOUTS

a. If more than one character is crossed out, (by placing a horizontal line midway through the characters with a carbon black felt tip pen) a horizontal crossout character (US) will appear at display center. The characters before and after the crossout in the text also appear before and after the crossout character. The Red Pointer in the viewing window will indicate the first character of the crossout.

b. If the crossout is located at the Left Margin, a left margin character (LF in Figure 2-5) will appear in the left LED. If the crossout extends to the end of the line, a NUL character will appear in the right LED. If an entire line is

NOTE: Lower-case alphabet characters are not recognized; they are keyed, displayed and output as upper-case characters.

SYN = PAGE ABORT

BEL = ERROR CODE

BS = BACK SPACE
CAN = TIME OUT CODE

LF = BEGINNING OF LINE

FS = BEGINNING OF PAGE

RS = END OF PAGE

US = CROSSOUT

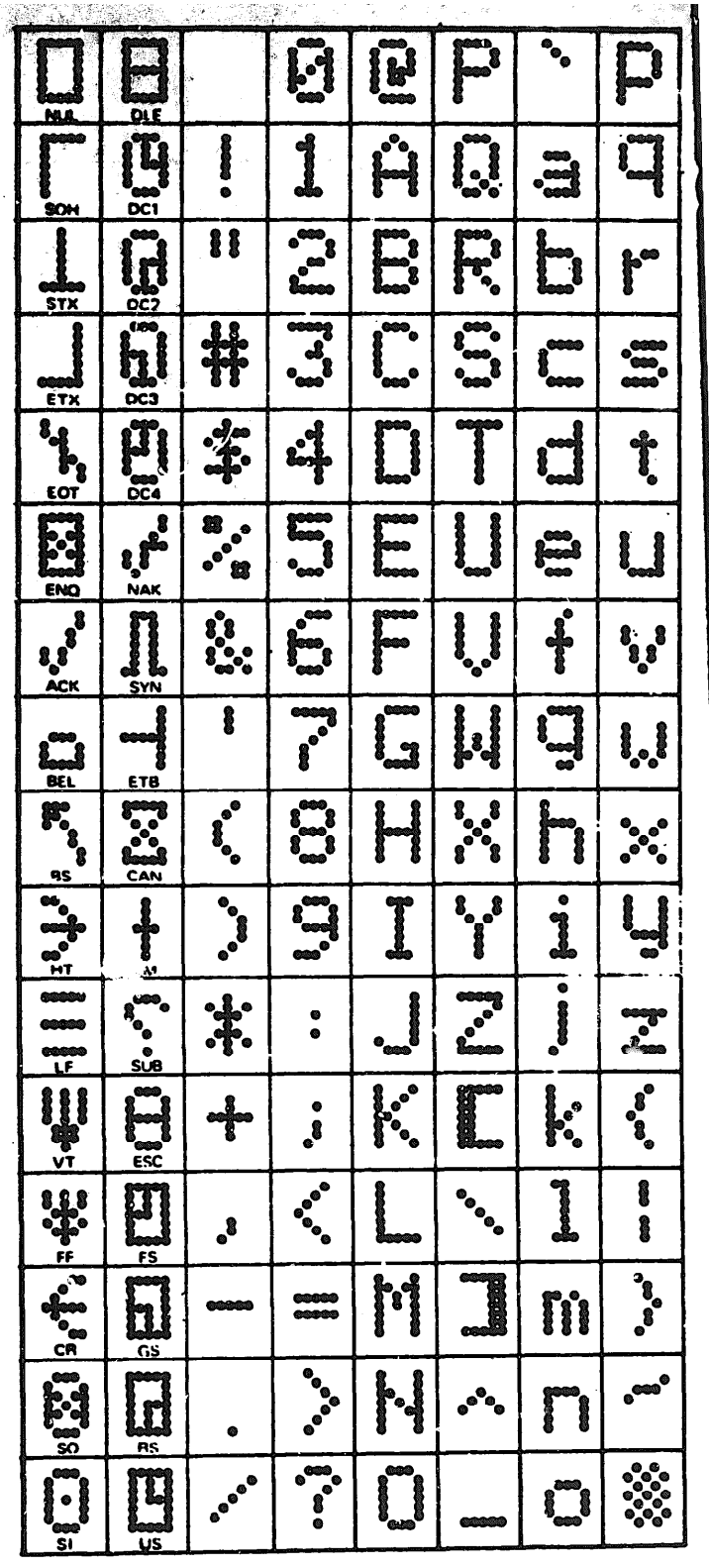

Figure 2-5 LED Display Character Patterns

crossed out, the first character on display is left margin, the second is horizontal crossout, and the third is NUL.

c. Crossouts may be handled as follows:

(1) Crossout Deletion. - If you desire to delete the entire crossout, press the CR key on the keyboard; The tone will stop and scanning will resume.

(2) Character Crossout Correction. - Where it is desired to replace the crossout with different characters:

(a) Enter the desired character or characters on keyboard; tone will stop and each character entered will appear at display center as key is pressed.

(b) Press CR key on keyboard; reading will resume.

(3) Line Crossout Correction. - If an entire line is crossed out, perform the following procedure:

(a) Press NUL key on keyboard; read--head will move to far left, tone will stop, and three NUL symbols will appear on display.

(b) Enter entire correct line on keyboard; each character entered will appear at display center as key is pressed,

(c) Press CR key on keyboard; reading will resume.

d. If during the preceeding steps an incorrect entry was made on the keyboard, perform the following procedure:

(1) Press BACK SPACE key on keyboard; previous keyed character or, if none, backspace symbol will appear at display center.

(2) Enter correct character on keyboard; correct character will appear at display center.

(3) Continue entries as required.

(4) Press CR key on keyboard; reading will resume.

e. Asterisks, as well as crossouts, are used for in-text editing. See Appendix A. One asterisk in text will delete the previous character including a space. Two asterisks will delete all characters back to, but not including, the previous space or margin. Three asterisks delete all characters back to Left Margin. In each case, reading continues without pause. All asterisks are deleted from the output. Asterisks may, however, appear on the display.

2-9. **HANDLING ERROR STOPS**

a. The ALPHA's program has provisions for detecting and displaying error conditions within several areas of its operation, These areas include Paper movement, Scanning, Editing, Output and Header Sheet routine.

b.. Displayed in the leftmost LED will be a BEL symbol (see Figure.2-5) which denotes that an error condition exists. Contained in the middle LED will be either a "P", "S". "E". "O", or "H" character defining the nature of the error. The third LED may display a number from 0 to 9 which identifies the particular error in that group. Refer to Table 2-4 for a listing of most display error messages.

c. The characters displayed in the middle LED indicate failures of the following natures;

P Paper feed

S Hardware failure

E **Edit error**

0 **Output error**

H **Header Sheet error**

d. When an error occurs, ALPHA will stop scanning and an audible alarm will **sound, To stop the** alarm **and clear the error condition, the RESET and START witches must be** toggled **respectively to reinitiate operation. Check the display error message against Table 2-4 to find and remedy the error.**

CAUTION. - DO NOT **AT ANY** TIME **TRY** TO REINITIATE **OPERATION** IF **A BEL-P-3 OR BEL-P-4 ERROR** CONDITION EXISTS **WITHOUT** FIRST **FOLLOW-ING THESE** SIMPLE **PROCEDURES:**

TABLE 2-4

LED- Display Error Messages

DISPLAY INDICATION	ERROR
BEL-H-0	A number in an @ command or on a Header Sheet was larger than the allowed maximum for a number used in this context.
BEL-H-1	Illegal @ code on Header Sheet line.
BEL-H-2	Header Sheets out of sequence. (i.e. an attempt was made to read a longer input string length code).
BEL-H-3	Illegal character to the right of the equal sign on a Header Sheet line.
BEL-H-4	Missing, or incomplete, specification of the out put field (right of equal sign) on a Header Sheet.
BEL-H-5	Attempt to output from incorrectly defined code conversion table.
BEL-H-6	@ Command error (such as no space following the command).
BEL-H-7	Code Conversion Table full.
BEL-H-8	Scanning Parameter error (out of range).

TABLE 2-4

LED Display Error Messages **(continued)**

DISPLAY INDICATION	ERROR
BEL-P-2	Double Page Feed
BEL-P-3	Paper Feed Jam (No paper within 3 seconds)
BEL-P-4	Page Eject Failure
BEL-S-1	Possible Hardware Failure - Rescan Sheet
BEL-S-2	Possible Hardware Failure - Rescan Sheet
BEL-S-3	Possible Hardware Failure - Rescan Sheet
BEL-E-1	Program Malfunction - Rescan Sheet
BEL-E-2	Program Malfunction - Rescan Sheet
BEL-E-3	Output Buffer overflow (Line > 250 chars.)
BEL-E-4	Program Malfunction - Rescan Sheet
BEL-0-1	Output Device Not Ready-Clock/Control Signal Missing;

(1) Toggle Reset.

(2) Loosen the two screws which secure the upper console located under the front corners of the machine directly below the Format and Control panels. (See figure 2-6)

(3) Slowly raise the upper console until it reaches the stop.

(4) Remove any paper jammed in the page feeder or paper handler.

(5) Lower the upper console and secure the two screws.

(6) Reinitiate operation by toggling START.

2-10. STOPPING OPERATION.

a. Operations will stop. if any of these conditions occurs:

(1) STOP is toggled

(2) RESET is toggled

(3) An AUTOMATIC STOP occurs when one minute passes during which no Messageforms are available in the feed tray.

b. The ALPHA is in standby mode when the FEED, RUN, and Read Head lamps are off.

c. Each of these types of stops is different where:

(1) stop. - If ALPHA is placed in the standby mode with the STOP position of the RESET/STOP switch, the line being read will be finished and scanning will resume if either START or CONTINUE is toggled. The READ Head will be at the extreme left.

(a) If CONTINUE is toggled after STOP, scanning resumes on the next line of the same page.

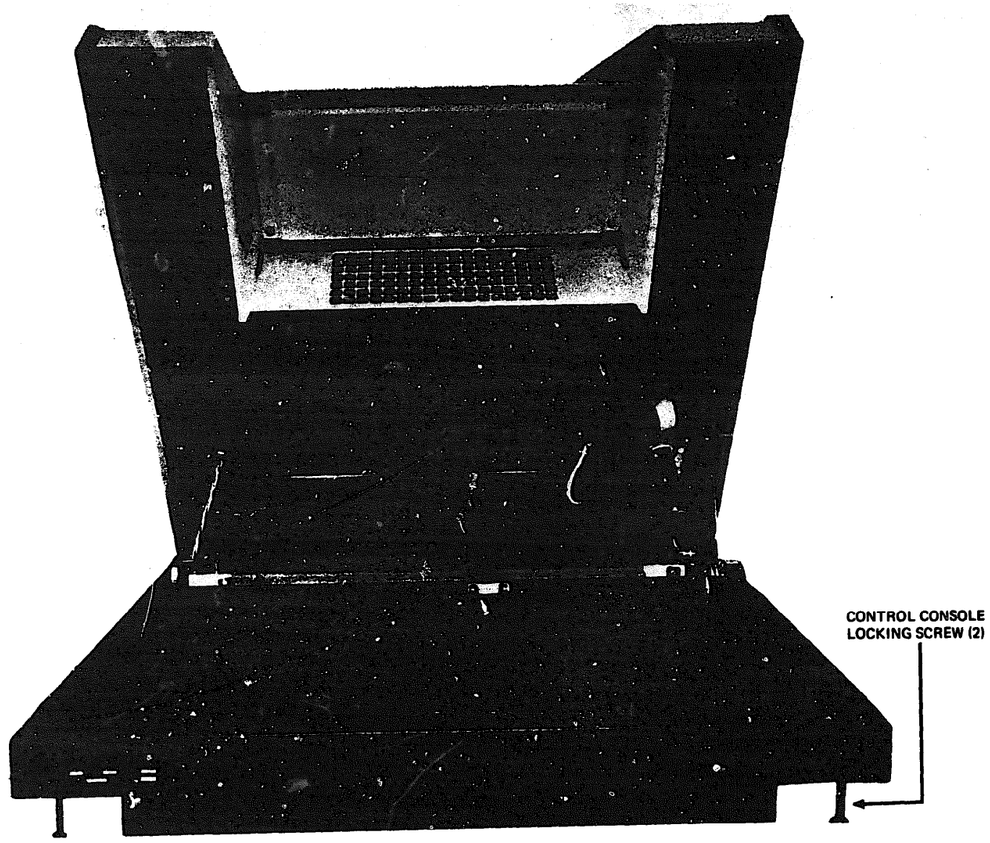

Figure 2-6 Upper Console Raised

(b) If START is toggled, any Messageforms under the Read Head Assembly will be ejected and scanning will begin on a new Messageform,

NOTE. - If the mode selector is moved from the OPERATE position, the START position must be used.

(2) Reset. - If the RESET position is toggled, scanning stops wherever the Read Head is at that moment. START must be toggled to resume operation.. Any paper under the Read Head Assembly will be ejected and scanning will begin on a new Messageform.

(3) Automatic Stop. - If all the Messageforms in the paper tray have been scanned and no additional forms are inserted, the ALPHA will automatically go into the STANDBY Mode after one minute. The Read Head will be in the center position. When ALPHA automatically goes into the Standby Mode, START must be toggled to resume operation. Since the last Messageform was ejected prior to going into STANDBY, scanning will start on a new Messageform.

2-11. POWER DOWN PROCEDURE. - To disconnect service power and stop the ALPHA, set the POWER switch to OFF only while ALPHA is in the STANDBY mode to avoid having to reintroduce Header sheets to ALPHA. All lights and fans will go off (the control console fan will continue to rotate for a short time).

CHAPTER 3

PREVENTIVE MAINTENANCE

3-1. INTRODUCTION. - This chapter contains the necessary preventive maintenance procedures that should be performed periodically to prevent major equipment failures. Preventive maintenance depends primarily upon performance checks of the equipment, and includes visual inspection of mechanical components. Visual inspections aid in the discovery of conditions, which, if not remedied, may result in faulty operation, unwanted service interruptions, and breakdowns. Adherence to the preventive maintenance procedures presented herein ensures optimum equipment performance, maximum service life, and minimum down time resulting from equipment failure.

3-2. INSPECTION. - Periodic inspections should be made to determine if any unusual or abnormal wear is occurring and to determine the need for cleaning. Particular attention must be paid to wear of belts and rollers and to dust out paper residue that may collect inside the machine.

3-3. CLEANING. - Proper cleaning of the machine is essential for efficient operation. When cleaning, do not allow any liquid to run or drip into the machine. Similarly, when cleaning with compressed air, use only moderate pressure to avoid injury to components. Clean the machine as follows:

a. Exterior Surface. - Exterior surfaces may be cleaned

with a cloth moistened with a detergent solution.

Note. Do not apply aerosol spray cleaners directly to the exterior of the machine.

b.. Interior. - The interior of the machine may be cleaned as required with compressed air and/or a vacuum cleaner. This is accomplished as follows:

(1) Disconnect main power cord.

(2) Open rear access door (Fig. 3-1) to expose main wire wrap assembly.

(3) Loosen the knurled knob and swing out the main wire wrap assembly; this will expose the rear of the power supply.

(4) Carefully remove and clean each board if required. 'Use a soft brush or a gentle stream of clean dry compressed air to remove any dust or dirt and a contact cleaner for the electrical contacts.

(5) Blow out and vacuum the rear of the power supply.

(6) Close and secure main wire wrap assembly and rear access panel.

(7) Remove the front access panel by lifting it from the bottom straight up approximately 1/2 inch.

(8) Loosen the knurled knob and swing out the hinged panel; this will expose the external memory board.

(9) Blow out and vacuum the front portion of the power supply.

(10) Upon completion, secure the hinged panel and front access panel. Do not apply excess pressure on the panel as the top screws could break.

c. **Stack Feeder Assembly.** - Periodically the Stack Feeder plastic belts and paper handler assembly rollers acquire a buildup of waxes and/or sizing from the paper stock, To remove this buildup of foreign matter proceed as follows:

(1) Set the POWER switch on the Format Panel to on.

(2) Toggle the START position of the START-CONTINUE switch on the Control Panel,

(3) Moisten a gauze pad or cloth with denatured alcohol.

(4) As the Stack Feeder operates, hold the pad against each of the rotating plastic belts, one at a time.

CAUTION. Do not allow the cloth or pad to be pulled into the mechanism.

d. **Paper Handler Assembly.** - Clean the Paper Handler Assembly as follows:

(1) Turn power off.

(2) Loosen the two Control Console hand screws (Fig. 2-6) fastening the Control Console Assembly to the Cabinet Assembly.

(3) Slowly raise the Control Console from the front until it stops in the vertical position.

(4) Using a gauze pad or cloth moistened with alcohol, clean the rollers by turning them by hand, and the upper and lower platens.

(5) Slowly lower the Control Console Assembly to the Cabinet Assembly and fasten in place with two Control Console screws.

e. Paper Viewing Window and Mirrors. - If the viewing window or mirror(s) become dirty, proceed as follows:

(1) Gain access to the viewer window and mirrors by following the procedure given in Chapter 2, paragraph 2-9(d) (accessing the Paper Handling Assembly).

(2) Clean the window or mirror(s) with a lens tissue or lint free cloth. In some cases it may become necessary to lightly moisten the cleaning cloth with a commercial cleaner to remove accumulations of foreign matter.

CAUTION .- Always handle the mirrors by metal frames; this will keep oil from the fingers off the reflecting surfaces.

3-4. INSPECT AND CLEAN STACK FEEDER.

a. Place unit in off line status.

b. Remove any paper from stack feeder.

c. Turn POWER switch to OFF.

d. Loosen the two knurled locking screws in the front of the unit and raise the operating console to the full open position.

e. Loosen the single page feeder assembly retaining screw and carefully slide the unit straight out of the cabinet.

(1) Place the. page feeder on its side on a flat padded surface.

f. Remove the four corner screws from the bottom of the unit.

(1) Place the unit in its normal upright position.

g. Remove the four flat head screws from the back, two in each lower rear corner.

h. Carefully lift the cover off the page feeder assembly.

i. Blow out the page feeder assembly with low pressure filtered air.

(1) Use the small parts cleaning brush to dust all interior and exterior portions.

j. Inspect the stack feeder assembly for:

(1) Presence of foreign matter.

(2) Loose or cracked drive belts.

(3) Loose or missing hardware.

(4) Burned or cracked wiring.

(5) Loose mounting of solenoid%

CAUTION: When installing page feeder back into ALPHA, extreme caution must be exercised to avoid damaging exposed drive train.

k. Install stack feeder in ALPHA and secure with the retaining screw.

l. Turn POWER switch to ON.

m. Toggle STOP, RESET, and START.

n. Inspect unit for:

(1) Excessive bearing noise or vibration.

(2) Misalignment of pulleys, shafts or drive belts.

o. Toggle RESET.

(1) Inspect for smooth operation of the brake assembly.

p. Turn power switch to OFF.

q. Loosen the stack feeder assembly retaining screw and carefully slide the unit straight out of the cabinet-

(1) Place the stack feeder on the flat padded surface

r. Replace the cover on the stack feeder and secure with the eight screws previously removed.

s. Install the stack feeder in the ALPHA and secure with the retaining screw.

t. Lower the operating console and secure with the two knurled locking screws.

3-5. CLEAN AND INSPECT LOWER ASSEMBLY.

a. Open the rear door of the ALPHA.(Fig. 3-1).

b. Unlatch the mother board and swing it open.

c. Remove the lower front cover.

d. Open the door containing the external memory assembly,

e. Using clean dry low pressure air and a soft cleaning brush blow out and clean:

(1) Entire lower assembly including power supply.

(2) Exterior only of the external memory and interface card.

f. Inspect unit; look for:

(1) Loose, disconnected, or broken wires on mother board and lower assembly.

(2) Loose or missing I.C. on mother board.

(3) Loose or damaged cables.

(4) Presence of foreign matter.

(5) Discolored or scorched components.

(6) Cracked or frayed insulation.

(7) Loose connections.

(8) Loose circuit cards.

(9) Bulged or leaking capacitors.

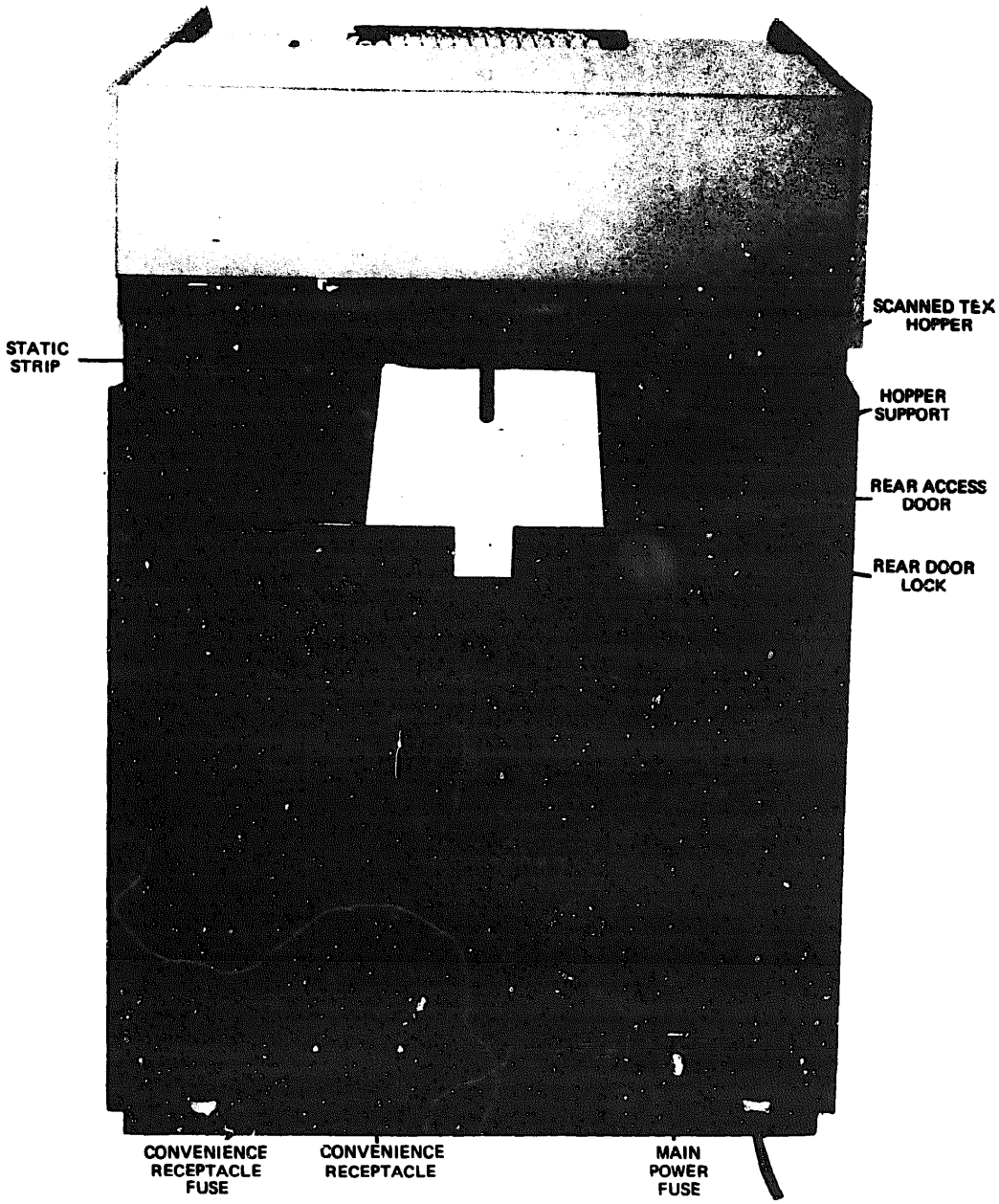

Figure 3-1. ALPHA Rear View

g. Close and secure the external memory door.

h. Replace the lower front cover.

i. Close and secure the mother board.

j. Close and secure the rear door.

k. Return equipment to normal operating condition.

APPENDIX A

DELETION SYMBOL EDITING

A-1. GENERAL DESCRIPTION.-

a. **You can easily correct typographical errors that are detected during typing by the use of** a **special deletion** symbol **which** will **not appear in the output data.**

b. The rules for deletion symbol **editing are quite** simple. **The typist may delete a character, word, or** line **by typing one, two, or three** deletion symbols **respectively.**

* **Deletes the previous character.**

** **Deletes the previous word (back to the previous space or beginning of Line, whichever came Last),**

*** **Deletes the line (back to left margin).**

c. Never space before or after a deletion symbol. **A space is considered a character.**

A-2. SINGLE DELETE, -

a. Single Delete eliminates **the immediately preceding character. The deleted character may be anything including a space or character. Never put a space between the character to be deleted and the deletion** symbol **as that** would delete the **space** and not **the** character,

INPUT: THIS **IS AN EXAMPLE OF CHARACTER** EDITING.

OUTPUT: THIS IS AN EXAMPLE OF CHARACTER EDITING,

b. **In the above** example, **the typist spotted the absence of the "E" in "CHARACTER", deleted the "R" by typing one** dele-

tion symbol (*) and typed "ER" to finish the word "character".

A-3. DOUBLE DELETE. -

a. Eliminates all, preceding characters up to, but not including, a space. Double deletion symbols following a space are improper procedure and are ignored.

INPUT: THIS IS A WORD COREC**CORRECTION.

OUTPUT: THIS IS A WORD CORRECTION.

b. Here the typist has forgotten the second "R" in the word "CORRECTION", deleted the incorrect word (COREC) with "**" and retyped the word correctly. Note that no space appears before the first deletion symbol or after the last deletion symbol.

A-4. TRIPLE DELETE. -

a. Triple Delete eliminates all characters and spaces, including an indent, back to the left margin. The line may be retyped immediately following the triple deletion editing or begun again on the following line.

INPUT A: This was**IS A BOD**BADLY RYED***THIS WAS

INPUT B: THIS WAS**IS A BOD**BADLY RYED***

THIS WAS BAD.

OUTPUT A: THIS WAS BAD.

OUTPUT B: THIS WAS BAD.

b. The typist here had much difficulty getting started. After making excessive errors, three deletion symbols (***)

were typed which deleted everything up to the left margin and finally re-typed the desired Line. Notice that you may continue typing immediately after the 1st deletion symbol or drop down to the next line and continue typing there.

INPUT: CHARACTR*EX**CHARACTER AND WORD DELETES MAY BE COMBINED.

OUTPUT: CHARACTER AND WORD DELETES MAY BE COMBINED.

c. In this example, the typist deleted the original word in addition to the single character deletion. On the word "CHARACTER" would appear on the output. Any combination of one, two, or three deletion symbols may be used in a line.

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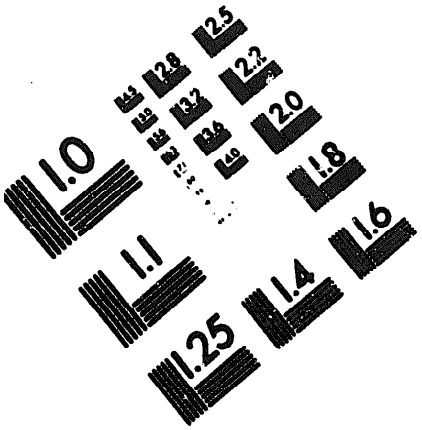

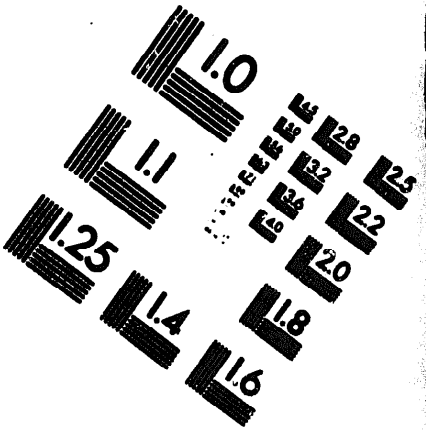

150 MM

1.0 mm (e= .81 mm)

ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890
abcdefghijklmnopqrstuvwxyz$¢£/%#½¼¾—=+×&@*

1.5 mm (e= 1.09 mm)

ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890
abcdefghijklmnopqrstuvwxyz$¢£/%#½¼¾—=+×&@*

2.0 mm (e= 1.37 mm)

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890$¢£/%#½¼¾—=+×&@*

2.5 mm (e= 1.77 mm)

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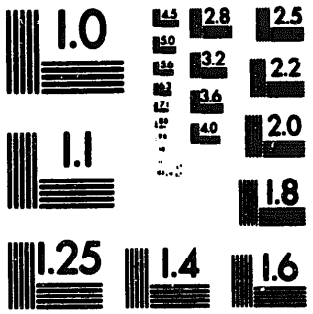
abcdefghijklmnopqrstuvwxyz
1234567890$¢£/%#½¼¾—=+×&@*



1.0 mm (e= .81 mm)

ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890
abcdefghijklmnopqrstuvwxyz$¢£/%#½¼¾—=+×&@*

1.5 mm (e= 1.09 mm)

ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890
abcdefghijklmnopqrstuvwxyz$¢£/%#½¼¾—=+×&@*

2.0 mm (e= 1.37 mm)

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890$¢£/%#½¼¾—=+×&@*

2.5 mm (e= 1.77 mm)

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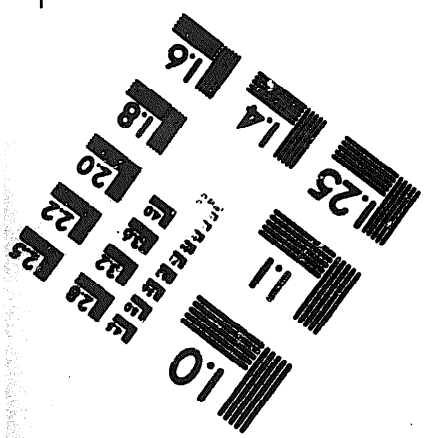
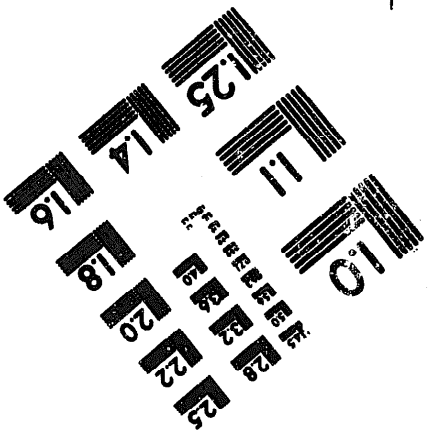
abcdefghijklmnopqrstuvwxyz
1234567890$¢£/%#½¼¾—=+×&@*

200 MM





250 MM