OPERATOR MANUAL

1231 SYSTEM

AUTOMATED BUSINESS SYSTEMS
a division of Litton Industries

1231
OPERATOR
MANUAL

CONSISTING OF:

CENTRAL PROCESSOR
MODEL 1602

KEYBOARD - MODEL 11

READER - MODEL 60

PUNCH - MODEL 70

PRINTER - MODEL 30

EBS 315

Automated Business Systems
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SECTION 1

INTRODUCTION AND SYSTEM DESCRIPTION

INTRODUCTION

This manual is intended to acquaint the operator with the EBS/1231 System. It describes each unit or device of the system, and instructs the operator in the correct procedures to set-up and use each device. The manual also contains instructions for using the "Operating Utility System" by which programs can be created, tested and executed.

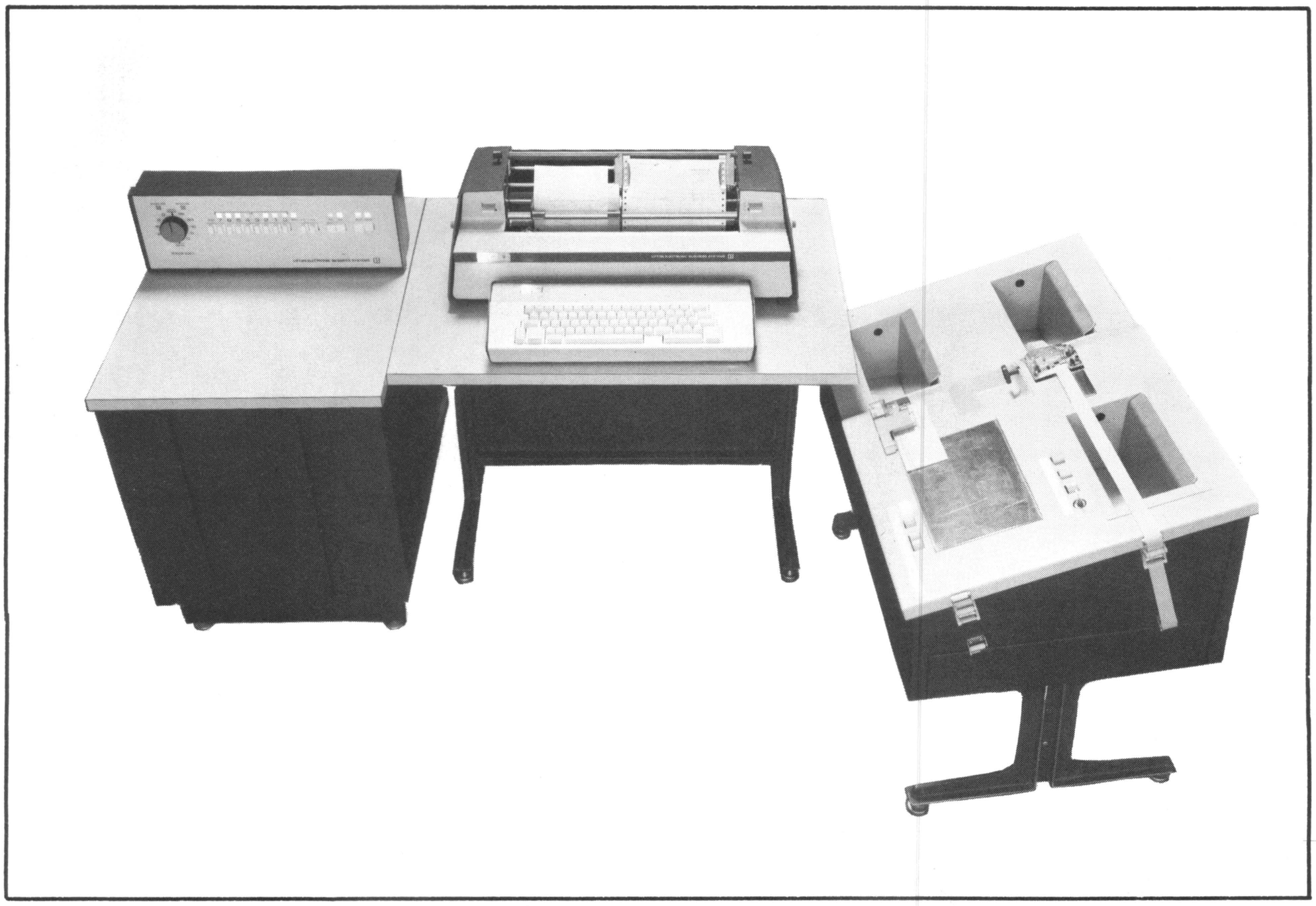


Figure 1.1

The EBS/1231 System has been developed by Litton's Automated Business Systems Division to provide industry with a versatile, compact, automated data storage and computing system, suitable for a variety of accounting applications. The EBS/1231 System is composed of a Model 1602 Central Processor, a Model 60/70 Reader/Punch and a Model 30 Printer with an accessory Model 11 Keyboard.

MODEL 1602 CENTRAL PROCESSOR

The 1602 processor contains the Operating Utility System (OPUS), an application program, and the storage area that holds data and totals for the application program.

The 1602 processor controls the 1231 system. The processor performs all computations required by an application program. It controls the operation of associated input devices, such as the keyboard or reader, and output devices, such as the punch or printer.

These devices have cables which connect directly to the processor or to another device. All devices are energized when the processor is turned ON. The processor then selects or unselects a device as required by the program.

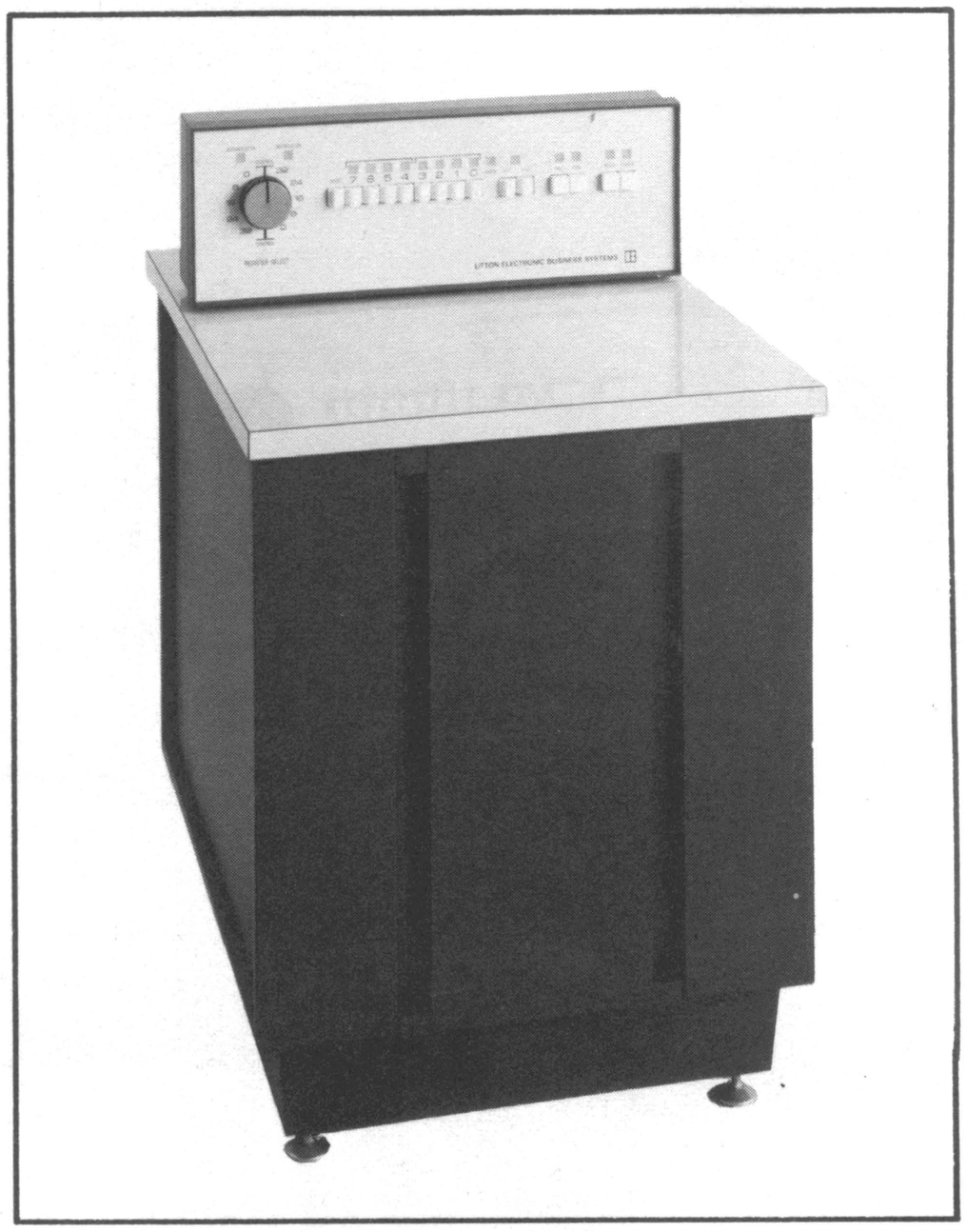


Figure 1.2

MODEL 11 KEYBOARD

Information is manually entered into the processor through the Model 11 keyboard. The arrangement of the keys corresponds largely to that of a standard typewriter. All alphabetic keys are upper case.

Numeral keys appear in two locations. One set, placed along the top row of the keyboard, corresponds to the arrangement of a standard typewriter. The second set, on the right side of the keyboard, corresponds to the arrangement of a 10-key adding machine.

MODEL 60 READER

Application programs are normally punched in tape. Data also may be punched in tape or edge-punched cards. These programs or data are entered into the processor with the Model 60 Reader.

The Punch/Reader console contains three switches. One switch causes tape or cards to advance rapidly through the reader; a second switch causes tape or cards to advance one character at a time, and the last switch causes tape or cards to move backward one character at a time.

MODEL 70 PUNCH

Application programs are created, tested, and then punched into tape. Data also can be punched into tape or cards for use at a later time. These programs and data are punched, under processor control, by the Model 70 Punch. Punching is entirely automatic when the punch is selected.

The Punch/Reader console contains two switches. One switch enables the operator to rapidly advance tape or cards through the punch and the second switch controls the format of punching codes into tape or cards.

MODEL 30 PRINTER

Data within the processor or data acquired from one of the input devices can be used to produce a printed record on the Model 30 Printer. Printing is under processor control which, according to the program stored, provides signals for automatic tabulation, form advancement and printing.

SECTION 2

OPERATION -CENTRAL PROCESSOR

POWER SWITCH

When the power switch is depressed, it turns power ON. The light above the power switch comes ON to indicate that power is ON. The light goes out and power is shut OFF when the power switch is depressed a second time.

SYSTEM READY INDICATION

Once power is ON as signaled by the power light, the HALT light comes ON. When the memory drum reaches the correct speed for processing, the READY light comes on.

The operator then depresses the HALT, READY and RUN switches, in that order. The RUN light will light when its switch is depressed. The HALT light will go out when the RUN switch is depressed.

The keyboard SELECTED light will begin to flash. The EBS/1231 system is now ready to begin processing.

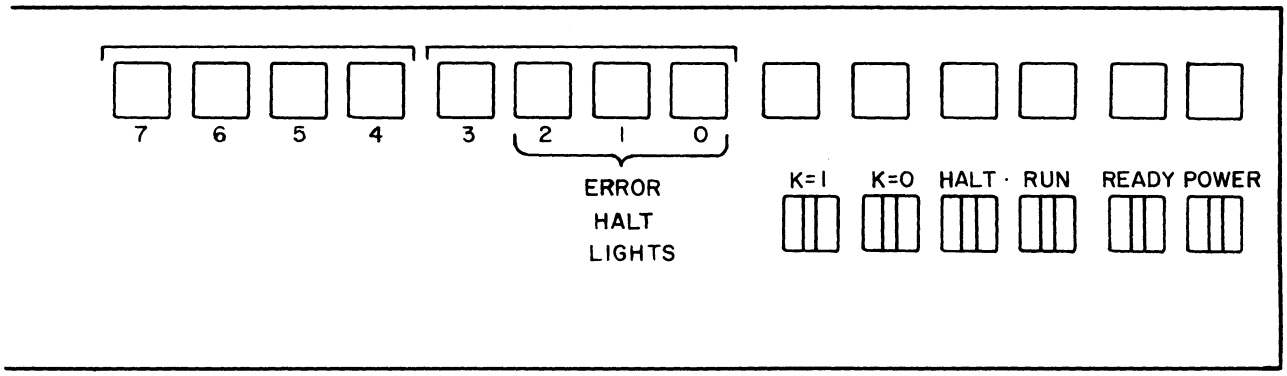


Figure 2.1

ERROR HALT LIGHTS

Refer to Section 9 for a description of the ERROR HALT lights on the console and information on causes for the lights to come ON and the required correction.

SECTION 3

OPERATION- KEYBOARD

SECTION 3

OPERATION- KEYBOARD

A. LIGHTS & SWITCHES

1. Selected Light

The SELECTED light is lit when the application program provides for the manual entry of data into the processor.

The SELECTED light flashes when the Operating Utility System (OPUS) is waiting for a routine to be selected. (Refer to Section 8 for a description of OPUS.) The SELECTED light goes OUT when manual entry is not required by OPUS or by the application program.

2. Release Switch

The RELEASE switch is a combination switch and light. When the keyboard is unselected and a key is depressed, the RELEASE light comes on and the character code of the depressed key is stored in the keyboard.

By depressing the lighted RELEASE switch, the RELEASE light will go out and the character will be cleared from the keyboard.

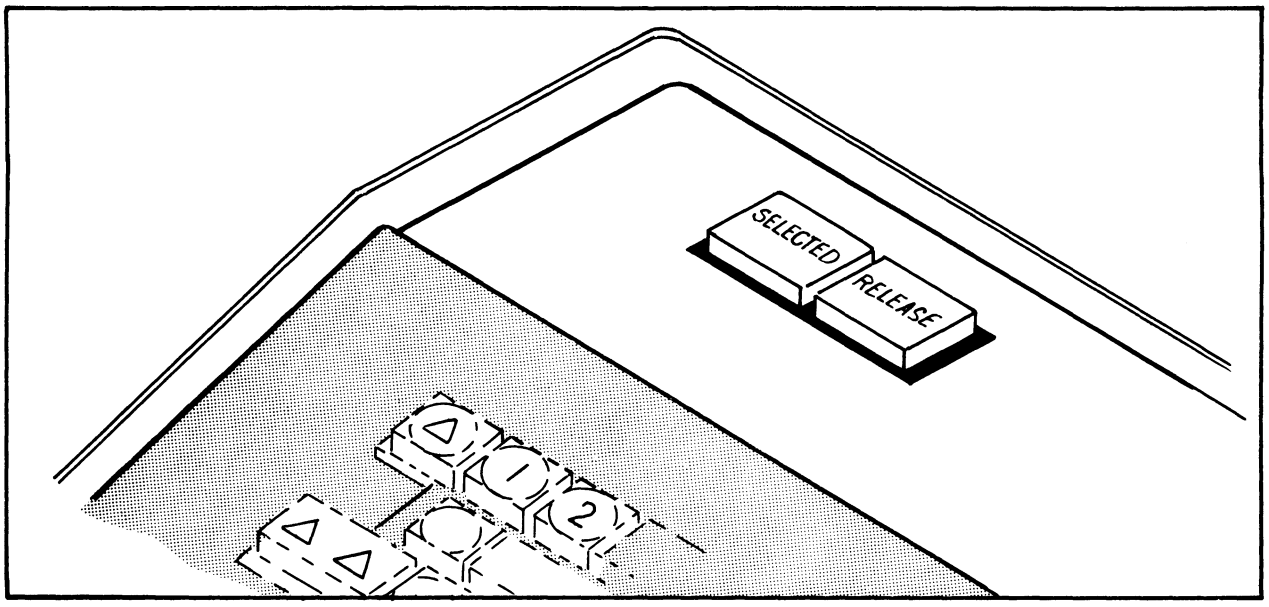


Figure 3.1

B. KEYBOARD KEYS

Information is manually entered into the processor when the keyboard is selected and keys are depressed. The processor accepts each entered key's character code and immediately releases the key to the UP position. Key coding is sensed electronically, thereby permitting "touch typing".

1. Alphabetic and Numeral Keys

The arrangement of the ALPHABETIC and NUMERAL keys corresponds to the keyboard of a standard typewriter. A second set of numeral keys is located on the right side of the keyboard and the arrangement of this set corresponds to that of a 10-key adding machine. The processor accepts the code of a numeral key depressed from either set.

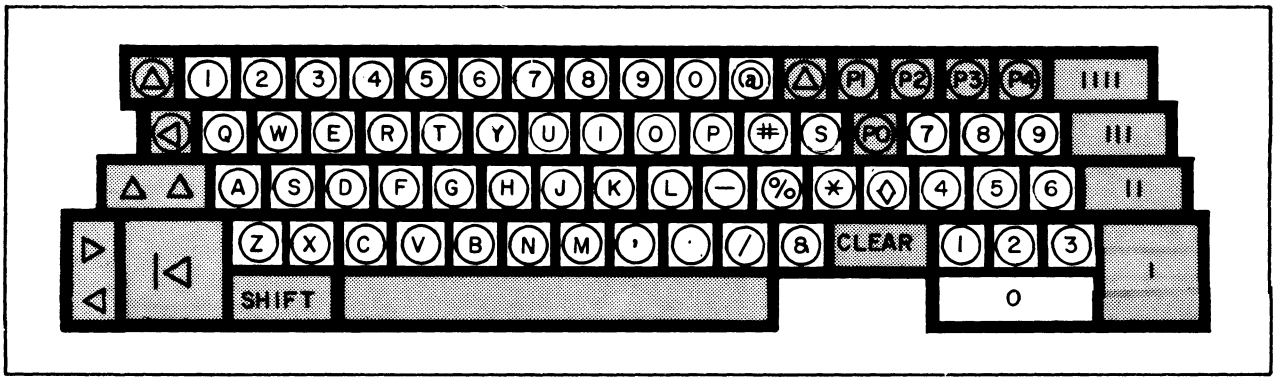


Figure 3.2

2. Punctuation and Symbol Keys

PUNCTUATION keys (period, comma, slash and hyphen) and the SYMBOL keys (@, #, %, *, ◇, &) are keyed in the same manner as alphabet keys.

The code for the diamond (◇) key is sensed by the processor as a minus. The convenient key position near the 10-key numeral block enables the operator to use it as a minus key while entering numeric data.

3. Printer Format Keys

The printer format keys are used to position the print wheel and to advance forms in the printer.

Index - Left

This key is located to the left of the top row. The key advances the left platen only by one print line when platen halves are not joined. The key causes both the left and right platen to advance by one print line if platen halves are joined.

Index - Right

This key advances the right platen and the pin-feed tractor by one print line when platen halves are not joined. When platens are joined, only the pin-feed tractor advances by one print line. The key is located in the top row to the left of the P1 key.

Index - Both

The key advances both the left and the right platen and the pin-feed tractor by one print line.

Return

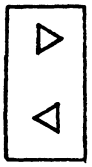
The key moves the print wheel to one of the tab positions assigned by the application program.

Space

The key moves the print wheel one print position to the right.

Backspace

The key moves the print wheel one print position to the left.



Print Display

The print wheel moves eight print positions to the right when this key is depressed and held down. The print wheel returns to its original position as soon as the key is released.

The key should not be depressed when data are being printed under processor control.

4. Function Keys

Five FUNCTION keys labeled P0, P1, P2, P3, P4 and four control keys marked I, II, III, and IIII are in the keyboard pattern. These keys control specific operations in an application program and their specific use is detailed in the operating instructions for the application program.

CLEAR Clear

The CLEAR key can be depressed to erase the characters already entered if the operator senses an error during a manual numeric entry but before the key that ends the input is depressed. The operator should then re-enter the entire field.

SHIFT Shift

The numbers assigned to most of the keys shown in Figure 3.3 refer to tab positions on the printer. If the shift key is depressed in combination with one of these other keys, the print wheel moves to the tab position assigned to that key.

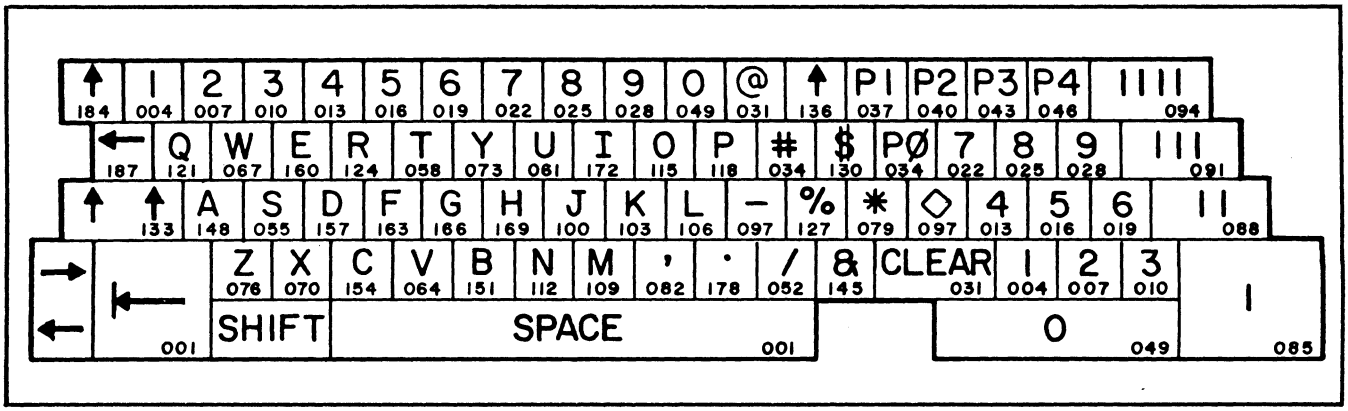


Figure 3.3

C. KEYING

Depressing a key stores a key's character code in the keyboard.

If the keyboard is selected, the character is immediately accepted by the processor.

If the keyboard is not selected, the RELEASE light comes ON, indicating the processor has not retrieved the character. The key, however, returns to the UP position.

A second key can then be depressed, but the key will remain DOWN until either the keyboard is selected or the RELEASE switch is depressed. As soon as the keyboard is selected, the processor accepts both characters in the sequence in which they were entered into the keyboard. If the RELEASE switch is depressed instead, both characters are cleared from the keyboard and they are not accepted by the processor.

SECTION 4

OPERATION - READER

A. LIGHTS AND SWITCHES

1. Reader Selected Light

Data can be entered through the reader when the READER SELECTED light is lit. The light goes out when the reader is unselected.

The reader can not enter data into the processor under any of the following conditions:

A. The reader is unselected.
B. The reader cover is up.
C. The STEP ADVANCE or STEP REVERSE switches are depressed.
D. The TAPE TENSION switch is open.

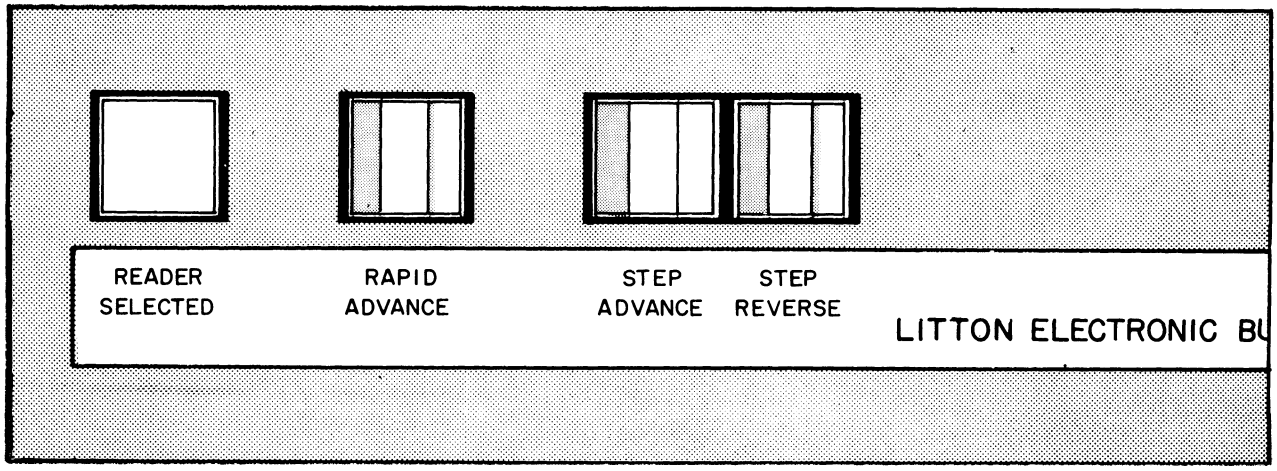


Figure 4.1

2. Rapid Advance Switch

When this switch is depressed and held down, it causes tape or cards to move forward at normal reader speed. Single edge-punched cards are moved through the reader and ejected; attached edge-punched cards move through the reader without stopping.

The switch can be effective only when the tape-tension switch is closed and the reader cover is down.

3. Step Advance Switch

The switch causes tape or cards to move forward one character position. The use of this switch does not require the reader cover to be down or the tape-tension switch to be closed.

4. Step Reverse Switch

The switch causes tape or cards to move back one character position. The use of this switch does not require the reader cover to be down or the tape-tension switch to be closed.

5. Tape Tension Switch

This switch is mounted on the right side of the Punch/Reader console. The switch must be closed to allow the processor to accept data from the reader (left view of Figure 4.2).

To open the switch, the operator must depress the release plate. This plate swivels out from the switch.

The switch will open automatically when tape, threaded through the switch, puts tension on the switch because of binding or friction. When the switch is opened, reading stops. The operator can then rectify the cause of the tension, close the switch and continue reading.

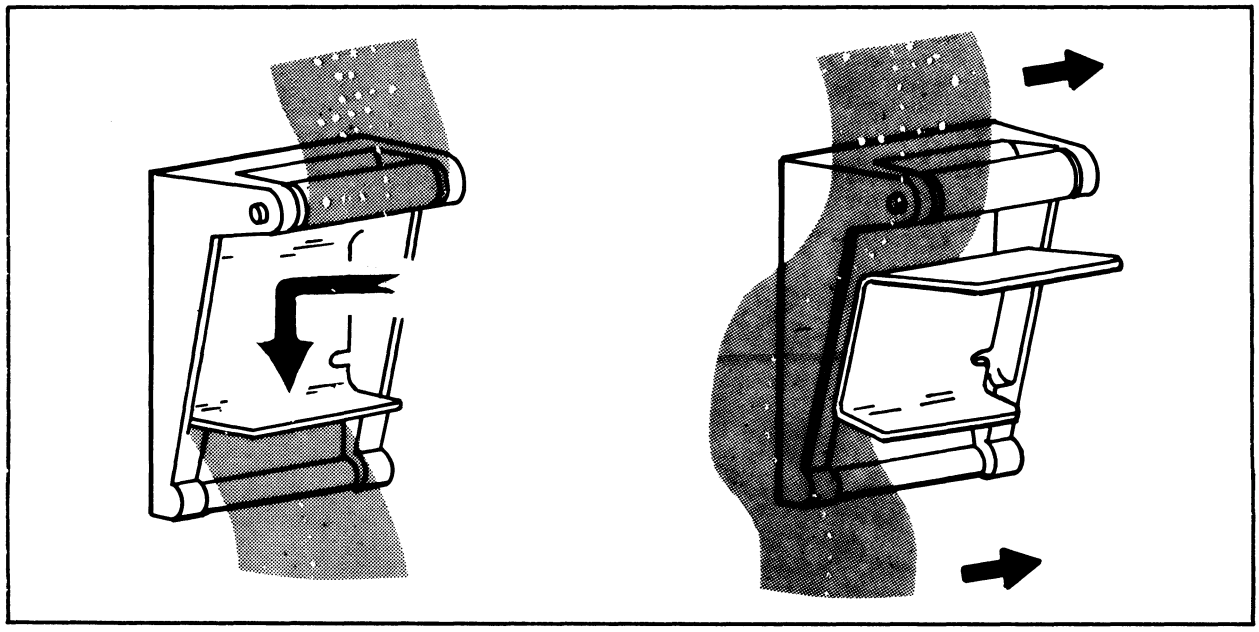


Figure 4.2

B. READER COVER

The reader cover must be down in order for the processor to accept data from the reader.

The operator can gain access to the tape or card by moving the cover latch to the right to open the cover, see Figure 4.3.

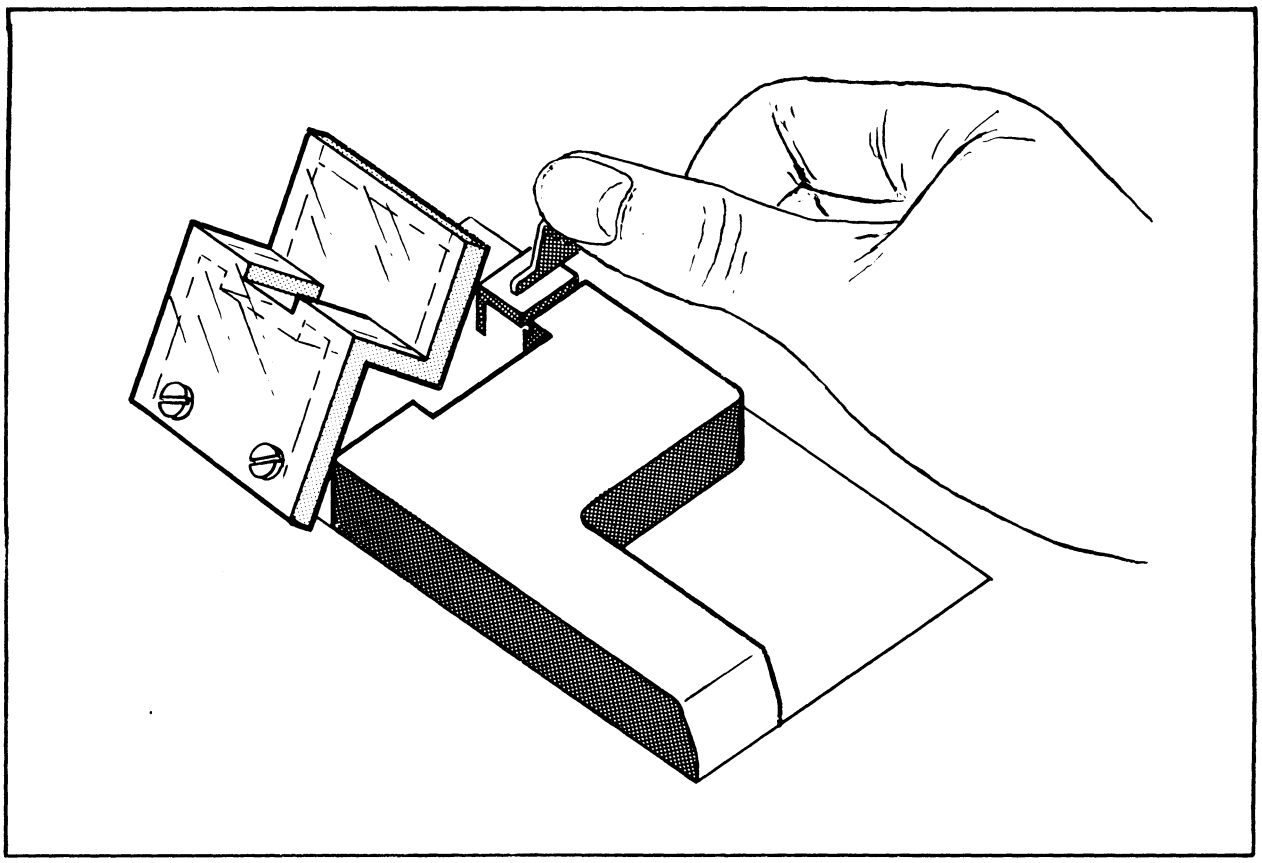


Figure 4.3

C. PUNCHED TAPE

A drawer is located at the base of the Punch/Reader console. This drawer houses the roll of punched tape that is to be fed into the reader.

1. Outside Feed

Punched tape, which is to be read by unspooling from the outside, is placed on one reel half as shown in Figure 4.4. The half reel sits on the center spindle. The roll of tape is placed onto the reel so that it unspools in a counter-clockwise direction.

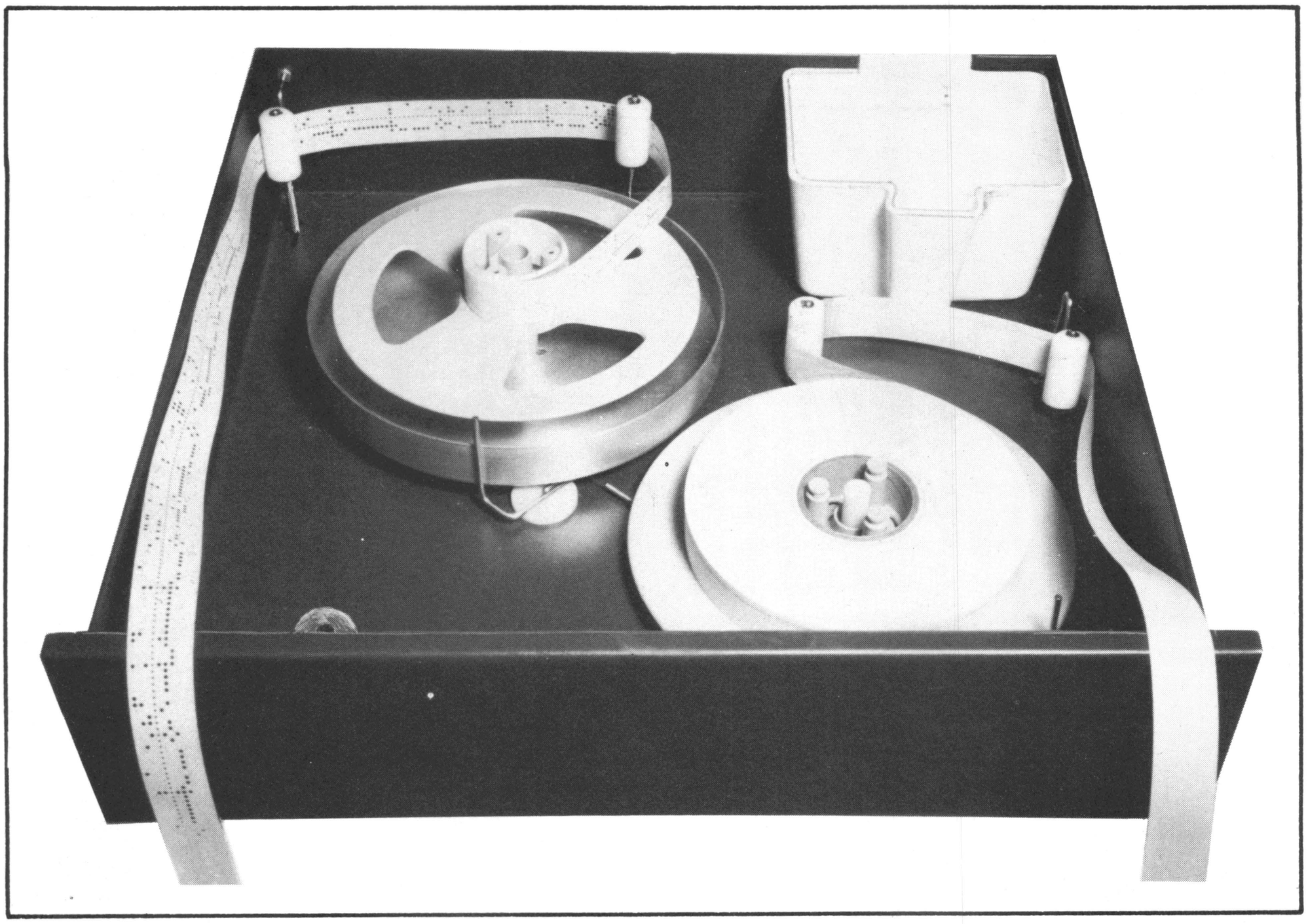


Figure 4.4

The tape is pulled around the outside of the movable brake roller at the rear of the drawer and around the fixed roller in the left-hand corner. It is then pulled toward the operator and out of the drawer. It should come out so that sprocket holes are closer to the left-hand side.

2. Inside Feed

If punched tape is to be unspooled from the center, the plastic reel half is removed from the left-hand spindle. The tapered mandrel from the front of the drawer is instead placed over the

spindle. Tape is placed LOOSELY over the mandrel as shown in Figure 4.5. The tape must NOT be wound tight. Tape unspools in the same way as outlined for OUTSIDE FEED.

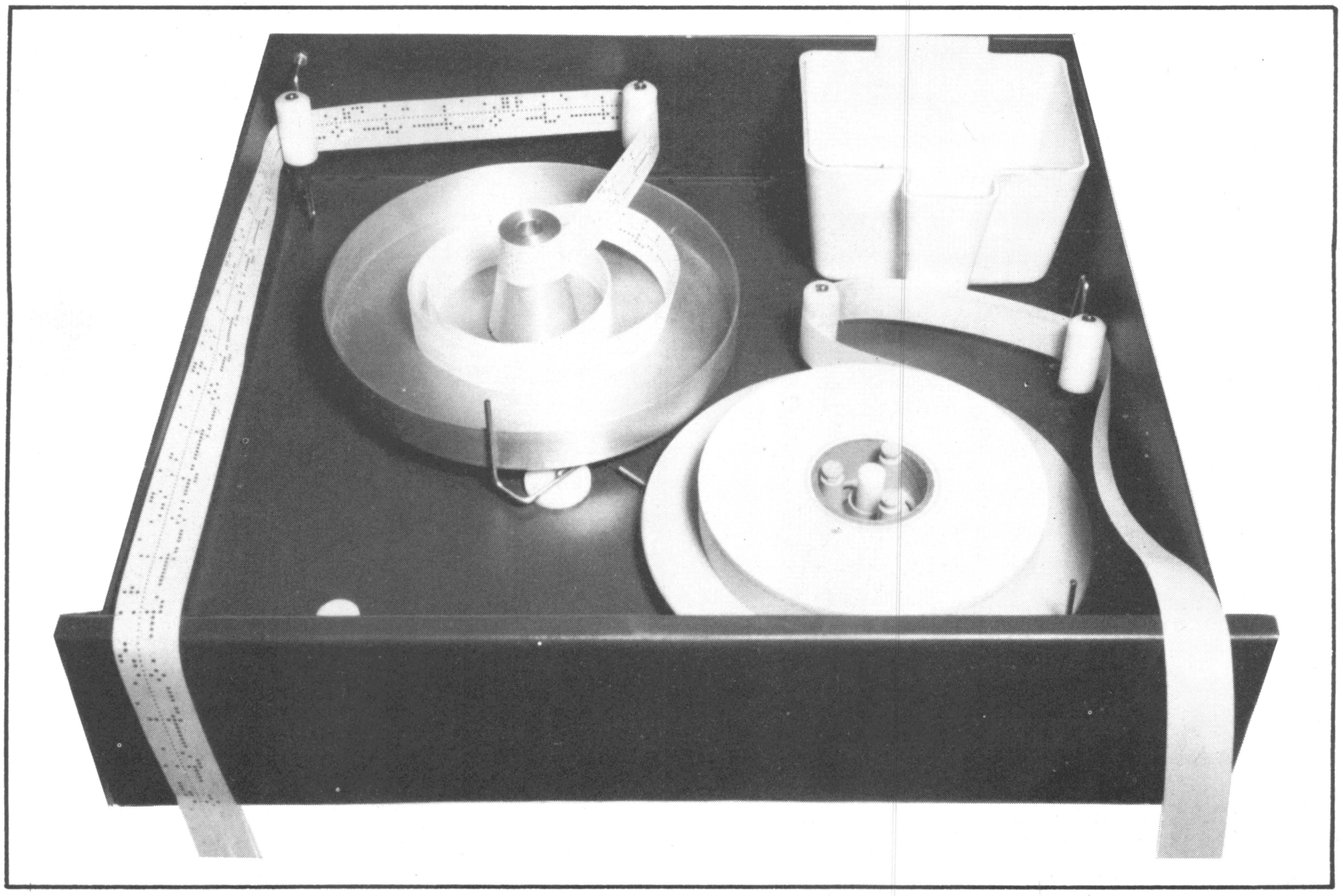


Figure 4.5

3. Positioning

The end of the tape is positioned on the lower guide roller of the Punch/Reader console, so that the tape fits over the roller but under the hold-down clip (Figure 4.6). The tape is then inserted in the tape tension switch by pulling the release plate of the switch forward and by slipping the right edge of the tape in between the release plate and the switch. This action is shown in the right-hand view of Figure 4.2. The switch then is closed as shown in the left-hand view of the same illustration.

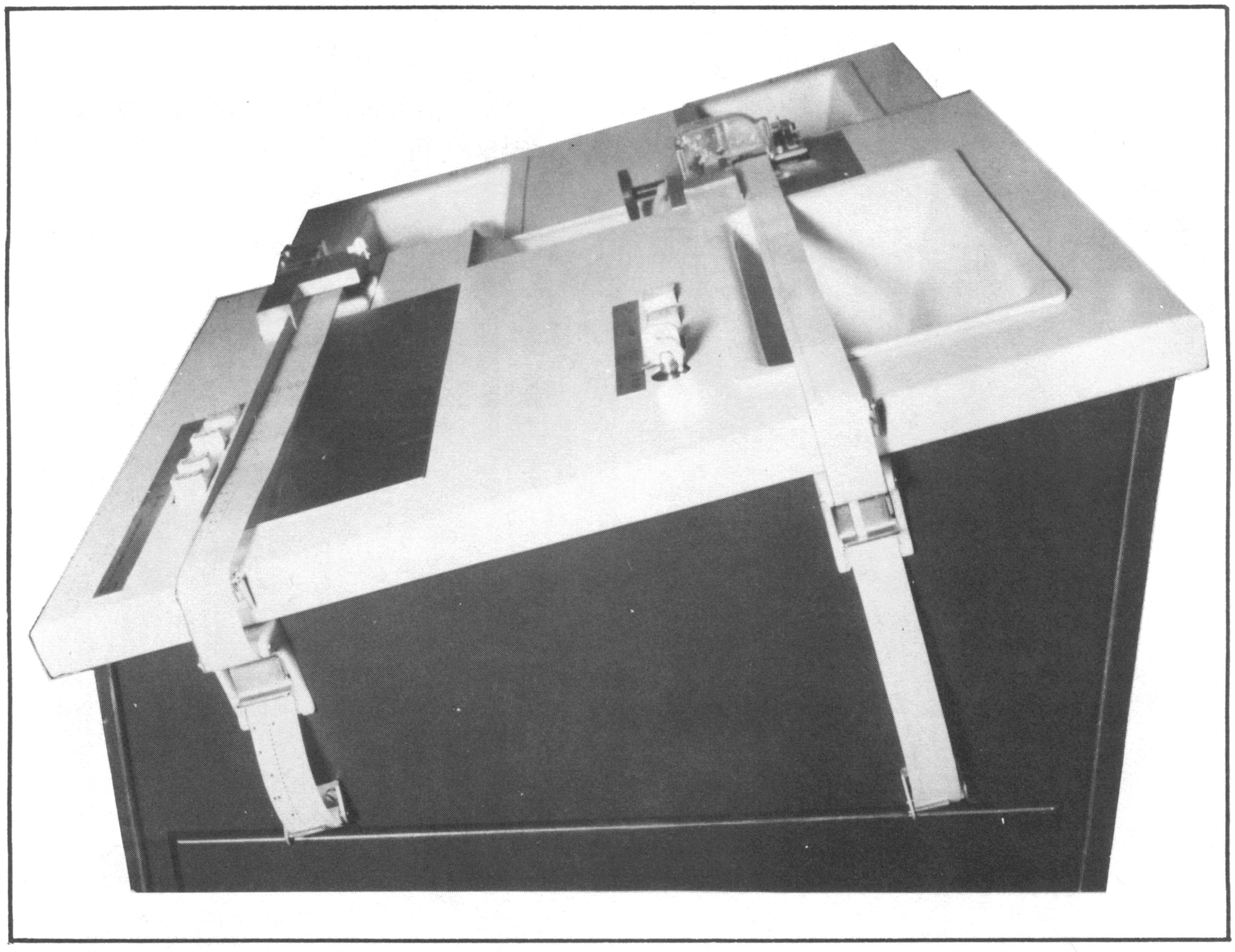


Figure 4.6

4. Insertion

With power ON, tape is inserted into the reader as shown in Figure 4.7. Sprocket holes are closest to the lower guide edge on the Punch/Reader console. Tape is guided by the operator but not held back. As soon as the leading edge enters the reader, the automatic feed mechanism pulls the tape into the reader.

IMPORTANT: Imprinted tape must have the imprint facing up. This prevents tape from being inserted backward. Unmarked tape should have its forward end marked on the upper surface to make certain that it is inserted facing forward.

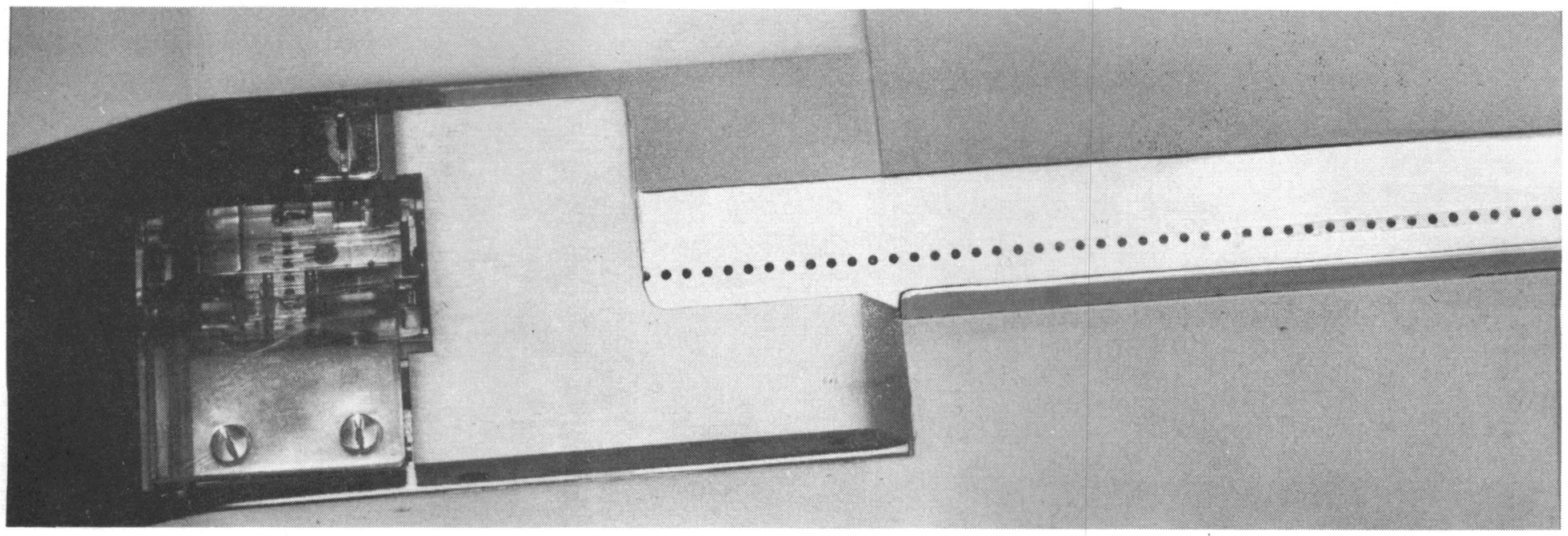


Figure 4.7

D. EDGE-PUNCHED CARDS

1. Card Insertion

Edge-punched cards are inserted singly as shown in Figure 4.8. The left edge of the card is placed against the lower edge of the card guide on the Punch/Reader console. The card is fed into the reader so that the card edge stays in contact with the guide edge. The operator should guide the card into the reader with constant forward hand motion but should not hold it back. The feed roller pulls the card forward as soon as the leading edge contacts the roller. It is important that the operator follow this procedure carefully to avoid damaging sprocket holes in the card.

2. Trimming

Edge-punched cards must have clean leading and triling edges. Notched, torn or damaged leading edges may prevent correct positioning of the card in the reader. Irregular trailing edges may cause faulty ejection of cards.

Figure 4.8

Cards should be trimmed. The card trimmer shown in Figure 4.9 simultaneously trims the leading edge of a card and the trailing edge of the preceding card. A card trimmer can be acquired from most office supply stores.

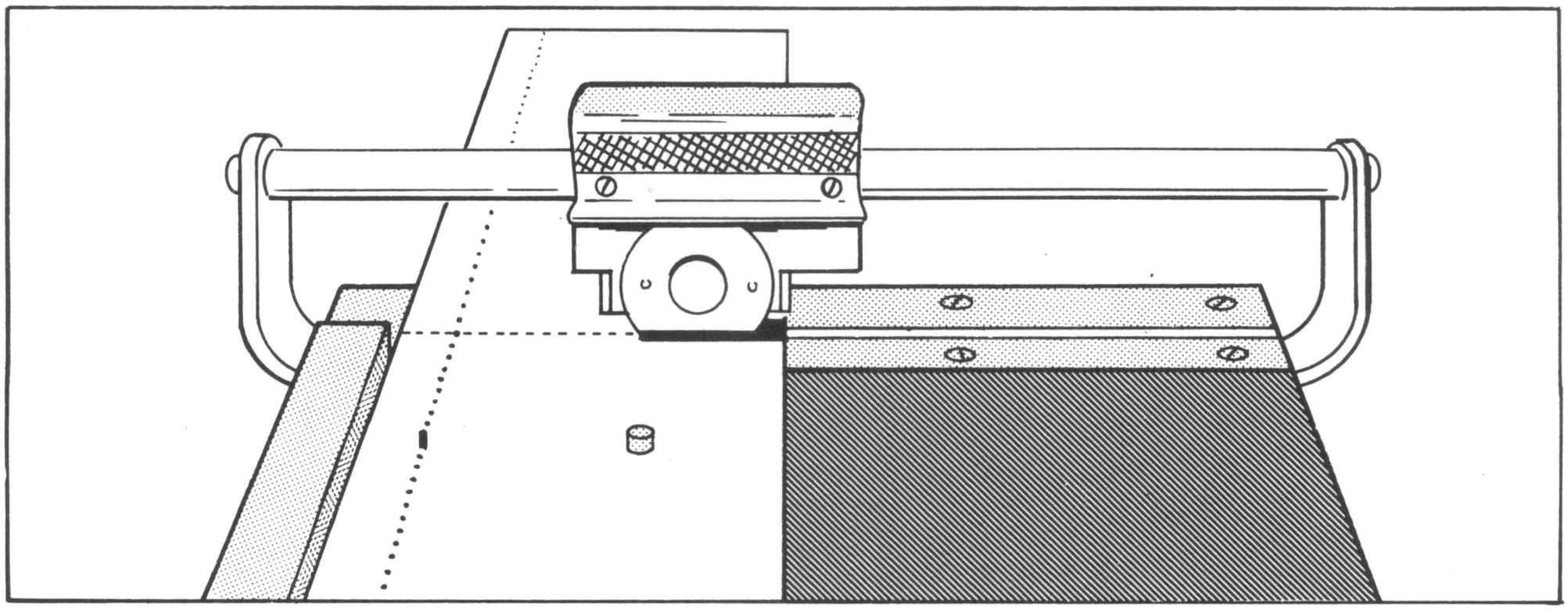


Figure 4.9

SECTION 5

OPERATION - PUNCH

A. LIGHTS AND SWITCHES

1. Punch Selected Light

Data can be punched into tape or cards when the punch is selected by the processor. The PUNCH SELECTED light comes ON when the punch is selected, and it goes OUT when the punch is unselected.

Data cannot be punched into tape or cards under any of the following conditions:

A. The punch is unselected.
B. The punch cover is up.
C. The tape-tension switch is open.
D. No tape or cards at the punching station.
E. The rapid advance switch is depressed.
F. The parity error light is lit.

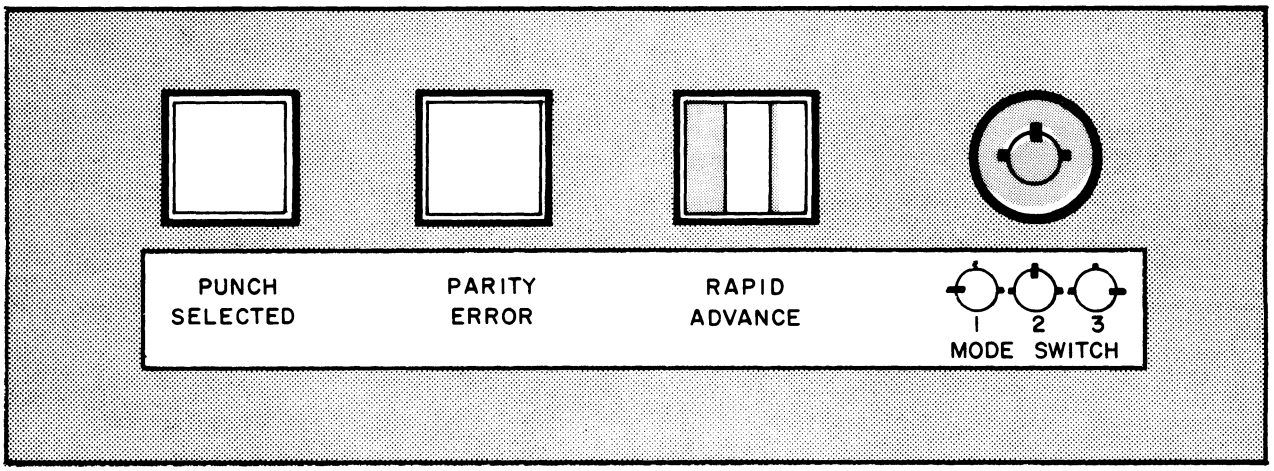


Figure 5.1

2. Parity Error Light

Under normal operating conditions, the punch should produce codes containing an ODD number of holdes (ODD parity). If the processor senses that an EVEN number of holes (EVEN parity) were punched, punching stops and the PARITY ERROR light comes ON.

Refer to Section 9 for correction procedures under Output Parity Errors.

3. Rapid Advance Switch

When this switch is depressed and held down, it causes tape or cards to pass through the punch at normal punch speed. The switch can be effective only provided that the tape-tension switch is closed and the cover is down.

If fan-folded cards are being processed, the switch has to be depressed only briefly to move a card. The following card automatically stops at the correct position. Holding the switch down moves more than one card through the punch.

4. Mode Switch

The MODE switch is key-operated. The key can be set to one of three positions.

Position No. 1

The processor allows the punch to produce codes with an EVEN number of holes. When the RAPID ADVANCE switch is depressed, the punch produces sprocket holes in tape or cards but no code holes are punched.

Position No. 2

When the processor senses that a code was punched containing a parity error, punching stops and the PARITY ERROR light is lit. Setting the MODE switch to position #2 resets the parity error detector, so that punching may continue. Refer to Section 9 (Output Parity Error) for an example of how to use the MODE switch in position #2.

The key should normally not be left in position #2. When the RAPID ADVANCE switch is depressed, all eight code hole positions are punched into tape or cards.

Position No. 3 (Normal Setting)

In this position, the processor allows the punch to produce codes with an ODD number of holes in tape or cards. When the RAPID ADVANCE switch is depressed, the punch produces sprocket holes and a code hole in the #5 punch position.

5. Tape-Tension Switch

This switch is mounted on the right side of the Punch/Reader console. The switch must be closed, with tape inside the switch (left view, Figure 5.2) for the punch to operate.

To open the switch, the operator must depress the release plate. The plate swivels out from the switch. (Right view, Figure 5.2.)

The switch will open automatically when tape, threaded through the switch, puts tension on the switch because of binding or friction.

The switch is also a no-tape indicator. Punching stops when tape is not inserted in the switch or when the tape supply has run out.

When tape is removed from the punch for processing of cards, the tape should be torn off above the tape-tension switch. This enables the punch to process cards. Otherwise, tape must be inserted in the switch to allow the punch to process cards.

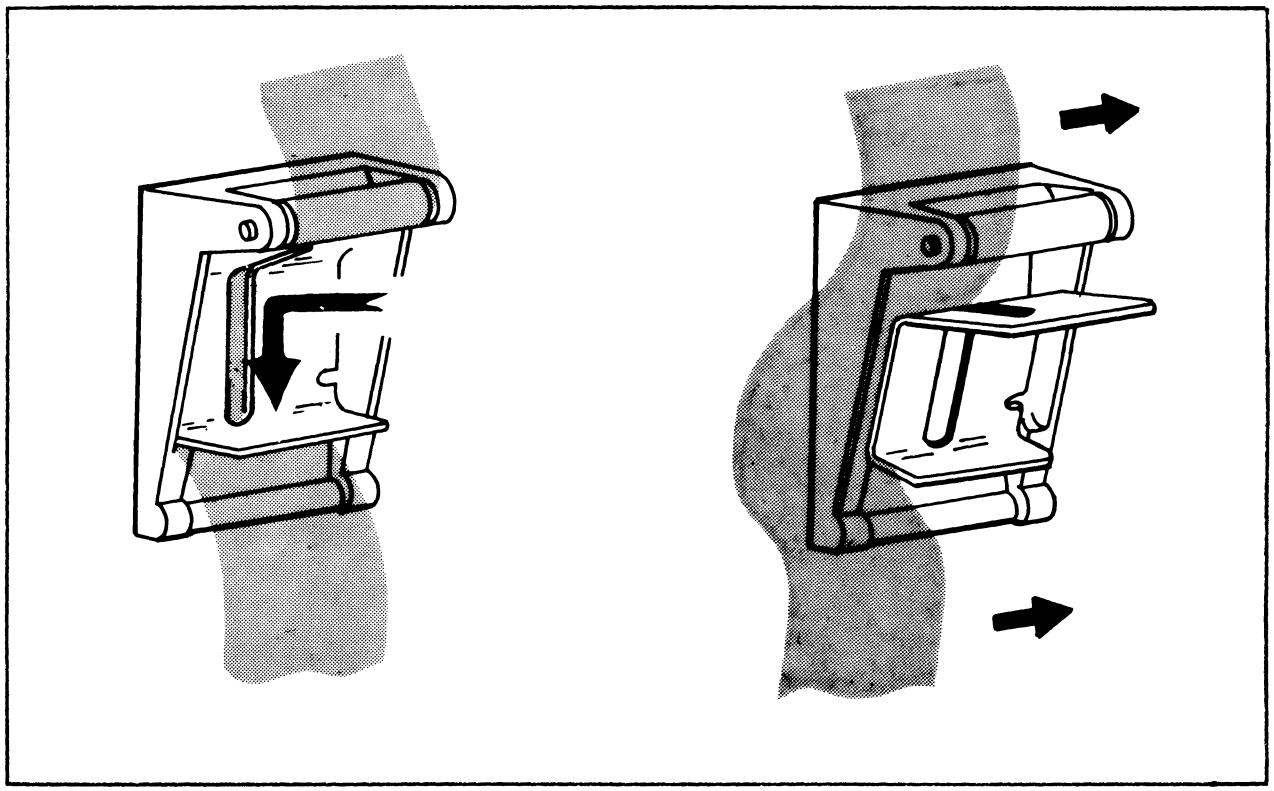


Figure 5.2

B. PUNCH COVER

The punch cover must be down in order for the punch to operate.

To gain access to the tape or cards, the operator can open the cover by moving the cover latch away from the cover (Figure 5.3).

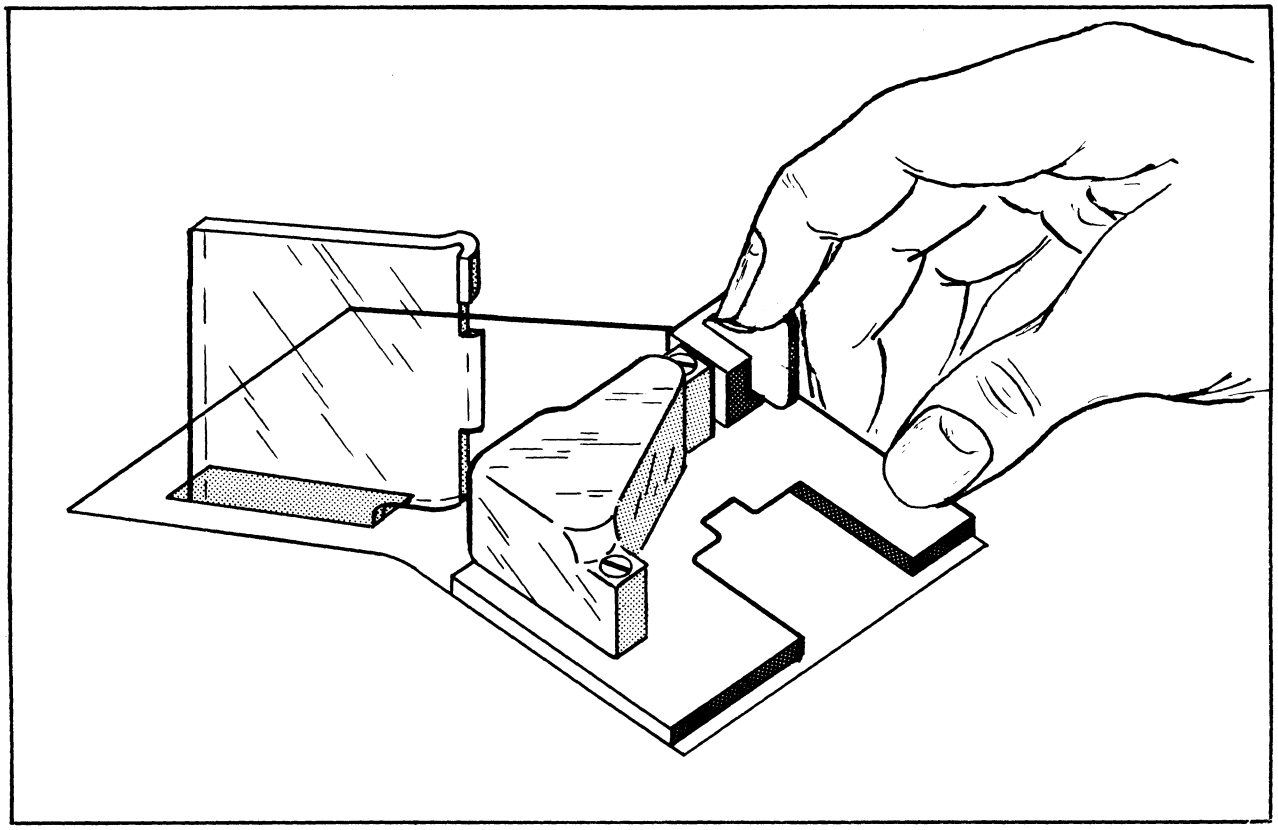


Figure 5.3

C. PUNCHED TAPE

A drawer is located at the base of the Punch/Reader console. This drawer houses the reel of paper tape to be inserted into the punch.

1. Supply Reel

   The lower half of the plastic reel supplied with the Punch/Reader console sits on the right-hand spindle of the tape reel drawer as illustrated in Figure 5.4. The supply reel of tape must be

positioned so that its end moves counter clockwise when tape is unspooled. The tape is spun around the outside of the movable brake roller and around the outside of the fixed roller on the right side of the drawer. The end of the tape is then pulled toward the operator and out of the drawer. At that point, the operator must make sure that the outside of the tape - as mounted on the supply reel - faces downward. (Figure 5.4.)

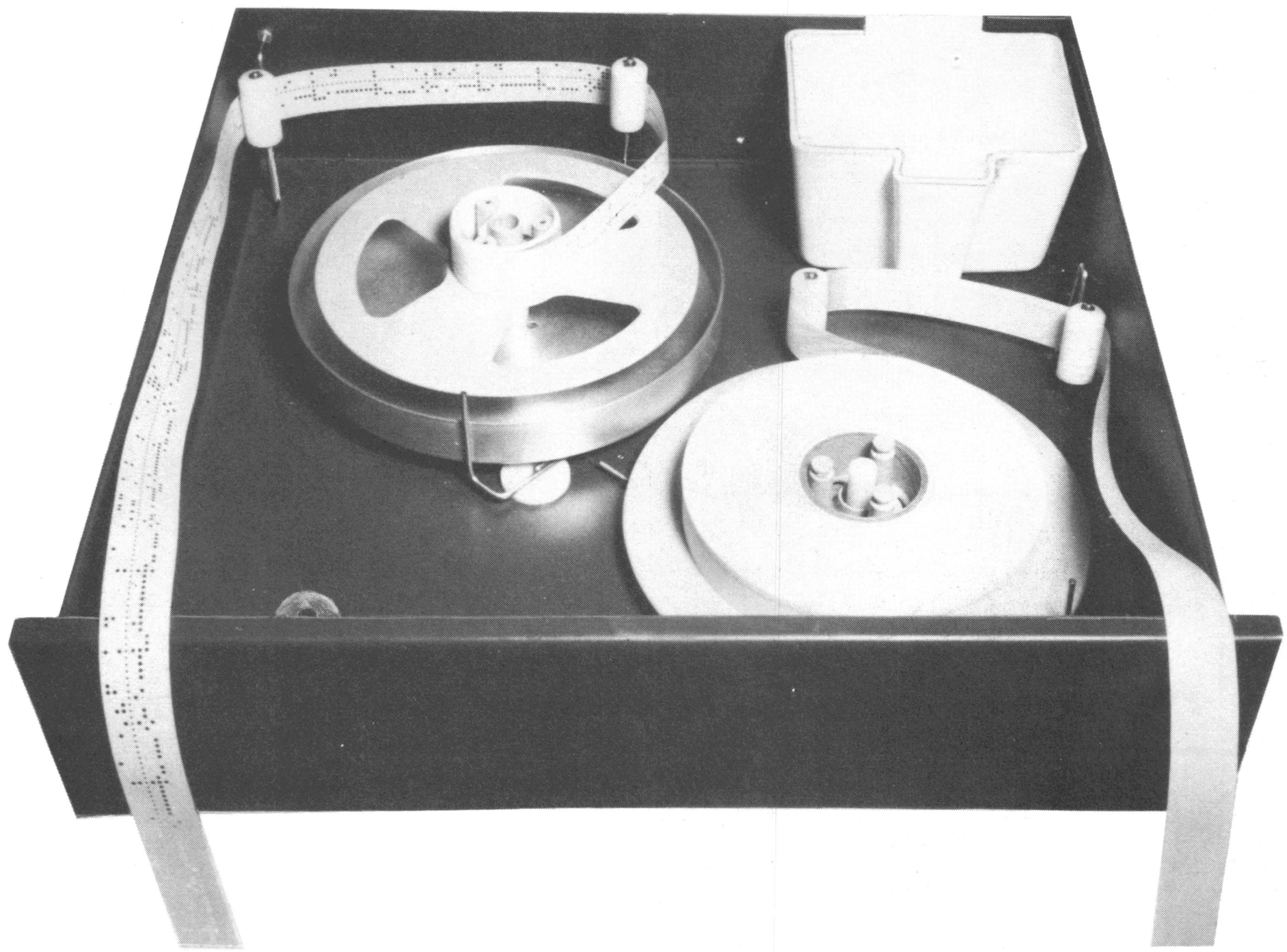


Figure 5.4

NOTE: On tapes with printing on the outside surface, the printing should face down and away from the operator.

2. Positioning

The end of the tape is positioned on the lower guide roller of the Punch/Reader console, see Figure 5.5, so that the tape fits over the roller, but under the hold-down clip.

NOTE: If correctly-positioned, the outside of the tape should now face the operator. Tape with imprinting should have the printing face outward.

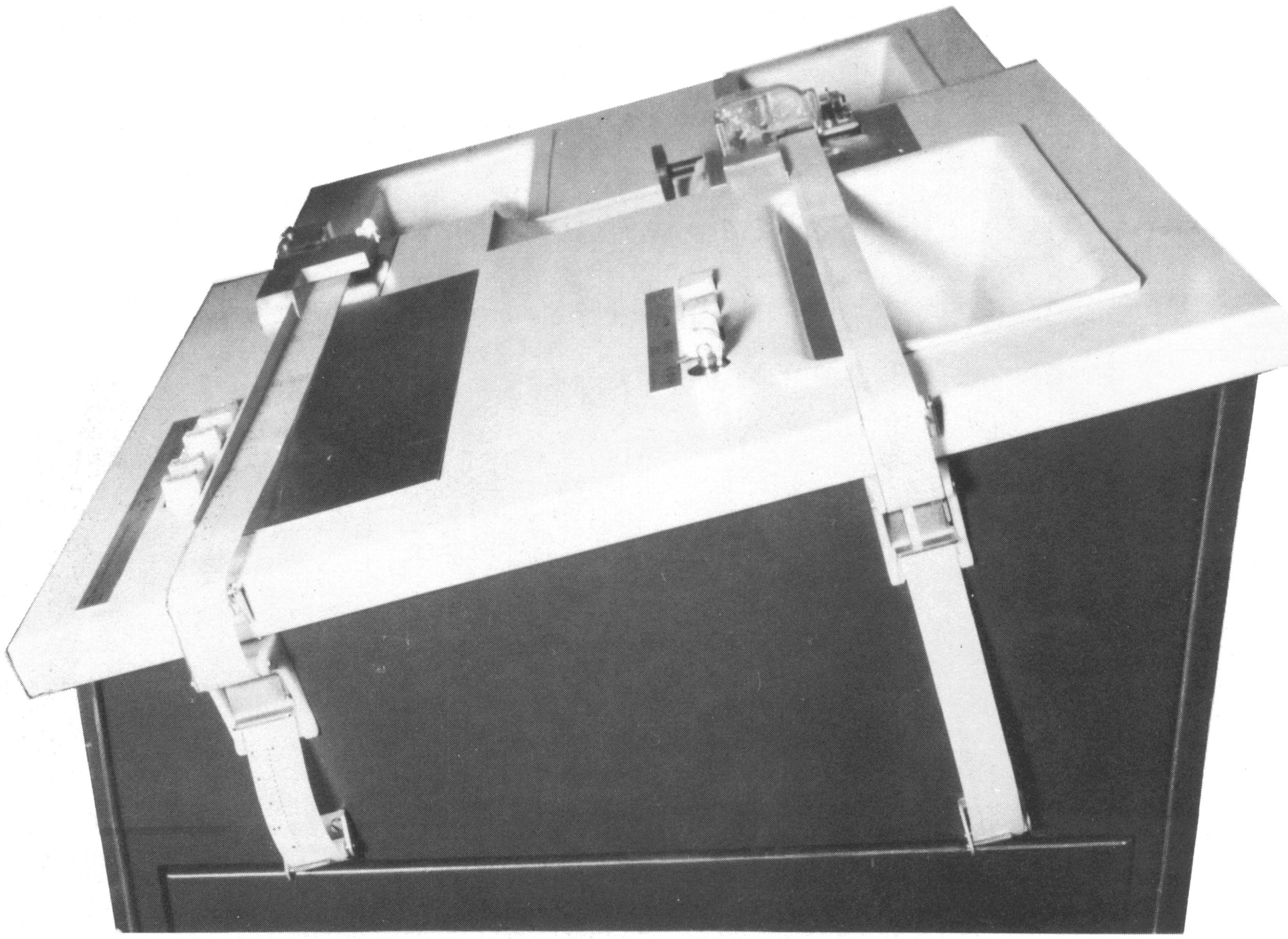


Figure 5.5

The tape is then inserted in the tape tension switch by pulling the release plate of the switch forward and by slipping the right edge of the tape in between the release plate and the switch. This action is shown in the right-hand view of Figure 5.2. The operator then closes the switch.

3. Insertion

With power ON, the tape is inserted over the tape guide at the top of the punch. The operator inserts the tape into the punch as far as it will go and then positions the tape by turning the handwheel in the direction of tape travel. Power must be on before the handwheel can be turned.

The operator inserts tape until it passes under the cover. The operator positions the tape with the handwheel and advances it

by depressing the RAPID ADVANCE switch. The forward end of the tape is then torn off to produce a clean leading edge. Correct insertion will keep the left side of the tape butted against the lower edge of the guide on the Punch/Reader console, see Figure 5.6.

IMPORTANT: Unmarked or non-imprinted tape should be marked by the operator to show the top and forward edge. Such marking ensures that the leading end is later inserted correctly in the reader.

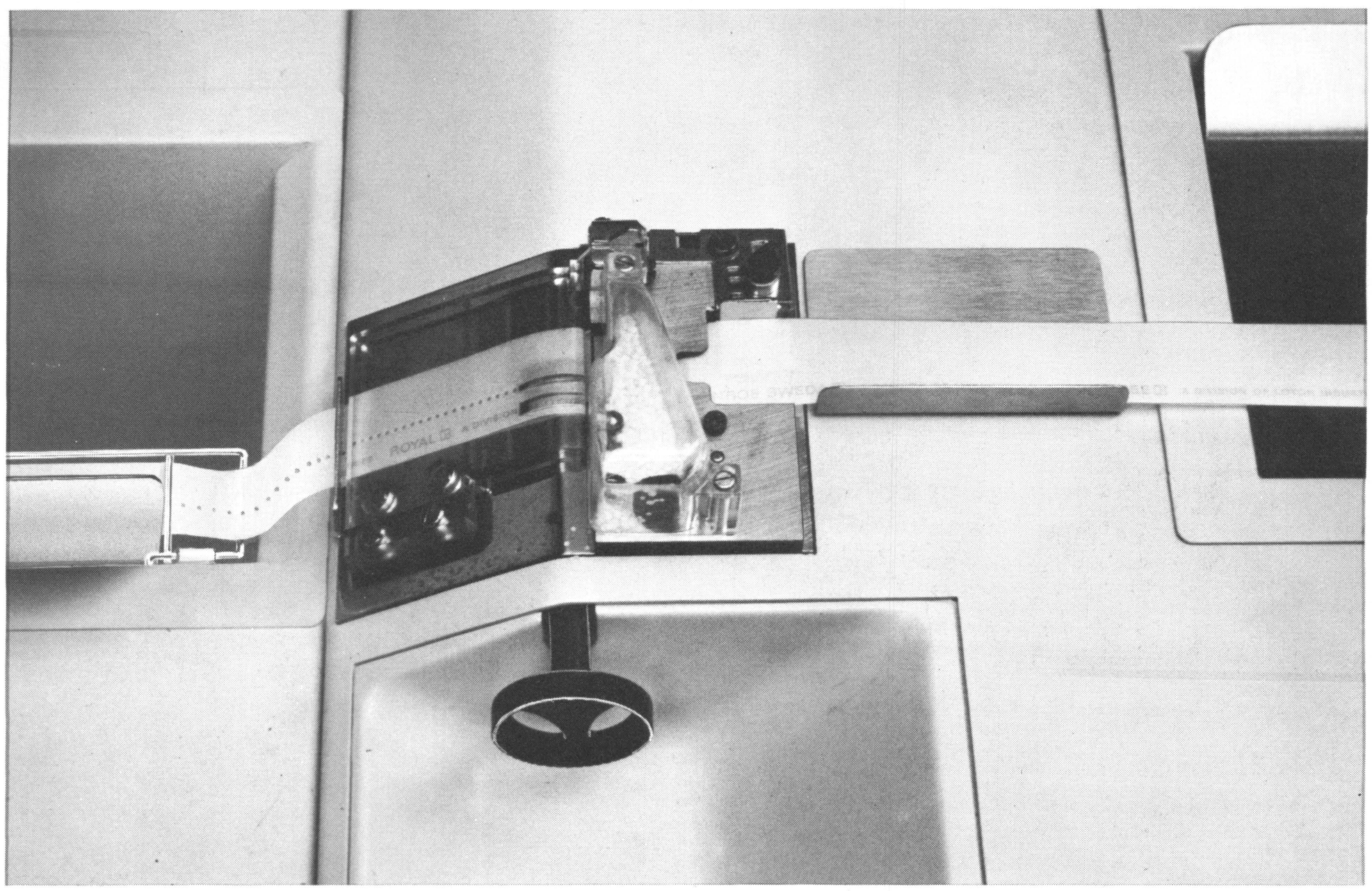


Figure 5.6

D. EDGE-PUNCHED CARDS

1. Card Insertion

IN and OUT bins are provided for fan-folded cards. Cards are placed into the IN bin in such a way that pre-punched sprocket holes are facing to the left. Cards must come out of the bin as shown in Figure 5.7. The hole in the first card must be near the forward edge.

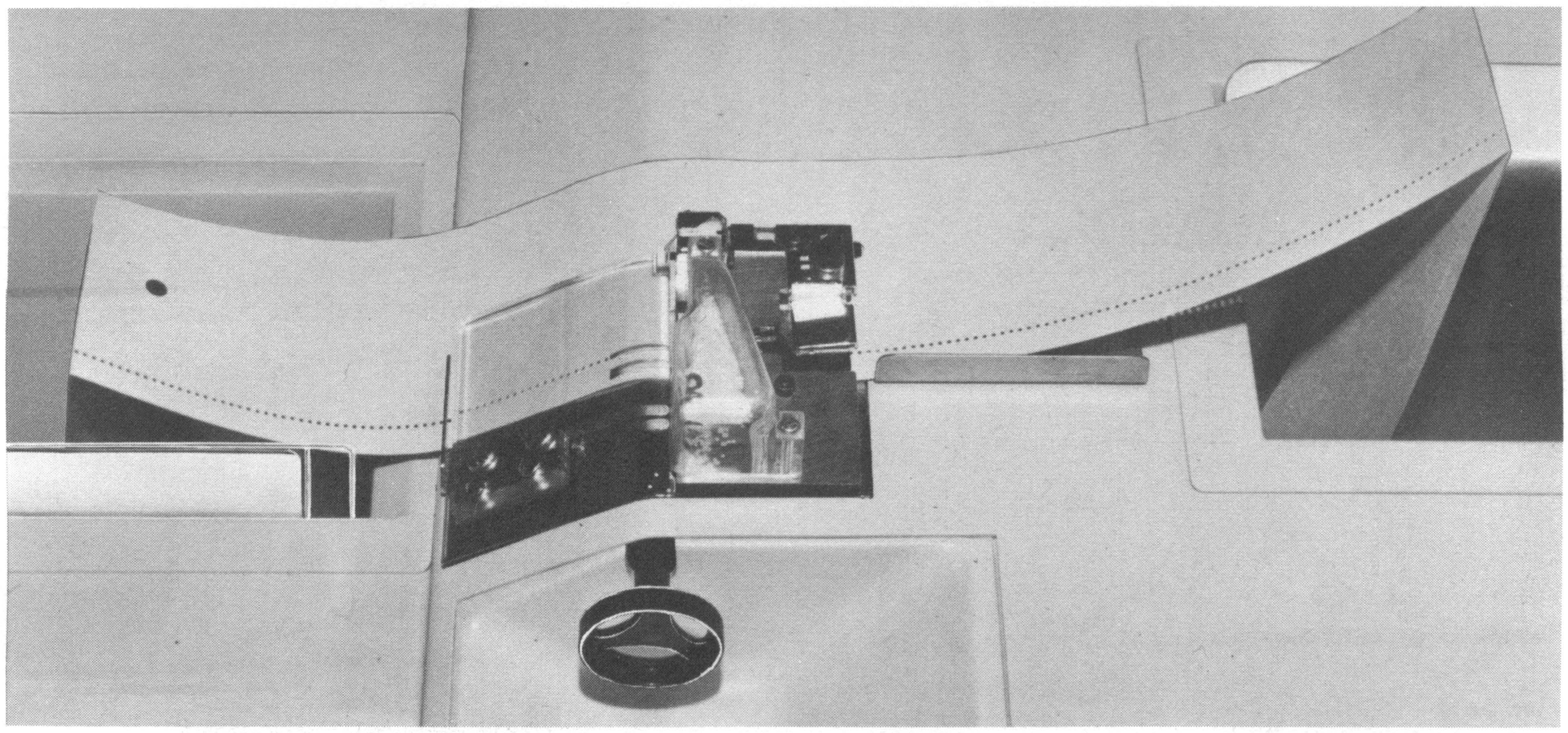


Figure 5.7

The first card in the stack is inserted into the punch as shown in Figure 5.8. The card must be placed below the card pressure plate directly under the tape guide. The operator inserts the card as far into the punch as it will go, then uses the hand-wheel to position it until its forward end touches the guide line. The operator then depresses the RAPID ADVANCE switch briefly to advance each card. The card advances through the punch, and the next card stops automatically at the correct punch position, see Figure 5.7.

E. CHAD REMOVAL

CHAD is the waste matter that accumulates from punching holes in tape or cards. This CHAD collects in the chad box at the right rear of the tape drawer. (Figure 5.4.) The box will hold the CHAD of one reel of punched tape. The drawer must be closed during the punching operation so that the CHAD can accumulate in the box. Otherwise, it will collect behind the drawer.

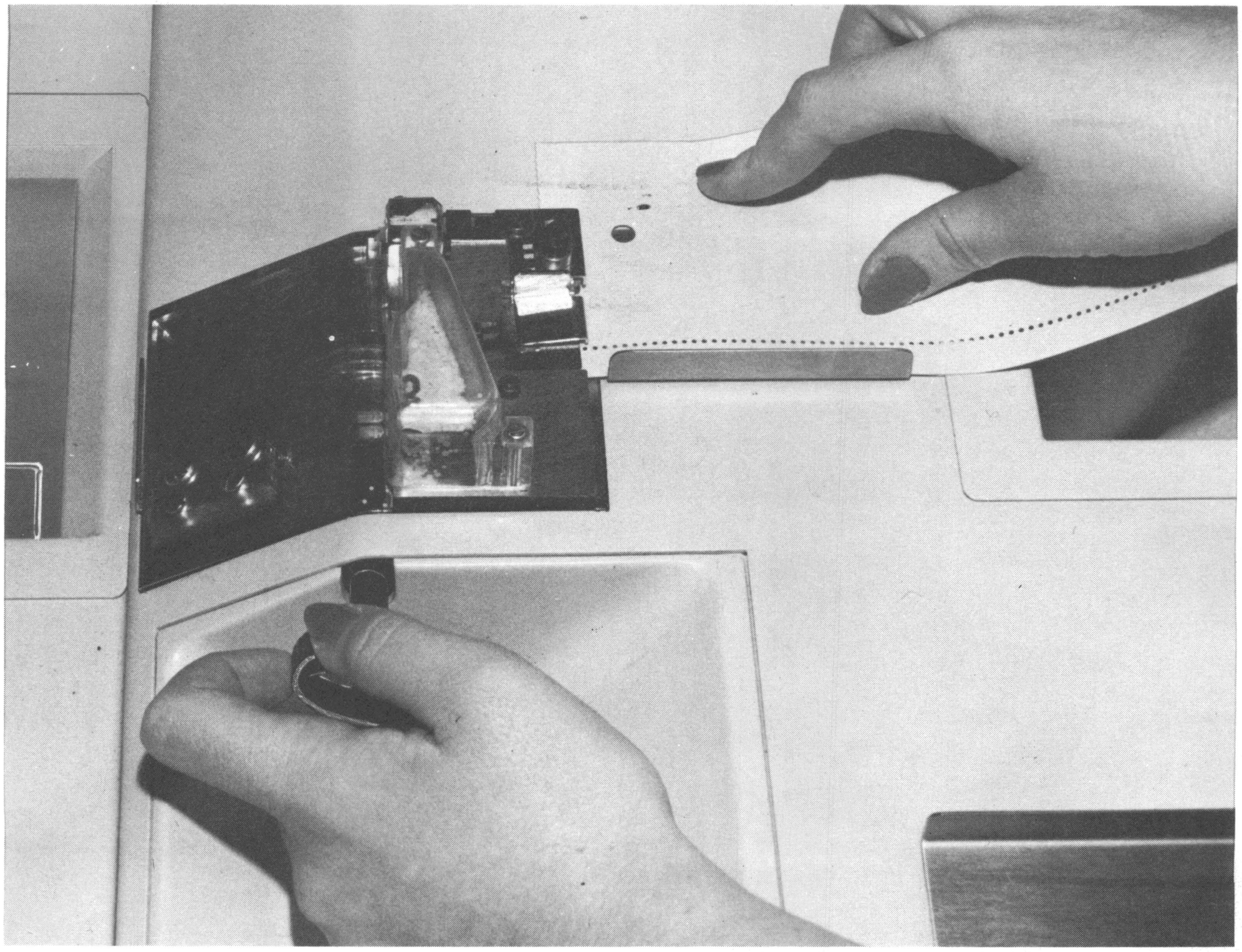


Figure 5.8

SECTION 6

OPERATION - PRINTER

A. LIGHTS AND SWITCHES

1. Selected Light

Data can be printed only when the SELECTED light is lit. The light goes out when the printer is unselected.

2. Busy Light

The BUSY light is a combination light and switch. The light is lit when the printer attempts to output a character but can not do so because:

A. The print wheel is in motion.

When the print wheel is no longer in motion, the BUSY light will automatically go out.

B. The front-feed carriage is open.

The BUSY light goes out when the operator closes the carriage by depressing the carriage (open, close) switch.

C. The print wheel is at print position #192.

The BUSY light will go out when the operator depresses the BUSY switch twice. The print wheel will return to print position #1.

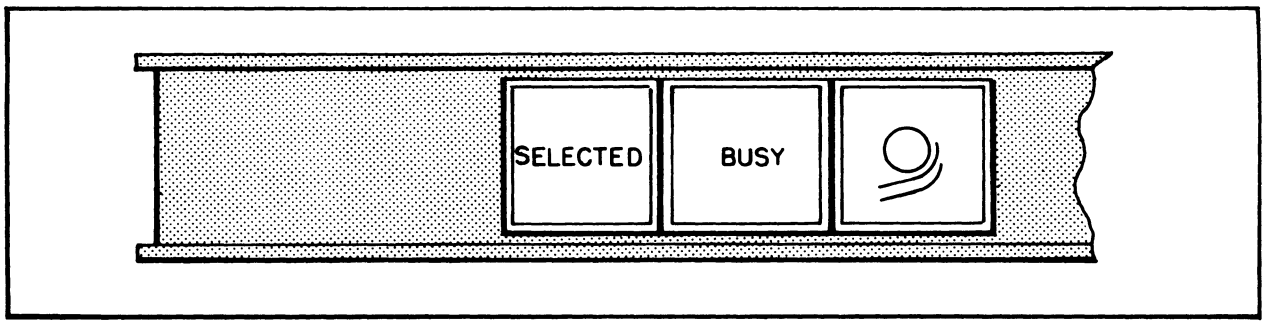


Figure 6.1

3. Carriage (Open/Close) Switch

Depressing the switch will close the carriage if it is open. If the carriage is closed, depressing the switch will open the carriage.

When the carriage opens, the card guides and line finder move forward and down. In this position, the operator can manually insert, adjust, or remove forms from the front.

B. OTHER PRINTER FEATURES

1. Front Pressure Roller Selectors

The front pressure rollers are used to hold the journal roll and front-fed forms against the platen. Separate sets of rollers are provided for the left and right platens. Each set of rollers is controlled by a selector (Number 4, Figure 6.2).

The front pressure roller selectors extend from the front of the printer.

Top Position

The front pressure rollers remain closed at all times.

Center Position

The front pressure rollers open when the carriage is opened; and close when the carriage is closed.

Bottom Position

The selector can be moved to the bottom position only when the carriage is open. This setting keeps the rollers in an open position at all times.

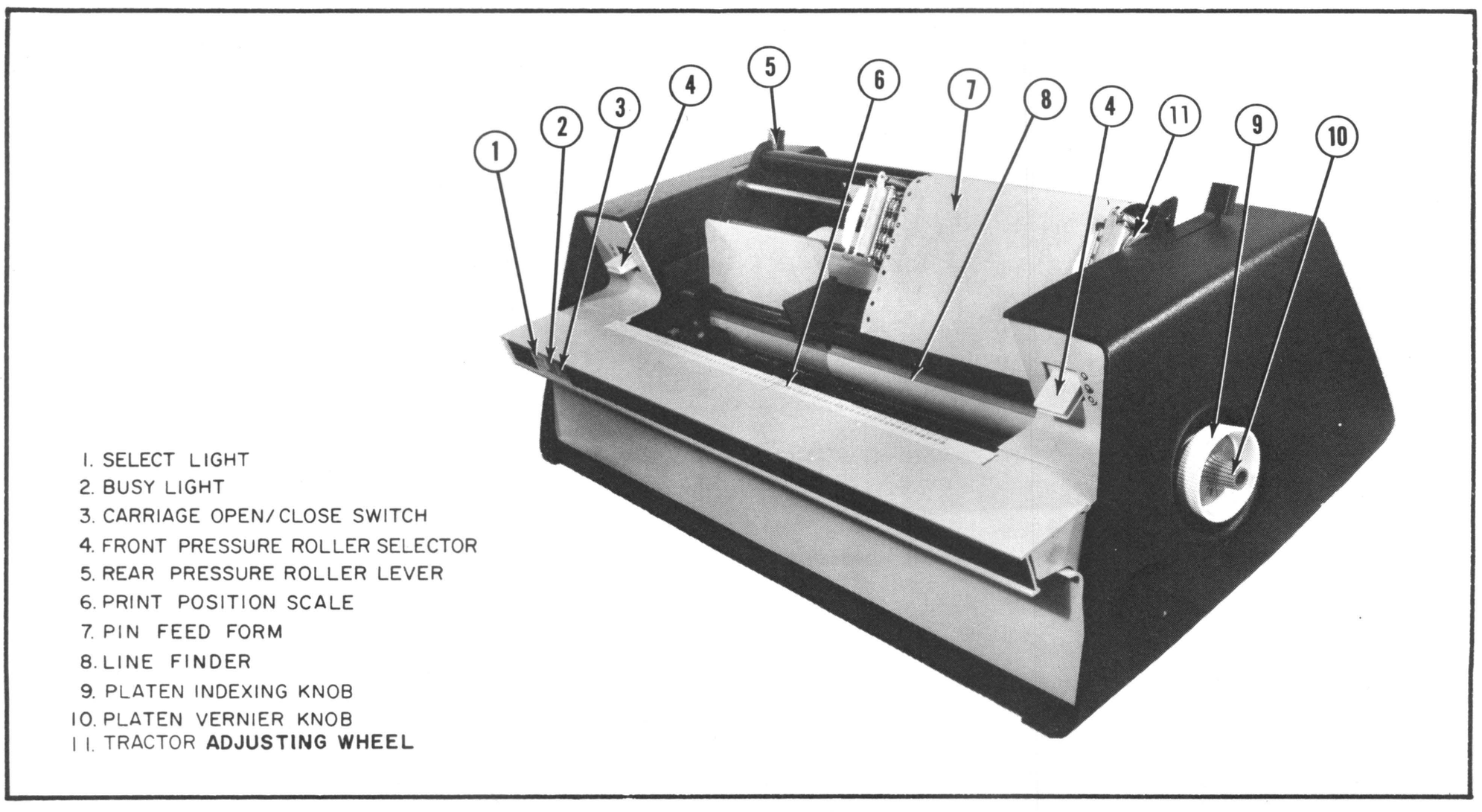


Figure 6.2

2. Rear Pressure Roller Levers

The rear pressure rollers are used to hold the journal roll against the platen. Separate sets of rollers are provided for the left and right platens. Each set of rollers is controlled by a lever (Number 5, Figure 6.2). To open the rollers, the lever is pushed to the rear of the printer. To close the rollers, the lever is pulled forward.

3. Line Finder and Card Guides

The LINE FINDER is a transparent plastic strip which supports two movable card guides. These card guides assist the operator in inserting front-feed forms.

The LINE FINDER and card guides open and close when the "carriage (open/close)" signal is sent to the printer.

With the carriage open, the operator can insert a form between the card guides so that the lower edge of the LINE FINDER lies across the top edge of the last printed line on the form. The print wheel will then be able to print on the next available print line on the form as soon as processing continues.

4. Platen Indexing Knob

The large knob on either side of the printer, controls the manual movement of its corresponding platen if the platen is unlocked. When the platen is locked, the left knob turns the entire platen; the right knob turns the continuous form tractor.

5. Platen Vernier Knob

A smaller knob inside each indexing knob enables the operator to precisely position the corresponding platen if it is unlocked. When the platen is locked, the left vernier knob turns the entire platen and the right vernier knob turns the continuous form tractor.

6. Platen Lock

When the platen is locked, <u>both</u> the right and left platens rotate in unison. When the platen is unlocked, both platens can rotate independently of each other.

<u>Locking Procedure</u>

A. Pull the top cover of the printer away from the printer and swing it up and out. (Figure 6.3.)

B. Rotate the left platen indexing knob until the red dot on the platen hub faces toward the front.

C. Slowly turn the right platen indexing knob until the lock button at the end of the right platen lines up with the ~~red dot~~ small hole on the left platen hub.

D. With a screwdriver or other flat surface, press the lock button to the left and into the right end of the right platen. If the red dot and the lock button are aligned properly, the lock will move into the right platen to lock both platens. Moving the left indexing knob will then rotate both platens.

If the lock button does <u>not</u> enter into the right platen, move the left vernier knob slowly in either direction to exactly align the red dot. When alignment is correct, the lock button will engage and locking is complete.

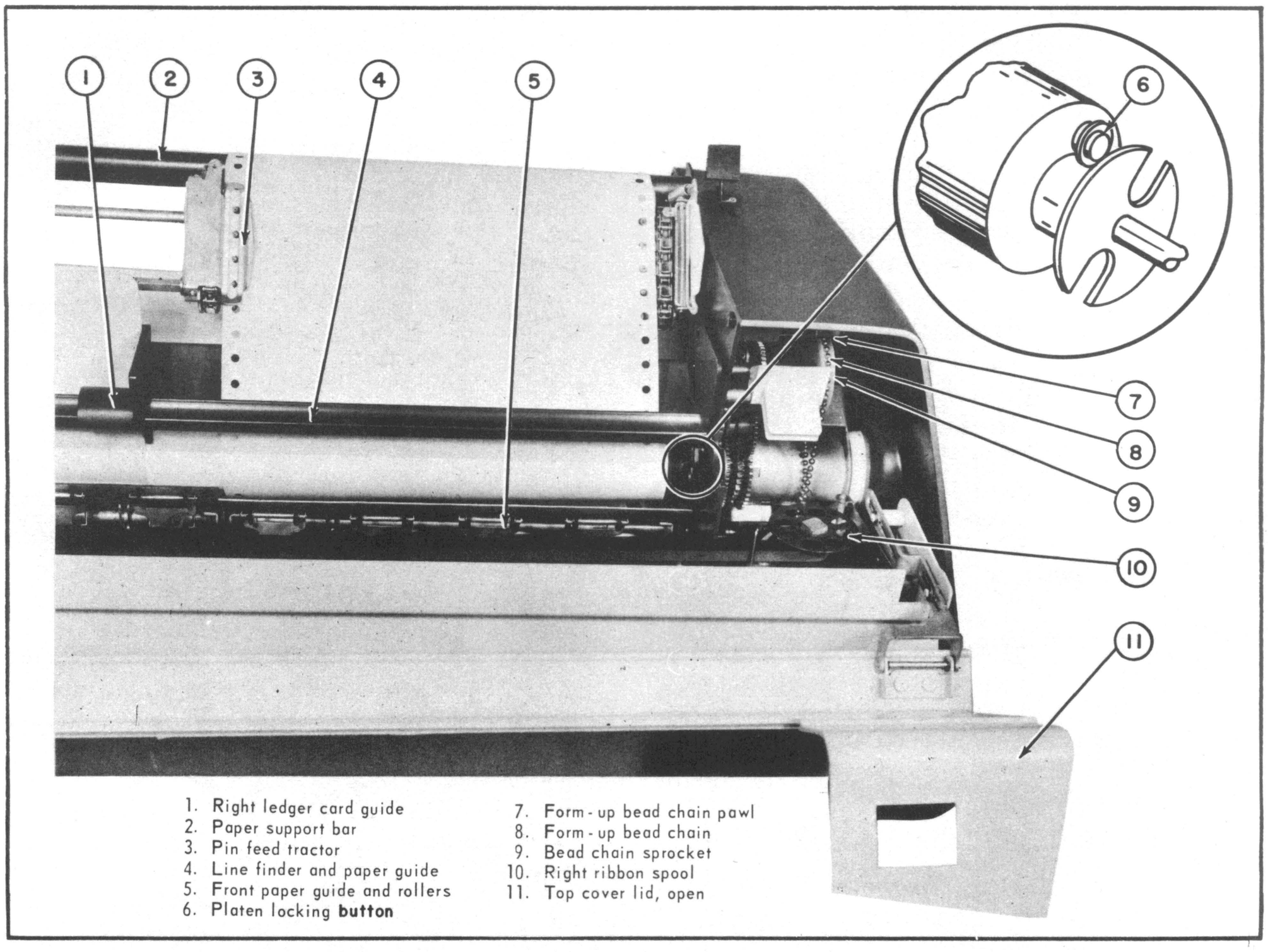


Figure 6.3

Unlocking Procedure

A. Pull the top cover of the printer away from the printer and swing it up and out.

B. Turn the left platen indexing knob until the lock button at the end of the right platen is visible.

C. Pry the lock button out of the right platen with a screwdriver or other flat surface. Rotate the right vernier knob to line up the slot in the right-hand drive hub with the lock button and push the button to the right into the drive hub as far as possible. The platen is now unlocked.

7. Ribbon

A two-color ribbon is used for imprinting. The ribbon is positioned so that red faces down. The ribbon moves continuously while the printer is turned ON.

If the ribbon becomes worn or damaged, replace it while the system is turned OFF.

A. Pull the top cover forward and swing it up and out.

B. Push each friction arm away from its spool until the arm is held open. (Figure 6.4.)

C. Remove the ribbon from guides on the printer, pull up both ribbon spools and remove the ribbon from one spool. Discard the other spool and ribbon.

D. Install a replacement ribbon on the left-hand spool post. The ribbon must have metal end tabs and metal eyelets five inches from each end.

E. Make sure that the ribbon is positioned so that red faces down. Thread the ribbon through the guides on the print wheel carriage. Make sure that the right ribbon eyelet is positioned between the right actuating arm and its adjacent spool. If more ribbon must be pulled from the supply spool, release the ribbon drive mechanism by moving the two actuating arms toward the center.

F. Insert the end tab in the right take-up spool. Turn the printer ON and observe ribbon movement. Make corrections if necessary. Then close the top cover.

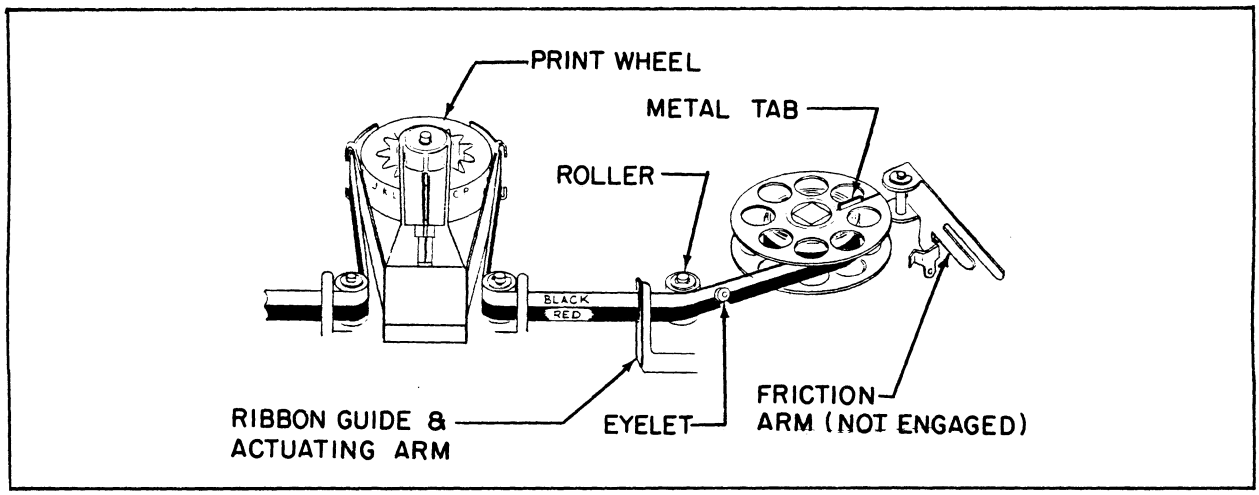


Figure 6.4

C. FORMS INSERTION

1. Narrow Journal Roll

A. Go to the rear of the printer and place the journal roll between the two hangers at the rear of the printer.

B. Open the rear pressure rollers by pushing the appropriate rear pressure roller lever to the rear.

C. Move to the front of the printer and set the corresponding front pressure roller selector to the center position. Open the carriage by depressing the carriage (open/close) switch. The line finder automatically moves up and away from the platen.

D. Go back to the rear of the printer. Feed the journal roll between the rear pressure rollers and the platen, between the front pressure rollers and the platen, and under the line finder. (Figure 6.5.)

E. Pull enough paper through the printer to be sure that paper will feed straight into the printer.

F. Move back to the front of the printer. Close the carriage by depressing the carriage (open/close) switch. The line finder will lower automatically. Close the rear pressure rollers by pulling the appropriate rear pressure roller lever forward.

2. Full-width Journal Roll

Follow the same procedures as those for the NARROW journal roll, but use both rear pressure roller levers and both front pressure roller selectors. The platen must be locked in order to use a FULL-WIDTH journal roll.

3. Cut Journal (Sheets)

The same procedures are followed as those of the journal roll, except that a roll is not used. Therefore, hangers do not have to be used.

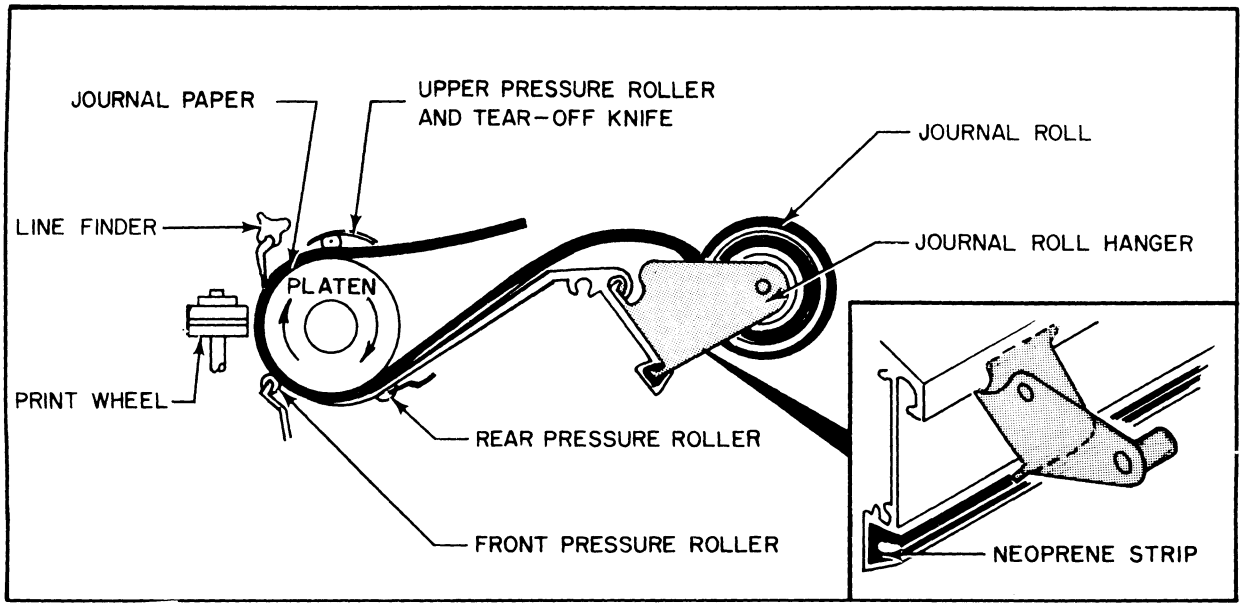


Figure 6.5

4. Front-Feed Forms

Ledger cards and similar cut forms are inserted from the front of the printer between the card guides. They are held in place during processing by the front pressure rollers (Figure 6.6).

<u>To insert front-feed forms:</u>

A. Set the card guides on the line finder to the width of a form so the form can be inserted easily.

B. Set the appropriate front pressure roller selector to the center position. Open the carriage by depressing the carriage (open/close) switch.

C. Insert the form between the card guides. Depress the carriage (open/close) switch to close the carriage.

D. If all cards are to be printed on the same line, set the adjustable stops on the paper tray at the rear of the printer into a notch at which the lower edge of the card just touches the stops. If the print line is not the same on all cards, refer to step 3, page 6-3, for use of the line finder in aligning front-feed forms.

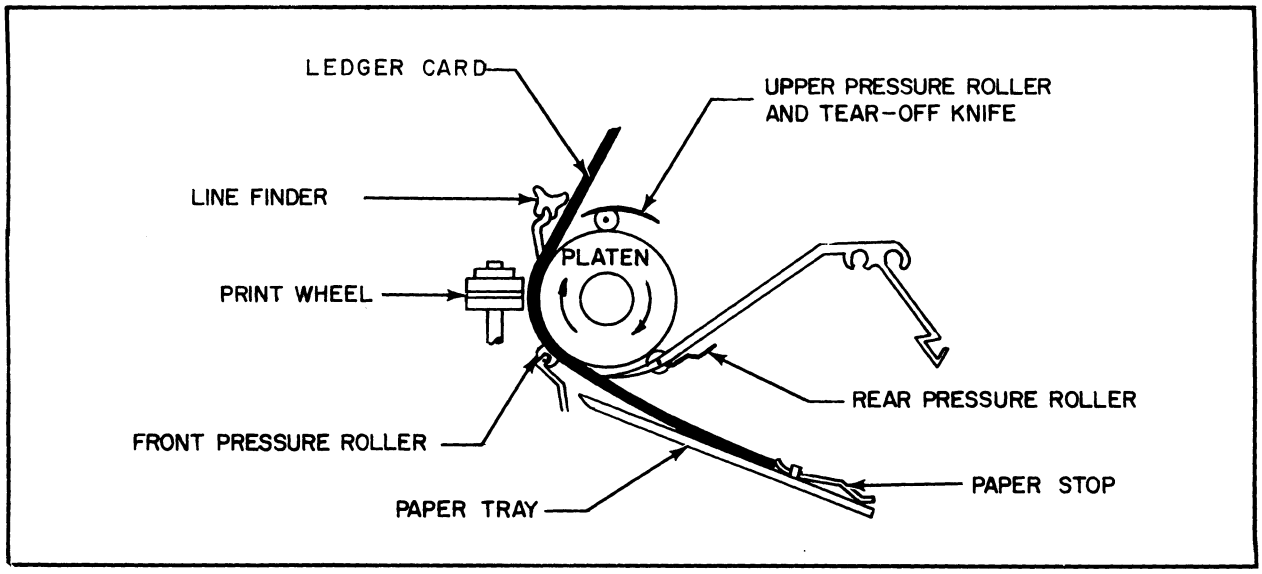


Figure 6.6

5. Continuous Forms

Continuous forms are normally used with the tractor assembly. (Figure 6.7.) The two tractors of the assembly can be adjusted to accept forms of different widths. Continuous forms are loaded from the rear, similarly to journal rolls.

<u>To insert continuous forms:</u>

A. Set the appropriate front pressure roller selector to the center position. Depress the carriage (open/close) switch to open the front pressure rollers.

B. Insert the continuous forms from the rear, between the front pressure rollers and the platen.

C. Open the covers on both tractors. Position the holes on each side of the form over the tractor pins. Close both tractor covers.

D. If the entire tractor assembly has to be moved sideways to correctly align the form, use the tractor adjusting wheel (Number 11, Figure 6.2). Turning this wheel clockwise or counter clockwise moves both tractors to the right or left.

E. Front pressure rollers should normally remain open when using continuous forms. Therefore, set the front pressure roller selector to the bottom position. If a journal roll is used behind the continuous form, the front pressure roller selector should be set to the center position.

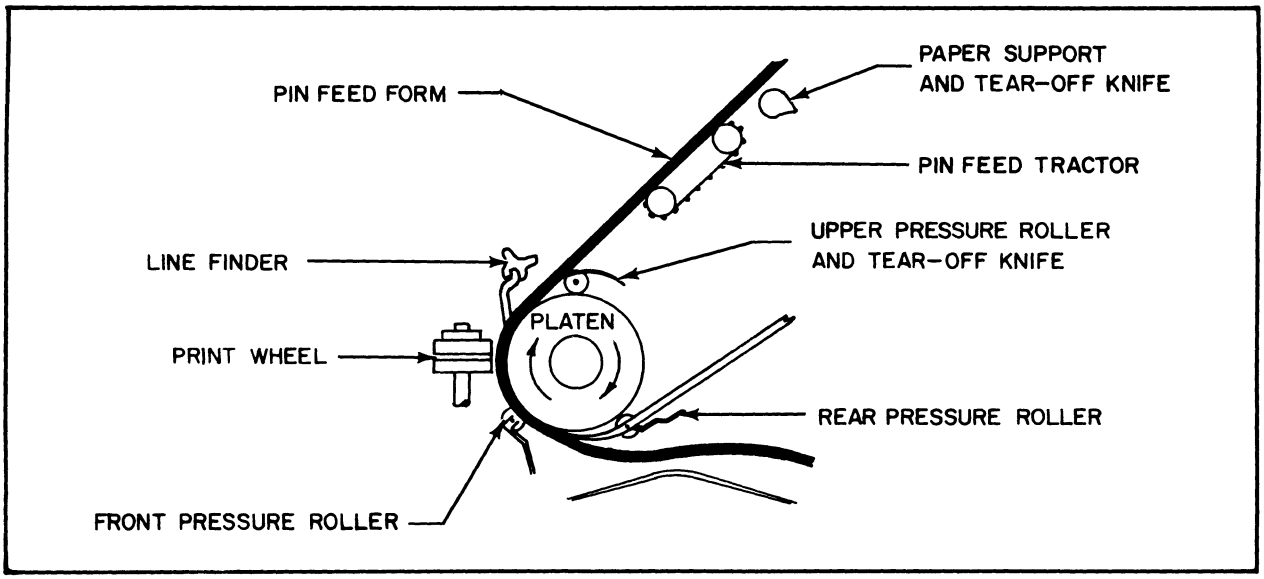


Figure 6.7

D. RAPID ADVANCE OF CONTINUOUS FORMS

The rapid upward movement of continuous forms from one print line to another pre-determined line is called FORM-UP. This rapid movement through the printer to another pre-determined print line on a form is controlled by a chain attached to the printer. (Figure 6.8.)

Attach the FORM-UP chain as follows:

1. Refer to Section 5 to insert the continuous forms into the printer. Align the form on the first print line.

2. Pull the top cover of the printer forward and swing it up and out.

3. Carefully place the chain onto the notched wheel located behind the right front pressure roller selector.

4. Position the chain on the wheel so the large brass bead is on top of the wheel, directly under the activator arm. The small brass beads must face out toward the front of the printer. If an adjustment of the continuous form is necessary to properly align the form after the chain is in position, use the vernier knob only. Do not use the larger indexing knob because it will move the chain [illegible] an incorrect position.

5. Replace the top cover.

NOTE: If the bead chain is dropped into the printer while trying to place it on the wheel, call your service technician for instructions to retrieve the chain.

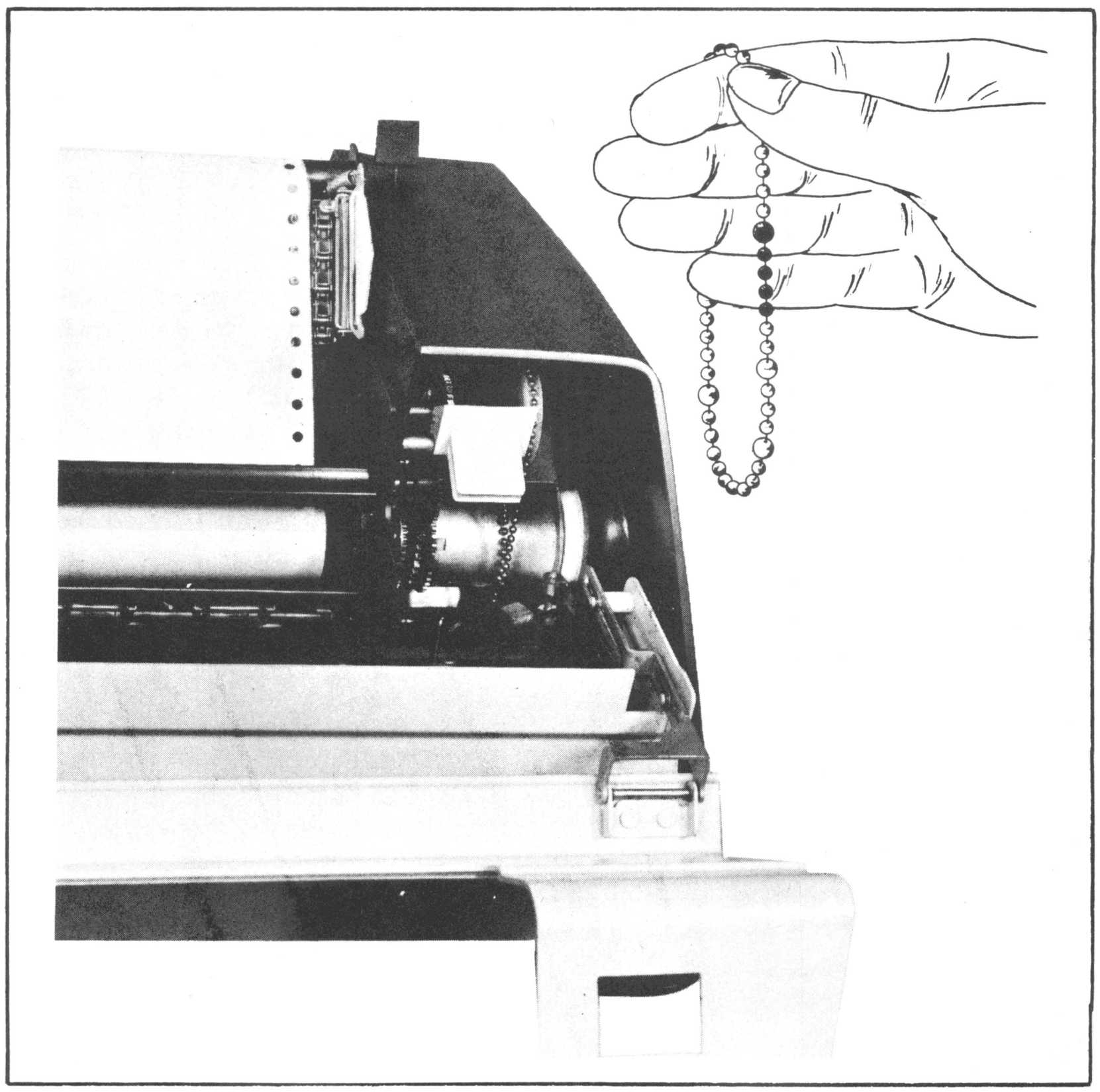


Figure 6.8

SECTION 7

DEVICE CONNECTIONS

INSTALLATION AND DEVICE CONNECTION

The 1231 System is installed by a service technician who arranges and interconnects system components. At no time should anyone else but the technician attempt to disconnect and rearrange the system.

Figure 7.1 shows cable and power cord connections. Device connectors must not be removed.

CAUTION: Use of a cube plug is not allowed. If an extension cord has to be used, wire size must be at least #14 gage, or heavier, to provide sufficient current carrying capacity.

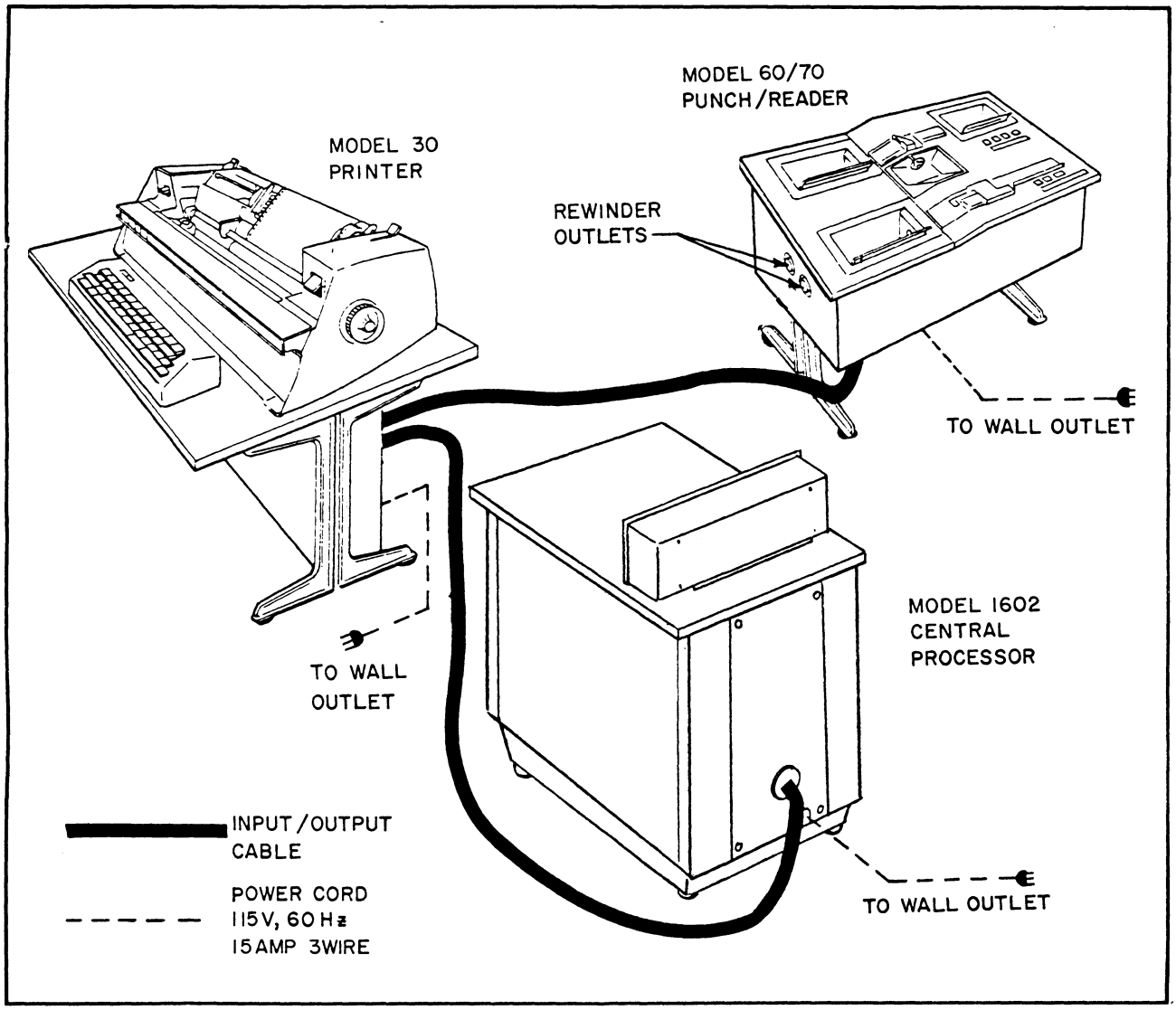


Figure 7.1

FUSE REPLACEMENT

The printer has one fuse which should be checked if printer and keyboard do not operate while power is ON. The fuse is located in a holder below the printer next to the power cord. The fuse and cap is shown in Figure 7.2. It is withdrawn from the underside of the printer for replacement together with its cap.

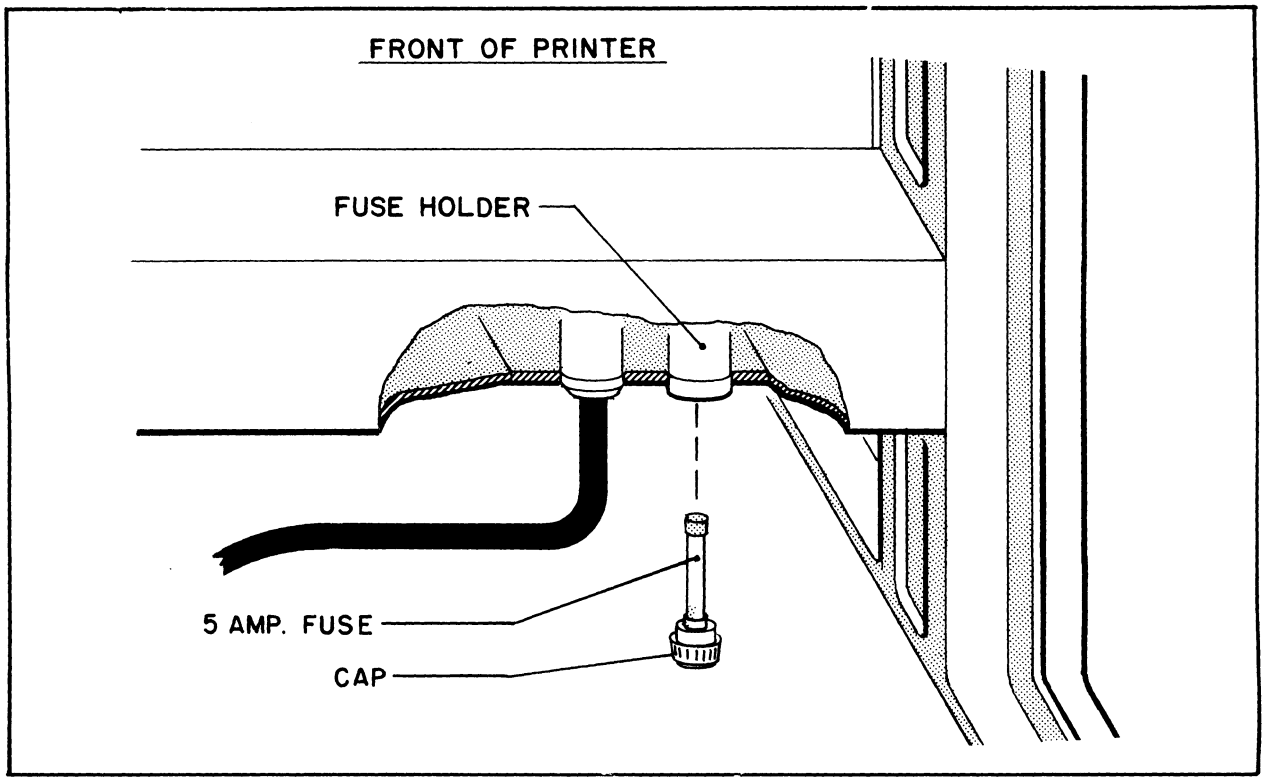


Figure 7.2

1. Turn power OFF by removing the printer plug from the wall outlet or other receptacle.

2. Remove the fuse by turning the cap counter clockwise. Replace the cap with fuse as a unit, and lock it by turning the cap clockwise. The holder installed in the printer can be retained.

3. Re-insert the power cord plug in the wall outlet or other receptacle. Check printer operation.

SECTION 8

OPERATING UTILITY SYSTEM (OPUS)

INTRODUCTION

This section of the manual describes the various service routines available to the programmer and the operator.

When a service routine is selected to provide assistance to the programmer in the creation and testing of an application program, that service routine is found in the Operating Utility System (OPUS).

When an operator is ready to process an application program, a service routine is available to process at the beginning of the application program. This service routine is found in the Operating Utility System (OPUS).

OPUS provides the following features of importance to the programmer and the operator:

1. OPUS is permanently stored in memory, making the service routines and function-routines available whenever required.

2. The programmer, when creating an application program, need only enter the symbolic instructions. Conversion to machine-language codes is handled internally by OPUS.

3. When OPUS senses an error during the processing of an application program, it will display a pattern of lights on the console to indicate the type of error. Thus, corrective action can be quickly taken, and processing can resume in a minimal amount of time.

OPUS provides service routines for manually entering, through the keyboard, program instructions and data into the 1231's memory; printing program instructions and data from the 1231's memory; punching program instructions and data from the 1231's memory onto paper tape; examining individual program instructions and data for possible change; reading of program instructions and data from punched paper tape into memory; and the execution of a stored application program.

HOW TO USE OPUS

Entry into OPUS is automatic once the EBS/1231 START-UP procedure or RESTART procedure is accomplished.

START-UP

1. Depress the POWER button. (The light above the POWER and HALT buttons will light. When the memory drum reaches the proper speed for processing, the READY light will be lit.)

2. Depress (in this order) the HALT, READY, and RUN buttons. (The light above each button will light as it is depressed. The light above the HALT button will go out when the RUN button is depressed.)

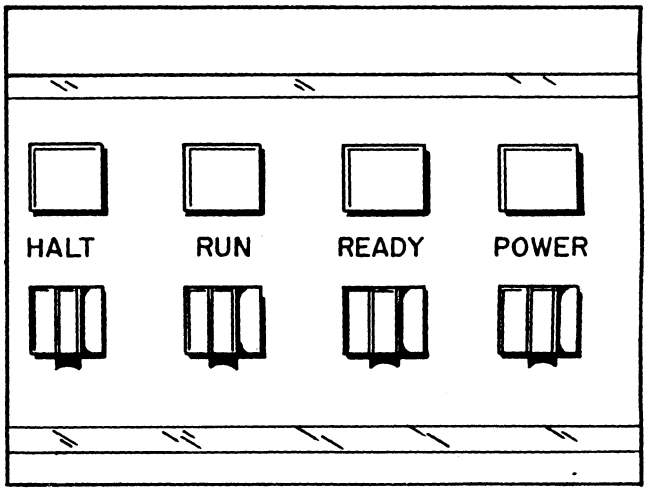


Figure 8.1 EBS/1231 Console

3. The keyboard SELECTED light will begin flashing. Whenever the keyboard SELECTED light flashes, it is an indication that OPUS has been entered and is waiting for the depression of a selection key to indicate which OPUS service routine is desired.

RESTART

The RESTART procedure is used when power is already on and a return to OPUS is desired. The RESTART procedure follows the same procedures as steps 2 and 3 of the START-UP procedure.

DESCRIPTION OF OPUS SERVICE ROUTINES

This section will list the name of the service routine; the selection key to depress to enter the service routine; and a description of how the routine operates.

These service routines can be grouped into three types of routines:

1. Program Creation Routines
2. Program Testing Routines
3. Program Operation Routines

1. Program Creation Routines

KEYBOARD KEYS	NAME AND DESCRIPTION
(R)	Reset Memory to the Origin-Pattern This routine stores a unique pattern of bits in each program (P) and storage (V) register. These bit-patterns, or origin-patterns, do not resemble any program instructions or legal data. The origin-pattern is different in each register. Since this routine destroys the previous contents of every register quickly, the depression of selection key R will not, by itself, activate this routine. When R is depressed, the word RESET will print. If it is truly desired to reset memory, the SHIFT key is held down with the left hand and the P4 key is depressed. The origin-pattern will then be established. If selection key R was accidentally depressed, and it is not desired to reset memory, depress any key. ERR will print. Control will return to OPUS. This routine <u>should</u> be selected prior to manually entering the instructions of a new application program. As instructions or data are entered, the origin-pattern in each used register is destroyed. This will indicate to OPUS which registers should be punched into the program tape, without the need for entering the beginning and ending register numbers.
(P) OR (V)	Register Mode Control. Prior to the selection of most service routines, the programmer must indicate which type of register (program or storage) the service routine is to affect. Once this indication is made, OPUS will maintain this mode until a different type of register is to be acted on. That is, a return to OPUS from a service routine will cause the same type of registers to be automatically selected for subsequent utility routines.

KEYBOARD KEYS	NAME AND DESCRIPTION
(O) OR (N)	Octal (O) or Decimal (N) Format.

If the register mode control (described previously) was set to storage (V) registers, the programmer has the option of entering or printing data in either octal (base 8) or decimal (base 10) format. Selection key O or N is depressed to indicate the format desired. Once this indication is made, OPUS will maintain the selected format until the other format is desired.

NOTE: OPUS monitors the use of all its routines. If it senses a violation to any rule governing its use, ERR will print and control will return to OPUS. The register mode control is automatically set to handle "P" registers and the format is set to octal (O).

(S) Store Instructions or Data.

This routine allows for the keyboard entry of symbolic program instructions into "P" registers, and data into "V" registers.

P-REGISTER ENTRY

1. Enter the numeric address (000-127) of the register whose instructions are to be keyed-in. The digits will print as they are entered.

2. Depress "#" key. This key indicates the end of an address entry. The # symbol prints, followed by a tab to position 19.

3. Enter the operation (symbolic) code of the instruction. The letters print as they are entered.

4. Depress the SPACE bar. This key indicates the end of the operation code.

5. Enter the additional code (if applicable) for the instruction. The additional code prints as it is entered.

6. Depress one of the following keys:

If another instruction is to be keyed into this same register. (The printer will line feed and tab to position 19 awaiting the entry of the next instruction.) Return to Step 3.

If this is the 4th line in the register, the printer will line feed, print an S, print out the address of the next register, print #, and tab to position 19 awaiting the entry of the first instruction. Return to Step 3.

This key stores the instructions into the specified register, line feeds, prints an S, and prints out the address of the next register. It then tabs to position 19 awaiting entry of the first instruction. Return to Step 3.

If this key is used and this was not the 4th instruction in the register, the unused instruction areas will be filled with automatic jumps before being stored into memory.

If no more instructions are to be keyed-in and a return to OPUS is desired. Any unused instruction areas in this register will be filled with automatic jumps prior to storing the register. Control will return to OPUS.

NOTE: If "ERR" prints, the entire register's contents must be re-entered. Probably an operation code or additional code was not within the required limits monitored by OPUS. Control returns to OPUS.

NAME AND DESCRIPTION

V-REGISTER ENTRY

1. Be certain the correct format (octal or decimal) is entered. The only legal digits for entering data in the octal format are digits 0 through 7. This format is primarily used for edit words. It may be used for positive constants but it must not be used for negative constants.

   In the decimal format, only digits 0 through 9 are legal. This format should be used for both positive and negative constants.

2. Enter the numeric address (00-63) of the register whose data is to be keyed-in. The digits will print as they are entered.

3. Depress the # key. The # symbol will print followed by a tab to position 25.

4. Enter the data. Each digit prints as it is entered. When entering constant data (either positive or negative) only the significant digits need be entered. OPUS will fill the positions to the left of the digits with zeroes. If a storage register is to contain all zeroes, one zero must be entered. When a negative value is entered, the minus sign may be entered any time prior to the entry of the end code. If a mistake is made while entering data in either the octal or decimal format, depress the HALT, READY, and RUN buttons. Control returns to OPUS. The routine can then be re-selected.

5. Depress one of the following end keys:

   [I]

   The contents of this register are stored in memory, the printer will line feed, S will print, the address of the next storage register will print followed by a tab to position 25 awaiting the entry of data to the next register. Return to step 4, above.

The contents of this register are stored in memory, and control returns to OPUS.

NOTE: If "ERR" prints, an illegal digit or key was depressed. Control returns to OPUS. The data must be re-entered.

KEYBOARD KEY	NAME AND DESCRIPTION
	Print Out Program or Storage Registers.

This routine prints out the contents of the specified registers. The printout of program registers is in the same symbolic form that it was entered. The printout of storage registers can be in the octal or decimal format selected.

TO PRINT OUT REGISTERS

1. Be certain the correct register mode is selected (selection key P or V). Then select the W key (print out routine).

2. Enter the numeric address of the first register to be printed. (Program registers 000-127; Storage registers 00-63.) The digits print as they are entered.

3. Depress the # key. (# prints.)

4. Enter the numeric address of the last register to be printed. The digits print as they are entered.

5. Depress the # key (# prints, followed by a line feed, a tab to position 1, and one space. The address of the first register prints, # prints, and a tab to position 25). The contents of the register prints out. This is repeated for each register in the range specified. When the contents of the last register have been printed, control returns to OPUS.

The format of an octal printout is:

X XXX XXX XXX XXX

The format of a decimal printout is:

XXX.XXX.XXX.XXX

NOTE: During the printout of P-registers, when OPUS recognizes the origin-pattern as the contents of the program register, the register address is printed, followed by the printing of the word "empty". The printout continues to the next register address. If the origin-pattern is recognized while printing storage registers, the pattern is printed octally or decimally depending on the mode selected.

KEYBOARD KEYS	NAME AND DESCRIPTION
L	Punch Tape Leader. This routine punches about four inches of tape leader automatically.
T	Punch Program Into Tape. This routine will punch, in sequence, the contents of all program and storage registers which vary from their origin-pattern. Only those registers which contain program instructions and data will be punched into tape.
P2	Verification of Program Tape. With the newly created program tape on the reader (device 2 input), this routine will compare the contents of the registers punched in tape with the corresponding contents in memory. If a discrepancy is found, "COMP ERR" will print and control will return to OPUS. The tape should be thrown away and another one punched.

2. Program Testing Routines

KEYBOARD KEY	NAME AND DESCRIPTION
@	Change the Contents of a Register.

This routine allows the printing of the contents of a specific program or storage register. The option is then available to change or accept the printed contents. The contents of program registers will be in symbolic format. The contents of storage registers will be either octal or decimal depending on the format selected.

TO PRINT A PROGRAM REGISTER

1. Enter the numeric address (000-127) of the register to be printed. The digits print as they are entered.

2. Depress the # key. (# prints, followed by a tab to position 19.)

3. The first instruction in the register is printed, followed by a tab to position 37.

4. If the instruction is acceptable, depress one of the following:

   [I]

   The next instruction will print.

   [II]

   The contents of this register will be stored in memory. The first instruction of the next register will print.

   [←]

   The contents of this register will be stored in memory and control will return to OPUS.

NAME AND DESCRIPTION

5. If the instruction is to be changed, enter the operation code; enter a space; enter the additional code (if applicable) enter either the control I, control II or return key as described in step 4, above.

TO PRINT A STORAGE REGISTER

1. Enter the numeric address (00-63) of the register to be printed. The digits print as they are entered.

2. Depress the # key. (# prints, followed by a tab to position 25.)

3. The data print, followed by a tab to position 37.

4. If the data are acceptable, depress one of the following keys:

   [I]

   The contents of this register will be stored in memory and the data in the next register will print.

   [←]

   The contents of this register will be stored in memory and control will return to OPUS.

5. If the data are to be changed, enter the new data. The digits print as they are entered.

6. Depress the control I or the return key as described in step 4, above.

NOTE: If a register will no longer be used by the application program and it is desirable to delete it from the next program tape to be punched, refer to the origin pattern list in the appendix to find out what origin pattern to enter. Setting the register back to its own origin-pattern indicates to OPUS not to punch it in tape. Setting a storage register to zero will not keep it from being punched to tape.

KEYBOARD KEYS	NAME AND DESCRIPTION
X	Print Out Register A. This routine will print out the contents of register A with a decimal format.
Y	Print Out Register B. This routine will print out the contents of register B with a decimal format.

NOTE: When testing a program, it may be desirable to print out the contents of register A (X); register B (Y); or a storage register (Q) immediately after an arithmetic function has been performed. The special instruction "OPUS" may be substituted for a program instruction which immediately follows the arithmetic function. When the program reaches the instruction "OPUS", control will return to OPUS. The appropriate test can then be selected.

3. Program Operation Routines

KEYBOARD KEYS	NAME AND DESCRIPTION
PI	Read Program Tape Into Memory. This routine will read a program tape and store the instructions and data in the P and V registers.
IIII	To Process an Application Program. This routine will transfer control out of OPUS and to the first instruction in P00. The 1231 will then begin processing the application program.

NOTE: During the testing of an application program, if the program executes a jump to a program register which contains the origin-pattern, "empty ERR" prints, and control returns to OPUS. The error can then be corrected.

SUMMARY

Sequence of operations to create, test and operate an application program:

1. Enter OPUS via start-up restart procedure.

2. Reset memory - key R, then shift key and P4 key.

3. Select register mode if not already selected. Key P, for program registers; key V, for storage registers.

4. Select format (octal or decimal) if key V was entered and the desired format was not previously selected. Key O for octal format; key N for decimal format.

5. Select the STORE routine. Key S.

6. Enter the numeric address and the # key of the desired register.

7. Enter the symbolic program instructions or data as outlined in the description of the STORE routine.

8. Continue to store instructions and/or data until the RETURN key is depressed and control is returned to OPUS.

9. Printout P and V registers for verification of correct entry. Key W.

10. Punch Tape Leader - key L.

11. Punch out program tape - key T.

12. Punch Tape Leader at the end of the tape - key L.

13. Verify the punched tape - key P2.

14. Test the program using key Q for register changes; key W for V-register printout; key X and Y for registers A and B printout.

15. Operate the program -- Using key P1 to read the program into memory; and control key IIII to pass control to the first instruction in P00 to begin processing the application program.

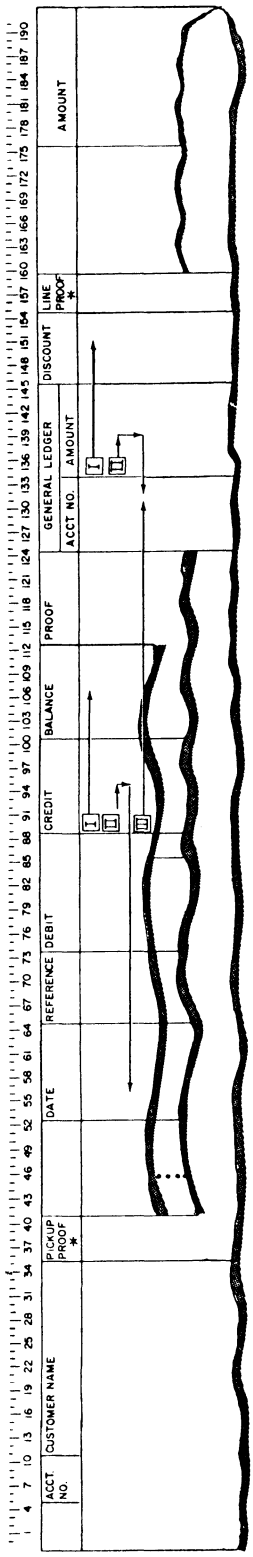


Figure 8.2

OPERATOR INSTRUCTIONS

An operating instruction card accompanies each application program. The card is specifically prepared for the customer's use and includes information for paper positioning in the printer, use of program selection and control keys, and other pertinent information. Two samples of cards are shown in Figures 8.2 and 8.3.

In addition to the operating instruction card, an operator set-up sheet similar to that shown in Figure 8.4 is supplied for each application. This sheet lists the types of forms to be used and the specific set-up for the printer.

OPERATING INSTRUCTION CARD

Each card is designed for a specific customer program. The card is inserted above the form guide and below the transparent plastic cover on the printer's position scale, number 6, Figure 6.2. Print positions on the instruction card are the same as those on the print position scale.

The sample card of Figure 8.2 shows three different media locating points. A journal roll between print positions 1 and 191, with the right side folded over and back to position 160. A ledger card is located between print positions 41 and 124 and above it is a statement between print positions 41 and 113.

Figure 8.3 shows a similar arrangement with a customer ledger on the left platen and a pin-feed invoice form on the right side. The pin-feed form again is transported by the form tractor and the ledger card moves up when the left-hand platen rotates.

Key labels on the instruction card indicate the function of various keys. Labels in Figure 8.3 are inserted in the outline of the instruction card form only for illustration purposes.

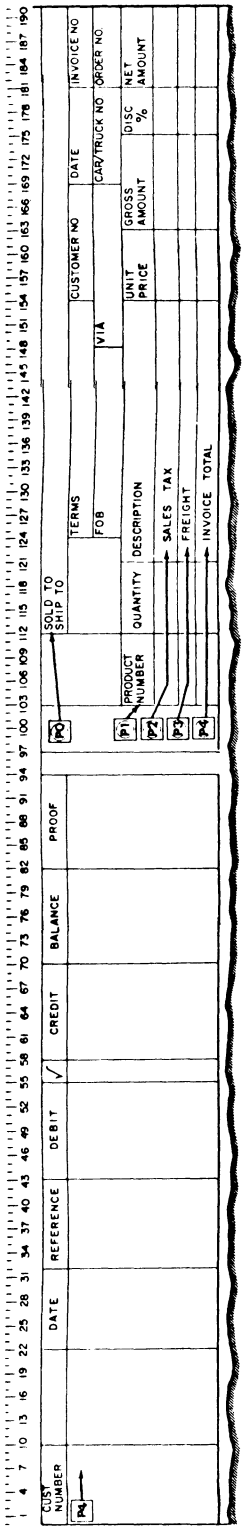


Figure 8.3

GENERAL PROGRAM OPERATION

The operator determines what program routine is to be performed. The Operating Instruction Card for that program is selected and inserted in the printer's position scale. The operator then selects the necessary forms and inserts them in the printer. The system is turned ON and the printer is set up according to the Operator Set-up Sheet.

The operator determines from the instructions what tape has to be loaded into the reader and selects it accordingly. The operator also determines whether the punch is to be used. If so, the operator inserts tape of sufficient length for the desired program purpose. The operator makes sure that the tape is free to move. The chad box in the tape drawer must be empty and in place. Media must be inserted correctly and tape tension switches and the cover must be closed.

The operator selects the necessary files and/or records to obtain information which must be entered into the system. The operator then checks to make sure that parity and mode switches are set correctly. Following the operating instructions and the Operating Instruction Card, the operator then starts the program.

OPERATOR SET-UP SHEET

APPLICATION | DATE

PRINTER SET-UP

REAR PRESSURE ROLLER LEVER

	LEFT		RIGHT	
OPEN	☐	REAR	☐	OPEN
CLOSED	☐	FORWARD	☐	CLOSED

FRONT PRESSURE ROLLER SELECTOR

CLOSED	☐	TOP	☐	CLOSED
O/C	☐	CENTER	☐	O/C
OPEN	☐	DOWN	☐	OPEN

PLATEN SPLIT ☐ JOINED ☐

FORM CHAIN YES ☐ NO ☐

LEDGER BOTTOM STOPS YES ☐ NO ☐

LEDGER GUIDES POSITION FROM ☐ TO ☐

PARITY SWITCH ODD ☐ EVEN ☐

MODE SWITCH PUNCH POSITION 1 ☐ 2 ☐ 3 ☐

FORMS	NAME OR TYPE	POSITION	
		FROM	TO
1.			
2.			
3.			
4.			
5.			

READ INPUT FILES

PUNCHED OUTPUT RECORDS

PROGRAM NAME OR IDENTIFICATION

EP 30 ☐ APPLICATION

_____ ☐ UTILITY

Figure 8.4

SECTION 9

ERROR HALTS

PARITY AND OTHER ERRORS

The various EP/31 instructions contain controls that check for odd parity on input and the entry of an excessive number of digits on input. There are also input controls on reading and distributing a data tape.

The EBS/1231 will automatically halt the program when one of these controls is violated. A pattern of lights will be displayed on the 1231 console indicating the reason for the halt. The following is the 1231 console panel of lights and switches.

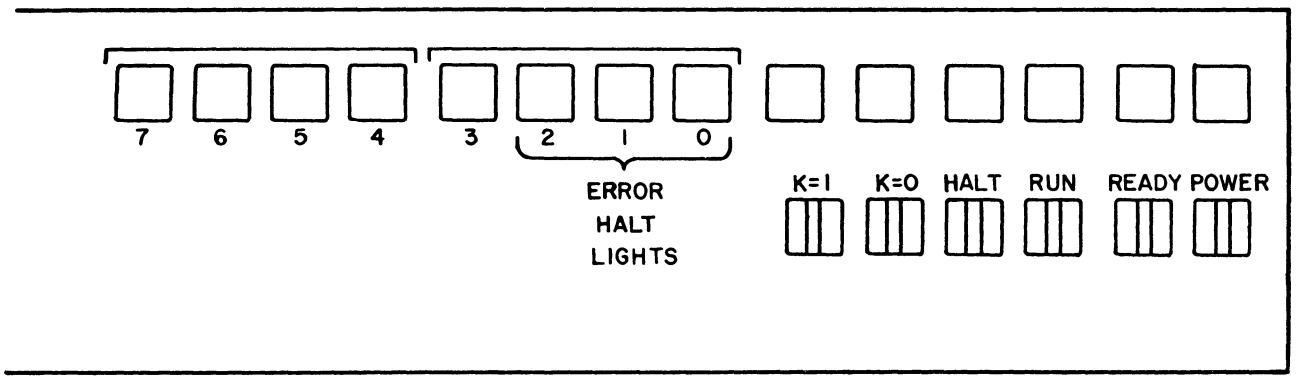


FIGURE 9.1

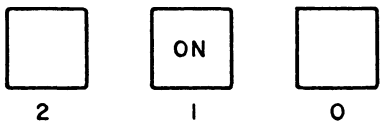
When the program halts, the RUN light will go out. Lights numbered 3 through 7 will go out; and a variable pattern of lights (numbered 0 through 2) will appear lit on the console.

The lights numbered 0 through 2 will be lit in the following pattern:

LIGHT PATTERN	REASON FOR HALT
2: off, 1: off, 0: ON	Parity error or an excessive number of digits entered in the input command. (Keyboard selected.)

CORRECTION PROCEDURE

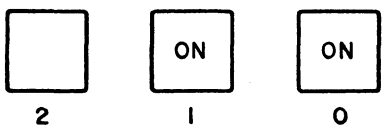
1. Depress keyboard RELEASE button.
2. Depress the CLEAR key.
3. Depress the RUN button on the console.
4. Re-enter the entire field.



Parity error on the SCI command. (Key board selected.)

CORRECTION PROCEDURE

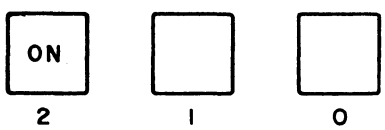
1. Depress keyboard RELEASE button.
2. Depress the RUN button on the console.
3. Re-enter the character.



Parity error detected during keyboard entry of alpha-numeric data. (DUP instruction.)

CORRECTION PROCEDURE

1. Depress keyboard RELEASE button.
2. Depress the RUN button on the console.
3. Re-enter the character.



A parity error was detected while reading a numeric field from tape.

CORRECTION PROCEDURE

1. Depress the REVERSE FEED button on the reader once.
2. Depress the RUN button on the console.
3. If the error halt is repeated, a parity error (even parity) is actually present in the tape. Refer to the error correction procedures of the application program involved.

ON		ON
2	1	0

An excessive number of digits were read from tape during the execution of the input command.

CORRECTION PROCEDURE

If both keyboard and reader are selected, make the correct entry through the keyboard as follows:

1. Open the reader tight-tension switch.

2. Move the tape in the reader so that the sensing pins are under the first code of the next field in the tape.

3. Depress the CLEAR key on the keyboard.

4. Depress the RUN button on the console.

5. Manually re-enter the field.

6. Close the tight-tension switch on the reader. Processing will continue.

If the keyboard is not selected, refer to the error correction procedures of the application program involved.

ON	ON	
2	1	0

A parity error was detected while reading a SCI character or while reading an alpha-numeric field from tape (DUP instruction).

CORRECTION PROCEDURE

Re-read the character as follows:

1. Depress the REVERSE FEED button on the reader once.

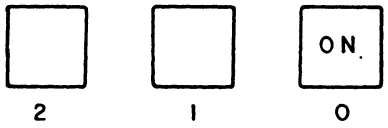
2. Depress the RUN button on the console.

3. If the error halt is repeated, a parity error is present in the tape. Refer to the error correction procedures of the application program involved.

ON	ON	ON
2	1	0

This error halt designates a control was violated while executing a distribution instruction. To determine the specific error involved, depress the HALT button on the console once. A new display of lights will appear. Refer to the section on Distribution Error Halts for the specific error and correction procedure.

DISTRIBUTION ERRORS



The DIST instruction has detected one of two errors:

1. A non-numeric character was detected in an address field that did not have an ignore code in the corresponding digit-position of the distribution edit word.

2. An end code in the distribution edit word was processed, and there was no end character in the corresponding position in tape.

CORRECTION PROCEDURE

1. Depress the STEP REVERSE switch on the reader once.

2. Depress the RUN button on the console. The character on tape will be re-read. If the character was accepted this time, processing will continue.

   If the character was in error again, processing will halt.

   A) Mark the tape so that it can be checked after the run.

   B) Depress the K=1 switch on the console.

   C) Depress the RUN button on the console. The program will search the tape for the start code of the next address field.

	ON	
2	1	0

The DIST instruction has detected a parity error (even parity in the tape).

CORRECTION PROCEDURE

Same as the correction procedure for the Error Halt on the preceding page.

	ON	ON
2	1	0

The DGET or DPUT instruction found a D-register address outside the range of 000 to 499 in register V07.

CORRECTION PROCEDURE

Depress the RUN button on the console. Control returns to OPUS.

OUTPUT PARITY ERROR

When the EBS/1231 recognizes the output of EVEN parity (parity error), the following sequence occurs:

1. The PARITY LIGHT on the Model 70 Punch comes ON.

2. Processing halts.

CORRECTION PROCEDURE

1. Depress the RAPID ADVANCE SWITCH. Produce enough tape leader so that a proper identification of the error can be written on the tape.

2. Label the tape with a reference to the record being processed.

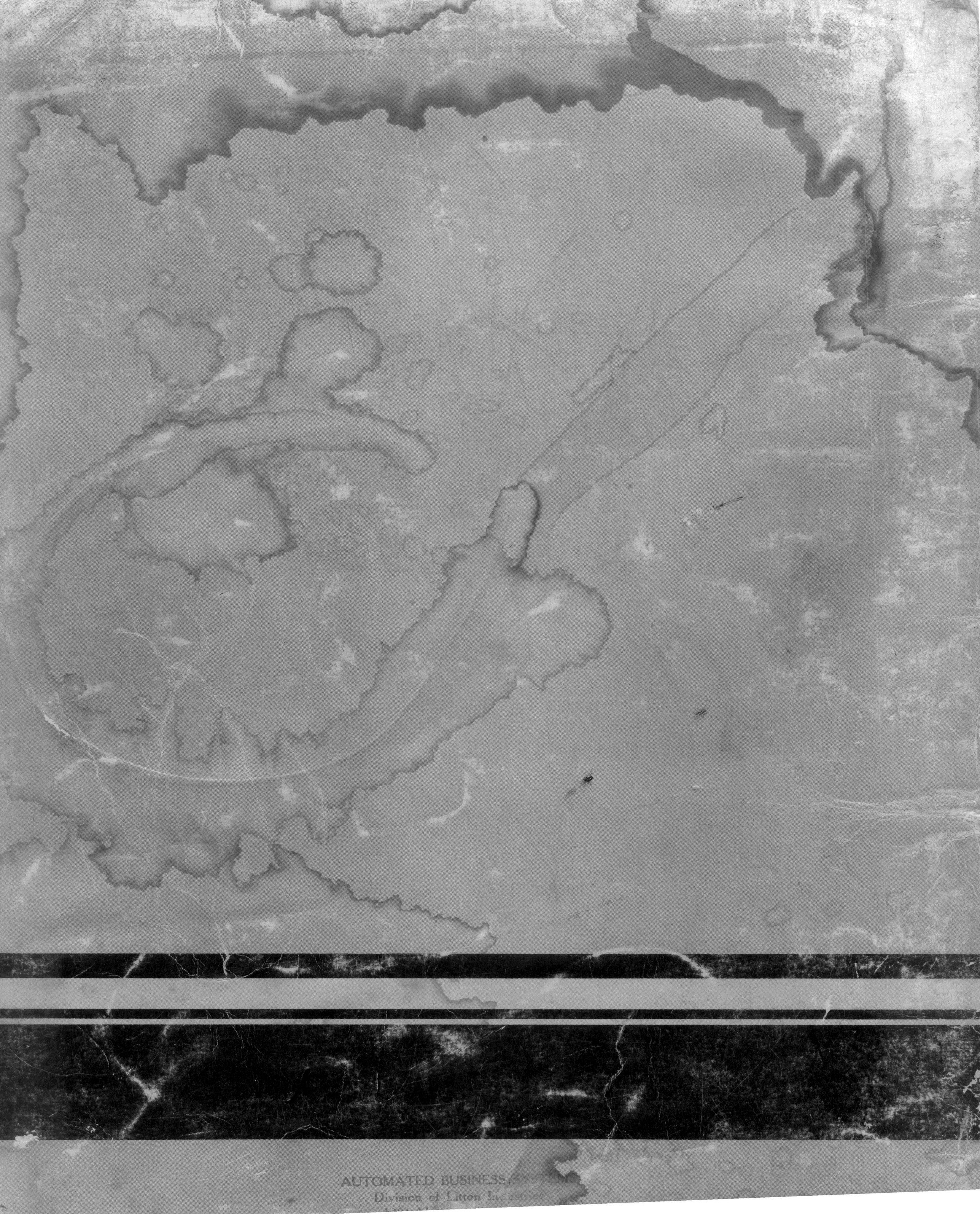
   EXAMPLE: Employee number, Invoice number, Product number, etc.

3. Open the TAPE-TENSION SWITCH on the punch.

4. Turn the MODE KEY on the punch to the middle position. The PARITY LIGHT goes OFF.

5. Turn the MODE KEY back to the right position.

6. Close the TAPE-TENSION SWITCH on the punch. Processing continues.



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