37 KEYBOARD UNIT

DESCRIPTION AND PRINCIPLES OF OPERATION

CONTENTS PAGE

1. GENERAL

1.01 This section provides the description and principles of operation for the late design, 11-contact 37 keyboard unit (Figure 1). Since this is a general revision, marginal arrows denoting added or changed information have been omitted from this section.

1.02 The keyboard is an electromechanical device that utilizes a set of contacts as a means for converting mechanical motion of depressed keytops into parallel electrical code paths. These paths when connected into external electronic logic are converted into the 7-level ASCII (American National Standard Code for Information Interchange — X3.4-1968). The eighth bit level in the keyboard output is for parity. The motor unit and 37 reset mechanism on the printer base unit are described in Sections 570-220-100 and 574-331-100 respectively.

1.03 Specific information covering adjustments and the lubrication of the keyboard unit can be found in Sections 574-321-703 and 574-321-704 respectively.

2. DESCRIPTION

BASIC UNIT

2.01 The keyboard unit contains the major mechanisms to establish the seven-bit code for 128 graphic and function characters and the eighth parity bit. A graphic is a character which is printed and a function causes a mechanical or electrical action to be performed.

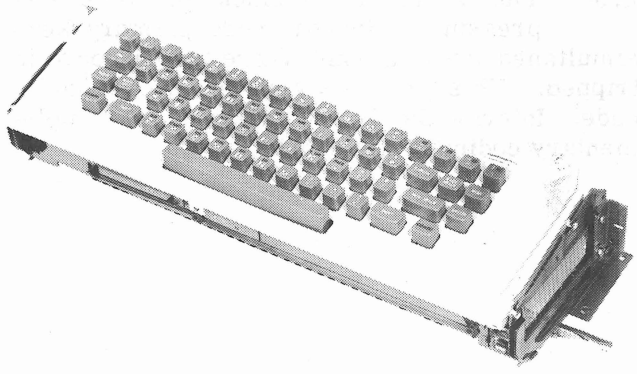


Figure 1 - 37 Keyboard Unit

Prepared for American Telephone and Telegraph Company by Teletype Corporation

2.02 The major mechanisms are described in the upper portion of Figure 2. The keyboard mechanism is further divided into several basic mechanisms which are identified in Figure 4.

2.03 The passive elements (nonoperating) are described in the lower portion of Figure 2. The electrical connector for the keyboard is also identified in Figure 2.

2.04 The theory of operation for the 37 reset mechanism on the base unit (Figure 3) is also described in this section since it and the keyboard are complementary mechanisms during operation. For additional information regarding assembly of the reset mechanism to the base unit and other variations refer to Section 574-331-100.

2.05 The control panel is a separate assembly apart from the keyboard unit. Button switch arrangements vary accordingly with the features and controls provided on the teletypewriter set. The control panel is mounted to the left and right brackets of the keyboard and has a connector receptacle that interconnects to the pan and cover assembly wiring. Only a brief description of the control panel is provided in this section. For a detailed description of the control panel switch buttons refer to the appropriate teletypewriter set description section.

STANDARD FEATURES

A. Keylever Interlock

2.06 The keylever interlock prevents depressing of two or more primary keys simultaneously to a point where the keyboard is tripped. This prevents generation of a faulty code. Interlocking is accomplished by complimentary coding of the codebars.

B. Code Selection Lock

2.07 The code selected by depressing a key is locked in place by the trip arm. The trip arm locks the codebars in position during the code sampling period. At the end of the code sampling period the reset mechanism on the printer base, returns the trip arm to its unoperated position, thus, removing the code selection lock.

C. Nonrepeat and Repeat

2.08 The nonrepeat and repeat features are provided for all keylevers which trip the keyboard mechanism. Depressing a key to its first stop position (normal downstop) trips the keyboard mechanism, and the character is transmitted once. To transmit the same character again, the key must be released and again depressed.

2.09 Further depression of the key, beyond the normal downstop position, places the keyboard mechanism in the repeat condition and the character is transmitted until the key is released.

VARIABLE FEATURES

A. Nonrepeatable Keys

2.10 Any key which trips the keyboard mechanism can be made nonrepeatable by inserting a repeat blocking clip in the front of the unit. The associated key then cannot be depressed beyond the normal downstop position. The repeat blocking clip can be inserted or removed as desired.

B. Auxiliary Contacts

2.11 In addition to the keyboard auxiliary contacts additional auxiliary contacts and a cam can be mounted on the base unit reset mechanism (2.04). This feature provides additional external timing or control pulses to operate the electronic logic of associated pheripheral equipment whenever a keyboard keytop is depressed.

KEYBOARD MECHANISM

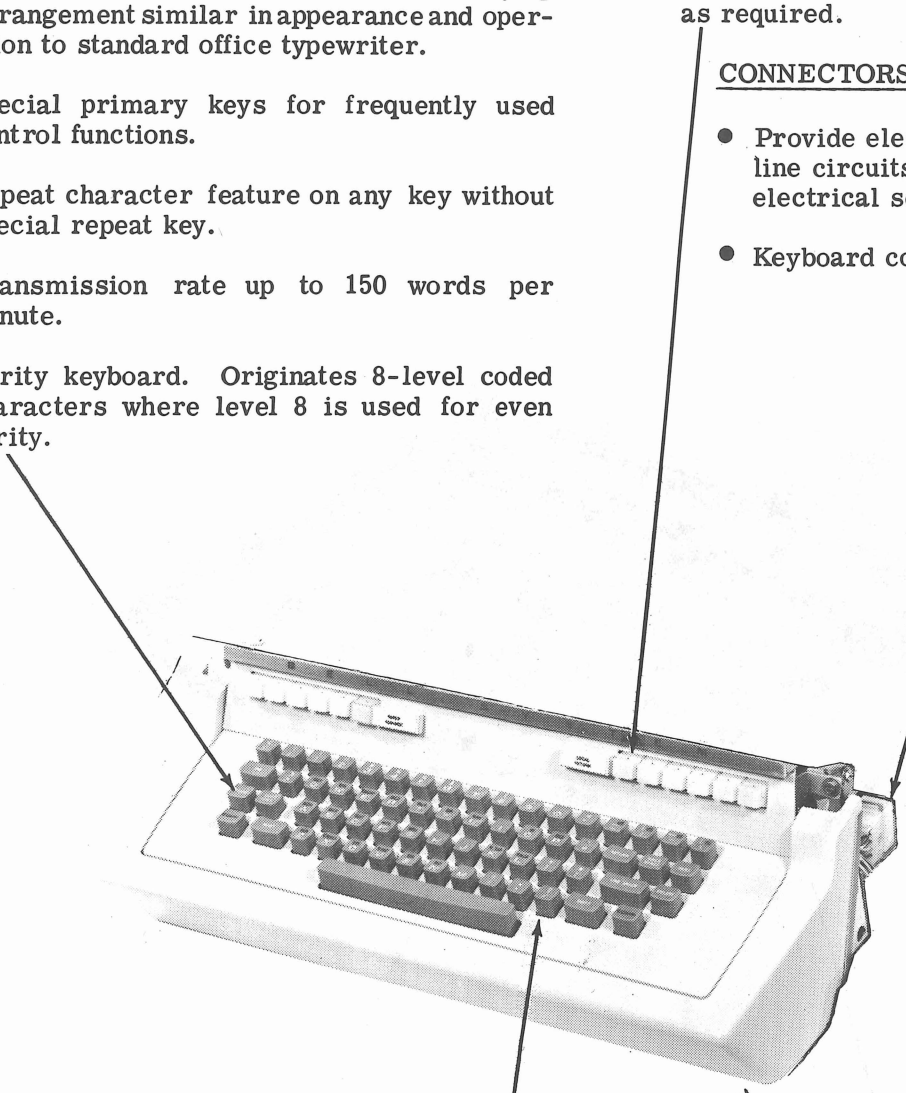
- Contains required keytops, codebars, and contacts to provide electrical paths for parallel code output.
- Upper and lower case characters. Keytop arrangement similar in appearance and operation to standard office typewriter.
- Special primary keys for frequently used control functions.
- Repeat character feature on any key without special repeat key.
- Transmission rate up to 150 words per minute.
- Parity keyboard. Originates 8-level coded characters where level 8 is used for even parity.

CONTROL PANEL

- Local function keys.
- Special control keys and indicators.
- Additional keys and indicators may be added as required.

CONNECTORS

- Provide electrical interface for signal line circuits between keyboard unit and electrical service unit.
- Keyboard contact receptacle.



KEYTOP GUIDE

- Restrains horizontal motion of keytops.
- Protects keyboard mechanism from dust and other hazards.

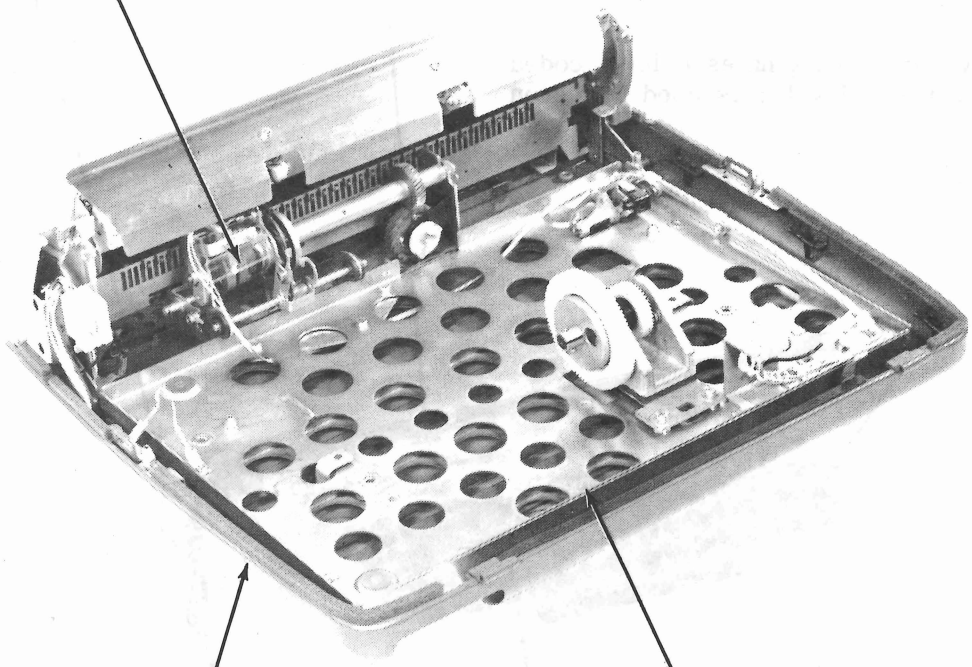
KEYBOARD HOUSING

- Protects keyboard mechanism from dust and other hazards.
- Modern styling.

Figure 2 - Keyboard Unit (Right Front View)

RESET MECHANISM

- Mechanically resets keyboard mechanism.
- Auxiliary cam and contacts for code sampling.
- Mechanically driven from typing unit.



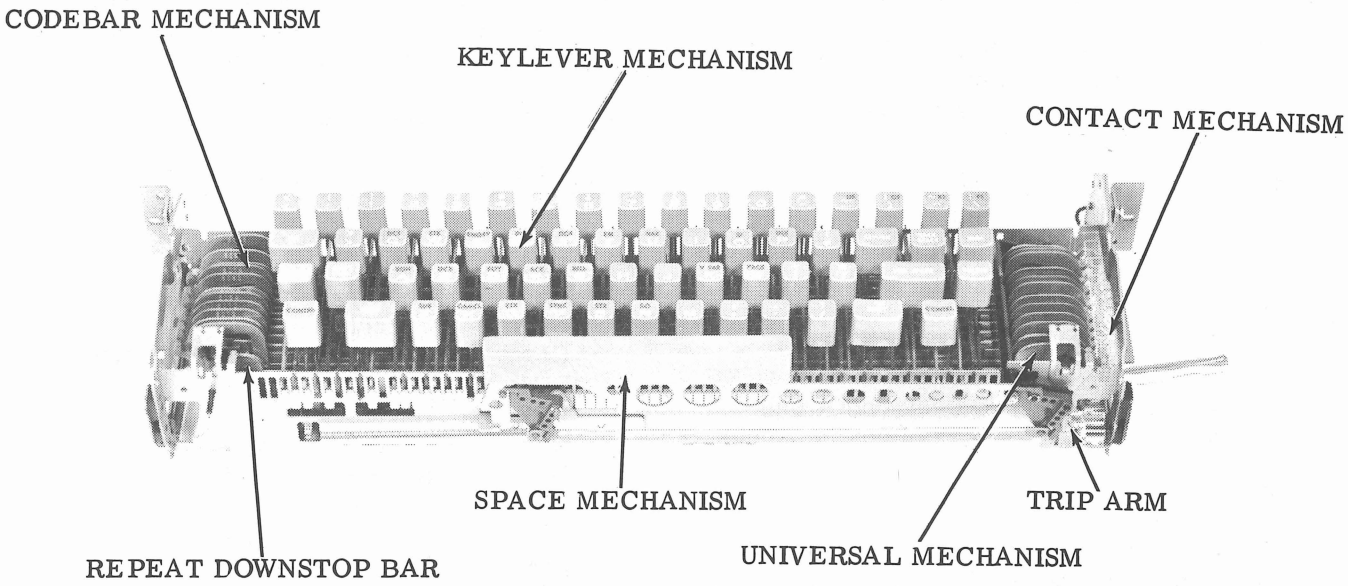
PAN

- Provides mounting facilities for base and keyboard mechanism.
- Provides shock mounting for base.

BASE

- Provides mounting facilities for typing unit and motor unit.
- Contains holes to suppress operating noise level.

Figure 3 - Keyboard Unit, Pan, and Base Unit (Right Rear View)



(Front View)

Figure 4 - Basic Mechanisms

TECHNICAL DATA

A. Physical Characteristics

YK801

Weight	5 pounds
Height	4-1/4 inches
Width	18 inches
Depth	6-1/4 inches

YK805

Weight	5 pounds
Height	4-5/8 inches
Width	16-3/4 inches
Depth	6-1/4 inches

2.12 The YK801 keyboard left and right brackets mount the keyboard to the cover pan of the printer set using four screws. Electrical connections from the keyboard contacts are routed along and terminate in a connector on the right side of the keyboard.

2.13 The YK805 keyboard is designed for mounting to the cover pan of the skintight hardened cover. Two screws secure the right side of the keyboard frame in place, and one screw and locating tab secure the left side frame. The keyboard is designed to fit within a maximum pan dimension of 17-3/8 inches.

B. Electrical Characteristics

Keyboard Mechanism	
Electrical contact ratings	+5.25 v dc (nominal) +48.00 v dc (maximum) +1.00 ma (nominal) +18.00 ma (maximum)
Reset Mechanism	
Keyboard auxiliary contact	-12.5 v dc (nominal)
Control Panel	
Lamps and Switches	25 v dc, 30 ma (nominal)

Note: Once used in applications over 20 volts dc, contacts can no longer be used in applications under 20 volts dc at a later time.

C. Signaling Code

Levels	Eight
Mark	Closed contact
Space	Open contact
Parity	Even

D. Keyboard Auxiliary Contacts

150 wpm — Closes 2.5 to 8.5 msec after reset camshaft begins to rotate and will remain closed 51 to 55 msec.

100 wpm — Closes 3.6 to 12.5 msec after reset camshaft begins to rotate and will remain closed 74 to 80 msec.

E. Keylever Spring Tension

Normal	Less than 7 ounces
Repeat	Less than 54 ounces

F. Environment

Temperature Ranges — This equipment is intended to be operated in a room environment within the temperature range of 40° F to 110° F. Serious damage to it could result if this range is exceeded. In this connection, particular caution should be exercized in using acoustical or other enclosures.

Relative Humidity Range

Minimum	0%
Maximum	95%

G. Character Arrangement

2.10 The character arrangement of the keytops is as shown in Figure 5. The keytop arrangement is similar to that of a standard office typewriter. In addition, frequently used control functions are provided as primary keys. Designations within keytop are as they appear on the mechanism. Designations shown above the keytop are control function legends. The following chart lists the control character legend and designation. The function as screened on the keytop is listed for those designations where the screening and legend differ.

H. Control Characters

LEGEND		DESIGNATION
ACK	-	Acknowledge
BEL	-	Bell
BS	-	Backspace
CAN	-	Cancel
CR	-	Carriage return (RETURN)
DC1	-	Device control 1
DC2	-	Device control 2
DC3	-	Device control 3
DC4	-	Device control 4
DEL	-	Delete
DLE	-	Data link escape
EM	-	End of medium
ENQ	-	Enquiry
EOT	-	End of transmission
ESC	-	Escape
ETB	-	End transmission block
ETX	-	End text
FF	-	Form feed
FS	-	File separator
GS	-	Group separator
HT	-	Horizontal tabulation (TAB)
LF	-	Line feed (NEW LINE)
NAK	-	Negative acknowledge
NUL	-	Null
RS	-	Record separator
SI	-	Shift in
SO	-	Shift out
SOH	-	Start of heading
SP	-	Space
STX	-	Start text
SUB	-	Start of special sequence
SYN	-	Synchronize
US	-	Unit separator
VT	-	Vertical tabulation (VT)

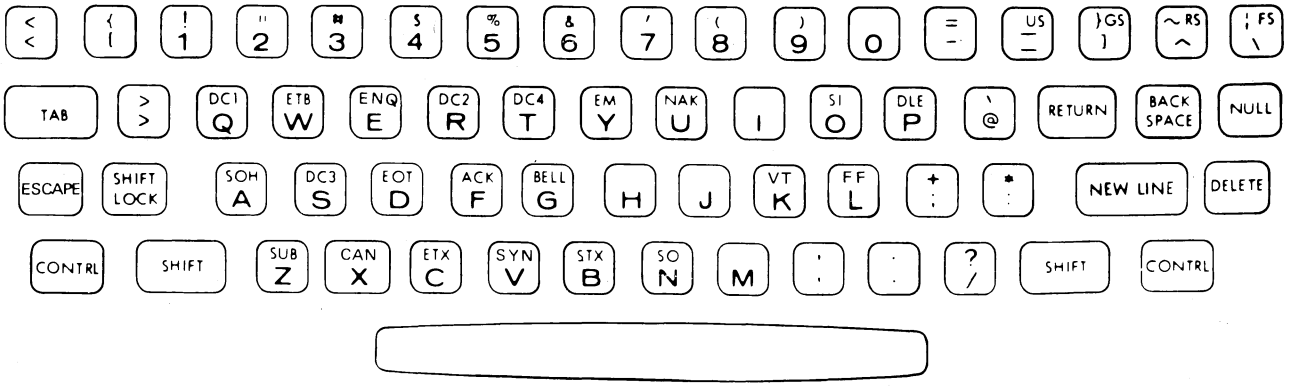


Figure 5 - Typical Keyboard Arrangement

3. PRINCIPLES OF OPERATION

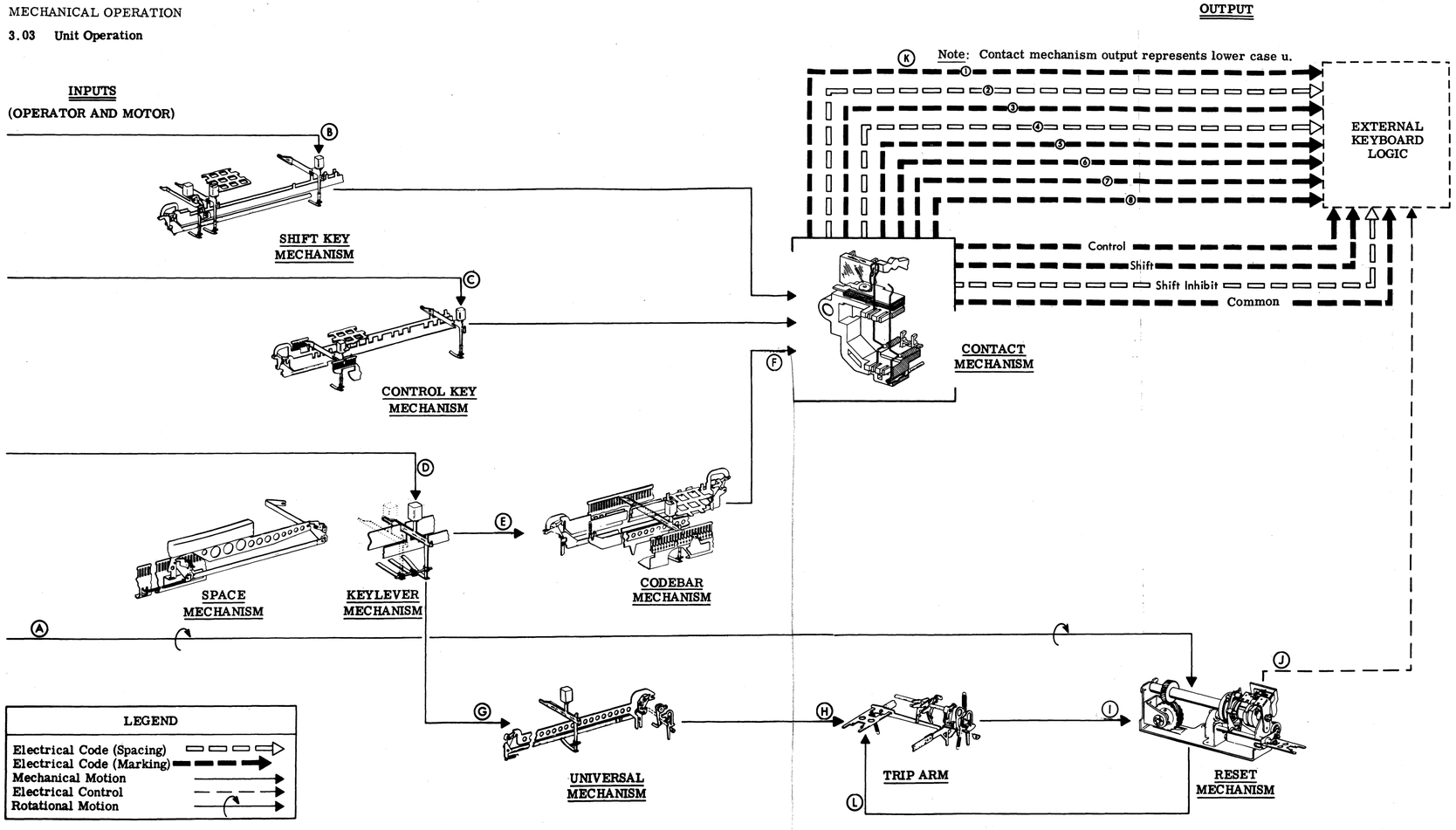
3.01 The principles of operation are divided into the mechanical operation and the electrical code generating logic of the keyboard unit. The mechanical operation is presented in: (1) a pictorial schematic of the unit; and (2) a series of mechanism drawings. Each illustration is supported with appropriate text to describe the purpose and operation of the mechanism. Where possible, the mechanism drawings are arranged in the order in which the mechanism operates. The electrical operation is limited to the elements which logically generate the eight levels of binary information.

3.02 The contents of this part are listed alphabetically in the operational index.

OPERATIONAL INDEX

MECHANICAL OPERATION

3.03 Unit Operation



OPERATION

- (A) Continuous rotational motion applied to main shaft of reset mechanism.
- (B) Depress SHIFT key to modify output of contact mechanism. Must be depressed before primary key.
- (C) Depress CONTROL key to modify output of contact mechanism. Must be depressed before primary key.
- (D) Depress primary key to select primary shift, or control character.
- (E) Engage and operate codebars other than SHIFT or CONTROL. (SHIFT and/or CONTROL codebars operated when SHIFT and/or CONTROL keys are depressed.)
- (F) Arrange code generating contacts.
- (G) Engage and operate universal codebar.
- (H) Release trip arm.
- (I) Engage cam sleeve with main shaft of reset mechanism.
- (J) Close keyboard auxiliary contacts to initiate sampling period of contact mechanism.
- (K) Keyboard output in form of circuit paths furnished to external logic for processing and character or control generation.
- (L) After sampling contact mechanism, reset trip arm.

3.04 Keyboard Mechanism

SHIFT KEY MECHANISM

Purpose

Changes character output of graphic primary keys from lower case graphics to upper case graphics, and mechanically blocks undesired primary keys.

Operation

The SHIFT key, when depressed, operates the shift codebar set, only. It does not trip the keyboard; ie, a recess in the SHIFT LOCK and both SHIFT keylevers prevent the keylevers from engaging the universal bar. The shift codebar set is spring biased so that the rear codebar is held upward. The rear codebar has two tine extension slots to receive the extensions of the two keylevers. When either SHIFT keytop is depressed, the other SHIFT keytop descends. The keylever is depressed against its leaf spring and the shift codebar spring. When the rear codebar descends, the front codebar ascends to mechanically block undesired primary keys; and the shift contacts are operated to alter the keyboard logic circuit. When released, the codebar set returns to its normal unoperated condition. To generate an upper case graphic, the SHIFT key must first be depressed followed by an unblocked primary key. The primary key trips the keyboard.

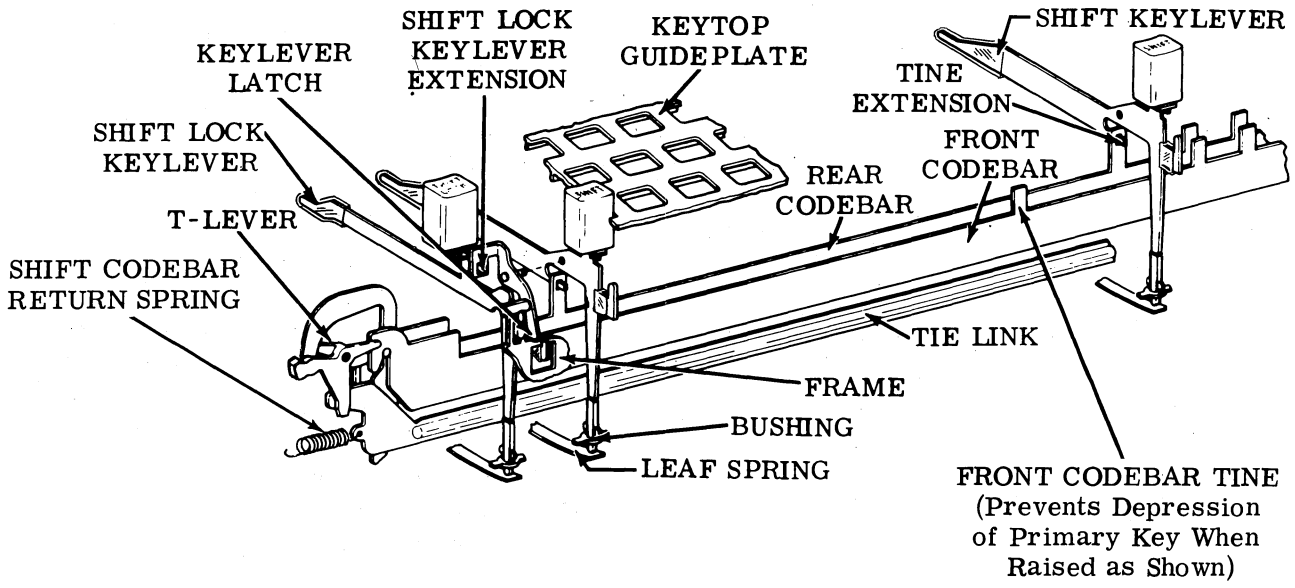
SHIFT LOCK

Purpose

Holds SHIFT key down.

Operation

With SHIFT LOCK key unoperated, the shift keylever latch will pivot toward rear as the SHIFT key is depressed. As SHIFT LOCK key is depressed, the shift lock keylever extension rotates keylever latch which carries the shift keylever downward. When SHIFT LOCK key is near lower end of its travel, the shift keylever latch engages the opening in the basket frame to hold SHIFT LOCK and both SHIFT keys in their depressed positions. To unlock, SHIFT key must be depressed further to unhook the shift keylever latch. Depressing SHIFT key while in lock condition will cause the shift keylever latch to rotate toward the rear and unhook itself from the basket frame. With no pressure on SHIFT LOCK key, the shift lock keylever will lead the shift keylever during upward travel, thereby holding shift keylever latch toward the rear as both keys ascend.



3.05 Keyboard Mechanism (continued)

CONTROL KEY MECHANISM

Purpose

Changes character output of certain primary keys from graphics to their control function equivalents, and mechanically blocks undesired primary keys.

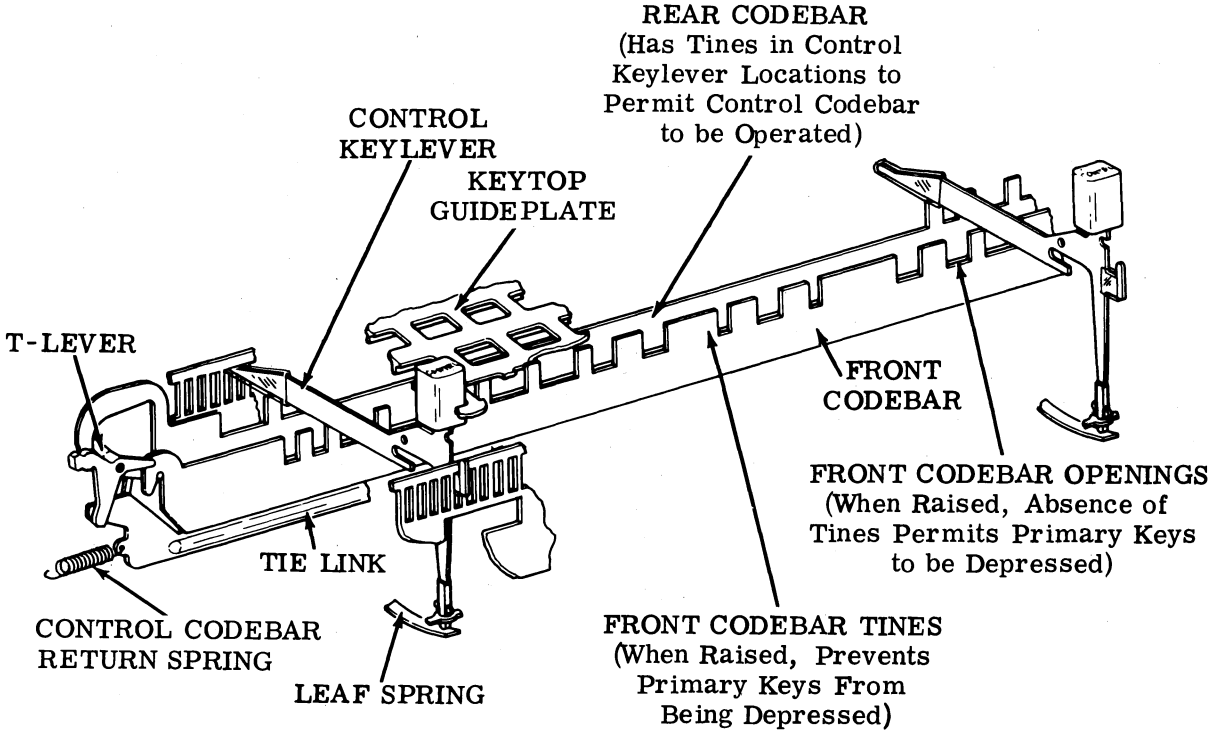
Operation

The CONTRL (control) key, when depressed, operates the control codebar set only. It does not trip the keyboard, ie, a recess in each control keylever prevents the keylever from engaging the universal bar. The control codebar set is spring biased so that the rear codebar is held upward. The rear codebar accepts the CONTRL key input to operate the codebar set. When operated, the rear codebar descends as the front codebar ascends. The control contacts are operated to modify the keyboard logic circuit. The front codebar rises to prevent certain primary keys from being depressed. The presence of a tine in the front codebar prevents the primary key from being depressed; the absence of a tine permits the key to be depressed. The CONTRL key must first be depressed followed by an unblocked primary key in order to generate a function character. When released, the control codebar set, contacts, keylever, and keytop return to their normal unoperated position.

CONTROL FUNCTIONS

Operation

Control functions can be generated from special primary keys or from CONTRL plus graphic primary keys. The same control function cannot be generated by both methods. When a primary key exists for a control function, eg, RETURN, both this primary key and the graphic primary key, M, would be blocked on control. RETURN can be generated in the shift or unshift mode but not in the control mode.



3.06 Keyboard Mechanism (continued)

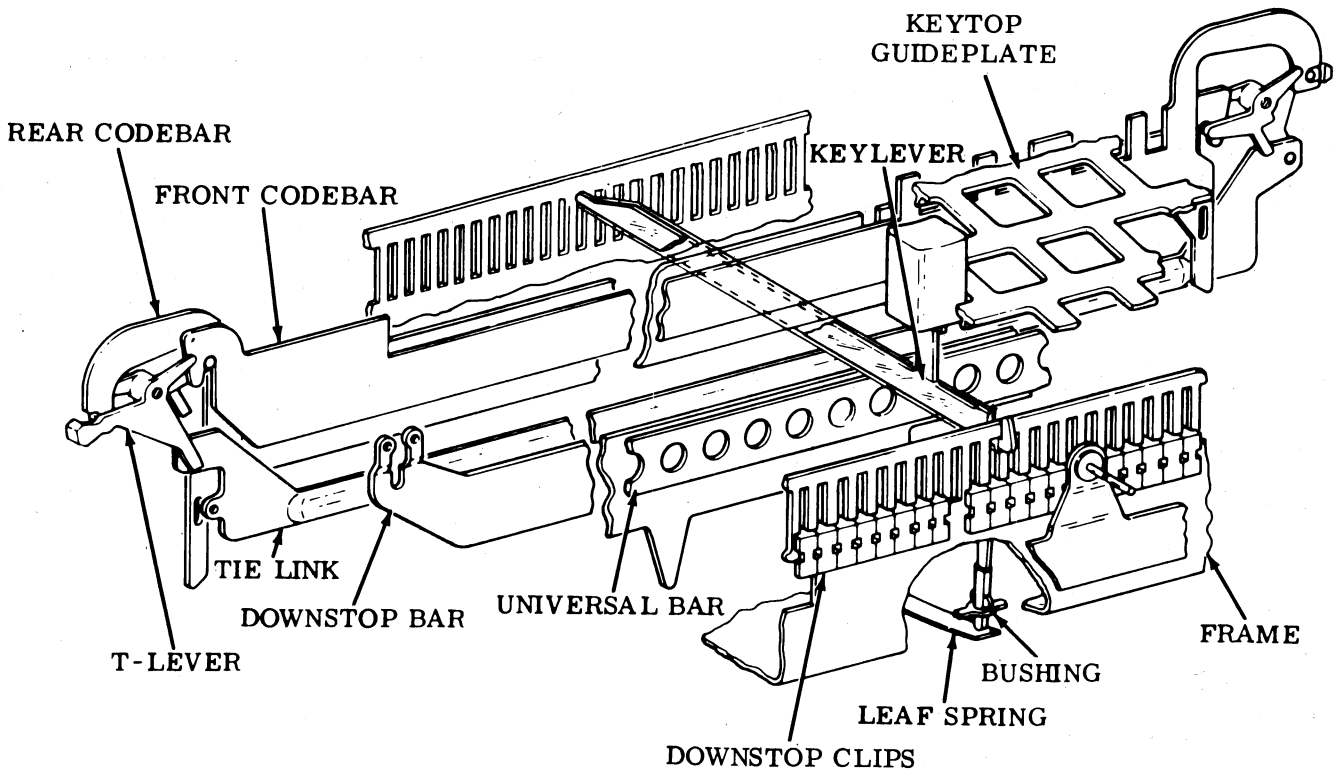
KEYLEVER MECHANISM

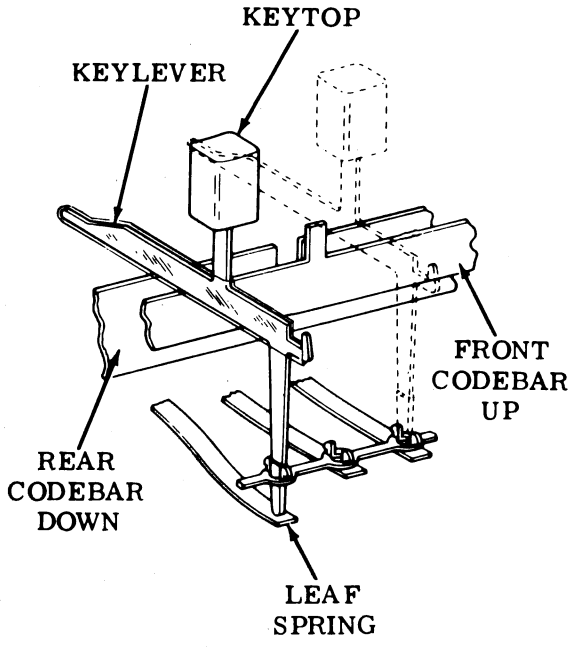
Purpose

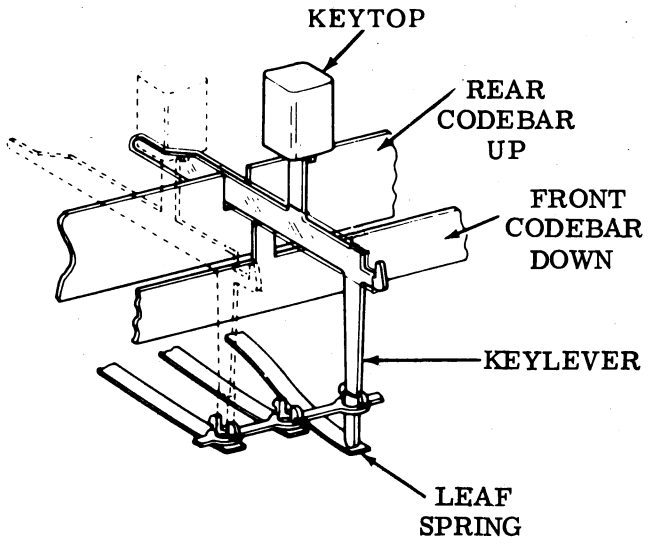
Positions the codebar sets which select the code combination associated with each primary key (other than SHIFT or CONTRL), and trips the keyboard.

Operation

When a primary key is depressed, the bottom surface of the keylever may reposition up to nine of the eleven codebar sets. The other two codebar sets are related to the SHIFT and CONTRL keys which, when depressed, will prevent depression of certain primary keys. A codebar set (operated by a primary keylever) will be repositioned when the solid portion of one codebar is up, and the open portion of the other codebar is down. As the keylever descends against its leaf spring, the codebar sets not previously positioned are repositioned; and the universal bar is engaged to trip the keyboard. (When tripped, the codebar sets are locked by the trip arm holding the code selection in position and preventing another character from being selected before the keyboard is reset.) A plastic bushing provides a guide for the keylever. If not blocked by the downstop clip, the keylever can be depressed against increased spring tension by way of the downstop bar, to repeat the character. When released, the primary key is returned to the upward position by its leaf spring.


KEYTOP
GUIDEPLATE
REAR CODEBAR
KEYLEVER
FRONT CODEBAR
TIE LINK
DOWNSTOP BAR
UNIVERSAL BAR
FRAME
T-LEVER
BUSHING
LEAF SPRING
DOWNSTOP CLIPS


KEYTOP
KEYLEVER
FRONT
CODEBAR
UP
REAR
CODEBAR
DOWN
LEAF
SPRING


KEYTOP
REAR
CODEBAR
UP
FRONT
CODEBAR
DOWN
KEYLEVER
LEAF
SPRING

3.07 Keyboard Mechanism (continued)

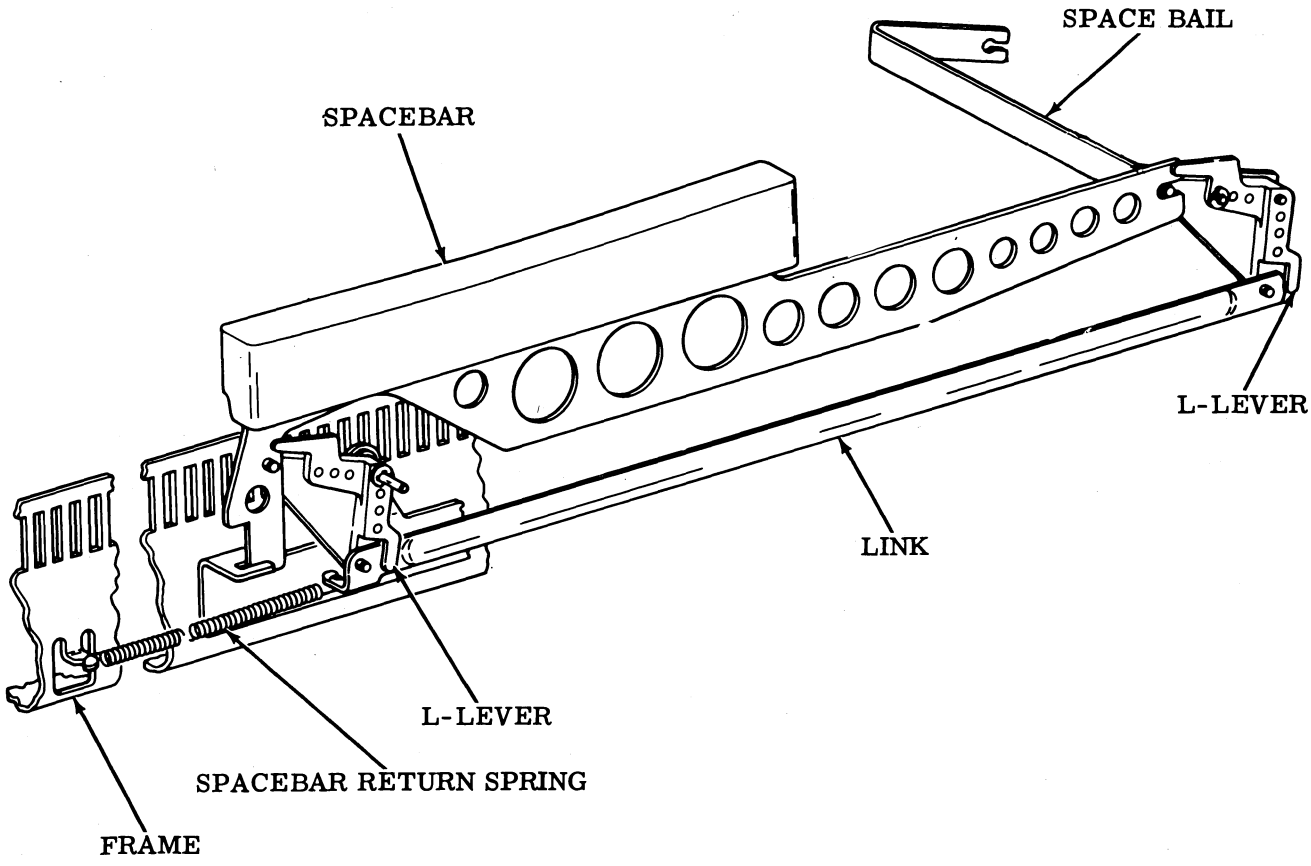
SPACE MECHANISM

Purpose

Provide a means for originating the space character from a bar compatible (both in shape and location) with conventional keyboards. The space character can be generated with the keyboard in the shift or unshift mode but cannot be generated in the control mode.

Operation

Depressing the SPACEBAR (when not blocked by control) will cause the space bail to rotate downward against the codebar sets. Only those codebar sets whose rear or front tines are up (at the space bail position) will be engaged to operate their respective contacts. The space bail, during its downward motion, engages the universal bar to trip the keyboard. When released, the space bail rises against the front and rear upstop bars by means of the spacebar return spring.



3.08 Keyboard Mechanism (continued)

CODEBAR MECHANISM

Purpose

Provides the means for transferring keylever inputs to contact mechanism.

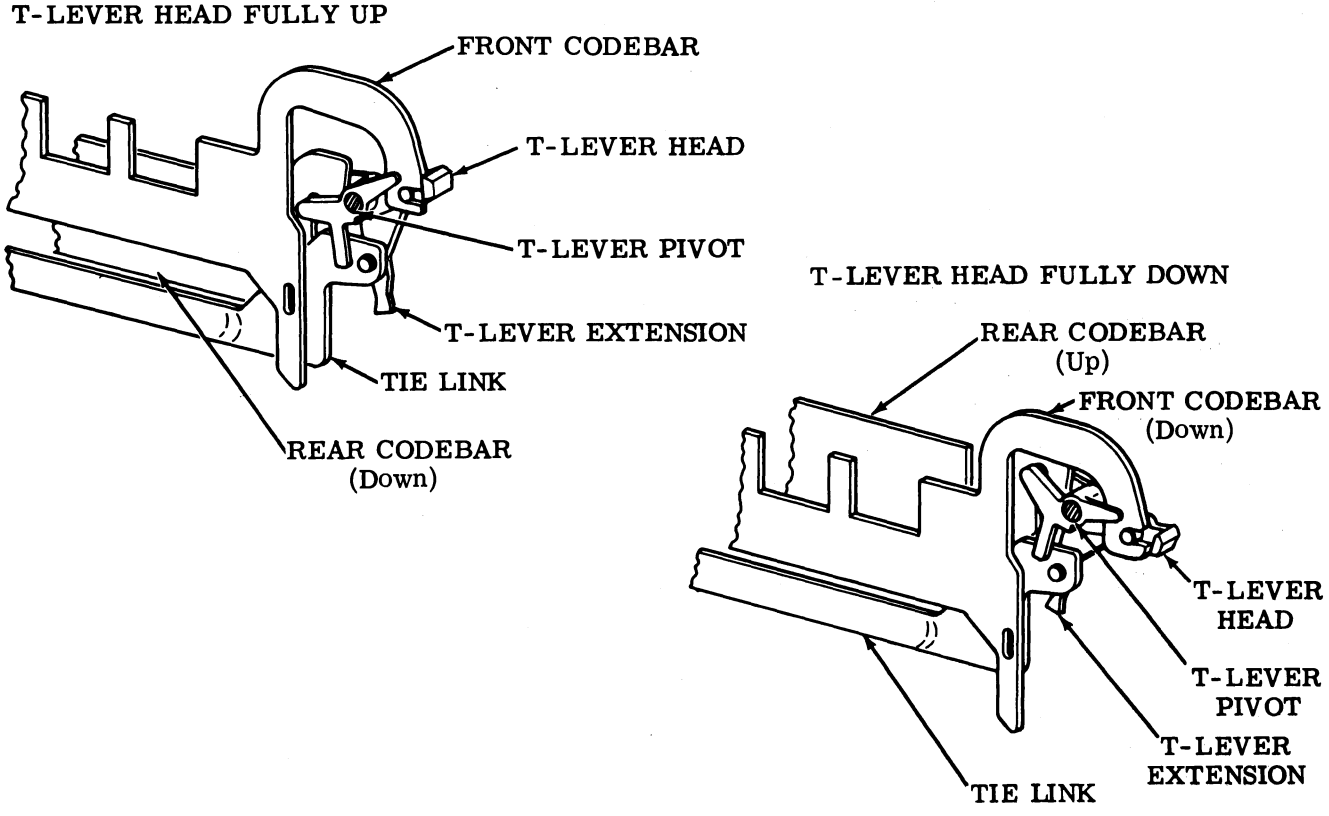
Operation

The codebar mechanism consists of the eight code level sets and the shift inhibit codebar set. The other two codebar sets, operated by the individual SHIFT and CONTRL keys, are associated with the shift and control mechanisms. Each codebar set consists of a front codebar, rear codebar, two T-levers, and a tie link.

Each codebar set can be placed in one of two states (binary). For purposes of discussion, the states are defined as follows: rear codebar up and front codebar down is the normal state; rear codebar down and front codebar up is the inverted state. (This state cannot be established by means of a keylever.) (The nine codebar sets are not spring biased as are the shift and control codebar sets. The normal and inverted states are based upon the assigned condition of the associated contacts.)

The nine codebar sets are positioned by a keylever mechanism. At effective keylever locations the front codebar is the compliment of the rear codebar; ie, where the front codebar is solid, the rear codebar is open, and conversely, where the front is open, the rear is solid. At ineffective keylever locations, such as SHIFT, SHIFT LOCK, and CONTRL, keylevers cannot position the codebar sets.

The two T-levers are attached to the codebar set, one at each end and are connected by the tie link. When the front codebar is down, the right end T-lever head is down; when the rear codebar is down, the right T-lever is up. The T-lever head positions the contact wires in the contact mechanism to provide the electrical code path associated with the depressed keylever mechanism.



3.09 Keyboard Mechanism (continued)

CONTACT MECHANISM

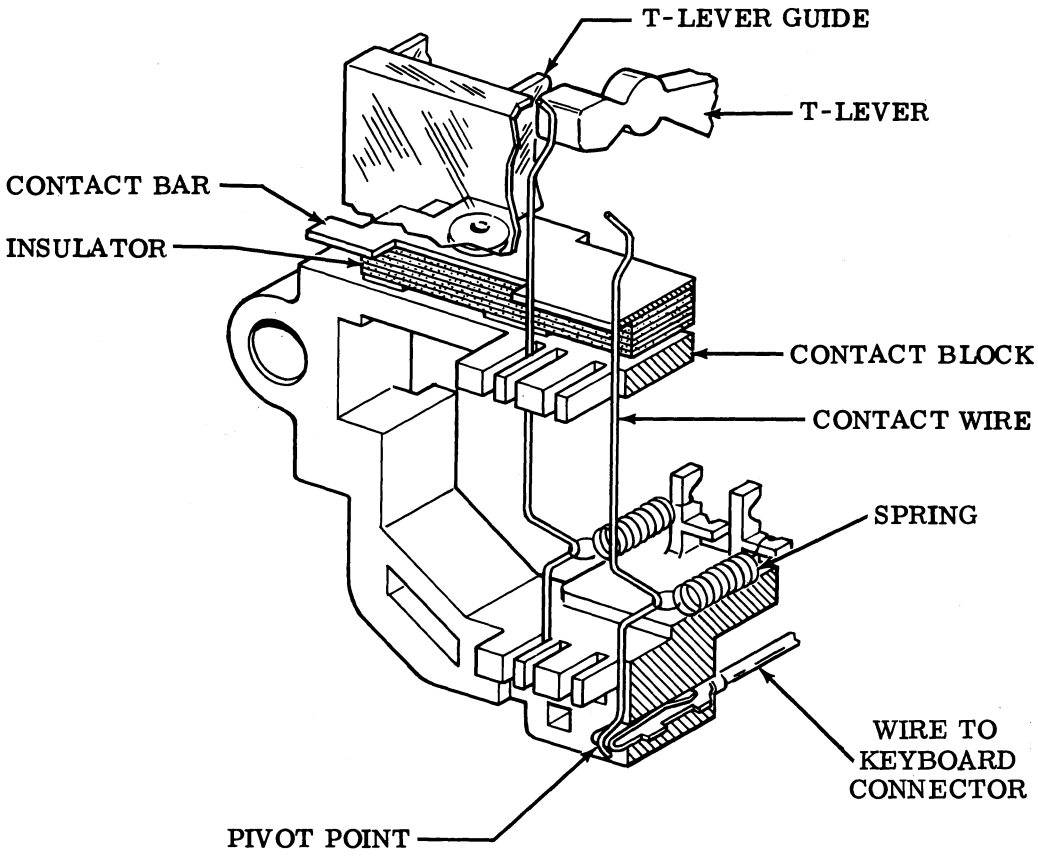
Purpose

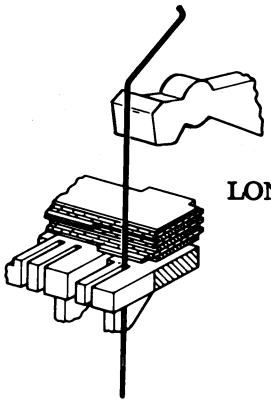
Provides circuit paths to external keyboard logic as determined by the depression of keylevers.

Operation

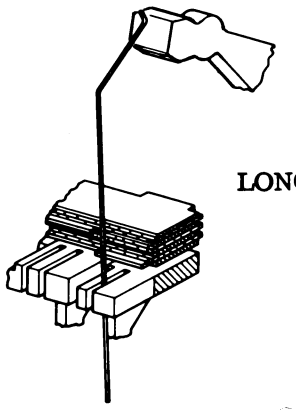
The contact mechanism consists of a contact block, a contact bar, insulators, and eleven contact wires. Two types of contact wires, short and long, are used. Slotted guides in the contact block hold the contact wires in place.

Each contact wire can be placed in one of two binary states. The contact wire is spring biased to a contact bar to provide the electrical connection. Positioning of the T-lever up establishes an electrical connection for the shorter contact wire and opens the electrical connection of the longer contact wire. Conversely, positioning of the T-lever down opens the electrical connection of the shorter contact wire and establishes an electrical connection for the longer contact wire. Refer to 3.15 for the electrical description of the contact mechanism.

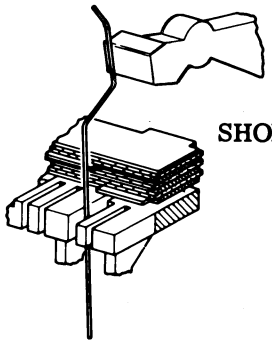




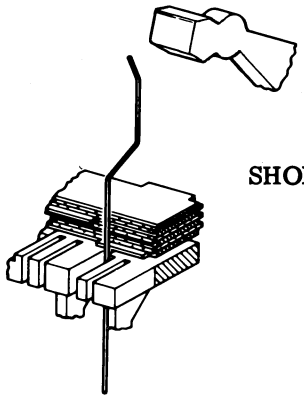
LONG CONTACT WIRE
T-LEVER DOWN



LONG CONTACT WIRE
T-LEVER UP



SHORT CONTACT WIRE
T-LEVER DOWN



SHORT CONTACT WIRE
T-LEVER UP

3.10 Keyboard Mechanism (continued)

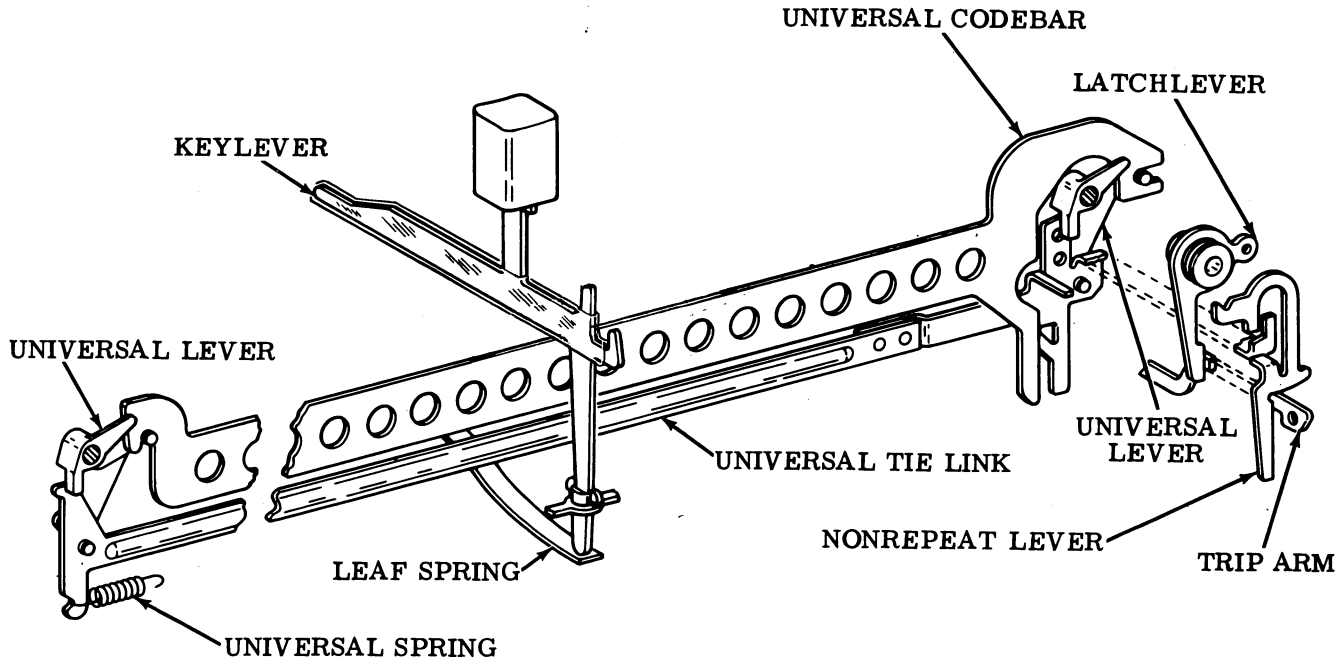
UNIVERSAL MECHANISM

Purpose

Releases the trip arm.

Operation

The universal mechanism consists of a single codebar which is spring biased in the up position and its associated universal tie link is biased to the right. Depressing a primary key places the codebar mechanism in its coded position at which time the keylever engages the universal codebar. Further depressing of the keylever moves the universal codebar downward pivoting the universal levers. This moves the universal tie link to the left. As the universal tie link moves to the left, it engages the nonrepeat lever and latchlever rotating them clockwise, releasing the trip arm. If the primary key is depressed beyond its normal downstop position, the universal tie link rotates the nonrepeat lever further to prevent latching of the trip lever. The character associated with the depressed keylever is thus continuously repeated until the trip lever is latched.



3.11 Keyboard Mechanism (continued)

TRIP ARM

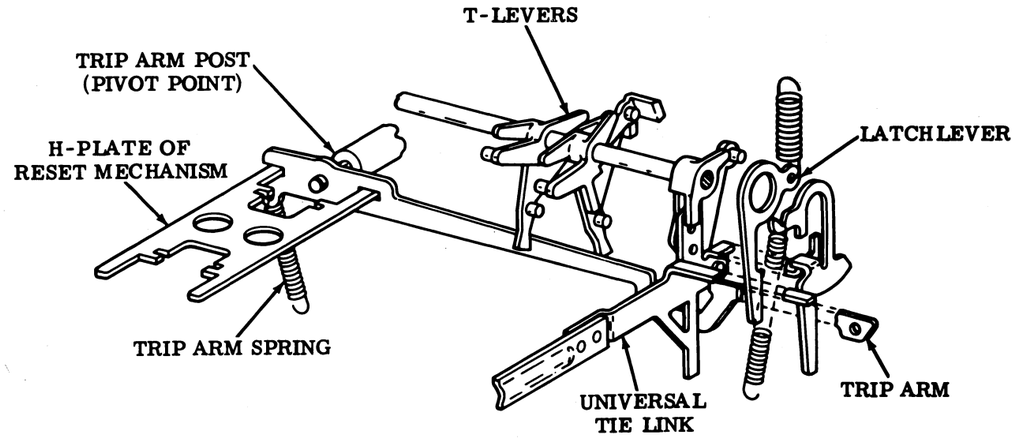
Purpose

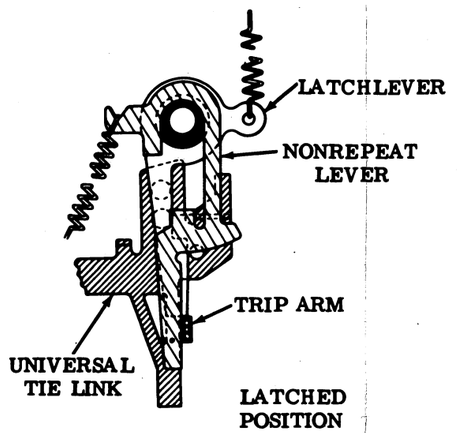
Lock T-levers in selected code position during code sampling period; trip reset mechanism; unlock T-levers at the end of code sampling period; pace operator to keyboard speed.

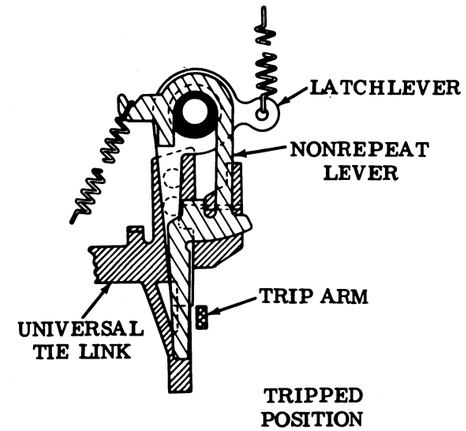
Operation

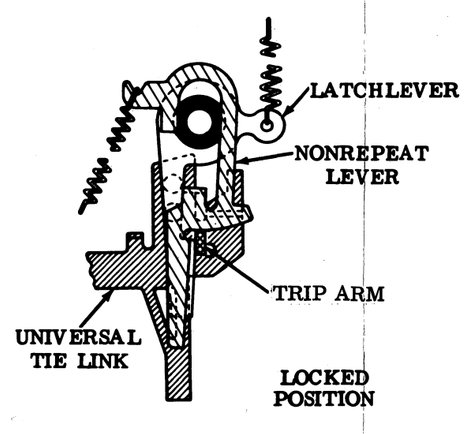
When the keyboard mechanism is in the unoperated condition, the trip arm is latched. When a primary key is depressed, the keylever engages the universal codebar and moves the universal tie link to the left. The universal tie link rotates the nonrepeat lever clockwise. The nonrepeat lever, in turn, rotates the latchlever clockwise releasing the trip arm. When released upward, the trip arm activates the reset mechanism. At the end of the reset mechanism cycle, the reset mechanism returns the trip arm to the latched position.

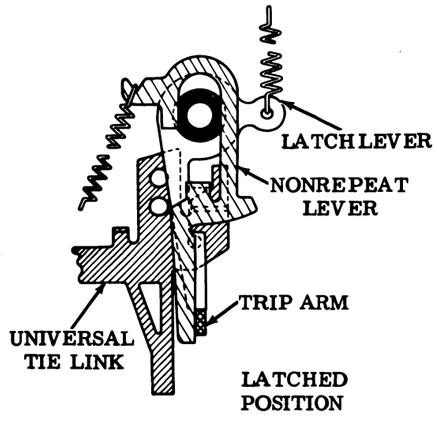
Holding the primary key at the normal downstop position at the end of the reset cycle does not block latching of the trip arm. During the reset cycle the trip arm moves the nonrepeat lever upward into the cutout area of the latchlever. When the trip arm is moved downward at the end of the reset cycle, the latchlever spring rotates the latchlever counterclockwise over the trip arm.











(Keylever Depressed to
Normal Downstop Position)

3. 12 Keyboard Mechanism (continued)

REPEAT MECHANISM

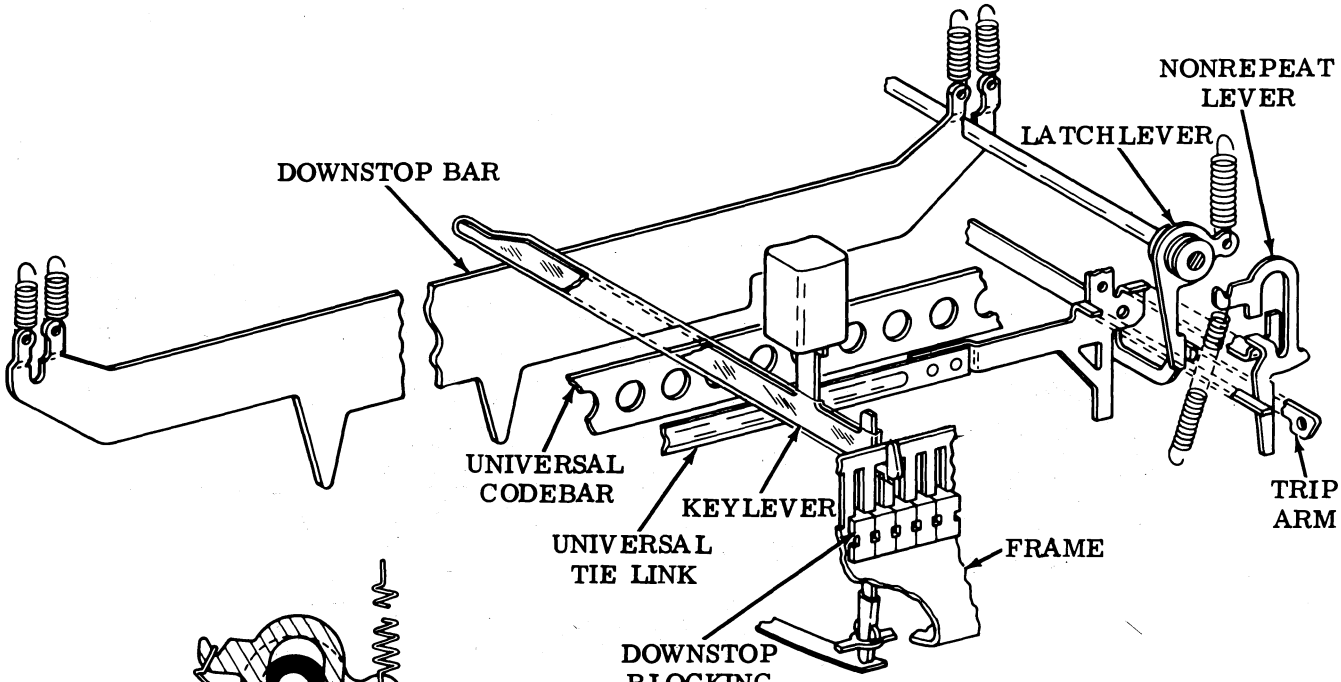
Purpose

Blocks latching of trip arm when primary key is held depressed beyond normal downstop position, permitting repeat of character until primary key is released.

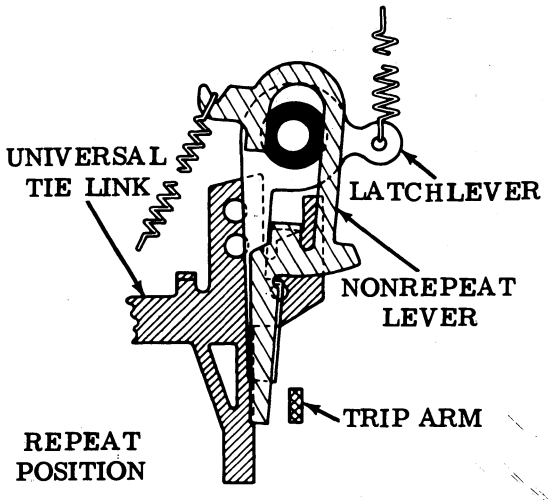
Operation

A keylever, not stopped by a downstop blocking clip, is stopped by the downstop bar when depressed by using normal finger pressure. Depressing the key further downward, on the spring-biased downstop bar, causes the universal codebar to move further downward. This moves the universal tie link further to the left. The nonrepeat lever strikes the vertical tab on the universal tie link and is pressed against the latchlever. This prevents the latchlever from returning to the latched position when the trip arm is reset. The trip arm, not being latched again raises and activates the reset mechanism. This action continues until the keylever is returned to the normal downstop position or released. When the keylever returns to the normal downstop position or is released, the nonrepeat lever does not block the return of the latchlever to its latching position and the repeat action is stopped.

Downstop blocking clips, which attach to the front keylever slots in the frame, block the downward movement of selected keylevers beyond the normal downstop position. Keylevers so blocked become nonrepeatable.



REPEAT MECHANISM



3.13 Reset Mechanism

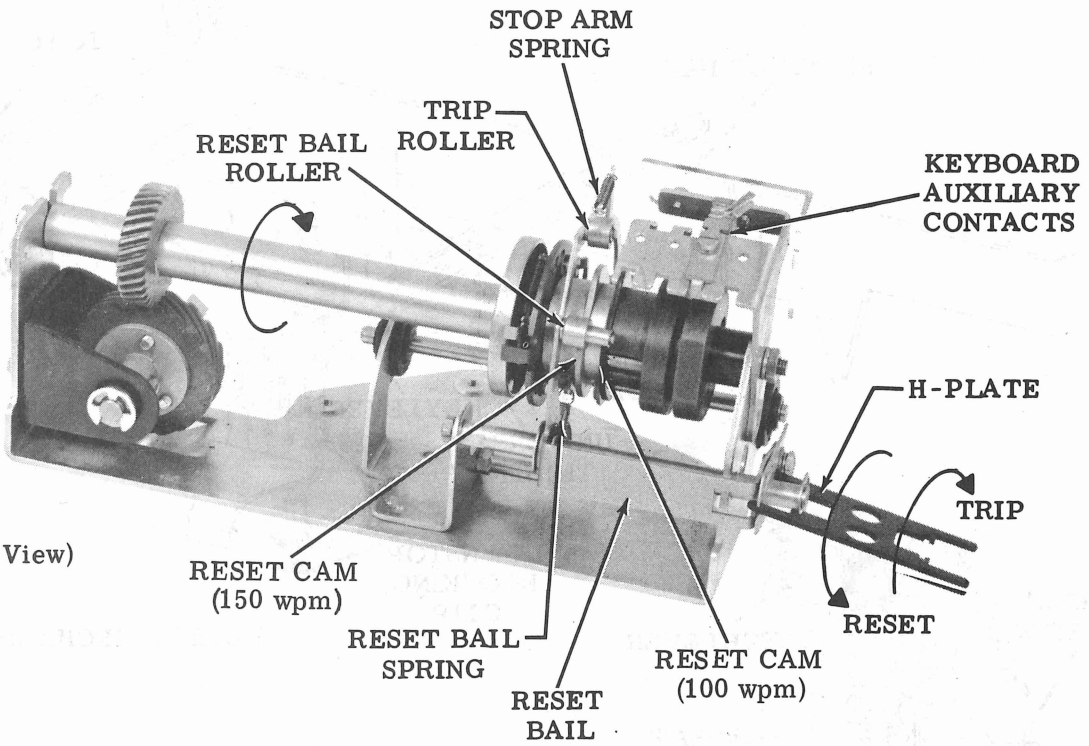
TRIP ARM RESET AND CONTACT SAMPLE

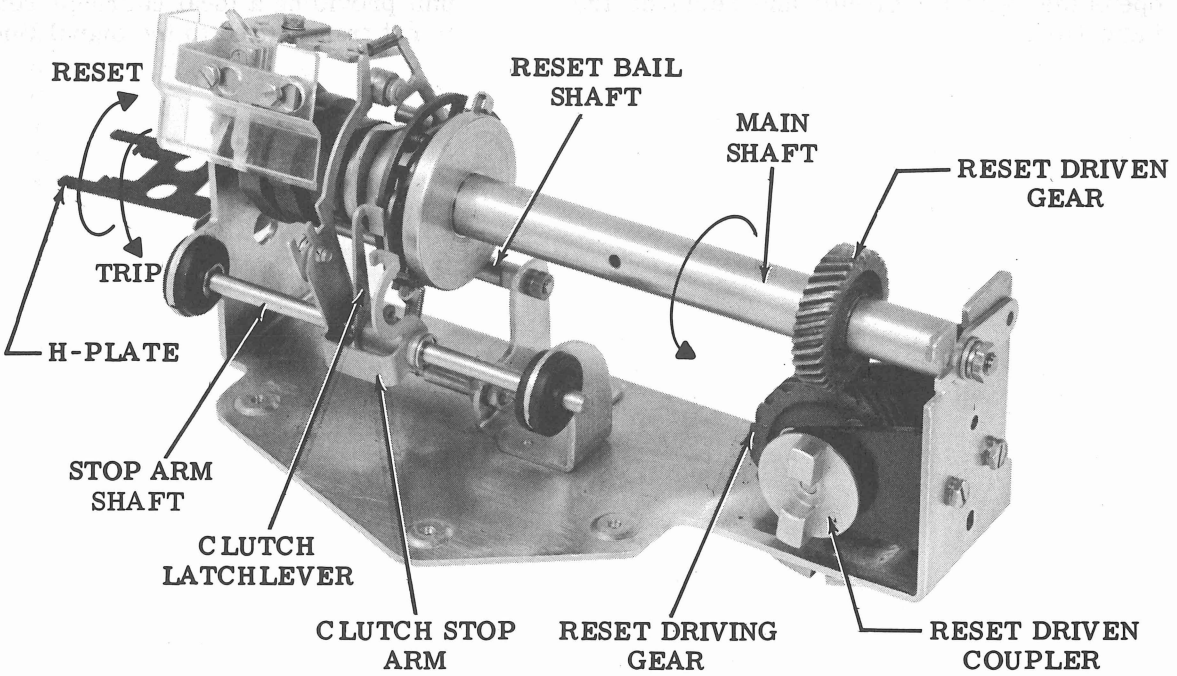
Purpose

Resets trip arm mechanism after a primary key has been depressed to permit subsequent key to be depressed; initiates code sampling period and distribution of selected code.

Operation

When the trip arm is released and travels upward, its extension beyond the pivot point moves downward applying a clockwise rotational motion to the reset mechanism H-plate. The H-plate transfers the rotating motion through the reset bail to the clutch stop arm. The clutch stop arm, which is spring biased inward, is moved outward releasing the clutch shoe lever. The clutch then engages the clutch drum and the main shaft drives the auxiliary cams through one cycle of operation. (As the clutch is a two-stop mechanism, 180 degree rotation of the main shaft provides one cycle of operation.) During the operating cycle, the reset bail roller follows the reset cam causing the reset bail to be rotated counterclockwise and the clutch stop arm to be returned to its blocking position. As the reset bail is rotated, the H-plate drives the trip arm downward returning it to its latched position. The keyboard auxiliary cam, during the operating cycle, closes the keyboard auxiliary contacts which generate a MESSAGE AVAILABLE signal. This signal initiates the movement of keyboard contact information through external logic where conversion to ASCII takes place (3.15). Before the operating cycle is completed, the auxiliary cam reopens the 12.5-volt keyboard auxiliary contact circuit and removes the signal.




RESET
RESET BAIL SHAFT
MAIN SHAFT
RESET DRIVEN GEAR
TRIP
H-PLATE
STOP ARM SHAFT
CLUTCH LATCHLEVER
CLUTCH STOP ARM
RESET DRIVING GEAR
RESET DRIVEN COUPLER

(Rear View)

3.14 Control Panel Mechanism

CONTROL, FUNCTIONS, AND INDICATORS

Purpose

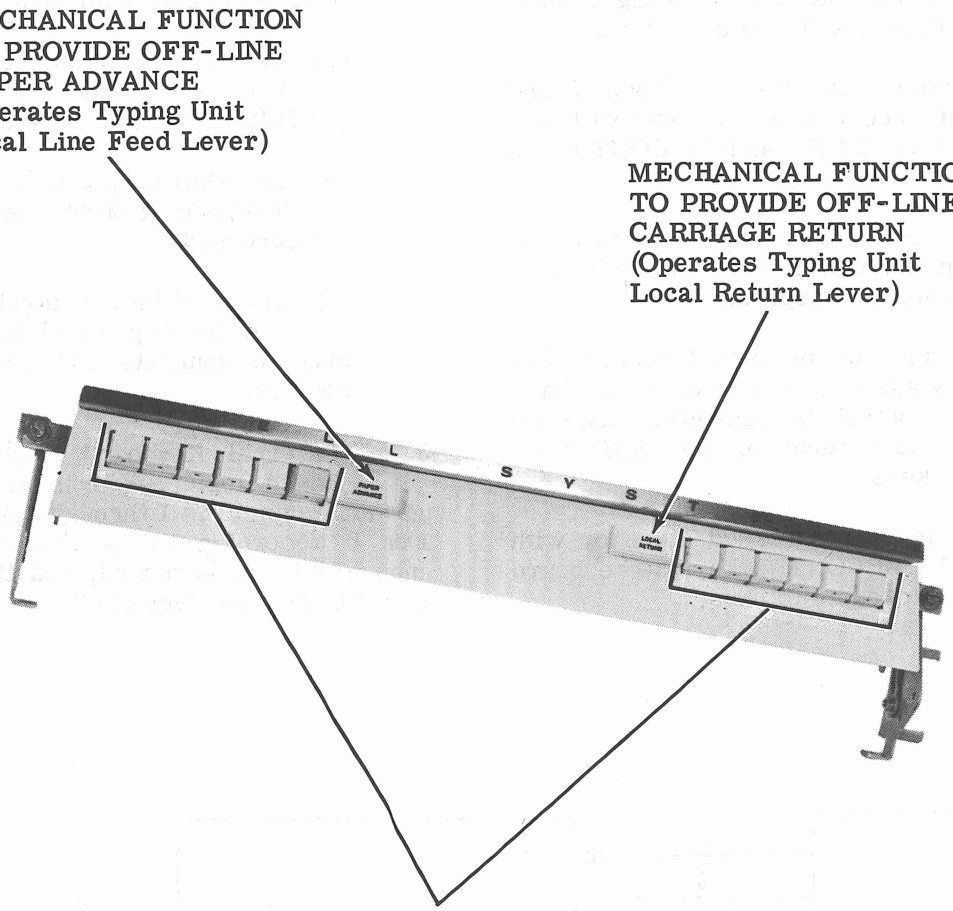
Provides operator control indicators, and off-line paper advance and carriage return controls.

Operation

The control panel provides electrical and mechanical functions for use by the keyboard operator. Three banks of six pushbutton-type indicators are provided to meet specific set applications. The indicator lights are controlled by the set's electrical service unit. Pressing a lighted pushbutton indicator opens the indicator circuit and removes the indication.

The PAPER ADVANCE pushbutton transfers a mechanical motion to the typing unit providing a local line feed which is not transmitted to the signal line.

Depressing the LOCAL RETURN pushbutton transfers a mechanical motion to the typing unit providing a local carriage return which is not transmitted to the signal line.


MECHANICAL FUNCTION
TO PROVIDE OFF-LINE
PAPER ADVANCE
(Operates Typing Unit
Local Line Feed Lever)
MECHANICAL FUNCTION
TO PROVIDE OFF-LINE
CARRIAGE RETURN
(Operates Typing Unit
Local Return Lever)
OPERATOR INDICATOR LAMPS
AND SWITCHES AS DETERMINED
BY SET APPLICATION

ELECTRICAL OPERATION

3.15 Keyboard Output

(1) The output of the keyboard consists of eleven leads or circuit paths through the keyboard contact mechanism. This output is applied to external logic to generate the 128 ASCII characters.

(2) As shown in the schematic diagram, the outputs are associated with specific codebars. The keys initiating the positioning of the codebars and the resulting contact operations affect the output as follows:

(a) Keyboard outputs 1 through 7 and parity occur when any key with the exception of SHIFT and/or CONTRL is depressed.

(b) The control and shift outputs occur when the CONTRL and SHIFT keys, respectively, are depressed.

(c) The shift inhibit output occurs when a key associated with only one character or control is depressed together with or independent of the SHIFT or CONTRL keys.

(3) When a key is depressed alone or with the SHIFT or CONTRL key, the keyboard output is developed as follows:

(a) Outputs 1 through 7 occur as binary state 1 or 0 according to ASCII for the character or control corresponding to the use of that key alone. For example, the binary state for outputs 1 through 7 is the same for the character A whether a lower or upper case A is entered into the keyboard.

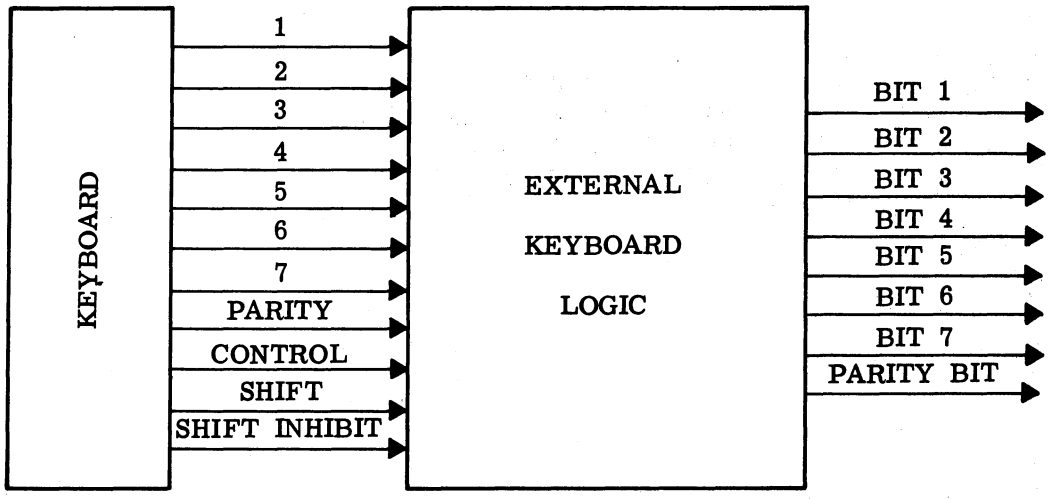
(b) The parity output state is binary 1 or 0 as determined by the total number of 1s in outputs 1 through 7. This output will be 1 or 0 to provide an even number of 1s in outputs 1 through 8.

(c) The control output state is a binary 1 or 0 depending on whether the CONTRL key is depressed.

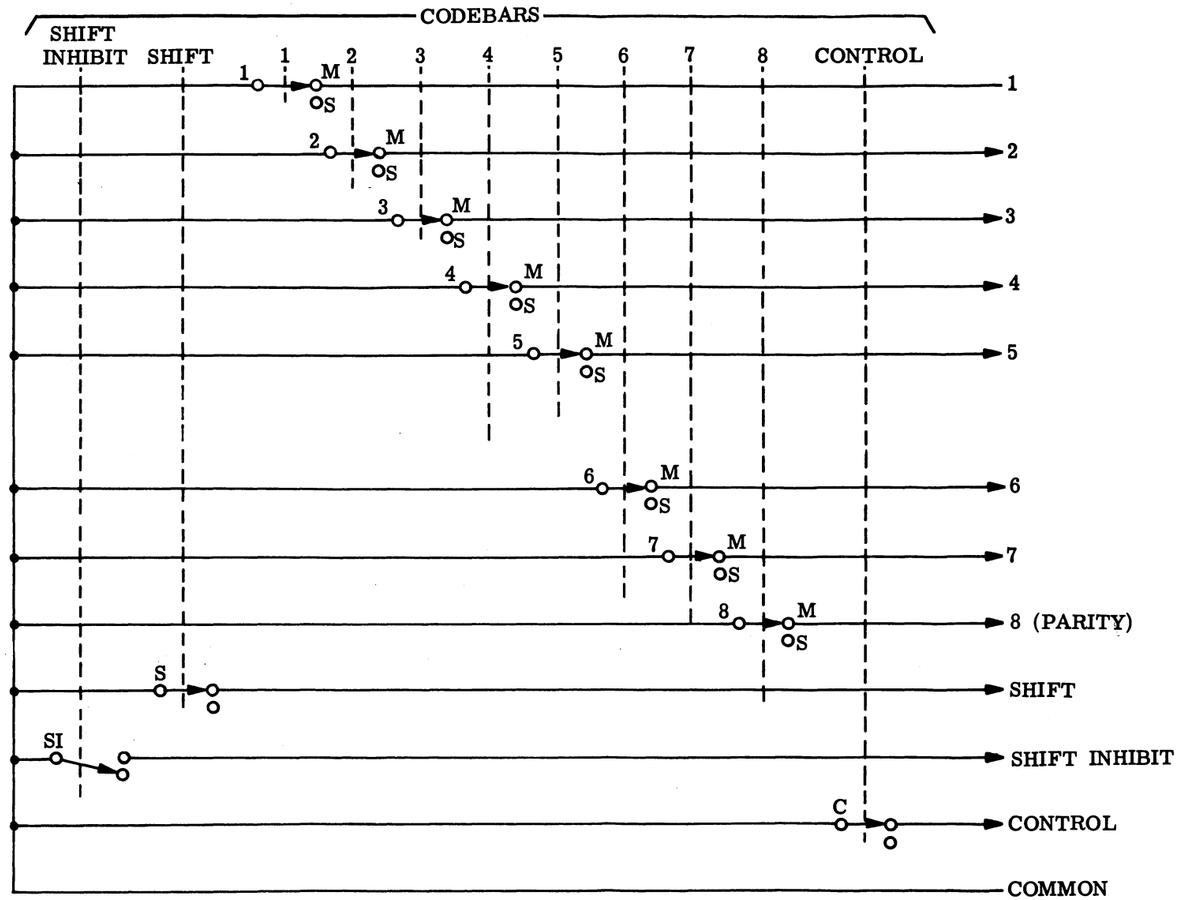
(d) The shift output state is a binary 1 or 0 depending on whether the SHIFT key is depressed.

(e) The shift inhibit output is binary state 1 if the depressed key can be used only to generate one character or one control.

3.16 External Keyboard Logic — The keyboard logic output is in the form of bit permutations. Bits 1 through 7 are binary state 1 or 0 according to the character or control entered into the keyboard, and the parity bit is 1 or 0 to provide even parity.



KEYBOARD SCHEMATIC DIAGRAM



Note: The number 1 - 8 codebars are shown in the marking position.
Shift, control and shift inhibit contacts are shown unoperated.

AMERICAN STANDARD CODE FOR INFORMATION INTERCHANGE (ASCII)

BITS 7				0				1			
BITS 6				0		1		0		1	
BITS 5				0	1	0	1	0	1	0	1
4	3	2	1								
0	0	0	0	NUL	DLE	SP	0	@	P	\	p
			1	SOH	DC1	!	1	A	Q	a	q
		1	0	STX	DC2	"	2	B	R	b	r
			1	ETX	DC3	#	3	C	S	c	s
	1	0	0	EOT	DC4	$	4	D	T	d	t
			1	ENQ	NAK	%	5	E	U	e	u
		1	0	ACK	SYN	&	6	F	V	f	v
			1	BEL	ETB	'	7	G	W	g	w
1	0	0	0	BS	CAN	(	8	H	X	h	x
			1	HT	EM	)	9	I	Y	i	y
		1	0	LF	SUB	*	:	J	Z	j	z
			1	VT	ESC	+	;	K	[	k	{
	1	0	0	FF	FS	,	<	L	\	l	|
			1	CR	GS	-	=	M	]	m	}
		1	0	SO	RS	.	>	N	^	n	~
			1	SI	US	/	?	O	—	o	DEL

Characters and controls are generated by use of a key alone ( ), with a SHIFT key ( ), or with a CONTRL key ( ). See Figure 6.