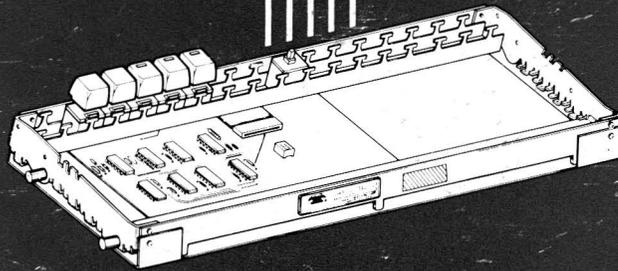




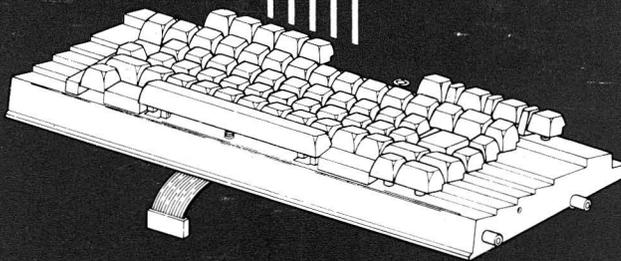
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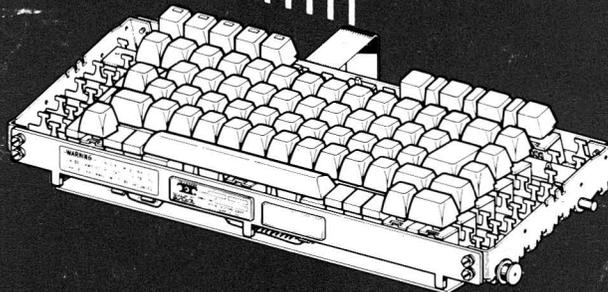
43K001 / AAA RO KEYBOARD

**REPAIR  
MANUAL  
525**

for  
**KEYBOARDS**



50K122AAE through AAM UNITIZED KEYBOARD



43K101 / CAA and CAB KEYBOARD

**Used in  
42/43 BASIC TERMINALS**



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The 43 KEYBOARD REPAIR MANUAL

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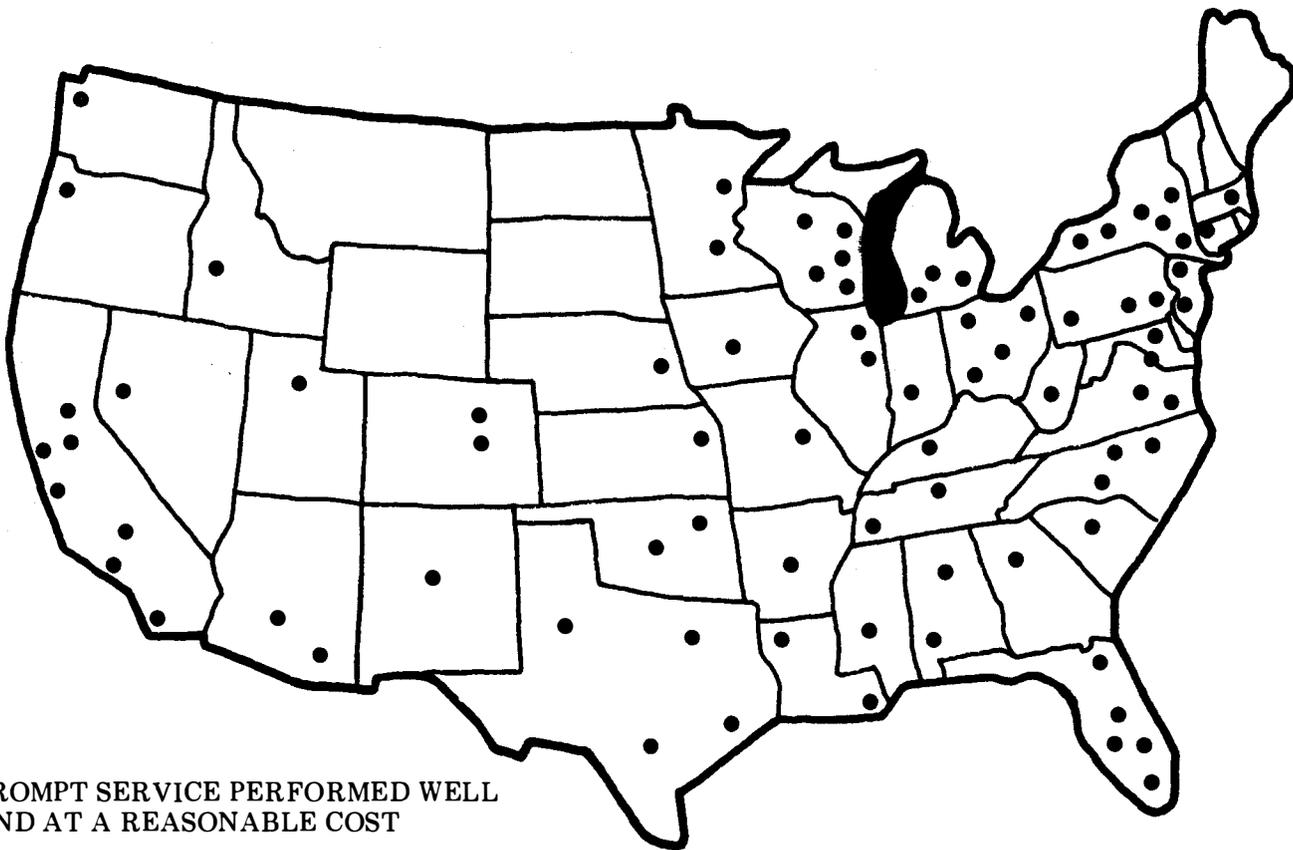
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THE 43 KEYBOARD  
REPAIR MANUAL  
INTRODUCTION

This manual provides complete repair information for the 43 keyboards used in 42/43 Basic Terminals. The manual is intended for field or shop use and is arranged into various parts that include Troubleshooting, Disassembly/Reassembly and Parts. The 50K122 unitized keyboard, however, is not a field repairable component. Disassembly in the field should not be attempted. Service Manual 369 provides complete servicing information for all versions of the Basic 43 8-Level Teleprinter and Service Manual 538 provides complete servicing information for all versions of the Basic 42 (5-Level) Teleprinter.

All replaceable components are identified in this manual. Waveforms are included on wiring diagrams and charts are provided for additional trouble isolation using an oscilloscope or volt-ohmmeter. No specially designed tools or shop facilities are required for repair operations. However, Standard 42 or 43 Teleprinter Terminals are required to test and troubleshoot the keyboard when not installed on location.

Spare parts for repair are available from Teletype Corporation. Repair personnel should be properly trained and have access to these spares before attempting repair of the 43 keyboards.

This manual is intended to be used with the following supplemental repair documentation for the 42/43 and 45-30 CPS Printers.

<u>MANUAL NO.</u>	<u>DESCRIPTION</u>
385	— Circuit Diagrams for Components used in 42/43 and 45-30 CPS Character Printer Terminals and Associated Units
416	— Product Support Manual
442	— 42/43 Paper Tape Unit
522	— TTL and SSI Logic Cards used in 42/43 and 45-30 CPS Character Printers
523	— Power Supplies used in 42/43 and 45-30 CPS Character Printer Terminals
525	— Keyboards used in 42/43 Basic Terminals
530	— SSI Keyboards used in 42/43 Buffered Terminals
533	— Parts — Enclosures, Paper Handling and Miscellaneous Accessories used with 42/43 and 45-30 CPS Character Printers
534	— Interfaces, Controllers and Modification Kit Circuit Cards associated with 42/43 Terminals (includes AB, SCU, and brief repair of non-pedestal controllers)
539	— 42/43 and 45-30 CPS Character Printer Mechanisms
568	— Internal Modems used in 42 Basic Terminals



**The 43 KEYBOARD REPAIR MANUAL**

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<b>PART 4</b>	<b>CIRCUIT DESCRIPTION AND DIAGRAMS</b>
<b>PART 5</b>	<b>PARTS AND UNIT CODES</b>
<b>PART 6</b>	<b>PACKING AND MARKING</b>



PART 1 — GENERAL DESCRIPTION

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B. KEYTOP ARRANGEMENTS .....	1-1
C. REFERENCES .....	1-3

A. GENERAL

This part provides a general description of the 43 keyboards as components used in 42/43 Basic Terminals (KSR and RO).

The 50K122/AAE and AAF unitized keyboards are a direct replacement for the 43K101/CAA and CAB modular keyboards respectively. The distinctive aspect of this keyboard is the unitized construction and normally open capacitive key elements in a matrix array.

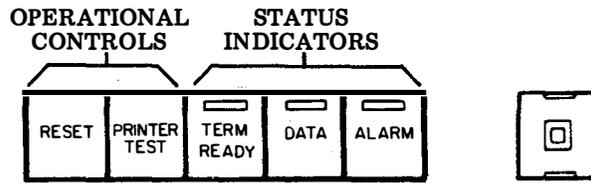
All ordering numbers shown in this manual are Teletype Corporation part numbers. When ordering replacement parts, unless otherwise specified, prefix each part number with the letters "TP" (ie, TP410055).

B. KEYTOP ARRANGEMENTS

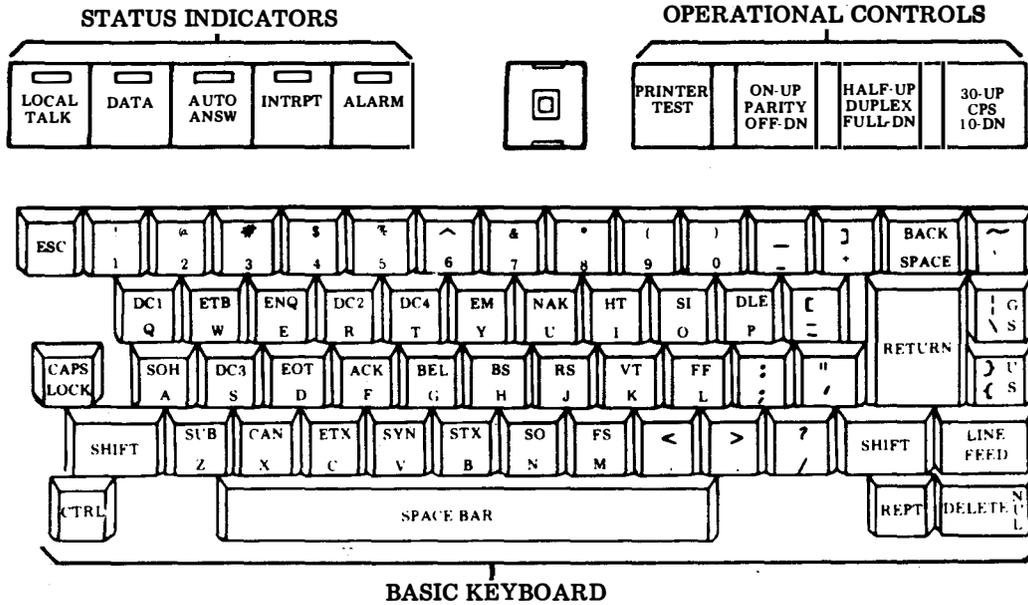
The keytop arrangements used in the 43 keyboards are divided into three major groups according to function or purpose. They are the operational controls, status indicators and the basic keyboard.

A description of the function of the keytops found on the keyboards shown in Fig. 1 through 2 can be found in the applicable How to Operate Manual or Service Manual.

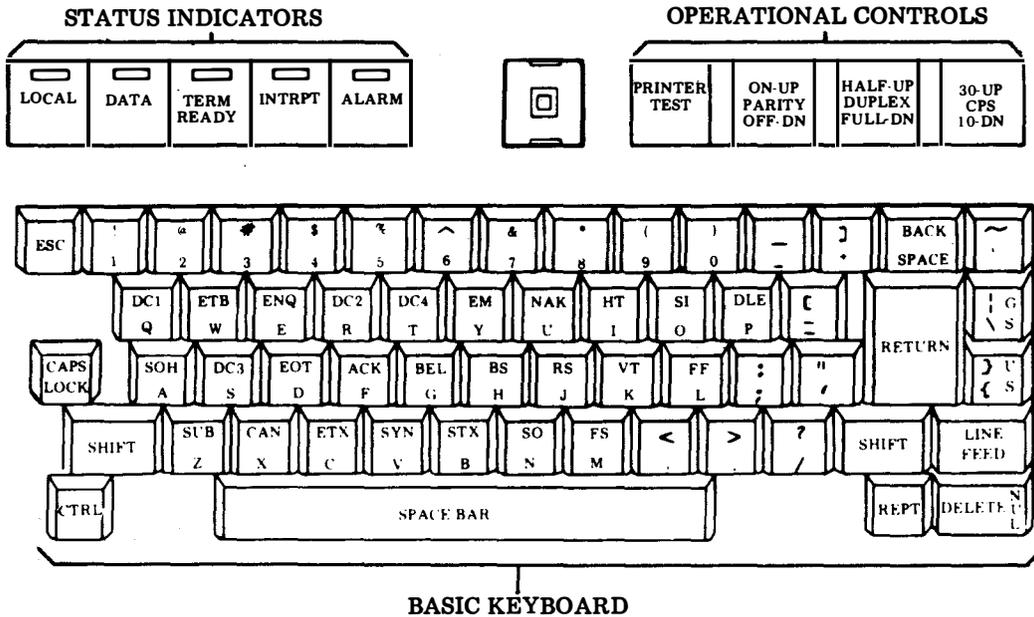
**B. KEYTOP ARRANGEMENTS (Contd)**



**Fig. 1—43K001/AAA**  
Used in 43 Basic RO Terminal



**Fig. 2—43K101/CAA or 50K122/AAE Keyboard**  
Used in 42/43 Basic Terminal With Terminal Data Unit



**Fig. 3—43K101/CAB or 50K122/AAF Keyboard**  
Used in 42/43 Basic Terminal With Terminal Auxiliary Unit

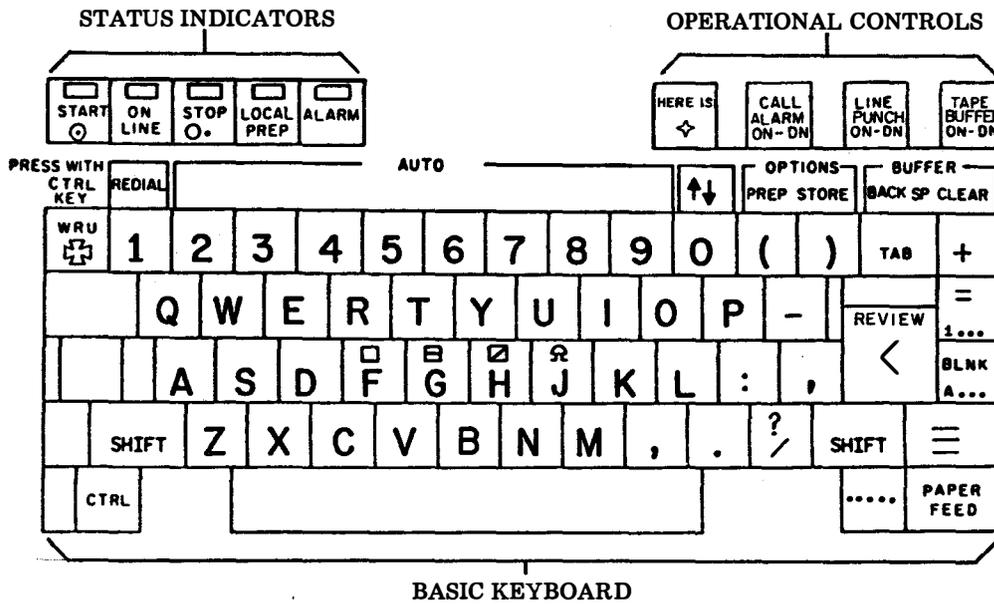


Fig. 4—50K122/AAG Keyboard  
Used in 42 Basic Terminal

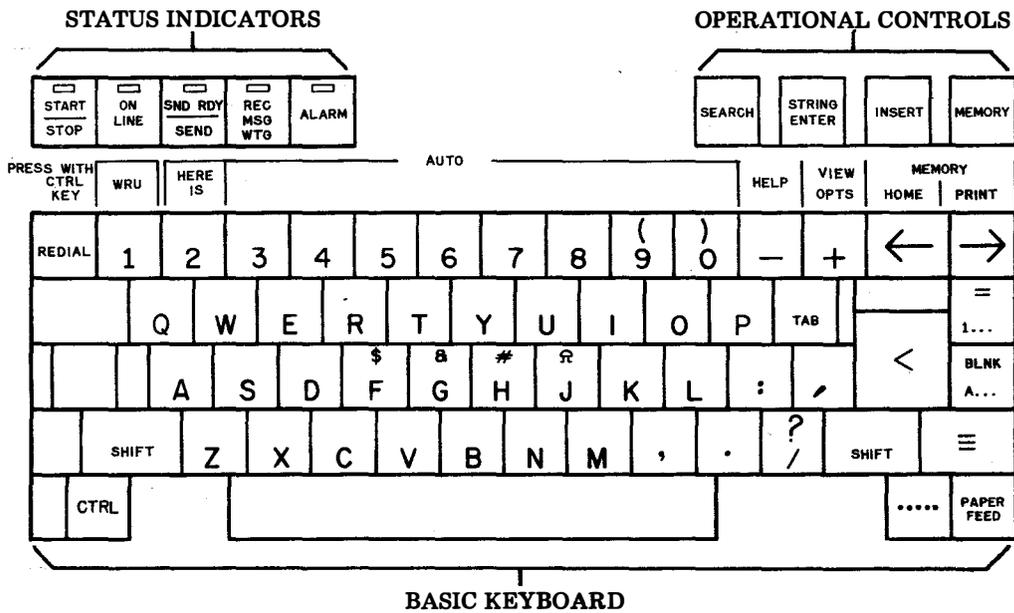


Fig. 5—50K122/AAM Keyboard  
Used in 42 Basic Terminal With 4K Buffer

**C. REFERENCES**

The 42 and 43 Teleprinter Technical References provide additional descriptions of the station components, features, applications, and interfacing.

The 369 and 538 Service Manuals provide all necessary information for trained crafts personnel to install, maintain, and if necessary, service the 42/43 Teleprinter using recommended lists of maintenance spares. The 50K122 keyboard is not, however, a field serviceable component of the 42/43 Terminal.

Procedures for testing the keyboard are provided in the testing section of the Service Manual. If any improper responses are found during testing they can be isolated in the TROUBLESHOOTING section of this manual.

PART 2 — TROUBLESHOOTING

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3. 43K001 RO KEYBOARD TROUBLESHOOTING .....	2-15

A. GENERAL

This section provides troubleshooting information for the Basic 43 keyboards (KSR and RO).

Keyboard troubleshooting is initiated by the 43 Basic KSR Teleprinter or 43 RO Teleprinter Troubleshooting, Service Manual or when trouble in the keyboard is suspected from symptoms observed.

Analysis in this section is limited to isolating the trouble within the keyboard up to its electrical interface at the logic card. The 43 keyboard must be tested as part of a Basic KSR or RO Teleprinter Station. Refer to the Teleprinter Testing section of the Service Manual. Where analysis indicates the trouble is not in the keyboard, return to the Teleprinter Troubleshooting section of the Service Manual for further analysis.

When a trouble is verified to be in the keyboard (by replacement of the keyboard) this section should be used to help isolate the trouble to any replaceable components to correct the trouble.

The keyboards are returnable to the Teletype Product Service Center for repair as a unit. Pack in carton (KSR keyboards — using conductive plastic bag) that was used to pack replacement keyboard. High voltage static discharge can damage KSR keyboard circuitry. The 346392 wrist strap is available to ground service personnel.

Isolation and correction of trouble is based on electrical and mechanical checks and parts replacement.

Trouble analysis is presented in the form of a "20 Questions" routine in 2. TROUBLESHOOTING GUIDE. The guide, with questions and yes and no columns, should be used always starting with the first question and proceeding according to the "yes" or "no" directive.

B. TROUBLESHOOTING1. 43K101 KEYBOARD TROUBLESHOOTING

## TROUBLESHOOTING GUIDE

QUESTION	YES	NO
1. Does failure involve either an operational control or a station indicator?	Go to 2.	Go to 12.
2. With power applied are any of the communications mode indicators; LOCAL (LOCAL TALK), DATA, TERM READY (AUTO ANSW) lit?	Go to 5.	Go to 3.
3. Is ALARM indicator lit (paper installed, cover closed)?	Go to 20.	Go to 4.
4. Do any indicators light under any conditions, ie, depressing indicator keyswitch, ALARM indicator on paper- out, LOCAL (LOCAL TALK) on by depressing PRINTER TEST key?	Go to 6.	Go to 18.
5. Do each of the three communications mode keyswitch indicators light when its keyswitch is depressed?	Go to 9.	Go to 6.
6. Does LOCAL (LOCAL-TALK) indicator light when its keyswitch is depressed?	Go to 7.	Go to 6a.
6a. Does LOCAL (LOCAL-TALK) indicator light when PRINTER TEST key is depressed?	Go to 20.	Go to 18a.
7. Does DATA indicator light or flash when its keyswitch is depressed?	Go to 8.	Go to 7a.
7a. Does DATA indicator light under any conditions, ie, loop-back, automatically from TERM READY (AUTO ANSW) mode?	Go to 20.	Go to 18a.
8. Does TERM READY (AUTO ANSW) indicator light when its keyswitch is depressed following depression of LOCAL (LOCAL-TALK) keyswitch?	Go to 9.	Go to 8a.
8a. Does TERM READY (AUTO ANSW) indicator light when power to the set is first turned on (no alarm conditions)?	Go to 20.	Go to 18a.
9. Does INTRPT indicator flash when INTRPT keyswitch is depressed while in loop-back mode?	Go to 10.	Go to 9a.

QUESTION	YES	NO
9a. Does INTRPT indicator light when remote station sends an on-line interrupt?	Go to 20.	Go to 18a.
10. Does ALARM indicator light when the INTERLOCK keyswitch is released up (cover open)?	Go to 11.	Go to 10a.
10a. Does ALARM indicator light when a paper-out condition exists?	Go to 20.	Go to 18a.
11. Do PRINTER TEST, PARITY, DUPLEX and CPS keyswitch operate properly under all conditions?	Go to 12.	Go to 20.
12. Do any keys generate characters?	Go to 13.	Go to 21a.
13. Are any characters generated when only REPT key is depressed?	Go to 27.	Go to 14.
14. Do any characters repeat, shift to upper case, or become a control function when only that key is depressed (CAPS LOCK key released up)?	Go to 28.	Go to 15.
15. Are any erroneous characters generated when the corresponding keyswitch is not depressed (ie, tapping on keyboard or depressing any other keyswitch)?	Go to 28a.	Go to 16.
16. Do all data keys generate characters (Shift, Control, Upper and Lower Case)?	Go to 16a.	Go to 17.
16a. Are proper characters generated for each key?	Review original failure symptom.	(1) Check for proper keytop. (2) Replace keyswitch logic.
17. Does more than one keyswitch within only one of the Sense Amp groups fail?  Refer to Circuit Descriptions and Diagrams.	Go to 25.	Go to 24.

**B. TROUBLESHOOTING (Contd)****1. 43K101 KEYBOARD TROUBLESHOOTING (Contd)****TROUBLESHOOTING GUIDE (Contd)**

QUESTION	YES	NO
18. Is -12 V present on pin 2 of circuit card cable connector P107 (if any keyswitches light go to Step 18a)?	Go to 18a.	Check for open circuit in cable.
18a. Is -12 V present on pin 4 of key-switch in question ?	Go to 18b.	Check for broken or open circuit land or defective solder connection on circuit board.
18b. Is -10 V or +5 V present on pin 3 of keyswitch in question?	Replace defective key-switch.	If voltage is -12 V dc, go to 19.
19. Is +5 V present on circuit card cable connection of keyswitch in question?	Check for broken or open circuit land to pin 3 of keyswitch in question.	Go to 19a.
19a. Is +5 V on the corresponding connector pin at P107?	Check for open circuit in cable.	Replace defective keyswitch.
20. Does keyswitch in question meet the mechanical requirements (depress and release properly, latch click, etc)?	Go to 20a.	Replace defective keyswitch.
20a. Is keyswitch in question: PRINTER TEST, PARITY, Interlock, DUPLEX or CPS?	Go to 20b.	Go to 21.
20b. Is +5 V present on pin 1 of keyswitch when keyswitch is open (released up position)?	Go to 20c.	Check cable for open circuit.
20c. Is 0 V present on pin 1 of keyswitch in question when keyswitch is closed (depressed down position)?	Go to 29.	Check for open circuit to P107 pin 4. Check for open connection at pins of keyswitch. Replace keyswitch.
21. Are any characters printed when several "data" keys are depressed?	Go to 24.	Go to 21a.
21a. Are supply voltages present on circuit card cable connection?	Go to 21b.	Check cable for open circuit.
21b. Is -8 V present on the cathode of CR1?	Go to 21d.	Go to 21c.
21c. Is -12 V present on the anode of CR1?	Replace CR1.	Check for open circuit on circuit board.
21d. Are supply voltages present at all integrated circuit packs?	Check for open circuit on circuit board.	Go to 22.
22. Are 01L and 02L clocks present and correct at MLA5 and 01 and 02 clocks present and correct at MLA1, MLA6 and MLB4?	Go to 24.	Go to 23.

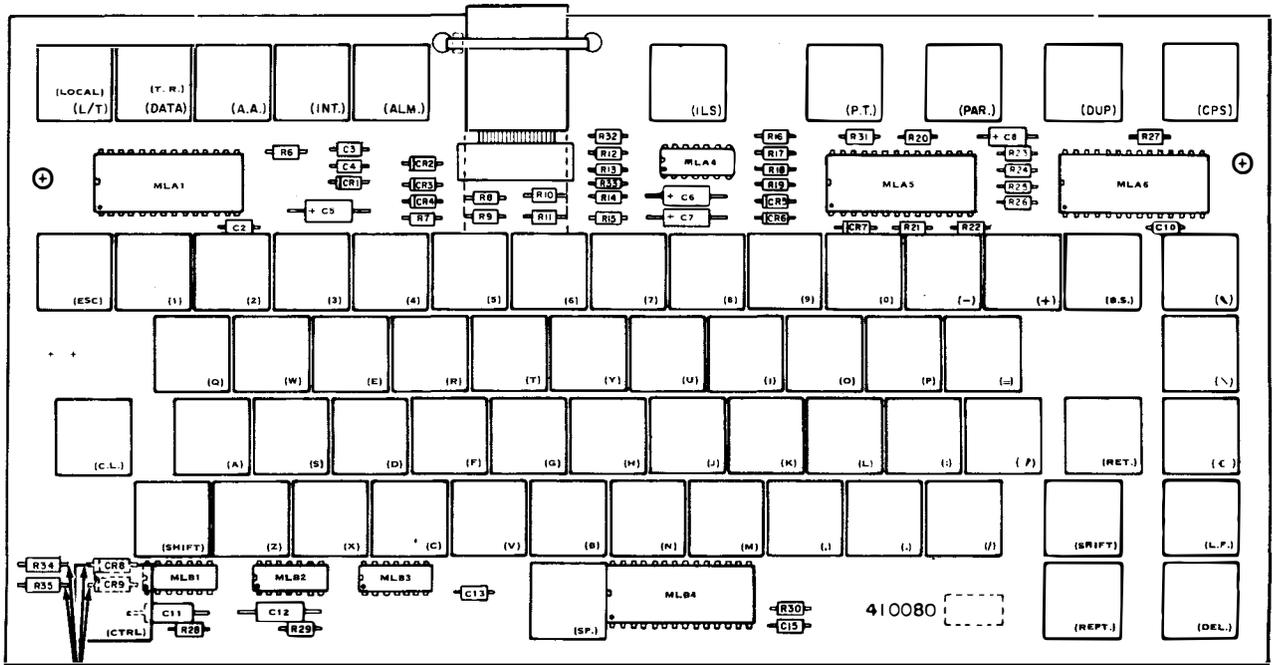
QUESTION	YES	NO
23. Is 560 KHz clock present on pin 1 of MLB3?	Check clock generation and driver circuitry.	Check cable for open circuit.
24. Is depression pulse present on Sense Amp input with keyswitch in question depressed?	Go to 25.	Check visually for a short between terminals of the keyswitch. If there is no short visible, remove the keyswitch and check signal again at input to sense amp. If a depression signal is not present, replace defective sense amp. If a depression signal is present, replace defective keyswitch.
25. Is depression pulse present on keyswitch logic input MLA5-10, 11 or 12 with key or one of the keys in question depressed.	Go to 26.	Replace defective sense amp.
26. With REPT key and keyswitch in question depressed, is serial data on MLA5-2 present?	Check cable P107-6 for continuity. Check CR2 and CR4.	Replace MLA5.
27. Does keyswitch in question meet the mechanical requirements (depress and release properly, latch, click, etc)?	Go to 27a.	Replace defective keyswitch.
27a. Is depression pulse present on keyswitch logic MLA5-10, 11 or 12 with no keys depressed?	Go to 27b.	Replace MLA5.
27b. Is depression pulse present on Sense Amp — logic inputs with no keys depressed?	Check for open connection to keyswitch, ie, depression pulse does not appear at associated keyswitch, pin 1. Check for cold solder connections at terminals of keyswitch. Replace keyswitch.	Replace defective sense amp.
28. Does keyswitch in question; REPT left and right SHIFT, CAPS LOCK or CTRL meet the mechanical requirements (depress and release properly, latch, click, etc)?	Go to 28a.	Replace defective keyswitch.
28a. With jumper strap connected from pin 2 of keyswitch in question to its associated sense amp input, is failure corrected?	Check for cold solder joint or broken land from sense amp to keyswitch. Replace keyswitch.	Go to 28b.

B. TROUBLESHOOTING (Contd)1. 43K101 KEYBOARD TROUBLESHOOTING (Contd)

## TROUBLESHOOTING GUIDE (Contd)

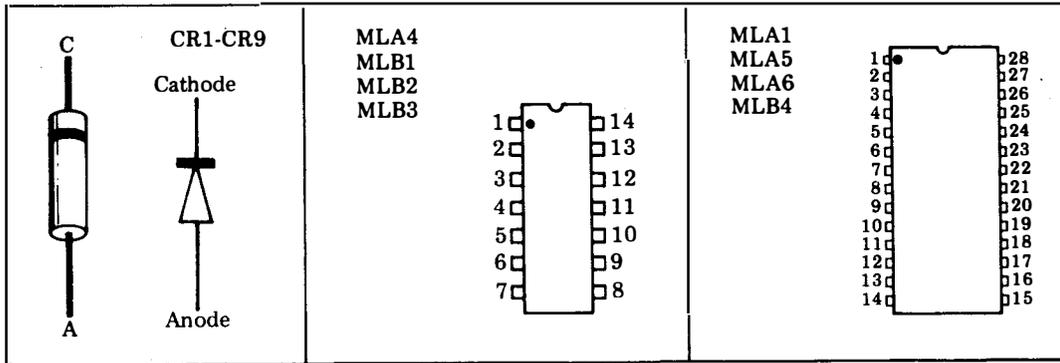
QUESTION	YES	NO
28b. Is depression pulse present on keyswitch logic inputs MLA5-10, 11 or 12 with no keys depressed?	Replace defective sense amp.	Replace MLA5.
29. Is trouble present but not defined?	Undefined trouble — refer to Circuit Descriptions and Diagrams, etc.	Review initial indication of trouble.

410080 CIRCUIT CARD COMPONENT LAYOUT



Not present on Issue 1A.

COMPONENT IDENTIFICATION AND LEAD DESIGNATION



SEMICONDUCTOR IN CIRCUIT STATIC FORWARD RESISTANCE

COMPONENT      RESISTANCE (Approx)

CR1-CR9      30 ohms

STATIC CIRCUIT RESISTANCE (See Note)

<u>CONNECTOR TERMINAL</u>	<u>REFERENCE POINT</u>	<u>RESISTANCE (Approx)</u>	
		<u>LO</u>	<u>HI</u>
P107-3 (+12 V)	P107-4 (logic gnd)	30 ohms	Infinity
P107-2 (-12 V)	P107-4 (logic gnd)	1.5K ohms	Infinity
P107-8 (+5 V)	P107-4 (logic gnd)	28 ohms	150 ohms

Note: Take resistance reading, reverse meter leads and take second resistance reading.

B. TROUBLESHOOTING (Contd)

1. 43K101 KEYBOARD TROUBLESHOOTING (Contd)

TRANSMITTED CODES (Excluding Start and Stop)

SENSE AMPS			UNSHIFT		SHIFT		CONTROL		Positive Logic Mark = 1 Space = 0 Hexadecimal Code Shown where No Character is Assigned.
Sense Amp Pin No.	Sense Amp No.	Data Enable No.	Switch Address	B <sub>8</sub> B <sub>7</sub> B <sub>6</sub> B <sub>5</sub> B <sub>4</sub> B <sub>3</sub> B <sub>2</sub> B <sub>1</sub> B <sub>0</sub> Character	B <sub>8</sub> B <sub>7</sub> B <sub>6</sub> B <sub>5</sub> B <sub>4</sub> B <sub>3</sub> B <sub>2</sub> B <sub>1</sub> B <sub>0</sub> Character	B <sub>8</sub> B <sub>7</sub> B <sub>6</sub> B <sub>5</sub> B <sub>4</sub> B <sub>3</sub> B <sub>2</sub> B <sub>1</sub> B <sub>0</sub> Character	B <sub>8</sub> B <sub>7</sub> B <sub>6</sub> B <sub>5</sub> B <sub>4</sub> B <sub>3</sub> B <sub>2</sub> B <sub>1</sub> B <sub>0</sub> Character		
11	1	1	0	NON-SEND	Shift (RH)	NON-SEND	Shift (RH)	NON-SEND	Shift (RH)
11	2	1	1	NON-SEND	CTRL	NON-SEND	CTRL	NON-SEND	CTRL
11	3	1	2	NON-SEND	Shift (LH)	NON-SEND	Shift (LH)	NON-SEND	Shift (LH)
10	1	2	3	1 0 0 1 0 1 1 1 1	/	0 0 0 1 1 1 1 1 1	?	1 1 1 1 1 1 1 1 1	
10	2	2	4	1 0 1 1 0 1 0 1 1	k	0 0 1 0 0 1 0 1 1	K	1 0 0 0 0 1 0 1 1	VT
10	3	2	5	1 0 1 1 1 0 0 1 1	s	0 0 1 0 1 0 0 1 1	S	1 0 0 0 1 0 0 1 1	DC3
9	1	3	6	0 0 0 1 0 1 1 1 0	.	1 0 0 1 1 1 1 1 0	>	1 1 1 1 1 1 1 1 1	
9	2	3	7	1 0 1 1 1 0 1 0 1	u	0 0 1 0 1 0 1 0 1	U	1 0 0 0 1 0 1 0 1	NAK
9	3	3	8	1 0 0 1 1 0 0 0 1 0	2	1 0 1 0 0 0 0 0 0 0	@	1 1 0 0 1 0 0 0 0 1	(91)
8	1	4	9	0 0 0 1 0 0 0 1 1 1	/	0 0 0 1 0 0 0 1 0 1	"	1 1 1 1 1 1 1 1 1	
8	2	4	10	0 0 0 1 1 0 1 0 1	5	1 0 0 1 0 0 1 0 1	%	1 1 0 0 1 0 1 0 0	(94)
8	3	4	11	1 0 1 1 1 1 0 1 0	z	0 0 1 0 1 1 0 1 0	Z	1 0 0 0 1 1 0 1 0	SUB
7	1	5	12	1 0 0 1 1 1 0 1 1	;	0 0 0 1 1 1 0 1 0	:	1 1 1 1 1 1 1 1 1	
7	2	5	13	0 0 1 1 1 0 0 1 0	r	1 0 1 0 1 0 0 0 1	R	0 0 0 0 1 0 0 0 1	DC2
7	3	5	14	0 0 1 1 1 0 0 0 1	q	1 0 1 0 1 0 0 0 1	Q	0 0 0 0 1 0 0 0 1	DC1
6	1	6	15	1 0 0 1 0 1 1 0 0	,	0 0 0 1 1 1 1 0 0	<	1 1 1 1 1 1 1 1 1	
6	2	6	16	0 0 1 1 1 0 0 1 1 0	f	1 0 1 0 0 0 0 1 1 0	F	0 0 0 0 0 0 0 1 1 0	ACK
6	3	6	17	1 0 1 1 1 0 0 0 0 1	a	0 0 1 0 0 0 0 0 0 1	A	1 0 0 0 0 0 0 0 0 1	SOH
5	1	7	18	1 0 0 0 0 1 0 0 0	Back Space	1 0 0 0 0 1 0 0 0	Back Space	0 1 0 0 1 1 1 0 0	(9C)
5	2	7	19	1 0 0 1 0 0 0 0 0	Space	1 0 0 1 0 0 0 0 0	Space	1 0 0 1 0 0 0 0 0	Space
5	3	7	20	0 0 1 1 1 0 1 1 1	w	1 0 1 0 1 0 1 1 1	W	0 0 0 0 1 0 1 1 1	ETB
3	1	8	21	0 0 1 1 0 1 1 0 0	j	1 0 1 0 0 1 1 0 0	L	0 0 0 0 0 1 1 0 0	FF
3	2	8	22	1 0 1 1 1 0 1 1 0	v	0 0 1 0 1 0 1 1 0	V	1 0 0 0 1 0 1 1 0	SYN
3	3	8	23	1 0 0 1 1 1 0 0 0 1	l	0 0 0 1 0 0 0 0 0 1	!	0 1 0 0 1 0 0 0 0	(90)
2	1	9	24	0 0 1 1 0 1 1 1 1	o (alpha)	1 0 1 0 0 0 1 1 1 1	O (alpha)	0 0 0 0 0 1 1 1 1	ST
2	2	9	25	0 0 1 1 0 0 0 1 1	c	1 0 1 0 0 0 0 1 1	C	0 0 0 0 0 0 0 1 1	ETX
2	3	9	26	0 0 1 1 1 1 0 0 0	x	1 0 1 0 1 1 1 0 0 0	X	0 0 0 0 1 1 0 0 0	CAN
28	1	10	27	0 0 0 1 0 1 1 0 1	-	0 0 1 0 1 1 1 1 1	_	0 1 0 0 1 1 0 1 0	(9A)
28	2	10	28	1 0 1 1 0 0 0 1 0	b	0 0 1 0 0 0 0 1 0	B	1 0 0 0 0 0 0 1 0	STX
28	3	10	29	1 1 0 0 0 0 0 0 0	LO (Local/Talk)	1 1 0 0 0 0 0 0 0	LO	1 1 0 0 0 0 0 0 0	LO
27	1	11	30	0 0 0 1 1 0 0 0 0	0 (zero)	1 0 0 1 0 1 0 0 1	)	0 1 0 0 1 1 0 0 1	(99)
27	2	11	31	1 0 1 1 0 0 1 1 1	s	0 0 1 0 0 0 1 1 1	G	1 0 0 0 0 0 1 1 1	BEL
27	3	11	32	0 1 0 0 0 0 0 0 1	L1 (Data)	0 1 0 0 0 0 0 0 1	L1	0 1 0 0 0 0 0 0 1	L1
26	1	12	33	1 0 1 1 1 0 0 0 0	p	0 0 1 0 1 0 0 0 0	P	1 0 0 0 1 0 0 0 0	DLE
26	2	12	34	0 0 1 1 1 0 1 0 0	t	1 0 1 0 1 0 1 0 0	T	0 0 0 0 1 0 1 0 0	DC4
26	3	12	35	0 1 0 0 0 0 0 1 0	L2 (Auto Ans)	0 1 0 0 0 0 0 1 0	L2	0 1 0 0 0 0 0 1 0	L2
24	1	13	36	0 0 0 1 0 1 0 1 1	+	1 0 1 0 1 1 1 0 1	]	1 1 0 0 1 1 0 1 1	(9B)
24	2	13	37	0 0 0 1 1 0 1 1 0	6	1 0 1 0 1 1 1 1 0	^	0 1 0 0 1 0 1 0 1	(95)
24	3	13	38	0 0 0 0 1 1 0 1 1	ESC	0 0 0 0 1 1 0 1 1	ESC	1 1 0 0 0 1 1 1 1	(8F)
23	1	14	39	1 0 0 1 1 1 1 0 1	=	1 0 1 0 1 1 1 0 1	[	1 1 1 1 1 1 1 1 1	

SENSE AMPS			Switch Address	UNSHIFT		SHIFT		CONTROL		Positive Logic Mark = 1  Space = 0  Hexadecimal Code Shown where No Character is Assigned.
Sense Amp Pin No.	Sense Amp No.	Data Enable No.		B <sub>8</sub> B <sub>7</sub> B <sub>6</sub> B <sub>5</sub> B <sub>4</sub> B <sub>3</sub> B <sub>2</sub> B <sub>1</sub> B <sub>0</sub>	Character	B <sub>8</sub> B <sub>7</sub> B <sub>6</sub> B <sub>5</sub> B <sub>4</sub> B <sub>3</sub> B <sub>2</sub> B <sub>1</sub> B <sub>0</sub>	Character	B <sub>8</sub> B <sub>7</sub> B <sub>6</sub> B <sub>5</sub> B <sub>4</sub> B <sub>3</sub> B <sub>2</sub> B <sub>1</sub> B <sub>0</sub>	Character	
23	2	14	40	1 0 1 1 0 1 1 1 0	n	0 0 1 0 0 1 1 1 0	N	1 0 0 0 0 1 1 1 0	S0	
23	3	14	41	0 1 0 0 0 0 1 0 0	Spare	0 1 0 0 0 0 1 0 0	Spare	0 1 0 0 0 0 1 0 0	Spare	
20	1	15	42	1 0 0 0 0 1 1 0 1	RET	1 0 0 0 0 1 1 0 1	RET	1 1 1 1 1 0 1 1 1	(F7)	
20	2	15	43	1 0 1 1 0 1 0 0 0	h	0 0 1 0 0 1 0 0 0	H	1 0 0 0 0 1 0 0 0	BS	
20	3	15	44	1 1 0 0 0 0 0 1 1	L3 (Intrpt)	1 1 0 0 0 0 0 1 1	L3	1 1 0 0 0 0 0 1 1	L3	
19	1	16	45	0 0 1 1 1 1 0 1 1	{	0 0 1 1 1 1 0 1 1	}	1 0 0 0 1 1 1 1 1	US	
19	2	16	46	1 0 1 1 1 1 0 0 1	y	0 0 1 0 1 1 0 0 1	Y	1 0 0 0 1 1 0 0 1	EM	
19	3	16	47	0 0 0 1 1 0 0 1 1	3	1 0 0 1 0 0 0 1 1	#	1 1 0 0 1 0 0 1 0	(92)	
17	1	17	48	0 0 1 0 1 1 1 0 0	\	1 0 1 1 1 1 1 0 0		0 0 0 0 1 1 1 0 1	GS	
17	2	17	49	1 0 0 1 1 0 1 1 1	7	1 0 0 1 0 0 1 1 0	&	0 1 0 0 1 0 1 1 0	(96)	
17	3	17	50	0 0 1 1 0 0 1 0 1	e	1 0 1 0 0 0 1 0 1	E	0 0 0 0 0 0 1 0 1	ENQ	
16	1	18	51	1 0 1 1 1 1 1 1 1	Delete	1 0 1 1 1 1 1 1 1	Delete	0 0 0 0 0 0 0 0 0	NUL	
16	2	18	52	1 0 1 1 0 1 1 0 1	m	0 0 1 0 0 1 1 0 1	M	1 0 0 0 1 1 1 0 0	FS	
16	3	18	53	1 0 1 1 0 0 1 0 0	d	0 0 1 0 0 0 1 0 0	D	1 0 0 0 0 0 1 0 0	EOT	
15	1	19	54	0 0 0 0 0 1 0 1 0	Line Feed	0 0 0 0 0 1 0 1 0	Line Feed	0 0 0 0 0 1 0 1 0	Line Feed	
15	2	19	55	0 0 1 1 0 1 0 1 0	j	1 0 1 0 0 1 0 1 0	J	0 0 0 0 1 1 1 1 0	RS	
15	3	19	56	1 0 0 1 1 0 1 0 0	4	0 0 0 1 0 0 1 0 0	\$	0 1 0 0 1 0 0 1 1	(93)	
14	1	20	57	1 0 0 1 1 1 0 0 0	8	1 0 0 1 0 1 0 1 0	*	1 1 0 0 1 0 1 1 1	(97)	
14	2	20	58	0 0 0 1 1 1 0 0 1	9	0 0 0 1 0 1 0 0 0	(	1 1 0 0 1 1 0 0 0	(98)	
14	3	20	59	0 0 1 1 0 1 0 0 1	i	1 0 1 0 0 1 0 0 1	I	0 0 0 0 0 1 0 0 1	HT	
13	1	21	60	0 0 1 1 0 0 0 0 0	~	0 0 1 1 1 1 1 1 0	~	1 1 0 0 1 1 1 0 1	(9D)	
13	2	21	61	NON-SEND	REPT	NON-SEND	REPT	NON-SEND	REPT	
13	3	21	62	NON-SEND	CAPS LOCK	NON-SEND	CAPS LOCK	NON-SEND	CAPS LOCK	

B. TROUBLESHOOTING (Contd)2. 50K122 UNITIZED KEYBOARD TROUBLESHOOTING

## TROUBLESHOOTING GUIDE

QUESTION	YES	NO
1. Do any indicator keys fail to light?	Go to 1a.	Go to 2.
1a. Is -12 V present on pin 4 of LED of keyswitch in question?	Go to 1b.	Check circuit card or cable for open circuit.
1b. Is -10 V present on pin 3 of LED of keyswitch in question?	Go to 2.	Check cable for an open circuit.
2. Do operational control keys operate correctly under all conditions?	Go to 3.	Go to 2a.
2a. Is +5 V present on circuit card cable connection of keyswitch in question when keyswitch is open (released up position)?	Go to 2b.	Check cable for an open circuit.
2b. Is 0 V present on circuit card cable connection of keyswitch in question when keyswitch is closed (depressed down position)?	Go to 3.	Check P107, pin 4 for an open circuit.
3. Are all characters printed when "DATA" keys are depressed?	Go to 4.	Go to 3a.
3a. Are supply voltages present on circuit card cable connections?	Go to 3b.	Check cable for an open circuit.
3b. Are supply voltages present at inputs to MLB1?	Go to 4.	Check circuit card for an open circuit. Check diode C1.
4. Is clock pulse present and correct at pin 11 of MLB1?	Go to 5.	Check cable and circuit card for an open circuit.
5. With REPT key and keyswitch in question depressed, is serial data present on pin 9 of MLB1?	Check P107, pin 6 for continuity. Go to 6.	Replace MLB1.
6. Are drive pulses present on pins 16, 17, 18, 19 and 20 of MLB1?	Go to 7.	Replace MLB1.
7. Are sense pulses present on input to MLB1 of keyswitch in question when it is closed (depressed down position)?	Go to 7b.	Check circuit card for an open circuit. Replace keyswitch in question.
7b. Are sense pulses present on sense line inputs to MLB1 with no keys depressed?	Replace keyswitch in question.	Go to 8.

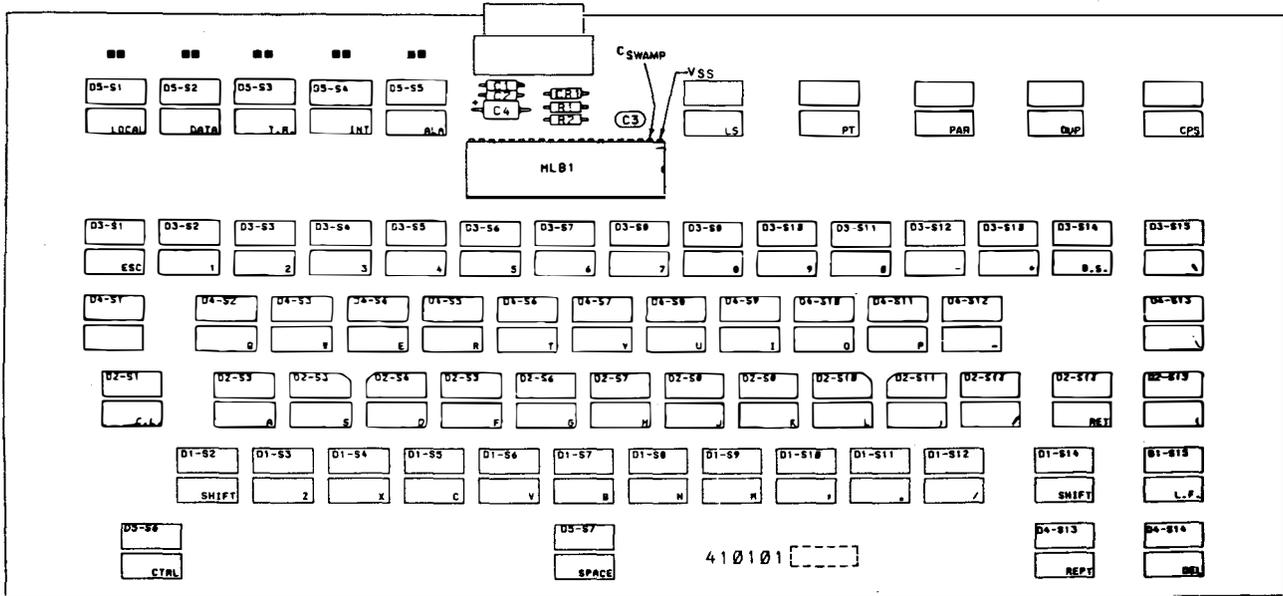
QUESTION	YES	NO
8. Does keyswitch in question meet the mechanical requirements (depress and release properly, latch, click, etc.)?	Go to 9.	Replace defective keyswitch.
9. Is trouble present but not defined?	Undefined trouble — refer to circuit description and diagrams, etc.	Review initial indication of trouble.

*Note:* The 410101 circuit card is susceptible to contamination when disassembled. The keyswitch contact areas of the circuit card should be wiped with a dry cheesecloth prior to reassembly. Any contamination can cause a keyboard failure.

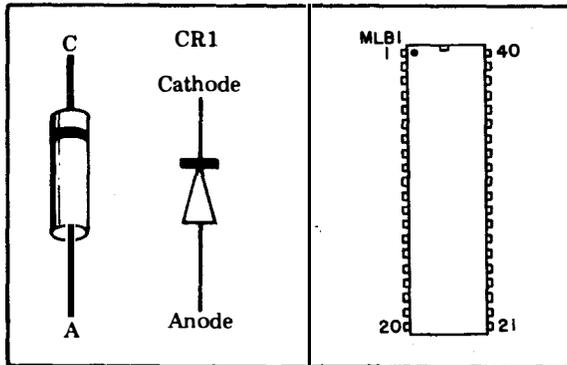
B. TROUBLESHOOTING (Contd)

2. 50K122 UNITIZED KEYBOARD TROUBLESHOOTING (Contd)

410101 CIRCUIT CARD COMPONENT LAYOUT



COMPONENT IDENTIFICATION AND LEAD DESIGNATION



SEMICONDUCTOR IN CIRCUIT STATIC FORWARD RESISTANCE

<u>COMPONENT</u>	<u>RESISTANCE (Approx.)</u>
CR1	30 ohms

STATIC CIRCUIT RESISTANCE (See Note)

<u>CONNECTOR TERMINAL</u>	<u>REFERENCE POINT</u>	<u>RESISTANCE (Approx.)</u>	
		<u>LO</u>	<u>HI</u>
P107-3 (+12 V)	P107-4 (logic card)	Infinity	Infinity
P107-2 (-12 V)	P107-4 (logic card)	1.5K ohms	6.5K ohms
P107-8 (+5 V)	P107-4 (logic card)	2K ohms	8.5K ohms

*Note:* Take resistance reading, reverse meter leads and take second resistance reading.

TRANSMITTED CODES (Excluding Start and Stop)

DRIVE	SENSE	UNSHIFT		SHIFT		CONTROL	
		8888888888888888 876543210	CHARACTER	8888888888888888 876543210	CHARACTER	8888888888888888 876543210	CHARACTER
1	15	Non-Send	CPS	Non-Send	CPS	Non-Send	CPS
1	14	Non-Send	DUPLEX	Non-Send	DUPLEX	Non-Send	DUPLEX
1	13	Non-Send	PARITY	Non-Send	PARITY	Non-Send	PARITY
1	12	Non-Send	PTR TEST	Non-Send	PTR TEST	Non-Send	PTR TEST
1	11	Non-Send	INTERLOCK	Non-Send	INTERLOCK	Non-Send	INTERLOCK
1	10	No Key		No Key		No Key	
1	9	No Key		No Key		No Key	
1	8	No Key		No Key		No Key	
1	7	100100000	SPACE	100100000	SPACE	100100000	SPACE
1	6	Non-Send	CONTROL	Non-Send	CONTROL	Non-Send	CONTROL
1	5	010000100	ALARM	010000100	ALARM	010000100	ALARM
1	4	110000011	INTERRUPT	110000011	INTERRUPT	110000011	INTERRUPT
1	3	010000010	AUTO ANS.	010000010	AUTO ANS.	010000010	AUTO ANS.
1	2	010000001	DATA	010000001	DATA	010000001	DATA
1	1	110000000	LOCAL	110000000	LOCAL	110000000	LOCAL
2	15	001100000	\	001111110	~	110011101	(9D)
2	14	100001000	BACKSPACE	100001000	BACKSPACE	010011100	(9C)
2	13	000101011	+	101011101	]	110011011	(9B)
2	12	000101101	-	001011111	_	010011010	(9A)
2	11	000110000	0	100101001	)	010011001	(99)
2	10	000111001	9	000101000	(	110011000	(98)
2	9	100111000	8	100101010	*	110010111	(97)
2	8	100110111	7	100100110	&	010010110	(96)
2	7	000110110	6	101011110	^	010010101	(95)
2	6	000110101	5	100100101	%	110010100	(94)
2	5	100110100	4	000100100	\$	010010011	(93)
2	4	000110011	3	100100011	#	110010010	(92)
2	3	100110010	2	101000000	@	110010001	(91)
2	2	100110001	1	000100001	!	010010000	(90)
2	1	000011011	ESC	000011011	ESC	110001111	(8F)
3	15	001011100	\	101111100		000011101	GS
3	14	101111111	DEL	101111111	DEL	000000000	NUL
3	13	Non-Send	REPEAT	Non-Send	REPEAT	Non-Send	REPEAT
3	12	100111101	=	101011011	[	Non-Send	
3	11	101110000	p	001010000	P	100010000	DLE
3	10	001101111	o	101001111	O	000001111	SI
3	9	001101001	i	101001001	I	000001001	HT
3	8	101110101	u	001010101	U	100010101	NAK
3	7	101111001	y	001011001	Y	100011001	EM
3	6	001110100	t	101010100	T	000010100	DC4
3	5	001110010	r	101010010	R	000010010	DC2
3	4	001100101	e	101000101	E	000000101	ENQ
3	3	001110111	w	101010111	W	000010111	ETB
3	2	001110001	q	101010001	Q	000010001	DC1
3	1	010000100	EXTRA	010000100	EXTRA	010000100	EXTRA

B. TROUBLESHOOTING (Contd)2. 50K122 UNITIZED KEYBOARD TROUBLESHOOTING (Contd)

## TRANSMITTED CODES (Excluding Start and Stop) (Contd)

DRIVE	SENSE	UNSHIFT		SHIFT		CONTROL	
		8 8 8 8 8 8 8 8 8 8 8 7 6 5 4 3 2 1 0	CHARACTER	8 8 8 8 8 8 8 8 8 8 8 7 6 5 4 3 2 1 0	CHARACTER	8 8 8 8 8 8 8 8 8 8 8 7 6 5 4 3 2 1 0	CHARACTER
4	15	001111011	{	001111101	}	100011111	US
4	14	100001101	RETURN	100001101	RETURN	111110111	(F7)
4	13	No Key		No Key		No Key	
4	12	000100111	,	000100010	"	Non-Send	
4	11	100111011	;	000111010	:	Non-Send	
4	10	001101100	l	101001100	L	000001100	FF
4	9	101101011	k	001001011	K	100001011	VT
4	8	001101010	j	101001010	J	000011110	RS
4	7	101101000	h	001001000	H	100001000	BS
4	6	101100111	g	001000111	G	100000111	BEL
4	5	001100110	f	101000110	F	000000110	ACK
4	4	101100100	d	001000100	D	100000100	EOT
4	3	101110011	s	001010011	S	100010011	DC3
4	2	101100001	a	001000001	A	100000001	SOH
4	1	Non-Send	CAPS	Non-Send	CAPS	Non-Send	CAPS
5	15	000001010	LINE FEED	000001010	LINE FEED	000001010	LINE FEED
5	14	Non-Send	RIGHT SHIFT	Non-Send	RIGHT SHIFT	Non-Send	RIGHT SHIFT
5	13	No Key		No Key		No Key	
5	12	100101111	/	000111111	?	Non-Send	
5	11	000101110	.	100111110	>	Non-Send	
5	10	100101100	,	000111100	<	Non-Send	
5	9	101101101	m	001001101	M	100011100	FS
5	8	101101110	n	001001110	N	100001110	SO
5	7	101100010	b	001000010	B	100000010	STX
5	6	101110110	v	001010110	V	100010110	SYN
5	5	001100011	c	101000011	C	000000011	ETX
5	4	001111000	x	101011000	X	000011000	CAN
5	3	101111010	z	001011010	Z	100011010	SUB
5	2	Non-Send	LEFT SHIFT	Non-Send	LEFT SHIFT	Non-Send	LEFT SHIFT
5	1	No Key		No Key		No Key	

3. 43K001 RO KEYBOARD TROUBLESHOOTING

## TROUBLESHOOTING GUIDE

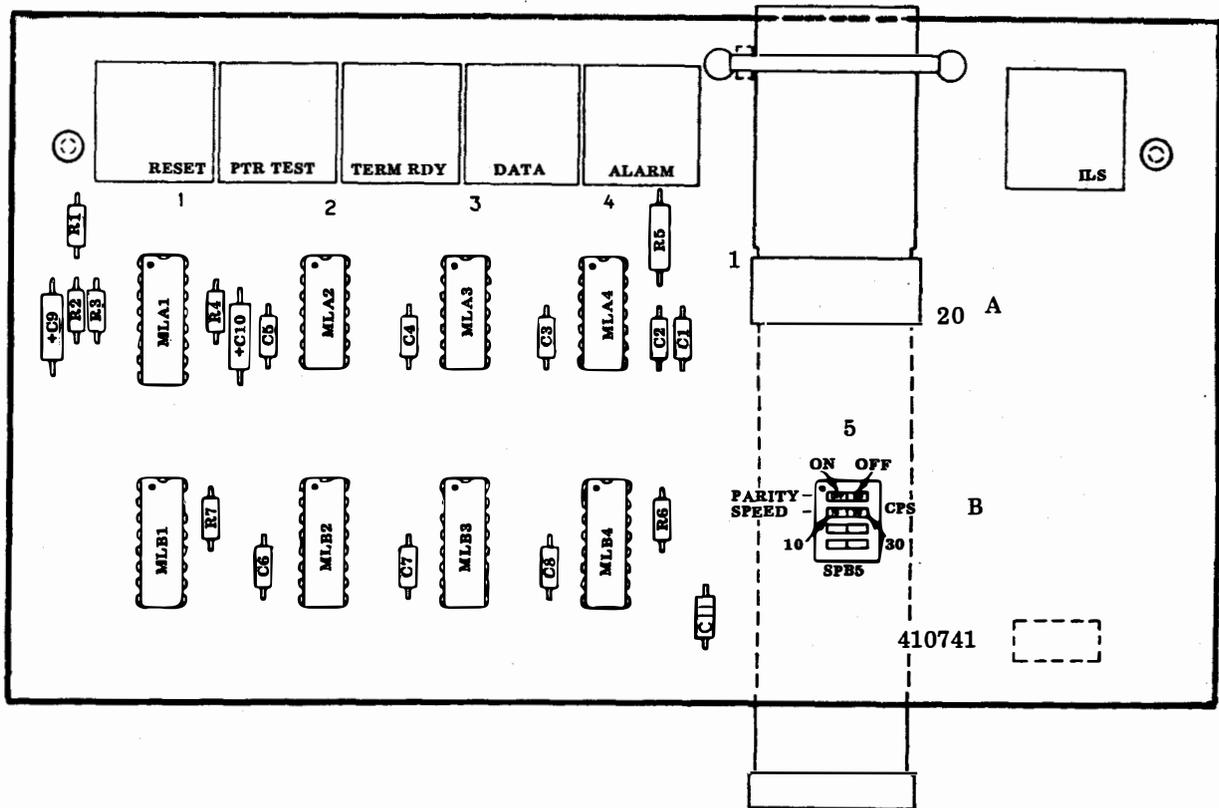
QUESTION	YES	NO
1. Do any indicators fail to light?	Go to 6.	Go to 2.
2. Is the test message printed while the PRINTER TEST key is depressed?	Go to 3.	Go to 7.
3. Does the TERM READY indicator turn on and ALARM turn off when the PRINTER TEST key is released (cover closed and paper installed)?	Go to 4.	Go to 8.
4. Does the ALARM indicator turn off (if on) and TERM READY turn on when the RESET key is depressed (cover closed and paper installed)?	Go to 5.	Go to 9.
5. Does ALARM indicator light when cover is opened?	Go to 12.	Go to 11.
6. Is -10 V or +5 V present on pin 3 of keyswitch in question?	Replace defective key-switch.	If voltage is -12 V dc go to 6a.
6a. Is +5 V present on circuit card cable connection of keyswitch in question?	Check for broken or open circuit land to pin 3 of keyswitch in question.	Go to 6b.
6b. Is +5 V present on the corresponding connector pin at P107?	Check for open circuit in cable.	Replace defective keyswitch.
7. Does pin 1 of PRINTER TEST key-switch toggle from +5 V to 0 V when keyswitch is depressed?	Check cable for open circuit.	Replace defective keyswitch.
8. Is negative pulse present on MLA3-3 when PRINTER TEST key is released?	Go to 10.	Check START CONTROL circuitry.
9. Does voltage on MLA3-3 toggle from +5 V to 0 V when RESET key is depressed and toggle from 0 V to +5 V when RESET key is released?	Go to 10.	Check START CONTROL circuitry.
10. With no keyswitch depressed, is MLB4-10 and 12 at +5 V?	Go to 10b.	Go to 10a.
10a. Is 0 V present on MLB4-1, 2, 3, 4, 5, 6, 7, and 15?	Replace MLB4.	Go to 10b.
10b. With MLA3-11 and 8 connected to GND, are clock pulses present on MLB2-5?	Go to 10c.	Check CLOCK DIVIDER circuitry.
<i>Note:</i> Printer may line feed when MLA3-11 and 8 are connected to GND.		

B. TROUBLESHOOTING (Contd)3. 43K001 RO KEYBOARD TROUBLESHOOTING (Contd)

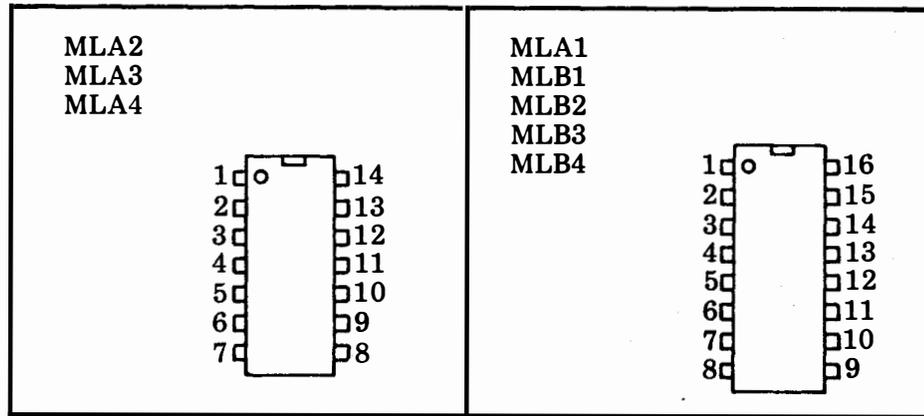
## TROUBLESHOOTING GUIDE (Contd)

QUESTION	YES	NO
10c. With MLA3-11 and 8 connected to GND, are MLB2 and MLB3 counting in binary?	Go to 10d.	Check ADDRESS COUNTER.
10d. With MLA3-11 and 8 connected to GND, are waveforms at MLB4-12 and 10 present and correct?	Go to 10e.	Replace MLB4.
10e. With MLA3-11 and 8 connected to GND are pulses present on MLA2-8?	Check START LATCH Replace MLB4.	Replace MLA2.
11. Is 0 V present on INTERLOCK SWITCH, pin 1 when INTERLOCK SWITCH is closed (depressed)?	Check cable for open circuit.	Replace defective keyswitch.
12. Is trouble present but not defined by question 1 through 11?	Undefined trouble — refer to Circuit Description and Diagrams, etc.	Review initial indication of trouble.
<i>Note:</i> Remove GND from MLA3-11 and 8 after correcting trouble (if strapped in Step 10b).		

410741 CIRCUIT CARD COMPONENT LAYOUT



COMPONENT IDENTIFICATION AND LEAD DESIGNATION



STATIC CIRCUIT RESISTANCE (See Note)

CONNECTOR TERMINAL	REFERENCE POINT	RESISTANCE (Approx)	
		LO	HI
P107-8 (+5 V)	P107-4 (logic gnd)	22 ohms	80 ohms
P107-2 (-12 V)	P107-4 (logic gnd)	Infinity	Infinity

Note: Take resistance reading, reverse meter leads and take second resistance reading.

B. TROUBLESHOOTING (Contd)3. 43K001 RO KEYBOARD TROUBLESHOOTING (Contd)

## TEST POINTS AND VOLTAGE READINGS

*Note:* Use Volt-Ohm-Milliammeter dc Volts Scale. Voltage readings are approximate and may be higher or lower than those specified, depending on meter used.

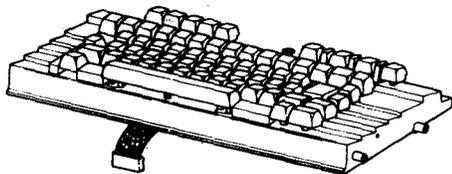
MLA1-7	Depress Reset Switch. Meter will momentarily deflect from +4 V to +3.9 V.
MLA1-9	Depress and release Printer Test Switch. Meter will momentarily deflect from +4 V to +3.9 V as switch is released.
MLA2-11	Depress and release Printer Test Switch. Meter will momentarily deflect from 0 V to +0.1 V as switch is released.
	Depress Reset Switch = +4 V Release Reset Switch = 0 V
MLA3-3	Depress and release Printer Test Switch. Meter will momentarily deflect from +4 V to +3.9 V.
	Depress Reset Switch = 0 V Release Reset Switch = +4 V
MLA3-6	Depress Reset Switch = +4 V Release Reset Switch = 0 V
MLA3-8	Depress Reset Switch = 0 V Release Reset Switch = +4 V
MLA4-1 = +7.5 V MLA4-12 = +3.5 V	
MLB1-6	Depress Reset Switch = +4 V Release Reset Switch = 0 V
MLB1-14	Depress Reset Switch = 0 V Release Reset Switch = +4 V
MLB4-2, 3, 6 and 7	Depress Reset Switch = +4 V Release Reset Switch = 0 V
MLB4-12	Depress Reset Switch = 0 V Release Reset Switch = +3.5 V

PART 3 — DISASSEMBLY/REASSEMBLY AND ADJUSTMENTS

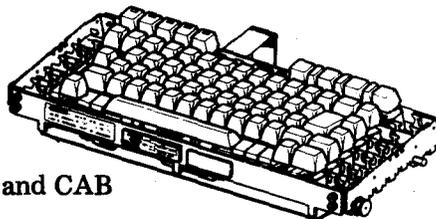
<u>CONTENTS</u>	<u>PAGE</u>
A. GENERAL .....	3-1
B. TOOLS REQUIRED .....	3-1
C. DISASSEMBLY/REASSEMBLY....	3-2
1. 43K101 KEYBOARD (KSR and RO).....	3-2
2. 50K122 UNITIZED KEY- BOARD.....	3-13
D. ADJUSTMENTS.....	3-16

A. GENERAL

This part provides disassembly/reassembly procedures for the 43 Basic keyboard (Fig. 1).



50K122/AAE and AAF



43K101/CAA and CAB

Fig. 1—43 Basic KSR Keyboards

*Note:* All part numbers shown in this manual are Teletype Corporation part numbers. When ordering replaceable components, unless otherwise specified, prefix each part number with the letters "TP" (ie, TP430047).

The keyboard circuitry can be damaged by static discharge. The 346392 static discharge ground strap is available for use by service personnel. Maintenance spares are provided in anti-static bags which should be saved for reuse when returning keyboards for repair.

The disassembly procedure includes that which is required for correction of troubles or replacement of parts in field or shop locations. The 50K122 unitized keyboard, however, is not field serviceable. All disassembly, with the exception of keytop removal should be performed in a shop facility. When removing a subassembly or part from the keyboard, follow the removal procedure and note the sequence of removal to enable proper reassembly.

Precautions should be taken to assure that the keyboard is disassembled and reassembled under clean conditions. No oil, grease, or other liquids shall be allowed on loose parts, subassemblies, keyswitches, or the complete keyboard.

Reference in the procedures to left or right and up or down and top or bottom, etc, refer to the keyboard in its normal operating position.

When removing a subassembly or part from the keyboard, do not force or pry parts to provide the necessary clearance for removal. No forcing is required to accomplish a removal procedure. Follow the removal procedure and note how each part is removed and the sequence of its removal so that proper reassembly can be accomplished. For reassembly, reverse the removal procedure except where different instructions are given.

B. TOOLS REQUIRED

The following tools are recommended for use during the disassembly and reassembly procedures:

- |                   |                              |
|-------------------|------------------------------|
| 75765             | Spring Hook — Pull           |
| 89954             | 1/4 Inch Nut Driver          |
| 100982            | Screwdriver (6 Inch Medium)  |
| 108285            | Long-Nose Pliers             |
| 346257            | Keyswitch Extractor          |
| 420204            | Keytop Extractor             |
| 346392            | Static Discharge Strap       |
| Customer Provided | Soldering Iron (Low Wattage) |
| Customer Provided | Desoldering Tool             |

### C. DISASSEMBLY/REASSEMBLY

#### 1. 43K101 KEYBOARD (KSR and RO)

##### Spacebar Mechanism (Early Design)

To remove the spacebar mechanism:

- (a) Disengage the leaf spring (bronze colored) from the wire bail using a spring hook and pull toward the front (Fig. 2).

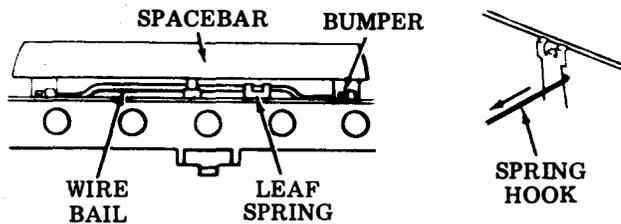


Fig. 2—Leaf Spring Disengagement

- (b) Disengage the two rear tines (one at each end of spacebar) with a small screwdriver while pulling the spacebar up and toward the front (Fig. 3).

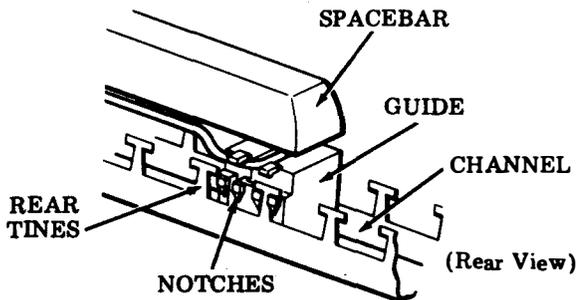


Fig. 3—Spacebar Removal

- (c) Continue applying upward pressure to the spacebar and disengage the two front tines.
- (d) Remove the wire bail from the left and right spacebar guides (snap in and out) (Fig. 4).

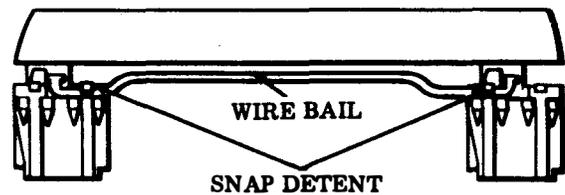


Fig. 4—Wire Bail Removal

To reassemble the spacebar mechanism:

- (a) Make sure the four tines engage the notches in the spacebar housing and the leaf spring is engaged to the wire bail.
- (b) Check mechanical operation of the spacebar so that it returns to its unoperated position freely when depressed and released slowly.

##### Spacebar Mechanism (Late Design)

To remove the spacebar, pry up on the left spacebar slide projection until the spacebar slide disengages from the housing. Lift and remove spacebar.

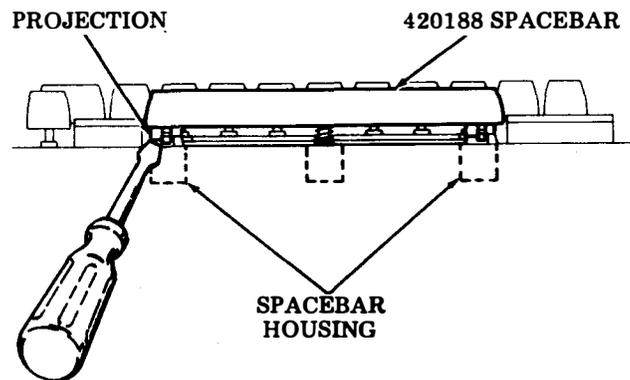


Fig. 5—Spacebar Removal

To remove the spacebar bail:

- (a) Remove spacebar (See Fig. 5).
- (b) Place 346257 tool over either spacebar housing and press downward. When the tool bottoms and embossed projections snap into notches on housing, squeeze and pull back on the tool to lift housing up. (Fig. 6).

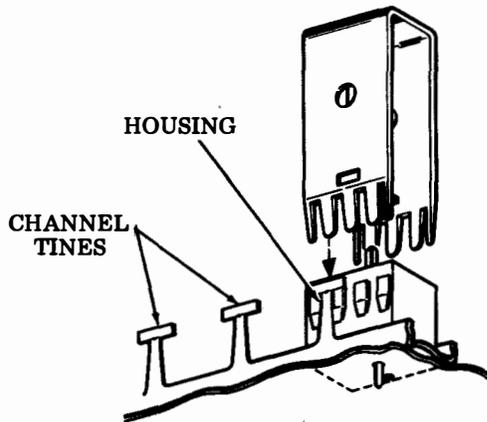


Fig. 6—Spacebar Housing Removal

*Note:* The tines of the tool must pass between the housing and the inside of the tines of the channel.

- (c) Repeat (b) for the other housing and lift out both housings with bail.
- (d) Remove bail from housings by snapping out of housing tab.

To reassemble the spacebar mechanism:

- (a) Snap the bail into the tabs on the spacebar housings as shown below.

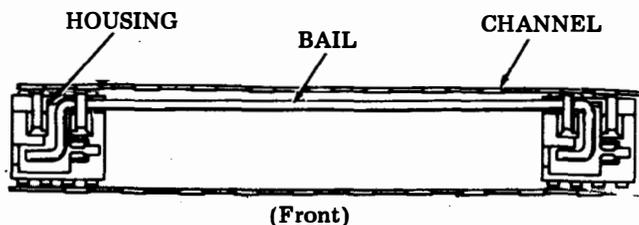


Fig. 7—Wire Bail and Housing Assembly

- (b) Snap the two spacebar housings into the keyboard channel. See Fig. 7. Make sure the four tines of the channel engage the notches in the spacebar housing.

- (c) Place the spacebar into the guide slots in the left and right housing. Position the bail into the notch (one left side and one right side) on the spacebar. Push down on the spacebar snapping it into place in the housing. See Fig. 8.

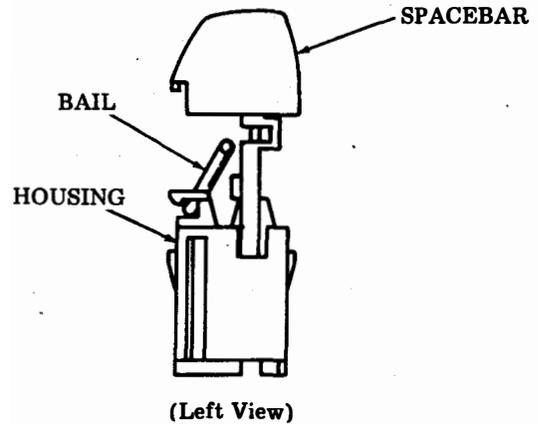


Fig. 8—Spacebar Assembly

- (d) Check mechanical operation of the spacebar so that it returns to its unoperated position freely when depressed and released slowly.

**Keytops**

To remove the keytops (Fig. 9):

- (a) There are two types of keytops used on the keyboard.

- (1) Control Keytop
  - Indicator
  - Nonindicator
- (2) Data Keytop



Fig. 9—Keytops

C. DISASSEMBLY/REASSEMBLY (Contd)

1. 43K101 KEYBOARD (KSR and RO) (Contd)

- (b) To remove the data keytops, place 420204 tool over keytop and pull up to remove (Fig. 10).

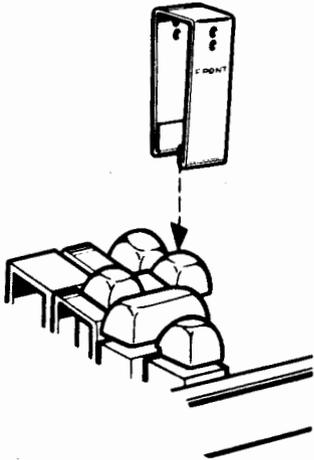


Fig. 10—Data Keytop Removal

**Warning:** CAPS LOCK, PARITY, DUPLEX, and CPS keytops must be in the fully extended, unlatched position before attempting to remove the keytop. Failure to observe this precaution will result in a damaged keyswitch.

- (c) To remove control keytops (Fig. 11):

- (1) Grasp keytop using thumb and index finger.
- (2) Exert upward force until keytop releases.

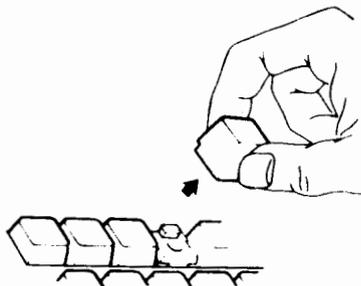
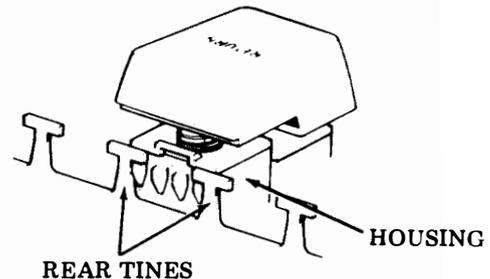


Fig. 11—Control Keytop Removal

- (d) To remove early design RETURN keytop with housing:

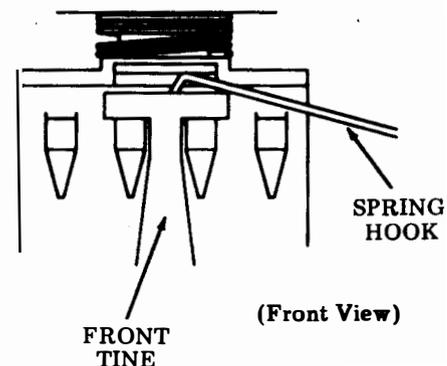
- (1) Remove keytops BACK SPACE, OVERLINE, GS, US, LINE FEED, SHIFT, and QUOTES that surround the RETURN keytop using 420204 tool.
- (2) Disengage the rear tines from housing with a small screwdriver while pulling the RETURN keytop up and toward the front (Fig 12).



(Rear View)

Fig. 12—Rear Tine Disengagement

- (3) Continue applying upward pressure to the RETURN keytop and disengage the front tine from housing using a spring hook. Remove keytop with housing from channel (Fig. 13).



(Front View)

Fig. 13—Front Tine Disengagement

To reassemble the early design keytop with housing:

Insert housing with key; observe position of locating lug on housing and press into channel. Housing must snap fully into front and rear channel tines.

To remove the late design RETURN keytop refer to Page 3-14, on keytop removal for the 50K122 unitized keyboard.

### Keytop Spacer

To remove the keytop spacer:

- (a) Remove keytop associated with spacer, and first keytop to the left (if present). (Refer to KEYTOPS.)
- (b) Slide spacer to the left as far as it will go and then pull rearward.

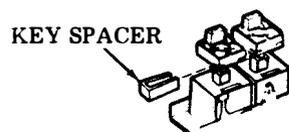


Fig. 15—Keytop Spacer Removal

To reassemble the keytop spacer:

- (a) Insert spacer from the left and while pushing to the right, observe that the spacer encloses the keytop push rod and the rear spring.
- (b) Replace keytops.

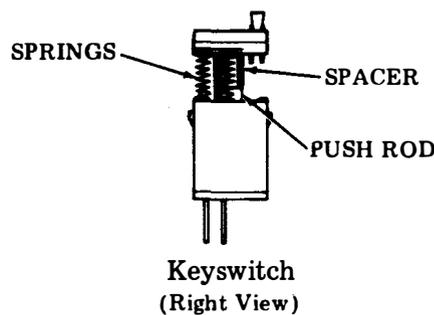


Fig. 16—Keytop Spacer Alignment

### Keyswitches

To remove the keyswitches:

- (a) Remove keytop.
- (b) Remove four screws and circuit card shield.
- (c) Remove solder from around terminal pins of keyswitch to be removed (Fig. 17).

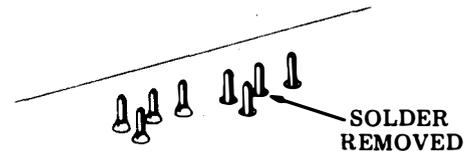


Fig. 17—Solder Removal

**Warning:** Use a grounded low-wattage soldering iron (avoid prolonged contact with pins) along with a desoldering tool to prevent damage to keyswitch card circuits and components.

- (d) Place 346257 tool over the keyswitch and press downward. When the tool bottoms and embossed projections snap into notches on keyswitch, squeeze and pull back on the tool to lift keyswitch out (Fig. 18).

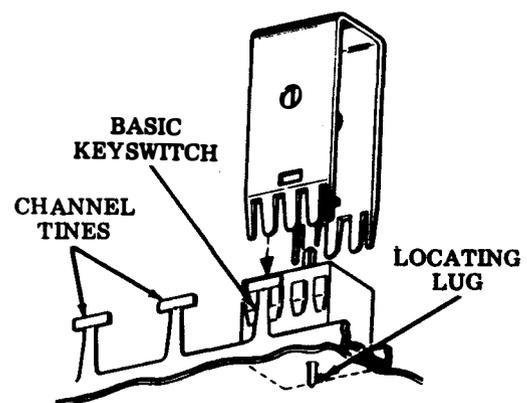


Fig. 18—Keyswitch Removal

**Note:** The tines of the tool must pass between the keyswitch housing and the inside of the tines on the channel.

C. DISASSEMBLY/REASSEMBLY (Contd)

1. 43K101 KEYBOARD (KSR and RO) (Contd)

To reassemble the keyswitch:

Insert new keyswitch, observe position of the locating lug, and press keyswitch into channel. Switch must snap fully into front and rear channel tines. Hold keyswitch in place and resolder.

Cable (KSR)

To remove the cable:

- (a) Remove the **PRINTER TEST, PARITY, DUPLEX** and **CPS** keytops. (Refer to **KEYTOPS**, Page 3-3).
- (b) Remove **INTERLOCK, PRINTER TEST, PARITY, DUPLEX** and **CPS** keyswitches (Fig. 19). (Refer to **Keyswitches**, Page 3-5).

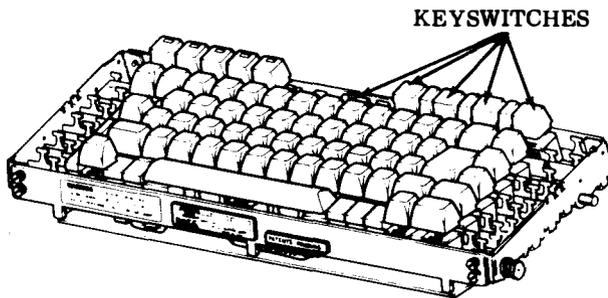


Fig. 19—Keyswitch Identification

- (c) Remove solder from around connector pins of cable to be removed (Fig. 20).

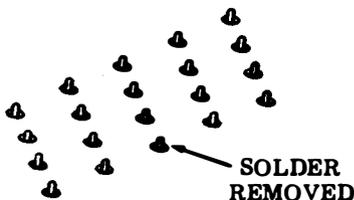


Fig. 20—Connector Pins

**Warning:** Use a grounded, low-wattage soldering iron (avoid prolonged contact with pins) along with a desoldering tool to prevent damage to card circuits and components.

- (d) Remove the circuit card cover located in front of the control keys from the channel. Use a spring hook to remove the cover from the mounting posts (Fig. 21).

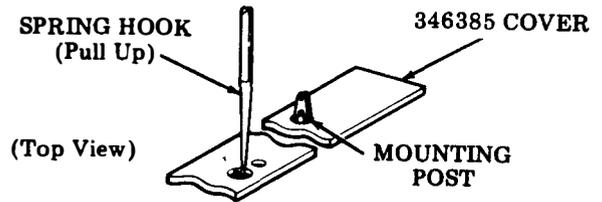


Fig. 21—Cover Removal

- (e) Cut the cable tie securing the cable to the circuit card.
- (f) Grasp the cable connector using thumb and index finger.
- (g) Exert upward force until cable connector releases (Fig. 22).

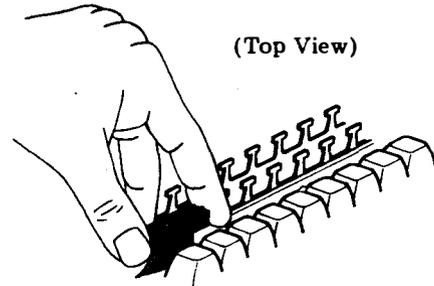


Fig. 22—Cable Connector Removal

- (h) Remove rear plate (Fig. 23).
- (i) Slide cable to the right until it clears the circuit card. Remove through opening between channels (Fig. 23).

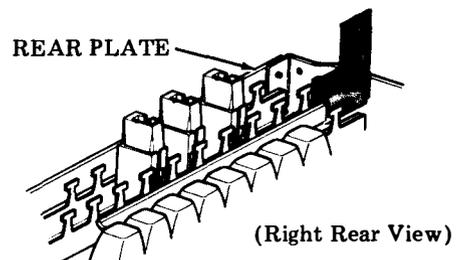


Fig. 23—Cable Removal

To reassemble the cable:

- (a) Insert new cable connector into circuit card holes and press into place. Hold cable connector in place and resolder.
- (b) Fasten cable to card using locally furnished cable tie.
- (c) Reassemble the keyswitches and keytops removed in Cable (KSR), (a) and (b), Page 3-6.
- (d) Replace circuit card cover removed in Cable (KSR), (d) Page 3-6.
- (e) Replace rear plate.
- (f) Replace circuit card shield.

Cable (RO)

To remove the cable:

- (a) Remove the interlock keyswitch (Fig. 24) (refer to Keyswitches, Page 3-5).



Fig. 24—Interlock Switch

- (b) Remove solder from around connector pins of cable to be removed (Fig. 25).

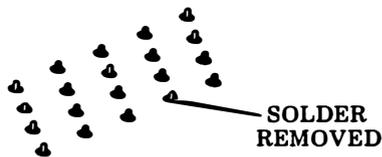


Fig. 25—Connector Pins

**Warning:** Use a grounded, low-wattage soldering iron (avoid prolonged contact with pins) along with a desoldering tool to prevent damage to card circuits and components.

- (c) Cut the cable tie securing the cable to the circuit card.
- (d) Remove the screw securing the right rear corner of the circuit card to the channel (Fig. 26).

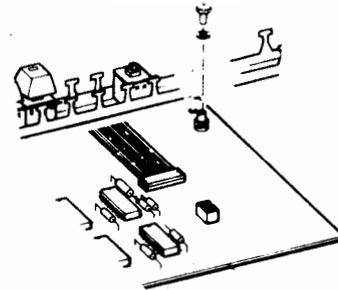


Fig. 26—Screw Removal

- (e) Grasp the cable connector using thumb and index finger (Fig. 27).
- (f) Exert upward force until cable connector releases.
- (g) While biasing the right rear corner of the circuit card downward, slide the cable to the right until it clears the circuit card. Remove the cable.

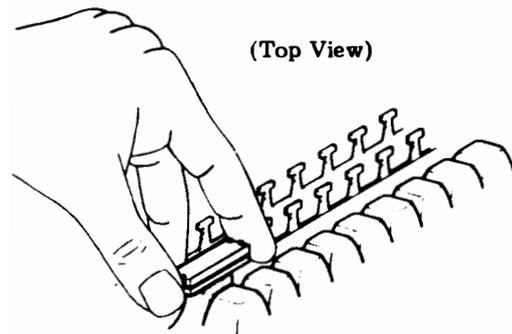


Fig. 27—Cable Connector Removal

C. DISASSEMBLY/REASSEMBLY (Contd)

1. 43K101 KEYBOARD (KSR and RO) (Contd)

Channel (KSR)

To remove the channel:

- (a) Remove all keytops associated with channel to be replaced. (Refer to Keytops, Page 3-3.)
- (b) Remove all keyswitches associated with channel to be replaced. (Refer to Key-switches, Page 3-5.)
- (c) Remove right side frame by removing four screws and loosening one screw (Fig. 28).

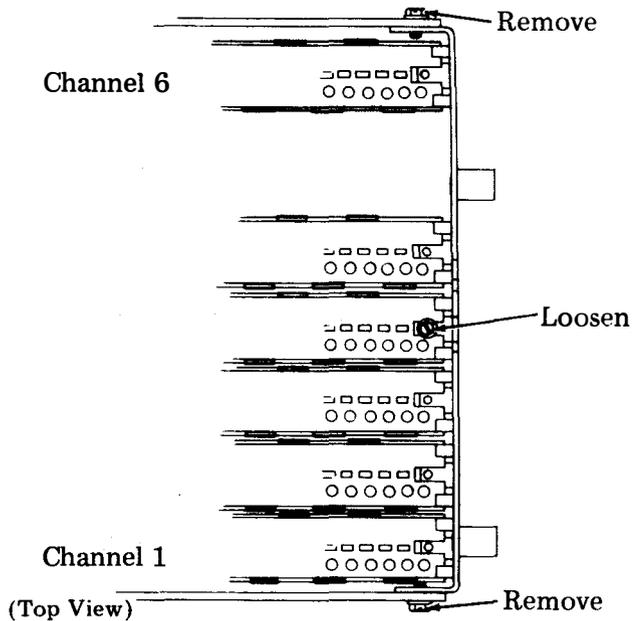


Fig. 28—Right Side Frame Removal

- (d) If removing Channel No. 4, remove screw and locating plate from left side of keyboard (Fig. 29).

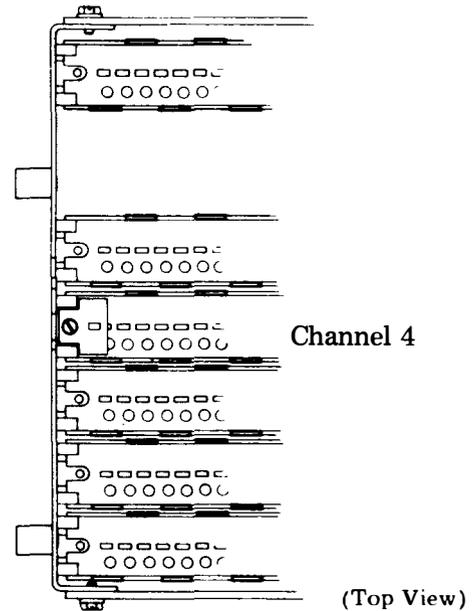
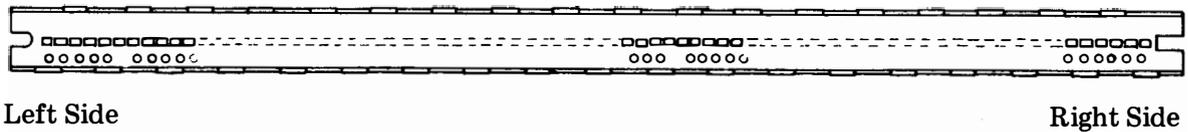


Fig. 29—Locating Plate

- (e) Pull channel to the right and lift out.

To reassemble the channel:



*Note:* Left side has curved slot; right side has square slot.

Fig. 30—Channel

- (a) Slide channel to the left and engage tines on left side frame.

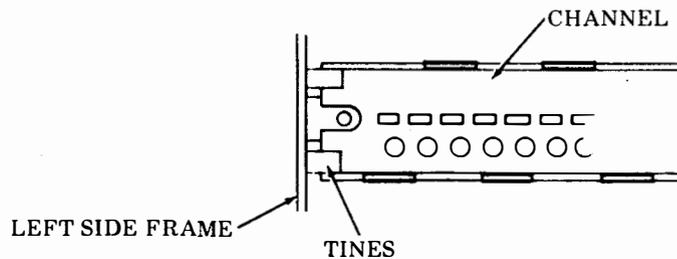


Fig. 31—Channel Engagement

- (b) Replace right side frame with all channels engaging side frame tines.
- (c) If removed, replace channel locating plate on left side.
- (d) Replace keyswitches removed.
- (e) Replace keytops removed.

C. DISASSEMBLY/REASSEMBLY (Contd)

1. 43K101 KEYBOARD (KSR and RO) (Contd)

Channel (RO)

To remove the channel:

- (a) Remove all keytops (refer to Keytops, Page 3-3).
- (b) Remove all keyswitches (refer to Keyswitches, Page 3-5).
- (c) Remove the two screws securing the circuit card to the channel (Fig. 32).

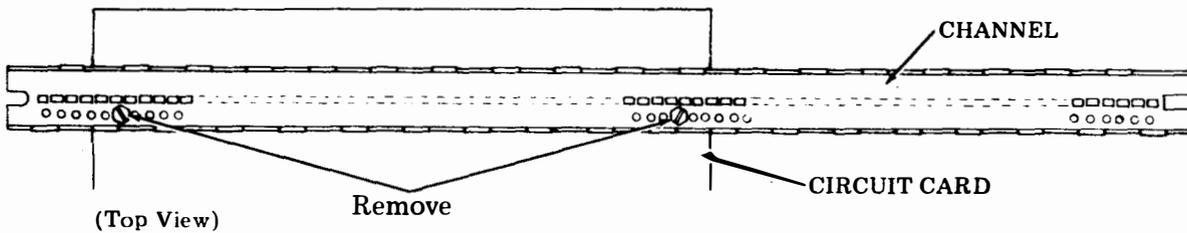


Fig. 32—Channel Removal

- (d) Remove the right side frame by removing four screws (Fig. 33).

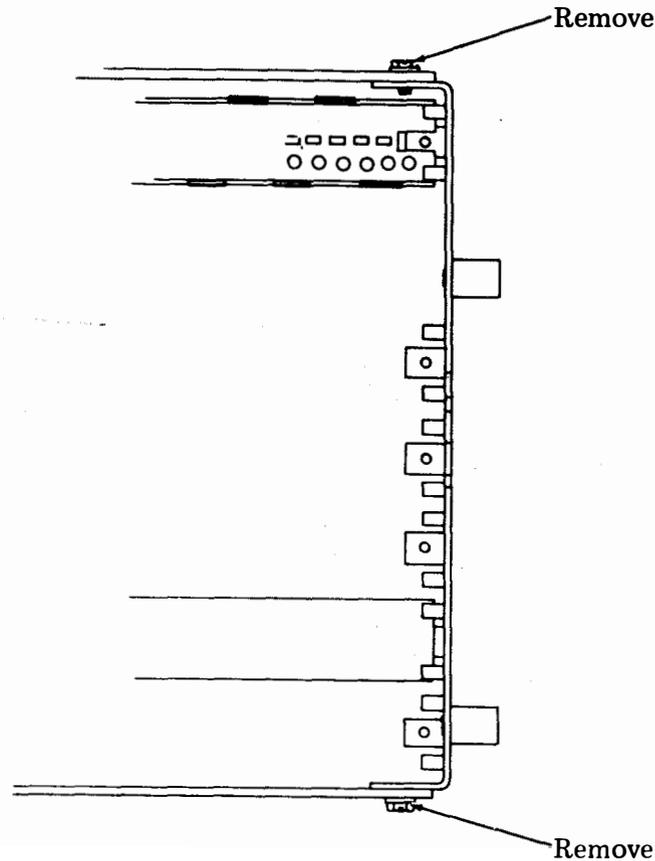


Fig. 33—Right Side Frame Removal

- (e) Pull channel to the right and lift out.

To reassemble the channel:

- (a) Slide channel to the left and engage tines on left side frame (Fig. 34).

*Note:* Left side has curved slot; right side has square slot (Fig. 35).

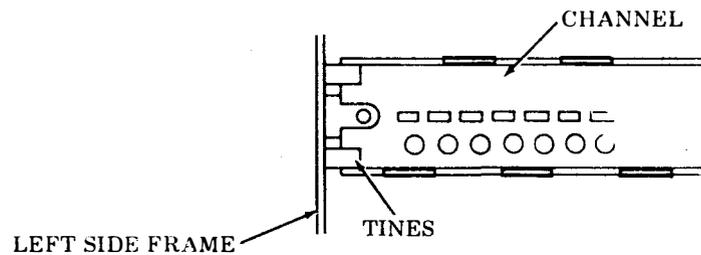


Fig. 34—Channel Engagement

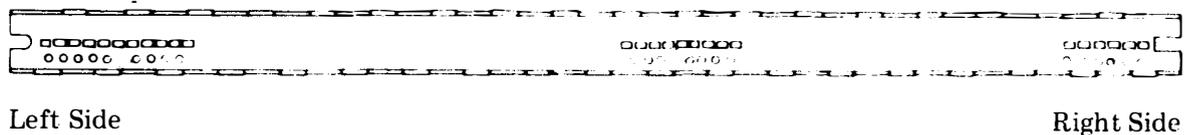


Fig. 35—Channel

- (b) Replace right side frame with channels engaging side frame tines.  
 (c) Replace the two screws that secure the channel to the circuit card.  
 (d) Replace all keyswitches previously removed.  
 (e) Replace all keytops previously removed.

#### Circuit Card Components

To disassemble the circuit card components:

- (a) Remove circuit card shield by removing four screws.  
 (b) KSR Only — If circuit card components to be replaced are located in Row A of circuit card, remove circuit card cover (perform Cable (KSR) (d), Page 3-6).  
 (c) KSR Only — If circuit card components to be replaced are located in Row B of circuit card, remove Channel No. 1 (perform Channel (KSR), Page 3-8).  
 (d) Remove solder from around terminal pins or leads of component to be removed.

*Warning:* Use a grounded low-wattage soldering iron (avoid prolonged contact with pins) along with a desoldering tool to prevent damage to card circuits and components.

- (e) Lift up and remove component.

C. DISASSEMBLY/REASSEMBLY (Contd)

1. 43K101 KEYBOARD (KSR and RO) (Contd)

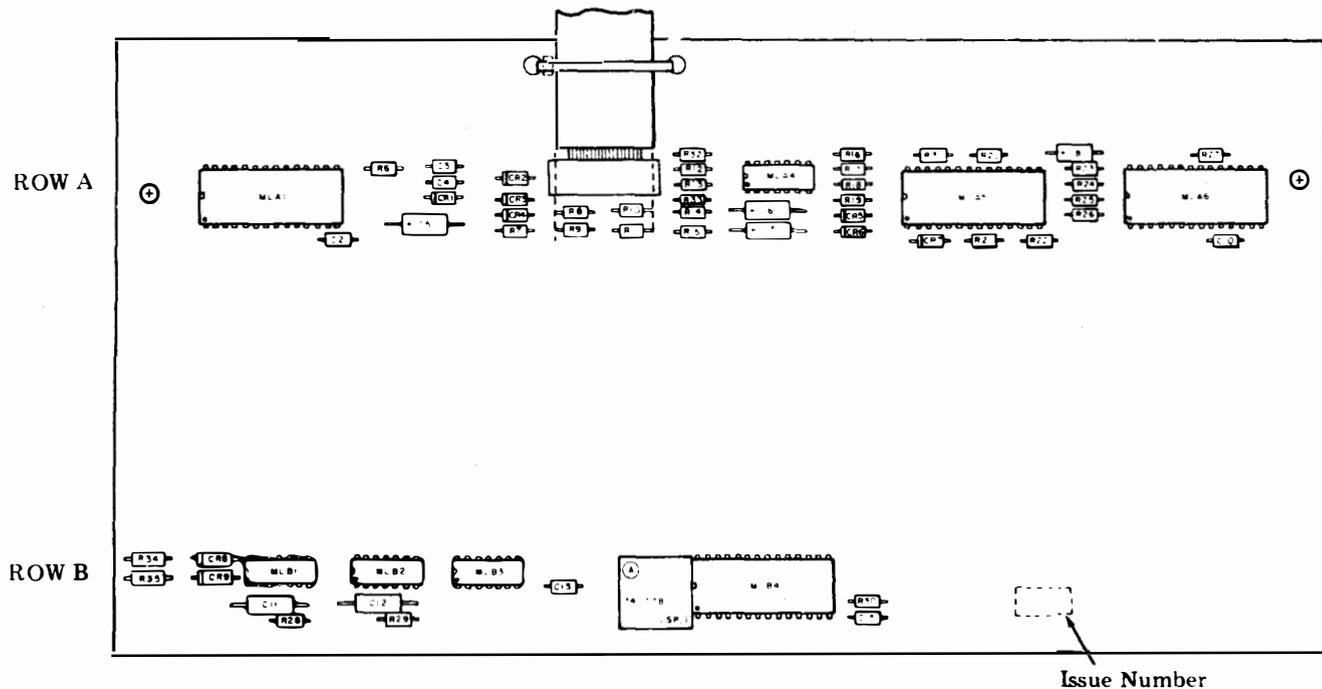


Fig. 36—Component Identification — 43K101 Keyboard

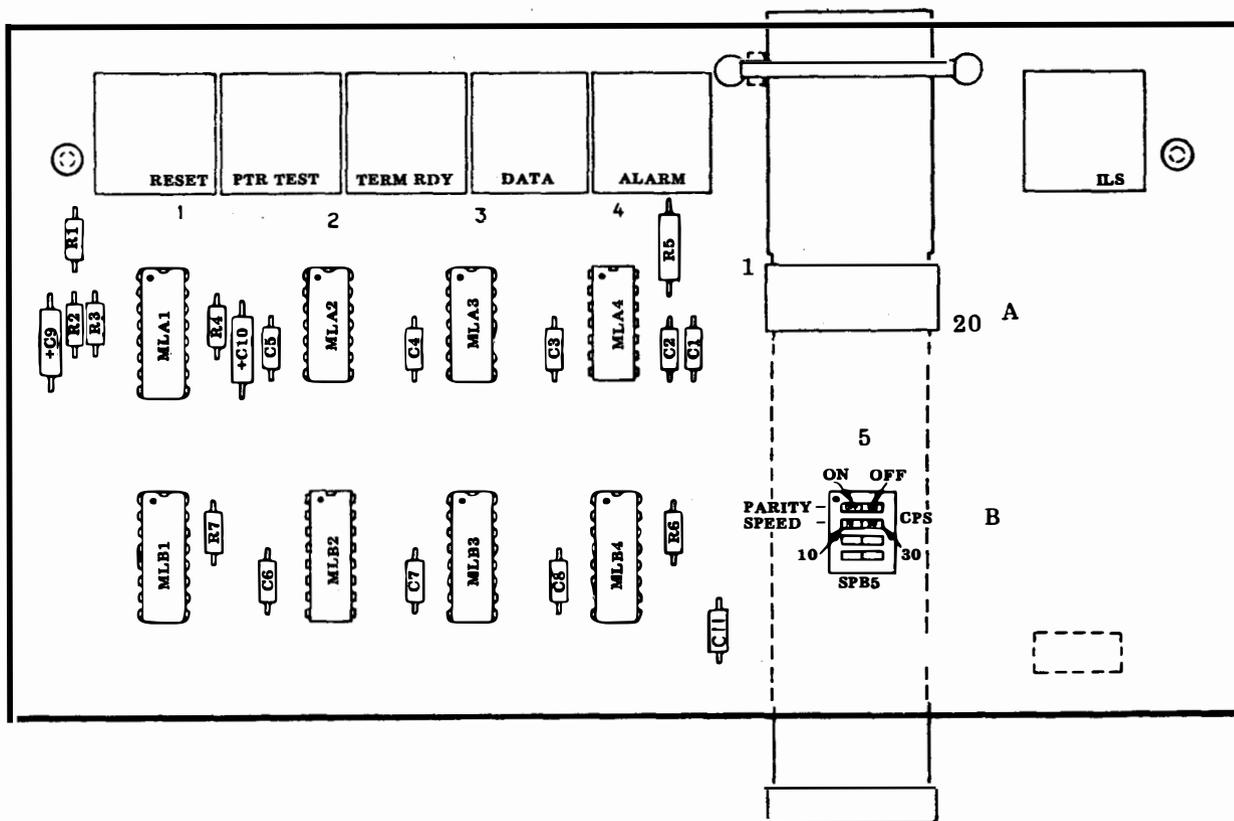


Fig. 37—Component Identification — 43K001 RO Keyboard

## 2. 50K122 UNITIZED KEYBOARD

### Spacebar Mechanism

To remove the spacebar mechanism:

- (a) With the spacebar in the undepressed state, insert a small screwdriver into the left side slot opening of the spacebar and exert a slight counterclockwise twist of the screwdriver while grasping the spacebar and pulling upward (Fig. 38).

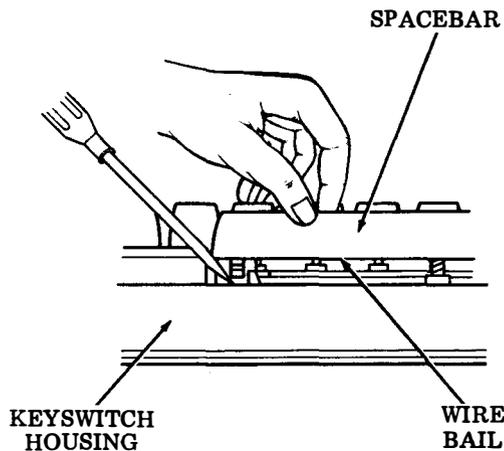


Fig. 38—Spacebar Removal

- (b) When the latching tab on the left side is twisted clear of its guide, the spacebar can be pulled free of engagement from the guide and wire bail.
- (c) When the spacebar is removed, the wire bail can be removed from its guide slots (Fig. 39).

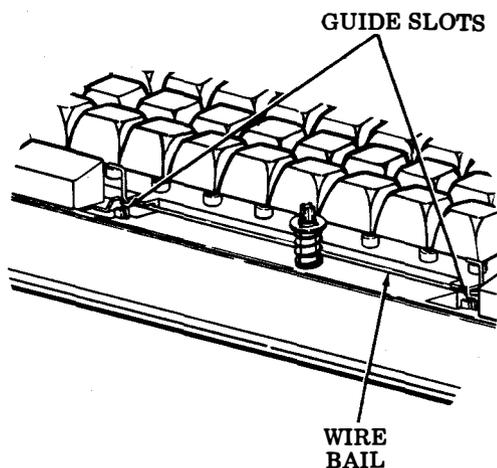


Fig. 39—Wire Bail Removal

- (d) To install spacebar, insert the wire bail in its guide slots and while engaging the spacebar with its guide and the wire bail, push down on the spacebar until the tab on the left side latches into the guide. (Fig. 40)

- (e) Check mechanical operation of the spacebar so that it returns to its unoperated position freely when depressed and released slowly.

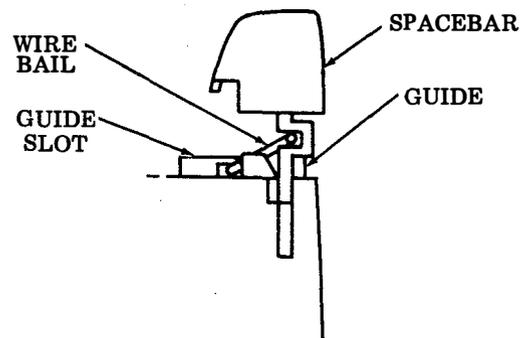


Fig. 40—Spacebar Assembly

### Keytops

To remove indicator keytop and indicator assembly:

- (a) Remove keytop by pulling up.
- (b) Remove indicator lens by pulling up until it releases.
- (c) Remove lens holder by pulling up.
- (d) Remove indicator assembly from housing by pulling up. In reassembly insure the terminal pins on the indicator assembly line up with the terminals on the keyboard logic circuit card.

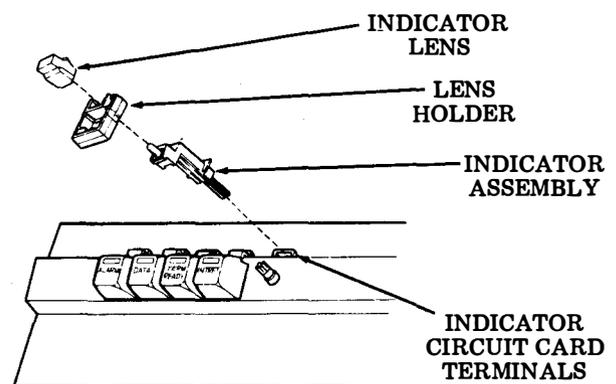


Fig. 41—Indicator Keytop Removal

### C. DISASSEMBLY/REASSEMBLY (Contd)

#### 2. 50K122 UNITIZED KEYBOARD (Contd)

To remove RETURN keytop:

- (a) Remove a minimal number of the surrounding keytops to allow the RETURN keytop to be grasped with the fingers. Remove by pulling up (Fig. 42).

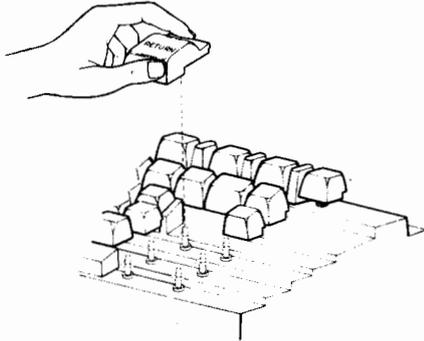


Fig. 42—Return Keytop Removal

For removal of data and control keytops, refer to Page 3-3 Keytop Removal for the 43K101 Keyboard.

#### Circuit Card

To remove the circuit card:

- (a) Support the keyboard bottom side up so that the keytops are not depressed.
- (b) Remove the five screws that secure the bottom pan to the keyswitch housing assembly (Fig. 43).
- (c) Remove the five screws that secure the insulator and circuit card to the keyswitch housing assembly (Fig. 43).

**Warning:** Once the circuit card is removed, maintain the keytops in the undepressed state. Depressing a keytop will dislodge the key plunger mechanism. Also, the cams of the latching keyswitches may fall out of engagement with the housing if the keyboard is positioned bottom side down. Refer to Page 3-16 for recommended holding fixtures for 50K122 keyboard disassembly.

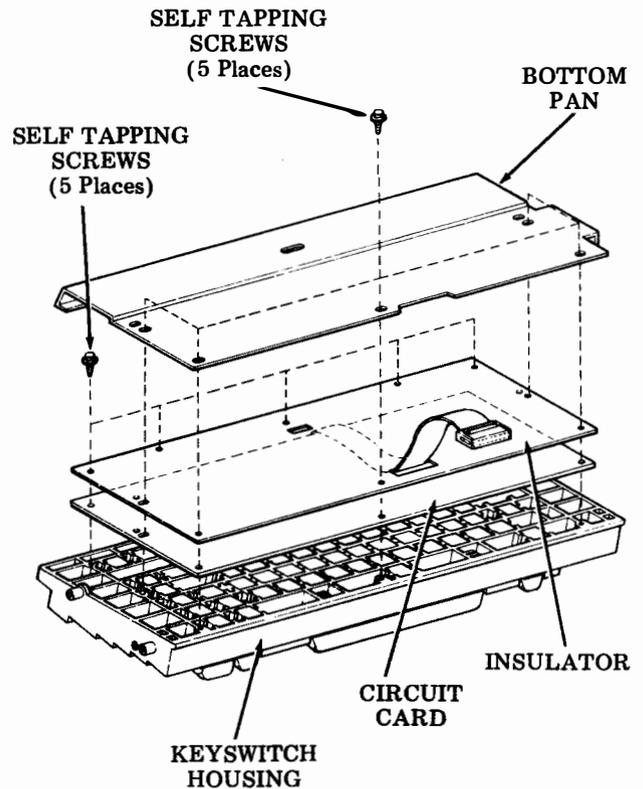


Fig. 43—Circuit Card Removal

#### Keyswitches

To remove the data keyswitch assembly:

- (a) With the circuit card assembly removed, depress the keytop of the plunger mechanism to be removed. The lower plunger assembly will disengage with the housing and can be removed. (Fig. 44).

**Note:** Once the lower plunger has been removed take care not to misplace the air gap spacer and magnet which lie in the housing assembly.

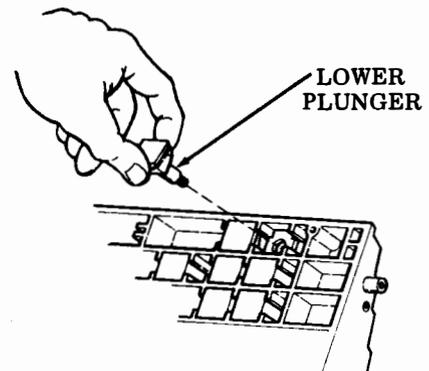


Fig. 44—Lower Plunger Removal

- (b) Remove the keytop and plunger retainer from the upper plunger.
- (c) Slide the upper plunger out through the bottom of keyswitch housing (Fig. 45).

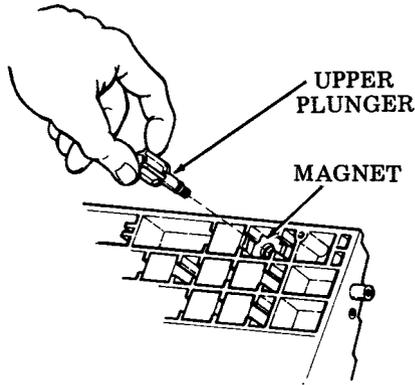


Fig. 45—Upper Plunger Removal

To remove the indicator keyswitch assembly:

- (a) With the circuit card and indicator keytop assembly removed, (Fig. 41), depress the indicator plunger assembly until it slides out of the housing.
- (b) The magnet can be removed by lifting it off the upper keeper. When reassembling insure the magnet is fully seated in the upper keeper of the housing. (See Note.)

To remove the latching keyswitch: (caps lock and control).

- (a) Remove the keytop, plunger retainer, compression spring and circuit card. (See 3-14).
- (b) Depress the plunger assembly until it slides out of the housing.

- (c) Remove the latching cam by grasping it's ring and pulling cam out of the housing. (Fig. 46.)
- (d) Remove the latch magnet and latch keeper by slipping them off the latching cam. (Fig. 46.)
- (e) During reassembly of the latch magnet and keeper, place the keeper against the magnet making sure to orient them so their outlines match.
- (f) Place the magnet and keeper into the cam recess with the magnet toward the cam. (See Note.)

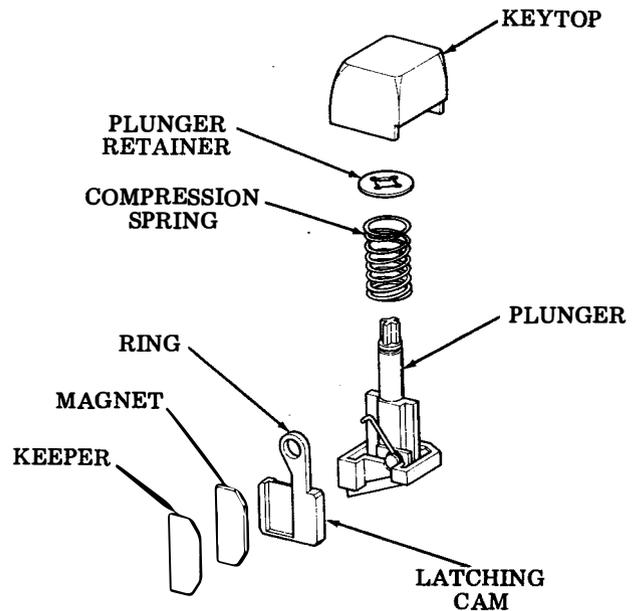


Fig. 46—Latching Keyswitch Removal

*Note:* Any magnets removed during disassembly should be cleaned of foreign particles before reassembling in the keyswitch housing.

C. DISASSEMBLY/REASSEMBLY (Contd)

2. 50K122 UNITIZED KEYBOARD (Contd)

Blocking Latching-Type Keyswitches

To block keytop in UP position:

- (a) Remove the keytop (Refer to KEYTOPS, Page 3-13).
- (b) Remove the nylon retainer and spring.

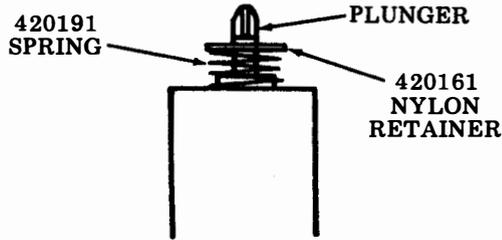


Fig. 47

- (c) Replace the nylon retainer.
- (d) With the plunger pulled up, insert a 420159 stop under the retainer as shown in Fig. 48.

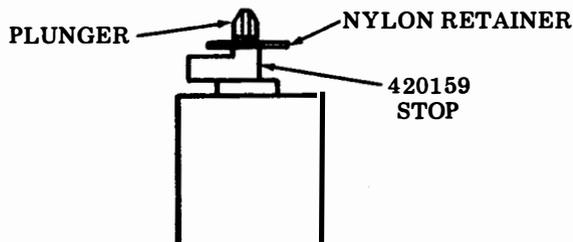


Fig. 48

- (e) Replace keytop removed or use blank keytop.

To block keytop in DOWN position:

- (a) With the keytop removed, remove the nylon retainer and spring (see Fig. 47).
- (b) Assemble 108103 spacer onto plunger.

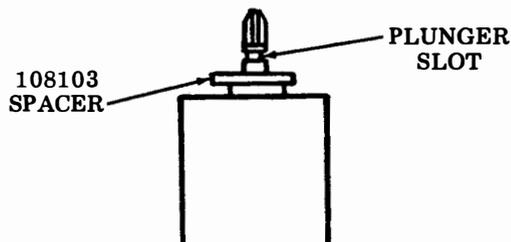


Fig. 49

- (c) With plunger held in fully latched down position, assemble 119652 retainer into plunger slot.

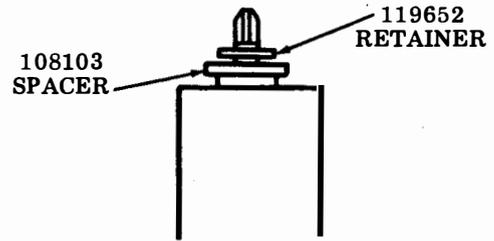


Fig. 50

- (d) Replace keytop removed or use blank keytop (see BLANK KEYTOPS).

BLANK KEYTOPS

The following blank keytops may be used to cover blocked keyswitches:

<u>Row</u>	<u>Blank Keytop</u>
Control Row (Top)	346168
Fifth Row	341024
Fourth Row	341022
Third Row	341010
Second Row	341019
First Row (Bottom)	341019

108103 Spacer

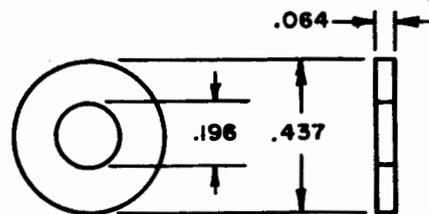


Fig. 51

119652 Retainer

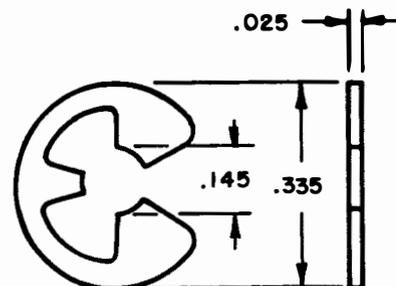


Fig. 52

**Keyboard Holding Fixture**

To aid in disassembly and reassembly procedures of the 50K122 keyboard the use of a keyboard holding fixture is recommended.

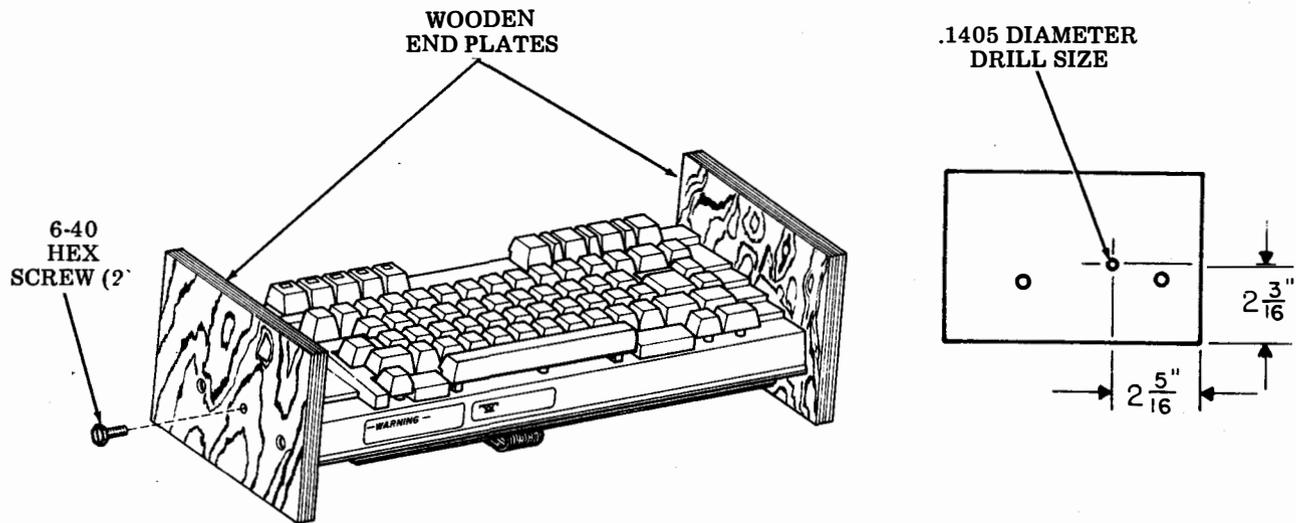
**Holding fixture for low volume keyboard repair:**

(a) The holding fixture is assembled using the 28277PK wooden end plates which are part of the keyboard packing material. (Fig. 53)

(b) To secure the wooden end plates to the keyboard drill a hole in each end plate as shown in Fig. 53.

(c) Insert a 6-40 hex screw 3/4 inch in length through the hole drilled in the end plate and screw it into the threaded hole normally used for the 181240 mounting screw.

(d) When both end plates are secured to the keyboard housing the keyboard can be turned over and the circuit card removed.



**Fig. 53—Holding Fixture For Low Volume Keyboard Repair**

**Note:** The bottom pan must be removed before the wooden end plates are mounted on the keyboard.

C. DISASSEMBLY/REASSEMBLY (Contd)

2. 50K122 UNITIZED KEYBOARD (Contd)

Holding fixture for high volume keyboard repair:

(a) The holding fixture is constructed from 1/16 inch thick steel plate.

(b) The holding fixture may be made by repair personnel using the dimensions shown in Fig. 54.

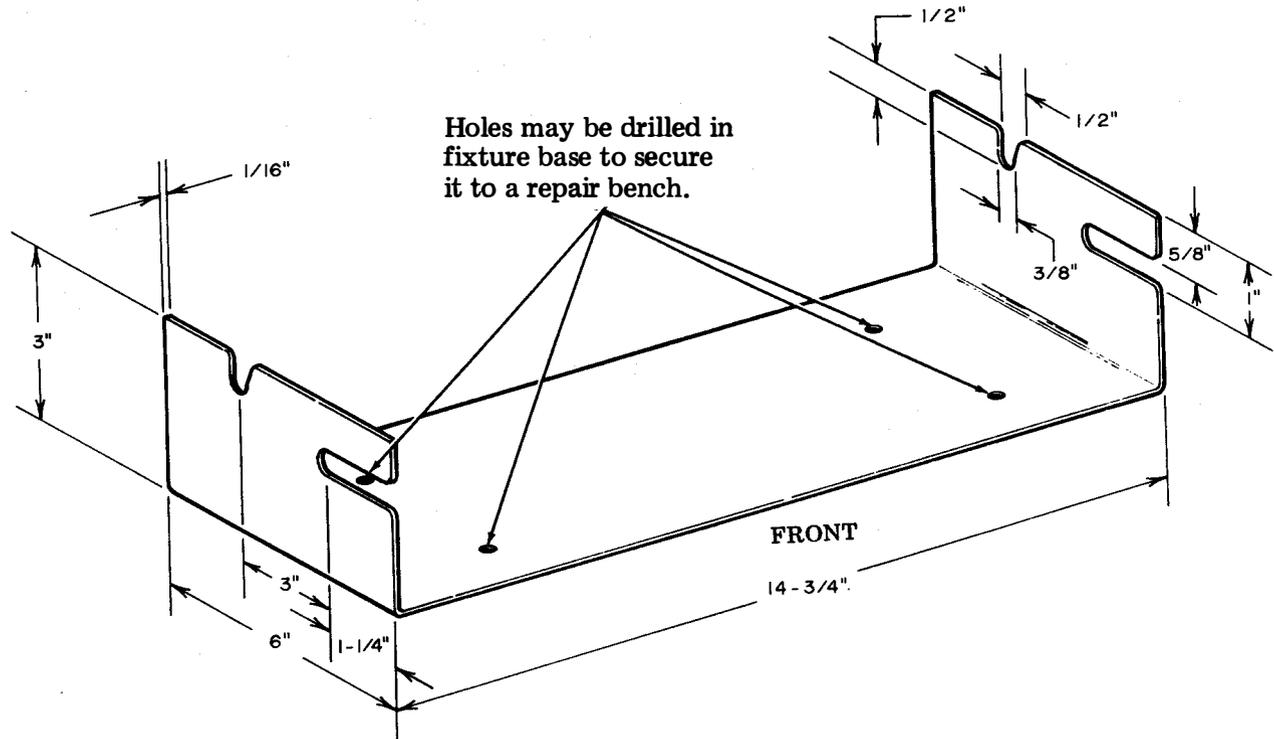


Fig. 54—Holding Fixture For High Volume Keyboard Repair

D. ADJUSTMENTS**Keyboard to Cover Alignment**

The following two requirements must be met:

**(1) Requirement**

**Left to Right Positioning** — When the free play movement of the cover (left to right) is taken up lightly in each direction, the cover should not touch any keyboard keytops.

**To Adjust**

Loosen two screws and position the printer and rear frame assembly to meet the requirement.

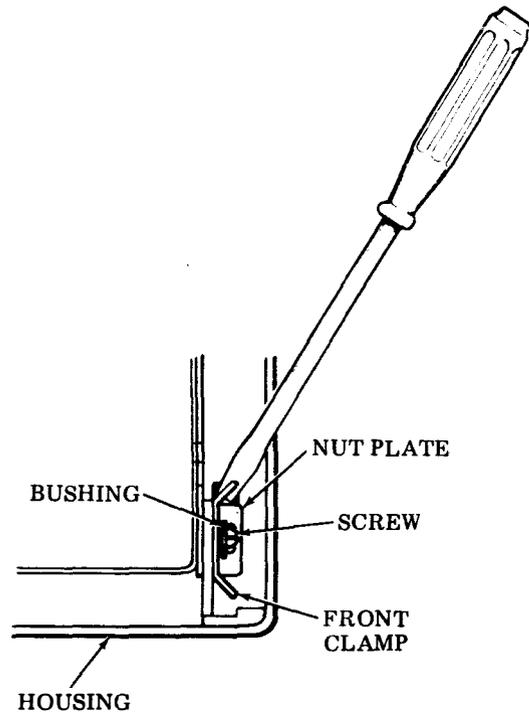
**(2) Requirement**

**Forward Positioning** — The two front bushing clamps should firmly engage the keyboard bushings and hold the printer and rear frame assembly fully forward into the housing without causing a bind between cover and keyswitches. There should be no front to rear play between the bushing and clamp (left and right sides).

**To Adjust**

Insert a screwdriver into the square hole in the nut plate and gently twist (or pry) the screwdriver with enough force to meet the requirement.

**Warning:** Do not overtwist the screwdriver.



(Top View — Right Corner)



PART 4 — CIRCUIT DESCRIPTION AND DIAGRAMS

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A. GENERAL

This part provides circuit descriptions and combined schematic and troubleshooting circuit diagrams for the 43 Basic KSR and RO keyboards.

Wave forms and voltage levels are shown on the diagrams wherever possible to aid in troubleshooting and understanding of the circuit theory. Circuit descriptions refer to coordinates on the schematic, ie, (C2) to locate the circuit being described.

For additional troubleshooting information associated with these circuit drawings, refer to PART 2 — TROUBLESHOOTING which includes:

- Troubleshooting charts.
- Tables for dynamic and static VOM measurements.
- Illustrated layouts of circuits and physical location of component and connector leads.

For part number identification of components and unit codes shown on circuit diagrams refer to PART 5 — PARTS AND UNIT CODES.

Most numbers shown on various leads, components and connectors on the circuit drawings are not actually marked on the equipment. They are required for identification purposes when referring to other parts of the manual.

The circuit diagrams in the part (with added information on circuit layouts and physical location of component leads from PART 2) are also available as a separate package of diagrams with each major component on a single sheet. The package of diagrams can be ordered from Teletype Corporation as Manual 385, 43 Teleprinter Circuit Diagrams.

B. CIRCUIT DESCRIPTIONS

43K101 KEYBOARD

1. KEYSWITCHES AND SENSE AMPLIFIERS

Each capacitive keyswitch is connected to a single input of a sense amplifier MLA1, MLA6 or MLB4 (F2). These sense amplifier determines the logic state applied to an input by comparing the charging time of the keyswitch connected to an input to the charging time of a reference capacitor (C2, C10, or C15). Charging current for the sense amplifiers is provided by reference resistors (R6, R27 or R3).

The keyswitch logic transmit Data Enable (DE) pulse which advance the sense amplifiers to their keyswitch input and places the keyswitches under test. When a DE pulse is received by the sense amplifiers, they will respond by transmitting two data bits if a keyswitch being sensed is depressed. Data bit 1 (1st depression) will go high when the keyswitch being sensed is first encountered as "depressed". Data bit 2 (2nd depression) will be high as long as the keyswitch continues to be depressed. This action continues until the sense amplifiers have tested all inputs (21 keyswitches). The keyswitch logic will then retransmit the 21 DE pulses plus 22 extra Data Enable pulses (while internal functions are being performed) and the cycle repeats.

## 2. KEYSWITCH LOGIC

On each scan, the keyswitch logic transmits a SYNC pulse to establish synchronization. The keyswitch logic will then send a series of DE pulses, one pulse per every 12 clock cycles. A test signal, End of Scan (EOS/Alarm) is provided for use as a timing reference. End of Scan is active twenty-four  $\emptyset 1$  periods after the Sync pulse.

When a keyswitch has been sensed as "depressed", the keyswitch logic will determine if it is to be sent as a character or is to modify the code of another keyswitch (ie, CAPS LOCK, SHIFT, CTRL or REPT). If the code is to be sent, it will appear as mark-space data on the serial sent data lead. The mark (high) level of Send Data and Repeat Mode (RPM) is limited to +5 V by CR2, CR3, CR4 and R7 (F7). The code consists of 11 bits: One start bit, 8 code bits, one parity bit and one stop bit. One bit time = 143 milliseconds.

## 3. CLOCK GENERATION AND DRIVERS

The 560 KHz clock from pin 12 of P107 (C1) is divided by 5 by MLB3, R28 R29, C11 and C12 delay appropriate edges of the 110 KHz signal and are recombined by MLB1 and MLB2 to produce nonoverlapping  $\emptyset 1$  and  $\emptyset 2$  predrive signals at pin 11 of MLB1 and MLB2. The non-overlap time is .3 microseconds minimum to 1.2 microseconds maximum for both nonoverlaps.

The predrive signals are coupled to MLA4 by C6 and C7. R14 and R15 limit the current levels. CR8, R34 and CR9, R35 insure a proper voltage swing for the clock driver. Clock driver MLA4 is a high voltage dual inverter. R16 and R17 prevent inductive ringing of the fast transitions on  $\emptyset 1$  and  $\emptyset 2$ .

### 50K122 KEYBOARD

#### 1. KEYSWITCH LOGIC

Each capacitive keyswitch in the matrix array is connected to a sense input on MLB1. Keyswitch validation is accomplished by comparison of the drive pulse voltage, coupled through the matrix to the sense inputs, with the fixed voltage of an analog comparator internal to MLB1. The comparator then presents key down information to the validation logic which is also internal to MLB1.

When a keyswitch has been validated as depressed, MLB1 will determine if the code is to be sent as a character or if it is to modify the code of another keyswitch (ie, CAPS LOCK, SHIFT, CTRL, or REPT). If the code is to be sent, it will appear as mark space data on the serial data lead. This lead (pin 6 at J1) is normally at the marking level. The marking level output voltage is greater than 4.5 volts, but less than the +5 volt supply. The spacing or low level output voltage is greater than 0 volts, but less than 0.5 volts. Output impedance for both serial data and repeat mode shall be less than 5K ohms in either logic state.

Repeat mode lead is at the low level as long as the REPEAT key is not depressed. When depressed, the repeat mode lead of MLB1 goes to the high level. When released the lead will return to the low level. If any other keyswitch is depressed while the REPEAT key is depressed, the character associated with that keyswitch will be sent once every 2.3 ms.

The CPS, DUPLEX, PARITY, and PRINTER TEST keys are normally open switches. When depressed the corresponding pins in J1 are connected to ground.

A 560 KHz square wave input from pin 12 of J1 is divided down to create all the timing signals needed to scan the matrix. Each key requires 28.6 ms to interrogate, and the entire 75 keys are scanned each 2.15 ms.

#### 2. POWER ON RESET AND POWER DISTRIBUTION

At power turn on approximately 0.5 seconds of power on reset delay is provided by resistor R2 and capacitor C4. During power on reset the serial data lead is held marking and the repeat mode is held off. The keyswitch array scanning is suppressed during power on reset. The reset function is provided by the substrate diode in MLB1.

Zener diode CR1 and resistor R1 provide a +5 volt supply for MLB1.

Capacitors C1 and C2 provide power supply decoupling.

### 43K001 RO KEYBOARD

#### 1. SEND DATA OUTPUT

Depressing the RESET key or releasing the PRINTER TEST key causes the keyboard to serially transmit a four character sequence to

the printer logic via the send data output pin 6. The character information is mark-space data encoded in ASCII\* or extended ASCII conforming to the following sequence of characters: LOCAL, CARRIAGE RETURN (CR), LINE FEED (LF) and AUTO ANSWER.

Each transmitted character consists of a start bit followed by nine bits of information defined as bits "0" through "8" and ending with a stop bit. The keyboard inserts three additional stop time intervals between each transmitted character. The data is transmitted at a 7 kilobits per second rate at TTL signal levels whereby a high is defined as a mark and a low is a space.

The four-character mark-space sequence is stored in the keyboard ROM whereby the total number of bits serially transmitted is 53 over a time interval of approximately 7.6 milliseconds. Internal keyboard control signals are also stored in the ROM.

## 2. START CONTROL

The RESET keyswitch when depressed, initiates the start sequence. Its signal is gated with the one-shot, MLA1-7 (F4) to eliminate noise spikes due to contact bounce, thus providing a clean signal to set the start latch to the "1" state.

The PRINTER TEST keyswitch, when depressed, applies a ground signal to the printer logic causing the printer to print out a test message. Upon the release of the PRINTER TEST keyswitch, the one-shot MLA1-9 (D3) is triggered presenting a low signal for approximately 12 milliseconds to gate input MLA2-12. This signal is used to set the start latch to the "1" state.

## 3. START LATCH

The start latch (E7), when in the set "1" state, removes the "MR" signal from the address counters MLB2 and MLB3 (F9) and the divide by 8 frequency counter. At this time, the output of the latch MLA3-6 goes high, the gate MLA3-11 is enabled, and its output goes low removing the reset (R0 and R9) on the decade counter, MLA4.

## 4. CLOCK DIVIDER

The input to the decade counter is a 560 KHz square wave free running clock signal from the printer logic card. With the decade counter

enabled, the input clock is divided by 10 and its output drives the second counter stage which is enabled by a low on the master reset (MR) input. The output of the second stage is a 7 KHz square wave signal that drives an address counter.

## 5. ADDRESS COUNTER

The address counter consists of two four-bit counters, MLB2 and MLB3. The address counter in turn drives the ROM address inputs. In the reset or idle state, the address counter is at count 0, all outputs low (0 V). With the clock logic enabled, the address counter is advanced at a 7 KHz rate and proceeds to count up until a count of 54 is reached.

## 6. ROM — STORED DATA

As the address counter is advanced, bit information that is stored in level 2 of the ROM (F10) is serially shifted out via pin 11 at a 7 KHz rate to the printer logic.

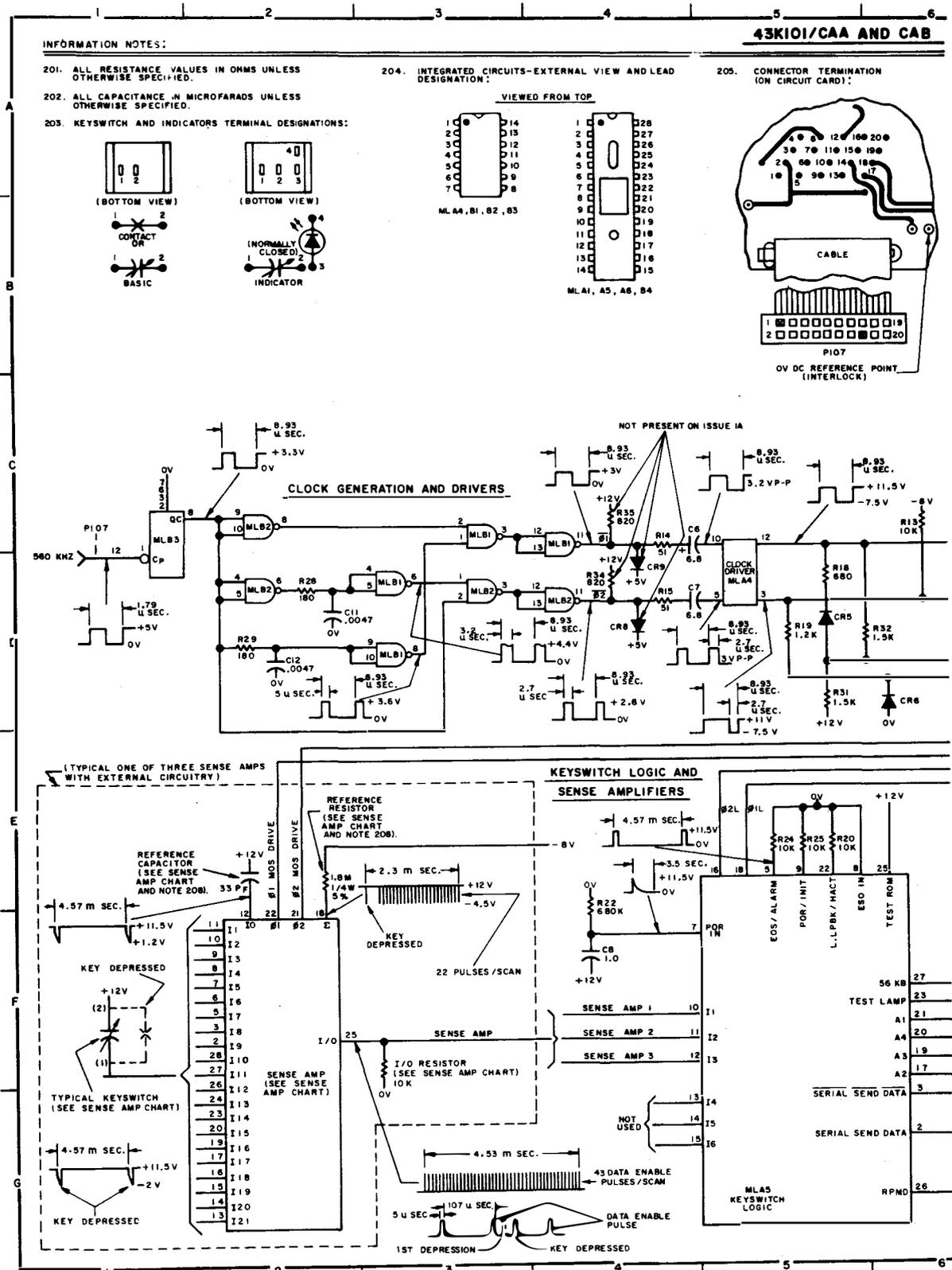
When address count 54 is reached, the level 1 output of the ROM goes to 0 V causing gate MLA3-11 to go high. The high signal from gate MLA3-11 resets the decade counter via pins 2 and 6 thereby inhibiting its output, stopping the address counter at count 54. The address counter remains at count 54 until the RESET key is released at which time the start latch is reset to the 0 state. This causes MLA3-8 to go high resetting the address counter to count 0. The send data lead is always marking during the idle state and after the four-character sequence has been transmitted.

ROM level 3, pin 10, is connected to MLA2, pin 10. This control input prevents premature resetting of the start latch once the four-character sequence has been started. When the address counter steps from count 0 to 1, the ROM level 3 output goes from a high to a low keeping a high on gate output MLA2-8. When count 54 is reached, level 3 output goes high and if the gate input MLA2-9 is high at this time, the start latch will be reset. If the gate input is low, start latch will not be reset until the RESET keyswitch is released or the one-shot MLA1-9 times out. It takes approximately 7.6 milliseconds to send the four-character sequence.

\*American National Standard Code for Information Interchange.

C. CIRCUIT DIAGRAMS

43K101/CAA AND CAB KEYBOARD LOGIC



**KEYBOARD LOGIC**

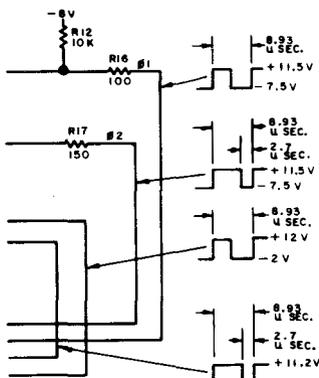
206. SENSE AMP CHART :

SENSE AMP PIN NO.	SENSE AMP 1 (MLA5)	SENSE AMP 2 (MLB4)	SENSE AMP 3 (MLA1)
11	SHIFT (RIGHT)	CONTROL	SHIFT (LEFT)
10	/	K	S
9	*	U	Z
8	/	S	Z
7	/	R	Q
6	/	F	A
5	BACK SPACE	SPACE	W
3	L	V	I
2	O	C	X
28	-	B	LOCAL (LOCAL TALK)
27	O (ZERO)	G	(DATA)
26	P	T	TERM. READY (AUTO ANSW.)
24	+	S	ESCAPE
23	=	N	(OPT. SPARE)
20	RETURN	H	(INTRPT.)
19	(	Y	3
17	)	7	E
16	DELETE	M	D
15	LINE FEED	J	4
14	8	9	4
13	\	REPEAT	CAPS LOCK
18	REFERENCE RESISTOR		
	R27	R30	R6
	I/O RESISTOR		
	R26	R21	R22
25	KEYSWITCH LOGIC (MLA5) INPUT PIN NO.		
	10	11	12
	REFERENCE CAPACITOR		
12	C10	C15	C2

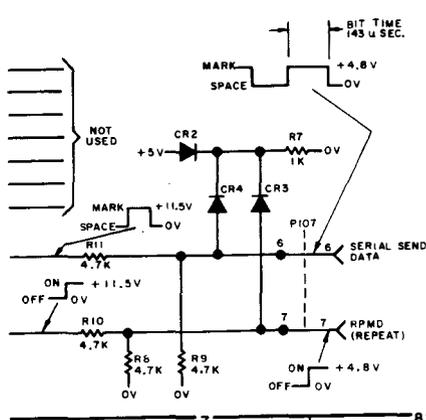
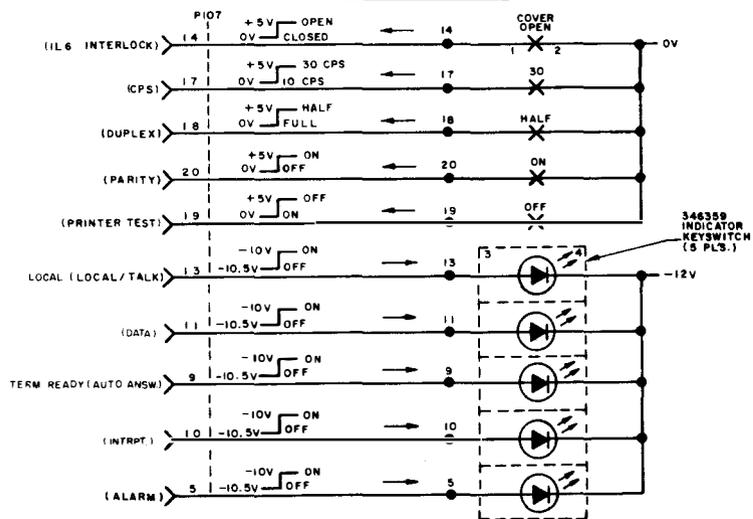
207 INTEGRATED CIRCUIT PART NUMBERS

PART NO.	DESIGNATION
342280	MLA1, A6, B4
339002	MLB1, B2
315990	MLB3
404027	MLA4
342238	MLA5

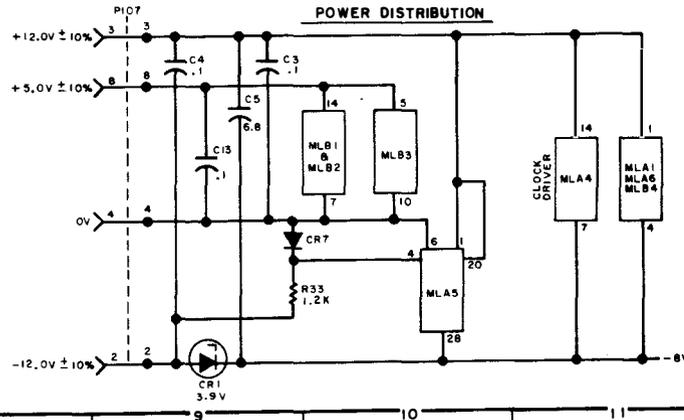
208. RESISTOR IS 2.7 MEGOHMS AND CAPACITOR IS 22 PF ON ISSUE 1G OR HIGHER.



**INTERFACE LOGIC**

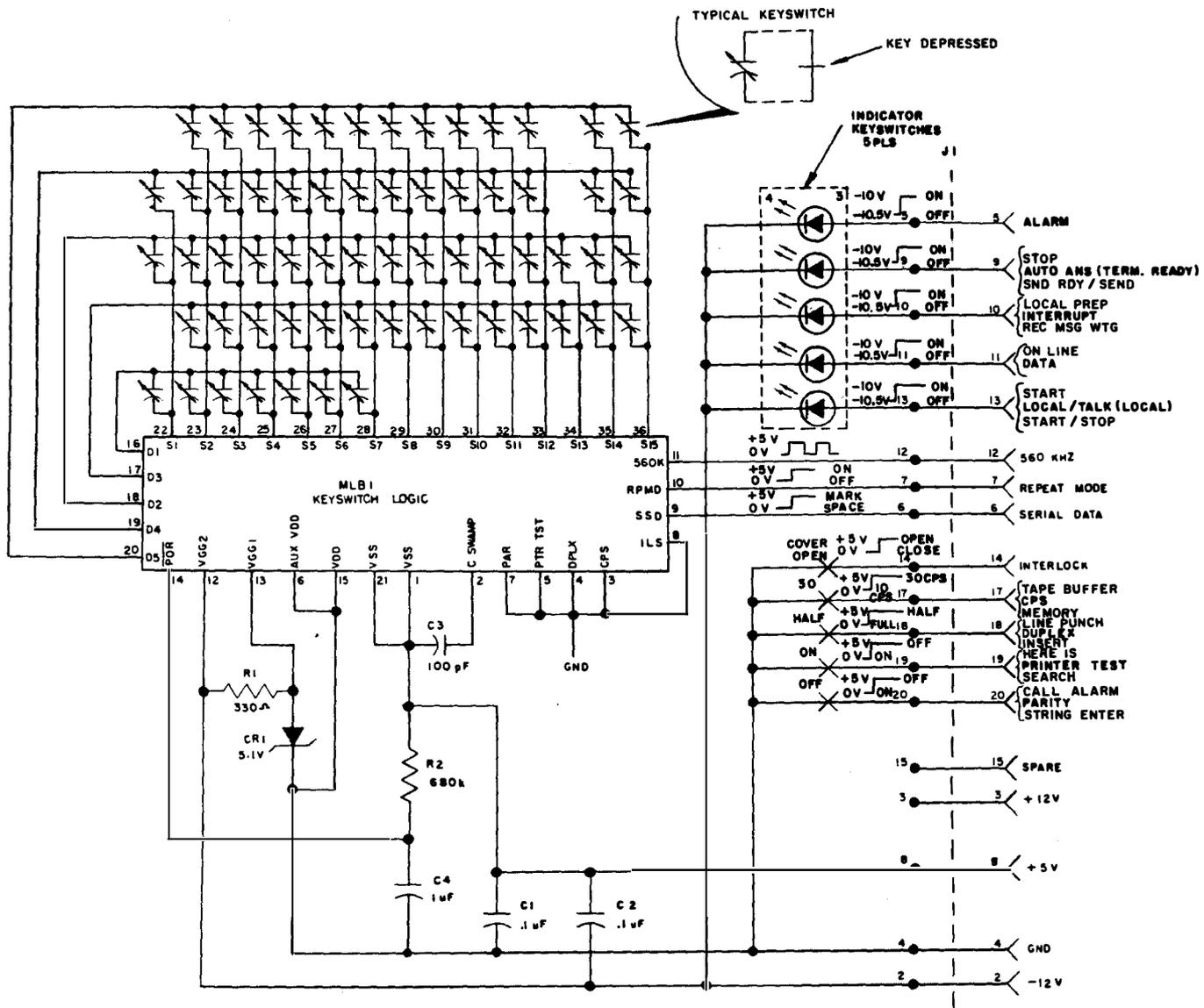


**POWER DISTRIBUTION**



C. CIRCUIT DIAGRAMS (Contd)

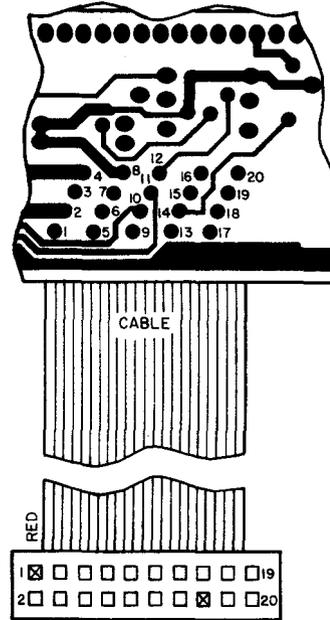
50K122/AAE AND AAF KEYBOARD LOGIC



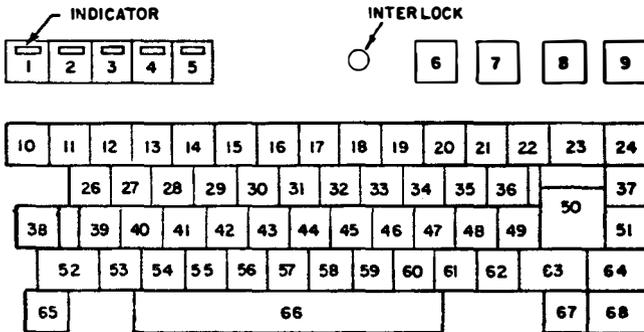
SENSE AND DRIVE LINE CHART

MLB1					
KEYSWITCH POSITION NOS. (SEE FIGURE BELOW)					
SENSE	DRIVE				
	D5	D4	D2	D3	D1
S1		38	10		1
S2	52	39	11	26	2
S3	53	40	12	27	3
S4	54	41	13	28	4
S5	55	42	14	29	5
S6	56	43	15	30	65
S7	57	44	16	31	66
S8	58	45	17	32	
S9	59	46	18	33	
S10	60	47	19	34	
S11	61	48	20	35	
S12	62	49	21	36	
S13			22	67	
S14	63	50	23	68	
S15	64	51	24	37	

CONNECTOR TERMINATION ON CIRCUIT CARD



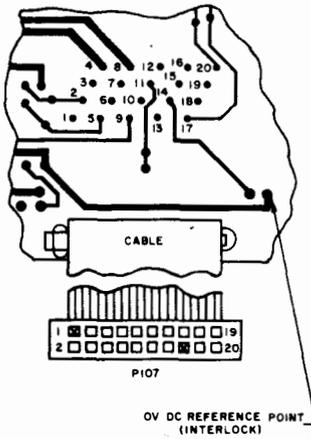
KEYSWITCH POSITION NUMBERS





INFORMATION NOTES CONT.

207. CONNECTOR TERMINATION (ON CIRCUIT CARD):



INFORMATION NOTES CONT.

208. MLB4 ROM ENCODING TABLE:

ADDRESS COUNT	OUTPUT 4321	ADDRESS COUNT	OUTPUT 4321	ADDRESS COUNT	OUTPUT 4321
0	0111	19	0011	38	0001
1	0001	20	0001	39	0011
2	0001	21	0001	40	0011
3	0001	22	0001	41	0011
4	0001	23	0001	42	0011
5	0001	24	0011	43	0001
6	0001	25	0011	44	0001
7	0001	26	0011	45	0011
8	0001	27	0011	46	0001
9	0011	28	0011	47	0001
10	0011	29	0001	48	0001
11	0011	30	0001	49	0001
12	0011	31	0011	50	0001
13	0011	32	0001	51	0011
14	0011	33	0011	52	0001
15	0001	34	0001	53	0011
16	0011	35	0001	54	0110
17	0001	36	0001		
18	0011	37	0001		

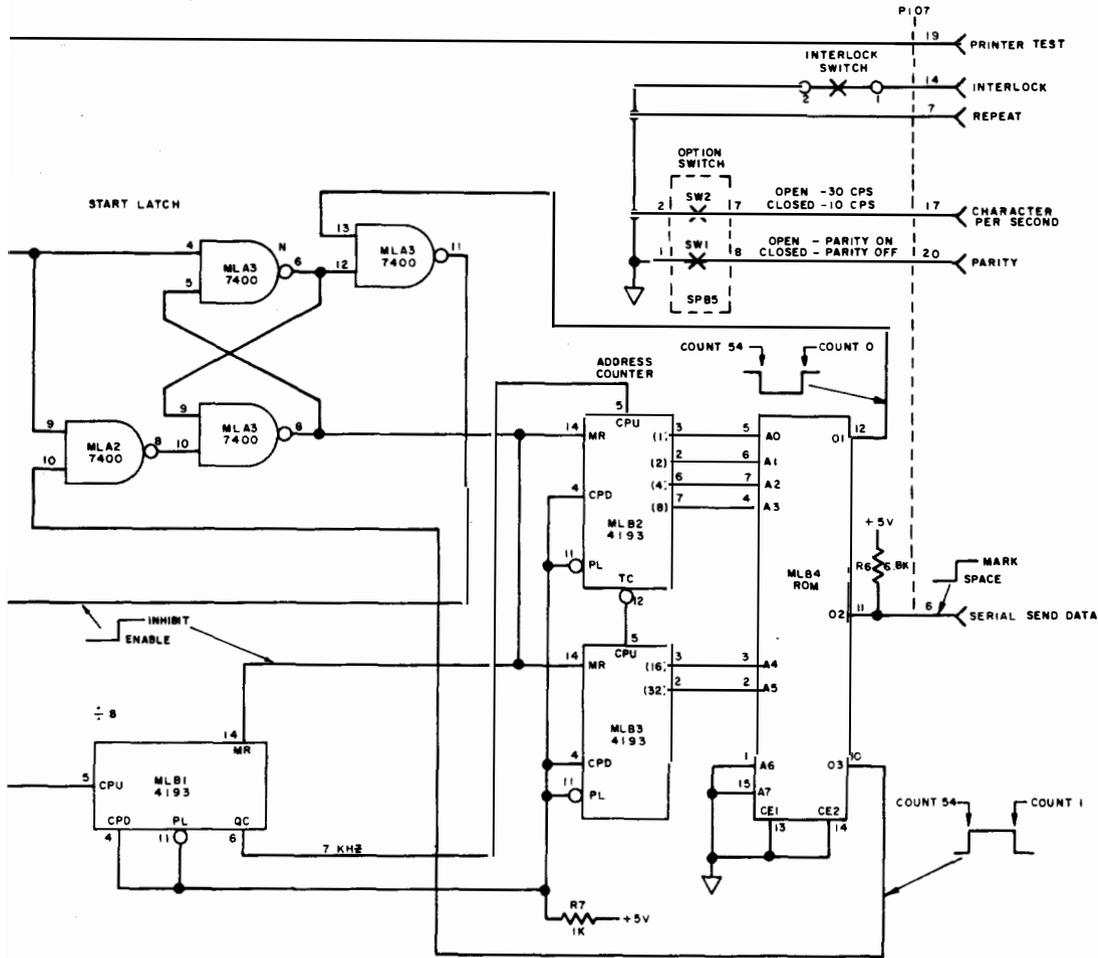
0 = LO  
1 = HI

209. SERIAL SEND DATA BITS:

CHARACTER	START	0	1	2	3	4	5	6	7	8	STOP	STOP	STOP	STOP
LOCAL	0	0	0	0	0	0	0	0	1	1	1	1	1	1
CARRIAGE RETURN	0	1	0	1	1	0	0	0	0	1	1	1	1	1
LINE FEED	0	0	1	0	1	0	0	0	0	0	1	1	1	1
AUTO. ANS.	0	0	1	0	0	0	0	0	1	0	1	1	1	1

0 = SPACE  
1 = MARK

210. ADDRESSES 55 THROUGH 255 CONTAIN "1" IN LEVELS 1 THROUGH 4.





PART 5 – PARTS AND UNIT CODES

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1. 410080 CIRCUIT CARD .....	5-2
2. MISCELLANEOUS PARTS .....	5-3
C. 50K122 KEYBOARD .....	5-5
1. 410101 CIRCUIT CARD .....	5-5
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D. 43K001 RO KEYBOARD .....	5-8
1. 410741 CIRCUIT CARD ASSEMBLY .....	5-8
2. MISCELLANEOUS PARTS AND KEYTOPS .....	5-10
E. KEYTOPS .....	5-11
F. NUMERICAL INDEX .....	5-13

A. GENERAL

Parts and unit identification and numbering information for 43K101, 50K122 and 43K001 keyboards are provided in this part.

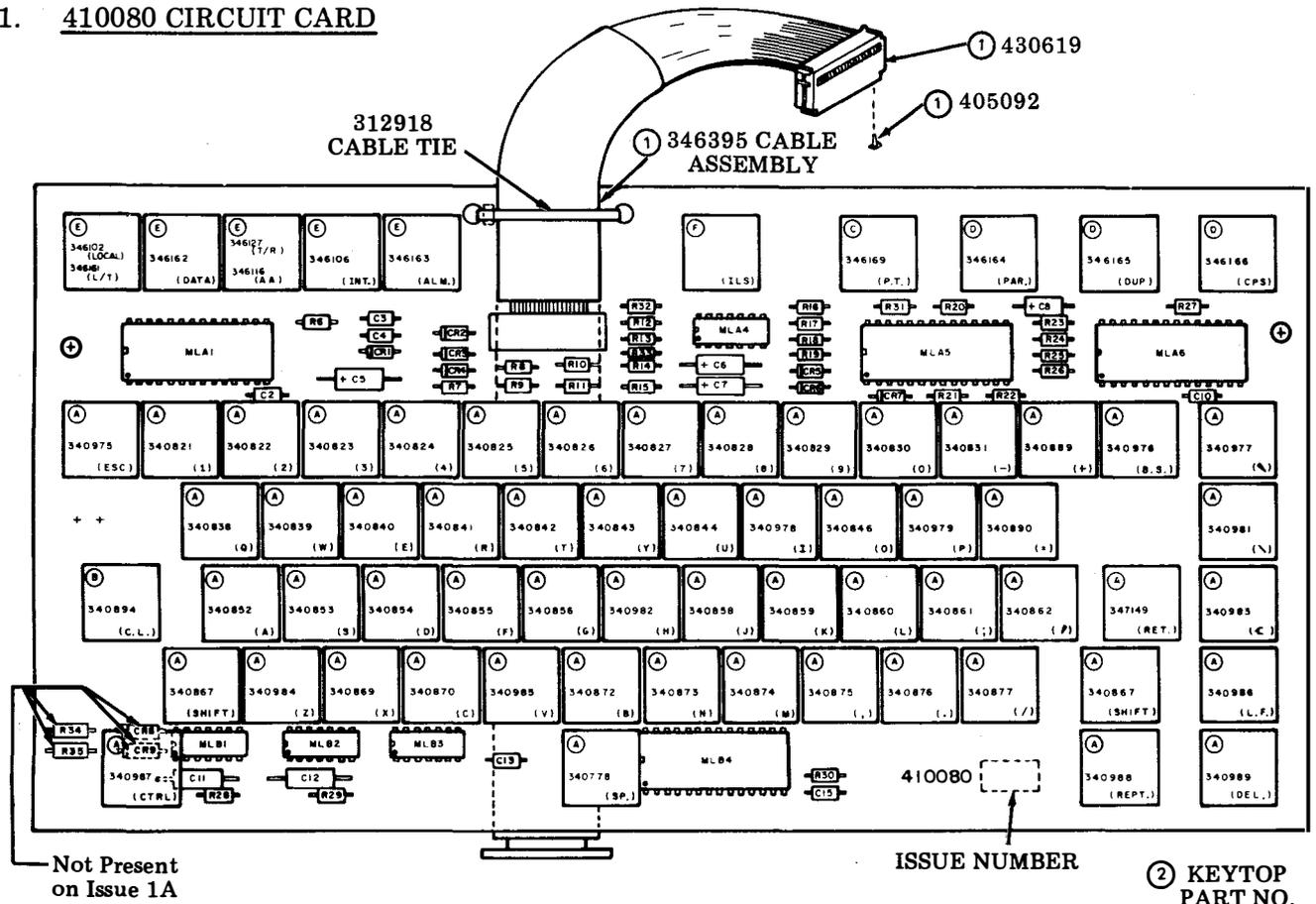
Units and parts are listed in the index in numerical order and indicate the page on which the parts appear. Asterisks are used to denote maintenance spares.

When ordering replaceable parts or components, unless otherwise specified, prefix each part number with the letters "TP" (ie, TP410055).

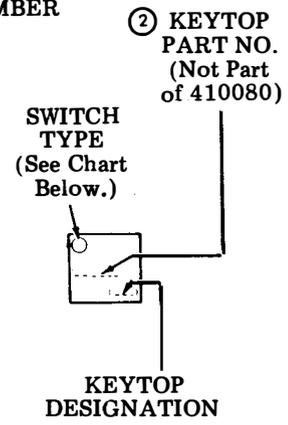
Troubleshooting and disassembly/reassembly information for these parts are provided in Parts 2 and 3 respectively.

**B. 43K101 KEYBOARD**

**1. 410080 CIRCUIT CARD**



REF. DESIG.	PART NO.	REQ.	QTY.	DESCRIPTION	REF. DESIG.	PART NO.	REQ.	QTY.	DESCRIPTION
MLA1	342280		3	SENSE AMP TSA-2L	R15	315948		1	RESISTOR, 100 OHM 1/4W
MLB1	339002		2	QUAD 2 INPUT GATE (9002)	R18	315971		2	RESISTOR, 680 OHM 1/4W
MLB2				SAME AS MLB1	R19	315953		1	RESISTOR, 1.2K OHM 1/4W
MLB3	339490		1	DECADE COUNTER (7490)	R20-22			2	SAME AS R12
MLA4	404027		1	CLOCK DRIVER	R23	333417		1	RESISTOR 680K OHM 1/4W
MLB4				SAME AS MLA1	R24-26			3	SAME AS R12
MLA5	342238		1	KEYSWITCH LOGIC TKL-2KP	R27			1	SAME AS R6
MLA6				SAME AS MLA1	R23-29	328793		2	RESISTOR 180 OHM 1/4W
					R30			1	SAME AS R6
CR1	346394		1	DIODE, ZENER 1N4730A	R17	330640		1	RESISTOR 150 OHM 1/4W
CR2-9	197464		8	DIODE 1N4148	R31-32	315954		2	RESISTOR 1.5K OHM 1/4 W
					R33			1	SAME AS R19
C2	453968		3	CAPACITOR 22 pF	R34-35	315952		2	RESISTOR, 820 OHM 1/4 W
C3-4	405324		3	CAPACITOR 0.1 MFD					
C5-7	333723		3	CAPACITOR 6.8 MFD					
C8	336948		1	CAPACITOR 1.0 MFD					
C10				SAME AS C2					
C11-12	300394		2	CAPACITOR, .0047 MFD					
C13				SAME AS C3					
C15				SAME AS C2					
R6	337325		3	RESISTOR 2.7M OHM 1/4W					
R7	321213		1	RESISTOR, 1K OHM 1/4W					
R8-11	315959		4	RESISTOR, 4.7K OHM 1/4W					
R12-13	320275		8	RESISTOR, 10K OHM 1/4W					
R14-15	315947		2	RESISTOR, 51 OHM 1/4W					

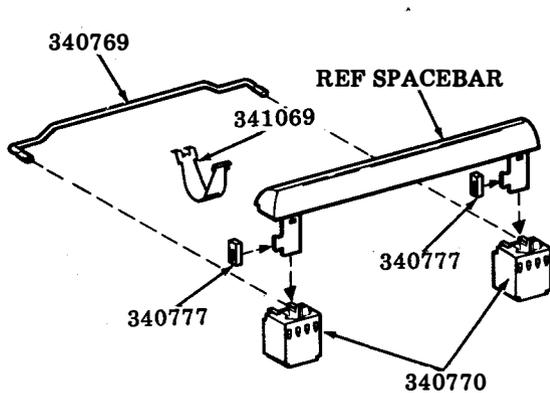
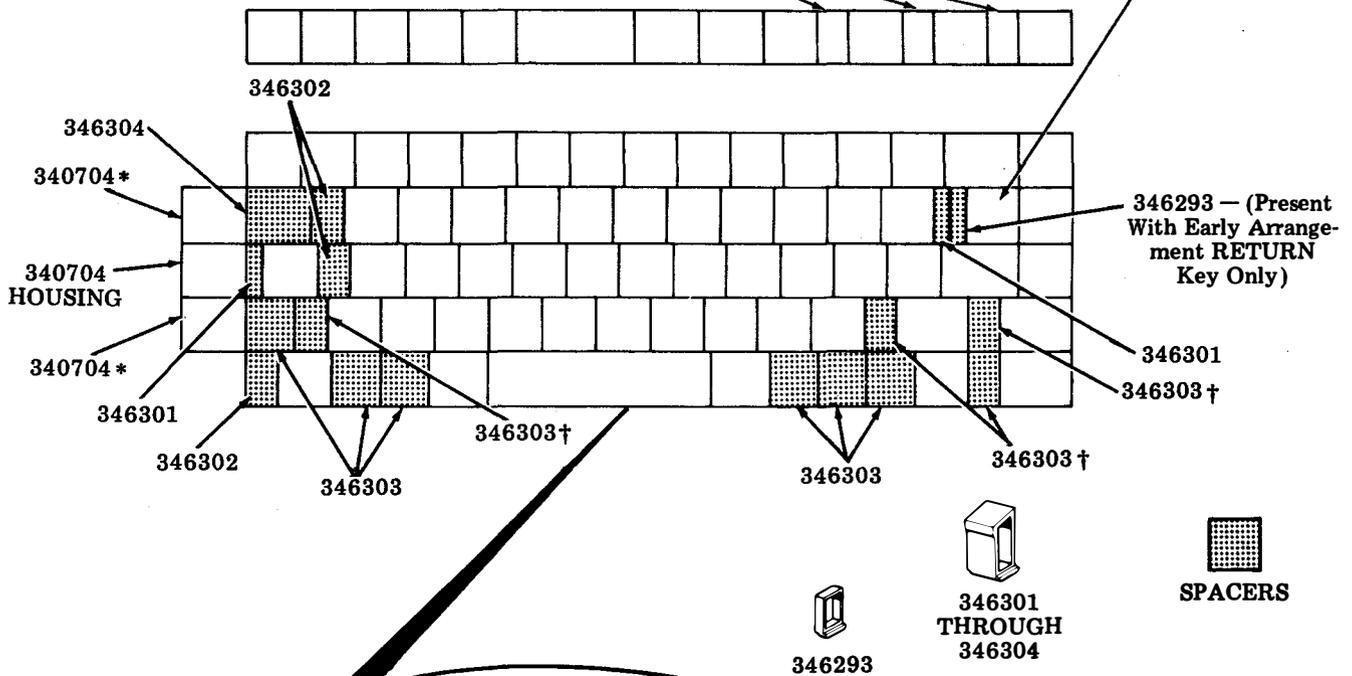
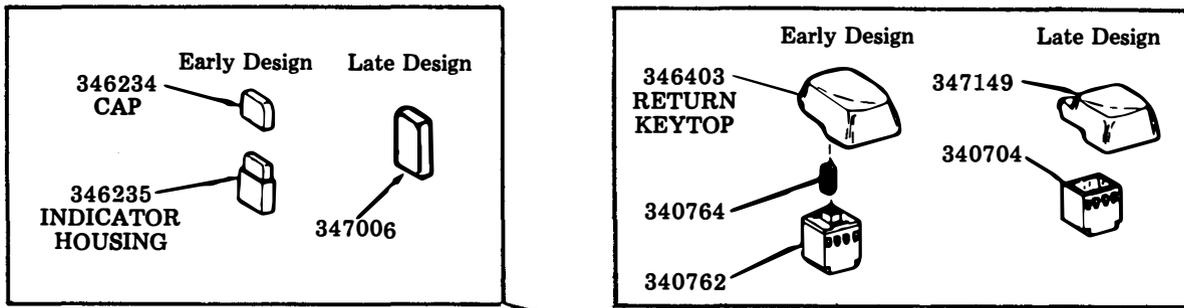


SWITCH NO.	TYPES	PUSH ROD COLOR	QTY
(A) 340720	BASIC	WHITE	57
(B) 340722	LATCHING	BLACK	1
(C) 340779	DC CONTACT	PINK	1
(D) 341098	LATCHING	GREY	3
(E) 346359	INDICATOR	ORANGE	5
(F) 346432	DC CONTACT	BLACK (Cut-OFF)	1

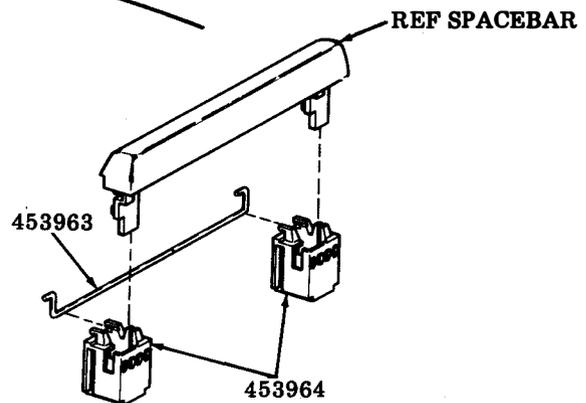
Note: Keytops are not part of 410080 circuit card. They are provided here for location identification only.

- ① Part of 346395 Cable Assembly
- ② Refer to Page 5-12.

2. MISCELLANEOUS PARTS



Early Arrangement Spacebar Guide



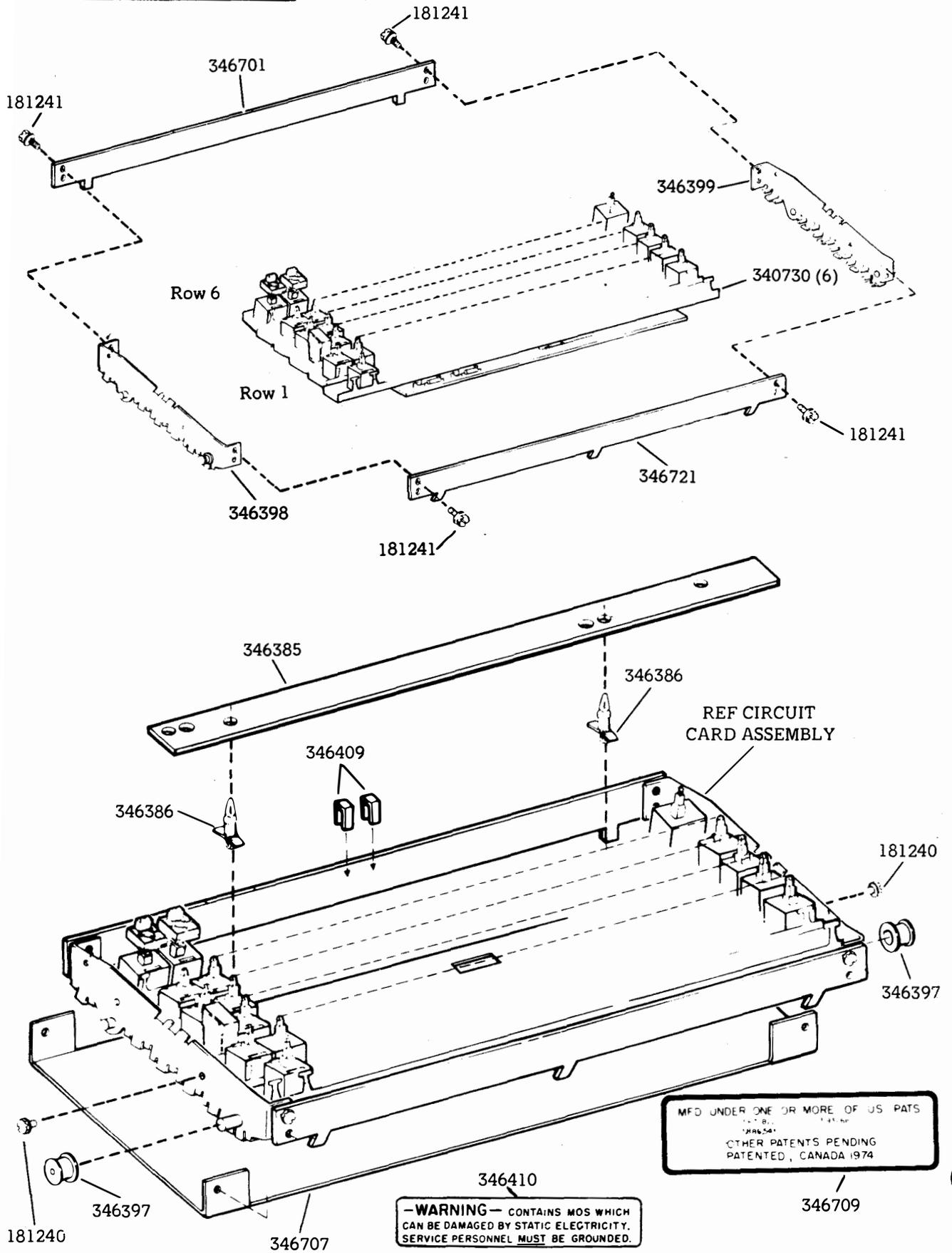
Late Arrangement Spacebar Guide

\*Present on early arrangement keyboards.

†Replaces two 346293 spacers used on early arrangement keyboards.

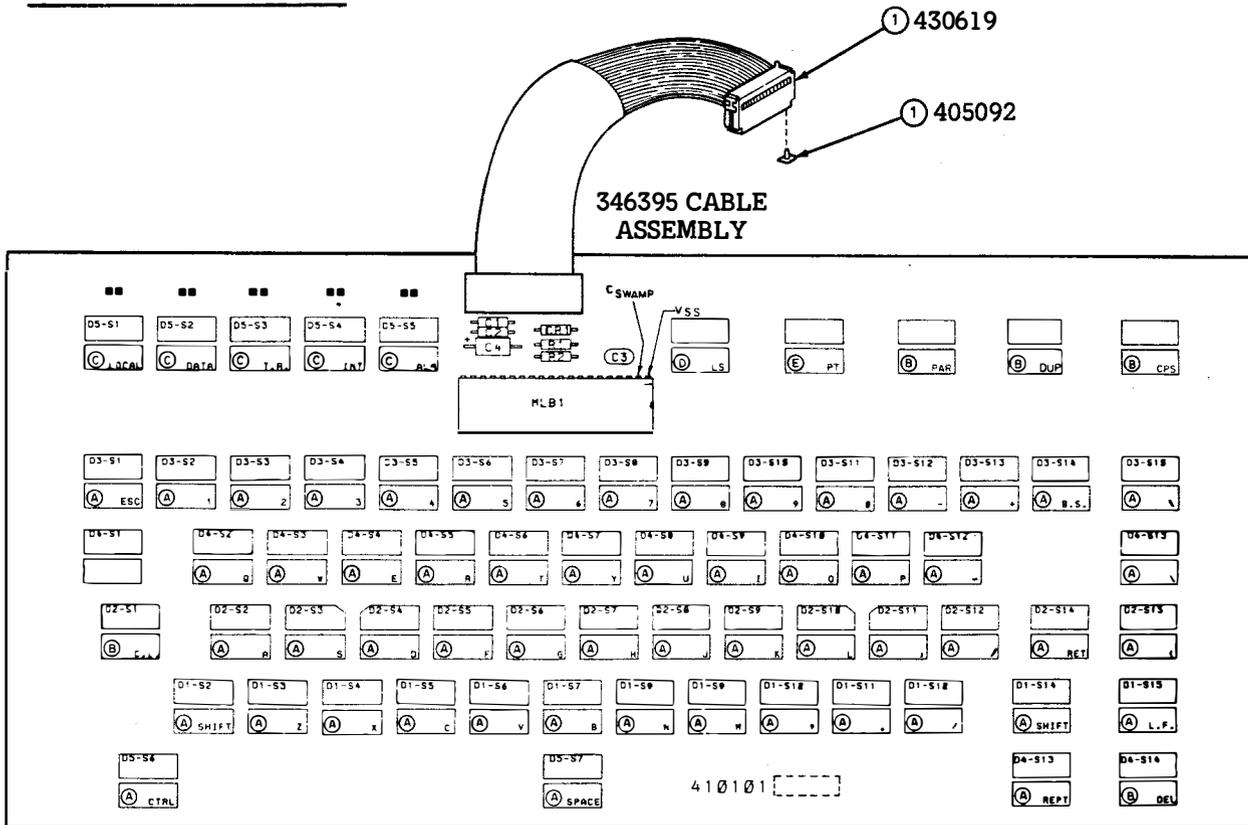
B. 43K101 KEYBOARD (Contd)

2. MISCELLANEOUS PARTS (Contd)

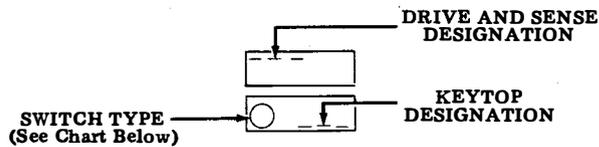


C. 50K122 KEYBOARD

1. 410101 CIRCUIT CARD



REF. DESIG.	PART NO	REG	DESCRIPTION
C1	483324		CAPACITOR, .1 MFD
C2			SAME AS C1
C3	328792		CAPACITOR, 100 PF
C4	336948		CAPACITOR, 1.0 MFD
R1	328785		RESISTOR, 330 OHM
R2	333417		RESISTOR, 600K
CR1	321967		DIODE, .5 1V
MLB1	438945		LOGIC, MOS
	489181		BOARD, ETCHED CIRCUIT
	346395		CABLE ASSEMBLY
	483611		TERMINAL



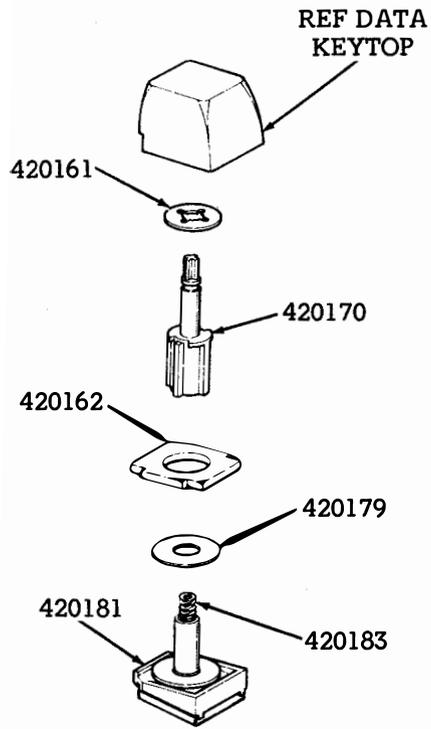
PLUNGER NO. #	TYPE	PUSH ROD COLOR
Ⓐ 420181	BASIC	WHITE
Ⓑ 420196	LATCHING	BLACK
Ⓒ 420163	INDICATOR	WHITE
Ⓓ 420176	BASIC (Interlock)	BLACK (Cut Off)
Ⓔ 420182	BASIC (Printer Test)	BLACK

① Part of 346395 cable assembly.

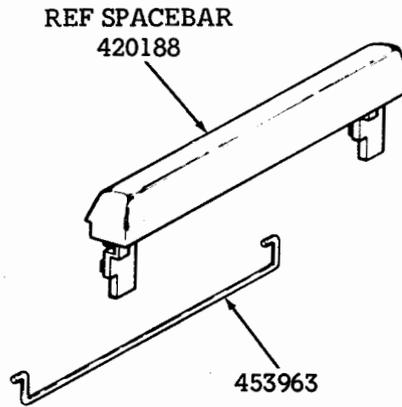
\* Refer to Page 5-6 for additional parts which comprise the keyswitch assemblies.

C. 50K122 KEYBOARD (Contd)

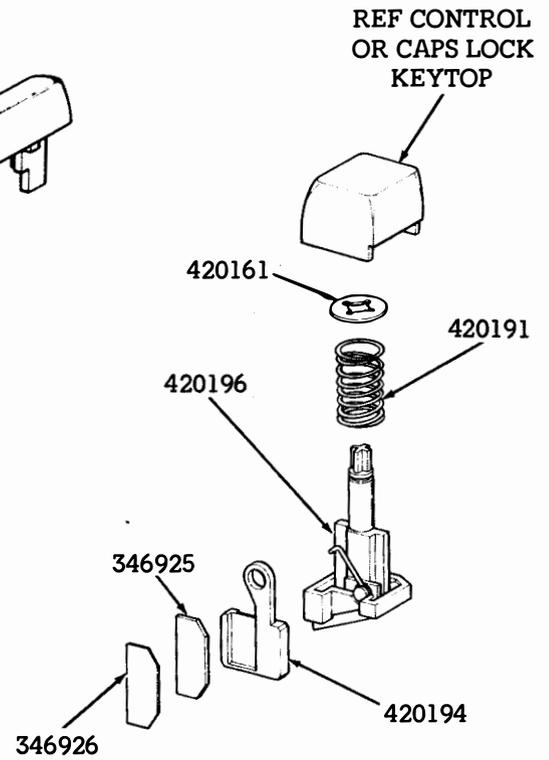
2. MISCELLANEOUS PARTS



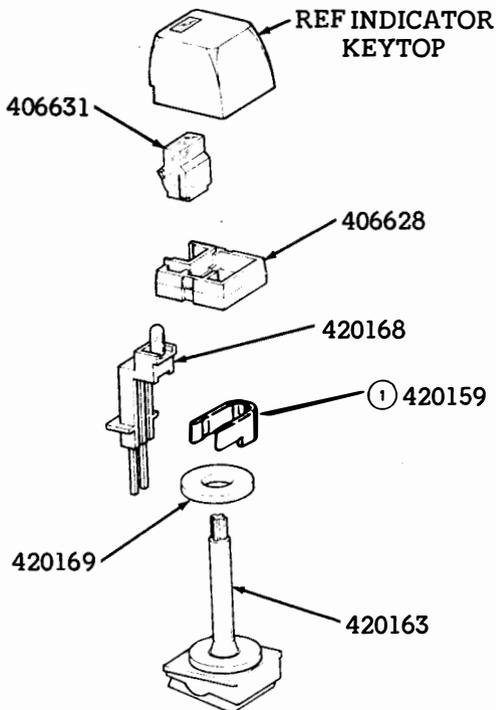
Data Keyswitch Assembly



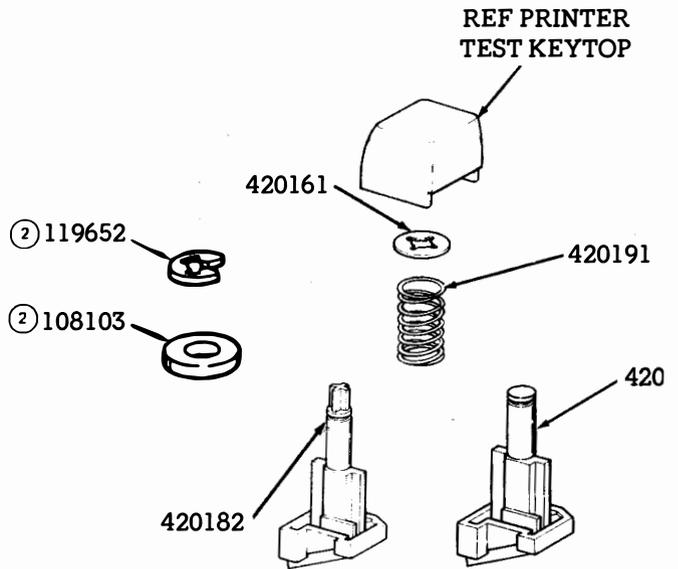
Spacebar Mechanism



Latching Keyswitch Assembly

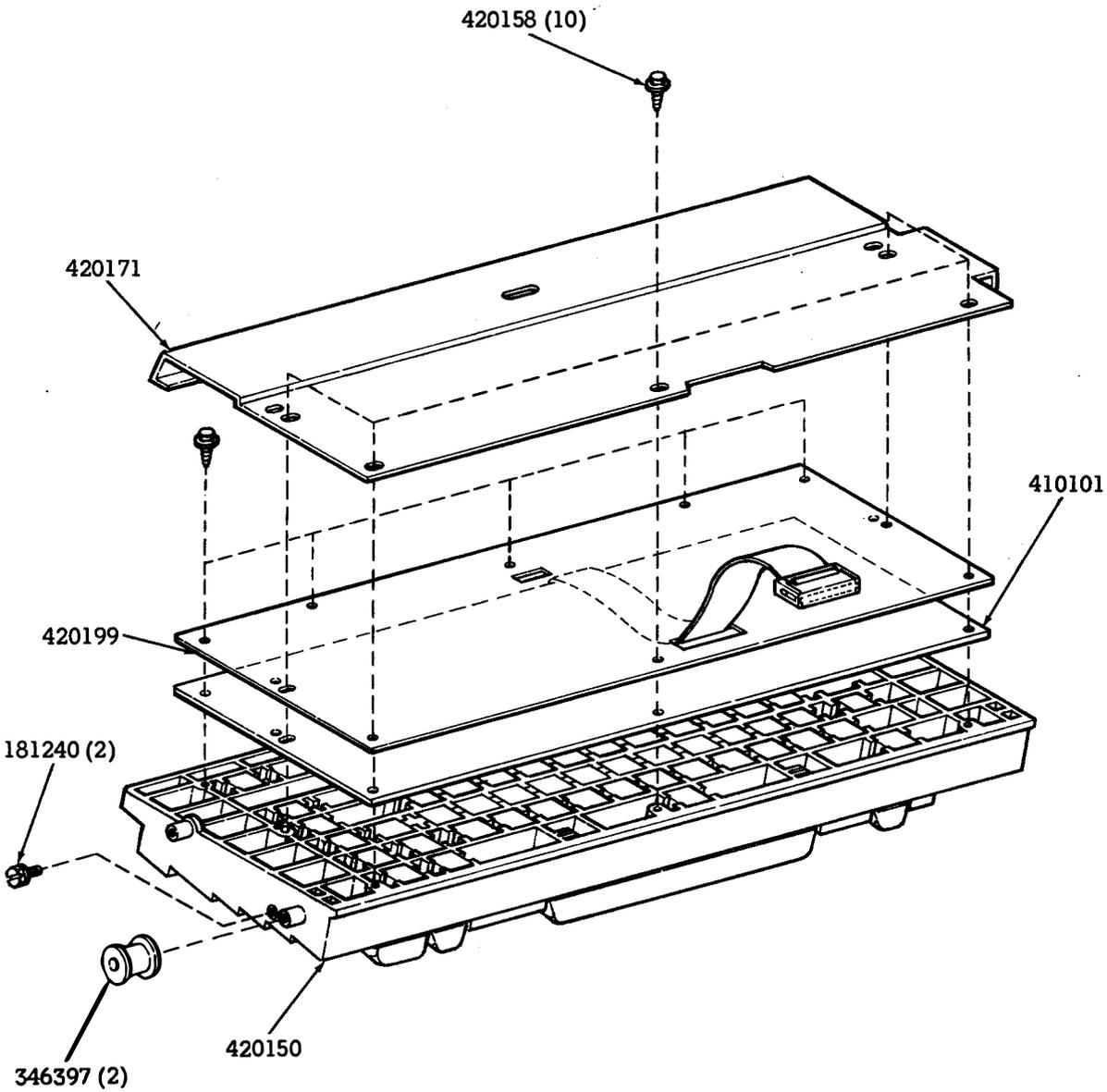


Indicator Keyswitch Assembly



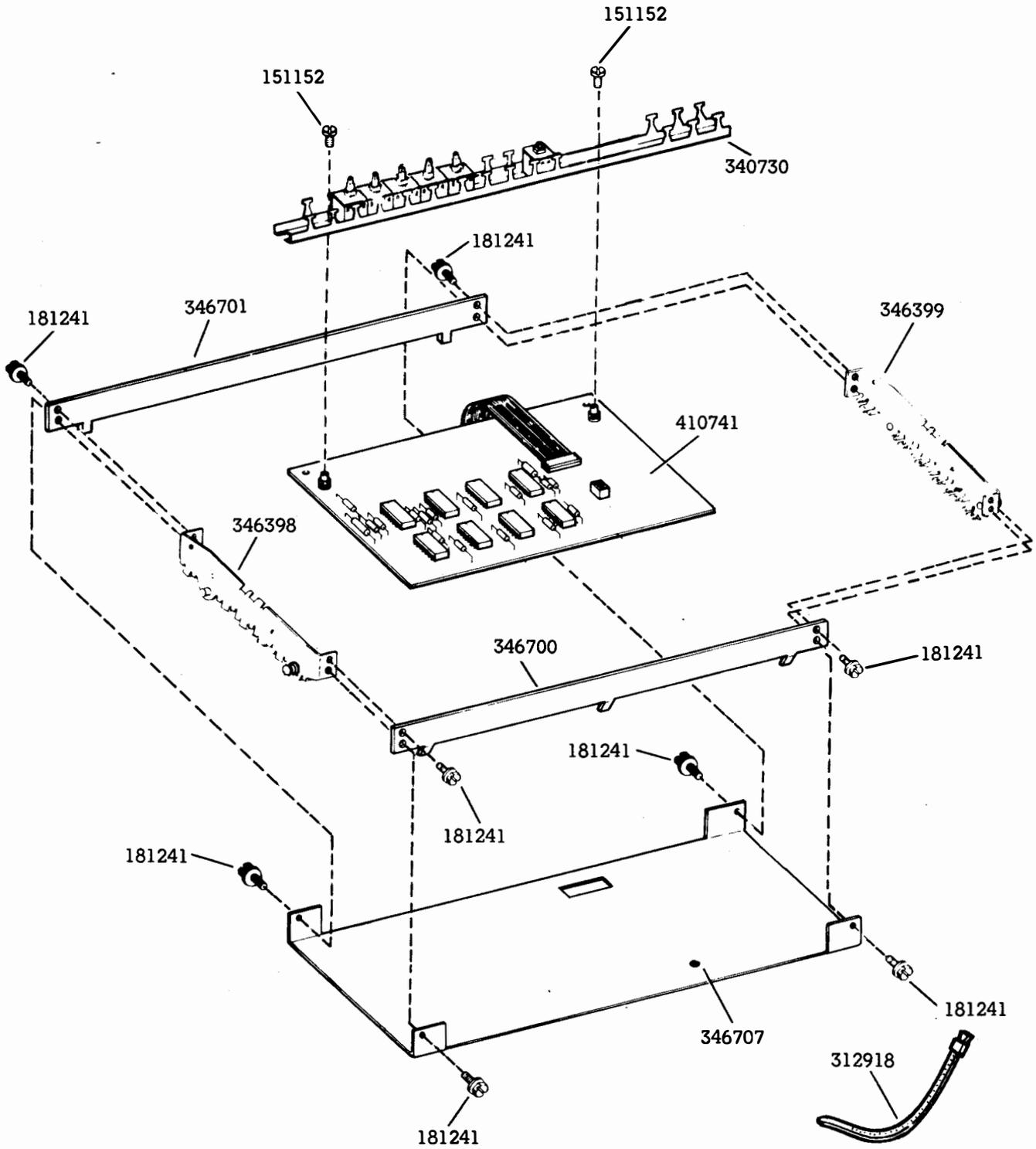
Interlock or Printer Test Keyswitch Assembly

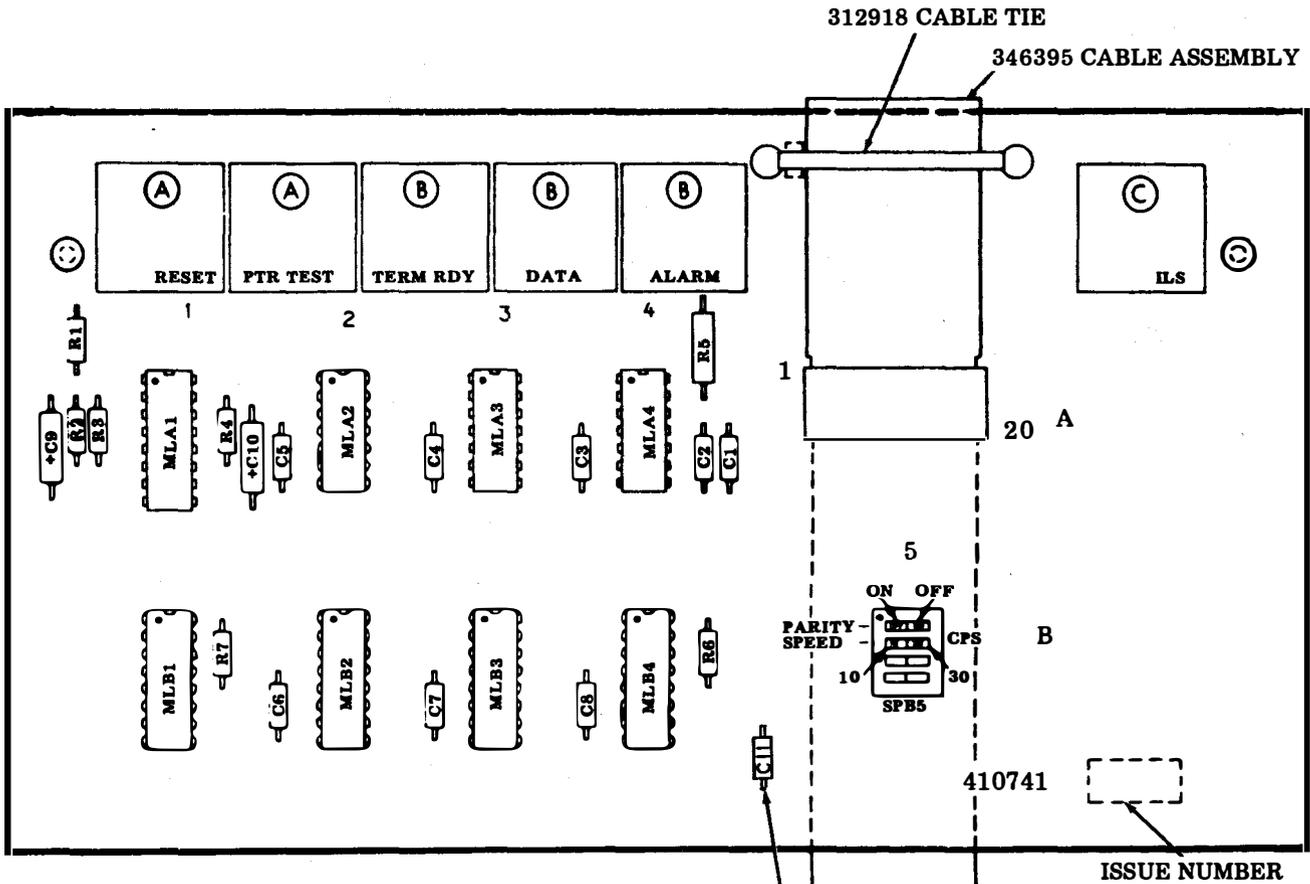
- ① Immobilizing stop on alarm keyswitch position only.
- ② Note part of keyboard – may be used to block keyswitch (see Page 3-16).



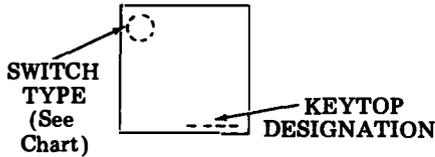
D. 43K001 RO KEYBOARD

1. 410741 CIRCUIT CARD ASSEMBLY





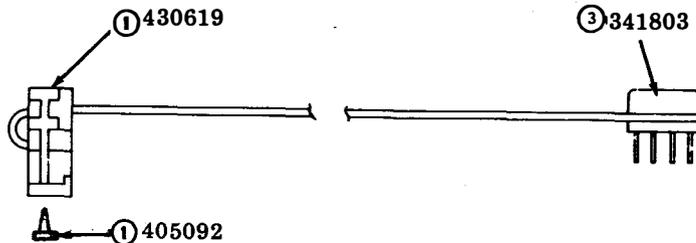
Note. Keytops are not part of 410741 circuit card assembly.



Present on Issue 2D or later.

REF DESIGN	PART NO. REQ	QTY	DESCRIPTION
MLA1	339602	1	DUAL ONE SHOT
MLA2	474300	2	QUAD 2 INPUT GATE
MLA3			SAME AS MLA2
MLA4	339490	1	DECADE COUNTER (7490)
MLB1	474193	3	4 BIT UP/DOWN CTR
MLB2			SAME AS MLB1
MLB3			SAME AS MLB2
MLB4	430506	1	ROM 256 X 4
SPB5	341804	1	SWITCH, 4 POS.
C1-C8	405324	8	CAPACITOR, 0.1 MFD
C9-C10	336948	2	CAPACITOR, 1.0 MFD
C11		1	SAME AS C1
R1	300092	2	RESISTOR, 6.8K 1/4W
R2	333409	2	RESISTOR, 39K 1/4W
R3	315960	1	RESISTOR, 5.6K 1/4W
R4			SAME AS R2
R5	137602	1	RESISTOR 470 1/2W
R6			SAME AS R1
R7	321213	1	RESISTOR 1K 1/4W

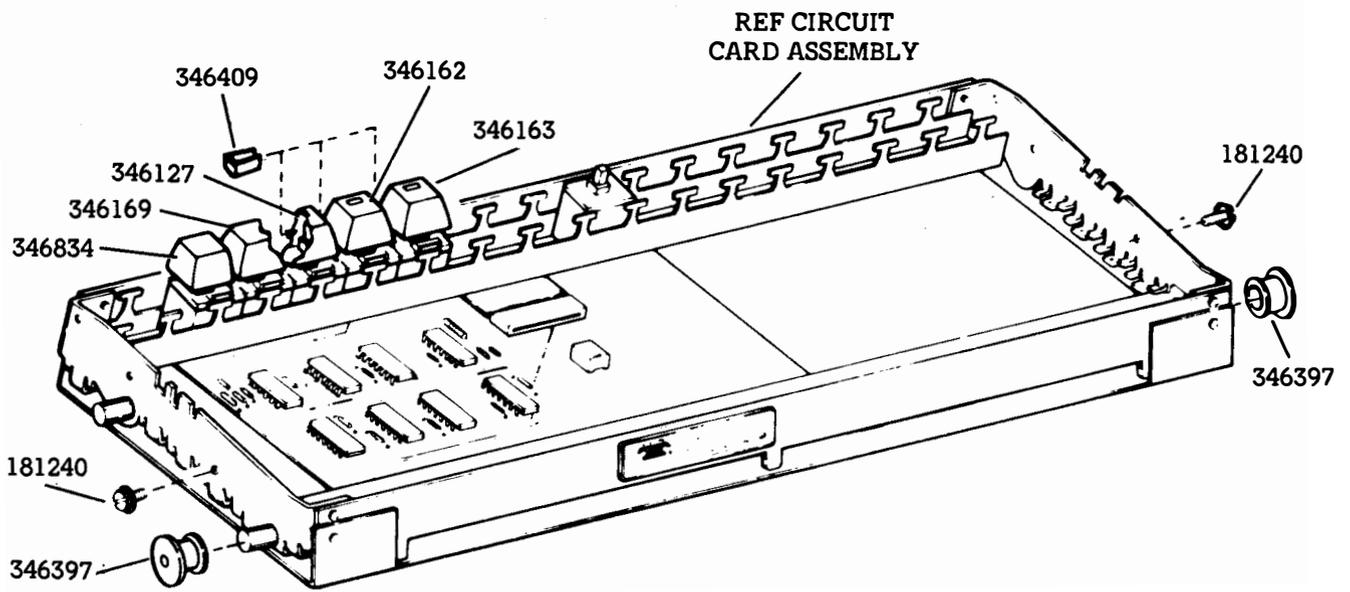
SWITCH NO.	TYPES	PUSH ROD COLOR	QTY
Ⓐ 340779	DC CONTACT	PINK	2
Ⓑ 346359	INDICATOR	ORANGE	3
Ⓒ 346432	DC CONTACT	BLACK (CUT-OFF)	1



① Part of 346395 Cable Assembly

D. 43K001 RO KEYBOARD (Contd)

2. MISCELLANEOUS PARTS AND KEYP TOPS

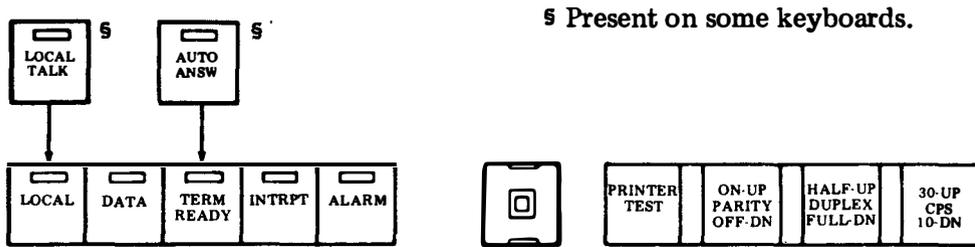


E. KEYTOPS

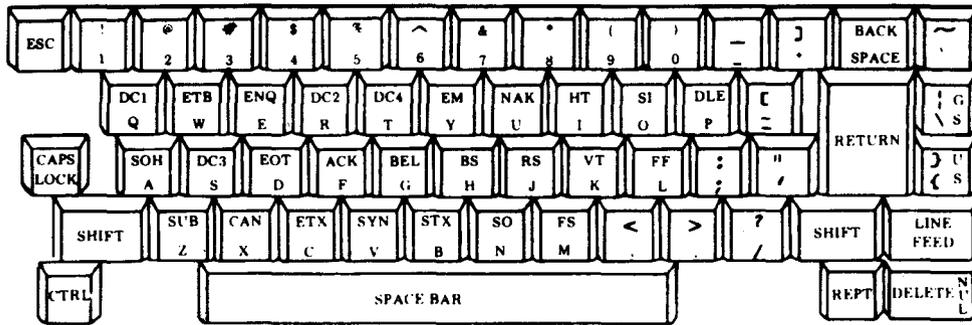
BASIC 43 KSR AND RO KEYTOPS



43K001/AAA KEYBOARD LAYOUT (RO)



§ Present on some keyboards.



43K101/CAA – CAB OR 50K122/AAE – AAF KEYBOARD LAYOUT (KSR)

## E. KEYTOPS (Contd)

## BASIC 43 KSR AND RO KEYTOPS (Contd)

PART NO.	KEY DESCRIPTION	PART NO.	KEY DESCRIPTION
340701	BLOCKING - CONTROL (See Note 6)	340872	STX B
340714	BLOCKING - DATA (See Note 6)	340873	SO N
340778	SPACEBAR (Old Design)	340874	FS M
340821	! 1	340875	< .
340822	@ 2	340876	> /
340823	# 3	340877	? .
340824	\$ 4	340889	} +
340825	% 5	340890	[ =
340826	^ 6	340894	CAPS LOCK
340827	& 7	340975	ESC
340828	* 8	340976	BACKSPACE
340829	( 9	340977	~ ,
340830	) 0	340978	HT
340831	- .	340979	DLE P
340838	DC1 Q	340981	: GS \
340839	ETB W	340982	BS H
340840	ENQ E	340983	} {
340841	DC2 R	340984	SUB Z
340842	DC4 T	340985	SYN V
340843	EM Y	340986	LINE FEED
340844	NAK U	340987	CTRL
340846	SI O	340988	REPT
340852	SOH A	340989	DELETE NUL
340853	DC3 S	346102	LOCAL (See Note 5)
340854	EOT D	346106	INTRPT
340855	ACK F	346116	AUTO ANSW (See Note 4)
340856	BEL G	346127	TERM READY (SEE Notes 2 & 5))
340858	RS J	346161	LOCAL - TALK (See Note 4)
340859	VT K	346162	DATA (See Notes 2 & 8)
340860	FF L	346163	ALARM (See Notes 1 & 2)
340861	: :	346164	ON-UP PARITY OFF-DN
340862	" /	346165	HALF-UP DUPLEX FULL-DN
340867	SHIFT	346166	30-UP CPS 10-DN
340869	CAN X	346169	PRINTER TEST
340870	ETX C	346403	RETURN (Old Design) (See Note 3)
		346834	RESET (See Note 7)
		347095	HERE IS (See Note 9) V
		347149	RETURN (New Design)
		420188	SPACEBAR (New Design)

**Note 1:** 346409 spacer must be installed under the 346163 key to block the action of the ALARM keyswitch on 43K101/CAA and CAB keyboards.

**Note 2:** 346409 spacer must be installed under the 346162, 346163, and 346127 key to block the action of the ALARM, TERM READY and DATA keyswitches on the 43K001/AAA keyboard.

**Note 3:** The 340764 compression spring between the 346403 key and the housing must be ordered separately.

**Note 4:** 346116 and 346161 keys are used on 43K101/CAA keyboard.

**Note 5:** 346102 and 346127 keys are used on 43K101/CAB keyboard.

**Note 6:** 340701 and 340714 keys are not part of the keyboard but may be used for local engineering requirements to block the action of keyswitches.

**Note 7:** 346834 key is used on 43K001/AAA keyboard only.

**Note 8:** All 43K101/CAA and CAB keyboards should have the DATA key unblocked. Remove the 346409 spacer, if present under the 346162 DATA key.

**Note 9:** 347095 key is used with 430900 answer-back modification kit.

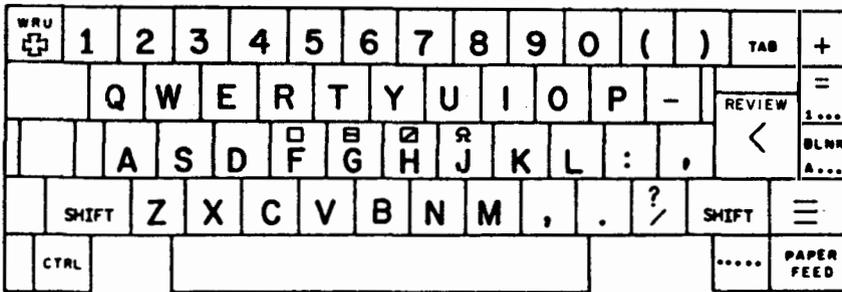
50K122/AAG



O



CONTROL ROW



ROW 5

ROW 4

ROW 3

ROW 2

ROW 1

PART NO.	KEY DESCRIPTION	PART NO.	KEY DESCRIPTION
0340867	Shift	0346541	7
0340877	/ ?	0346542	8
0340088	Tab	0346543	9
0340987	Ctrl	0346544	0
0340990	6	0346548	,
0340993	Q	0346549	.
0340994	W	0346558	M
0340995	E	0346571	-
0340996	R	0346675	(
0340997	T	0346676	)
0340998	Y	0346682	A
0340999	U	0346683	S
0341000	I	0346684	:
0341001	O	0346685	/
0341002	P	0346689	≡
0341005	D	0346882	On Line
0341009	K	0347169	WRU
0341010	L	0347176	J R
0341012	Z	0347182	....
0341013	X	0347183	+
0341014	C	0347256	1... =
0341015	V	0347257	A... Blnk
0341016	B	0347258	< Review
0341017	N	0347259	F □
0341019	Blank (Row 1 & 2 — see Note 2)	0347260	G □
0341021	Blank (Row 3)	0347261	H □
0341022	Blank (Row 4 — see Note 2)	0347262	Paper Feed
0341024	Blank (Row 5 — see Note 2)	0453961	Space Bar Assem
0346163	Alarm	0454324	Start
0346168	Blank (Control Row — see Note 2)	0454326	Stop
0346536	1	0454327	Local Prep
0346537	2	0454368	Here Is
0346538	3	0454369	Call Alarm
0346539	4	0454370	Line Punch
0346540	5	0454371	Tape Buffer

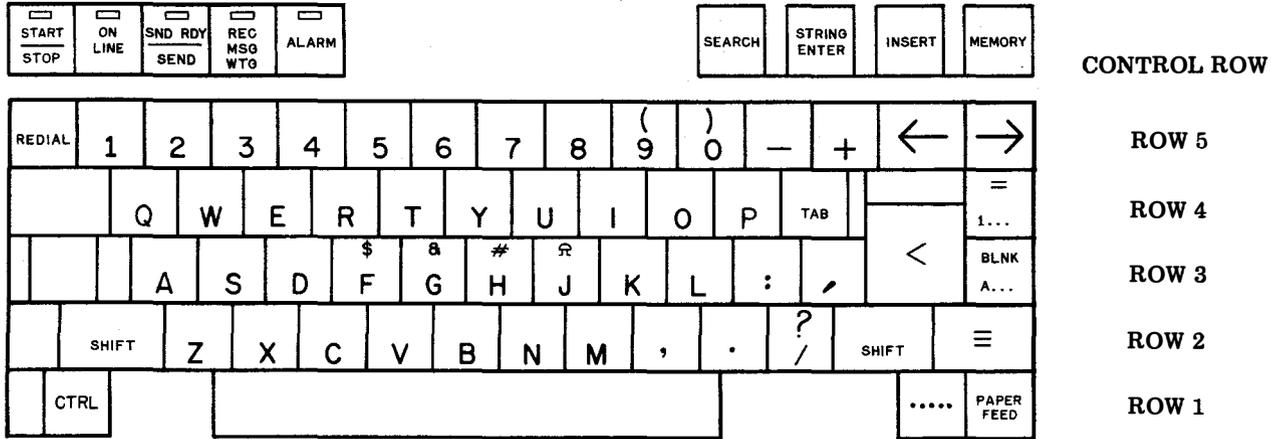
Note 1: 420159 immobilizing stop must be installed under the 346163 ALARM key to block the action of the ALARM keyswitch.

Note 2: These keys are not part of the keyboard but may be used for local engineering requirements.

E. KEYTOPS (Contd)

BASIC 43 KSR AND RO KEYTOPS (Contd)

50K122/AAM



PART NO.	KEY DESCRIPTION	PART NO.	KEY DESCRIPTION	PART NO.	KEY DESCRIPTION
0340829	9 (	0341017	N	0346685	'
0340830	0 )	0341019	Blank (Row 1 & 2 -	0346689	=
0340867	Shift		see Note 2)	0346691	F \$
0340877	/ ?	0341021	Blank (Row 3)	0346692	G &
0340888	Tab	0341022	Blank (Row 4 -	0346693	H #
0340987	Ctrl		see Note 2)	0346843	Rec Msg Wtg
0340990	6	0341024	Blank (Row 5 -	0346847	Snd Rdy/Send
0340993	Q		see Note 2)	0346880	Start/Stop
0340994	W	0346163	Alarm	0346882	On Line
0340995	E	0346168	Blank (Control	0347153	<
0340996	R		Row - see Note 2)	0347176	J R
0340997	T	0346536	1	0347182	....
0340998	Y	0346537	2	0347183	+
0340999	U	0346538	3	0347256	1... =
0341000	I	0346539	4	0347257	A... Blnk
0341001	O	0346540	5	0347262	Paper Feed
0341002	P	0346541	7	0413949	Redial
0341005	D	0346542	8	0413950	<
0341009	K	0346548	,	0413951	>
0341010	L	0346549	.	0453961	Space Bar Assem
0341012	Z	0346558	M	0454401	Memory
0341013	X	0346571	-	0454402	Insert
0341014	C	0346682	A	0454403	String Enter
0341015	V	0346683	S	0454404	Search
0341016	B	0346684	:		

Note 1: 420159 immobilizing stop must be installed under the 346163 ALARM key to block the action of the ALARM keyswitch.

Note 2: These keys are not part of the keyboard but may be used for local engineering requirements.

F. NUMERICAL INDEX

Note: When ordering parts prefix each number with the letters "TP" unless specified otherwise.

Part Number	Description and Page Number	Part Number	Description and Page Number	Part Number	Description and Page Number
108103	Washer, Flat 6	340838		346127	Keytop 10,12
119652	Ring, Retaining 6	thru		346161	Keytop 12
137602	Resistor, 470 Ohm 9	340844	Keytop 12	346162	Keytop 10,12
151152	Screw, 4-40 x 3/16 Hex 8	340846	Keytop 12	346163	Keytop 10,13,14
181240	Screw w/Lockwasher, 6-40 x 3/16 Hex 4,7,10	340852	thru	346164	Keytop 12
181241	Screw w/Lockwasher, 6-40 x 1/4 Hex 4,8	340856	Keytop 12	346165	Keytop 12
197464	Diode 2	340858	thru	346166	Keytop 12
300092	Resistor, 6.8K Ohm 9	340862	Keytop 12	346168	Keytop 13,14
300384	Capacitor, .0047 MFD 2	340867	Keytop 12,13,14	346169	Keytop 10,12
312918	Strap, Cable 2,8,9	340869	Keytop 12	346234	Cap 3
315947	Resistor, 51 Ohm 2	340870	Keytop 12	346235	Housing 3
315948	Resistor, 100 Ohm 2	340872		346293	Spacer 3
315952	Resistor, 820 Ohm 2	thru		346301	Spacer 3
315953	Resistor, 1200 Ohm 2	340876	Keytop 12	346302	Spacer 3
315954	Resistor 2	340877	Keytop 13,14	346303	Spacer 3
315959	Resistor, 4700 Ohm 2	340888	Keytop 13,14	346304	Spacer 3
315960	Resistor, 5600 Ohm 9	340890	Keytop 12	*346359	Keypad 2,9
315971	Resistor, 680 Ohm 2	340894	Keytop 12	346385	Cover 4
320275	Resistor, 10000 Ohm 2	340975	thru	346386	Support 4
321213	Resistor 2,9	thru		346394	Diode 2
321967	Diode 5	340979	Keytop 12	*346395	Cable Assembly 2,5,9
328783	Resistor, 180 Ohm 2	340981	Keytop 12	*346397	Bushing 4,7,10
328785	Resistor, 330 Ohm 5	340982		346398	Frame 4,8
328792	Capacitor 5	thru		346399	Frame 4,8
330640	Resistor, 150 Ohm 2	340986	Keytop 12	346403	Keytop 3,12
333409	Resistor, 39K Ohm 9	340987	Keytop 12,13,14	346409	Spacer 4,10,12
333417	Resistor, 680K Ohm 2	340988	Keytop 12	346410	Label 4
333727	Capacitor, 6.8 MFD 2	340989	Keytop 12	*346432	Keypad 2,9
336948	Capacitor, 1.0 MFD 2,5,9	340990	Keytop 13,14	346536	thru
337325	Resistor 2	340993	thru	346542	Keytop 13,14
339002	Circuit, Integrated 2	thru		346543	Keytop 13
339490	Circuit, Integrated 2,9	341002	Keytop 13,14	346544	Keytop 13
339602	Circuit, Integrated 9	341005	Keytop 13,14	346548	Keytop 13,14
340701	Keytop 12	341009	Keytop 13,14	346549	Keytop 13,14
340704	Housing 3	341010	Keytop 13,14	346558	Keytop 13,14
340714	Keytop 12	341012		346571	Keytop 13,14
*340720	Keypad 2	thru		346675	Keytop 13
*340722	Keypad 2	341017	Keytop 13,14	346676	Keytop 13
340730	Channel 4,8	341019	Keytop 13,14	346682	thru
340762	Housing 3	341021	Keytop 13,14	346685	Keytop 13,14
340764	Spring, Compression 3,12	341022	Keytop 13,14	346689	Keytop 13,14
340769	Bail, Wire 3	341024	Keytop 13,14	346691	Keytop 14
340770	Guide 3	341069	Spring, Leaf 3	346692	Keytop 14
340777	Bumper 3	*341098	Keypad 2	346693	Keytop 14
340778	Keytop 12	341803	Connector 9	346700	Rail 8
*340779	Keypad 2,9	341804	Switch 9	346701	Rail 4,8
340821	thru	342238	Circuit, Integrated 2	346707	Shield 4,8
340828	Keytop 12	342280	Circuit, Integrated 2	346709	Plate 4
340829	Keytop 12,14	346102	Keytop 12	346721	Rail, Front 4
340830	Keytop 12,14	346106	Keytop 12	346834	Keytop 10,12
		346116	Keytop 12	346843	Keytop 14

F. NUMERICAL INDEX (Contd)

Part Number	Description and Page Number	Part Number	Description and Page Number	Part Number	Description and Page Number
346847	Keytop 14	406631	Lens 6	420188	Bar, Spacer 6,12
346880	Keytop 14	409101	Board, Circuit 5	420191	Spring 6
346882	Keytop 13,14	410055	Card, Circuit 1	420194	Cam 6
346925	Magnet 6	410080	Card, Circuit 1,2	420196	Plunger 5,6
346926	Keeper 6	410101	Card, Circuit 1,5,7	420199	Insulator 7
347006	Spacer 3	410741	Card, Circuit 1,8,9	430506	Circuit, Integrated 9
347095	Keytop 12	413949	Keytop 14	430619	Connector 2,5,9
347149	Keytop 3,12	413950	Keytop 14	430900	Modification Kit 12
347153	Keytop 14	413951	Keytop 14	430945	Circuit, Integrated 5
347169	Keytop 13	420150	Housing 7	453961	Keytop 13,14
347176	Keytop 13,14	420158	Screw, 5-20 Spl 7	453963	Bail 3,6
347182	Keytop 13,14	420159	Stop 13,14	453964	Housing 3
347183	Keytop 13,14	420161	Retainer 6	453968	Capacitor 2
347256	Keytop 13,14	420162	Magnet 6	454324	Keytop 13
347257	Keytop 13,14	420163	Plunger 5,6	454326	Keytop 13
347258		420168	Indicator Assembly 6	454327	Keytop 13
thru		420169	Magnet 6	454368	
347261	Keytop 13	420170	Plunger 6	thru	
347262	Keytop 13,14	420171	Cover 7	454371	Keytop 13
403611	Terminal 5	420176	Plunger 5,6	454401	
404027	Driver 2	420179	Spacer 6	thru	
405092	Plug 2,5,9	420181	Plunger 5,6	454404	Keytop 14
405324	Capacitor 2,5,9	420182	Plunger 5	474000	Circuit, Integrated 9
406628	Holder 6	420183	Spring, Compression 6	474193	Circuit, Integrated 9

Keyboard Code	Description and Page Number
*43K001/CAA	Keyboard 11
*43K101/CAA	Keyboard 11
43K101/CAB	Keyboard 11
50K122/AAE	Keyboard 11
50K122/AAF	Keyboard 11
50K122/AAG	Keyboard 13
50K122/AAM	Keyboard 14

\*Maintenance Spares

PART 6 — PACKING AND MARKING

	CONTENTS	PAGE
A.	GENERAL .....	6-1
B.	KEYBOARD PACKING (KSR and RO) .....	6-2

A. GENERAL

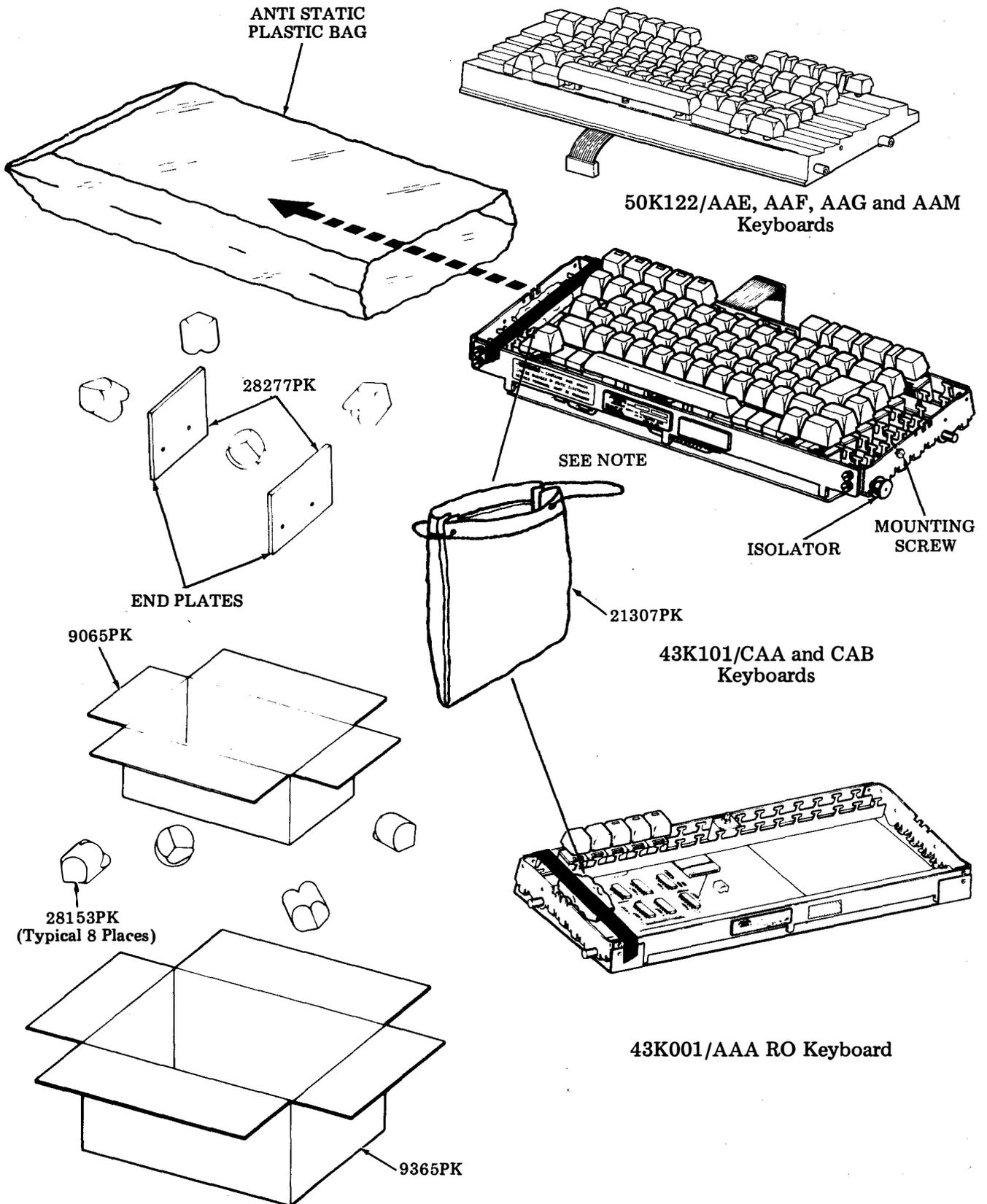
This part provides packing information for the 43 KSR and RO keyboards.

The keyboard should be properly packed for storage or transportation between service and customer locations. Packing provides protection against damage or contamination and facilitates storage, stock selection and handling.

Identify the contents on the outside of each carton after packing, with the code or part number, using indelible markers or premarked adhesive labels.

**B. KEYBOARD PACKING (KSR and RO)**

*Note:* Place isolators and mounting screws into 21307PK bag and tape bag to keyboard. Insert KSR keyboard into anti static plastic bag before installing end plates.







## Teletype Corporation

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Repair Manual 525  
Issue 2, November 1983