# 43 KEYBOARD

# DISASSEMBLY/REASSEMBLY

CONTENTS PAGE



## 1. GENERAL

1.01 This section provides disassembly and reassembly procedures for the 43 keyboard.

1.02 This section is reissued to include the 50K122/AAE and AAF unitized keyboard and all the 43 Teleprinter Buffered Station keyboards. All references to opcon have been changed to keyboard.

1.03 The KSR 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 antistatic bags which should be saved for reuse when returning keyboards for repair.

1.04 The extent of the disassembly procedure is limited to that which is required for correction of troubles or replacement of parts in field locations. When removing a subassembly or part from the keyboard, follow the removal procedure and note the sequence of removal to enable proper reassembly.

1.05 The 50K122/AAE and AAF unitized keyboards are not field servicable. Therefore, disassembly procedures are not provided. However, keytop identification information in this section does apply. The unitized keyboards are returnable to Western Electric for repair.

1.06 Refer to Maintenance Tools, Section 570-005-800, for a complete listing of the various types of hand tools available for maintenance of Teletype® equipment. For a listing of the tools required to perform the disassembly and reassembly of the 43 keyboard, refer to 2. TOOLS REQUIRED.

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

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

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

1.10 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.

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1.11 Refer to 43 Teleprinter Dissassembly/ Reassembly, Section 574-500-720 for keyboard removal and replacement procedures.

1.12 Some parts that are not listed in the parts sections are shown as necessary to the disassembly procedures such as screws, ring retainers, etc. Most of these parts are common to other Teletype product line and if needed may already be available in available in field repair kits or can be ordered.

2. TOOLS REQUIRED

2.01 The following tools are recommended for uses 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 |
| 346260 | Keytop Extractor |
| 346392 | Static Discharge Strap |
| Telco Provided | Soldering Iron (Low Wattage) |
| Telco Provided | Desoldering Tool |

3. DISASSEMBLY/REASSEMBLY

SPACEBAR MECHANISM (Early Design)

3.01 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. 1).

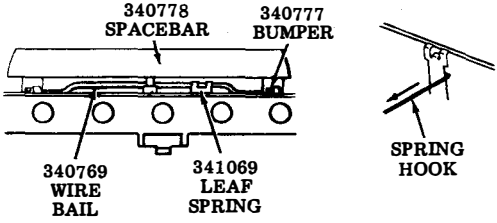



Fig. 1—Leaf Spring Disengagement

(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. 2).

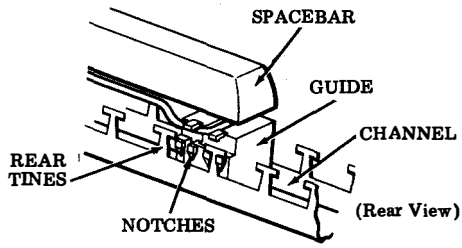



Fig. 2—Spacebar Removal

(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 (snaps in and out) (Fig. 3).

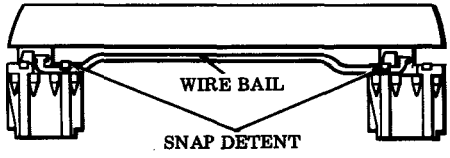



Fig. 3—Wire Bail Removal

3.02 To reassemble the spacebar mechanism:

(a) Make sure the four tines engage the notches in the space bar 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)

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

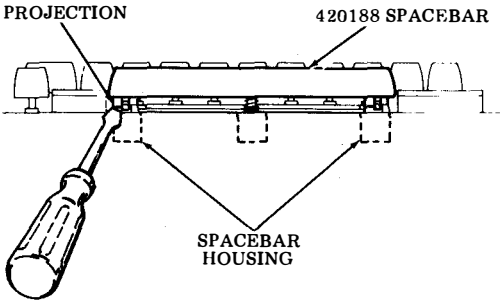



Fig. 4—Spacebar Removal

3.04 To remove the spacebar bail:

(a) Remove spacebar see 3.03.

(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. 5).

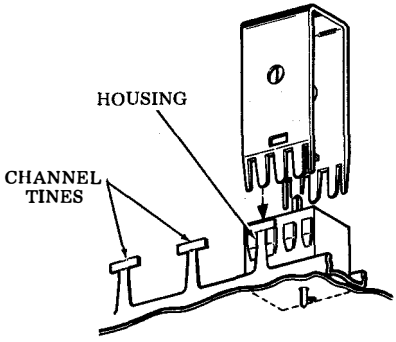



Fig. 5—Spacebar Housing

*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.

3.05 To reassemble the spacebar mechanism:

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

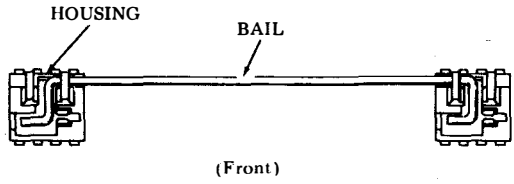



Fig. 6—Wire Bail and Housing Assembly

(b) Snap the two spacebar housings into the keyboard channel, see Fig. 6. Make sure the four tines of the channel engages 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. 7.

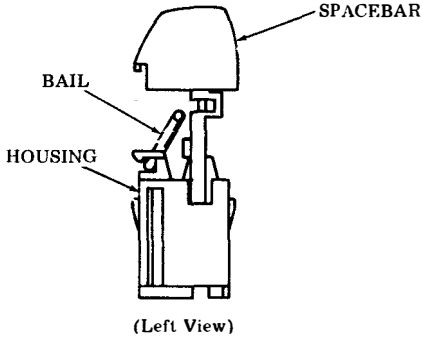



Fig. 7—Spacebar Assembly

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

KEYTOPS

3.06 To remove the keytops (Fig. 8):

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

(1) Control Keytop

Indicator
Nonindicator

(2) Data Keytop

Fig. 8—Keytops

(b) To remove data keytops, place 346260 tool over the keytop and pull up to remove (Fig. 9).

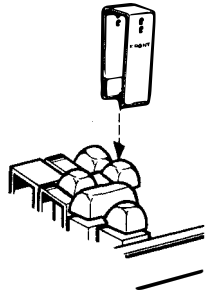


Fig. 9—Data Keytop Removal

*Warning: CAPS LOCK, PARITY, DUPLEX, and CPS keytops, if present, 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. 10):

(1) Grasp keytop using thumb and index finger.

(2) Exert upward force until keytop releases.

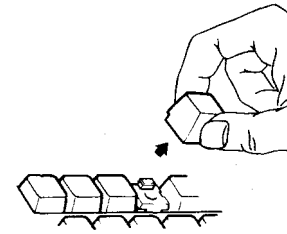


Fig. 10—Control Keytop Removal

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

(1) Remove the keytops that surround the RETURN keytop using 346260 tool.

(2) Disengage the rear tines from housing with a small screwdriver while pulling the RETURN keytop up and toward the front (Fig. 11).

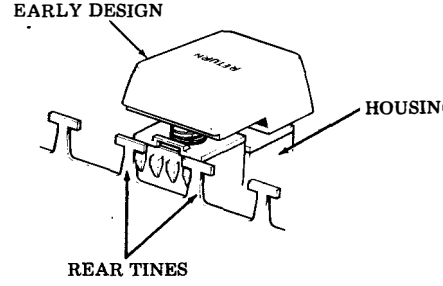



Fig. 11—Rear Tine Disengagement

(3) Continue applying upward pressure to the RETURN key and disengage the front tine from housing using a spring hook. Remove keytop with housing from channel (Fig. 12).

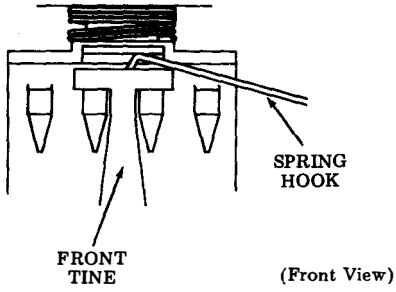



Fig. 12—Front Tine Disengagement

(e) To remove the late design RETURN keytop:

(1) Remove the keytops that surround the RETURN keytop using the 346260 tool.

(2) Grasp the RETURN keytop using thumb and index finger.

(3) Exert upward force until keytop releases.

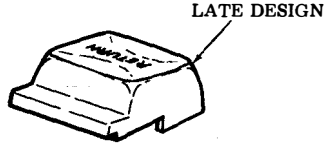



Fig. 13—Late Design RETURN Keytop

3.07 To reassemble the early design RETURN 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.

KEYSWITCH

3.08 To remove the keyswitch:

(a) Remove shield to expose circuit card by removing four screws. Cut cable tie, if present, securing loose end of cable to the keyboard.

(b) Remove keytop.

(c) Remove solder from around terminal pins of keyswitch to be removed (Fig. 14).

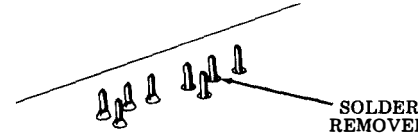



Fig. 14—Solder Removal

*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. 15).

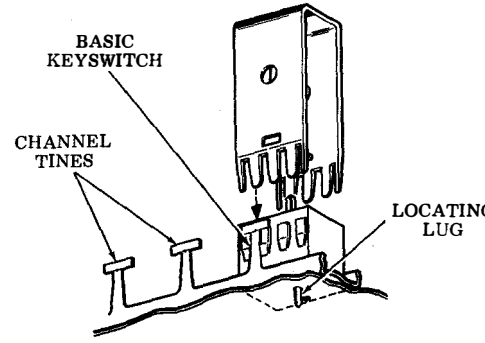



Fig. 15—Keyswitch Removal

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

3.09 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.

BLOCKING SPACER

3.10 To remove blocking spacer:

(a) Remove keytop associated with blocking spacer and first keytop, if present, to the left (see 3.06).

(b) Slide spacer to the left as far as it will go and then pull to the rear (Fig. 16).

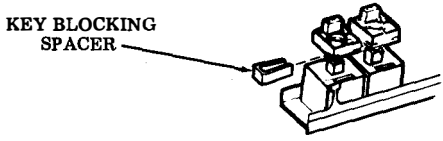



Fig. 16—Blocking Spacer Removal

(c) In reassembly, insert spacer from the left and observe that the spacer encapsulates the keyswitch push rod and that the front part of the spacer is located between the keyswitch springs (Fig. 17).

(d) Replace keytops.

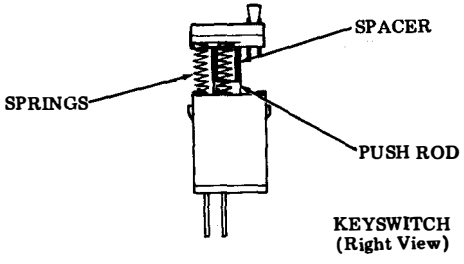



Fig. 17—Blocking Spacer Reassembly

CABLE BASIC (KSR)

3.11 To remove the cable:

(a) Remove shield to expose circuit card by removing four screws.

(b) Remove the PRINTER TEST, PARITY, DUPLEX and CPS keytops.

(c) Remove the INTERLOCK, PRINTER TEST, PARITY, DUPLEX and CPS keyswitches (Fig. 18).

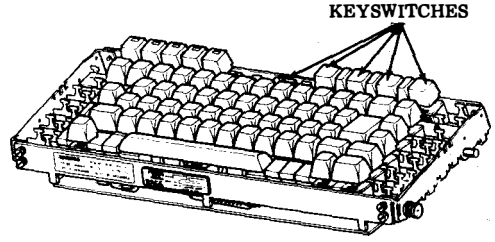



Fig. 18—Keyswitch Identification

(d) Remove solder from around connector pins of cable to be removed (Fig. 19).

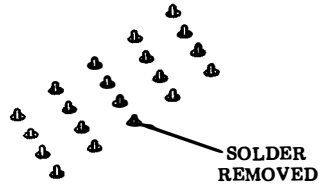



Fig. 19—Connector Pins

*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. 20).

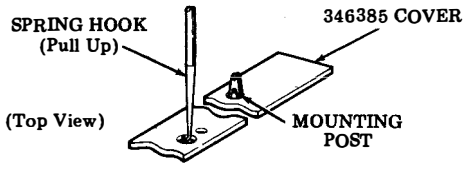



Fig. 20--Cover Removal

(e) Grasp the cable connector using thumb and index finger.

(f) Exert upward force until cable connector releases (Fig. 21).

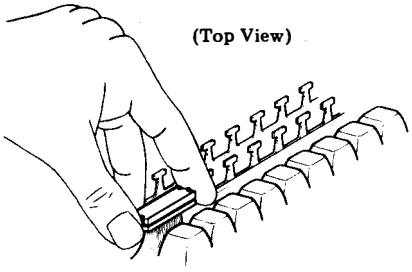



Fig. 21--Cable Connector Removal

(g) Remove rear plate (Fig. 22).

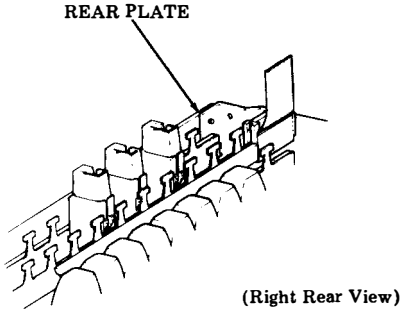



Fig. 22--Cable Removal

(h) Slide cable to the right until it clears the circuit card. Remove through opening between channels (Fig. 22).

3.12 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 keyswitches and keytops removed in 3.11 (b) and (c).

(d) Replace circuit card cover removed in 3.11 (e).

(e) Replace rear plate.

(f) Replace shield removed in 3.11 (a).

CABLE BASIC (RO)

3.13 To remove the cable:

(a) Remove the interlock keyswitch (see 3.08).

(b) Remove solder from around connector pins of cable to be removed (Fig. 19).

*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 side of the circuit card to the channel (Fig. 23).

(e) Grasp the cable connector using thumb and index finger (Fig. 21).

(f) Exert upward force until cable connector releases.

(g) While biasing the right rear cover of the circuit card in the downward direction; slide the cable to the rear until it clears the circuit card. Remove cable.

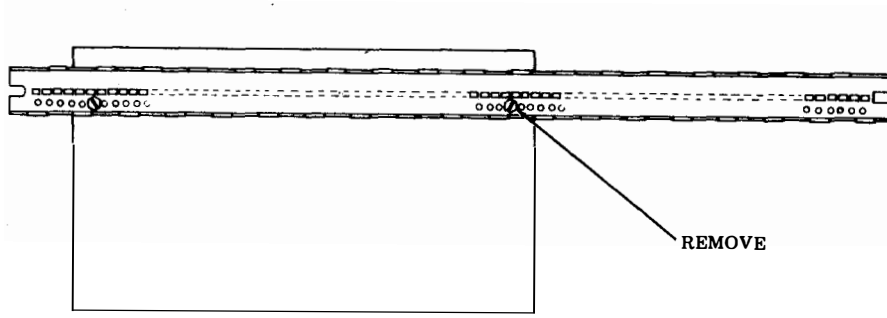



Fig. 23 -Channel

3.14 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 cable tie.

(c) Secure the circuit card to the channel with the screw previously removed.

(d) Reassemble interlock keyswitch previously removed.

(e) Replace circuit card shield.

CABLE BUFFERED STATION

3.15 To remove the cable:

(a) Remove the left most nine keytops. See Fig. 24.

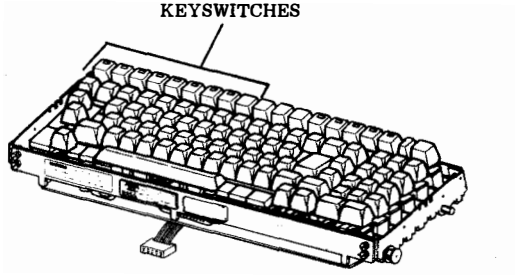



Fig. 24—Keyswitch Identification

(b) Remove the keyswitches associated with the keytops in (a). See 3.08 for keyswitch removal.

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

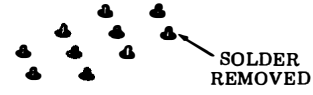



Fig. 25--Connector Pins

*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.*

(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. 26).

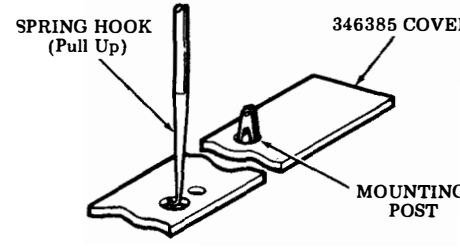



Fig. 26--Cover Removal

(e) Grasp the cable and cable connector and exert upward force until cable connector releases.

(f) Cut cable ties securing the cable to the circuit card.

(g) Remove rear plate and left side frame (Fig. 27).

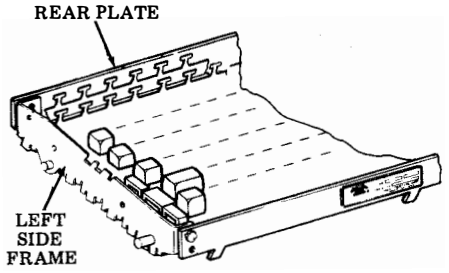



Fig. 27--Cable Removal

(h) Slide cable to the left until it clears the circuit card and remove.

3.16 To reassemble the cable:

(a) Insert new cable connector into circuit card holes and press into place. Route cable as shown in Fig. 28. Hold cable connector in place and resolder.

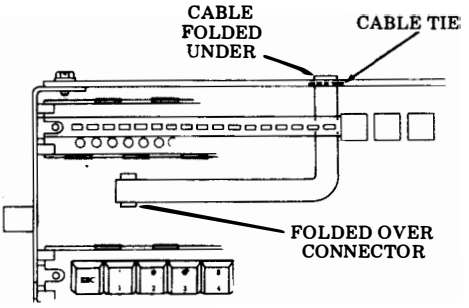



Fig. 28--Cable Routing

(b) Fold the cable under the circuit card and fasten to the circuit card using a cable tie. See Fig. 28.

(c) Reassemble keyswitches and keytops removed in 3.15 (a) and (b).

(d) Replace rear plate and left side frame removed in 3.15 (g).

(e) Replace circuit card cover removed in 3.15 (d).

(f) Replace circuit card shield and fasten the loose end of the cable to the circuit card using a cable tie, see Fig. 29.

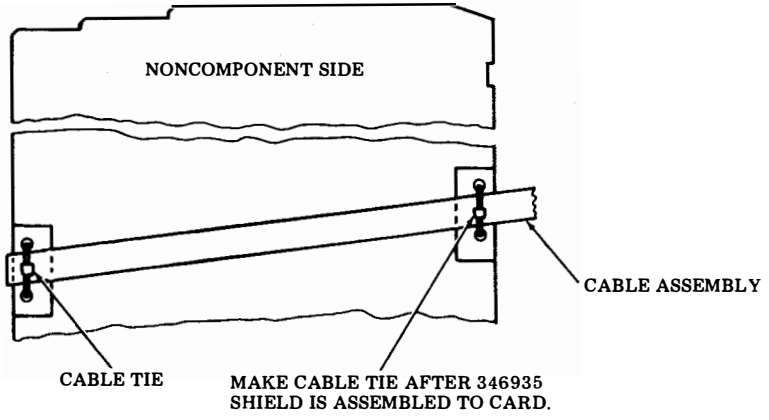



Fig. 29--Cable Replacement

## 4. KEYTOP AND KEYSWITCH IDENTIFICATION

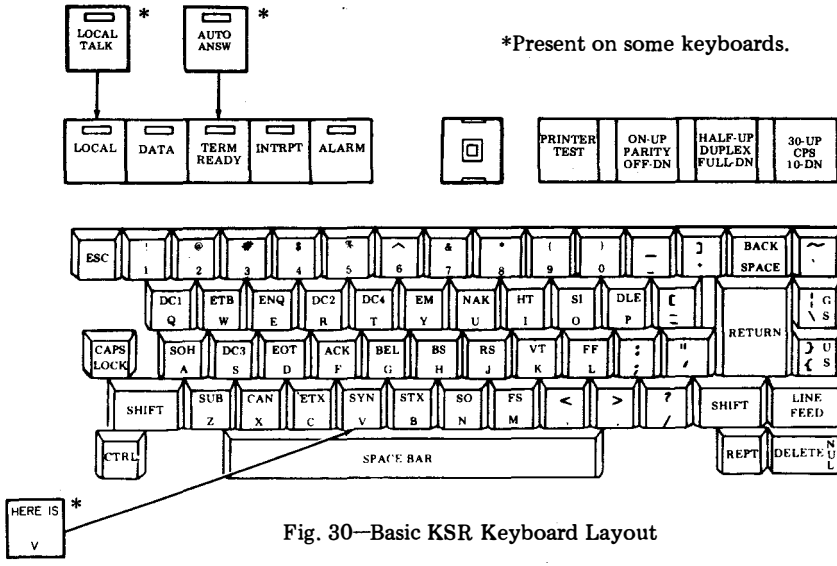



Fig. 30—Basic KSR Keyboard Layout

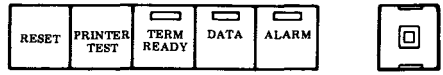



Fig. 31—Basic RO Keyboard Layout

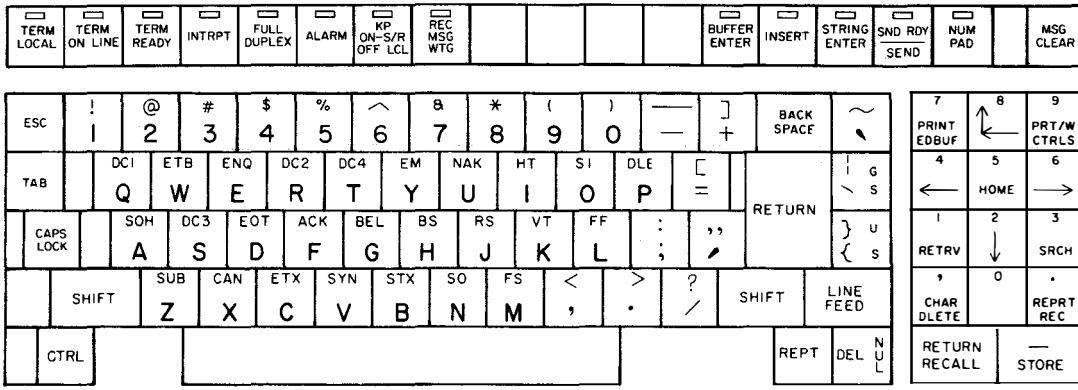



Fig. 32—8-Level Buffered Send/Receive Keyboard Layout

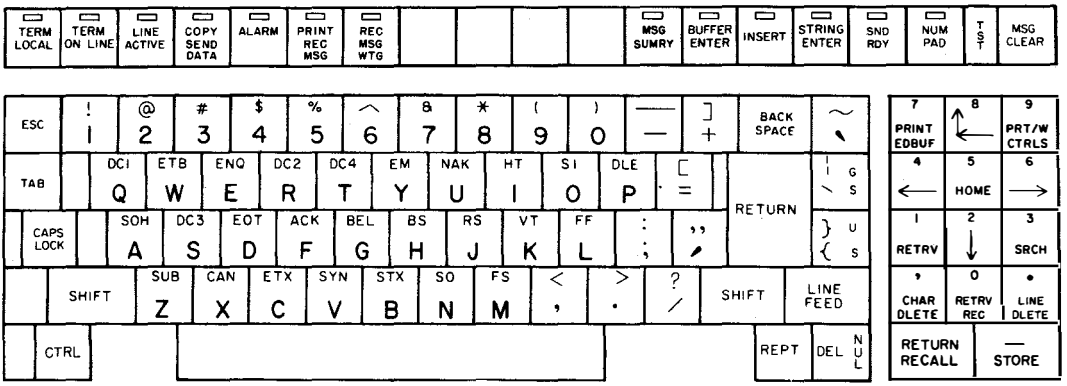
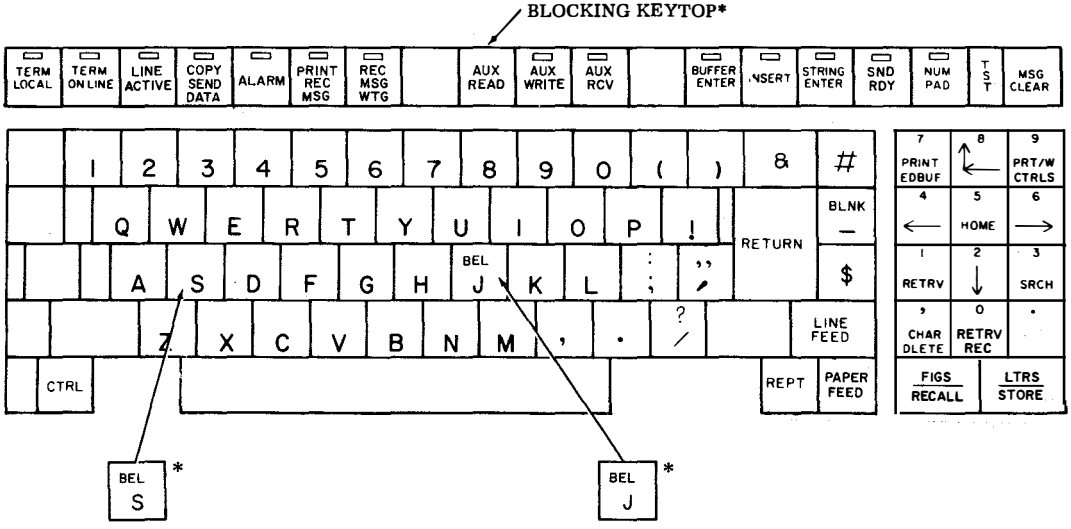



Fig. 33—8-Level Buffered Selective Calling Keyboard Layout




*Present on some keyboards.

Fig. 34—5-Level Buffered Selective Calling Keyboard Layout

| PART NO. | KEYTOP DESCRIPTION | PART NO. | KEYTOP DESCRIPTION |
|---|---|---|---|
| 340701 | BLOCKING — CONTROL | 340982 | BS H |
| | | 340983 | } US { |
| 340714 | BLOCKING — DATA | 340984 | SUB Z |
| | | 340985 | SYN V |
| 340778† | SPACEBAR | 340986 | LINE FEED |
| 340821 | ! 1 | 340987 | CTRL |
| 340822 | @ 2 | 340988 | REPT |
| 340823 | # 3 | 340989‡ | DELETE NUL |
| 340824 | $ 4 | 340990 | 6 |
| 340825 | % 5 | 340993 | Q |
| 340826 | ^ 6 | 340994 | W |
| 340827 | & 7 | 340995 | E |
| 340828 | * 8 | 340996 | R |
| 340829 | ( 9 | 340997 | T |
| 340830 | ) 0 | 340998 | Y |
| 340831 | — - | 340999 | U |
| 340838 | DC1 Q | 341000 | I |
| 340839 | ETB W | 341001 | O(ALPHA) |
| 340840 | ENQ E | 341002 | P |
| 340841 | DC2 R | 341005 | D |
| 340842 | DC4 T | 341006 | F |
| 340843 | EM Y | 341007 | G |
| 340844 | NAK U | 341008 | H |
| 340846 | SI O | 341009 | K |
| 340852 | SOH A | 341010 | L |
| 340853 | DC3 S | 341012 | Z |
| 340854 | EOT D | 341013 | X |
| 340855 | ACK F | 341014 | C |
| 340856 | BEL G | 341015 | V |
| 340358 | RS J | 341016 | B |
| 340859 | VT K | 341017 | N |
| 340860 | FF L | 341020 | (BLANK SHIFT) |
| 340861 | : ; | 346102 | LOCAL |
| 340862 | " / | 346106 | INTRPT |
| 340867 | SHIFT | 346116 | AUTO ANSW |
| 340869 | CAN X | 346127 | TERM READY |
| 340870 | ETX C | 346161 | LOCAL TALK |
| 340872 | STX B | 346162 | DATA |
| 340873 | SO N | 346163 | ALARM |
| 340874 | FS M | 346164 | ON-UP PARITY OFF-DN |
| 340875 | < , | 346165 | HALF-UP DUPLEX FULL-DN |
| 340876 | > . | 346166 | 30-UP CPS 10-DN |
| 340877 | ? / | 346169 | PRINTER TEST |
| 340889 | ] + | 346403§ | RETURN |
| 340890 | [ = | 346536 | 1 |
| 340894 | CAPS LOCK | 346537 | 2 |
| 340975 | ESC | 346538 | 3 |
| 340976 | BACKSPACE | 346539 | 4 |
| 340977 | ~ ` | 346540 | 5 |
| 340978 | HT I | 346541 | 7 |
| 340979 | DLE P | 346542 | 8 |
| 340981 | ¦ GS \ | 346543 | 9 |

Fig. 35—Keytop Identification

| PART NO. | KEYTOP DESCRIPTION | PART NO. | KEYTOP DESCRIPTION |
|---|---|---|---|
| 346544 | 0(ZERO) | 346842 | KP ON—SR OFF—LCL |
| 346548 | ' | 346843 | REC MSG WTG |
| 346549 | . | 346844 | BUFFER ENTER |
| 346558 | M | 346845 | INSERT |
| 346559 | J | 346846 | STRING ENTER |
| 346589 | TAB | 346847 | SND RDY SEND |
| 346590¶ | DEL NUL | 346848 | NUM PAD |
| 346591 | 7 PRINT EDBUF | 346849 | MSG CLR |
| 346592 | 8 ↑ | 347095 | HERE IS V |
| 346593 | 9 PRT/W CTRLS | 347142 | BLNK— |
| 346594 | 4 ← | 347149** | RETURN |
| 346595 | 5 HOME | 347177 | PAPER FEED |
| 346596 | 6 → | 347218 | 0 RETRV REC |
| 346597 | 1 RETRV | 347219 | . LINE DLETE |
| 346598 | 2 ↓ | 347236 | & |
| 346599 | 3 SRCH | 347237 | # |
| 346600 | , CHAR DLETE | 347238 | ! |
| 346601 | 0 | 347239 | $ |
| 346602 | . REPRT REC | 347240 | BEL S |
| 346603 | RETURN RECALL | 347241 | FIGS — RECALL |
| 346604 | — STORE | 347242 | LTRS — STORE |
| 346675 | ( | 347255 | . (NUM PAD) |
| 346676 | ) | 420188†† | SPACEBAR |
| 346682 | A | 454351 | COPY SEND DATA |
| 346683 | S | 454352 | PRINT REC MSG |
| 346694 | BEL J | 454353 | LINE ACTIVE |
| 346834 | RESET | 454354 | MSG SUMRY |
| 346839 | TERM LOCAL | 454355 | SND RDY |
| 346840 | TERM ON LINE | 454365 | AUX REC |
| 346841 | FULL DUPLEX | 454366 | AUX READ |
| | | 454367 | AUX WRITE |

† Early Design Spacebar

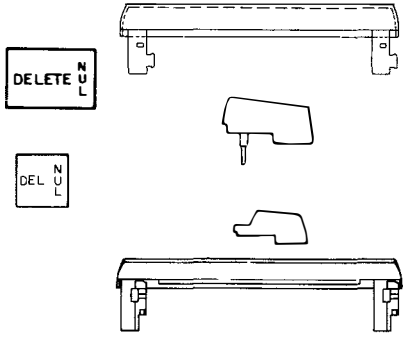
‡ Basic Keyboard Key

§ Early Design Return Key

¶ Buffered Keyboard Key

** Late Design Return Key

†† Late Design Spacebar




See Notes on following page.

Fig. 35—Keytop Identification (Contd)

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

*Note 2:* The 346409 spacer must be installed under the 346162, 346163 and 346127 key to block the action of the ALARM keyswitch on the 43K101/CAB and 43K001/AAA and the TERM READY and DATA keyswitches on the 43K001/AAA keyboard.

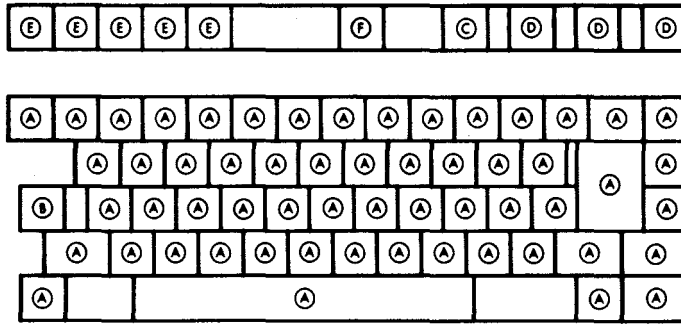
*Note 3:* The 340764 compression spring between the 346403 key and the housing must be ordered separately.

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

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

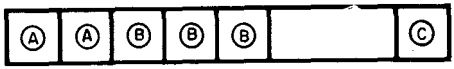
*Note 6:* The 340701 and 340714 keys may be used for local engineering requirements to block the action of keyswitches.

*Note 7:* All 43K101/CAB operator consoles should have the DATA key unblocked. Remove the 346409 spacer, if present under the 346162 DATA key.



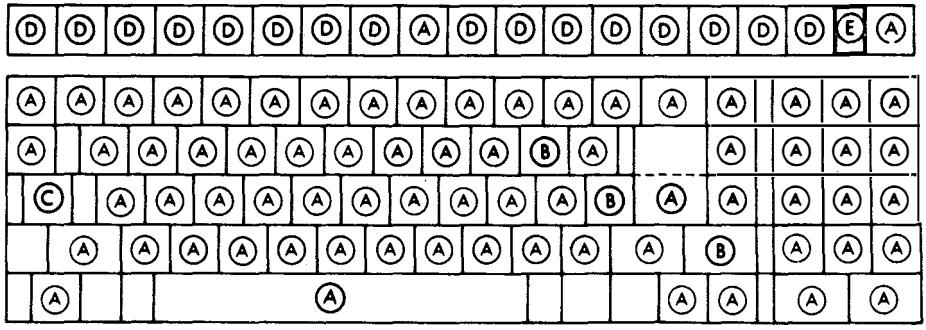
| SWITCH NO. | TYPES | PUSH ROD COLOR |
|---|---|---|
| Ⓐ 340720 | BASIC | WHITE |
| Ⓑ 340722 | LATCHING | BLACK |
| Ⓒ 340779 | DC CONTACT | PINK |
| Ⓓ 341098 | LATCHING | GREY |
| Ⓔ 346359 | INDICATOR | ORANGE |
| Ⓕ 346432 | DC CONTACT | BLACK (Cut-Off) |

Fig. 36—Basic KSR Keyswitch Identification




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

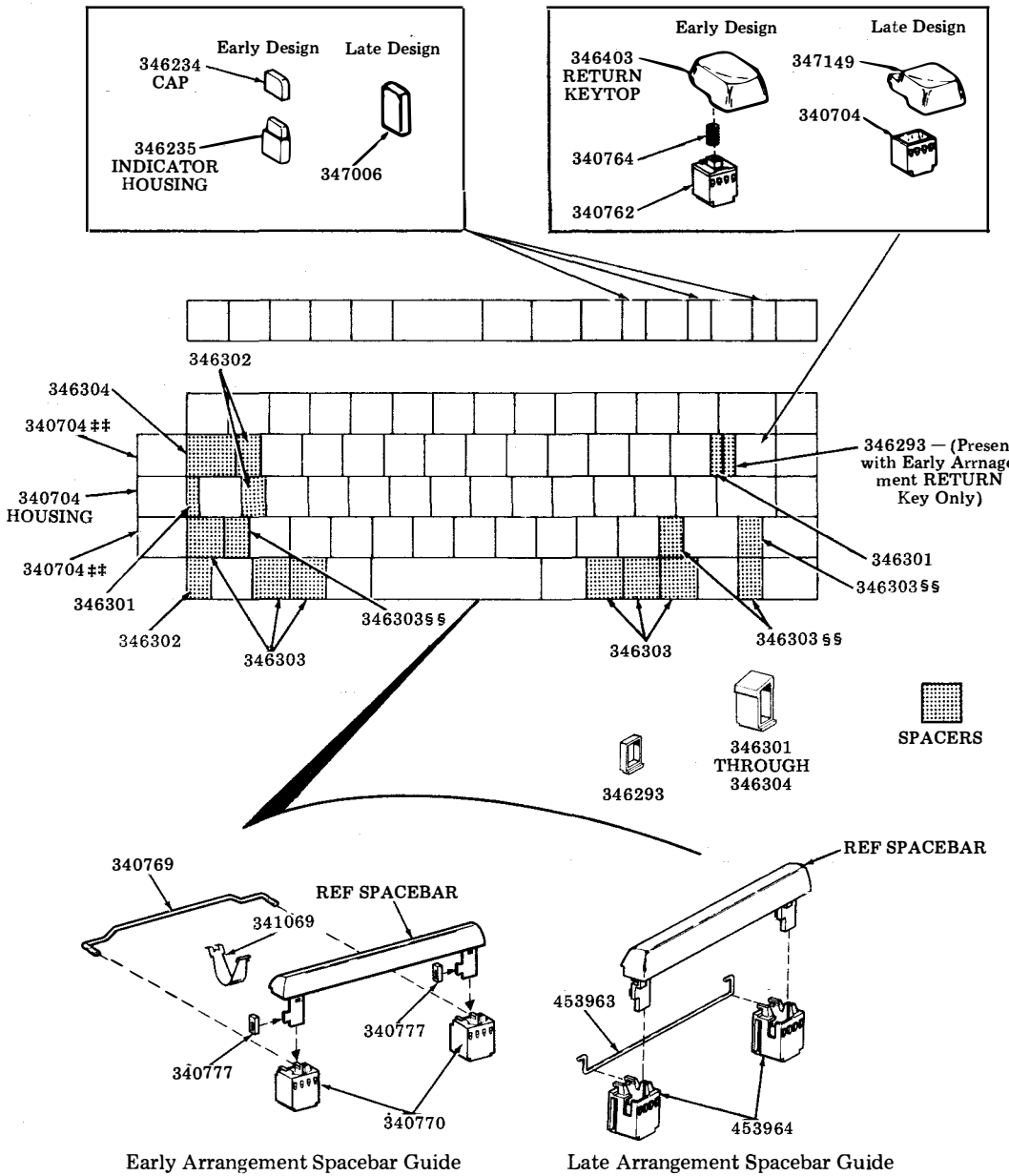
Fig. 37—Basic RO Keyswitch Identification



| SWITCH NO. | TYPES | COLOR PUSH ROD |
|---|---|---|
| A 340720 | BASIC | WHITE |
| B 340721 | OVERTRAVEL | GREEN |
| C 340722 | LATCHING | BLACK |
| D 346359 | INDICATOR | ORANGE |
| E 341088 | INDICATOR ONLY | ——— |

Fig. 38—Buffered KSR Keyswitch Identification

5. SPACER, HOUSING AND REFERENCE IDENTIFICATION

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‡‡Present on Early Arrangement Keyboards
§§Replaces Two 346293 Spacers Used on Early Arrangement Keyboards

Fig. 39—Basic KSR Keyboard

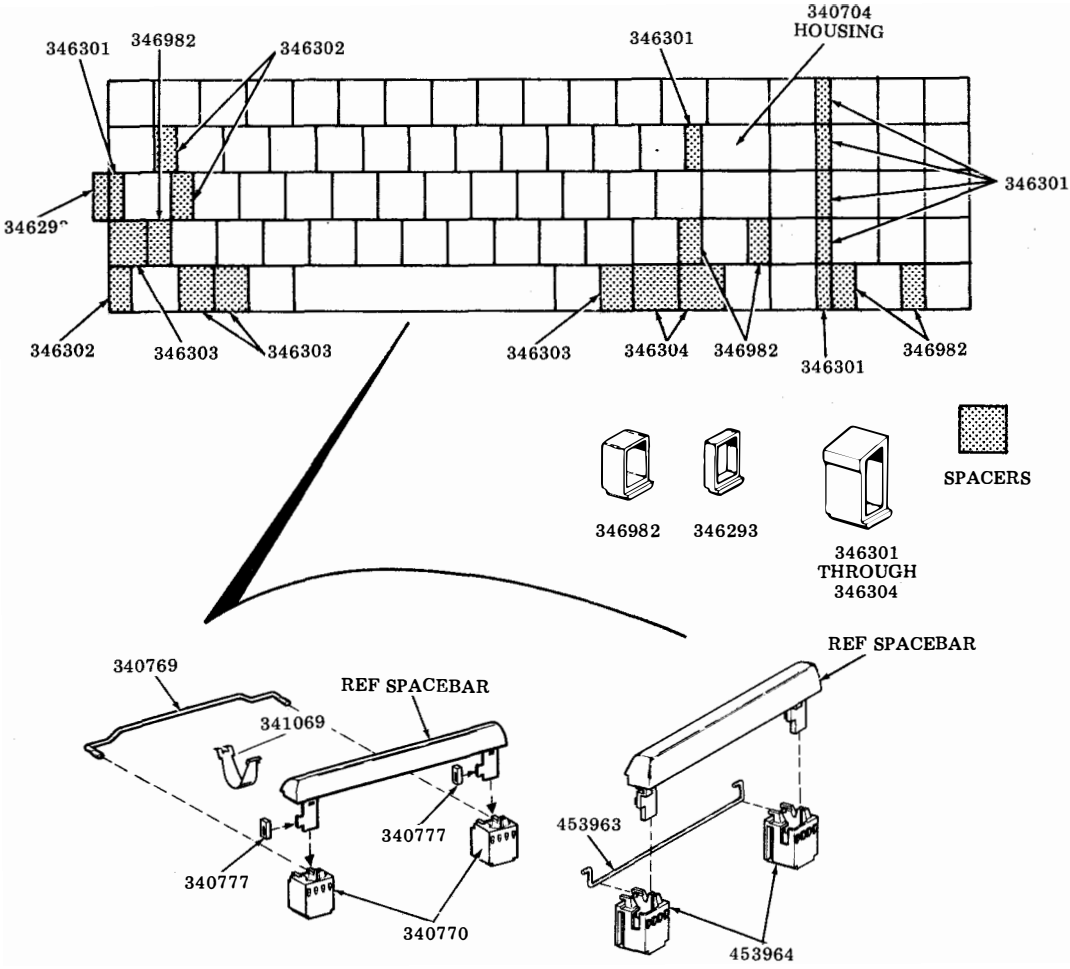


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Fig. 40—Buffered Keyboard