INSTRUCTIONS FOR INSTALLING 320036, 321219, 321220, 321272, 323489, 324051, 324052, and 324503 LOW LEVEL RFI (POLAR-EMC) MODIFICATION KITS WHICH ADD A SHIELDED SIGNAL GENERATOR CONTACT BOX TO MODEL 28 KEYBOARDS OR TRANSMITTER DISTRIBUTORS

1. GENERAL

1.01 The 320035, 321219, 321220, 321272, 323489, 324051, 324052, and 324503 modification kits provide a specially shielded signal generator contact box for low level operation and radio frequency (rfi) suppression. They are not intended for general use. Typical signal generators are illustrated in Figures 3, 4, and 5.

1.02 Parts ordering information for 320036, 321219, 321220, 321272, and 323489 modification kits is given in Figures 1 and 2. Parts ordering information for the 324051, 324052, and 324053 modification kits is as follows:

Teletype No.	Navy Nomenclature
324051	MK-1116/UG
324052	MK-1112/UG
324053	MK-1113/UG

324051 Modification Kit

This modification kit contains all the parts necessary to add a shielded signal generator to an LXD (320036 or 321220 modification kits), plus the following parts which are illustrated in Specification 50501S:

Part No.	Description	Quantity
156677	Insulator	1
326354	Core	2
326372	Contact assembly	1
256M	Coil, magnet	2

324052 Modification Kit

This modification kit contains all the parts normally included in the 321272 modification kit plus the following parts which are illustrated in Specification 50501S:

Part No.	Description	Quantity
2191	Lockwasher	1
3598	Nut 6-40 hex	1
7002	Flat washer	1
92260	Lockwasher	1

Part No.	Description	Quantity
135563	Ground strap	2
151631	Screw 6-40 x 5/16 hex	1
326355	Cable assembly	1
326357	Contact assembly	1
252M	Coil, magnet	1

324053 Modification Kit

This modification kit contains all the parts normally included in the 321219 modification kit plus the following parts which are illustrated in Specification 50501S:

Part No.	Description	Quantity
2191	Lockwasher	1
3598	Nut 6-40 hex	1
7002	Flat washer	1
92260	Lockwasher	1
135563	Ground strap	2
151631	Screw 6-40 x 5/16 hex	1
155751	Insulating tubing	1
182520	Diode	1
326355	Cable assembly	1
326357	Contact assembly	1
327343	Cable	1
252M	Coil, magnet	1

Note: The 324051, 324052, and 324053 modification kits are intended to convert certain equipment to low level operation and provide for synchronous pulse operation. See applicability chart in Paragraph 1.03 and reference 164660 modification kit (Specification 50047S) for further information on synchronous pulse operation.

1.03 The modification kits (mod kits) covered by this specification should be used only in conjunction with electrical service assemblies (ESA) equipped with a 303142 low level keyer card. Information on the keyer card can be found in Specification 50509S (NAVSHIPS 0967-273-9010). Specific applications for the kits are given in the following chart:

	Applicability	
Modification Kit	Teletype Code	Navy Nomenclature
320036	LXD in Model 28 Automatic Send-Receive (ASR) Teletypewriter Set except LXD11	TT-251/UG, TT-439/UG, etc

Modification Kit	Applicability	
	Teletype Code	Navy Nomenclature
321219	LAK in Model 28 ASR Set except LAK21	MX-2643/UG, TT-371/UG, TT-433/UG, etc
321220	Self-Contained LXD except LXD11	TT-187/UG, TT-187A/UG, TT-187C/UG, TT-273/UG, etc
321272	LK in Model 28 Keyboard Send-Receive (KSR) Teletypewriter Set except LK25	MX-1114C/UG, MX-1677A/UG, TT-385/UG, TT-387/UG, TT-388/UG, TT-434/UG, TT-503/UG, Keyboard used on TT-176/UG, etc
323489	LTRK in Model 28 Send-Receive Typing Reperforator Set	TT-253/UG, TT-253A/UG, TT-253C/UG, TT-292/UG, etc
324051	LXD11	TT-311/UG
324052	LK25	MX-3310/UG
324053	LAK21	MX-3312/UG

1.04 For parts other than those in the kits, see the sectionalized literature written about the set involved.

2. INSTALLATION

GENERAL INSTRUCTIONS

2.01 These installation instructions cover each application described in Paragraph 1.03. Instructions differ depending upon the component onto which the mod kit is being installed and whether or not magnets and contacts are to be installed.

2.02 Installation of the modification kits is best done with the typing unit (where applicable) removed from its base. For instructions, see the appropriate disassembly and reassembly literature for the set involved.

2.03 References to up, down, left, right, front, and rear pertain to the equipment as viewed from the operator's position when facing the signal generator.

2.04 Before proceeding with the disassembly and reassembly work, read the applicable portions of the installation text carefully. After completing the reassembly work, be sure all screws and nuts are tight. Check adjustments required in Paragraph 3.01. Check for springs unhooked from their anchors and check through several revolutions of the main shaft for alignment and binds in the various mechanisms.

MOUNTING 320036 MOD KIT ONTO LXD IN ASR SET (Figures 6 and 7)

2.05 Remove existing wires on the signal generator. Tape each wire separately and tie back to the main body of the cable.

2.06 Remove and retain the 86304 contact link spring. Remove and retain the 156747 screws, 2191 lockwashers, and 7002 flat washers which mount the signal generator contact box assembly. Remove and discard the contact box assembly.

2.07 Install the new 323646 contact box assembly (Figure 2) with cable and connector onto the transmitter distributor front plate. Secure the assembly with the 156747 screws, 2191 lockwashers, and 7002 flat washers retained in Paragraph 2.06. Slip the end of the contact link into the slot in the contact rocker bail. Replace the 86304 contact link spring retained in Paragraph 2.06.

2.08 Remove and discard the 154462 bracket which holds the tongue on the 154485 transmitter distributor cover retaining the two 111017 screws, two 2191 lockwashers, and two 7002 flat washers which mount the bracket. Mount the 321284 connector mounting bracket (Figure 1) in place of the 154462 bracket with the connector cut-out toward the rear of the cabinet. Secure the bracket with the 111017 screws, 2191 lockwashers, and 7002 flat washers which were retained.

2.09 Slip the cable from the new signal generator through the slot in the 321284 connector mounting bracket. Slip the connector coupling and the mounting screws through the holes in the mounting bracket. Secure the connector to the mounting bracket with four 125011 flat washers, four 110743 lockwashers, and four 3599 nuts.

MOUNTING 321219 MOD KIT ONTO LAK IN ASR SET (Figures 8, 9, and 10)

2.10 Remove existing wires on the signal generator. Tape each wire separately and tie back to the main body of the cable. Remove ground strap if LAK is so equipped.

2.11 Remove and retain the 86304 contact link spring. Remove and retain the 151632 screws, 2191 lockwashers, and 7002 flat washers which mount the signal generator contact box assembly. Remove and discard the contact box assembly and existing eccentric.

2.12 Install the 323838 eccentric and the new 323644 contact box assembly (Figure 2) with cable and connector onto the signal generator mounting plate. Secure with the 151632 screws, 2191 lockwashers, and 7002 flat washers retained in Paragraph 2.11. Slip the end of the contact link into the slot in the contact rocker bail. Replace the 86304 contact link spring retained in Paragraph 2.11.

2.13 Mount the 321281 connector mounting bracket (Figure 1) on the left rear corner of the keyboard. Mount the connector mounting bracket to the base using two 151632 screws, two 2191 lockwashers, two 7002 flat washers, and two 3598 nuts. Dress cable and route as illustrated in Figure 10.

2.14 Slip the cable from the new signal generator through the slot in the connector mounting bracket. Slip the connector coupling and mounting screws through the holes in the mounting bracket. Secure the connector to the mounting bracket with four 125011 flat washers, four 110743 lockwashers, and four 3599 nuts.

MOUNTING 321220 MOD KIT ONTO SELF-CONTAINED LXD (Figures 6, 11, and 12)

2.15 Remove existing wires on the signal generator contacts. Tape each wire separately and tie back to the main body of the cable.

2.16 Remove and retain the 86304 contact link spring. Remove and retain the 156747 screws, 2191 lockwashers, and 7002 flat washers which mount the signal generator contact box assembly. Remove and discard the contact box assembly.

2.17 Install the new 323646 contact box assembly (Figure 2) with cable and connector onto the transmitter distributor front plate. Secure the assembly with the 156747 screws, 2191 lockwashers, and 7002 flat washers retained in Paragraph 2.16. Slip the end of the contact link into the slot in the contact rocker bail. Replace the 86304 contact link spring retained in Paragraph 2.16.

2.18 Replace the front posts (Figure 11) on each of the terminal blocks with the 164872 posts supplied. Mount the 321242 connector mounting bracket on the two posts just installed. Secure with two 3598 nuts and two 2191 lockwashers.

Note: The 321242 connector mounting bracket mounts behind the 156758 (A204) terminal block mounting bracket as shown in Figure 12.

2.19 Route Cable on Standard-Sized Self-Contained LXD: Route cable along rear of LXD along length of motor to the 156758 (A204) terminal block mounting bracket at the upper right corner of the set. Continue routing the cable along the terminal block end of the set to the 321242 connector mounting bracket. Tie cable at outside of the two motor mounting posts.

2.20 Route Cable on Miniaturized Self-Contained LXD: Remove the motor from the base by removing four mounting screws. Route the cable along rear of LXD as shown in Figure 12 under handle, near motor mounting post, along capacitor to 156758 (A204) terminal block mounting bracket. Tie the cable to left rear motor mounting post as shown in Figure 12. Replace motor.

2.21 Slip the cable from the new signal generator through the upper slot in the connector mounting bracket. Slip the connector coupling and mounting screws through the holes in the mounting bracket. Secure the connector to the mounting bracket with four 125011 flat washers, four 110743 lockwashers, and four 3599 nuts.

MOUNTING 321272 MOD KIT ONTO LK IN KSR SET OR 323439 MOD KIT ONTO LTRK IN SEND-RECEIVE TYPING REPERFORATOR SET (Figures 13, 14, 15, and 16)

2.22 Remove existing wires on the signal generator contacts. Tape each wire separately and tie back to main body of the cable.

2.23 Remove and retain the 86304 contact link spring. Remove and retain the 151632 screws, 2191 lockwashers, and 7002 flat washers which mount the signal generator contact box assembly. Remove and discard the contact box assembly and existing eccentric.

2.24 Install the 323838 eccentric and the new 323645 contact box assembly (Figure 2) with cable and connector onto the signal generator mounting plate. Secure with the 151632 screws, 2191 lockwashers, and 7002 flat washers retained in Paragraph 2.23. Slip the end of the contact link into the slot in the contact rocker bail. Replace the 86304 contact link spring retained in Paragraph 2.23.

2.25 Install 321243 Bracket in LK (Figure 14): Mount the 321243 connector mounting bracket on the left rear corner of the keyboard. Mount the connector mounting bracket to the keyboard using two 151632 screws, two 2191 lockwashers, two 7002 flat washers, and two 3598 nuts. Dress cable and route as illustrated in Figure 15.

2.26 Install 323490 Bracket in LTRK (Figure 16): Remove the two 151631 screws, two 2191 lockwashers, and two 76461 flat washers which mount the 194170 tape guide. Retain the two 2191 lockwashers and 76461 flat washers and discard the two 151631 screws. Mount the 194170 tape guide and the 323490 connector mounting bracket in the same position using two 151632 screws provided in the mod kit and two 2191 lockwashers and 76461 flat washers previously retained.

2.27 Slip the cable from the new signal generator through the slot in the connector mounting bracket. Slip the connector coupling and mounting screws through the holes in the mounting bracket. Secure the connector to the mounting bracket with four 125011 flat washers, four 110743 lockwashers, and four 3599 nuts.

MOUNTING 324051 MODIFICATION KIT ONTO LXD11 (TT-311/UG) IN ASR SET OR SELF-CONTAINED LXD (Figures 6, 7, 11, and 12)

2.28 Remove LXD with its cable from base. For instructions see Bulletin 235B (NAVSHIPS 92733A). Retain mounting hardware including cable clamps.

2.29 Replace the existing 156532 (O857) magnet cores with the new 326354 cores provided. Replace the magnets with the 256M magnets provided. Check the CLUTCH MAGNET adjustment in Bulletin 235B (NAVSHIPS 92733A). Replace the 160621 bracket, 160623 shield, and 152458 shield with the 156677 insulator. Use existing hardware to mount insulator (Figure 6).

2.30 Remove the 160639 (S800) control contact assembly from rear plate mechanism and replace with the 326372 control contact assembly provided. Use the old mounting hardware. For parts, see Paragraph 1.02 of this specification and Bulletin 1161B (NAVSHIPS 92733A). Check START-STOP SWITCH BRACKET and TIGH TAPE, START-STOP SWITCH CONTACT SPRING adjustments in Bulletin 235B (NAVSHIPS 92733A).

2.31 Replace LXD onto base. For instructions see Bulletin 235B (NAVSHIPS 92733A).

2.32 Remove the old signal generator and install the new 323646 contact box assembly. See Paragraphs 2.05 through 2.09 for instructions on mounting the new contact box assembly onto LXD in ASR Set. See Paragraphs 2.15 through 2.21 for instructions on mounting the new contact box assembly onto self-contained LXD.

MOUNTING 324052 MODIFICATION KIT ONTO LK25 (MX-3310/UG) IN KSR SET (Figures 13, 14, 15, 17, and 18)

2.33 Remove the old signal generator and install the new 323645 contact box assembly. See Paragraphs 2.22 through 2.25 and 2.27 for instructions on mounting the new contact box assembly onto LK in KSR Set.

2.34 Remove the plug connector which is shown in Figure 17. Remove the shell from the connector. Solder one of the two furnished 135563 ground straps to terminal 18 on the plug connector as shown in Figure 17. Feed the lug end of the ground strap out through the hole in the plug connector shell and connect the lug with the shell clampscrew using the 92260 lockwasher provided.

2.35 Remove the keyboard connector shown in Figure 17. Remove all the wires from the keyboard connector and cut the old signal generator cable wires back into the cable as far as possible. Clean all connector pins.

2.36 The LK25 is equipped for synchronous pulse operation, and because of this, the existing magnet, contact assembly, and connecting cable must be removed. Retain cable clamps and hardware. Replace the existing magnet with the 252M magnet. Replace the switch with the 326357 contact assembly. Both are provided with the modification kit.

2.37 Solder the remaining 135563 ground strap to terminal 18 on the keyboard connector as shown in Figure 17. Wire the 326355 cable to the keyboard connector, 252M magnet, and 326357 contact assembly as shown in Figure 18. Similar wiring is illustrated in 8295WD wiring diagram. Secure the 326355 cable to the keyboard base with the cable clamps and hardware retained in Paragraph 2.36. Mount the cable clamps at same points they were mounted when they secured the old cable.

Note: Further information on synchronous pulse operation can be found in Specification 50047S.

2.38 Remount the keyboard connector to the keyboard base. Ground the lug end of the 135563 strap to the keyboard base using the furnished 151631 screw, 7002 flat washer, 2191 lockwasher, and 3598 nut. Replace the plug connector and shell.

2.39 Perform the synchronous pulse adjustments required in Paragraph 3.01.

MOUNTING 324053 MODIFICATION KIT ONTO LAK21 (MX-3312/UG) IN ASR SET (Figures 8, 9, 10, 17, 18, and 19)

2.40 Remove the old signal generator and install the new 323644 contact box assembly. See Paragraphs 2.10 through 2.14 for instructions on mounting the new contact box assembly onto the LAK in the ASR Set.

2.41 Remove the plug connector which is shown in Figure 17. Remove the shell from the connector. Solder one of the two furnished 135563 straps to terminal 18 on the plug connector as shown in Figure 17. Feed the lug end of the strap out through the hole in the plug connector shell and connect the lug with the shell clampscrew using the 92260 lockwasher provided.

2.42 Remove the keyboard connector shown in Figure 17. Remove all the wires from the keyboard connector and cut the old signal generator cable wires back into the cable as far as possible. Clean all connector pins.

2.43 The LAK21 is equipped for synchronous pulse operation, and because of this, the existing synchronous pulse magnet, clutch trip switch, and connecting cable must be removed. Retain cable clamps and hardware. Replace the existing magnet with the 252M magnet. Replace the switch with the 326357 contact assembly. Both are provided with the modification kit.

2.44 Solder the remaining 135563 ground strap to terminal 18 on the keyboard connector as shown in Figure 17. Wire the 326355 cable to the keyboard connector, 252M magnet, and 326357 contact assembly as shown in Figure 18. Secure the 326355 cable to the keyboard base with the cable clamps and hardware retained in Paragraph 2.43. Mount the cable clamps at same points they were mounted when they secured the old cable.

Note: Further information on synchronous pulse operation can be found in Specification 50047S.

2.45 The K-KT-T auxiliary switch in the keyboard must be rewired to control the relays in the appropriate electrical service assemblies. For better access to the switch, remove the tape container and its bracket according to Bulletin 250B (NAVSHIPS 0967-173-6020, Volume 2). Only the wires shown in Figure 19 should remain on those terminals of the keyboard terminal blocks illustrated. All other wires on terminals 1, 2, 4, and 7 of the keyboard terminal blocks should be removed to other unused terminals. Wire the 327343 cable to the keyboard terminal blocks and keyboard connector as shown in Figure 19. Also install the 182520 diode as shown in Figure 19.

Note: When wiring the diode to the K-KT-T switch, use a low wattage soldering iron of approximately 25 watts.

2.46 Remount the keyboard connector to the keyboard base. Ground the lug end of the 135563 strap to the keyboard base using the furnished 151631 screw, 7002 flat washer, 2191 lockwasher, and 3598 nut. Replace the plug connector and shell.

CAUTION: THE AUXILIARY SWITCH SHOULD BE EQUIPPED WITH A 158114 CAM FOR MECHANICAL LINKUP TO THE KEYBOARD AND REPERFORATOR. THE KEYBOARD MUST ALSO HAVE THE 193802 MODIFICATION KIT (SPECIFICATION 50121S) TO DELAY KEYBOARD TRIP ON REPEAT CHARACTER. IF NOT SO EQUIPPED, THIS HARDWARE MUST BE SEPARATELY ORDERED.

2.47 Perform the synchronous pulse adjustments required in Paragraph 3.01.

3. ADJUSTMENTS AND LUBRICATION

3.01 Except for LXD11 (TT-311/UG), LK25 (MX-3310/UG), and LAK21 (MX-3312/UG), there are no static adjustments required for the modification kits. The LXD11 requires a check of the CLUTCH MAGNET, START-STOP SWITCH BRACKET, and TIGHT TAPE, START-STOP SWITCH CONTACT SPRING adjustments which are found in Bulletin 235B (NAVSHIPS 92733A). Synchronous pulse adjustments for LK25 and LAK21 are given in Figures 20 through 25.

3.02 After installation of a modification kit and 303142 low level keyer card (Paragraph 1.03) into a set, the signal generator must be adjusted to obtain the proper keyer output. See Specification 50509S (NAVSHIPS 0967-273-9010) for this adjustment.

3.03 These modification kits require no lubrication.

4. PRINCIPLES OF OPERATION

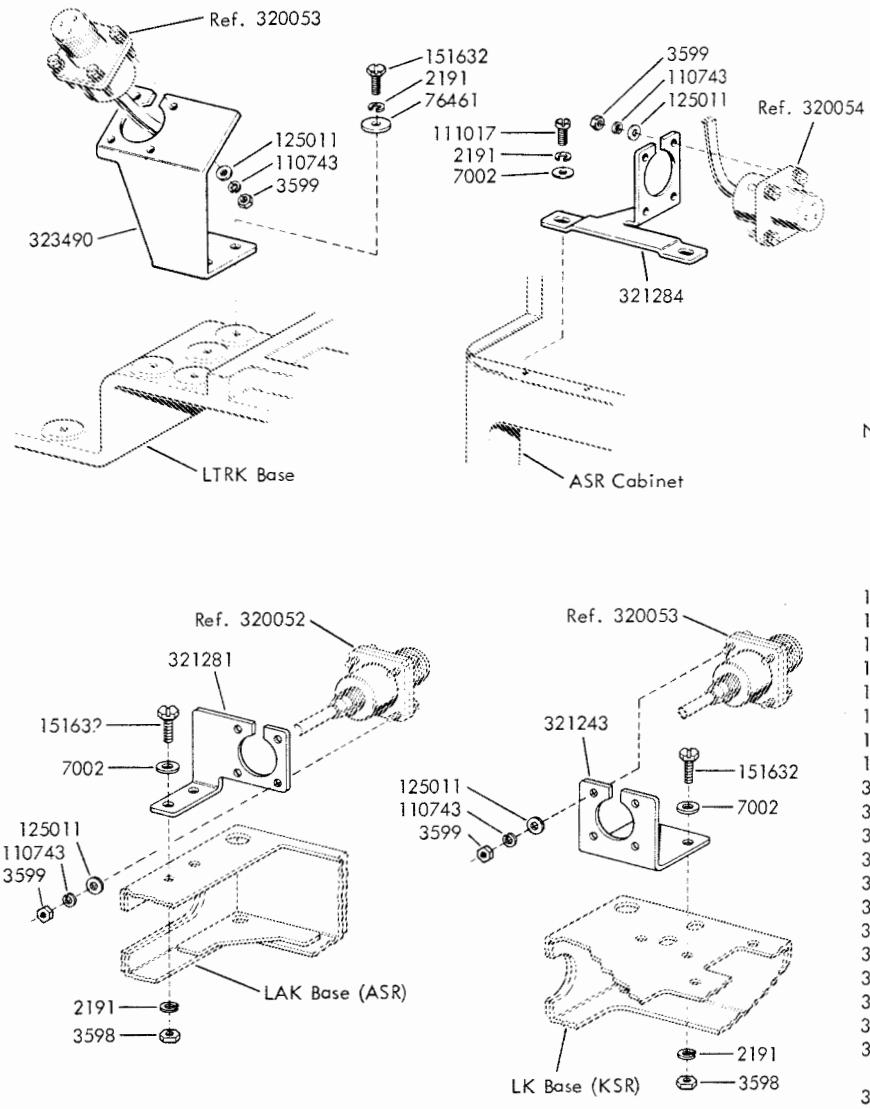
4.01 An electrical service assembly (ESA) equipped with a power supply card and a low level keyer card is required for operation of the signal generators included in mod kits covered by this specification. The signal generators should not be used to directly drive the signal line. For further information on the ESA, power supply card, and keyer card, see Specification 50505S (NAVSHIPS 0967-273-6010), 50508S (NAVSHIPS 0967-274-7010), and 50509S (NAVSHIPS 0967-273-9010) respectively.

Note: The 321268 filter card assembly is a part of each signal generator, but since it is used in conjunction with the low level keyer card, its operation is described in Specification 50509S.

4.02 Radio frequency interference (rfi) is suppressed by shielding, electrical isolation, and low energy operation.

4.03 Sequential electrical signals are generated by gold-plated contacts (Figure 5) and are fed through the signal generator cable to the low level keyer. Low energy power for the signal circuit originates with the keyer card and associated power supply card.

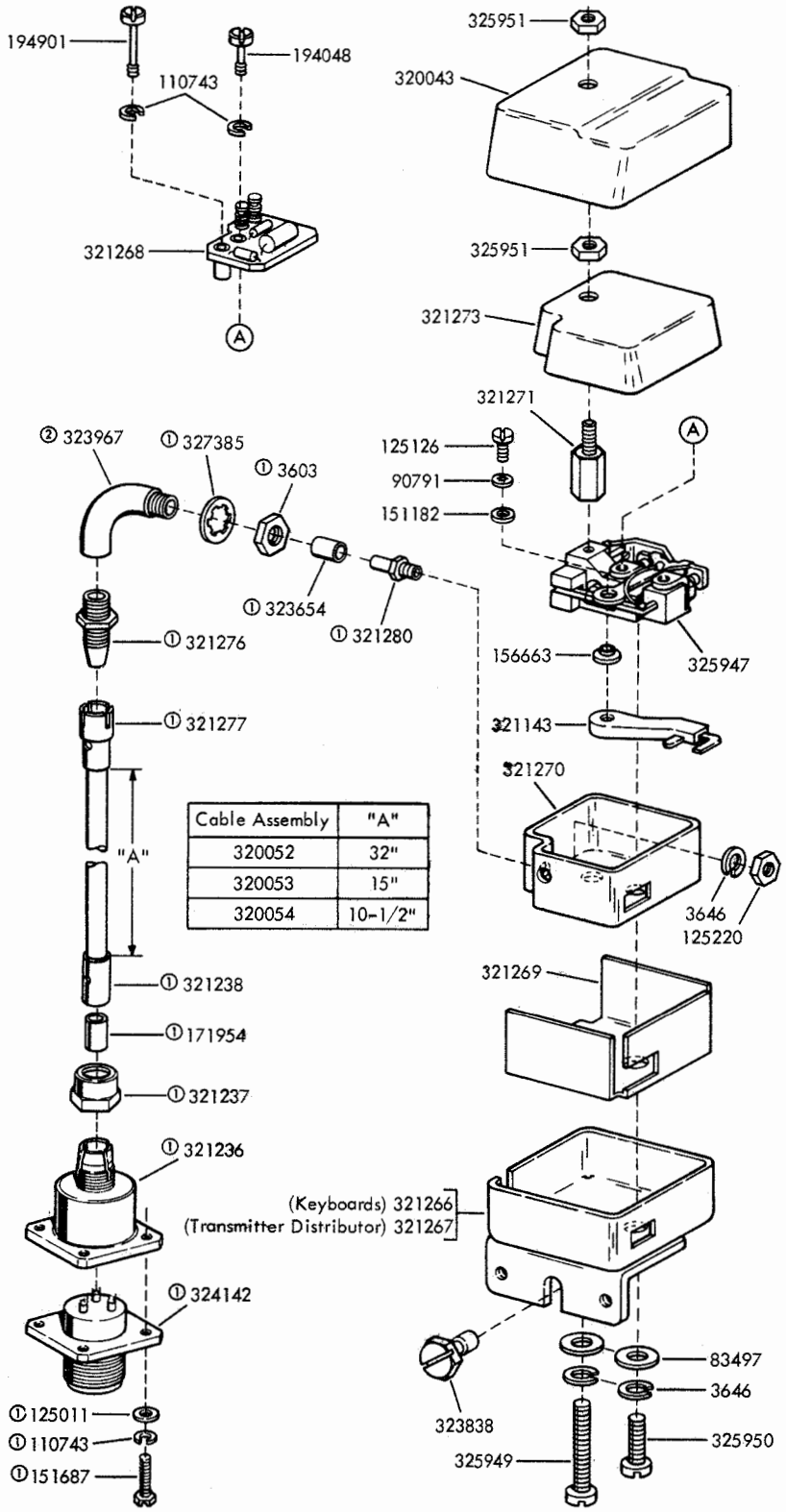
4.04 Remaining details of operating principles for a signal generator can be found in the appropriate section of Bulletin 270B, Volume 1 (NAVSHIPS 93788).



NUMERICAL INDEX

Part Number	Description
2191	Washer, Lock
3598	Nut, 6-40 Hex
3599	Nut, 4-40 Hex
7002	Washer, Flat
76461	Washer, Flat
110743	Washer, Lock
111017	Screw, 6-40 x 5/16 Fil
125011	Washer, Flat
151411	Block, Terminal
151412	Insulator
151632	Screw, 6-40 x 3/8 Hex
156758	Bracket
164872	Stud
320036	Modification Kit (for ASR Mounted LXD)
320052	Cable Assembly
320053	Cable Assembly
320054	Cable Assembly
321219	Modification Kit (for ASR Keyboard LAK)
321220	Modification Kit (for Miniature LXD Set)
321242	Bracket, Connector Mounting
321243	Bracket, Connector Mounting
321272	Modification Kit (for KSR Keyboard LK)
321281	Bracket, Connector Mounting
321284	Bracket, Connector Mounting
323489	Modification Kit (for Reperforator Keyboard LTRK)
323490	Bracket, Connector Mounting

Figure 1 - 320036 (LXD), 321219 (LAK), 321220 (LXD), 321272 (LK) and 323489 (LTRK) Modification Kits to Provide Shielded Signal Generator Assembly



NUMERICAL INDEX

Part Number	Description
3603	Nut, 1/4-32 Hex
3646	Washer, Lock
83497	Washer, Flat
90791	Washer, Lock
110743	Washer, Lock
125011	Washer, Flat
125126	Screw, 2-56 x 9/32 Fil
125220	Nut, 8-40 Hex
151182	Washer, Insulating
151687	Screw, 4-40 x 7/16 Fil
156663	Bushing, Insulating
171954	Connector, Blue Inner Shielding
194048	Screw, 4-40 Spl
194901	Screw, 4-40 Spl
320043	Cover, Outer
320052	Cable Assembly (for LAK)
320053	Cable Assembly (for LK, LTRK)
320054	Cable Assembly (for LXD)
321143	Link
321236	Coupling, Connector
321237	Nut, 3/8-32 Spl
321238	Sleeve
321266	Box w/Bracket
321267	Box w/Bracket
321268	Network, Filter
321269	Insulator
321270	Box, Inner
321271	Post, Nylon
321273	Cover, Inner
321276	Bushing
321277	Clamp
321280	Bushing
323644	Box Assembly, Contact
323645	Box Assembly, Contact
323646	Box Assembly, Contact
323654	Connector, Purple Outer Shielding
323838	Eccentric
323967	Fitting, Cable
324142	Connector, 3 Pt Plug
325947	Contact Assembly
325949	Screw, 8-32 x 1 Nylon Fil
325950	Screw, 8-32 x 1/2 Nylon Fil
325951	Nut, 6-32 Nylon Hex
327385	Washer, Lock

① Part of 320052 (for LAK), 320053 (for LK, LTRK), and 320054 (for LXD), Cable Assemblies

② Peculiar to 320054 (for LXD) Cable Assembly

Figure 2 - 323644 (LAK), 323645 (LK and LTRK) and 323646 (LXD) Contact Box Assemblies

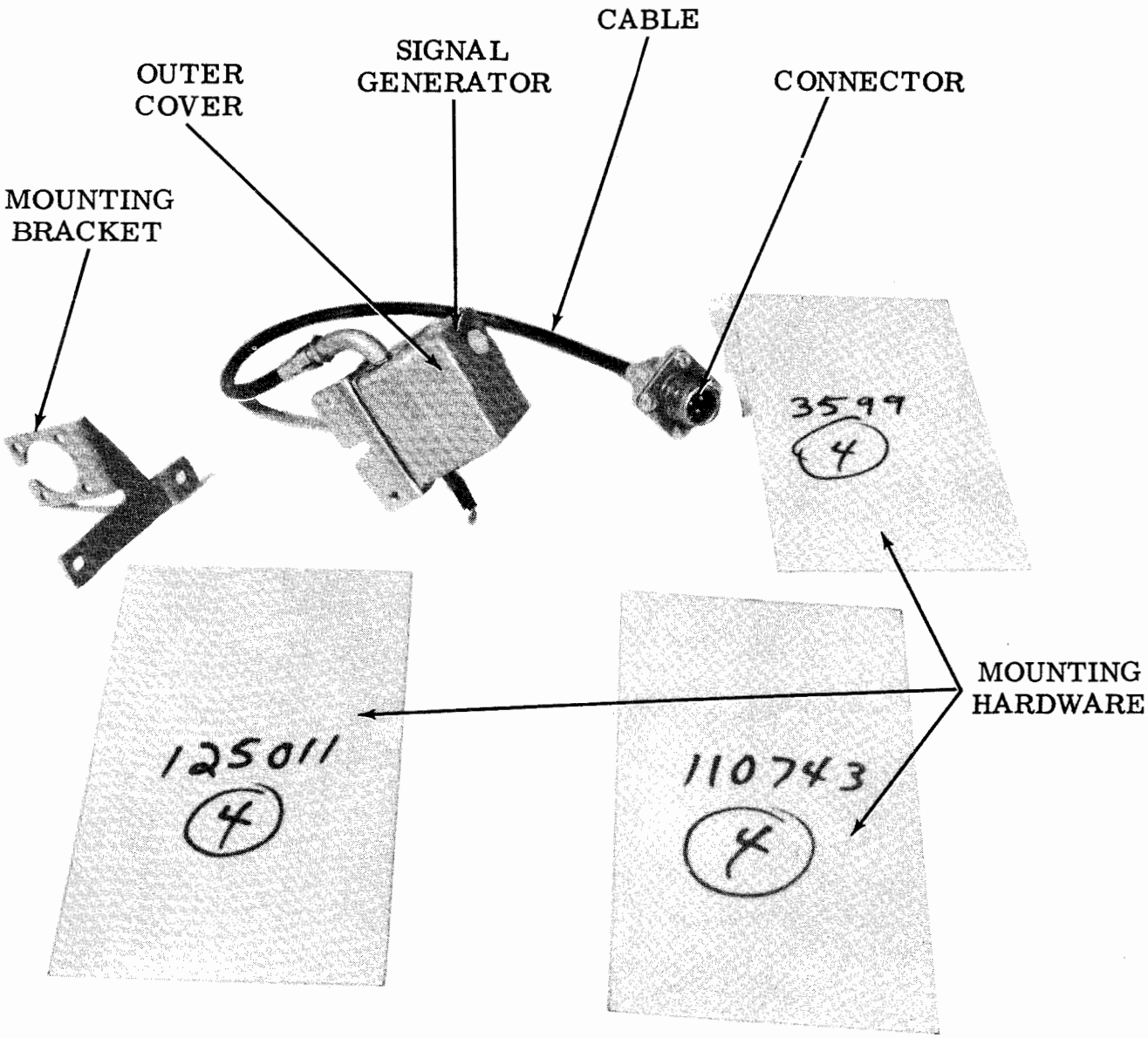


Figure 3 - Typical Signal Generator with Mounting Bracket and Hardware

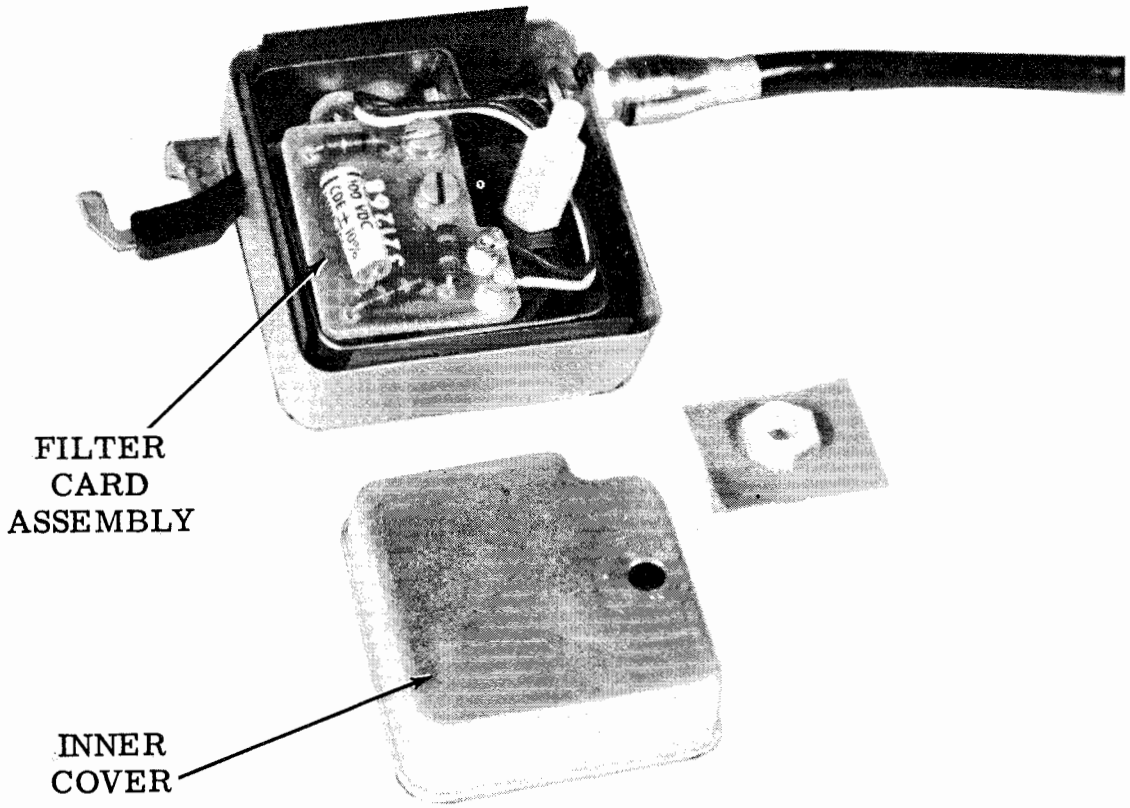


Figure 4 - Typical Signal Generator with Inner Cover Removed

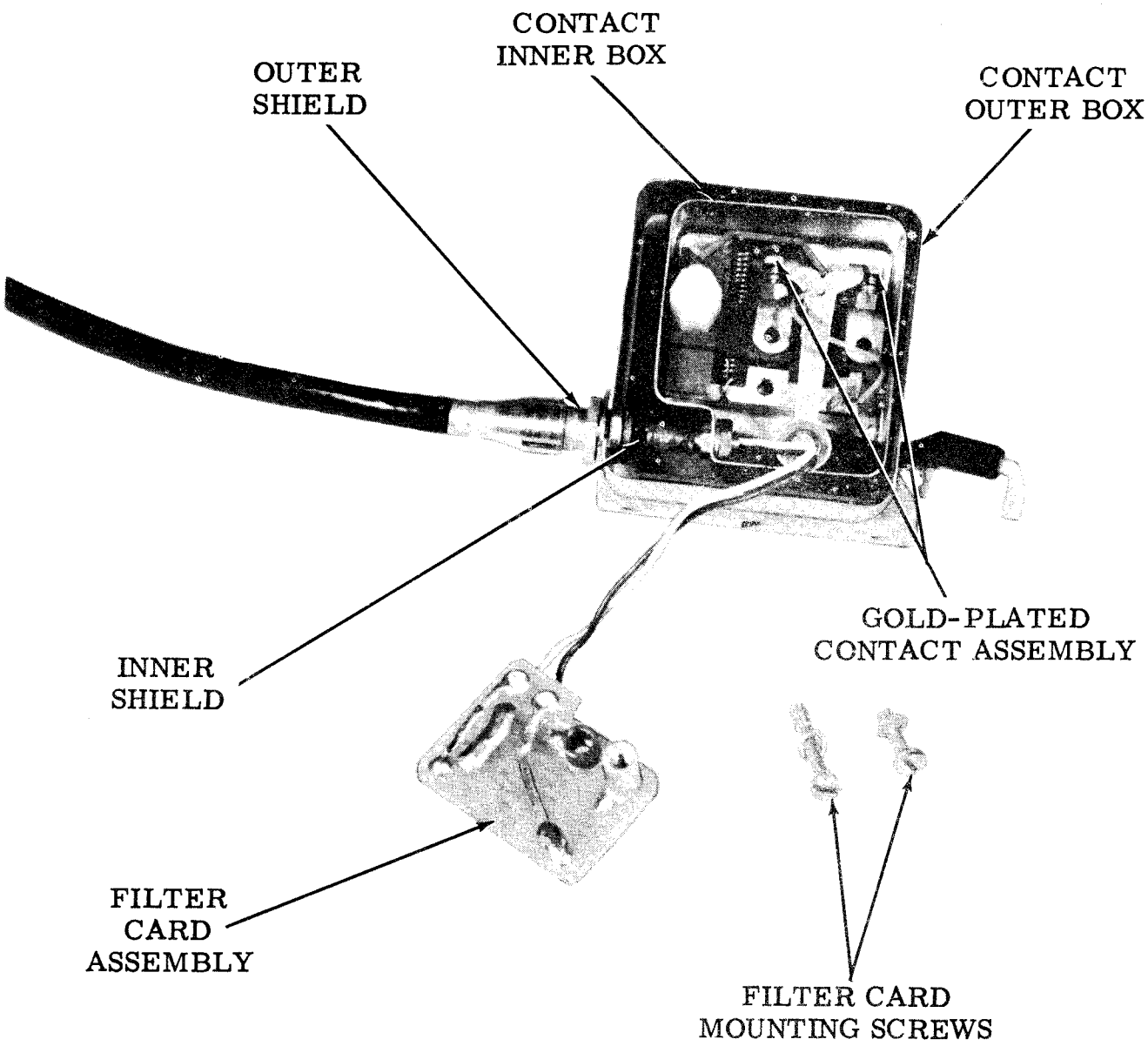


Figure 5 - Typical Signal Generator with Filter Card Assembly Removed

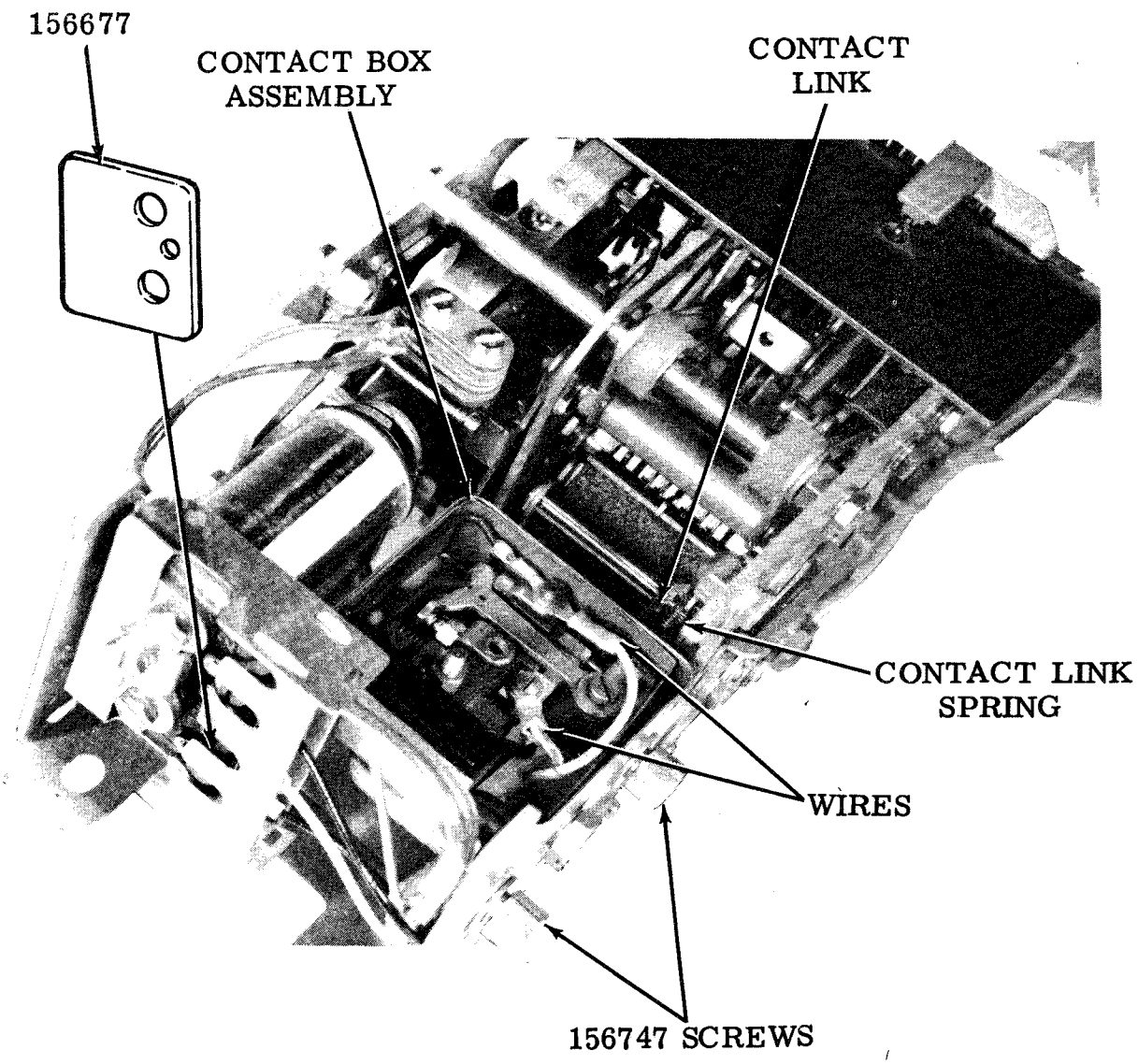


Figure 6 - Transmitter Distributor Showing Signal Generator

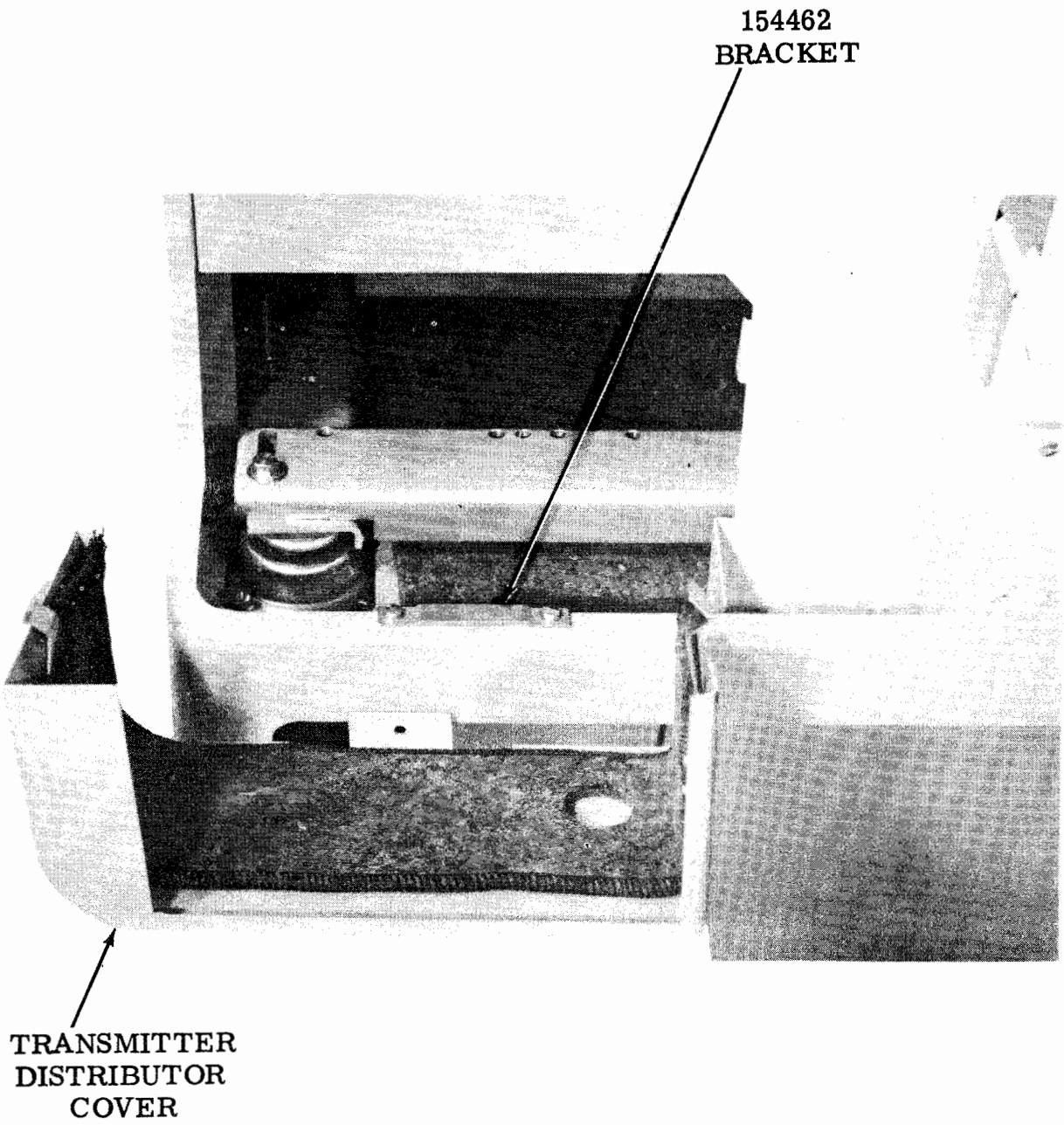


Figure 7 - Cabinet (ASR) Showing Transmitter Distributor Cover Removed

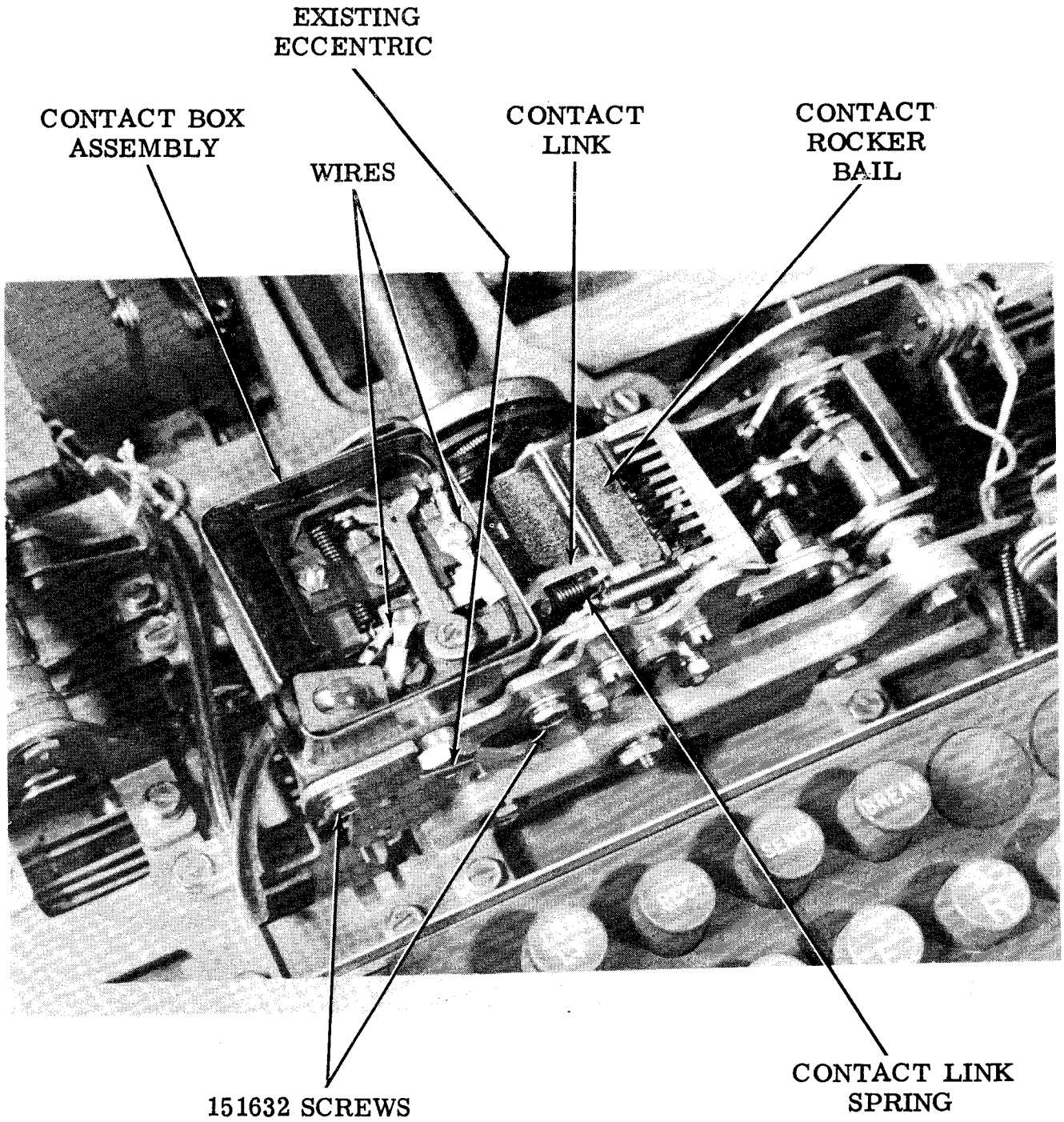


Figure 8 - Keyboard (LAK) Showing Signal Generator

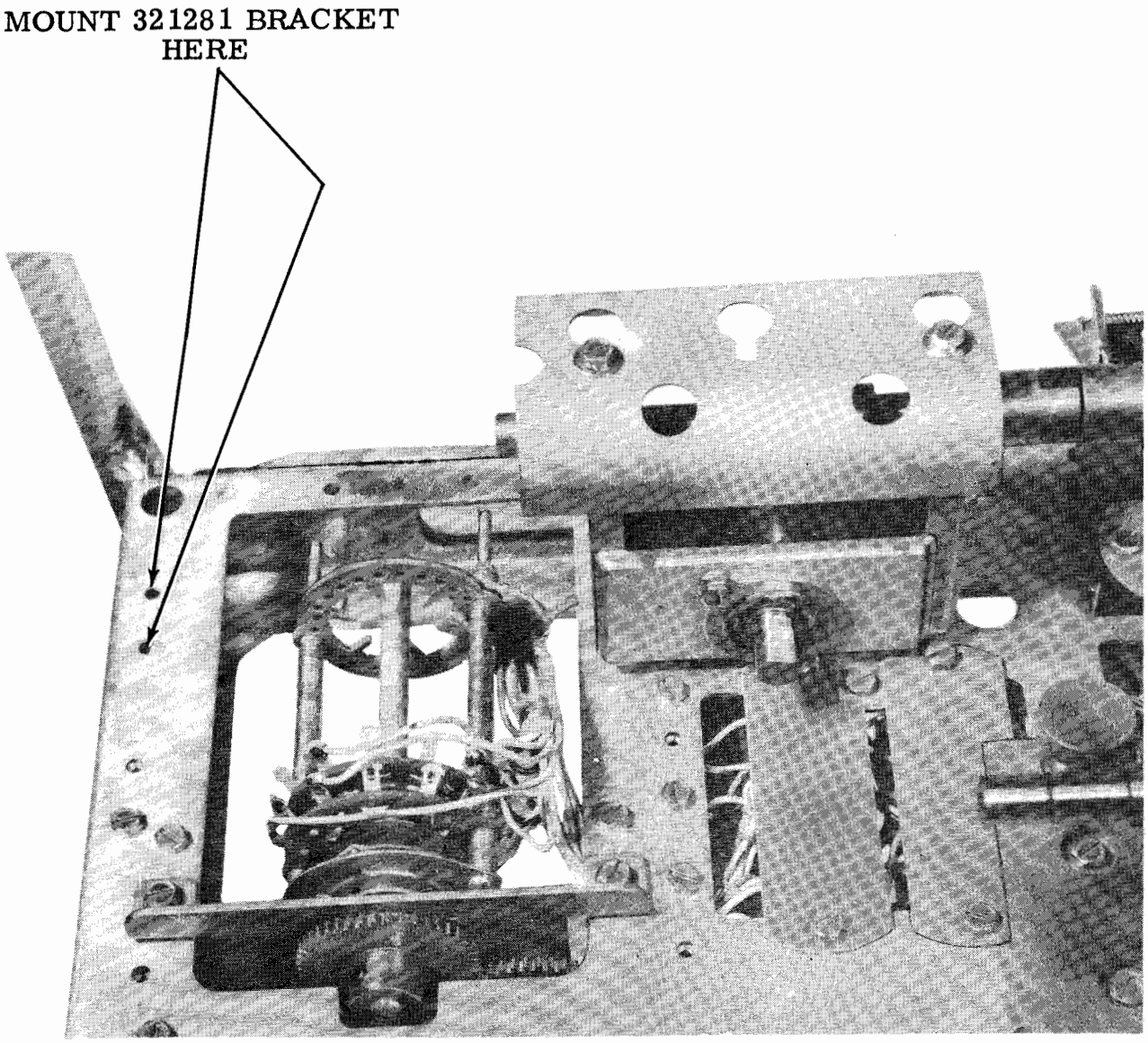


Figure 9 - Keyboard (LAK) Showing Left Rear Corner

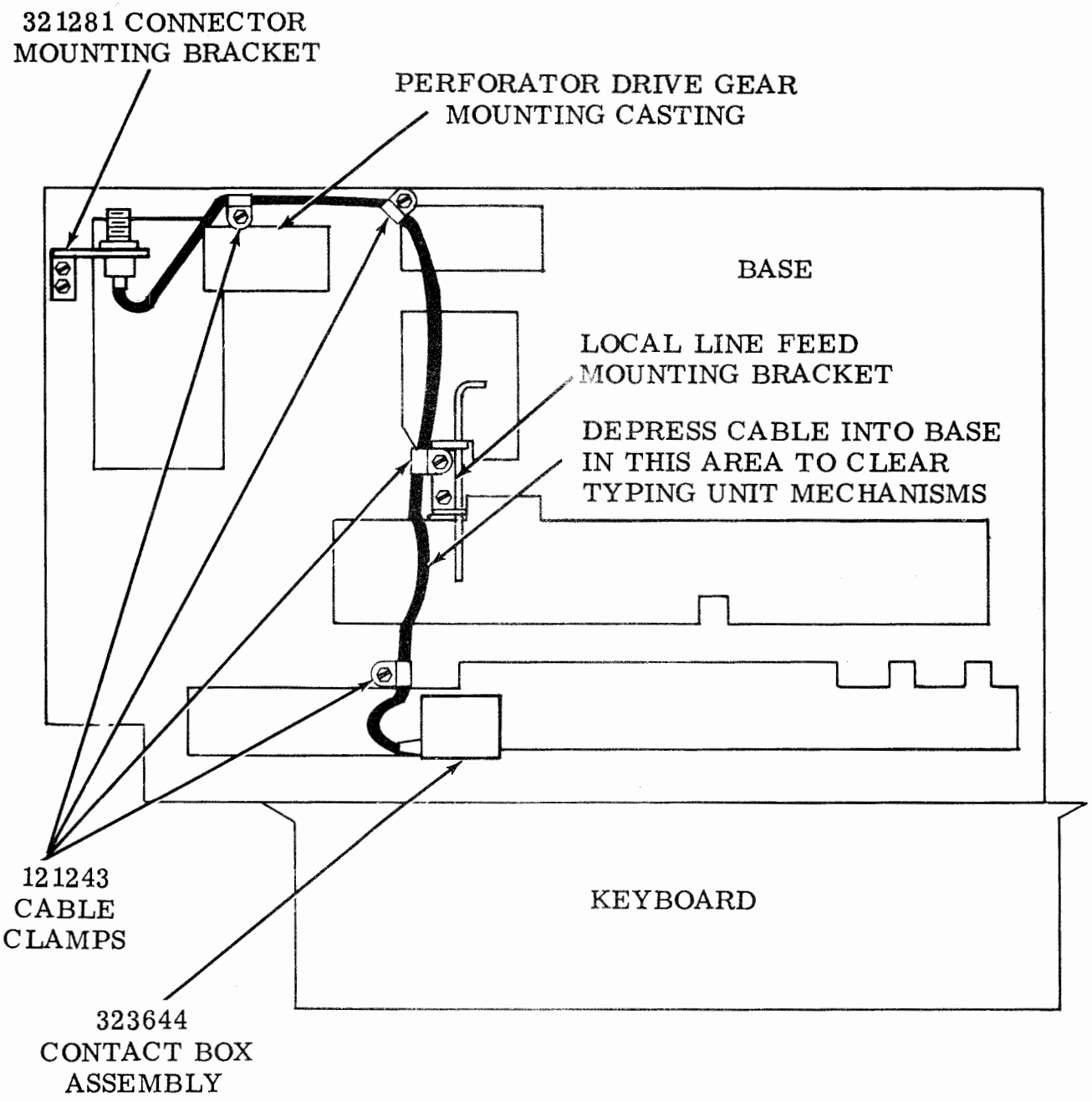


Figure 10 - Cable Routing for LAK

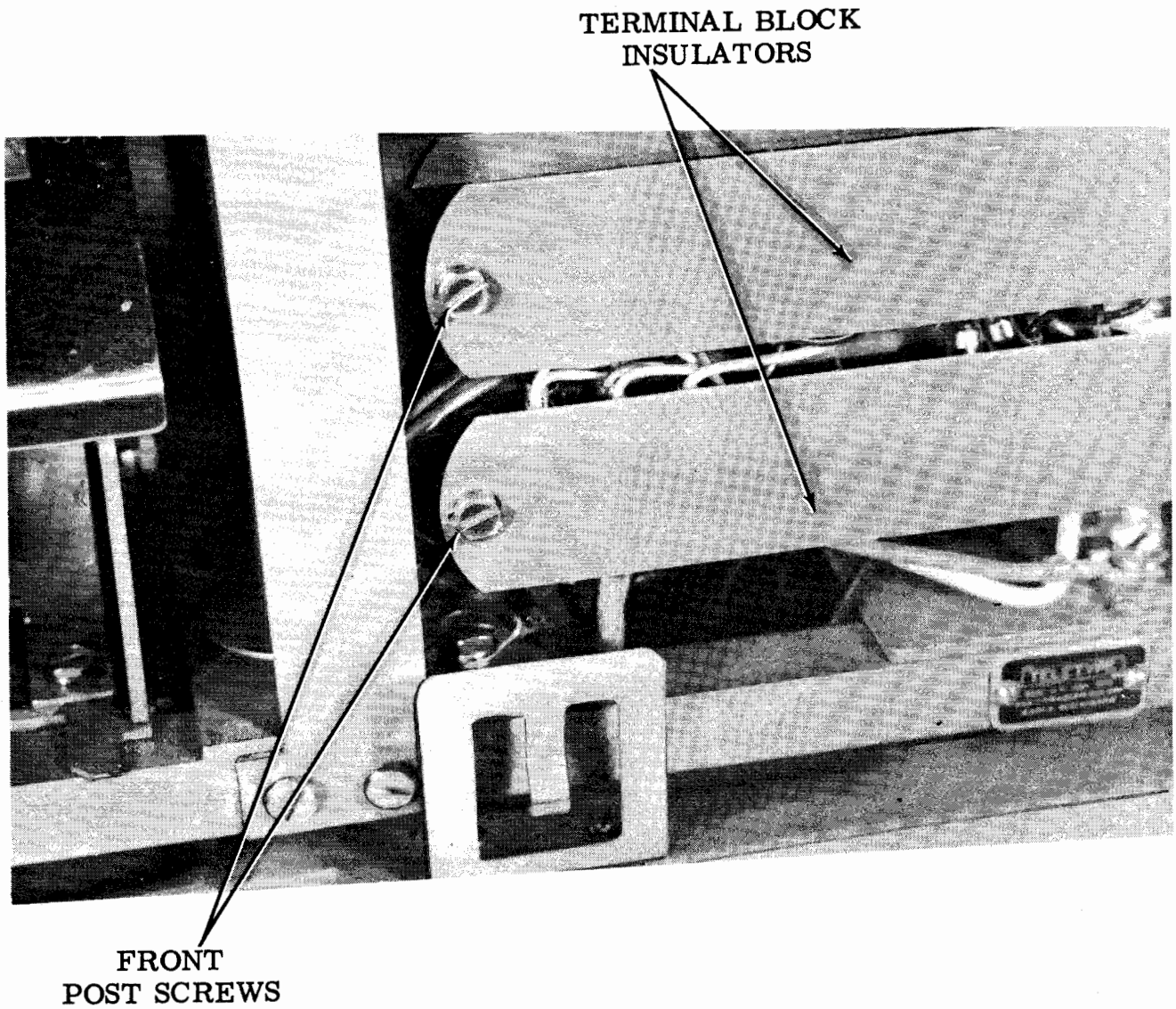


Figure 11 - Self-Contained (LXD) Showing Terminal Block Insulators

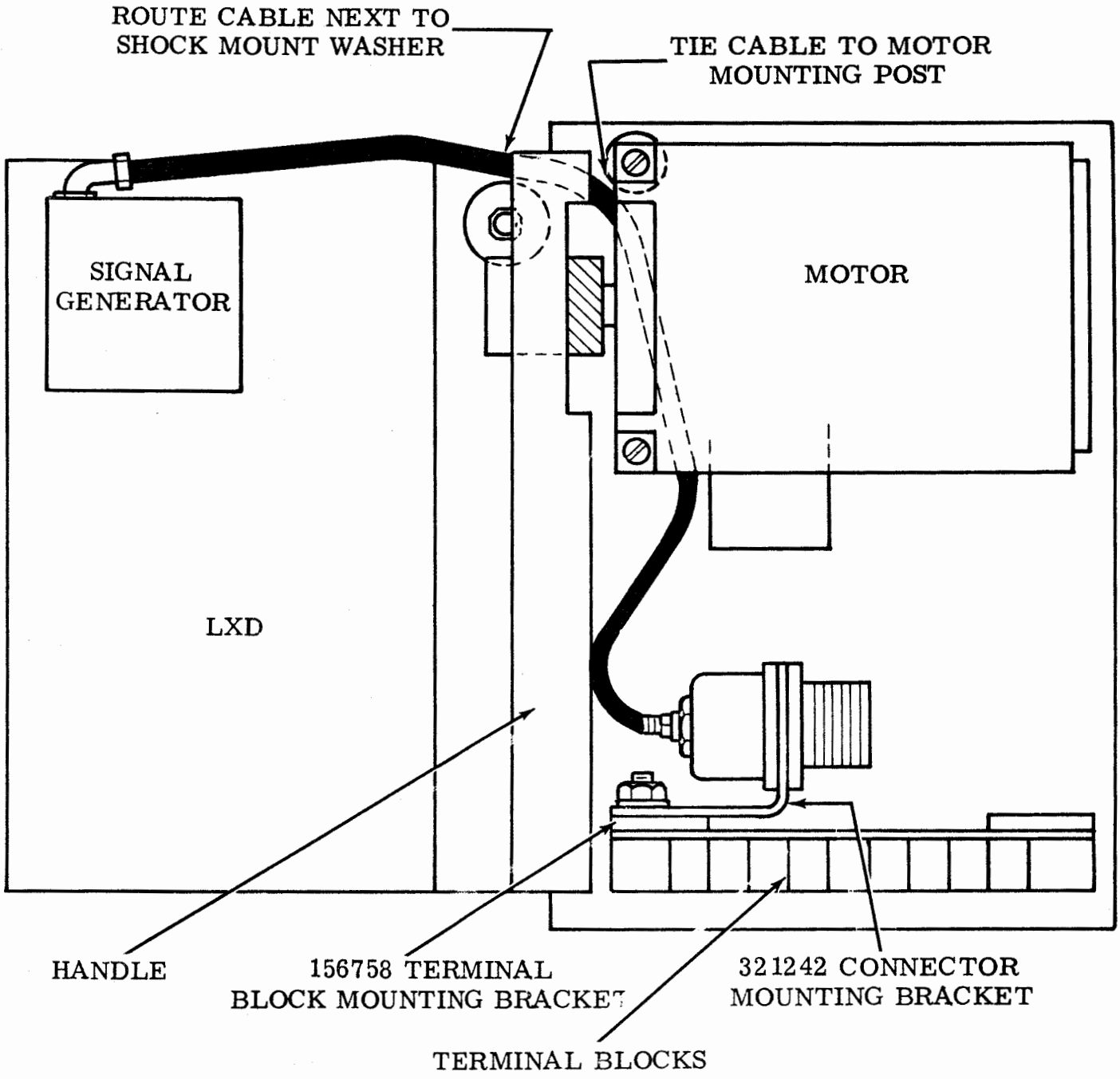


Figure 12 - Cable Routing for Miniature Self-Contained LXD

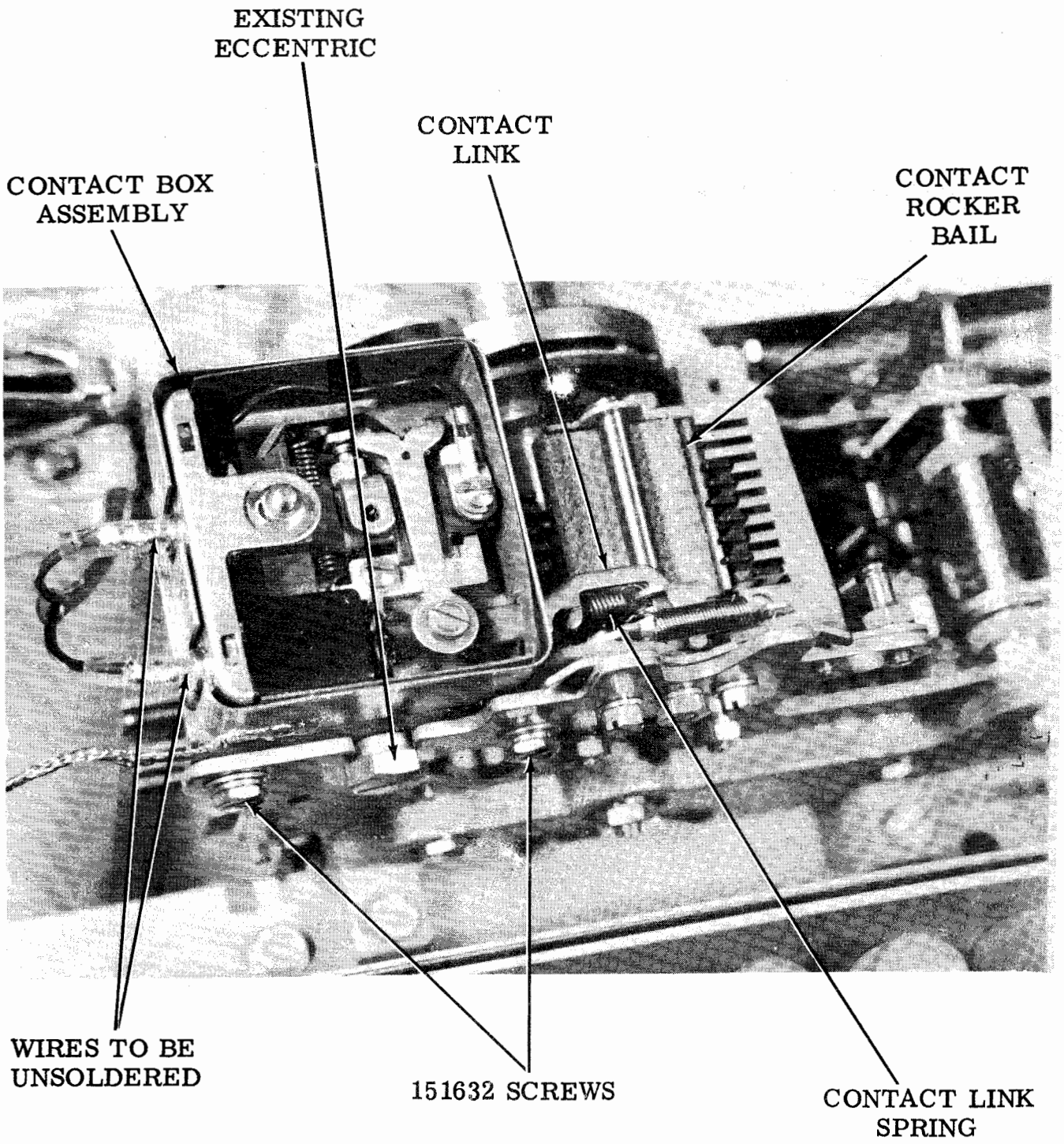


Figure 13 - Keyboard (LK) Showing Signal Generator

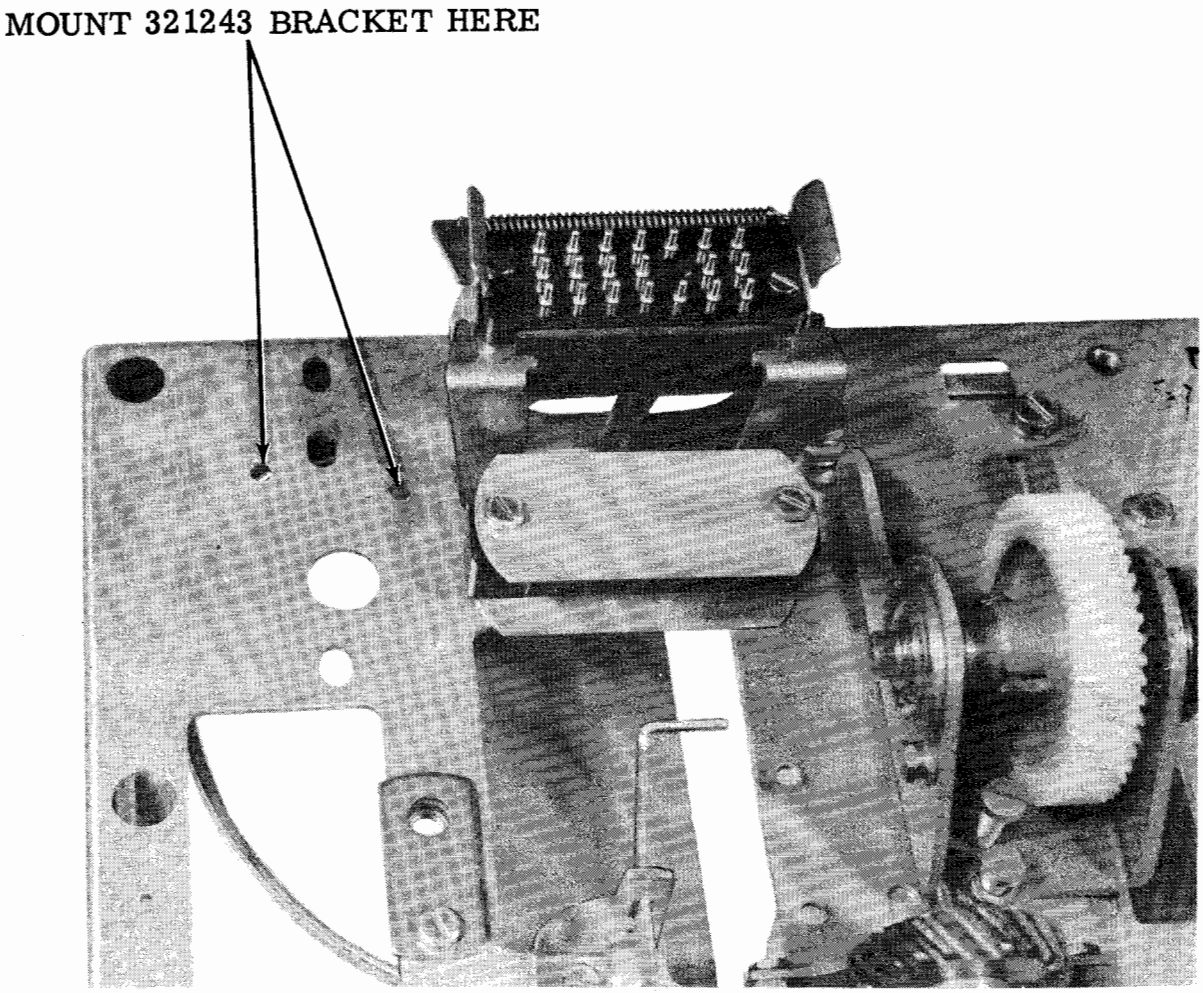


Figure 14 - Keyboard (LK) Showing Left Rear Corner

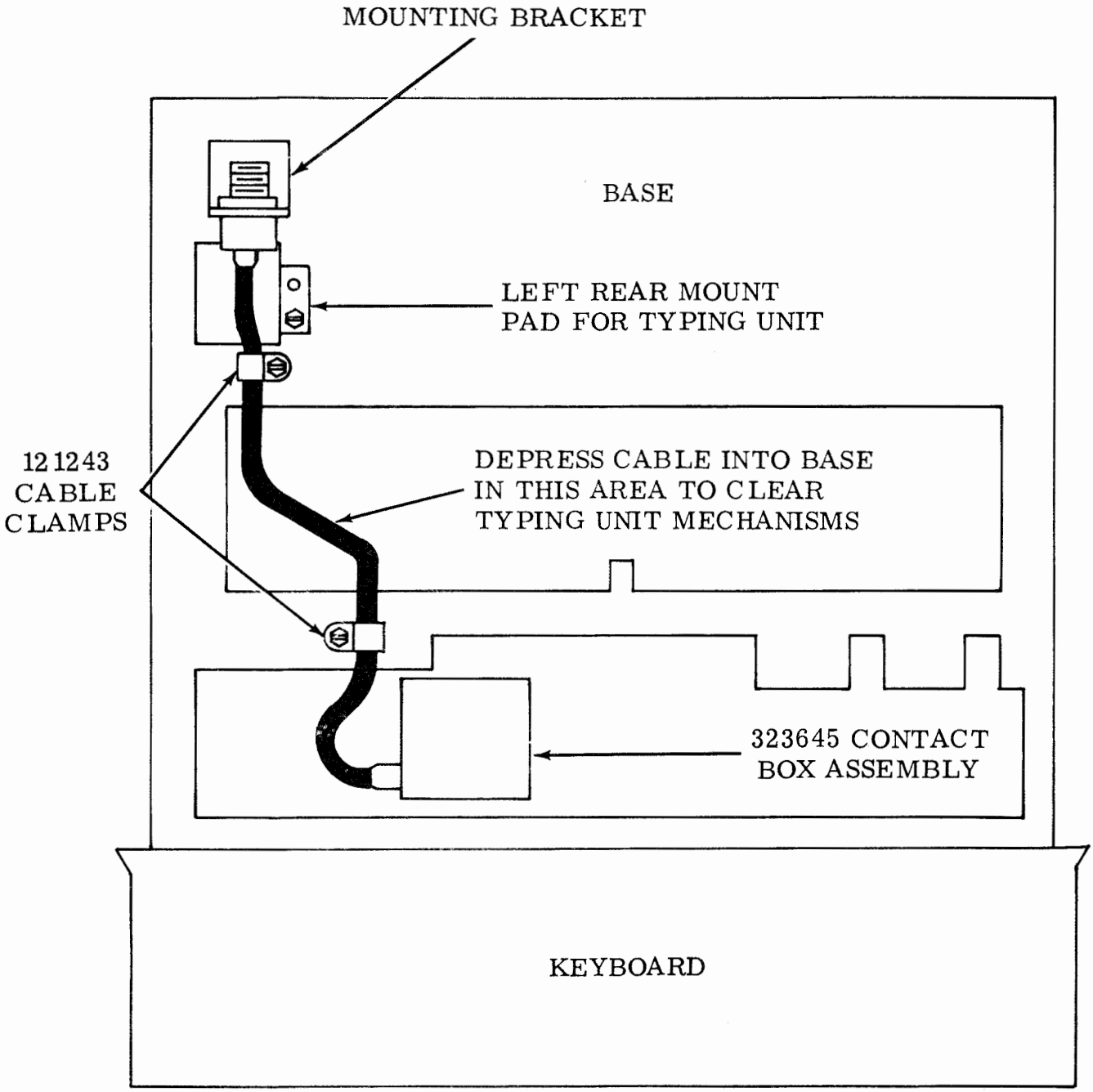


Figure 15 - Cable Routing for LK

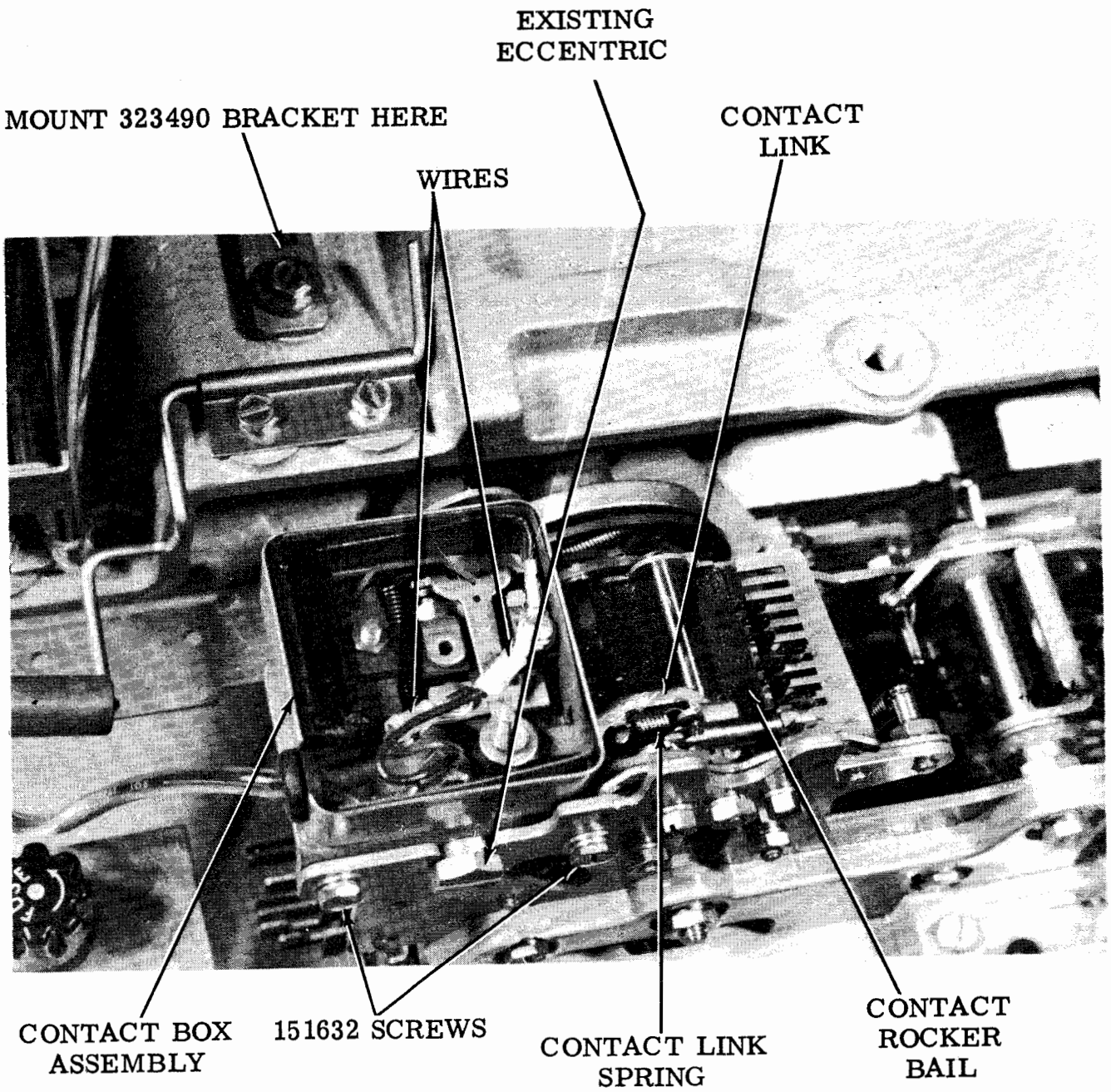


Figure 16 - Keyboard (LTRK) Showing Signal Generator

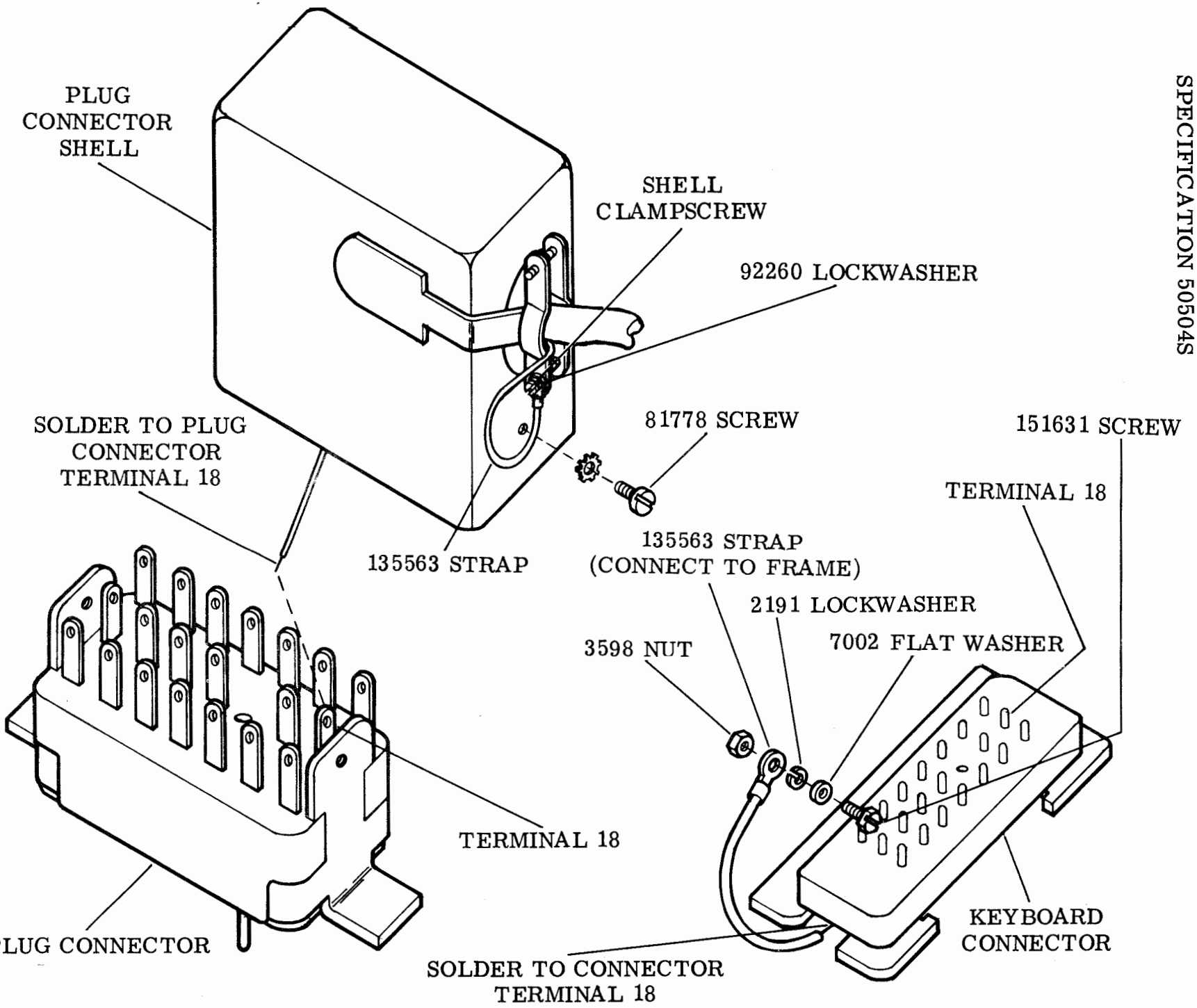


Figure 17 - 135563 Strap Placement for Grounding the Keyboard Connector

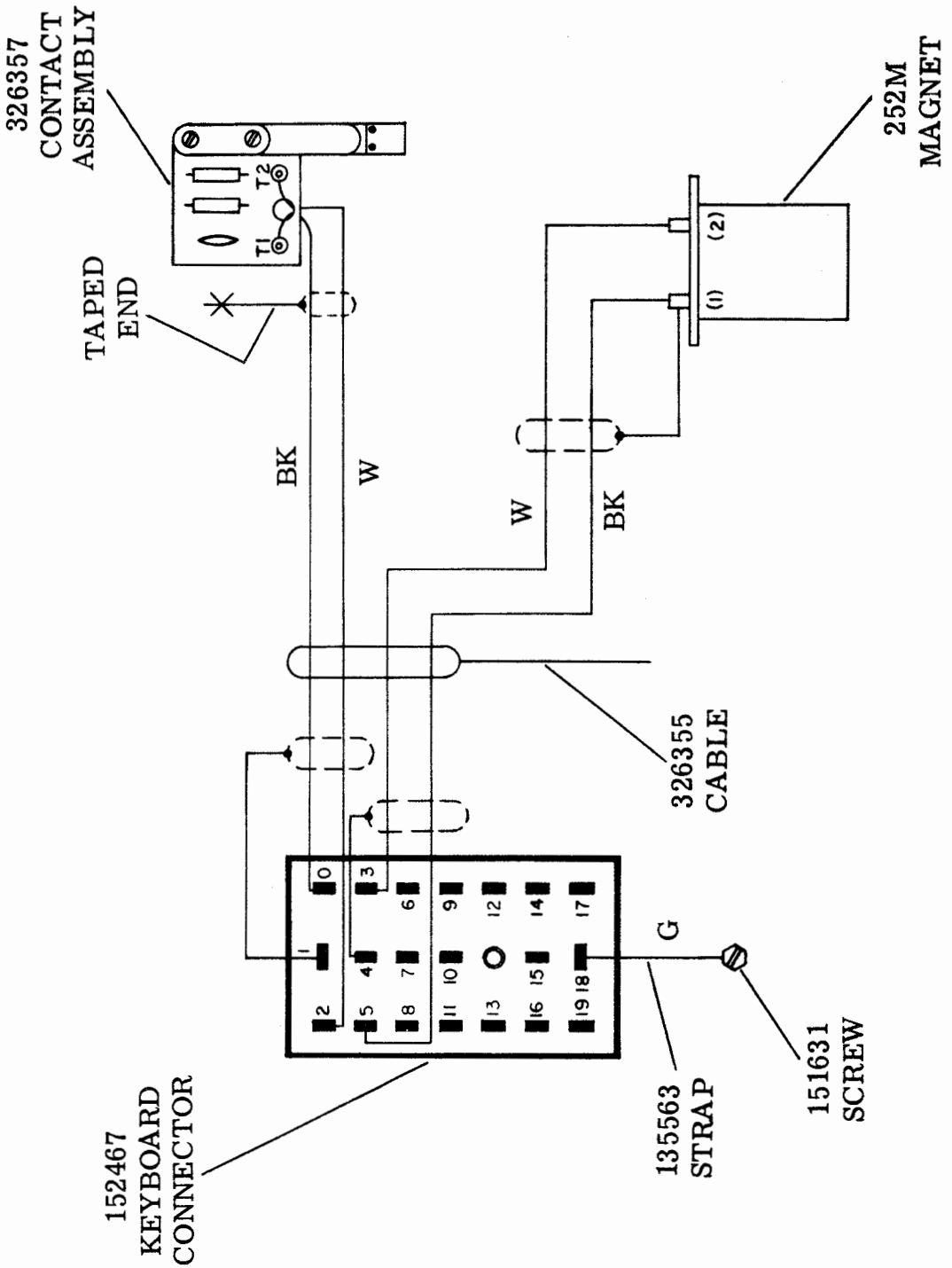


Figure 18 - Magnet and Contact Assembly Wiring

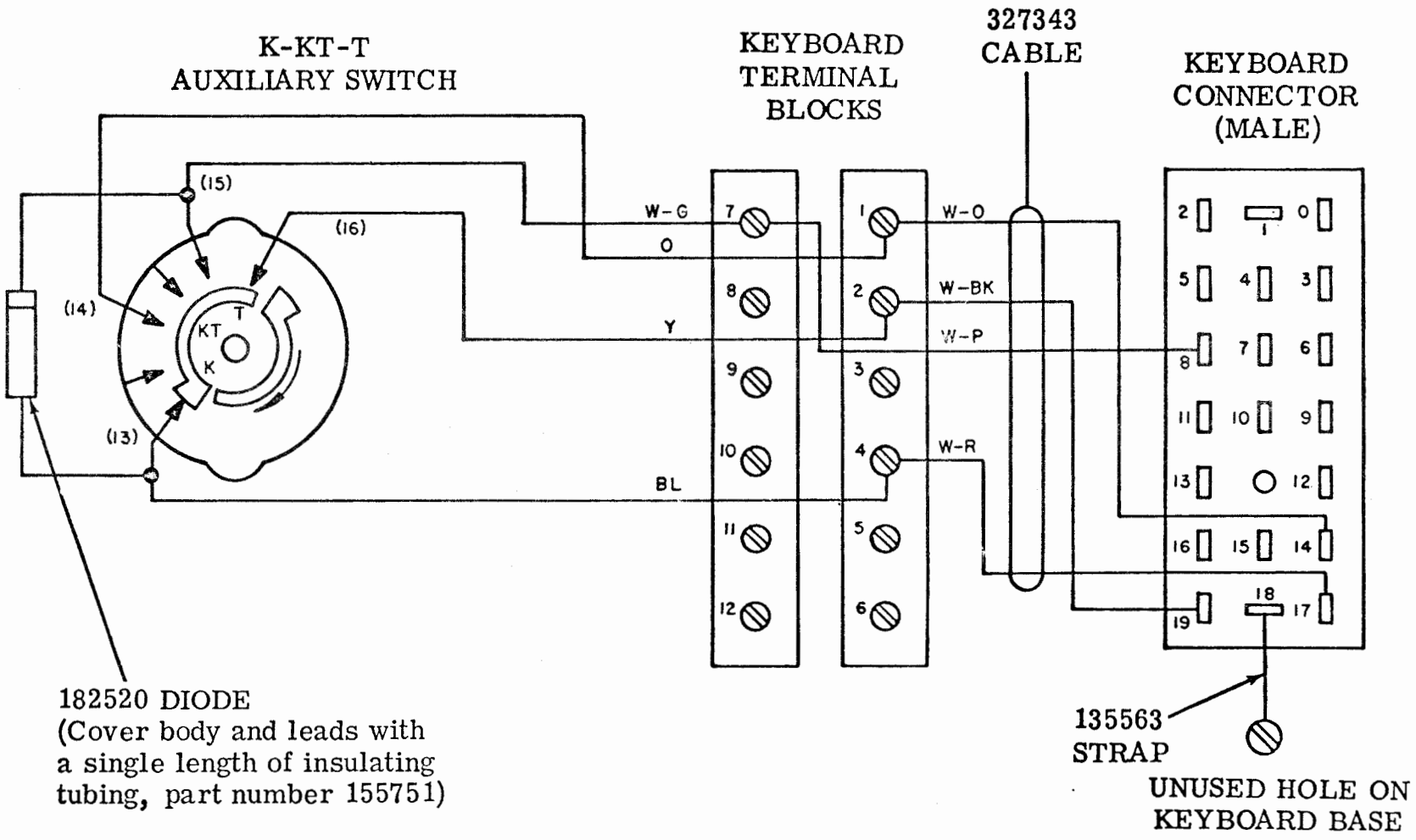


Figure 19 - K-KT-T Auxiliary Switch Wiring for LAK21

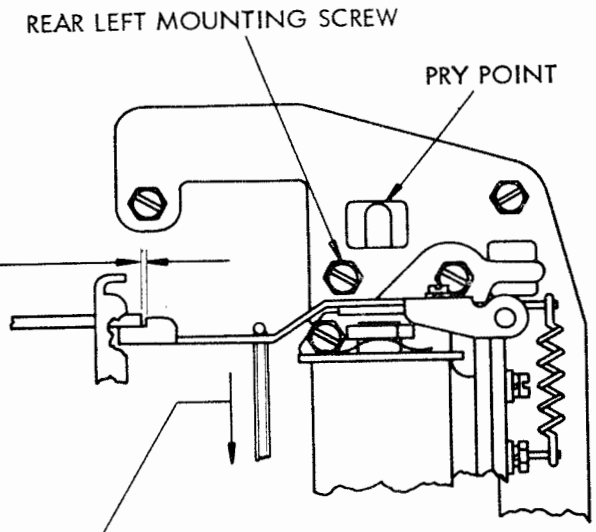
MOUNTING BRACKET (B)

TO CHECK
WITH MAGNET NOT ATTRACTED AND CLUTCH TRIP BAR IN FURTHEST LEFT POSITION.

REQUIREMENT
MIN 0.005 INCH --- MAX 0.015 INCH BETWEEN CLUTCH TRIP BAR AND ARMATURE LEVER.

TO ADJUST
POSITION MOUNTING BRACKET WITH THREE MOUNTING SCREWS LOOSE BY MEANS OF PRY POINT.

NOTE
TIGHTEN REAR LEFT MOUNTING SCREW AND MAKE MOUNTING BRACKET ADJUSTMENT (C).



MAGNET ARMATURE (D)

TO CHECK
CLUTCH TRIP BAR IN EXTREME LEFT POSITION. HOOK 32 OZ SCALE TO ARMATURE LEVER AS SHOWN. MEASURE AT RIGHT ANGLE TO ARMATURE LEVER AS INDICATED.

REQUIREMENT
MIN 3 OZ --- MAX 5 OZ
TO PULL ARMATURE LEVER FROM CLUTCH TRIP BAR.

ARMATURE HINGE (A)

REQUIREMENT
WITH ARMATURE IN ATTRACTED POSITION AND PLAY IN ARMATURE PIVOT TAKEN UP TOWARD MAGNET, THERE SHOULD BE MIN SOME---MAX 0.004 INCH CLEARANCE BETWEEN THE ARMATURE AND THE MAGNET BRACKET EXTENSION.

TO ADJUST
POSITION ARMATURE WITH HINGE BRACKET MOUNTING SCREW AND SPRING POST LOOSE.

MOUNTING BRACKET (C)

TO CHECK
WITH ARMATURE LEVER HELD AGAINST MAGNET POLE FACE AND CLUTCH TRIP BAR IN FURTHEST RIGHT POSITION.

REQUIREMENT
MIN 0.005 INCH --- MAX 0.015 INCH BETWEEN CLUTCH TRIP BAR AND ARMATURE LEVER.

TO ADJUST
WITH RIGHT REAR AND LEFT FRONT MOUNTING BRACKET SCREWS LOOSE POSITION MOUNTING BRACKET BY MEANS OF PRY POINT.

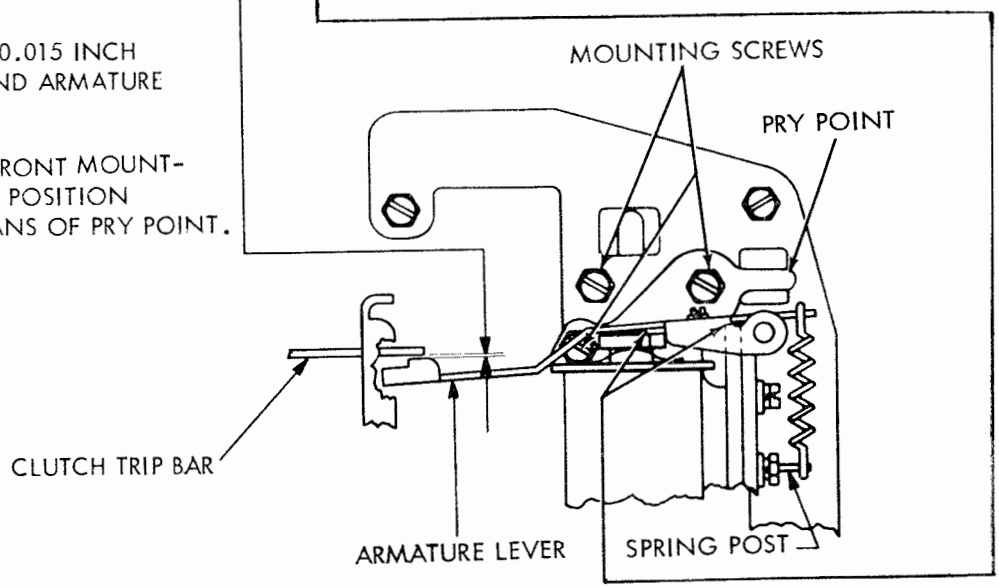
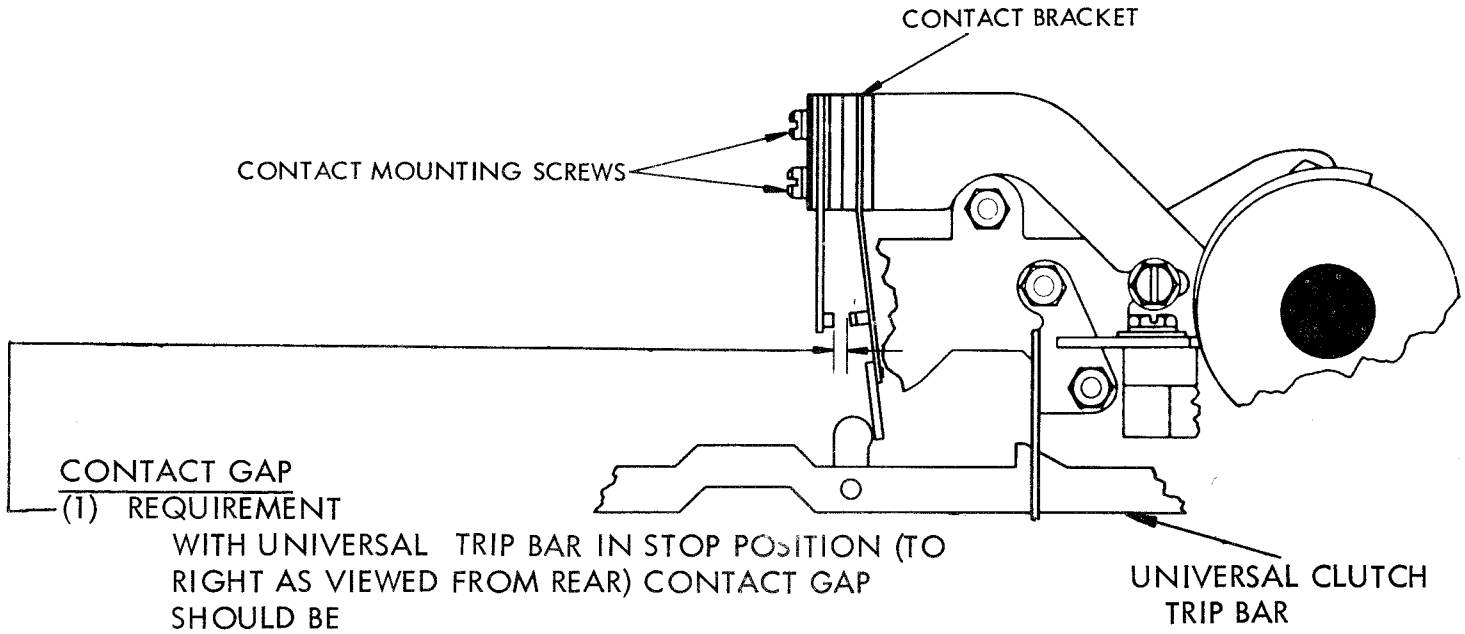


Figure 20 - Synchronous Pulse Adjustments



CONTACT GAP

(1) REQUIREMENT

WITH UNIVERSAL TRIP BAR IN STOP POSITION (TO RIGHT AS VIEWED FROM REAR) CONTACT GAP SHOULD BE

MIN 0.020 INCH

(2) REQUIREMENT

WITH UNIVERSAL TRIP BAR IN TRIPPED POSITION (TO LEFT AS VIEWED FROM REAR) CLEARANCE BETWEEN CONTACT SWINGER AND TRIP BAR EXTENSION SHOULD BE

MIN SOME --- MAX 0.006 INCH

TO ADJUST

POSITION CONTACT MOUNTING BRACKET WITH ITS MOUNTING SCREWS LOOSENED.

UNIVERSAL TRIP BAR CONTACT REQUIREMENT

WITH UNIVERSAL CLUTCH TRIP BAR IN OPERATED POSITION (TO THE LEFT AS VIEWED FROM REAR)

MIN 3-1/2 OZ --- MAX 4-1/2 OZ

TO OPEN CONTACTS.

TO ADJUST

BEND CONTACT SWINGER

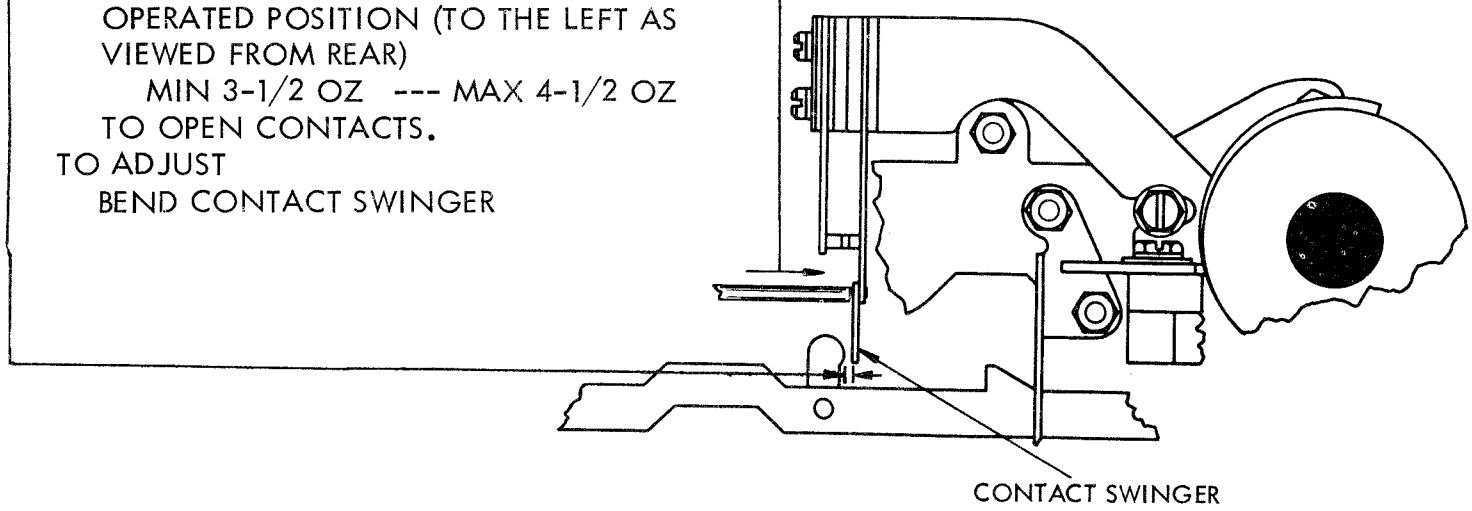
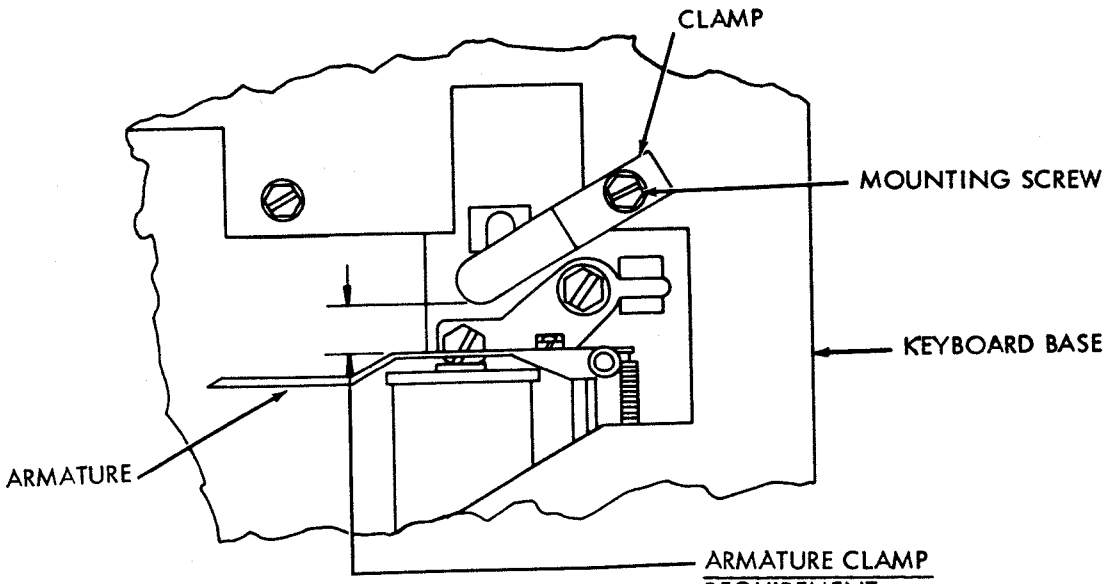


Figure 21 - Synchronous Pulse Adjustments (continued)



REQUIREMENT

WITH ARMATURE OPERATED, CLEARANCE BETWEEN ARMATURE CLAMP AND ARMATURE APPROX 3/8 INCH

TO ADJUST

POSITION CLAMP WITH ITS MOUNTING SCREW LOOSENED.

NOTE: TO MAKE KEYBOARD OPERABLE WITHOUT ELECTRICAL PULSE TO OPERATE STEPPING MAGNET LOOSEN CLAMP MOUNTING SCREW AND ROTATE CLAMP COUNTERCLOCKWISE TO HOLD THE ARMATURE IN THE OPERATING POSITION. MAINTAIN 0.005 INCH TO 0.015 INCH CLEARANCE BETWEEN CLUTCH TRIP BAR AND ARMATURE LEVER.

Figure 22 - Synchronous Pulse Adjustments (continued)

NOTE: THIS ADJUSTMENT APPLIES ONLY TO LAK21 (MX-3312/UG).

PERFORATOR CLUTCH RELEASE TRIP

REQUIREMENT

PERFORATOR CLUTCH SHOULD TRIP CONSISTENTLY IN K-T POSITIONS WHEN BLANK AND REPEAT KEYLEVERS ARE DEPRESSED SIMULTANEOUSLY. WHEN THE CONTROL KNOB IS TURNED FROM K POSITION TO K-T POSITION, THE PERFORATOR CLUTCH SHOULD TRIP WHEN THE FIRST KEYLEVER IS DEPRESSED. CLEARANCE BETWEEN MAIN TRIP LEVER AND CLUTCH RELEASE

MIN 0.015 INCH
MAX 0.025 INCH

TO ADJUST

PLACE CONTROL KNOB IN T POSITION. LOOSEN MAIN TRIP LEVER LATCH CLAMP SCREWS AND MOVE LATCH TO EXTREME LEFT. STRIKE BLANK KEYLEVER. MOVE THE STOP BRACKET TO THE RIGHT UNTIL IT IS OUT OF ENGAGEMENT WITH THE LATCH. MOVE THE CLUTCH TRIP BAR EXTENSION TO THE RIGHT UNTIL IT LATCHES. POSITION MAIN TRIP LEVER LATCH TO RIGHT TO OBTAIN REQUIRED CLEARANCE. TIGHTEN SCREWS.

NOTE: CHECK FOR CLEARANCE BETWEEN RESET BAIL AND SLIDES WHEN THE RESET LEVER IS TRIPPED. REFINE ADJUSTMENT IF NECESSARY TO OBTAIN OPERATIONAL CLEARANCE.

TO CHECK

WITH THE STOP BRACKET SCREWS FRICTION TIGHT, MOVE THE STOP BRACKET SLOWLY TO THE LEFT UNTIL THE LATCH JUST TRIPS. TIGHTEN CLAMP SCREWS. TURN ON MOTOR. DEPRESS BLANK AND REPEAT KEYLEVERS SIMULTANEOUSLY. IF OPERATION IS SATISFACTORY, TURN TO K-T POSITION AND REPEAT. TURN TO K POSITION AND BACK TO K-T POSITION. DEPRESS A KEYLEVER. PERFORATOR CLUTCH SHOULD TRIP. IF IT DOES NOT, MOVE STOP BRACKET SLIGHTLY TO THE RIGHT AND REPEAT THE ABOVE ADJUSTMENT.

NOTE: IF KEYBOARD DOES NOT HAVE BLANK KEYLEVER USE "T" KEYLEVER INSTEAD OF BLANK.

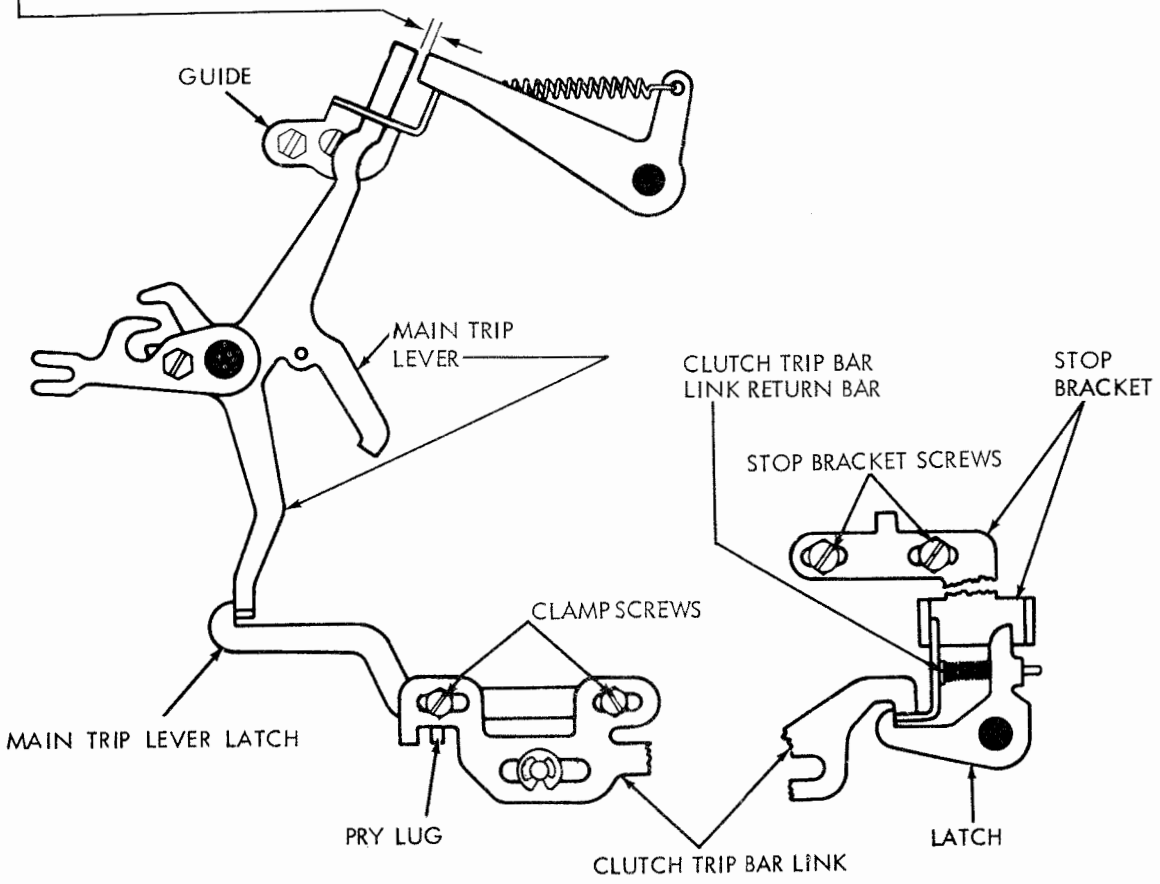
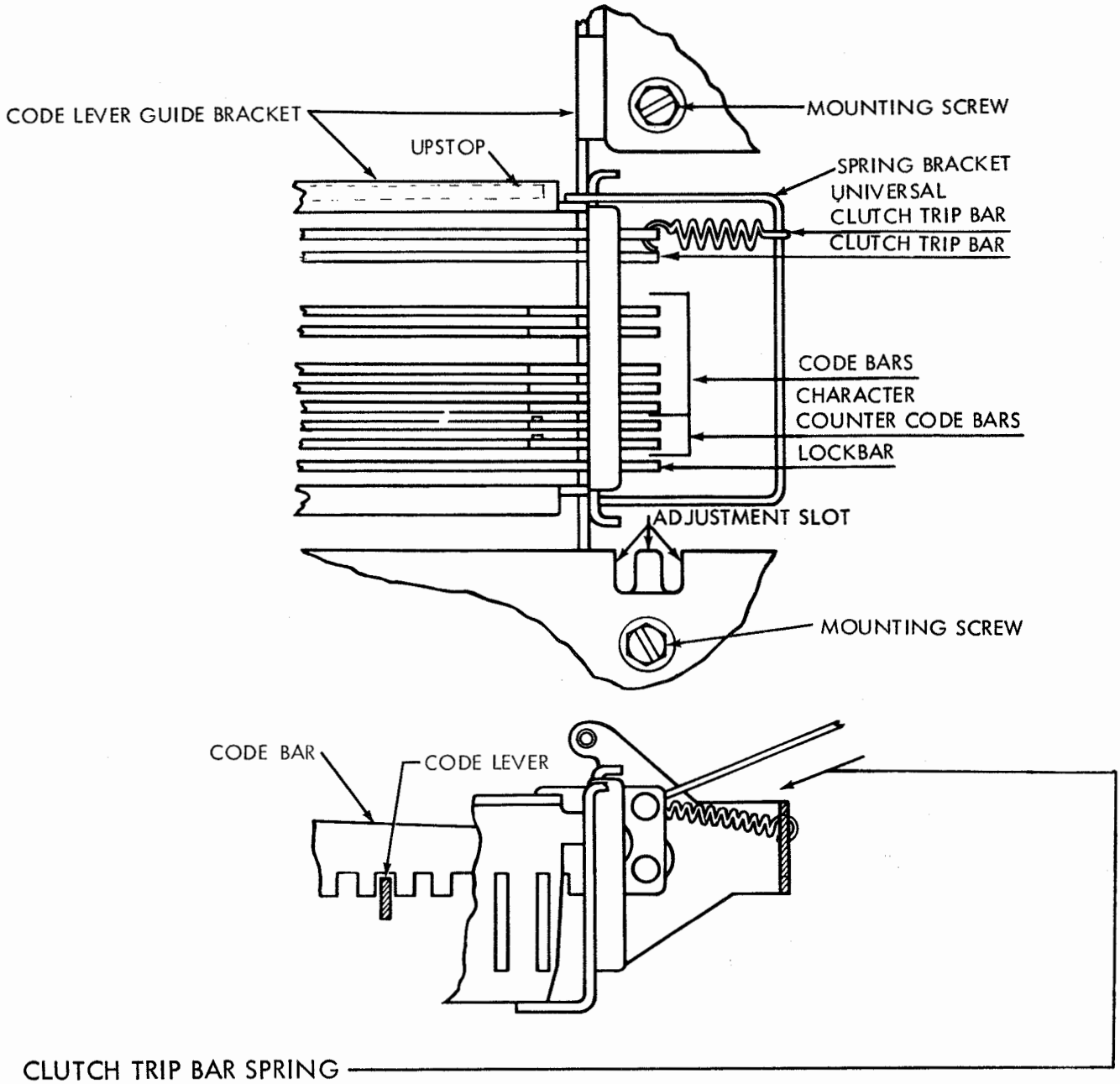


Figure 23 - Synchronous Pulse Adjustments (continued)



REQUIREMENT

WITH CLUTCH DISENGAGED (LATCHED), POWER OFF, AND ARMATURE OF MAGNET HELD AWAY FROM CLUTCH TRIP BAR

MIN 9 OZ --- MAX 12 OZ

TO START CLUTCH TRIP BAR MOVING.

Figure 24 - Synchronous Pulse Adjustments (continued)

NOTE: REFERENCE FIGURES 15 AND 18 FOR ILLUSTRATIONS ON FOLLOWING ADJUSTMENT.

UNIVERSAL CLUTCH TRIP BAR SPRING
LK25 (MX-3310/UG)

TO CHECK
HOLD SWINGER OF CONTACT ASSEMBLY AWAY FROM UNIVERSAL CLUTCH TRIP BAR. DISENGAGE (LATCH) CLUTCH AND PUSH ON RIGHT HAND END OF TRIP BAR WITH A SPRING SCALE.

REQUIREMENT
MIN 9 OZ --- MAX 12 OZ
TO START UNIVERSAL CLUTCH TRIP BAR MOVING.

LAK21 (MX-3312/UG)

TO CHECK
DISENGAGE (LATCH) CLUTCH. DEPRESS BLANK KEY TO ALLOW UNIVERSAL CLUTCH TRIP BAR TO FALL TO RIGHT. UNHOOK SPRING FROM SPRING BRACKET.

REQUIREMENT
MIN 8 OZ --- MAX 12 OZ
TO STRETCH SPRING TO INSTALLED LENGTH.

Figure 25 - Synchronous Pulse Adjustments (continued)