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ENGINEERING SPECIFICATION FOR  
 MODEL 28 KEYBOARD SEND RECEIVE AND AUTOMATIC SEND-RECEIVE  
 SETS FOR BOEING TELETYPEWRITER SYSTEM

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References:

Specification	6155S
"	6268S
"	6275S
"	6322S
"	6363S
"	6525S
"	6536S
"	6566S
"	6596S
"	6626S
"	6637S
"	6693S
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SECTION II

DETAILED DESCRIPTION AND THEORY OF OPERATION

1. DETAILED DESCRIPTION

- a. The Model 28 Automatic Send-Receive Set for the Boeing Teletypewriter System consists of a Cabinet (LAAC233), a Keyboard Perforator Transmitter Base (LAK27/LPE4BRX), a Page Printer (LP93/AHE) with YP Type Box, an Electrical Service Unit (LESU66) with RY30 Line Relay, a Transmitter Base with Answer-Back mechanism (LCXB16), Transmitter (LXD5) and Motor (LMU3).
- b. The Model 28 Keyboard Send-Receive Set for the Boeing Teletypewriter System consists of a Cabinet (LAC216, a Keyboard Base with answer-back mechanism (LK26), a Page Printer (LP93/AHE) with YP Type Box, an Electrical Service Unit (LESU67) with RY30 Line Relay, and Motor (LMU3).
- c. The description of the component units are as follows:
  - (1) Cabinets (LAAC233 and LAC216)
    - (a) The LAAC233 Cabinet is similar to the LAAC209 Cabinet. (See Specification 6596S) The LAC216 Cabinet is similar to the LAC204 Cabinet. (See Specification 6363S)
      1. The cabinets have a yellow lens with bulb on the left side of the cabinet dome.
      2. The cabinets have no power switch or line test switch.
      3. The cabinets have no offset copy holder.
      4. A low-paper and paper-out switch assembly is provided in the upper center rear of the cabinets.
      5. Terminals 181 through 220 are supplied in the upper right rear of the LAAC233 Cabinet and terminals 41 through 80 are supplied on the right side of the LAAC233 and LAC216.
      6. A cable which terminates at the 41-80 blocks of the cabinets plugs into the typing unit stunt box connector.

(2) Keyboard Perforator Transmitter Base (LAK27/LPE4BRX) and  
Keyboard Base (LK26BRX)

*See Bulletin:*

- (a) The keyboards have an electrically operated gear shift for changing speeds from 60 to 100 WPM. *1149B-Fig. 2-30  
1169A-Fig. 1-45*
- (b) The keyboards have a solenoid to permit off line operation of the form feed-out mechanism.
- (c) The local line feed operating link has an offset to prevent it from engaging the extension of the form feed-out lever on the page printer.
- (d) A "Here Is" keylever is provided for answer-back trip-off.
- (e) A contact is provided to close once during each revolution of the signal generator, to operate a slow release relay in the LESU.
- (f) The BRX Keytop arrangement is similar to the ARP arrangement except that the C/WRU keytop for answer-back request replaces the C/1/8 keytop.
- (g) The LAK27 is similar to the LAK4 (see Specification 6155S).
- (h) 1. The LAK27 uses the LMJ3 drive motor.
- (h) The LK26 is similar to the LK16 (see Specification 6322S).
1. The LK26 has an answer-back mechanism (see Specification 60020S).
- (i) The LPE4 is similar to the LPE1. (See Specification 6155S)
1. A motor with pinion is mounted on the perforator casting and drives the mainshaft. The motor capacitor and a four terminal block are mounted on a bracket above the motor.
2. The clutch driving gear and its associated clutch are omitted from the main shaft. A clutch drum without gear mounting provision is used on the mainshaft. A spacer is replaced by the driven gear.
3. The jack shaft is omitted.

(3) Typing Unit (LP93)

(a) The LP93 is similar to the LP60. (See Specification 6275S)

1. The LP93 has a page feed-out transmitter control with transfer contacts brought out to the typing unit connector.
2. The LP93 has a form-out mechanism to provide 11 inch form feed-out from the stunt box on blank Z or by means of a solenoid operated lever on the keyboard base (off line).
3. The following stunt box contacts are supplied. All are momentarily operated.

<u>Operated On</u>	<u>Slot</u>	<u>Type</u>
L.F. Blank LTRS	14	Normally open
Blank N	16	Transfer
Figs C	23	Transfer
Figs C	24	Normally open
UCH	26	Transfer
UCS	30	Normally open
Blank Z	42	Normally closed

4. The stunt box has function bars to provide suppression of printing of the first character following a blank.
5. The page printer has universal transfer contacts operated by the stripper bail mechanism.

(4) YP Type Box

(a) The YP Type Box is similar to the RC Type Box except that a Maltese Cross is supplied on upper case C instead of 1/8.

(5) Electrical Service Units, LESU66 (ASR and LESU67 (KSR)

- (a) The LESU66 is similar to the LESU13. (See Specification 6626S) The LESU67 is similar to the LESU7/134. (See Specification
1. No line shunt relay, line test key or power switch is provided.
  2. The answer-back control relay assembly is mounted just to the left of the line relay mounting assembly.
  3. A .500 ampere rectifier is mounted just to the right of the line relay mounting assembly.
  4. To the right of the .500 ampere rectifier are mounted in order a slow release relay and a motor control relay.

## 2. THEORY OF OPERATION

### a. Cabinets (LAAC233 and LAC216)

- (1) The low-paper switch has a lever which rides on top of the form paper as it feeds through the opening in the back of the cabinet into the page printer. A notch is supplied in a form near the end of the supply. The lever drops through this notch and actuates the low-paper switch, providing a maintained contact closure. See Figure 2
- (2) The paper-out switch has a lever which rides on top of the form paper but does not sense the notch provided for the low-paper bail. At the end of the form supply this lever drops, operating the paper-out switch, providing a maintained contact closure.

### b. Keyboard Perforator Transmitter (LAK27/LPE4) and Keyboard Base (LK26/BRX)

- (1) The speed changing mechanism operates as described below. Reference is made to the attached Figure 1.



- (a) The 60 and 100 WPM gear pairs are constantly meshed and operating. Each driven gear contains a keyed hub which is adjacent to and has the same diameter as the sleeve shown pinned to the output shaft. Associated with the low speed gear is a helical spring which is assembled over the gear hub and sleeve with an interference fit. This spring is right hand wound and is not fastened to the gear or the sleeve. This portion of

of the assembly is called the "overrunning clutch", or "low speed clutch". Associated with the higher speed gear pair is a similar spring, but wound in the opposite direction (L.H.) and having the beginning of the first turn bent up from the gear hub to engage the stop sleeve or collar which is free to rotate on the gear hub and shaft sleeve. On the stop sleeve is a stud which can be engaged by the stop lever when the magnet is energized to change speeds. This portion of the assembly is called the "on-off clutch", or "high speed clutch".

- (b) The input shaft drives the two gear pairs simultaneously. With the stop pawl in the disengaged position, the high speed gear will cause its associated spring to wind-up, reducing its diameter and locking the output shaft through the pinned sleeve to the gear. Since the shaft is rotating at a speed greater than the low speed gear, the overrunning clutch spring (R.H.) tends to unwind, permitting the shaft to overrun the low speed gear.

If the "on-off clutch" sleeve is stopped (by energizing the magnet and dropping the stop lever into engagement with the stud), the high speed clutch spring is released and the output shaft slows down. When the output shaft equals or is slightly less than the speed of the lower speed gear, the rotation of the lower speed gear causes the formerly overrunning spring to wind up, thereby locking the lower speed gear to the output shaft through the pinned shaft sleeve. When the stop lever is disengaged from the spring sleeve, the spring of the higher speed gear winds up, locking the drive at the higher speed. As the shaft speed increases, the lower speed spring clutch releases and again overruns.

(2) Form Feed-out link and form feed-out

The form feed-out link differs from the standard form feed-out link in that the operating edge is formed so that it does not engage the extension of the form feed-out lever on the page printer. Form feed-out is accomplished in one of the following ways:

- (a) On line through the receipt of BLANK Z. The theory of operation is given in Section II of Specification 6536S.
  - (b) Off-line through a contact closure. The contact closure applies 110 volts DC across the form feed-out solenoid. The solenoid operates the form feed-out link which engages the line feed lever and form feed-out lever on the page printer. Thus they are tripped off from the solenoid instead of from the line feed slide.
- (3) The theory of operation of the keyboard perforator transmitter base as given in Specification 6155S applies to the LAK27/LPE4 except where incompatible with this specification.
- (a) The LPE4 tape perforator is similar to the LPE1 tape perforator. It differs in the method of driving the punch. The jack shaft is eliminated and the main shaft is driven by a 1600 RPM split phase induction motor mounted on the LPE4. A 3.3 Mfd capacitor is used for starting and running the motor. The function clutch is driven at 533 RPM and the punch is driven at 1066 RPM. Additional motor information is given in Specification 9097S.

c. Electrical Service Units

- (1) Slow release relay (non-contention feature)
  - (a) The keyboard universal contact closes during each operation of the signal generator. When it closes, it operates the slow release relay, which opens the answer-back magnet circuit. This prevents the keyboard from operating its own answer-back when FIGS C is typed. Because of the slow release feature of the relay, (200-300 ms), the contacts remain open while the FIGS C contact in the stunt box closes, preventing the answer-back control relay from operating on FIGS C.
- (2) Answer-back control relay assembly (delay of answer-back)
  - (a) The answer-back control may be operated in the following ways:
    - 1. By pressing the HERE IS key momentarily.
    - 2. On receipt of FIGS C from a remote station. The FIGS C stunt box contact closes momentarily to operate the answer-back control relay

- (b) When the answer-back control relay operates, the 60 MFD capacitor and its 470 ohm current limiting resistor are connected to 120 V DC, and the capacitor charges. When the slow release relay releases, the capacitor is again connected across the answer-back magnet circuit. The capacitor discharges, operating the answer-back magnet. In the KSR Set, the answer-back magnet is held operated mechanically until the end of the answer-back. In the ASR it is held operated electrically until the end of the answer-back by its latching contact. The diode prevents the capacitor from re-charging through the latching contact when the latching contact closes. At the time the normally closed contact (of the transfer controls) recloses, a potential difference of 120 volts exists across the capacitor. As the capacitor discharges through the answer-back magnet circuit, this potential difference is reduced by the time the latching contact closes. Since a potential difference of 120 volts DC is applied across the answer-back magnet circuit, and the potential across the capacitor is now less than that across the answer-back magnet circuit, the capacitor ceases to discharge through this path. It is therefore necessary to provide the 820 ohm resistor to complete the discharge of the capacitor so that the capacitor does not re-operate the answer-back magnet by completing its discharge when the latching contact opens.



Figure 1

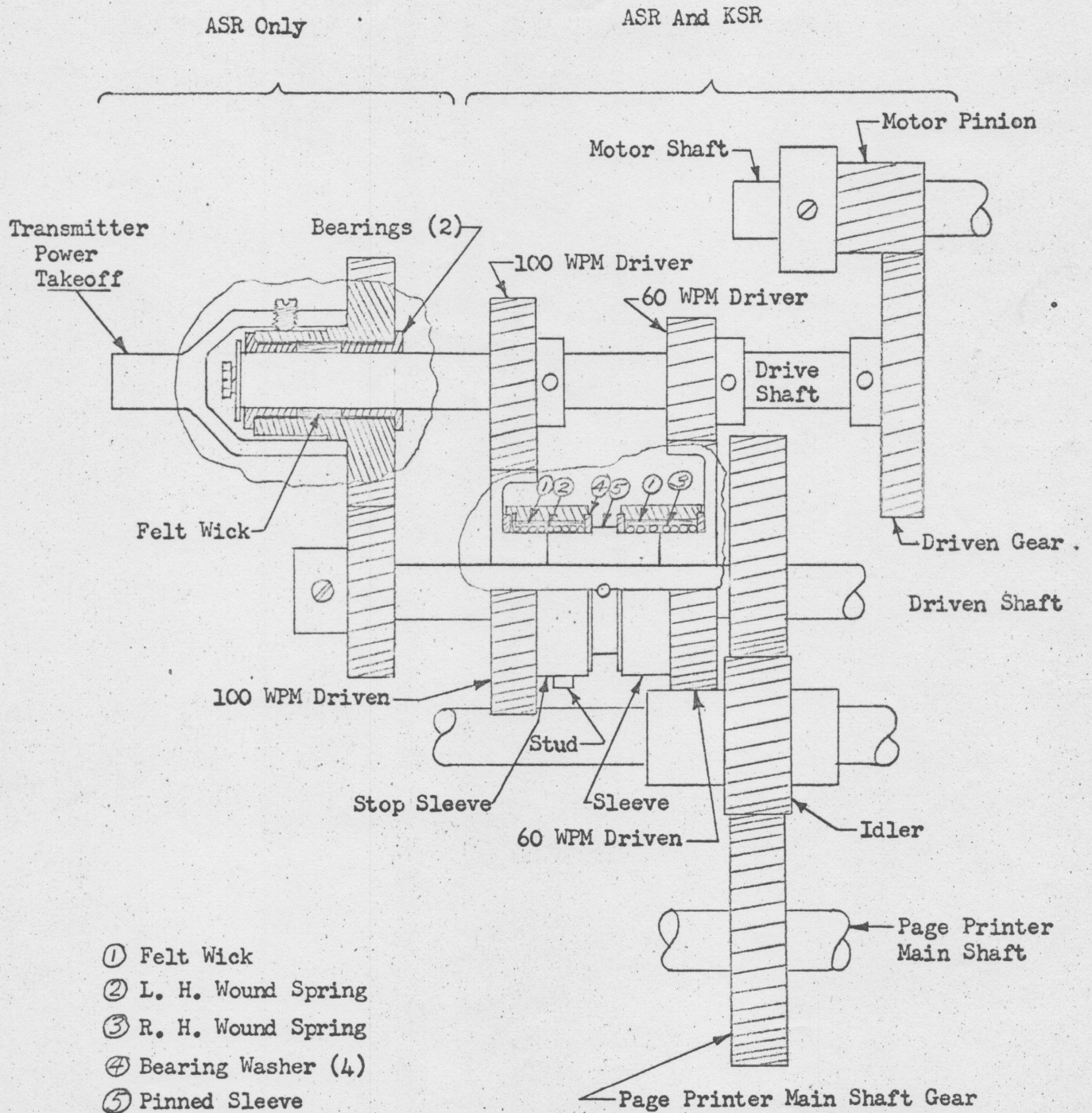
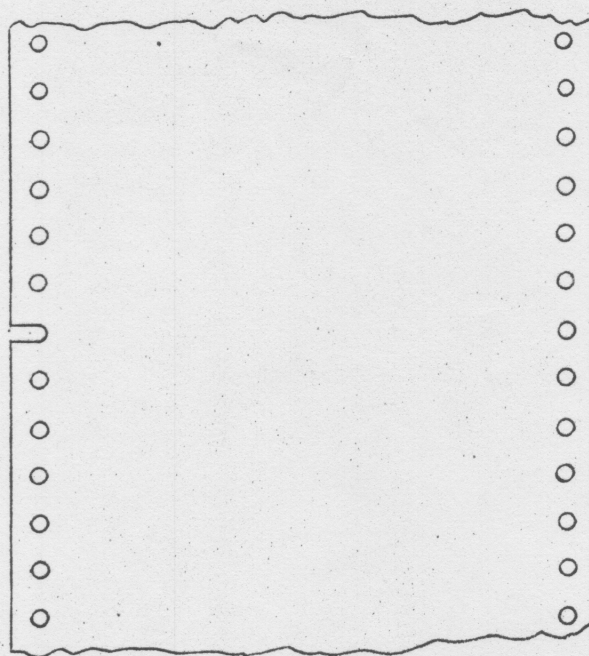


Figure 2



Notch Formed By Cutting To Edge Of Sprocket Feed Hole

FIGURE 2

SECTION III

ADJUSTMENTS, SPECIAL REQUIREMENTS AND LUBRICATION

1. ADJUSTMENTS

- a. The LAAC233 shall be adjusted as given in Section III of Specification 6596S except where incompatible with this specification. The LAC216 shall be adjusted as given in Section III of Specification 6363S except where incompatible with this specification.
- b. Keyboard perforator transmitter base (LAK27/LPE4) and Keyboard Base (LK26)
  - \* (1) Universal keyboard contact, see Specification 6988S, Section III.
  - (2) Universal keyboard switch, under "Here Is" keylever, see End-of-Message Keylever Switch Adjustments, Specification 6924S, Section III.
  - (3) Signal Line-Break Switch, Specification 6566S, Section III.
  - (4) Repeat on-space, Specification 6861S, Section III.
  - (5) Gear shift
    - \* (a) There shall be .004 to .008 inch backlash between the motor pinion and its driven gear, and between the page printer mainshaft gear and its driven gear at the points of minimum backlash. The shafts on the gear shift assembly shall be parallel to the motor shaft, as judged by eye.
    - (b) To adjust, loosen the four screws which mount the speed shift gear bracket assembly and loosen the two lock nuts which lock the adjusting bushings at the rear of the assembly. Loosen the nut plate mounting screw just in front of the gear bracket. Move the assembly backward or forward and adjust the height at the rear by means of the adjusting bushing nearest to the motor; the other bushing should be backed out for clearance. After correct adjustment has been obtained, lock the adjusting bushing nut. Turn the other bushing with the fingers until it touches the base and tighten the lock nut. Tighten lock nuts and mounting screws.

(6) Gear shift magnet (Figure 3)

- (a) The pole face on the armature shall meet the pole face on the magnet squarely.
- (b) To adjust, loosen the gear shift lever on its shaft and the magnet bracket mounting screws and position the magnet. Tighten screws.

(7) Clutch stop lever (Figure 3)

- (a) With the armature resting against the magnet pole face, there shall be .002 to .010 clearance between the gear shift lever and the sleeve with stud.
- (b) To adjust, loosen the screw which clamps the lever to its shaft. Position the lever and tighten the screw.

(8) Stop (Figure 3)

- (a) With the armature held in its position farthest away from the magnet pole face (Gear shift lever stop resting against casting), there shall be .010 to .020 clearance between the end of the stud on the sleeve and the clutch stop lever.
- (b) To adjust, loosen the screw which clamps the stop to its shaft and position the stop until the requirement is met. Tighten clamp screw.

(9) Form feed-out solenoid

- (a) When the form feed-out solenoid is operated, there shall be .005 to .035 inch overtravel of the form start slide on the page printer after the blocking lever falls in place behind it. See Figure 5, Specification 6536S, Section V.
- (b) To adjust, loosen the two screws which mount the form feed-out solenoid assembly and position the assembly until the requirement is met. Tighten screws.

c. The LAK27/LPE4 shall be adjusted as given in Section III of Specification 6155S except where incompatible with this specification.

(1) Backspace Mechanism, Specification 6268S, Section III.

- (2) Perforator motor pinion and driven gear
- \*(a) There shall be .004 to .008 backlash between the motor pinion and its driven gear at the point of minimum backlash.
  - (b) To adjust, loosen the four screws which mount the motor, and loosen the two lock nuts which lock the adjusting bushings at the left end of the motor. Adjust the height at the left end of the motor by means of the adjusting bushing nearest the front; the other bushing should be backed out for clearance. After correct backlash adjustment has been obtained, lock the adjusting bushing nut. Turn the other bushing with the fingers until it touches the mounting plate and tighten the lock nut. Tighten all lock nuts and mounting screws.
- d. The LK26 shall be adjusted as given in Section III of Specification 6322S except where incompatible with this Specification.
- (1) Answer-Back adjustments, Specification 60020S, Section III.
  - \*\* (2) Motor Control Relay Switch Adjustment see Figure 4.
- e. The LP93/AHE shall be adjusted as given in Section III of Specification 6275S except where incompatible with this specification.
- (1) Page feed-out and transmitter control, Specification 6536S, Section III. Operation is on Blank Z instead of upper case Z.
  - (2) On line stunt shift control, Specification 6525S, Section III.
  - \*(3) Universal Contact, adjust per Specification 6822S, Section III, except where incompatible with this specification.
    - (a) Timing Adjustments
      - 1. Drive Cam Adjustment
        - a. The contacts shall close for 40 to 55 milliseconds at 100 WPM operation.
        - b. To adjust, loosen the screw holding the drive cam to the shaft. Place a wrench over the flats of the drive cam and rotate the cam to meet the requirement. Closure time may be measured using a distortion test set. The contacts should close for 300 to 400 divisions on the 7.42 unit scale at 100 WPM.
- \*\* (4) Page Printer receiving margins
- (a) The page printer shall accept signals with 35% bias and end distortion, when operated at 60 or 100 WPM with the range scale set at the common optimum setting for dual speed operation.
  - (b) To Adjust:
    - 1. At 100 WPM, bias the selector between the limits of 0% to -7% internal bias.
- NOTE: Do not readjust selector for 60 WPM receiving margins.

2. Obtain receiving margins at 100 and 60 WPM and calculate the common optimum bias setting for dual speed operation as follows:

Let  $O_c$  equal the common optimum bias setting

$UMB_{100}$  equals the upper orient limit marking bias at 100 WPM

$LSB_{60}$  equals the lower orient limit spacing bias at 60 WPM

$$\text{Then: } O_c = \frac{UMB_{100} + LSB_{60}}{2}$$

- f. The LCXB16 adjustments are as follows (ASR only):

(1) Answer-back adjustments, Specification 60185S, Section III.

(2) Answer-back position adjustment

(a) There shall be .005 to .010 backlash between the answer-back driven gear and its driver.

\*(b) Loosen the four screws which mount the 176761 answer-back bracket and position the assembly until the requirement is met. Tighten the screws.

- g. The LXD5 shall be adjusted as given in Section III of Specification 6637S.

## 2. SPECIAL REQUIREMENTS

- a. LAAC and LAC Low-Paper and Paper-Out Switch Spring Tensions

(1) It shall require 1/4 to 1-1/2 ounces to pull the low-paper and paper-out levers up to a point where the switches operate.

(2) To measure, hook the pull end of an eight ounce spring scale under the ends of the levers and pull vertically upward.

- b. The special requirements given in Section III, Specification 6155S shall apply to the LAK27/LPE4 except where incompatible with this specification. The special requirements given in Section III of Specification 6322S shall apply to the LK26 except where incompatible with this specification.

(1) Gear shift magnet armature spring tension

\*(a) It shall require 2-1/2 to 7 ounces to start the armature moving toward the magnet.

\*(b) With the magnet de-energized, apply the push end of an 8 ounce spring scale to the armature pole piece at the center and just below the edge of the bracket to which the pole piece is fastened.

(2) Form feed-out link spring tension

(a) It shall require 3-1/2 to 6-1/2 ounces to start the form feed-out link moving.

\*(b) Hook the end of an 8 ounce spring scale over one of the bends in the link and pull in line with the spring toward the rear of the LAK.

\*(3) Solenoid spring tension

(a) It shall require 1/2 to 2 ounces to push the solenoid plunger all the way into the solenoid.

(b) Apply the pull end of an 8 ounce spring scale to the top of the trip lever and pull horizontally.

- c. The special requirements given in Section III, Specification 6275S shall apply to the LP93 except where incompatible with this specification.
- (1) Page feed-out and transmitter control, Specification 6536S, Section III.
  - (2) On-line stunt shift control, Specification 6525S, Section III.
  - (3) Form feed-out, Specification 6693S
    - (a) Form feed-out torsion spring (176704)
      1. It shall require from 1/8 to 1-1/4 ounces to start the bail moving.
      2. To measure, hook the pull end of an 8 ounce scale over the lower end of the 160937 bail and pull with the line feed clutch trip lever held out of engagement.

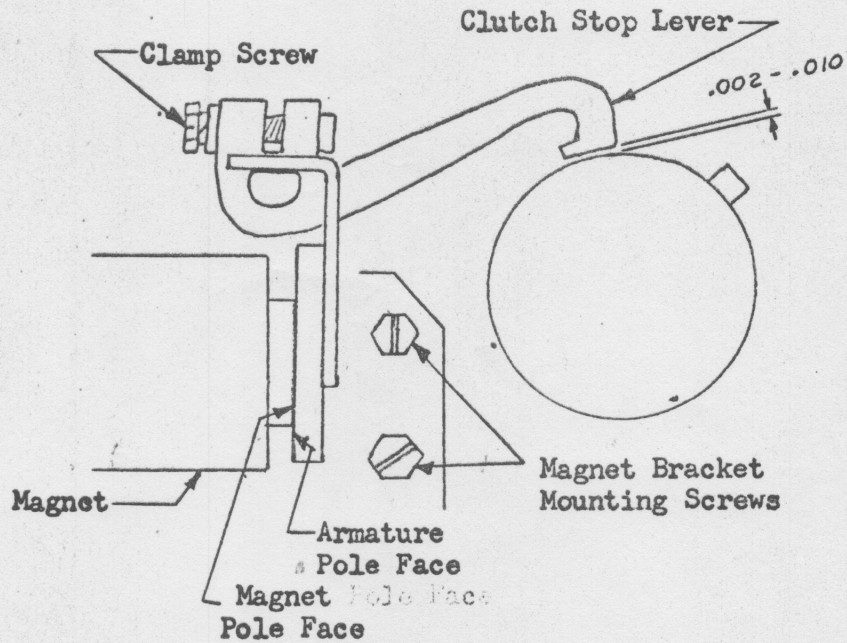
### 3. LUBRICATION

- a. The cabinet lubrication requirements given in Section III, Specification 6596S and 6363S shall apply to the LAAC233 and LAC216 respectively except where incompatible with this specification.
- b. The lubrication requirements given in Section III, Specification 6155S and 6322S shall apply to the LAK27/LPE4 and LK26 respectively except where incompatible with this specification.
  - (1) Gear shift mechanism
    - (a) Grease
      1. LAK27, 10 gears - light coat around periphery of gears.
      2. LK26, 8 gears - light coat around periphery of gears.
    - (b) Oil
      1. Four oilite bearings - coat
      2. Transmitter power take off driven gear bearings - coat. Felt wick - saturate. (LAK27 only)

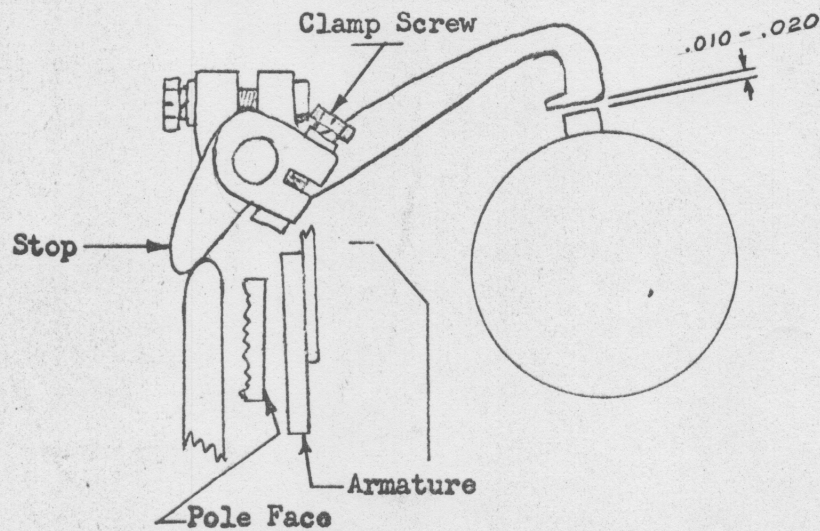
3. 60 and 100 WPM driven gear bearings and idler gear bearing - coat.
  4. Spring clutches
    - a. Two clutch springs and all hubs - coat
    - b. Two felt wicks - saturate
    - c. Four bearing washers - coat
  5. Two armature shaft bearing points - 2 drops at each point.
  6. Form feed-out solenoid
    - a. Two lever bearing points - 1 drop each
    - b. Link sliding surface and operating surface - 1 drop each.
- (2) LPE4
- (a) Grease
    1. Motor pinion and driven gear
- c. LCXB16 (ASR only)
- (1) Grease
    - (a) Five gears - light coat around periphery of gears
  - (2) Oil
    - (a) Four oilite bearings - coat
- d. The lubrication and special requirements given in Section III, Specification 6637S shall apply to the LXD5 (ASR only)
  - e. The lubrication requirement given in Section III, Specification 6275S shall apply to the LP93 except where incompatible with this specification.



Figure 3

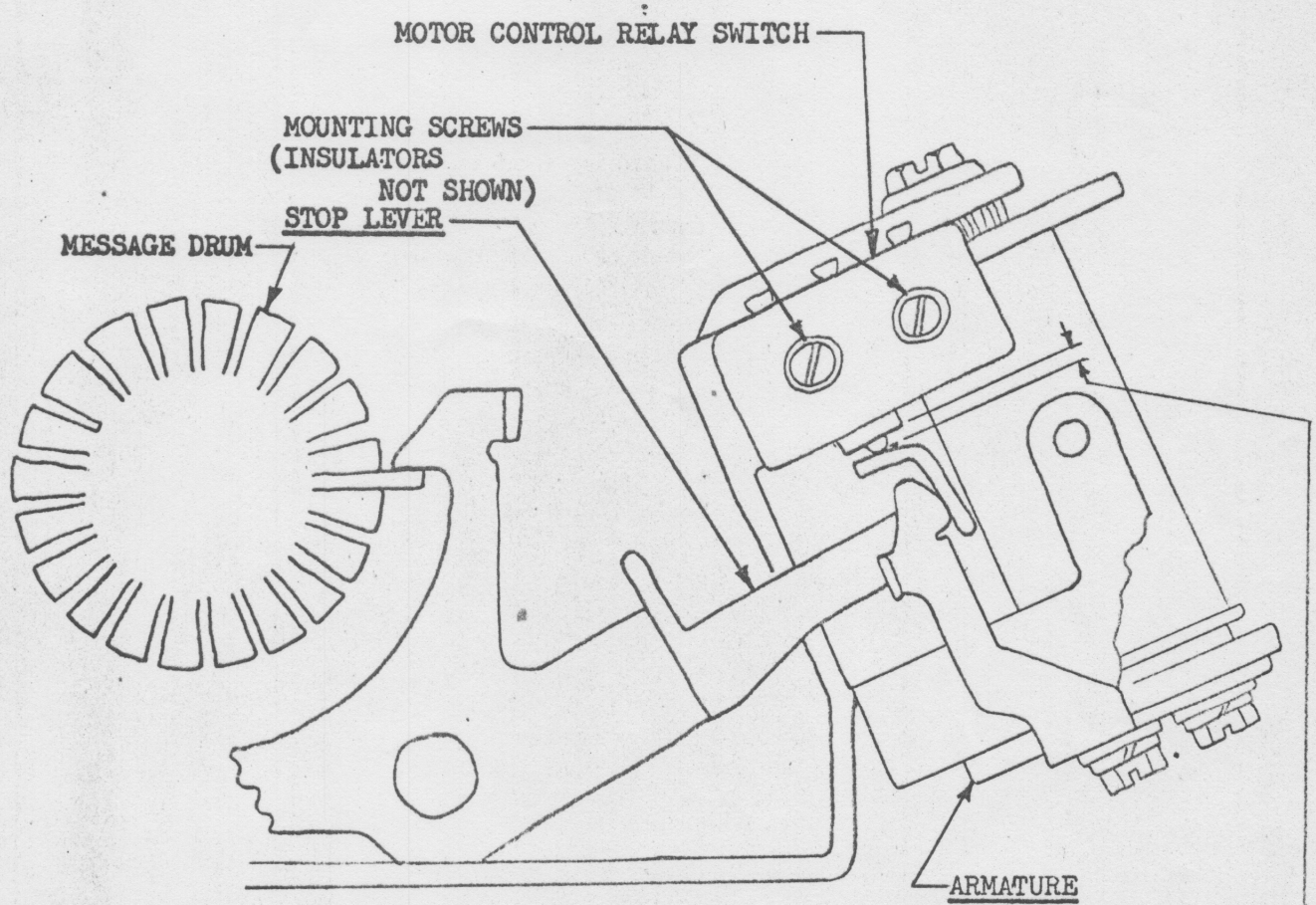


GEAR SHIFT MAGNET AND CLUTCH STOP LEVER ADJUSTMENTS



STOP ADJUSTMENT

Figure 4



**MOTOR CONTROL RELAY SWITCH**

**REQUIREMENT:** With the Armature Against the Magnet Core, the switch shall be in the operated position.

**TO ADJUST:** Loosen The Two Switch Mounting Screws Friction Tight and Position The Switch To Meet The Requirement. Tighten The Screws.

SECTION V

INSTALLATION AND SERVICING INSTRUCTIONS

1. INSTALLATION

a. General

- (1) The Model 28 Automatic Send-Receive set for the Boeing Aircraft Company consists of the following coded items:
  - (a) LAAC233 Cabinet
  - (b) LAK27/LPE4BRX Keyboard Perforator Transmitter Base
  - (c) LP93RX/AHE Page Printer
  - (d) Type Box YP
  - (e) LESU66 Electrical Service Unit
  - (f) LCXB16 Transmitter Base
  - (g) LXD5 Transmitter
  - (h) LMU3 Motor
  - (i) RY30 Line Relay
  
- (2) The Model 28 Keyboard Send-Receive set for the Boeing Aircraft Company consists of the following coded items:
  - (a) LAC216 Cabinet
  - (b) LK26BRX Keyboard Base
  - (c) LP93RX/AHE Page Printer
  - (d) Type Box YP
  - (e) LESU67 Electrical Service Unit
  - (f) LMU3 Motor
  - (g) RY30 Line Relay

b. Unpacking

- (1) The coded items are packaged in individual cardboard cartons. To unpack, cut the sealed edges of the carton carefully so as not to damage the contents.

c. ASR Set Assembly

- (1) For LAAC Cabinet installation information see Specification 6596S, Section V.
- \* (2) Install the LESU66 Electrical Service Unit in the LAAC233 Cabinet using the two 151437 studs provided with the LESU. Connect the LESU to the cabinet terminals and install straps as shown in 4336 WD wiring diagram. Route the cable to terminals 41-80 between the two terminal blocks.
- (3) Plug the RY30 Line Relay into the LESU.
- (4) Install the 145365 pinion on the LMU3 motor using the 159287 isolator and two 145392 posts provided with the LAK. Mount the LMU3 motor on the LAK using four of the 151678 screws provided with the LAK. Avoid jamming gears. (See Gear Shift Adjustment in Section III - Final adjustment is made later.) Connect the motor leads as shown in 4338WD wiring diagram.
- (5) Remove the right front cross bar following the procedure given in Section III of Specification 6596S under "Left Front Cross Bar Adjustment."
- (6) Install the LAK27/LPE4BRX keyboard in the cabinet. Place four No. 105029 washers (included in LCXB16) under the LAK mounting holes and mount the LAK using the four 151549 mounting screws provided with the cabinet.
- (7) Replace right front cross bar, reversing removal procedure.
- (8) Mount the LCXB16 Transmitter Base using the six 163517 rubber bushings, three 164101 shoulder studs, three 103305 flat washers, three 2669 lock washers and three 74807 nuts. Plug in transmitter and answer-back connectors. Connect 176725 cable to cabinet terminal blocks as shown in 4339 WD. Couple the LCXB to the gear shift on the LAK by means of the 176751 shaft and two 173645 couplings provided with the LCXB. The 173645 couplings should be installed with the external hub on the shafts with the bearings. The ground strap terminal should be fastened between the washer and lock washer on the right rear mounting stud.

- (9) Mount the LXD5 Transmitter Distributor using the three 151632 screws, three 2191 lock washers, and three 125015 flat washers provided with the LCXB.
- (10) Place the YP Type Box in place on the LP93 Page Printer. Install the LP93 Page Printer using four of the 151678 screws provided with the LAK. Adjust the gears. (See Gear Shift Adjustment in Section III)
- (11) Plug in the connectors to the page printer (two) and the keyboard (one).
- (12) Apply a thin film of grease to all gears installed per this specification.
- (13) With forms feeding into the page printer, the low-paper switch should operate upon sensing the notch provided near the end of the forms, and the paper-out switch should operate at the end of the forms. Loosen the switch bracket mounting screws and adjust position. Tighten screws.

d. KSR Set Assembly

- (1) For LAC Cabinet installation information see Specification 6363S, Section V.
- (2) Install the LESU67 Electrical Service Unit in the LAC216 Cabinet using the two 151437 studs provided with the LESU. Connect the LESU to the cabinet terminals and install straps as shown in 4342 WD wiring diagram.
- (3) Plug the RY30 Line Relay into the LESU
- (4) Install the 145365 pinion on the LMU3 motor using the 159287 isolator and two 145392 posts provided with the LK. Mount the LMU3 motor on the LK using four of the 151678 screws provided with the LK. Avoid jamming gears. (See Gear Shift Adjustment in Section III - Final adjustment is made later.) Connect the motor leads as shown in 4343 WD wiring diagram.
- (5) Loosen the two thumb screws and remove the front cross bar.
- (6) Install the LK26 keyboard in the cabinet using the four 151549 mounting screws provided with the cabinet.

- (7) Replace front cross bar, tighten thumb screws.
- (8) Place the YP Type Box in place on the LP93 Page Printer. Install the LP93 Page Printer using four of the 151678 screws provided with the LK. Adjust the gears. (See Gear Shift Adjustment in Section III)
- (9) Plug in the connectors to the page printer (two) and the keyboard (one).
- (10) Apply a thin film of grease to all gears installed per this specification.
- (11) With forms feeding into the page printer, the low-paper switch should operate upon sensing the notch provided near the end of the forms, and the paper-out switch should operate at the end of the forms. Loosen the switch bracket mounting screws and adjust position. Tighten screws.

**\*\*e.** LP93 Range Scale Setting

- (1) Set the range scale at the common optimum bias setting for dual speed operation at 60 and 100 WPM. See Section III.