

CTS ENGINEERING

FORM TTMXNC

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ASSOCIATED PRESS TELETYPE
FIELD MAINTENANCE MANUAL

A definition for INSPECTION:

To perform a good inspection, it is necessary to check all of the points where (1) misadjustment can develop, (2) wear occurs, and (3) incorrect operation is taking place or has taken place.

The Teletype should have a good appearance when the inspection is finished. The work area should be restored to good condition with papers rags, etc. cleaned up and any spills, dirt, etc. taken care of.

Any supplemental devices should be put back the way they were found or as the customer wants them. If they are being used improperly this should be pointed out tactfully. If there is a question of proper teletype operation, it should be pointed out that improper operation may result in a shorter service life or abnormal breakdown.

A definition for LUBRICATION:

An excess of oil or grease may be defined as that amount of lubricant that does not adhere to the operating surface, sliding member, or pivot. The excess lubricant gets pushed out of the way during the operation except in the case of pivots. Lubricating with oil, the saturation point is reached the instant oil starts to overflow or runs out the other side. Even this amount is excessive in a lot of instances. The film of oil that actually lubricates is extremely thin and any oil outside of the contact area does nothing, generally, for the lubrication. In fact, excess oil can collect dust, possibly containing abrasive particles, which can cause a more rapid wearing of the parts involved. Although the difference in the wear rate may be very small, the overall difference between two teletypes, one lubricated properly and the other lubricated improperly, can sometimes be very apparent with respect to the appearance, sound, and operation of the teletypes.

Excess grease and oil should be wiped away, leaving all non-operating surfaces clean and free of lubricants.

With respect to lubrication with grease, light grease is used where necessary. Here again, an excess of grease can gather dust and dirt and affect machine operation and useful life.

Good lubrication entails making sure that the surfaces to be lubricated are covered with a film of oil, the assemblies that call for it are filled with the proper amount of grease and in the proper places. All excess lubrication should be wiped off of the parts involved.

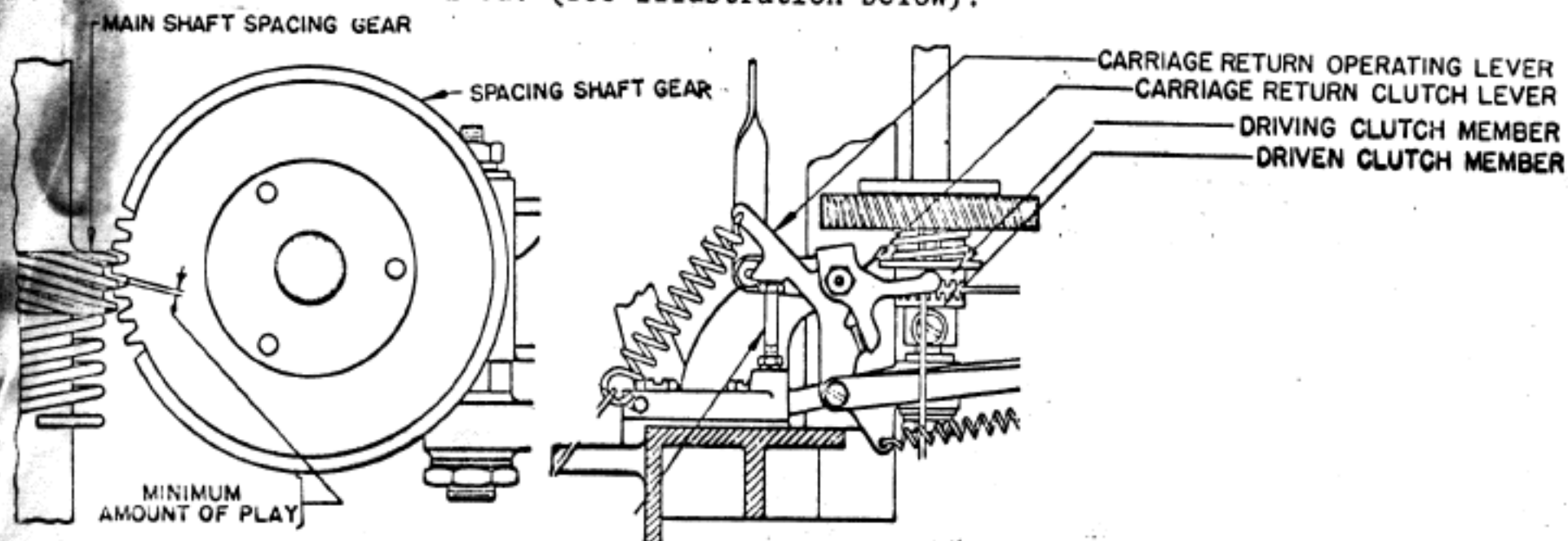
NOTE: Keep oil and grease away from all electrical coils, contacts, connections, etc. An example is the surface of an armature adjacent to the core of a coil. If there is grease on the armature and core, the armature can be held up when the coil is de-energized.

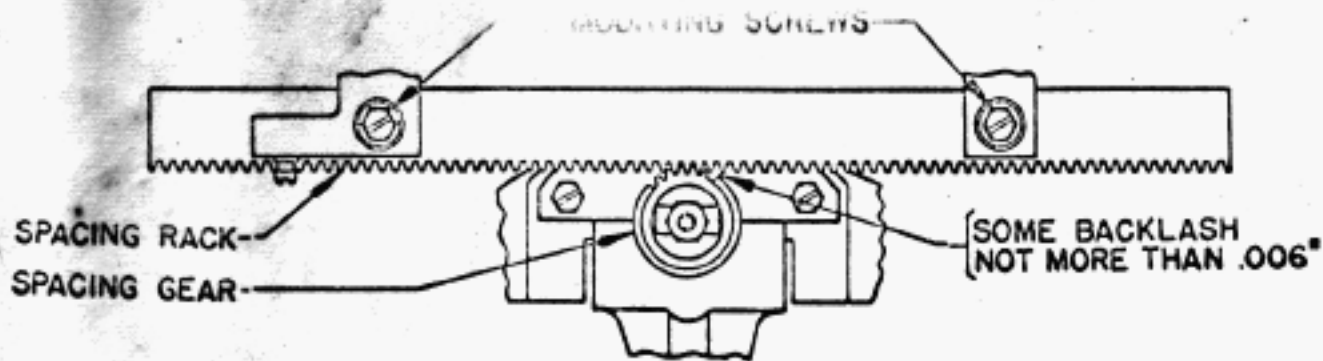
Techniques of Field Servicing or Routining are somewhat different than those acquired for rebuild of Teletype equipment. Once the unit is rebuilt in the bureau and sent to the field in new condition, the Technician's responsibility is to keep the unit in new condition without rebuilding on each inspection trip. When Field Servicing it is not necessary nor desirable to completely disassemble the teletype for a proper inspection. The unit should, however, be disassembled enough to clean, inspect, lubricate and replace worn parts. KEY WORDS ARE CLEAN AND INSPECT. The words are synonomous. Clean the unit by wiping each part or section clean. Taking time to do so allows or forces inspection of the complete unit. Close inspection therefore leads to worn parts, loose screws, maladjustments, etcetra.

When the typing unit is lifted from the base, set it aside. Wipe clean the base and motor. Lubricate the motor bearings with LUBRIPLATE. Check wiring and all connections on the base. Usually that is all that will be required to service the Teletype base. Wipe clean the table, table shelf and Subset if mounted on the printer table shelf.

The typing unit should be serviced by starting at the bottom and "build it up". Start with cleaning and inspecting the frames and associated components, mainshaft, selector, range finder, printing bail assembly and finally the typebasket, in that order. Remove those sections of the typing unit necessary to get to the bottom, or mainshaft, before actually servicing the typing unit.

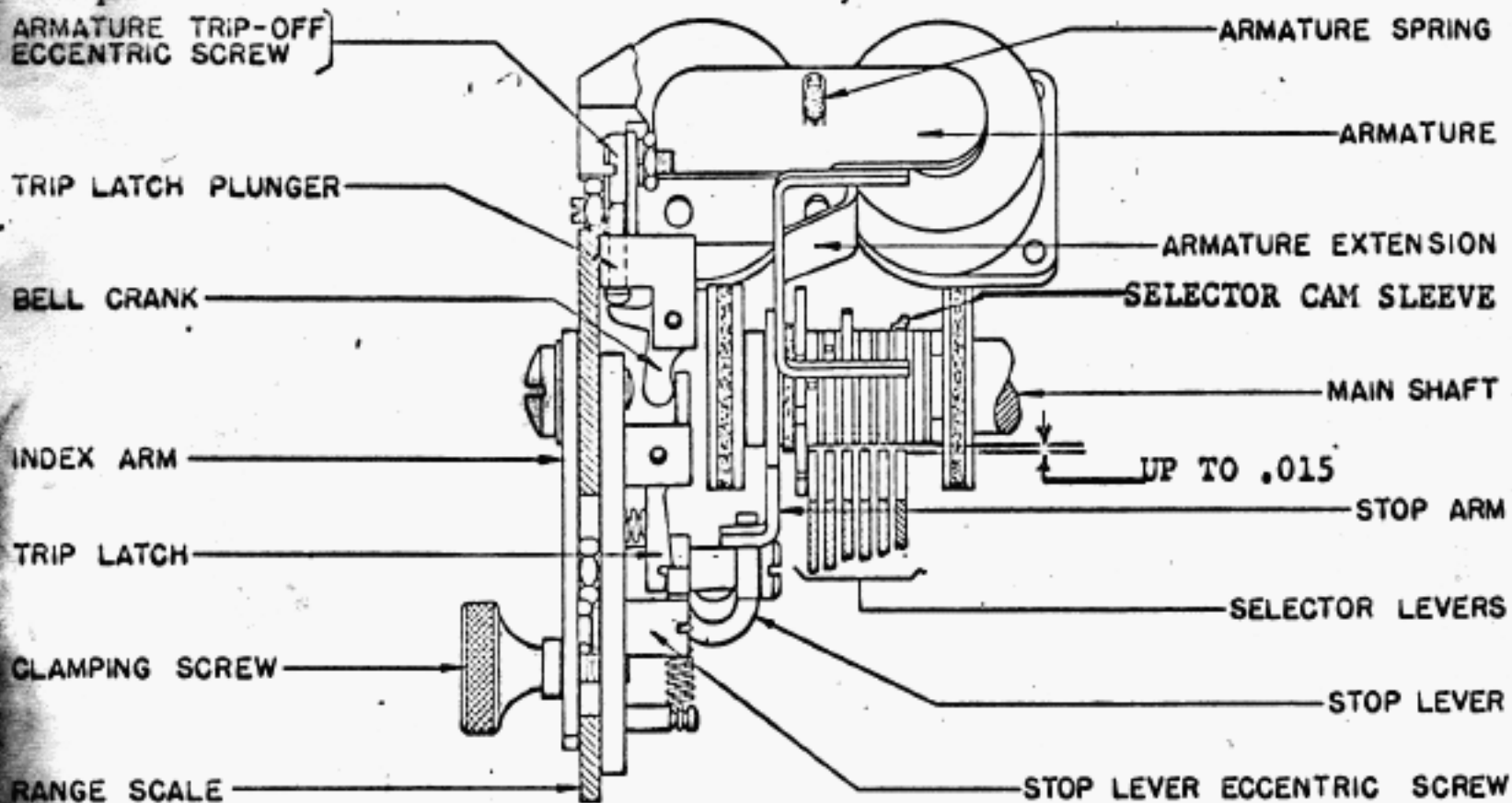
1. Remove the typebasket and set it aside.
2. Remove the printing bail assembly and set it aside.
3. Clean and inspect the front of the TU. Replace parts if necessary.
4. Turn the TU so that right end can be wiped, cleaned and inspected.
5. Turn the TU so rear of TU can be wiped clean and inspected. While cleaning and inspecting rear of Typing Unit give special attention to the spacing shaft assembly. Check for proper backlash of spacing shaft and mainshaft gears. If necessary reposition the lower spacing shaft b racket. Be sure the carriage return clutch and operating lever assembly bearing and bearing post are clean and oiled. (See illustration below).





6. Turn the TU on its right end (frames), clean and inspect. Selector unit, range finder and magnets are located on the left end of the unit you are inspecting.
7. Remove the range finder unit and set it aside.

It is not necessary to disassemble the Selector Unit to determine if the Selector Unit needs rebuilding. To determine this before removing the MAIN-SHAFT, check the clearance between the selector cam sleeve "body" (See diagram below) and the Selector Lever "toes". There should be up to .015 clearance between the two points as the mainshaft is rotated. If the selector lever toes are touching the selector cam sleeve assembly body at any point when the shaft is rotated, the selector unit should be disassembled and rebuilt including new swords, "T" levers and springs. When rebuilding the Selector Unit it is not usually necessary to replace the Selector levers, unless one or more are obviously worn or damaged. Separator plates can also be reused. If burrs or grooves are worn in the separator plates, use a fine grain stone and polish the worn areas before reassembly.



It is assumed at this point that checks have shown the selector does not need rebuilding. If clearance between the Selector Levers and Cam Sleeve Assembly is proper the unit will operate satisfactorily for another six months. The exception would be an obvious broken part in the assembly. Then the units must be disassembled to replace the broken part.

To remove the MAINSHAFT.

1. Remove the 72516 retaining disc, located on end of mainshaft, with the proper screwdriver. DO NOT USE pliers on the retaining disc. (LH thread).
2. Remove the 6863 cam sleeve disc.
3. Remove the cam sleeve assembly.
4. Remove the mainshaft bearing caps.
5. Remove the mainshaft and set it aside. (The TU is still standing on the right end frames).

With the mainshaft removed from TU frames, continue to wipe clean and inspect the underside of the Typing Unit.

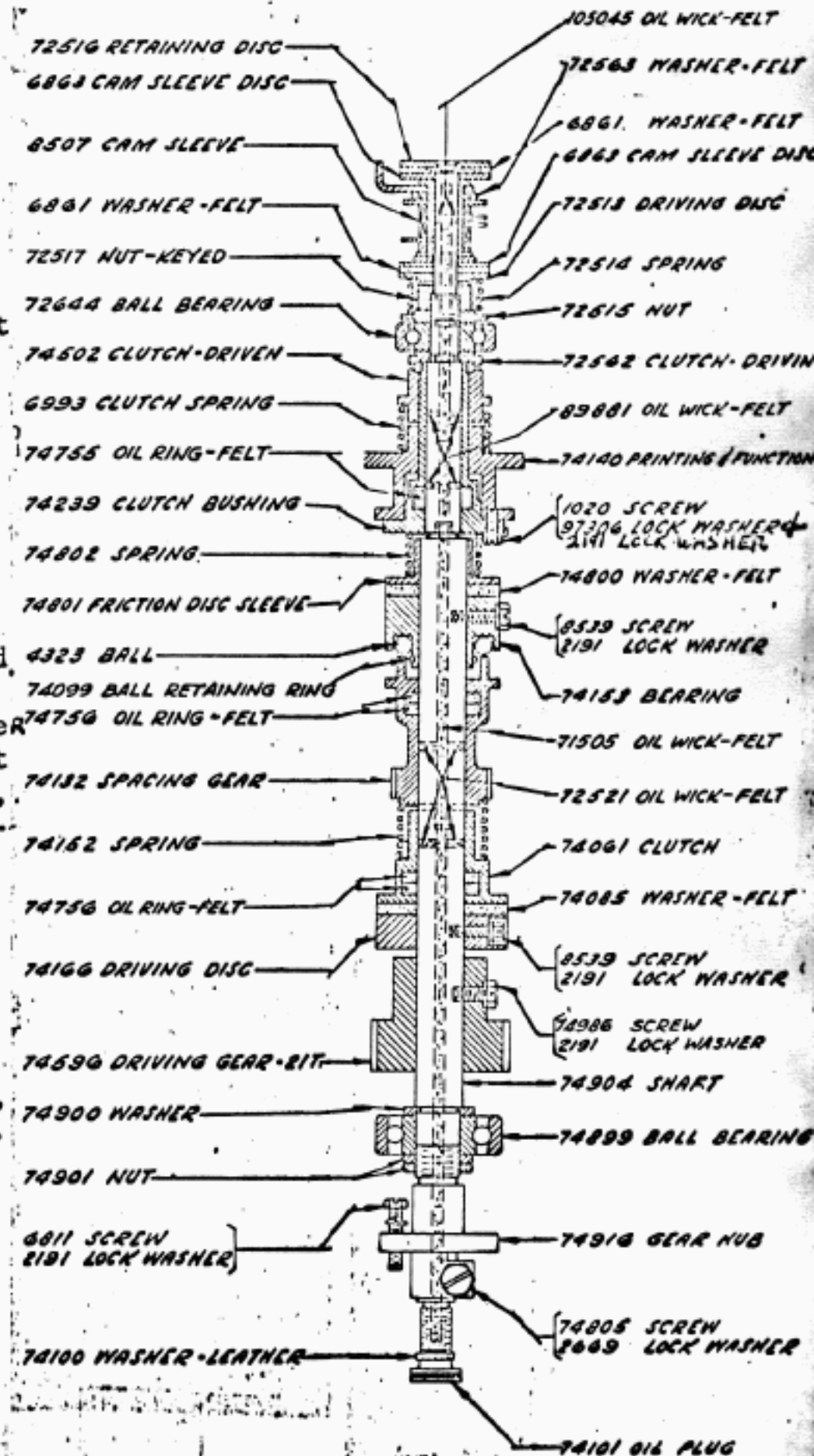
Disassemble the mainshaft. Remove all parts down to the 74166 driving disc, starting at the small end of the shaft. Remove the 122974 nut and small mainshaft bearing. (It is not necessary to remove the 74166 driving disc, driving gear and fiber gear for proper inspection of the mainshaft).

1. Wipe the shaft clean and inspect for excessive wear.

2. Inspect each mainshaft oil wick to determine if all are soft and feeding oil properly. If the unit has been serviced regularly and properly the oil wicks will be OK and need not be replaced. Should they show glaze, are hard or black - all should be replaced.

EXCEPTION: Never replace the long wick through the mainshaft. If removed for any reason, leave it out of the shaft. This will allow more oil reserve capacity in the shaft. The long wick, over a period of time, has a tendency to clog the mainshaft.

NOTE: It is a MUST for the MAINSHAFT to be disassembled and inspected with every inspection of the Typing Unit.



With the mainshaft disassembled, you are at the theoretical "bottom" of the Typing Unit under Field Servicing conditions. The unit should now be built up, starting with assembly of the mainshaft. Refer to the illustration on page 4 and reassemble the mainshaft starting with the 129547 (74085) felt washer. Saturate the felt washer with oil before installing on main shaft.

NOTE: Mainshaft felt washers (clutches) may or may not need replacing with every inspection. In fact, there is an advantage in leaving the original felt washers in the mainshaft if they have not been used while dry, which will cause fraying or glazing. Once the felts have gone through a 6 month, or less, period of operation without obvious damage they will last indefinitely after flexing and reoiling. If the felts are worn thin or have other obvious damage, install new felts on the mainshaft.

Be sure to inspect, clean and oil each part as it is placed on the shaft. Replace worn or doubtful parts.

Starting with the felt washer above reassemble the mainshaft up to and including the 74153 bearing (middle of shaft). Saturate the felts inside the 74061 clutch and 74231 spacing gear. If necessary clean the oil spiral inside both parts with end of the push-pull spring hook.

Before completing assembly of the mainshaft, remove the 74101 oil plug at large end of shaft. Position the mainshaft on end, small end down, and lean the shaft against the TU. (TU is still standing on right end). Fill the mainshaft with oil by flowing oil into the large end allowing it to soak through the shaft, adding oil at the top to keep the shaft full. Observe the oil wicks in the shaft and the opposite end of the shaft. Be sure the oil wicks become saturated, replace the oil plug and place the mainshaft in a horizontal position. (NEVER FILL THE MAINSHAFT BY FORCING OIL THROUGH THE SHAFT WITH YOUR PRESSURE OIL CAN. This could displace the oil wicks and will not allow the wicks to become saturated. Nor does it assure the shaft is full of oil).

Inspect, clean and oil remainder of mainshaft parts. Complete the assembly. Again be sure to saturate the oil wicks inside the 74239 clutch bushing. DO NOT, at this time, install the cam sleeve, cam sleeve disc, felt washer and retaining disc on end of the mainshaft. Do place the 72514 spring, driving disc felt washer, and 6863 cam sleeve disc on the mainshaft.

NOTES: 1. Make sure the 1020 screw which holds the printing and function cam on the clutch bushing is tight and secure. It should have both the 97309 and 2191 lockwashers. One or the other lockwasher will not always lock the screw permanently.

2. The mainshaft, two main ball bearings, should be cleaned, inspected and repacked with Lubriplate Ball Bearing grease with every inspection. Place the Lubriplate on the bearing surface and force it through the bearing with finger tip or flat side of screwdriver blade. Same procedure on both sides of the bearings. (Placing lubriplate on the outside of the bearing will not do the job. The Lubriplate will be thrown off with the first few rotations of the mainshaft). When properly packed the bearing will not wear. The packing also forms a seal and prevents dirt from getting into the bearing.

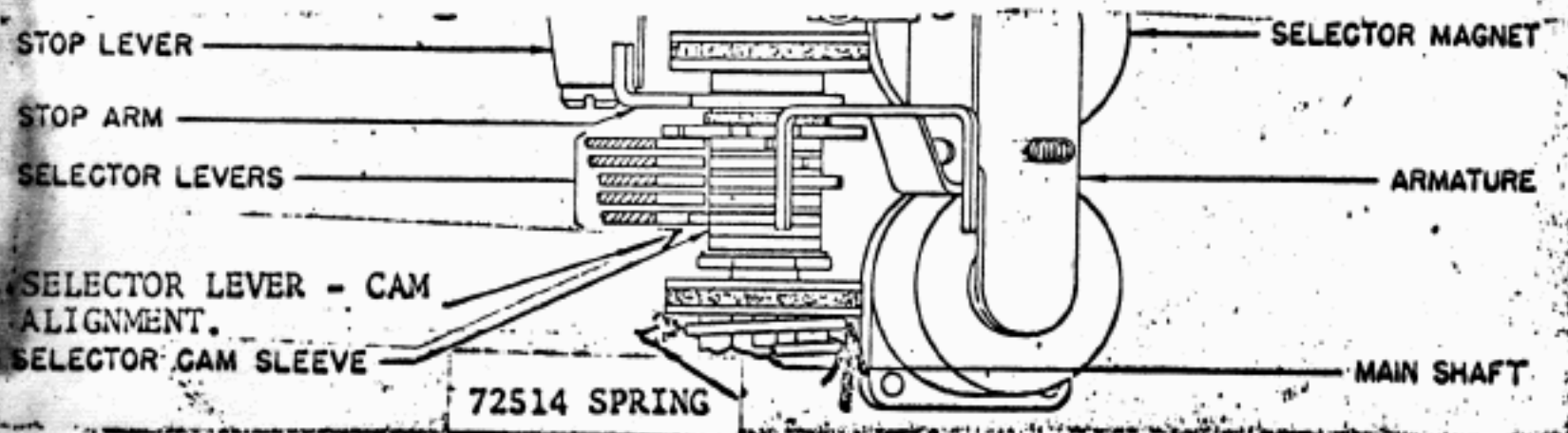
We are assuming at this point that the selector did not need rebuilding. If it needs rebuilding - now is the time to do so. Do the rebuilding in accordance with your rebuild training.

The mainshaft is now ready to install in the Typing Unit as the next step in "building up" the unit. Be sure all screws and nuts on the shaft are tight and secure.

Assuming everything remaining on the Typing Unit needs no further attention - install the mainshaft. Replace the bearing caps on mainshaft bearings but DO NOT tighten the screws at this time. Leave the screws friction tight so the mainshaft can be properly positioned for later adjustments.

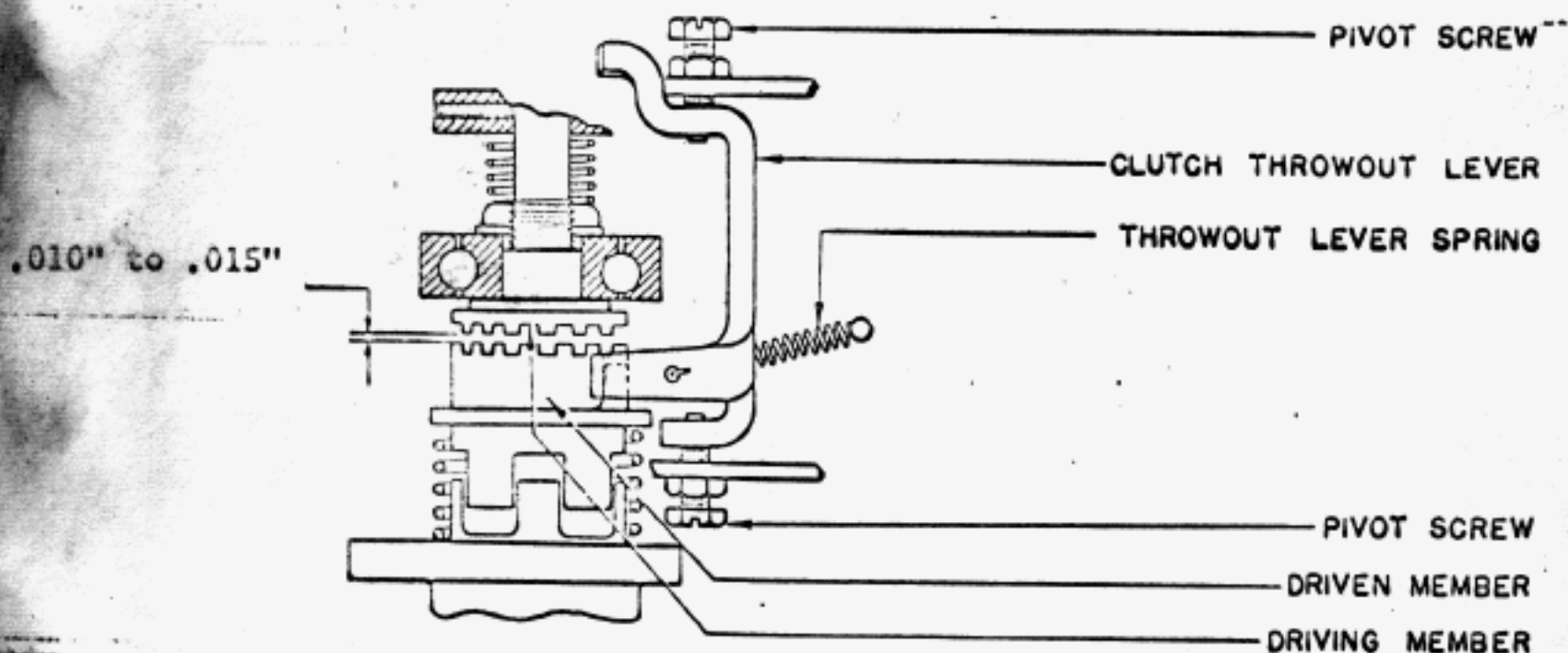
Install the cam sleeve assembly. Turn it slowly clockwise as you exert light pressure downward against the 72514 spring. Hold the cam sleeve in position against the spring and take a screwdriver in left hand, hold it against the large portion of the cam sleeve assembly (top) using flat side of screwdriver blade. While holding the cam sleeve in position with the screwdriver blade, with right hand, install the 6863 cam sleeve disc, felt washer and 72516 retaining disc. Tighten the retaining disc with the proper screwdriver. DO NOT USE PLIERS.

MAINSHAFT ADJUSTMENT: (See illustration below) While rotating the mainshaft, the selector cams should line up with their respective selector levers, but slightly to the lower side. Adjusting the shaft so the cams align to the lower side in respect to the selector levers will allow for wear and compression of the small felt washers. As the felts compress and wear, the cam sleeve assembly tends to move toward the end of the shaft because of pressure exerted by the 72514 spring. This wear invariably occurs during normal operation. The slightly out of alignment adjustment will allow for the wear. The cams and selector levers will eventually line up perfect. If not adjusted in this manner, the slightest wear will shift the cam and cause erratic pick-up of unwanted pulses.



After proper positioning of Mainshaft, tighten screws, with nut driver, on both bearing caps.

Complete the mainshaft adjustments by checking, readjusting if necessary, the clutch throwout lever. (See illustration below). There should be .010" to .015" clearance between the 72562 and 74502 clutch teeth surfaces with the driven member fully cammed out of engagement with the driving member. The clutch throwout lever should be free of binds at the pivot screws and have only minimum end play. The Mainshaft installation is now complete.



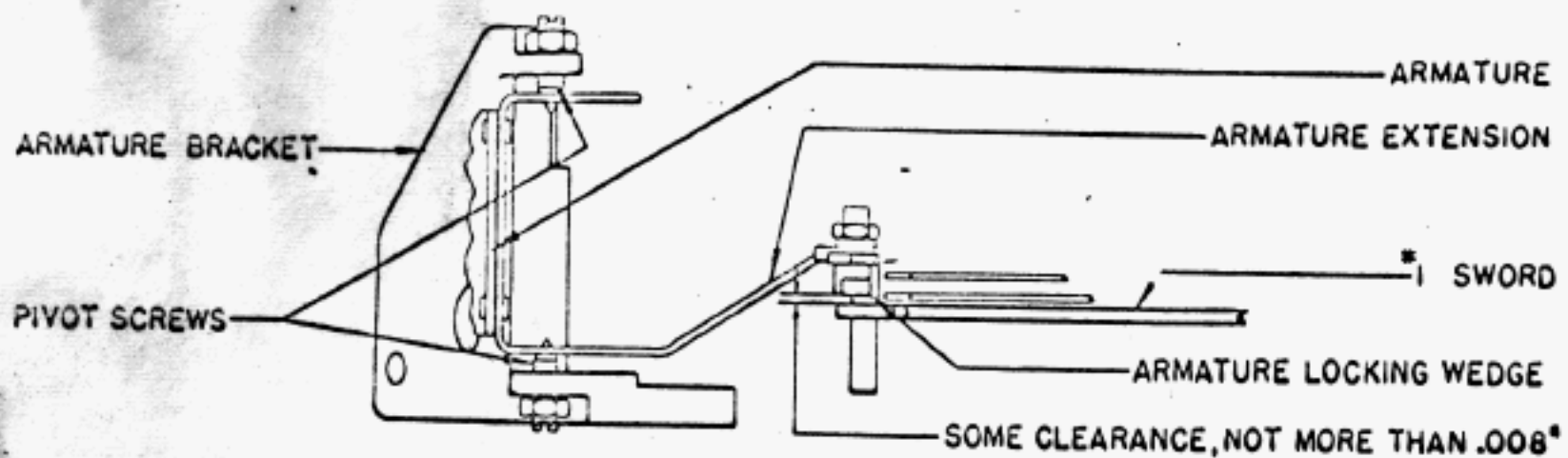
SELECTOR ASSEMBLY CHECK AND ADJUSTMENTS: Typing Unit remains on right end frames for the selector check and adjustments.

For field servicing there are certain Selector adjustments which are slightly different from book adjustments. The field servicing adjustments are made to allow for normal wear in the unit and will improve overall performance.

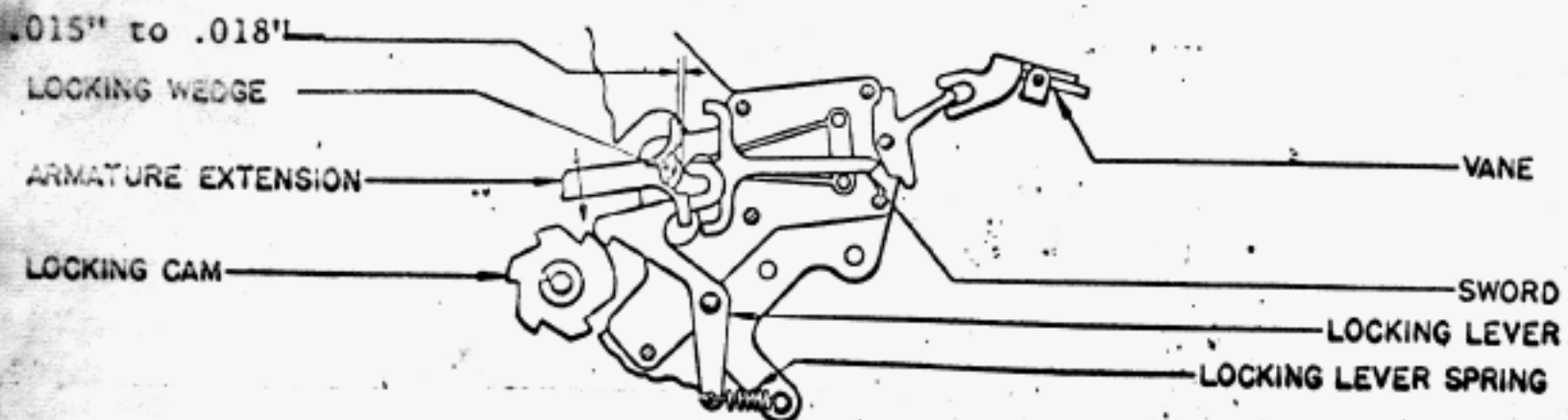
Up to this point no adjustments have been disturbed on the Selector Unit during the cleaning and inspection. The range finder assembly remains off of the unit.

PULLING MAGNET SELECTOR ADJUSTMENTS:

There should be some clearance, not more than .008" between lower surface of the armature locking wedge and the No. 1 sword with the selector lever resting on peak of its cam. Armature end play should be only perceptible between its pivot screws. (see illustrations below).



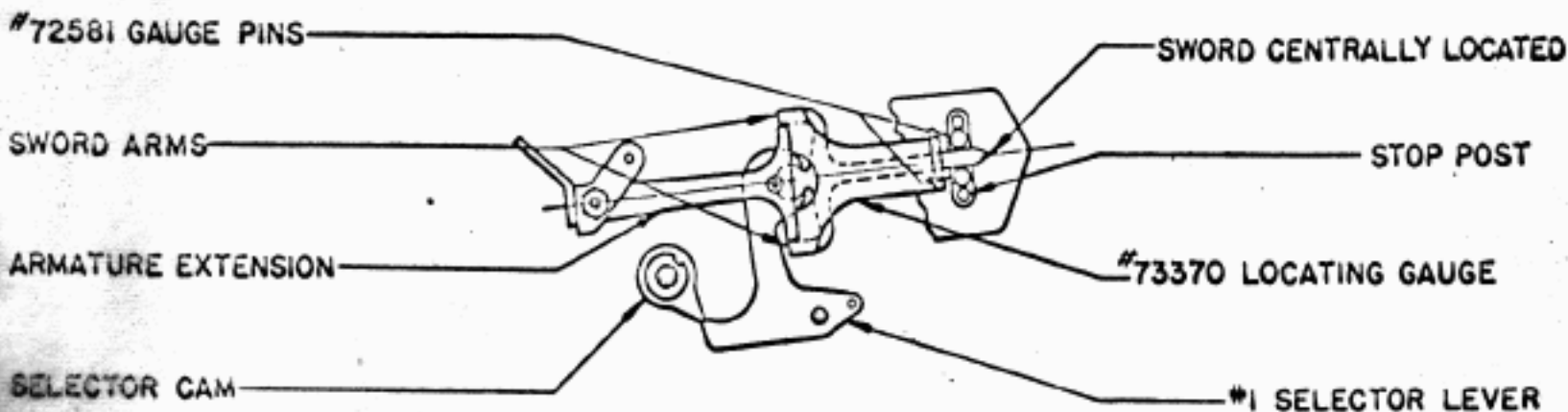
There should be at least .015" clearance between the point of the locking wedge and point of locking lever, with locking lever on high part of cam. (This allows for wear of the locking lever and cam surface. The Teletype book adjustment of .008 will not allow for enough probable wear). (See illustration below)



The Selector armature bracket adjustment can be checked in the following manner without using gauges or the 73370 locating gauge.

Rotate the Mainshaft while holding the armature in the SPACE position. This positions all swords against their respective stop post. With swords in that position, slowly turn Mainshaft and observe when the No. 1 Selector lever rides up toward the peak of its cam. When it reaches the peak you should be able to move the armature extension past the arm of the sword without the surfaces touching, but with no more than .002" clearance. (Make sure the sword is against its stop post and the No. 1 selector lever is on the peak of its cam). That check is the same as using the .040" gauge as in rebuilding selectors according to the Teletype adjustment manual. This method however is much more expedient. Make the same check for MARK, by holding the armature in the marking position and check the other side of the armature extension and sword arm. If the same condition exists on both sides of the extensions, the armature bracket is properly positioned and all adjustments are correct. It also proves there has been a minimum of wear on all associated parts. No further adjustment or checks of the armature bracket are necessary.

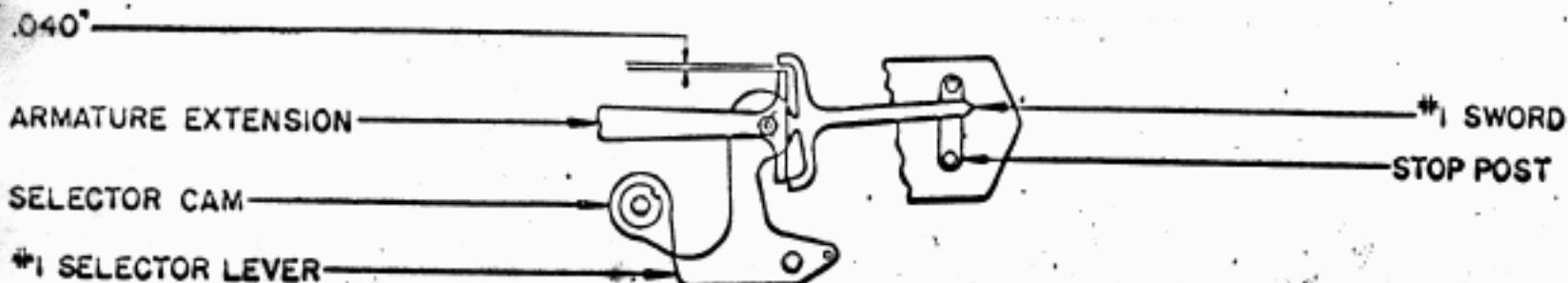
That check also proves the theoretical straight line drawn through the center of the armature pivots, locking wedge, locking lever point, through center of sword blade and center of "T" lever pivot post. (See illustration below). Use the .040 gauge if not sure of the adjustment. (Refer to Teletype adjustment manual). Remember if one adjustment is changed, all adjustments must be checked and remade in sequence.



The armature stop adjustments should be made using the .040" gauge to assure proper adjustment of later related adjustments. Later adjustments are critical, in relation to the trip latch-stop lever on the range finder. If the armature stop adjustments are not proper the trip latch-stop lever adjustment will be impossible. Adjust armature stops as follows:

With the armature held in SPACE position, rotate the mainshaft one complete turn. Then with the No. 1 selector lever on high part of its cam, there should be .040" clearance between the flat side of armature extension and the sword arm extension, inside surface. (See illustration below). Adjust the STOP SCREW to obtain the clearance if necessary. With the armature held in the MARK position, rotate the mainshaft one complete turn and make the same adjustment check on the opposite armature extension and the No. 1 sword arm. (You will find it helpful to remove one end of the armature spring and locking lever spring.) Holding the armature in the MARK position check the clearance. If necessary adjust the STOP NUT to get the .040" clearance.

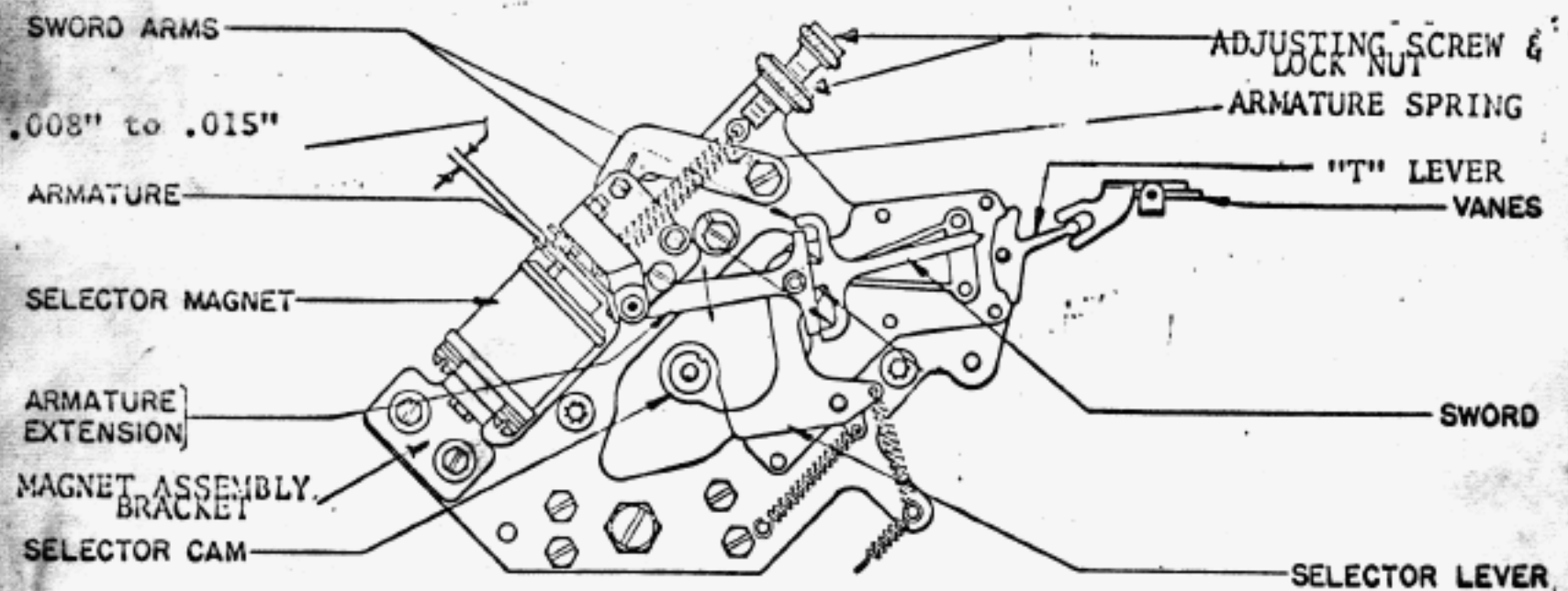
NOTE: The self locking stop nut may not be snug on the adjusting screw. If not, back it off the screw and pinch the slotted end together and remake the adjustment. (If loose it will back away from the adjustment in operation). Replace the locking lever spring and the armature spring.



To complete the selector assembly adjustments, position the Magnet Assembly Bracket so there is .008" to .015" clearance between the top of each magnet core and the armature, with the armature held in the MARK position. (See illustration below). Adjust by loosening the magnet bracket mounting screws and positioning the bracket. Tighten the mounting screws. (NOTE: In making this adjustment, the left edge of the core of the magnet should align with the left edge of the armature. Also, the top surface of the armature core must be square with the armature surface).

Adjust the armature spring adjusting screw midway of its length. Tighten the lock nut.

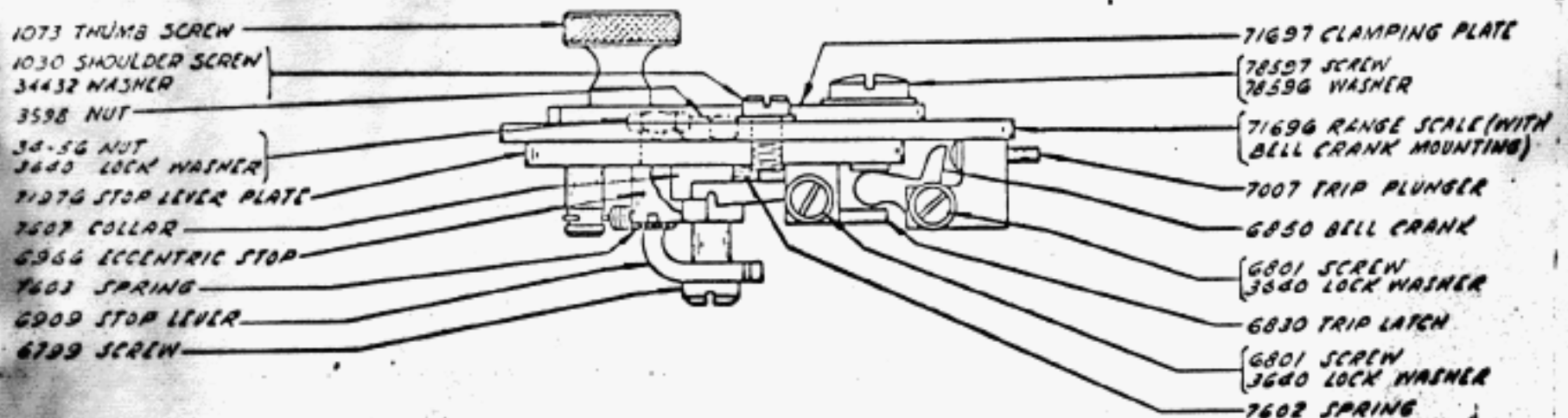
The preceding adjustments of MAINSHAFT, SELECTOR ASSEMBLY and MAGNET adjustments should be complete and final. When the Teletype is completely assembled and put on the line, the adjustments already made are the determining factor for a good operating range of the Teletype. With all adjustments checked and properly made the Teletype should operate within the range of 10-90 or 15-95 from a good line signal when tested.



While the Typing Unit is still standing on the right end frames, oil the selector unit. Place a drop of oil on each of the armature pivots. A couple drops of oil on the top end of the "T" lever pivot post and on the selector lever pivot post. (The oil will run slowly down the posts and lubricate all bearing surfaces). Also a drop of oil on the locking wedge point. Another on each "T" lever extension where the "T" levers operate in the yoke of selector vanes. DO NOT pour oil on the selector assembly. Excess oil will do no good but will cause trouble if oil gets on surface of armature or on magnet core and coils.

Be sure to put a drop of oil on clutch throwout lever pivots. LUBRIPLATE the surface of throwout lever where it cams with the 74502 clutch. Lubriplate the surfaces where the throwout lever and cam extension operate together. Spin the Mainshaft to be sure all surfaces are coated with lubriplate.

RANGE FINDER ASSEMBLY - Clean and inspect. Replace worn parts where necessary.

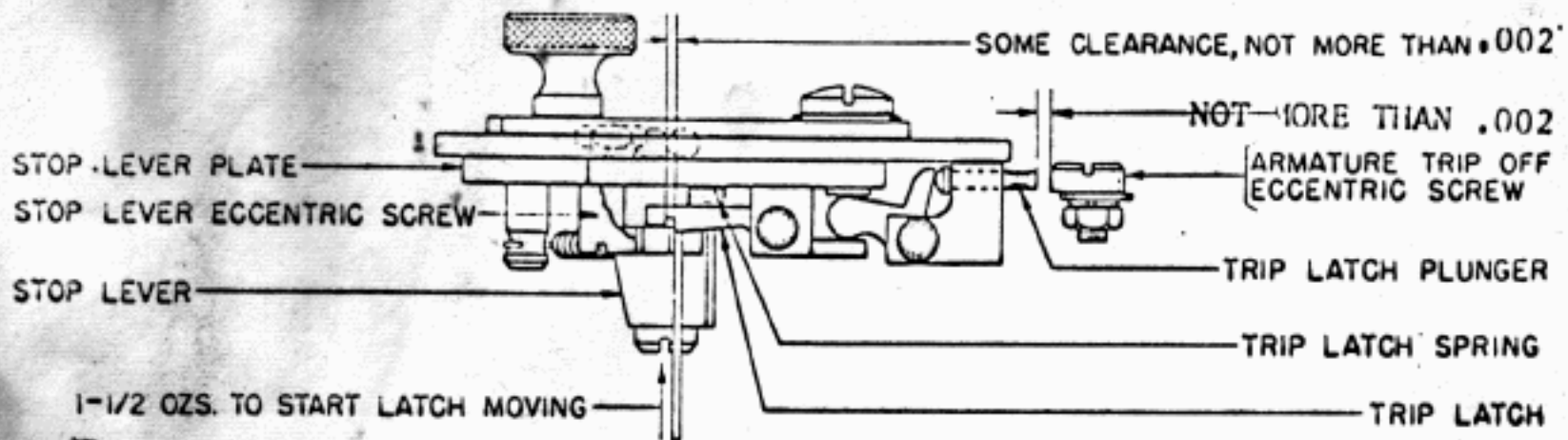


To determine if there is excessive wear on trip latch and stop lever surfaces where they latch, position the trip latch by pushing down on the trip plunger until the stop lever latching surface barely contacts the edge of the trip latch. At the same time hold the stop lever against the trip latch latching surface. When the extreme edges are in contact, try forcing the stop lever past the trip latch. If the latch surfaces are rounded from wear, the stop lever will slip past the trip latch under pressure. This indicates enough wear to cause occasional false trip-offs in operation and both parts should be replaced.

The 7602 compression spring should have at least 1 1/2 ounce of tension against the trip latch. Replace if it does not. (A new 7602 spring will usually appear one or two rounds longer than one that is compressed through long service).

To lessen the wearing effect on surfaces of the stop lever and trip latch, adjust the stop lever eccentric stop so there is a minimum of clearance, not more than .002" between the trip latch and stop lever surfaces when the latches are fully latched. Position the stop lever eccentric stop by means of its lock nut if necessary. Recheck the adjustment after tightening the lock nut. (See illustration below). Oil the range finder assembly. A drop of oil on each pivot and on each operating surface.

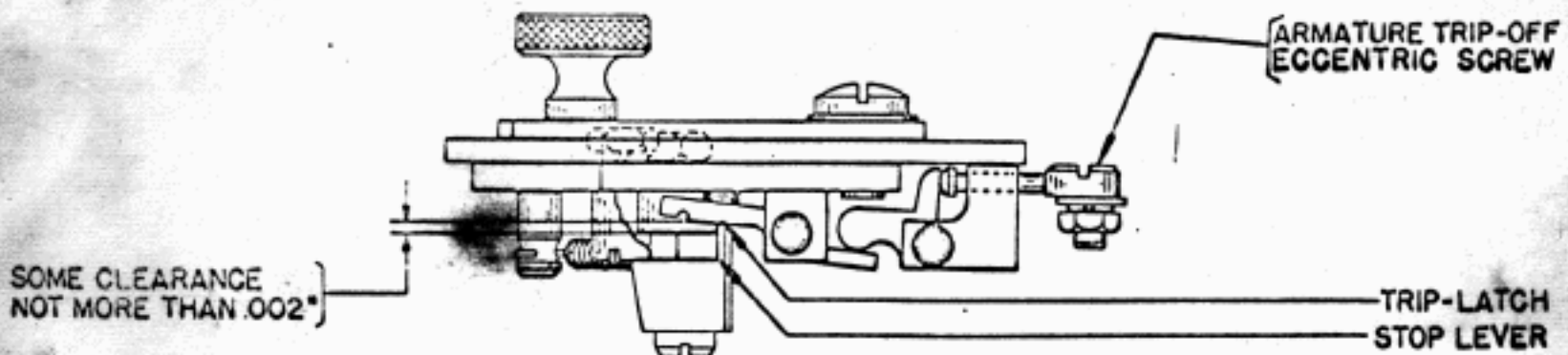
Install the range finder assembly on its mounting posts. Before tightening the 1030 shoulder screws, push slightly with the left thumb against the bottom of range finder, holding the assembly toward the armature trip-off eccentric screw. This will give maximum latch up of the selector cam extension and stop lever latching surfaces. The stop lever extension should overtravel the trip off lever, when in unlatched position, by at least three-fourths the thickness of the stop lever extension. Rotate the mainshaft to determine this adjustment with the armature held in the SPACE position. Tighten the 1030 shoulder screws. (Illustrations and location of adjustment on next page).



The armature trip-off eccentric adjustment should meet the following requirements:

The armature trip-off eccentric screw should be adjusted, if necessary, so there is some clearance but not more than .002" between the stop lever and trip latch when the armature is held in the SPACE position. Rotate the mainshaft until the stopping edge of stop lever is directly below the latching surface of the trip latch. (See illustration below).

When the armature is held in the MARK position against its stop nut, there should be some clearance but not more than .002" clearance between the eccentric adjusting screw and end of the trip latch plunger. (See illustration above).

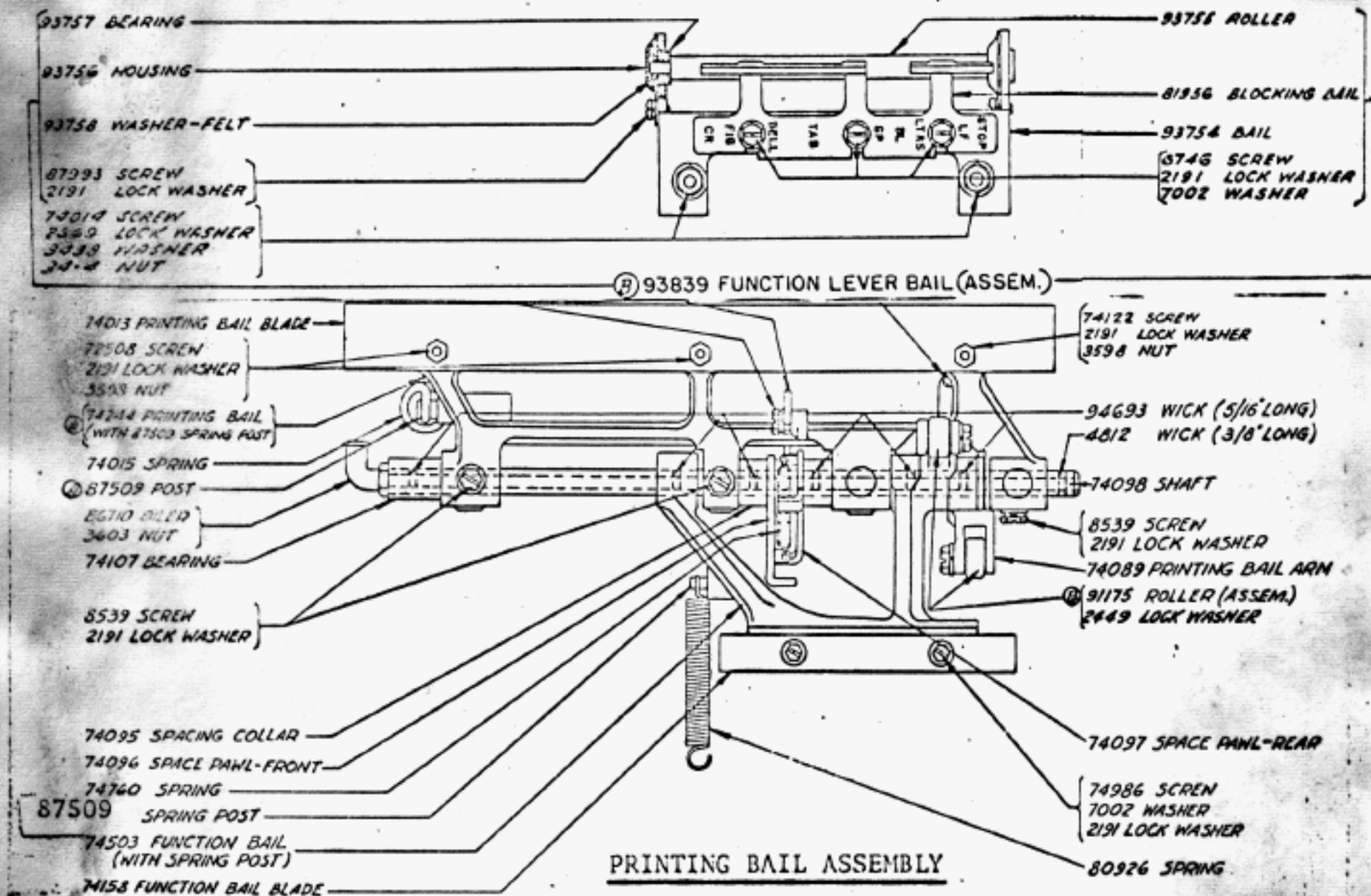


Check and if required, refine the above adjustments with the armature trip-off eccentric adjusting screw. When those requirements are met the mainshaft, selector assembly and range finder assembly is complete. The unit thus far is clean, checked, parts replaced, adjusted and properly oiled. There is no need to make further checks of the units up to this point.

Now return the Typing Unit to its upright, normal position, front facing you.

Oil lightly between separator plates of the selector unit with light oil. A few drops between each plate. Also oil along the "T" lever pivots and place a few drops of oil on rear of separator plates where the selector levers operate. CAUTION -- DO NOT over oil the unit. Spin the mainshaft a few times to work the oil down into the selector.

The PRINTING BAIL ASSEMBLY with FUNCTION LEVER BAIL (Assem.) attached, is the next unit to be cleaned, checked and oiled before installing it on the Typing Unit. (Illustrations below).



When clean and inspected with all screws and nuts secure, lubricate the unit. The 91175 roller assemblies are roller bearings and must be packed with LUBRIPLATE, as follows:

1. Unscrew the bearing screw out to the end of the threads. (DO NOT completely remove the bearing screw).
2. Hold it in position at end of threads with left hand.
3. Force Lubriplate into open screw hole with grease gun. The Lubriplate will squeeze out through the roller assembly.
4. With your finger, hold tightly against the hole where you put lubriplate and replace the bearing center screw. Use open end wrench to secure the bearing screw.
5. Repeat the procedure for the other 91175 roller assembly.
6. Place a few drops of oil on the outside of the roller assemblies and turn them to dilute the Lubriplate.

NOTE: Oil alone in the assemblies is not sufficient. The assemblies must be packed with Lubriplate.

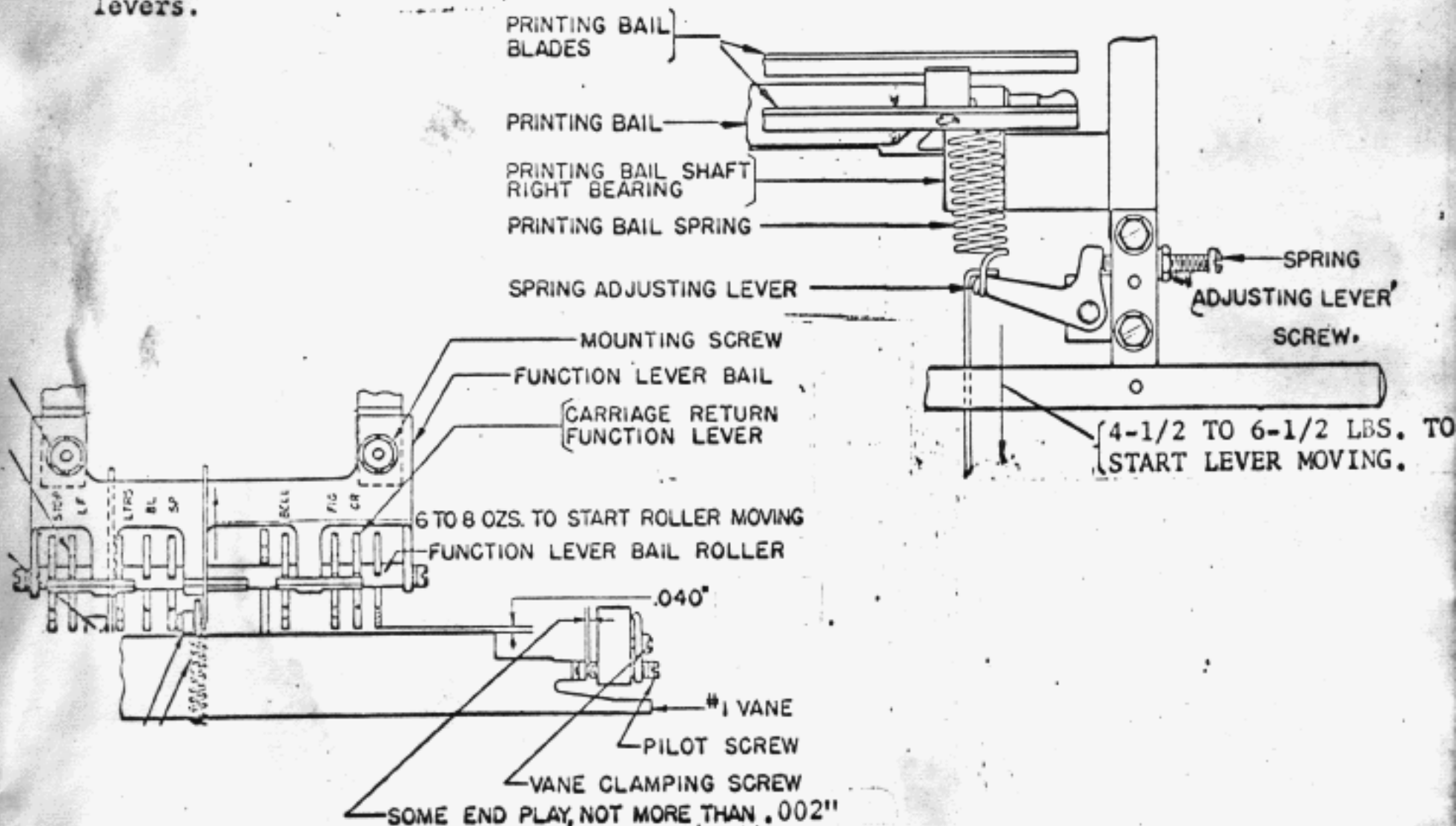
Now fill the assembly shaft with oil by turning the assembly on end with

the open end of shaft up. Continue to put oil into the shaft until it runs out the other end. Return assembly to horizontal position and oil lightly all bearing surfaces of the function bail and printing bail arm. (If the unit has been properly and regularly serviced in the past it will not be necessary to disassemble the printing bail nor to replace the oil wicks in the shaft). If in doubt, remove the shaft and inspect it.

Saturate the felt around the 97357 bearing on the function lever bail assembly. Coat the 93755 roller with Lubriplate.

Install the Printing Bail Assembly in the Typing Unit. The following requirements should be met: (See illustrations below).

1. With the assembly pushed all the way to the left, position the right bearing by utilizing its elongated mounting holes, so that printing bail end play is not more than .005".
2. Install printing bail and function bail springs.
(Lubriplate spring posts)
3. Adjust printing bail spring tension from 4 1/2 to 6 1/2 pounds with printing bail in rear most operating position.
4. With the printing bail in its rearmost position there should be .040" clearance between the rear edge of the No. 1 vane and front edges of the function levers.



5. With the CARRIAGE RETURN combination selected, rotate the mainshaft until the carriage return function lever comes all the way forward into the vanes. The carriage return function lever top edge and the front edge of the left projection of the function lever blocking bail should be flush (within .005").

6. With the UPPER CASE combination selected, rotate the mainshaft until the upper case function lever comes all the way forward into the vanes. The upper case function lever top edge and the front edge of the right projection of the function lever blocking bail should be flush (within .005").

7. If all requirements are met, spread a thin coat of lubriplate along inside of each 74013 printing bail blade.

8. There should be perceptible end play, not over .002", between the pilot screws and vane bearings.

9. A drop of oil on each pilot screw and vane bearing.

10. Spread a thin coat of lubriplate and thin with oil along front edges of all vanes.

11. Lubriplate and oil upper, center and front typebasket carriage tracks.

At this point check to make sure every point or spot on the Typing Unit requiring oil has been properly lubricated. Start at left end of platen. Oil all pivots and wearing surfaces on the left hand platen bracket. Move to the right end of platen and continue the oiling procedure. CAUTION: Do not over oil these areas. Excess oil will damage the platen.

Turn Typing Unit to right end and oil obvious points.

Turn Typing Unit and check rear of unit for proper oiling.

The Typing Unit is now complete except for the TYPEBASKET. The TYPEBASKET should be cleaned, inspected and oiled before installing on the Typing Unit.

Special attention of the TYPEBASKET is important. To avoid trouble calls the ribbon feed, ribbon reverse mechanisms and all adjustments on the typebasket must be correct. Needless to say this is the end result of a first class routine. Even, clean and accurate type should be a pleasing final result. Proper ribbon feed and reversal is essential to that final result.

Following are some points to give special attention for proper Typebasket operation over a long period of operation.

(MAKE ALL ADJUSTMENTS ACCORDING TO THE TELETYPE ADJUSTMENT MANUAL).

1. Ribbon reverse shaft.
 - a. Check for proper adjustment.
 - b. Check for wear on shaft, shaft bearings and bearing caps.
 - c. OIL.
2. Check vertical ribbon shaft bracket assemblies (right and left)

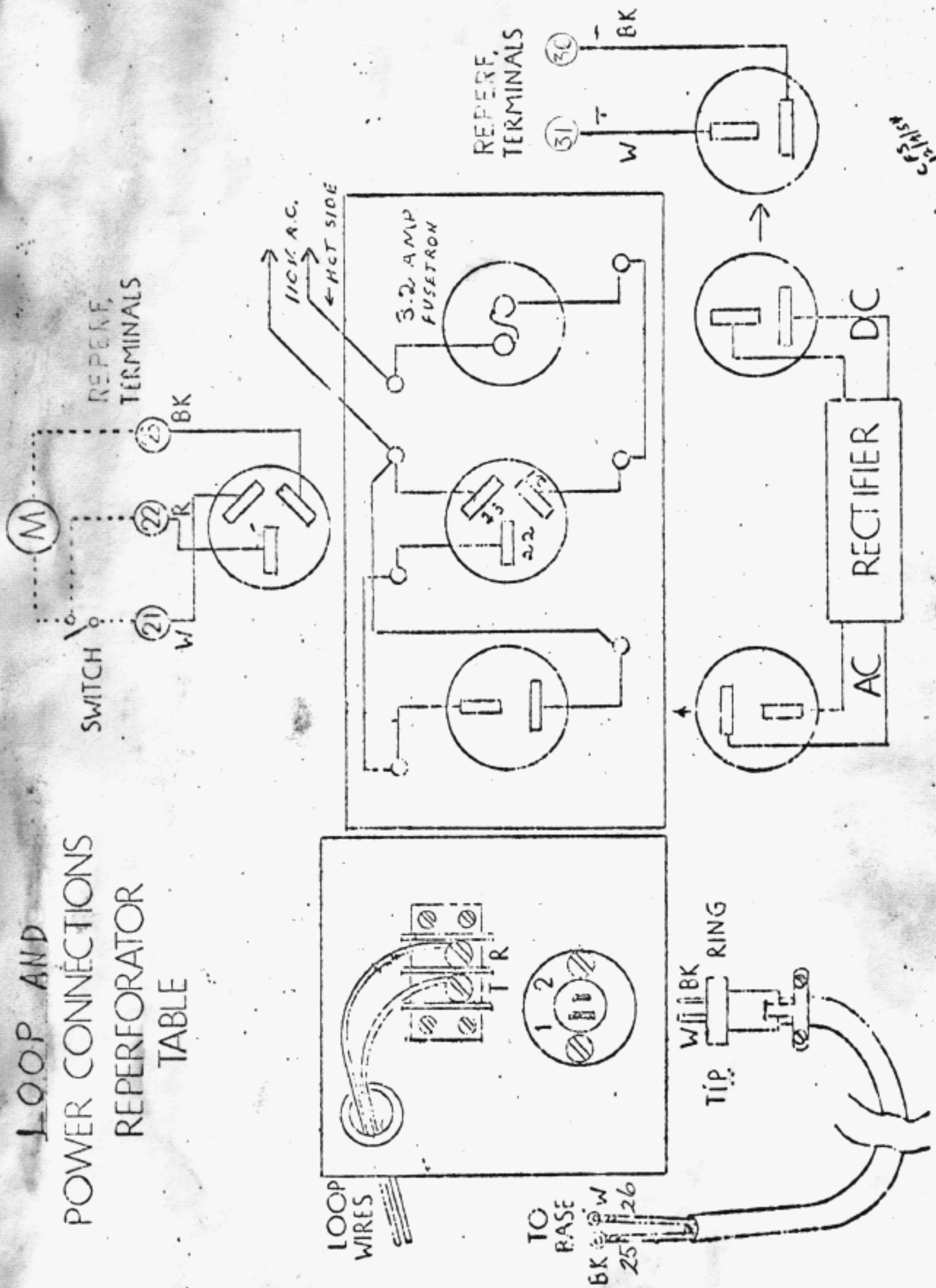
- a. Bevel gear adjustment & wear.
 - b. Shaft position.
 - c. Upper shaft gears. (Tighten set screws)
 - d. Ribbon reverse arms
3. Bell cranks and code bars. (Oil each pivot).
 4. Typebar assembly and typebar segment.
 - a. Clean thoroughly. Clean out each typebar segment, if necessary with a suitable sharp point. (A straightened out GEM paper clip is the ideal tool).
 - b. Wipe each typebar clean.
 - c. Oil segment.
 5. Clean and inspect Ribbon Spool cups and ribbon guide rollers. Replace ribbon spool shaft pins if deeply cut.
 6. Oil every pivot and wearing surface.
 7. Lubriplate reverse shaft detent.
 8. Lubriplate Pull Bar bail roller surfaces (right and left).

Install the TYPEBASKET on the Typing Unit.

With the carriage in its left and locked position the left hand margin screw should be adjusted snug against the dashpot operating lever. (No clearance between the two points with the dashpot lever held in the carriage locked position).

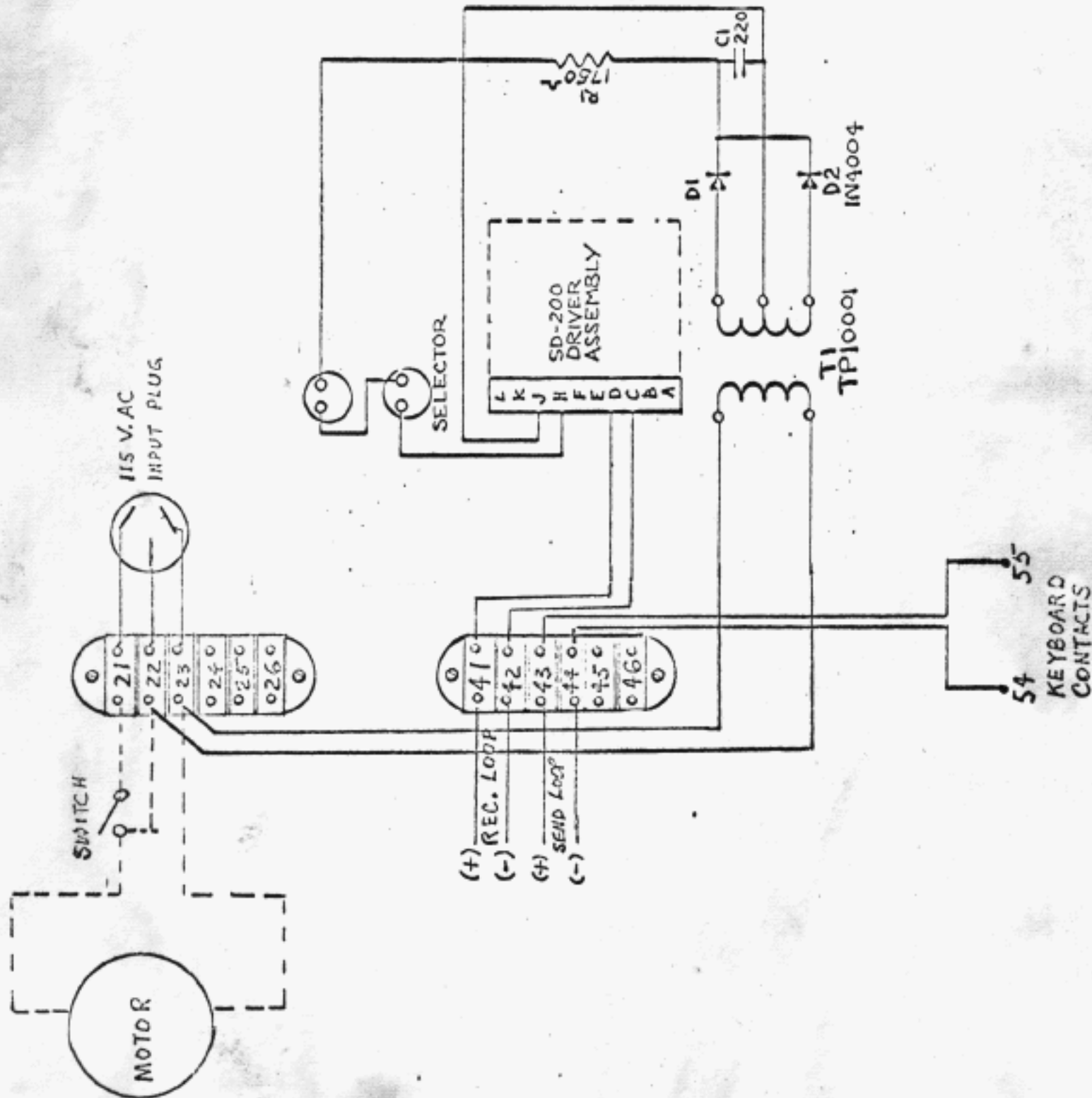
The Typing Unit is now ready for normal operation. Return Typing Unit to the base. Be sure the fiber gear and motor pinion are meshed properly before tightening the thumbscrews. Set the Typing unit on the base and turn the motor flywheel clockwise, then tighten the thumbscrews. Thread in paper, install ribbon and turn unit on. Take a range. As stated before, the unit should have a range spread of 80 points with upper and lower limits in the 10-90/15-95 range.

LOOP AND POWER CONNECTIONS REPERFORATOR TABLE



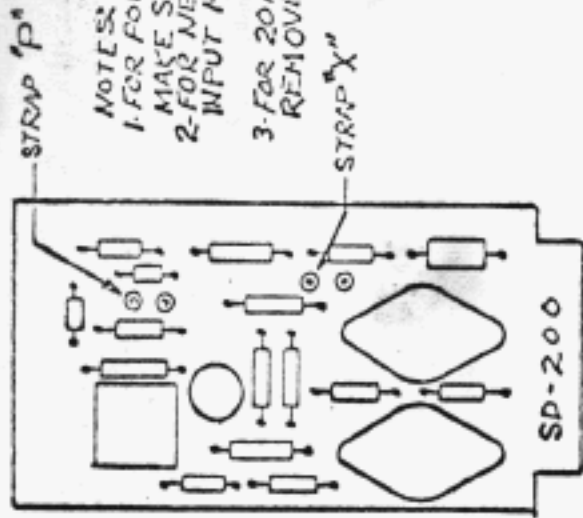
CS 1/15/54

PRINTER BASE WIRING WITH SD-200



NOTES:

- 1- INPUT SIGNAL CAN BE POLAR OR 20-60 MA NEUTRAL. STRAP SD-200 CIRCUIT CARD ACCORDINGLY.



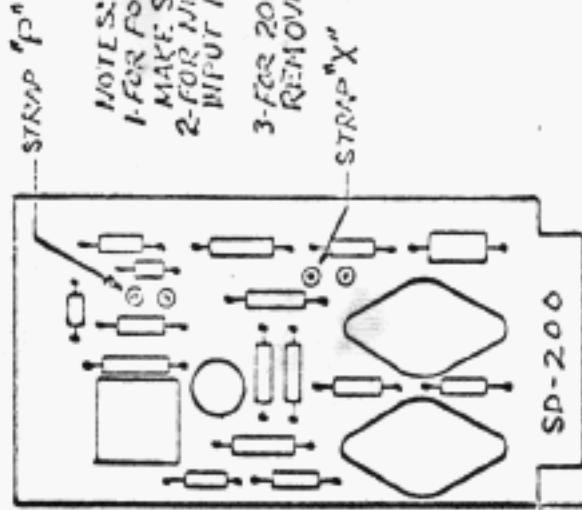
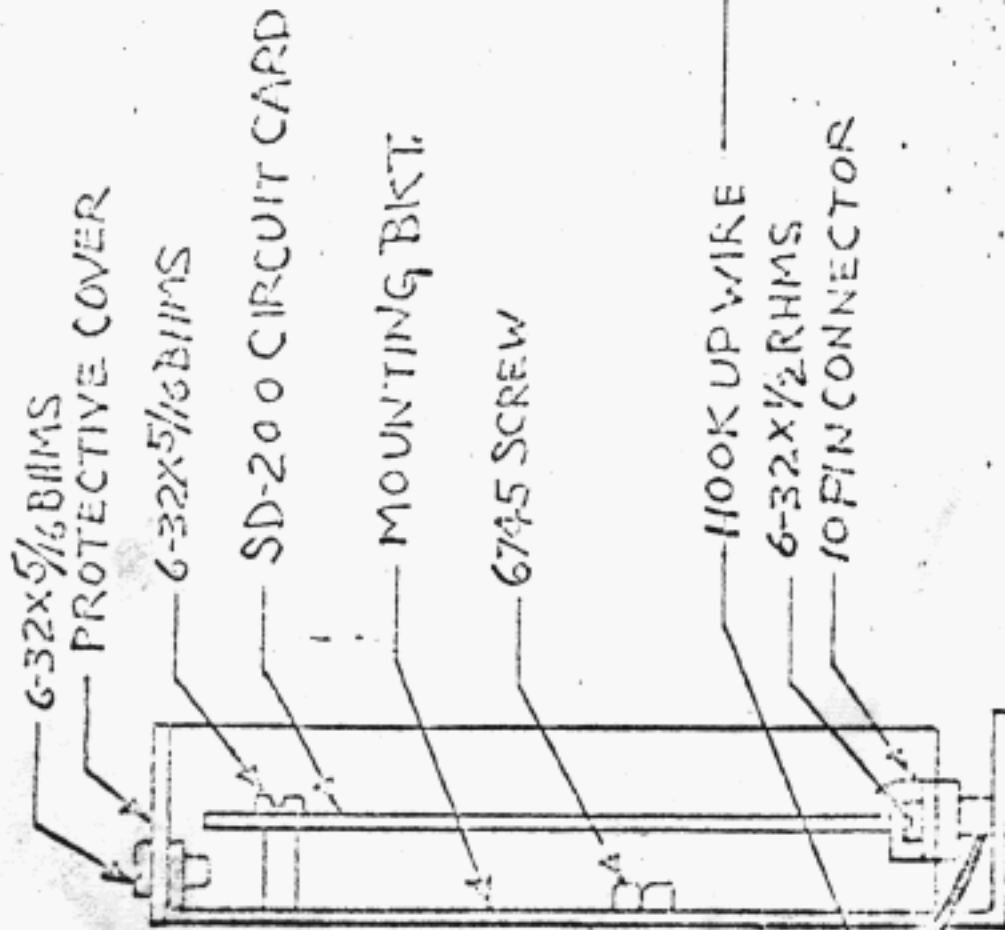
- NOTES:**
- 1- FOR FOLIO INPUT MAKE STRAP 'P' ONLY.
 - 2- FOR NEUTRAL 60 MA INPUT MAKE STRAP 'X' ONLY.
 - 3- FOR 20 MA NEUTRAL INPUT REMOVE ALL STRAPS.

PRINTER BASE

CJS
Engineering
3/4/70

NOTES:

- 1- INPUT SIGNAL CAN BE POLAR OR 20-60 MA NEUTRAL. STRAP SD-200 CIRCUIT CARD ACCORDINGLY.



- NOTES:
- 1- FOR POLAR INPUT MAKE STRAP "P" ONLY.
 - 2- FOR NEUTRAL 60 MA INPUT MAKE STRAP "X" ONLY.
 - 3- FOR 20MA NEUTRAL INPUT REMOVE ALL STRAPS.

WIRE	FUNCTION
RED	INPUT SIG. LINE
BLU	+ SLV. - TIP
GRN YEL	OUTPUT + SLV - TIP

CARD TERM.
C
D
H
J

MULTIPLEX COMMUNICATIONS W. BOSTON, N. Y.

TITLE: SD-200

DRAWN: J.G. 12-12-51

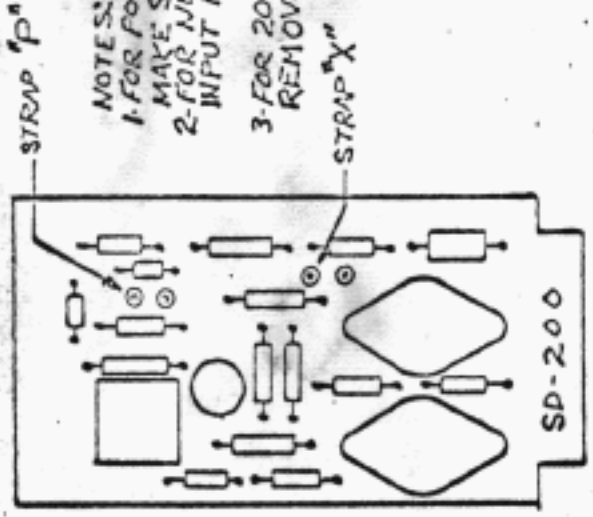
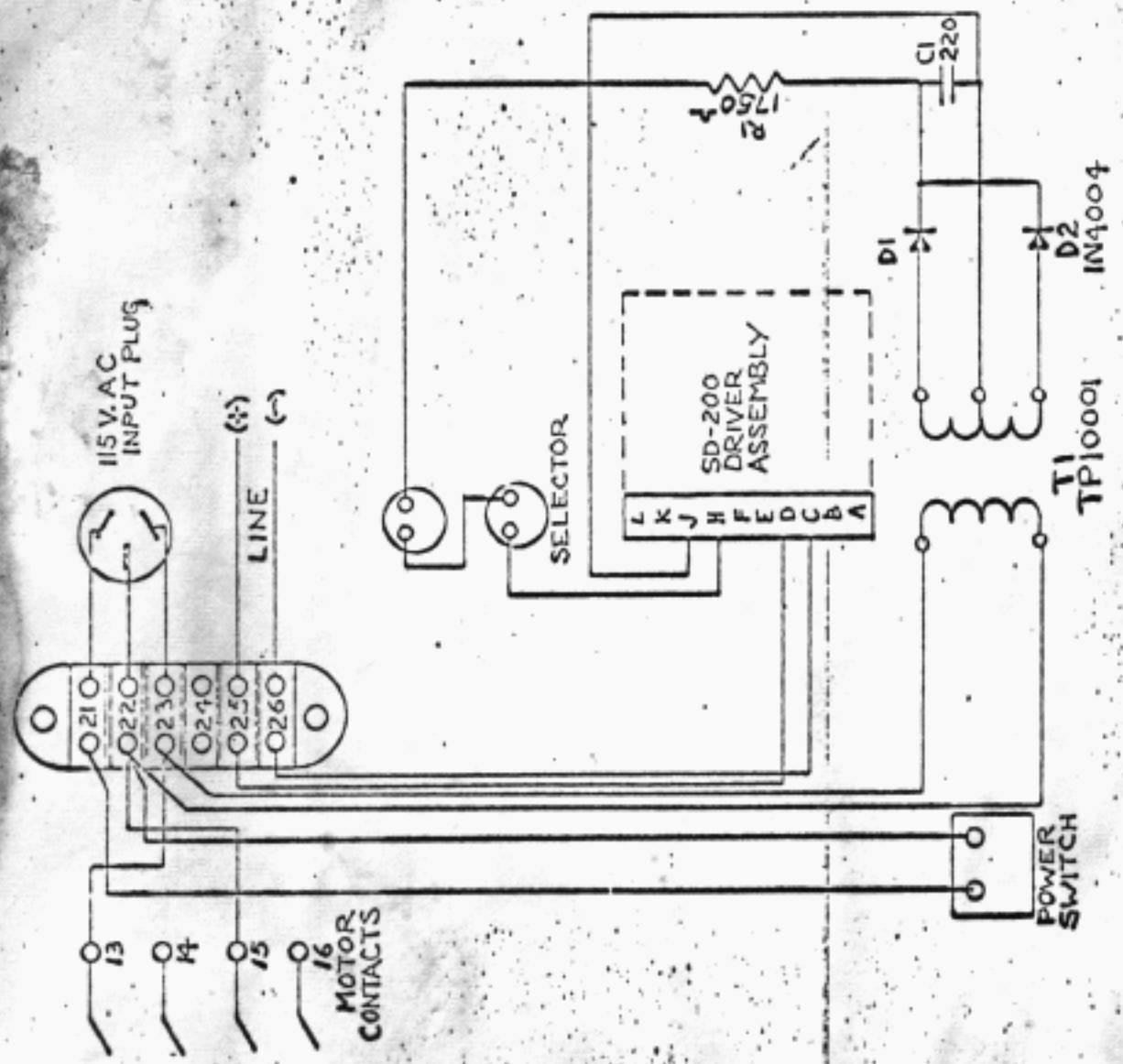
APPROVED: [Signature]

FR 300-3

SHEET 1 OF 1

NOTES:

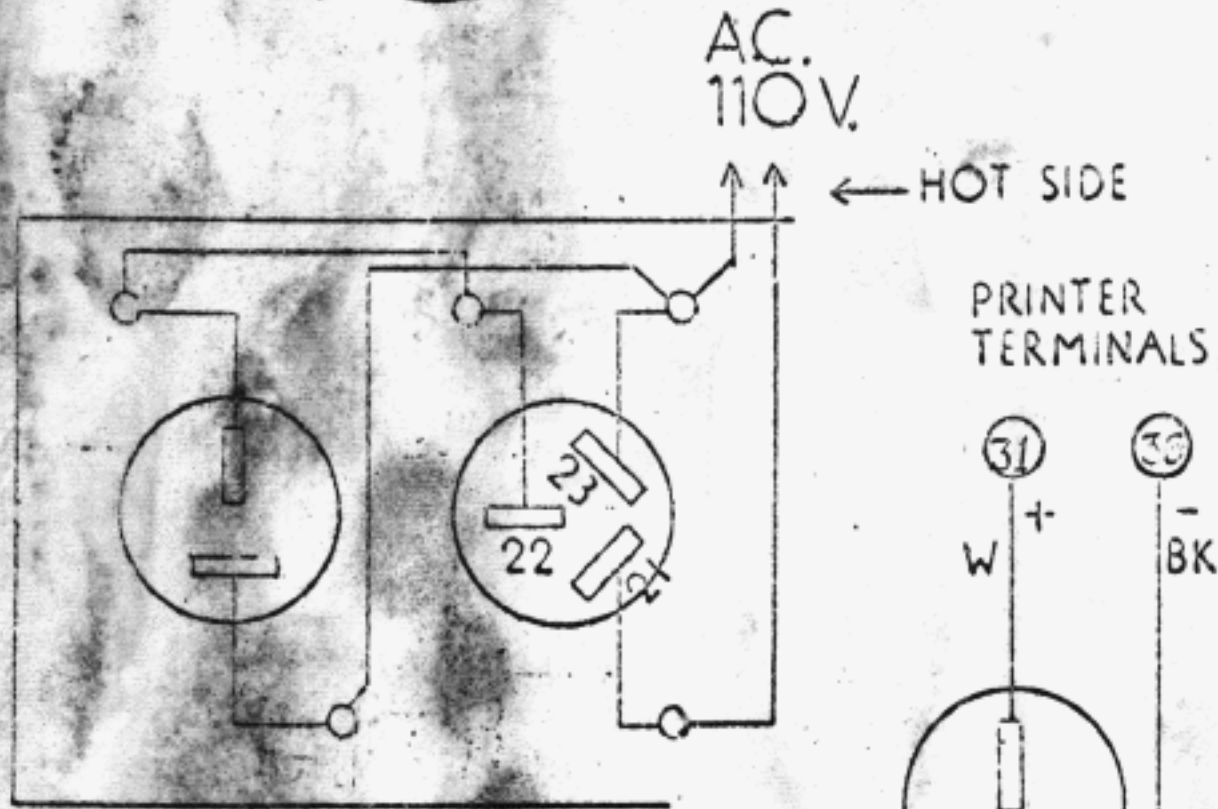
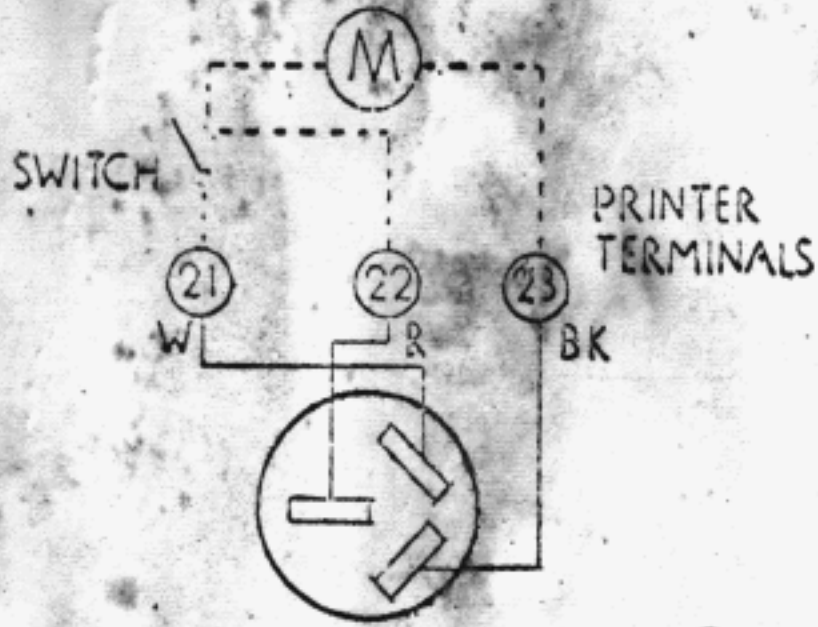
- 1- INPUT SIGNAL CAN BE POLAR OR 20-60 MA NEUTRAL. STRAP SD-200 CIRCUIT CARD ACCORDINGLY.



- NOTES:
- 1- FOR POLAR INPUT MAKE STRAP 'P' ONLY.
 - 2- FOR NEUTRAL 60 MA INPUT MAKE STRAP 'X' ONLY.
 - 3- FOR 20 MA NEUTRAL INPUT REMOVE ALL STRAPS.

MULTIPLEX COMMUNICATIONS W. BAYLOR, N. Y.		TITLE: CIRCUIT SCHEMATIC RPE DRIVER BASE	
DRAWN T.G.	12-12-51	APP'D P.J.	12-13-51
		OWG SIZE	1 OF 1
		RR 300-3	

POWER CONNECTIONS
PRINTER TABLE WITH
RECTIFIER



CTIS

Engineering

Evil 3/4/70