Teletype Corporation
Chicago, Illinois, U.S.A.

INSTRUCTIONS FOR ADJUSTING, LUBRICATING AND PREPARING MODEL 17 RADIO PRINTERS FOR OPERATION

UNPACKING

Remove the printer from its packing container. Remove the cover from the printer unit by taking out the two mounting screws at the rear corners of the base plate, and by loosening the two cover mounting screws in the front plate. (The two screws in the front plate need not be removed). The right cover mounting screw on the front plate may be made accessible by pulling the felt ink roll forward off its rotary stud mounting. If the printer is equipped with a governed motor, remove the wooden block under the motor.

ADJUSTING

General

The following adjustments are arranged in a sequence that would be followed if a complete readjustment of the printer were undertaken. This fact should be kept in mind when a single adjustment is made.

The spring tension values given in this specification were derived from measurements made with Teletype spring scales. These scales are calibrated for use in a vertical "pull" position. When used in any other position the reading is an indicated value. Therefore, in order to obtain the proper spring value readings the spring scales which are included in the Teletype printer catalog tool list should be used.

Remove the magnet unit cover from the front of the printer by taking out the two mounting screws from the underside of the base and the fillister head mounting screw from the front plate. Remove the motor pinion from the motor shaft after loosening the two motor pinion set screws.

Remove cover plate on underside of base plate by removing the 3 mounting screws.

Intermediate Shaft Assembly Adjustment

The intermatiate shaft should rotate freely and have less than .003" end play.

To adjust, remove the intermediate shaft assembly by removing the two screws which secure the intermediate shaft assembly to the printer front plate. Loosen the worm gear mounting screw and position worm gear on shaft. Tighten mounting screw.

Feed Roll Shaft Adjustment

The feed roll shaft should rotate freely and have less than .003" end play.

To adjust, loosen mounting screw of collar at rear of feed roll shaft, position collar, and tighten mounting screw.

Scanning Wheel Shaft Adjustment

The scanning wheel shaft should rotate freely and have less than .003" end play.

To adjust, loosen worm gear mounting screw on scanning wheel shaft. Position worm gear and tighten mounting screw.

Intermediate Gears Adjustment

Replace the intermediate shaft assembly on the front plate using the two screws previously removed.

There should be a barely perceptible amount of backlash between the scanning wheel shaft pinion and the intermediate shaft gear, and the feed roll shaft gear and the intermediate shaft pinion throughout a full revolution of the feed roll shaft gear.

To adjust, loosen the two screws which secure the intermediate shaft assembly to the printer front plate and shift the intermediate gear assembly. Tighten the mounting screws.

Motor Pinion Lateral Alignment

Replace the motor pinion.

The lateral alignment of the motor pinion and scanning wheel shaft driving gear should be such that the center line of the gear coincides with a vertical line through the center of the teeth in the motor pinion.

To adjust, loosen the motor pinion set screws and slide the pinion on the motor shaft. Tighten the set screws.

Motor Pinion Backlash Adjustment

There should be a barely perceptible amount of backlash between the motor pinion and the highest point on the scanning wheel shaft drive gear.

To adjust, (Printers equipped with horizontal foot mounted motors) add or remove shims under the motor feet.

To adjust, (Printers equipped with flange mounted motors) loosen the motor mounting screws and position the motor on the side plate to meet this requirement. Tighten the motor mounting screws.

MOTOR STOP UNIT ADJUSTMENTS

1. Armature Pivot Screws Adjustment

Remove the two screws and lockwashers which secure the motor stop unit to the rear plate of the printer and lift the motor stop unit away from the printer.

The motor stop magnet armature should be located approximately midway between the two legs of the motor stop unit bracket and should have a barely perceptible amount of end play.

To adjust, loosen the pivot screw locknut, position pivot screw, tighten pivot screw locknut.

2. Magnet Position Adjustment

The centers of the curved surfaces of both magnet cores should touch the armature when the armature is held operated by hand.

To adjust, loosen the two magnet mounting screws, position magnet, tighten the mounting screws and then recheck magnet position.

Note: The clearance between the curved surfaces of the magnet cores and the armature may be observed by holding the magnet in front of a light background.

3. Armature Air Gap Adjustment

With the Motor Stop Unit Armature in contact with the motor stop unit magnet cores there should be an air gap of from .020" to .025" between the armature and the eccentric stop.

To adjust, loosen the armature eccentric mounting screw, position the eccentric, tighten the eccentric mounting screw.

4. Armature Spring Tension

Hold the motor stop unit so the armature is horizontal. It should require a downward vertical push of 1½ to 2½ ozs. of an 8 oz. scale at the outside edge of the armature to start the

armature away from the eccentric stop.

5. Follower Lever Lower Spring Bracket Adjustment

The worm follower lever lower spring bracket should be positioned so that the form in the spring bracket nearest the mounting hole is parallel to the edge of the magnet armature on which it is mounted.

To adjust, loosen the spring bracket mounting screw nut, position the bracket, and tighten the nut.

6. Worm Follower Lever Lower Spring Tension

Hold the motor stop unit so the armature is horizontal. It should require a push of 2 to 3 ozs. on an 8 oz. scale held at right angles to worm follower lever at spring holes to start the lever downward.

7. Worm Follower Lever Rear Spring Tension

Hold the motor stop unit so the armature is horizontal. It should require a horizontal pull of 1 to 2 ozs. on an 8 oz. scale hooked over worm follower lever just inside of worm follower pin to move the follower lever to a position at right angles to the edge of the armature.

Tape Pressure Roll Lever Spring Tension

With inking roll removed and inking roll shaft bracket rotated to its extreme clockwise position it should require a pull of not less than 22 ozs. on a 32 oz. scale hooked over the lock nut from the left, of the roller mounting screw, to start the roller away from the feed roll.

PRELIMINARY PRINTING UNIT ADJUSTMENTS

1. Permanent Magnet

The permanent magnet should be saturated and the south magnetic

pole should be on top.

Remove the printing unit and remove the permanent magnet. Magnetize the magnet in a magnetic field of sufficient strength to saturate the magnet.

2. Armature Pivot Screw Adjustment

The printing unit armature should not bind on the armature pivot screws and should not have any perceptible end play.

To adjust, loosen the lock nut on the front pivot screw, screw the front pivot screw inward until the armature just begins to bind, then back the pivot screw approximately 1/16 revolution, and tighten lock nut. Check for bind and end play. Replace the permanent magnet with the south magnetic pole on top.

3. Armature Position

The armature should align with the magnet cores.

To adjust, loosen the two top plate and magnet mounting screws and position top plate until the armature is centrally located with respect to the magnet cores and the front edge of the armature is parallel with the front edge of the laminations of the magnet cores.

4. Laminated Magnet Core Position

There should be uniform and equal air gaps of from .0015" to .003" between the armature and the laminated magnet cores when the armature is positioned to have equal air gaps with the top plate.

To adjust, measure the average air gap between the top plate and right and left ends of the armature.

Note: Insert an .010" or .015" gage in one air gap and measure the other air gap. The average gap is the average of these two readings.

Insert a gage that is .0015" to .003" less than the average gap in the right upper gap. Rotate the armature counterclockwise as far as possible. Loosen the left mounting screw of the magnet core laminations. Position the laminations individually until they touch the left end of the armature. Tighten the left mounting screw.

Note: It may be necessary to loosen slightly the right mounting screw. The front or rear laminations may not touch the armature and these laminations should not project above the other laminations.

Remove the gage from the right upper gap and insert in the left upper gap. Rotate the armature clockwise, loosen the right mounting screw of the magnet core laminations. Position the laminations individually until they touch the right end of the armature. Tighten the right mounting screw.

Check laminations on left side. Check that the gap between one magnet core and the armature is 003" to 006" when the armature is rotated till it touches the other magnet core.

5. <u>Preliminary Printing Unit Position</u>

The printing unit should meet the following position requirements:

The bottom plate should be parallel to the base plate.

The front edge of the bottom plate should be parallel to the front edge of the base plate.

The printing blade should coincide with a vertical plane through the axis of the scanning wheel shaft.

The printing blade should overlap by an equal amount the front and rear edges of the scanning wheel.

To adjust, loosen the three mounting screw nuts and rotate the three lower mounting screw nuts until the bottom plate is equidistant from the base plate and then position the printing unit and tighten the three upper mounting screw nuts.

6. Motor Stop Control Contact Alignment

The control contact on the underside of the print hammer should align with the control contact screw assembled beneath it.

To adjust, loosen the two screws which secure the contact screws in insulating block, shift the block and tighten the screws.

7. Print Blade Clearance

With the print blade held against the scanning wheel there should be from .004" to .006" clearance between the contact on the print hammer and the contact screw.

To adjust, loosen the contact screw lock nut, position the screw, and tighten the lock nut.

8. Armature Air Gap Adjustment

There should be an approximately equal air gap at the right and left ends of the armature.

To adjust, increase or diminish the distance from the bottom plate of the printing unit to the base plate by rotating the six bottom plate mounting screw nuts an equal amount in a clockwise or counterclockwise direction as is necessary.

Note: For example if the right hand lower gap is greater than the left hand lower gap, the bottom plate is too low and all six nuts should be rotated an equal amount counter-clockwise as viewed from above.

Note: It may be necessary to make adjustment 8 roughly before adjustment 7.

Power Connection

Connect the printer to a source of power in accordance with information contained on wiring diagrams furnished with the printer.

Governor Adjustments

On printers equipped with governed motors, the governor should be adjusted as follows:

1. Governor Contact Alignment

   The contact point on the governor contact spring should align with the contact screw.

   To adjust, loosen the governor contact spring bracket mounting screws, shift the bracket, tighten the mounting screws. Recheck the adjustment.

2. Governor Contact Adjustment

   With the contact point on the governor contact spring touching the contact screw, the arm which carries the contact point should be parallel with the governor frame bridge.

   To adjust, loosen contact screw lock nut, position contact screw, tighten lock nut.

3. Governor Contact Spring Bearing Alignment

   The bearing pin on the governor contact spring should be positioned so that it will ride in the center of the jeweled bearing on the governor weight extension throughout

a full revolution of the governor.

To adjust, loosen and shift either the governor frame bridge, the governor contact spring assembly or the governor weight extension assembly, or a combination shift thereof. Tighten mounting screws of shifted parts. Recheck governor contact alignment.

4. Governor Weight Spring Tension

Unhook the governor weight spring from its adjusting screw and the governor weight. Hook a 12 pound scale in one end of the spring. It should require from 3-3/4 to 4-3/4 pounds to pull the spring to a length of one inch. Replace the spring.

5. Governor Contact Spring Tension

Unhook the governor contact spring from the speed adjusting lever and the speed adjusting lever and the spring post in the contact spring assembly and hook a 32 oz. scale in the end of the spring. It should require from 10 to 13 oz. to pull the spring to a length of 3/4 of an inch.

6. Motor Speed Adjusting Shaft Drag Spring Tension

Unhook the speed adjusting shaft drag spring from the speed adjusting shaft and hook a 12 pound scale in the end of the spring. It should require from 3 to 4 pounds to pull the spring to position length. Rehook the spring.

7. Preliminary Motor Speed Adjustment

The speed adjusting shaft should be positioned until there are approximately an equal number of threads of the shaft on each side of the rear plate.

Loosen the governor weight spring adjusting screw lock nut and position the adjusting screw until the motor will run at approximately 1800 rpm when turned on. Tighten lock nut before turning on motor.

8. Final Motor Speed Adjustment

Final motor speed adjustment may be made by rotating the speed adjusting shaft. Clockwise rotation will decrease the speed of the motor.

Motor Stop Unit Position Adjustment

Remount the motor stop unit on the rear plate, by means of the screws and lock washers previously removed. With the armature of the motor stop unit in the unoperated position, the pin on the worm follower lever should not engage the motor stop worm on the feed roll shaft, and the worm follower lever should stop against the flange on the collar assembled to the rear of the motor stop worm; with the armature in the operated position the worm follower pin should engage the motor stop worm and be moved toward the front of the printer when the worm is rotated.

To adjust, loosen the motor stop unit mounting screws, position the unit, and tighten the mounting screws.

Motor Stop Contacts Adjustment

1. Contact Springs Adjustment

Remove the motor stop contacts and bracket by removing the two mounting screws.

With contacts held vertical it should require a horizontal pull of 4 to 5 ozs. on an 8 oz. scale hooked just inside the insulator on the long contact spring to open the contacts.

Adjust by bending the long contact spring. Replace the contacts and bracket.

2. Bracket Position Adjustment

The motor stop contact bracket should be positioned so that with the motor running and the motor stop armature held against the magnet cores, the worm follower pin engaging the worm and moving toward the front, the worm follower lever should strike the middle portion of the insulator on the long contact spring and open the motor circuit. The delay in the opening of the motor stop contacts should be sufficient to permit the printer to feed from 2 to 5 inches of tape after a message.

To adjust, loosen the motor stop contact bracket mounting screws, position the bracket and tighten the screws.

Signal Connection

Connect the printer to a source of test signals in accordance with information on wiring diagrams furnished with the printer.

Ink Roll Adjustments

The ink roll should rotate freely and should ink the scanning wheel uniformly.

To adjust, position the ink roll so that there is always some clearance between the rear surface of the ink roll and the front surface of the rear leg of the ink roll shaft bracket and so it overlaps to the front and rear of the scanning wheel. Adjust the ink roll to bear equally on the scanning wheel by bending the rear leg of the ink roll shaft bracket. Replace the ink roll if it is not concentric with the shaft on which it rotates.

Adding Ink to the Ink Roll

Before the printer is placed in service it will be necessary to apply ink to the ink roll. This may be done by either rolling the felt roller in ink that has been poured on a sheet of paper, or by applying ink with a brush, or by soaking the ink roll in a container of ink for a time long enough for the felt to become saturated. A new ink roll will absorb more ink than one which has been previously inked. Excess ink on the periphery surface of the felt roll should be removed.

Tape

The printer cover should be placed to the right of the printer and a roll of tape be placed in the tape container. The tape reel should rotate freely on the tape reel stud. Thread the tape through the tape guide, under the tape feed pressure roller, under the scanning wheel and over the print blade.

Final Printing Unit Adjustment

The printing unit should print dots on a 60 cycle AC signal of less than 10 volts applied across terminals 3 and 7 of the printer. The dots should be of uniform intensity across the tape. The armature should return to the clockwise position at the end of a marking signal.

To adjust for uniform intensity of printing across the tape, raise or lower the rear edge of the bottom plate by rotating the rear mounting screw nuts.

To adjust the printer for maximum sensitivity raise the motor control screw contact until the printing blade forces the tape into contact with the scanning wheel and the wheel smudges the tape. Lower the contact until the smudging just stops, with the magnet unit cover in place.

Lower the bottom plate until the desired sensitivity is secured.

Note: There should be some spacing magnetic bias on the armature to return the armature to spacing position during no signal conditions. This is necessary for reliable motor stop operation. As the bottom plate is lowered this spacing magnetic bias is reduced and if the bottom plate is lowered too much it will change to marking bias.

The optimum adjustment for the printing unit is one with maximum sensitivity consistent with reliable operation of the motor stop unit.

Fine adjustments may be made with the right front mounting screw nuts.

Tape Guide Adjustment

The tape guide should be positioned so that with the pressure roller held away from the tape feed roll the tape will pass freely through the tape guide. There should be a small loop in the tape where it passes over the print blade. This loop should be approximately 1/2 as high as the clearance provided in the tape guide at that point.

To adjust, loosen the tape guide mounting screws and position the tape guide. Tighten the mounting screws.

Connection to Printer Signal Source

Connect the printer to the source of printer signals in accordance with information contained on wiring diagrams furnished with the printer.

Some small readjustments of the printing unit may be necessary to secure the best quality of printing from the printer. These adjustments will depend upon the signal source.

Should the printer print "white on black" instead of "black on white" reverse the input signal leads to terminals 3 and 7 of the printer.

Lubrication

Unless otherwise specified, one or two drops of a good grade of light oil at each of the places indicated will be sufficient. Use oil for lubrication at all places listed below except where the use of grease is specified.

1. Scanning wheel shaft - front and rear bearings.
2. Feed wheel shaft - front and rear bearings.
3. Motor Stop magnet armature and bearings points.
4. Motor stop worm follower lever - at pivot point.
5. Motor stop worm.
6. Feed wheel shaft gear - grease.
7. Scanning wheel shaft pinion - grease.
8. Intermediate shaft gears - grease.
9. Intermediate shaft - saturate oil wick.
10. Pressure roller arm - at pivot point.
11. Ink roll shaft

12. Print hammer at pivot points - Apply a drop of oil with the end of a tooth pick or similar article and apply to the print hammer pivot bearings.
13. Motor pinion - grease.
14. Scanning wheel shaft driving gear - grease.
15. Springs - oil both loops of all helical springs that exert a nominal tension of less than 2-1/2 pounds. Apply grease to both loops of all helical springs that exert a nominal tension of 2-1/2 pounds or more.
16. Governor contact spring pin - at jewelled bearing.

Replace Covers

Replace the cover plate on the base plate, the magnet unit cover and printer cover using the mounting screws previously removed.