

TM 11-374

WAR DEPARTMENT TECHNICAL MANUAL

TAPE FACSIMILE EQUIPMENT RC-58-B

RESTRICTED DISSEMINATION OF RESTRICTED MATTER

The information contained in restricted documents and the essential characteristics of restricted materiel may be given to any person known to be in the service of the United States and to persons of undoubted loyalty and discretion who are cooperating in Government work, but will not be communicated to the public or to the press except by authorized military public-relations agencies. (See also par. 18b, AR 380-5, 28 Sep. 42.)

TAPE FACSIMILE EQUIPMENT RC-58-B



WAR DEPARTMENT

23 FEBRUARY 1944

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WAR DEPARTMENT

WASHINGTON 25, D. C., 23 February 1944

TM 11-374, Tape Facsimile Equipment RC-58-B, is published for the information and guidance of all concerned.

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BY ORDER OF THE SECRETARY OF WAR:

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(For explanation of symbols see FM 21-6.)

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DESTRUCTION NOTICE

WHY— To prevent the enemy from using or salvaging the equipment for his benefit.

WHEN— When ordered by your commander.

HOW—

1. Smash—Use sledges, axes, hand axes, pickaxes, hammers, crow-bars, heavy tools, etc.
2. Cut—Use axes, hand axes, machete, etc.
3. Burn—Use gasoline, kerosene, oil, flame-throwers, incendiary grenades, etc.
4. Explosives—Use firearms, grenades, TNT, etc.
5. Disposal—Bury in slit trenches, fox-holes, other holes. Throw in streams. Scatter.

USE ANYTHING IMMEDIATELY AVAILABLE FOR DESTRUCTION OF THIS EQUIPMENT.

WHAT—

1. Smash—Optical-system lenses, tubes, gear housing, tape-feed mechanism, printer unit, cable connectors, dynamotor, drive motor, transformers, selenium rectifier units, meters, and control switches.
2. Cut—Cables.
3. Bend and/or Break—Amplifier and recorder-scanner mountings, all cases.
4. Burn—Canvas covers, technical manuals.
5. Bury or scatter—All parts of equipment after smashing.

SAFETY NOTICE

Voltages used in this equipment are high enough to endanger life and may be fatal if contacted by operating personnel. Operators must be careful not to contact high-voltage plate circuits or 115-volt a-c input connections while checking or servicing equipment. Make certain that power is turned off when disassembling any part of the equipment.

MOISTUREPROOFING AND FUNGIPROOFING

This equipment has received initial moistureproofing and fungiproofing treatment at the factory. This treatment must be renewed after a period of time. Instructions covering this process will be furnished later.

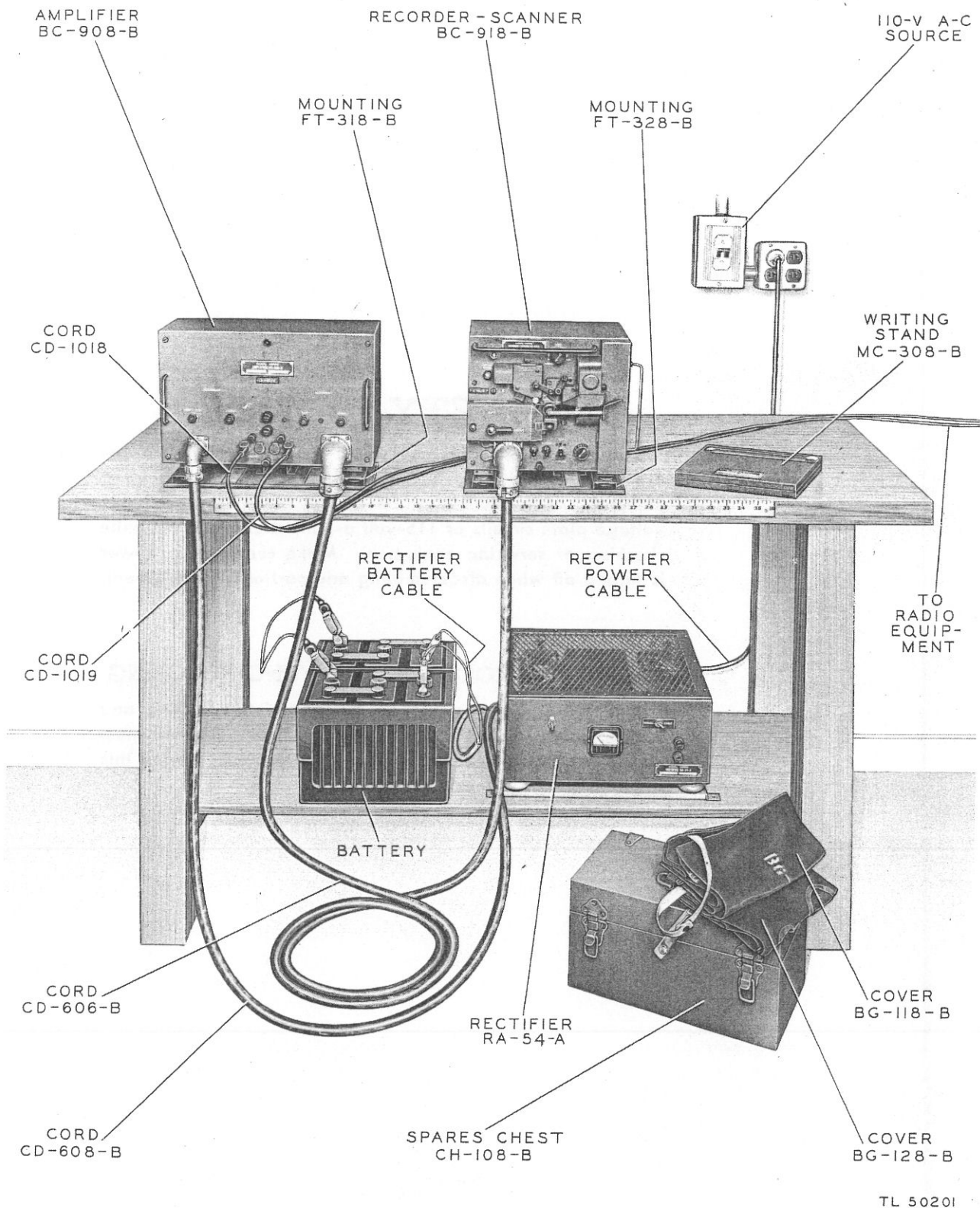


Figure 1—Tape Facsimile Equipment RC-58-B

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SECTION I DESCRIPTION

1. **GENERAL.** *a.* Tape Facsimile Equipment RC-58-B consists of a combination recorder and scanner unit with its associated amplifier, connecting cables, and auxiliary equipment. The equipment is designed for operation from a 12-volt d-c power source, but conversion to 24-volt d-c operation may be made by slight changes in connections and the replacement of several electrical sub-units in the equipment. D-C power is supplied either by battery alone, or by battery and a rectifier unit operating from a 115-volt a-c source.

b. The purpose of the equipment is to transmit messages, handwritten or typed on a paper tape, to or from similar equipment at other locations. Transmission between two tape-facsimile stations may be either by direct wire or by radio.

c. A written or typed tape message to be transmitted is threaded through a scanning device, which passes a beam of light repeatedly over the moving tape. This light is reflected from the tape to a pair of concave mirrors to a photoelectric cell which, when exposed to light, changes its electrical impedance in proportion to the amount of light it absorbs. The variations in intensity of the light, as reflected from the surface of the tape, are duplicated

as variations of electrical current passed through the photoelectric cell. These electrical variations, or impulses, are amplified, and sent by wire or radio to the receiver tape-facsimile station or stations. At this point the impulses are further amplified, and then are converted into mechanical energy to operate a printer mechanism that duplicates the original message.

d. At the point of reception, the recorder device starts automatically when the incoming signal is received, and stops automatically when the signal ceases. The printer mechanism reproduces the message upon a tape that is fed from a roll mounted under a cover on the side of the recorder-scanner.

e. The speed of the paper tape through the scanner head is 50 inches per minute, which corresponds to approximately 42 handwritten words. The speed and the length of sweep of the scanning beam over the tape, as well as the speed of the tape, provide satisfactory reproduction of large handwritten characters, or characters produced by a special typewriter using large type. Standard typewritten characters are too small to be reproduced satisfactorily.

2. **COMPONENTS.** Tape Facsimile Equipment RC-58-B consists of the following major components:

Description	Length (inches)	Height (inches)	Width (inches)	Weight (pounds)
Amplifier BC-908-B	14 $\frac{1}{2}$	9 $\frac{13}{16}$	8 $\frac{1}{2}$	39
Amplifier Cover BG-128-B.....	15	9 $\frac{7}{16}$	8 $\frac{5}{8}$	0.8
Amplifier Mounting FT-318-B.....	14 $\frac{5}{16}$	9 $\frac{5}{8}$	7 $\frac{7}{8}$	4
Battery BB-50	12 $\frac{7}{8}$	9 $\frac{7}{8}$	7 $\frac{7}{8}$	64
Cord CD-606-B	96	...	...	2.6
Cord CD-608-B	102	...	...	1.7
Cord CD-1018	120	...	...	0.5
Cord CD-1019	120	...	...	0.6
Recorder-Scanner BC-918-B	11 $\frac{9}{16}$	9 $\frac{15}{16}$	11 $\frac{3}{8}$	35
Recorder-Scanner Cover BG-118-B.....	11 $\frac{3}{4}$	9 $\frac{7}{16}$	11 $\frac{1}{16}$	0.8
Recorder-Scanner Mounting FT-328-B.....	11 $\frac{3}{16}$	9 $\frac{5}{8}$	8 $\frac{1}{16}$	3.7
Recorder-Tape M-298 (48 rolls).....	..	7	$\frac{3}{4}$	0.9 (per roll)
Rectifier RA-54-A (not supplied with all facsimile equipments).....	18	9	16 $\frac{1}{2}$	68
Spare-parts Chest CH-108-B.....	14 $\frac{3}{4}$	8 $\frac{3}{4}$	9	9 (not incl. spares)
Writing Stand MC-308-B.....	9 $\frac{1}{4}$	1 $\frac{1}{4}$	8 $\frac{1}{2}$	2

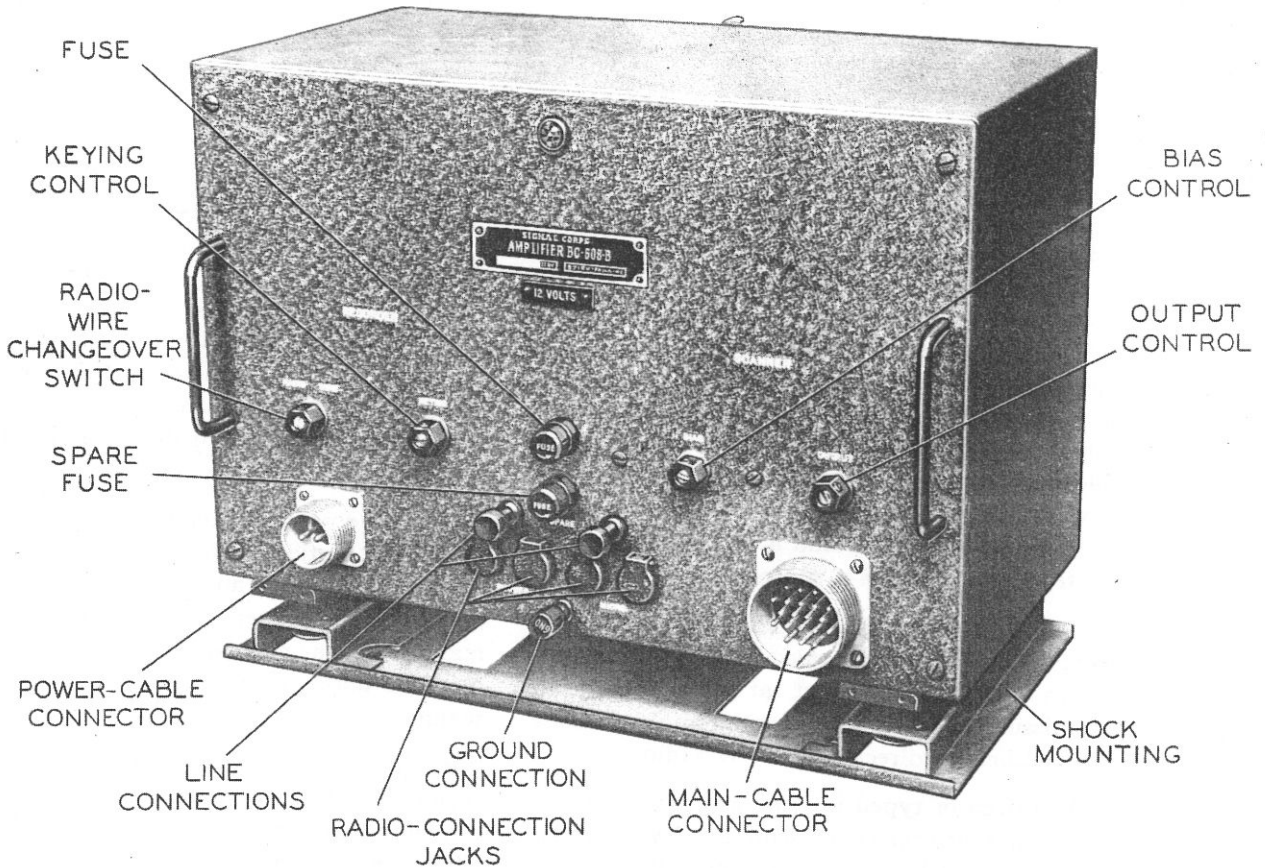


Figure 2—Amplifier BC-908-B and Mounting FT-318-B (front view)

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3. AMPLIFIER. The amplifier assembly consists of two sections, the scanner amplifier and the recorder amplifier. A dynamotor, supplying plate voltage, is also included in the amplifier assembly. A power-cable connector and a connector for the main cable from the recorder-scanner are mounted on the front panel of the amplifier. Also mounted on the front panel are the power-circuit fuse, a spare fuse, pilot lamp, radio-connection jacks, and variable controls for the amplifier.

a. Scanner amplifier. The scanner-amplifier section picks up the impulses that have originated in the photo-cell circuit and have been amplified by the preamplifier, and converts them to signals of two distinct frequencies, one for the white portions and one for the black portions of the message tape.

b. Recorder amplifier. The recorder-amplifier section picks up incoming signals from another tape facsimile station, filters out extraneous frequencies, and amplifies the black-frequency and

white-frequency impulses enough to operate the printer mechanism of the recorder-scanner.

c. Dynamotor. The dynamotor portion of the amplifier consists of a small motor-generator set and a filter unit in a metal case. The dynamotor delivers the high voltage necessary for application to the plates of the tubes in both the amplifier unit and the recorder-scanner unit. The filter smooths out voltage ripples and eliminates hash in the voltage supply, such as might be caused by brush arcing or slight fluctuations in speed.

d. Technical data.—(1) SCANNER AMPLIFIER.—

Beat-frequency oscillator... Frequency modulated.
Fixed-oscillator frequency.....55.00 kc.
Variable-oscillator frequency....56.15 to 56.65 kc.
Output frequency range.....1,000 to 1,800 cycles.
White frequency.....1,150 cycles.
Black frequency.....1,650 cycles.
Output level (maximum).....+22 db.
(zero level = 0.001 watts).

Description

Output impedance
 Radio 50 ohms.
 Wire 500 ohms.

(2) RECORDER AMPLIFIER.—

Input band-pass frequencies... 1,000 to 1,800 cycles.
 Input keying frequencies..... 15 to 500 cycles.
 Input level

Minimum...—45 db (zero level = 0.001 watts).
 Optimum 0.0125 watts.
 Maximum 2.5 watts.

Input impedance

Radio..... 8,000 ohms.
 Wire..... 500 ohms.
 Output push-pull.... 40 ma maximum current
 with 8 volts across coil.

(3) DYNAMOTOR.—

Input voltage 14 volts.
 Input current 3.3 amperes.
 Output voltage 235 volts.
 Output current 0.090 amperes.

4. RECORDER-SCANNER. *a.* The recorder-scanner combines the recording unit for incoming messages, and the tape-scanning unit for outgoing messages. The mechanical parts of the assembly are run by a small electric motor through a series of gears. A tape reel, mounted on the side of the recorder-scanner, furnishes a continuous supply of tape for recording incoming messages.

b. The recorder-scanner includes an automatic stop-start circuit, which starts the drive motor when an incoming signal is received or when a signal is being sent out. This causes the recording tape to be fed through the printer mechanism, or the outgoing-message tape to be fed through the scanner mechanism. Other recorder-scanner circuits are the photo-cell preamplifier circuit, and a synchronization-control circuit for the drive motor.

c. Mounted on the front panel are the connector for the main cable from the amplifier, radio-connection jacks, the POWER-OFF toggle switch, the

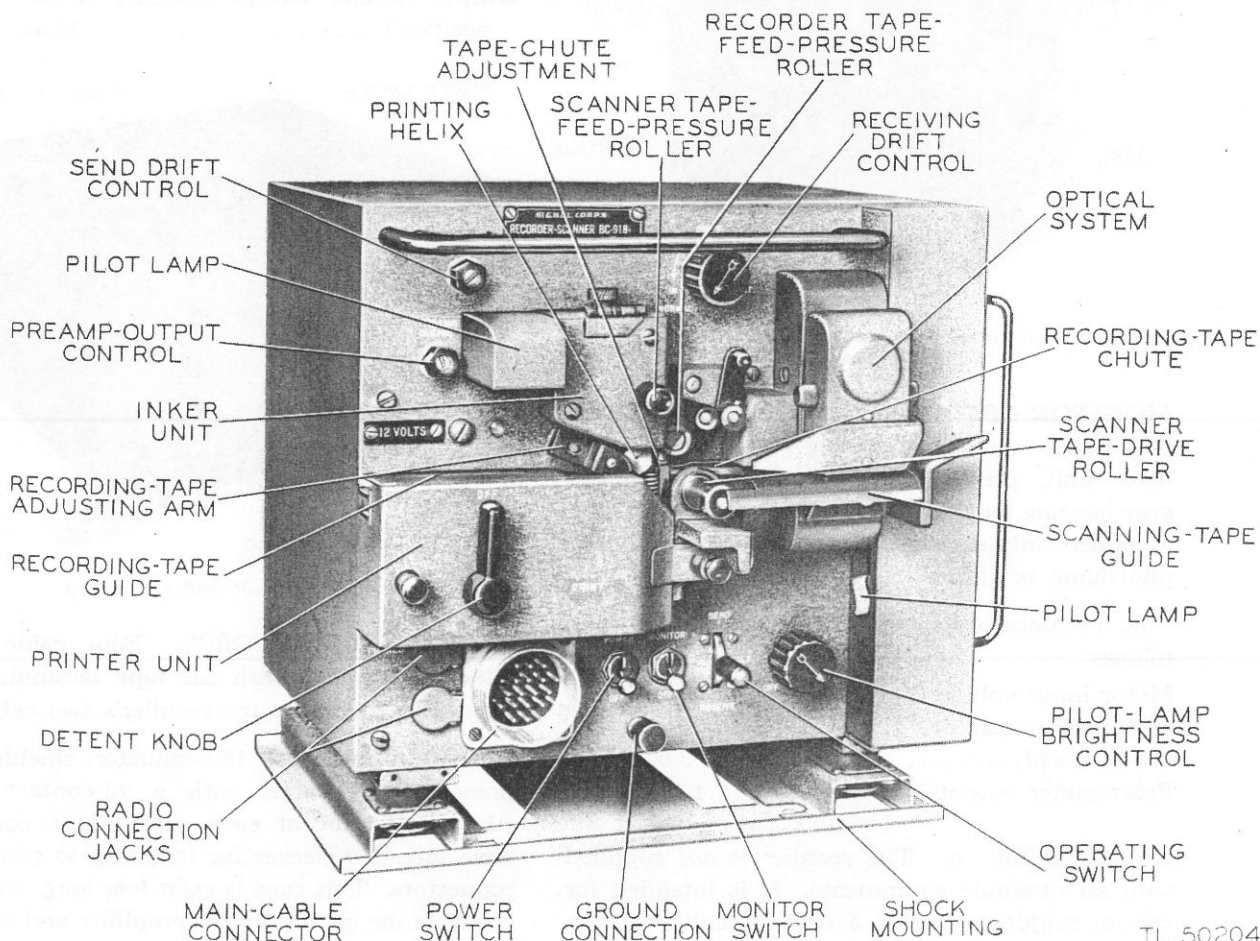


Figure 3—Recorder-Scanner BC-918-B and Mounting FT-328-B (front view)

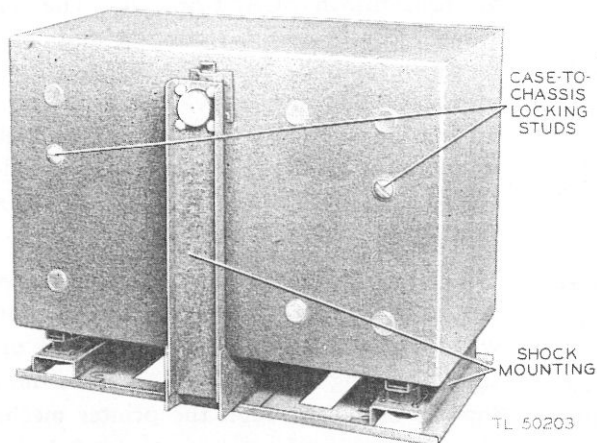


Figure 4—Amplifier BC-908-B and Mounting FT-318-B (rear view)

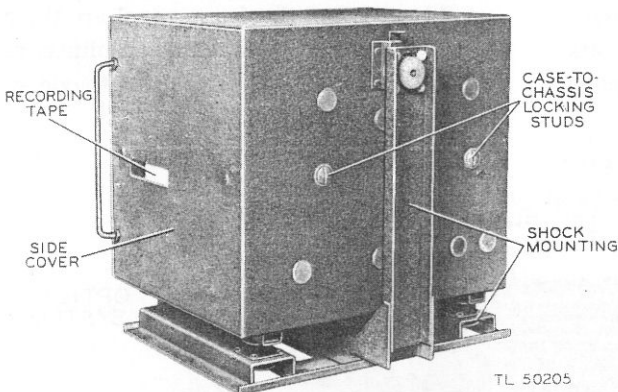


Figure 5—Recorder-Scanner BC-918-B and Mounting FT-328-B (rear view)

MONITOR-OFF toggle switch, a SEND-TALK-RECEIVE switch, recording-tape pilot lamp, inker unit, printer unit, tape-feed mechanisms, gear housing, optical system, and controls for pre-amplifier output, send-drift, receive-drift, and pilot-lamp brightness.

d. Technical data for the recorder-scanner is as follows:

- Motor input voltage.....12 volts.
- Motor input current.....2 amperes.
- Motor speed.....3,600 rpm.
- Preamplifier output impedance.....1,800 ohms.

5. RECTIFIER. a. The rectifier is not supplied with all facsimile equipments. It is intended for use, in conjunction with a battery, only where a 115-volt, 60-cycle a-c power supply is available.

Rectification is accomplished by two selenium rectifier units. Connections for a-c input and d-c output are made through bushings in the rear to terminal blocks inside the case. Mounted on the front panel are an ammeter for indicating output current, an ON-OFF power switch, a booster switch, and a fuse connected in the output circuit. A spare fuse also is mounted on the panel. Shock mountings for the rectifier case are included as part of the assembly. The rectifier is supplied with its own cables for connection to the a-c line and the battery.

- b. Technical data for the rectifier is as follows:
- Input voltage.....95 to 125 volts a-c.
 - Input frequency.....58 to 63 cycles.
 - Output voltage.....13.5 volts d-c.
 - Output current—full (NORMAL switch position)9.5 amperes d-c.
 - Output current—trickle (NORMAL switch position)3 amperes d-c.
 - Output current—charge (BOOST switch position)12 amperes d-c.

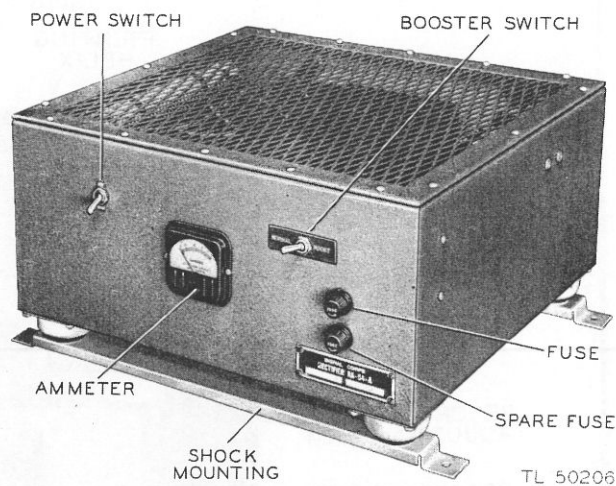


Figure 6—Rectifier RA-54-A

6. CONNECTING CORDS. Four cable assemblies are supplied with the tape facsimile equipment, in addition to the rectifier's two cables.

a. Main cord. An 18-conductor, shielded, neoprene-covered cable, with a 20-contact female elbow connector at each end. These connectors have threaded sleeves for fastening to panel cable connectors. This cord is eight feet long, and interconnects the circuits of the amplifier and recorder-scanner.

Description

b. Power cord. A two-conductor, shielded, neoprene-covered cable with a two-contact female elbow connector at one end, and a cable clamp and two fork terminals at the other end. The connector has a threaded sleeve for fastening to the amplifier power-cable panel connector, and the clamp has a threaded end for fastening to the

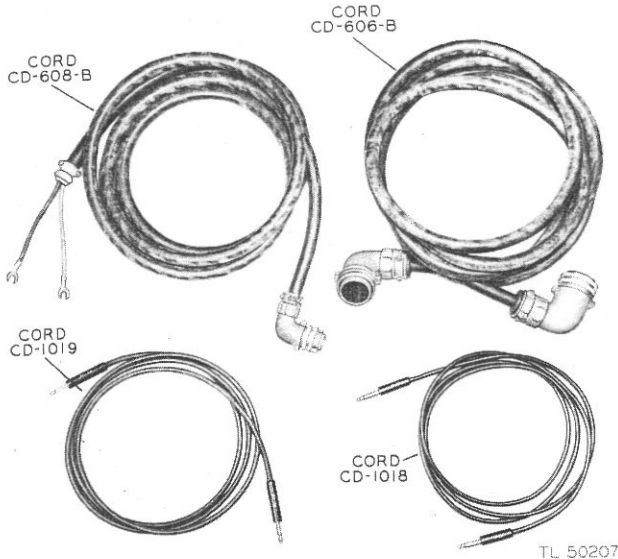


Figure 7—Cords for Tape Facsimile Equipment RC-58-B

rectifier or the battery box. This cord is eight feet long, and connects the amplifier to the d-c power source.

c. Receiver cord. A two-conductor, shielded, rubber-covered cable, with a two-circuit jack plug (Plug PL-55) at each end. This cord is 10 feet long, and is used for connecting either the recorder-scanner or the amplifier to the output of a radio receiver.

d. Transmitter cord. A two-conductor, shielded, rubber-covered cable, 10 feet long, with a three-circuit jack plug (Plug PL-68) at each end. This cord is used for connecting the recorder-scanner or the amplifier to the input of a radio transmitter.

7. WRITING STAND. The writing stand is a flat metal box, large enough to contain one roll of the paper tape used with the equipment. The tape is threaded through a series of rollers and guides inside of the box, and through a writing guide across

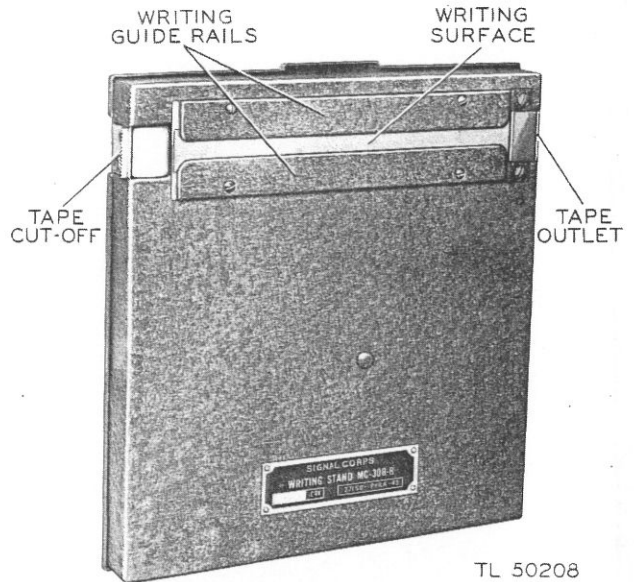


Figure 8—Writing Stand MC-308-B

the top surface. At the left outside edge is a saw-edged knife, for tearing off tape. The box has a hinged cover, allowing access to the inside for tape replacement.

8. SHOCK - MOUNTINGS. Shock - mount bases are supplied for the amplifier and the recorder-scanner. These consist of steel platforms with mounting pins suspended from rubber grommets at the four corners, and a rear bracket with another mounting pin and rubber grommet at the top. The amplifier and recorder-scanner, when mounted and locked on these pins, are cushioned from external shock or vibration.

9. COVERS. The amplifier and the recorder-scanner are equipped with waterproof canvas covers. These covers fit over the units, and furnish weather and dust protection for the equipments when they are not in use. The covers have slide fasteners at the sides, making them easy to put on or remove.

10. SPARE - PARTS KIT. Each tape facsimile equipment is accompanied by a chest of spare parts. This chest holds extra rolls of tape, fuses, vacuum tubes, and other items that need replacement from time to time.

SECTION II

INSTALLATION AND OPERATION

11. INSTALLATION. *a. Unpacking.* When unpacking the various units from the containers, be careful not to damage knobs or switches or other protruding parts. Inspect the equipment to make sure no part has been damaged during shipment. Handle carefully any tools used in unpacking, so that they will not smash meter dials or other fragile parts. Inspect all packing material carefully before setting up the equipment to be sure no small parts have been overlooked. Clean or blow all dust and dirt from the interiors of the various units. If excelsior has been used in packing, remove any small pieces of this material from the corners or closely-mounted parts.

CAUTION: Do not turn an air stream from a high-pressure hose on the parts of the optical system.

b. Mounting. (1) Remove the amplifier and the recorder-scanner from their shock-mount bases by pulling out the slide catches and lifting the units clear. Fasten the shock-mount bases securely to flat, horizontal surfaces. Mount the recorder-

scanner at a height convenient for operation. Take into consideration the lengths of the interconnecting cables when mounting the amplifier, the battery, the rectifier (if a rectifier is used), and the radio transmitter and receiver equipment. Do not separate units of the equipment by distances greater than the lengths of cables supplied.

(2) If a rectifier is to be used with the equipment, fasten it securely to a flat surface in any position convenient for operation of switches. Rectifier RA-54-A is equipped with shock-mounts, but it is not necessary to remove these mounts while installing the unit.

(3) Be sure that there is sufficient clearance around each unit to permit action of the shock mounts. Allow enough room in front of each unit for operation of the equipment. Consider the clearance necessary at the side of the recorder-scanner for replacing rolls of tape.

(4) When the amplifier and recorder-scanner bases are mounted, fit the two units in place on the bases. Fasten both the amplifier and the recorder-scanner to the shock mountings by closing

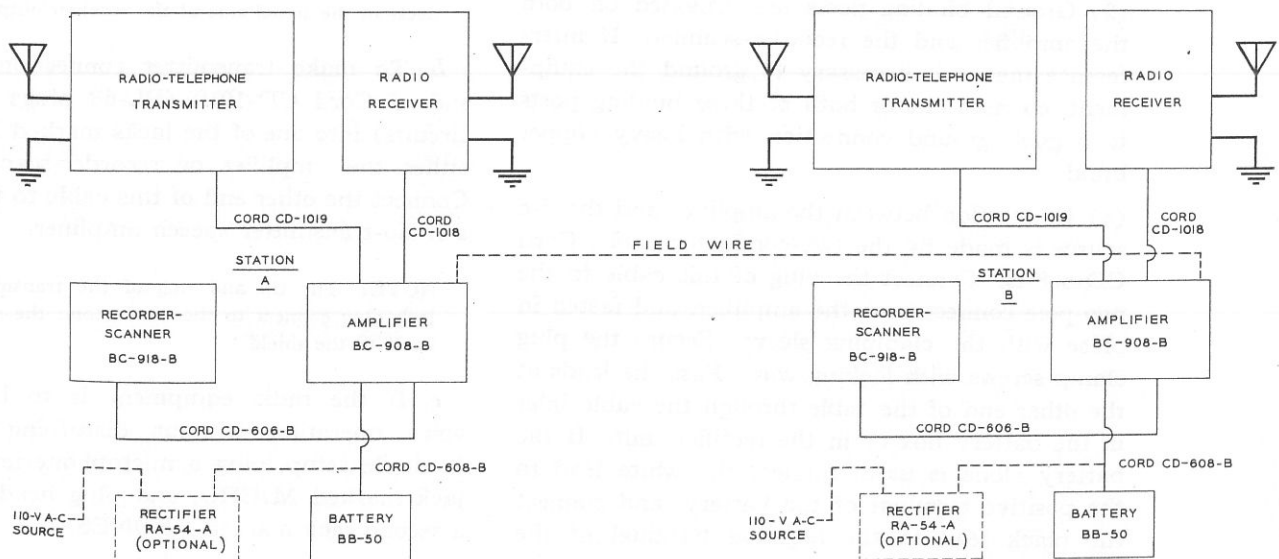


Figure 9—Typical connection setup between two facsimile stations

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the snap slides on the bottoms and backs of the cases. Thread a length of locking wire through the holes in each snap-slide handle and the stud on the slide holder to lock each slide in position (fig. 10).

c. Cable connections. (1) After installing the various units of the equipment, connect the amplifier and the recorder-scanner together by means of the 18-conductor cable, Cord CD-606-B. Fasten the plugs securely to the cable connectors by screwing down the plug clamping sleeves to the con-

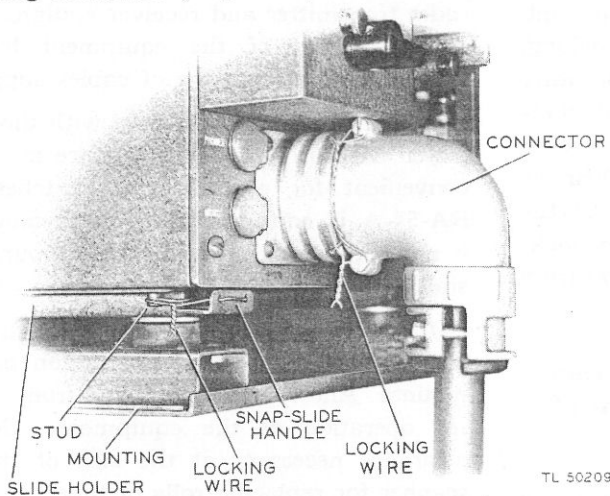


Figure 10—Installation of locking wire

nectors. Lock the sleeves in place by threading locking wire through the holes in the sleeves and in the heads of the plug clamp screws (fig. 10).

(2) Ground binding posts are provided on both the amplifier and the recorder-scanner. If interference makes it necessary to ground the equipment, connect one or both of these binding posts to a good ground connection with heavy copper braid.

(3) Connection between the amplifier and the d-c source is made by the two-conductor cable, Cord CD-608-B. Connect the plug of this cable to the two-pole connector on the amplifier, and fasten in place with the clamping sleeve. Secure the plug clamp screws with locking wire. Pass the leads at the other end of the cable through the cable inlet in the battery box or in the rectifier unit. If the battery alone is used, connect the white lead to the positive terminal of the battery, and connect the black lead to the negative terminal of the battery. If the rectifier is used, do not connect the cable terminals to the battery, but connect them to the rectifier terminals marked LOAD. Connect

the white lead to positive terminal No. 3, and the black lead to negative terminal No. 4. Then connect the rectifier battery cable to the battery. This cable has clips plainly marked + and -. Connect the + clip to the positive terminal of the battery, and the clip marked - to the negative terminal of the battery.

CAUTION: Make certain that terminal connections are tightly clamped. Connect white leads to positive terminals; connect black leads to negative terminals.

(4) WIRE OPERATION. If the interconnection between tape-facsimile stations is to be by wire, make connection at the two amplifier binding posts marked LINE. A transmission line of 500 ohms impedance is recommended, but any good grade of paired wires may be used.

(5) RADIO OPERATION. Cords CD-1018 and CD-1019 are furnished for radio operation of the equipment.

a. To make receiver connection, plug one end of Cord CD-1018 (PL-55 plugs have two circuits) into one of the jacks marked PHONES on either the amplifier or recorder-scanner panels. Connect the other end of this cable to the output of a radio receiver. A receiver output between 0.0125 and 2.5 watts is satisfactory.

NOTE: Make certain that the tip of the plug connects to the signal side of the receiver output.

b. To make transmitter connection, plug one end of Cord CD-1019 (PL-68 plugs have three circuits) into one of the jacks marked MICRO on either the amplifier or recorder-scanner panels. Connect the other end of this cable to the input of a radio-transmitter speech amplifier.

NOTE: The tip and ring of the transmitter-cable jack plug connect to the conductors; the sleeve connects to the shield.*

c. If the radio equipment is to be used for voice operation without disturbing the tape-facsimile setup, plug a microphone into a second jack marked MICRO, and plug headphones into a second jack marked PHONES.

CAUTION: When the equipment is returned to wire operation, make sure that

Installation and operation

all jack plugs have been disconnected from the amplifier and recorder-scanner panels.

12. PREPARATIONS FOR USE. a. Installing tape in recorder-scanner. All mechanical and electrical adjustments necessary for immediate operation of the tape-facsimile equipment have been made during manufacture. It is necessary, however, to install the recording tape to place the recorder-scanner in condition for printing. Thread the tape through the scanning device as follows:

- (1) Remove the side cover of the recorder-scanner unit after loosening the two thumbscrews.
- (2) Place the roll of tape on the tape-reel hub, so that the tape unrolls in a clockwise (to the right) direction when pulled from its free end (fig. 11).
- (3) Loop the free end of the tape under the wooden bobbin (247), and pull up about a foot length of tape.
- (4) Twist the tape 90° toward the inside of the case (counterclockwise when viewed from above),

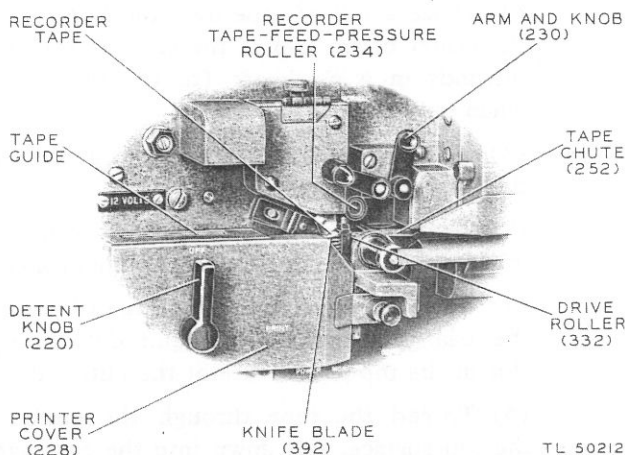


Figure 12—Threading recording tape through feed mechanism

12); turn the printer-unit detent¹ knob (220) to OFF; continue to push the tape through the tape chute, over the drive roller (332) and printer knife blade (392), and through the tape guide on the printer cover (228). Return the detent knob to PRINT, and put the side cover back in place.

b. Installing tape in writing-stand. Load the writing stand with a roll of tape for writing outgoing messages to be scanned. Loading procedure is as follows:

- (1) Open up the writing stand and lay the unit, open side up, on a flat surface.

¹ The detent is the grooved cam used to lock the printer assembly in or out of printing position.

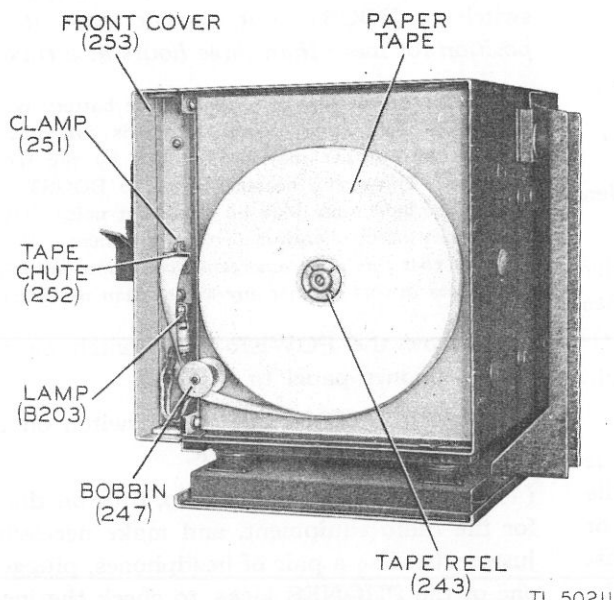


Figure 11—Installation of recording tape

and insert the free end of the tape in the tape-chute slot (252).

- (5) Push the slack through the slot until the tape is visible at the pressure roller.
- (6) Raise the recorder tape-feed-pressure roller (234) by means of its arm and knob (230) (fig.

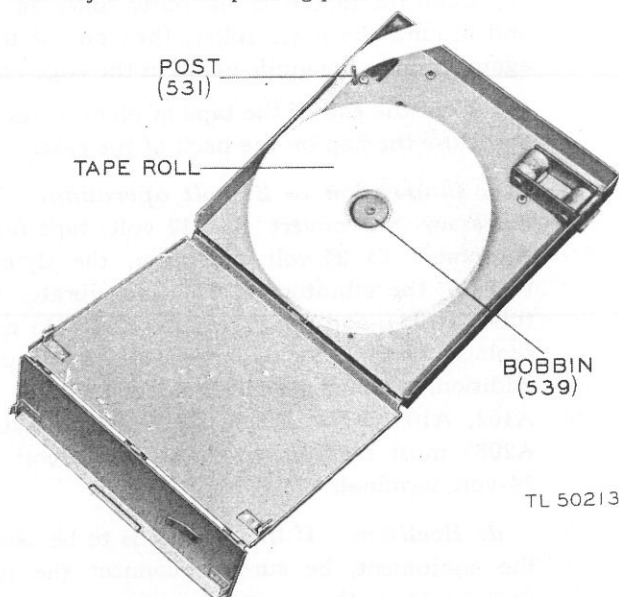


Figure 13—Installation of writing-stand tape (view 1)

(2) Place a roll of tape over the bobbin (539) in the center of the top of the case, so that the tape unwinds in a clockwise (to the right) direction when pulled (fig. 13).

(3) Thread the tape *between* the guide post and the triangular guide plate (531).

(4) Close the part of the case covering the tape roll, leaving the flap over the wooden rollers open.

(5) Lift the writing stand, and loop the tape over the triangular guide plate and out through the slot in the top of the case at the outer edge.

(6) Thread the tape through the guides across the top surface, and down into the case again be-

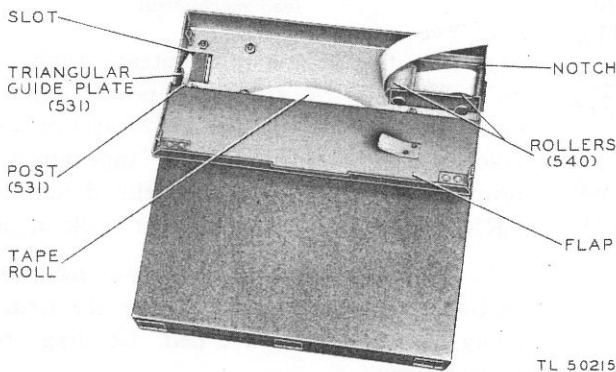


Figure 14—Installation of writing-stand tape (view 2)

tween the edge of the case and the exposed wooden roller.

(7) Loop the tape over the outer roller and under and around the inner roller, then out of the case again through the guide notch in the edge (fig. 14).

(8) Hold the end of the tape in place in the notch, and close the flap on the back of the case.

c. Conversion to 24-volt operation. If it is necessary to convert the 12-volt tape-facsimile equipment to 24-volt operation, the dynamotor (D101), the vibrator (E204), the vibrator ballast tube (R223), and the drive motor (D201) must be replaced with units designed for 24-volt use. In addition, all changeover link connections (A101, A102, A103, A104, A202, A203, A204, A205 and A206) must be changed from the 12-volt to the 24-volt terminals.

d. Rectifier. If the rectifier is to be used with the equipment, be sure to connect the rectifier power cable to the a-c supply source.

e. Radio equipment. If transmission is to be by radio, make sure that both transmitter and receiver are connected to their power sources.

f. RADIO-WIRE switch. Loosen the setscrew in the locking nut for the RADIO-WIRE switch on the amplifier. Turn the switch control shaft with a screwdriver counterclockwise (to the left) as far as possible if transmission is to be by radio, or clockwise (to the right) as far as possible if transmission is to be by wire. When the RADIO-WIRE switch is in the correct position, tighten the setscrew.

g. Lamp control. Adjust the control knob on the lower right of the recorder-scanner panel for whatever brilliancy of the pilot lamps is desired. Turning this control clockwise (to the right) increases the intensity of the light.

13. OPERATION. a. Starting. (1) If the rectifier is in the circuit, throw the rectifier ON-OFF switch to ON. Leave the BOOST-NORMAL switch at NORMAL, unless the battery is in a discharged condition. If the battery is low, throw the switch to BOOST, *but do not leave it in this position for more than three hours at a time.*

NOTE: In an *emergency*, when the battery is completely dead, or when no battery is available, the equipment power may be supplied by the rectifier alone. Throw the booster switch to BOOST. The rectifier load relay may be somewhat noisy, but this will not affect operation of the equipment. *Keep in mind that this is an emergency condition, and do not operate in this manner any longer than necessary.*

(2) Throw the POWER-OFF switch on the recorder-scanner panel to POWER.

(3) Turn the MONITOR-OFF switch on the recorder-scanner panel to OFF.

(4) If transmission is by radio, turn on the power for the radio equipment, and make necessary adjustments. Use a pair of headphones, plugged into one of the PHONES jacks, to check the incoming signal. With the SEND-TALK-RECEIVE switch at TALK, adjust the receiver volume for a good, clear signal in the headphones when the remote station is tuned in at its peak.

(5) For WIRE operation, turn the OUTPUT control on the amplifier front panel to its maximum clockwise position (first loosen the setscrew). If the equipment is connected for RADIO opera-

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tion, adjust the OUTPUT control to obtain modulation of the transmitter as close as possible to 100 per cent. If the transmitter is not equipped for determination of the percentage of modulation, adjust the amplifier OUTPUT control for the same modulation used for voice transmission. Do not over-modulate the transmitter with the facsimile-amplifier signal, since this causes loss of usable power and possible illegibility of the message on the recorder tape at the remote station. Be sure to tighten the setscrew locking the control after making the adjustment.

b. Receiving. If recording operation is desired, proceed as follows:

(1) Make sure that the printer detent knob is at PRINT.

(2) Move the SEND-TALK-RECEIVE switch downward to RECEIVE. If the distant station is sending, the message should appear on the recording tape.

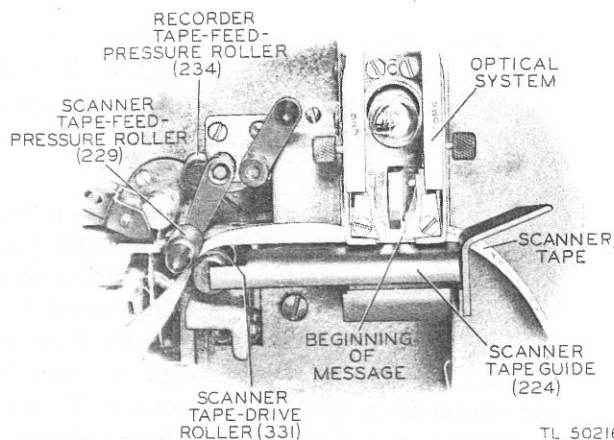
(3) Note whether the incoming message drifts abnormally across the recording tape. If this happens, turn the DRIFT control knob, at the upper right on the recorder-scanner panel clockwise (to the right), until the drift condition is corrected as much as possible.

NOTE: If the paper tape should pile up at the helix while receiving, turn the printer-unit detent knob to OFF immediately, and clear away the jammed tape. Use the phosphor-bronze cleaning strip (inside tape-reel cover) to clean out small bits of tape that may be clogging the tape chute. Remove the detent knob and the printer cover if necessary.

(4) If the equipment is being operated at extremely cold temperatures, it may be necessary to readjust the amplifier BIAS control or PREAMP OUTPUT control, or both, in order to make the recorded message easily readable. If the message is difficult to read, first check the felt ink roller, making sure that it is well saturated with ink. If this does not correct the trouble, adjust the two controls as outlined in paragraph 40b.

c. Sending. If sending operation is desired, proceed as follows:

(1) Prepare the message to be transmitted. This may be typed on tape with a special large character typewriter, or written on the writing-stand tape, using black ink or a pencil with black lead. *Do not use colored pencil or ink.* When using the writing stand, write or print with characters as



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Figure 15—Threading message tape through scanner head

large as the tape guide rails will permit. Allow about six inches of blank tape for threading through the scanner before beginning the message.

(2) When the message is complete, tear off the length of tape. Insert the starting end, message side up, through the scanner-tape guide from the right. *Do not try to insert the tape from the left.*

(3) Raise the recorder tape-feed-pressure roller (234) from contact with the recorder tape in order to prevent waste (fig. 15).

(4) Raise the scanner tape-feed-pressure roller, and push the message tape through from the right until it hangs over the scanner tape-drive roller (331) (fig. 15). Be sure that the beginning of the message is not yet under the scanner portion of the optical system.

(5) Throw the SEND-TALK-RECEIVE switch to SEND.

(6) Lower the scanner tape-feed-pressure roller (229) to the tape. This will cause the tape to move through the scanner, transmitting the message to the remote station.

NOTE: Be sure that the SEND-TALK-RECEIVE switch is at SEND, and not RECEIVE position, before lowering the pressure roller.

NOTE: If it is desired to check the outgoing message while sending, drop the recorder tape-feed-pressure roller into place on the recording tape, and throw the MONITOR-OFF switch to MONITOR. The outgoing message will be duplicated on the recording tape if the equipment is operating properly. (If transmission is by radio, tune the receiver to the same frequency as the transmitter for monitoring. Radio equipment must be capable of side-tone operation for successful monitoring.)

(7) When the message has been completely scanned, return the SEND - TALK - RECEIVE switch to RECEIVE. This places the equipment in readiness for automatic starting of the recording circuit.

d. Simultaneous receiving and sending.

When transmission is by radio, a message may be sent out at the same time that an incoming message from a remote station is being recorded, provided that the distance separating the transmitter and the receiver is great enough to prevent the transmitter from blocking the receiver. Tune radio transmitter and receiver to different frequencies. The transmitter frequency at the local station must coincide with the receiver frequency at the remote station, and the receiver frequency at the local station must coincide with the transmitter frequency at the remote station. The SEND-TALK-RECEIVE switch must be at SEND. In addition, throw the MONITOR-OFF switch to MONITOR, and make sure that the recorder tape-feed-pressure roller is dropped into position on the tape.

e. Talking. To talk between tape-facsimile stations during radio operation, throw the SEND-TALK-RECEIVE switch to TALK. While the switch is in this position, the microphone and headphones may be used in the normal manner for radio transmission and receiving.

f. Stopping. To stop the equipment, throw the POWER-OFF switch to OFF. If the rectifier is in the circuit, leave its ON-OFF switch at ON if desired, since the current from the rectifier to the battery is reduced automatically to a trickle charge when the tape-facsimile equipment is turned off. If the battery charge is low, throw the BOOST-NORMAL switch to BOOST.

CAUTION: The rectifier is not designed to deliver heavy currents over long periods of time. Throw the BOOST-NORMAL switch to NORMAL after three hours of booster operation.

g. Operating indications. The following visible and audible effects are indications of normal operation of the equipment:

(1) When the power switch is turned on, the power-indicator lamp on the amplifier front panel will glow. The two recorder-scanner panel lamps will glow if their control has been turned up sufficiently.

(2) When the SEND-TALK-RECEIVE switch is at RECEIVE, the recorder tape-feed-pressure roller automatically drops in position on the recorder tape. In addition, power is applied to a relay in the amplifier, closing the circuit to the dynamotor and putting this unit in operation. As a signal is picked up from a distant station, an automatic stop-start circuit trips a relay in the recorder-scanner, starting up the synchronizing vibrator and the drive motor in the recorder-scanner. The motor, through a system of gears, drives the tape-feed rolls, the printing helix, and the optical system. The printing helix drives the inker assembly inside of the inker housing on the recorder-scanner front panel. At the same time the printer-unit knife blade, actuated by the incoming signal, moves up and down against the bottom of the recorder tape, forcing the tape against the helix to print the incoming message. When the incoming signal ceases, the drive motor and its driven parts, and the vibrator automatically stop. Action of the printer unit also stops.

(3) When the SEND-TALK-RECEIVE switch is at SEND, the relays in the amplifier and the recorder-scanner are energized, starting the vibrator, the dynamotor, and the drive motor, and those parts operated either directly or indirectly by the drive motor. In addition to this mechanical action, the optical-system exciter lamp lights up, to provide the light beam for scanning the outgoing-message tape.

(4) When the SEND-TALK-RECEIVE switch is at TALK (used with radio operation only), the drive motor and its driven parts, and the dynamotor are inoperative. The optical-system exciter lamp does not light.

(5) If the rectifier is in the circuit, the rectifier relay will snap closed when the load power is switched on. This relay will open whenever the SEND-TALK-RECEIVE switch is at TALK, and will snap closed again when the switch is moved to either SEND or RECEIVE.

14. PRECAUTIONS DURING OPERATION. For safe and efficient use of the equipment, observe the following precautions during operation:

a. Do not try to use badly wrinkled or twisted tape.

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b. Do not try to lift the feed-pressure roller from the recorder tape while the SEND-TALK-RECEIVE switch is at RECEIVE.

c. Do not substitute slugs for the fuses.

d. Do not try to stop the drive rollers with fingers, or by jamming something into the rollers.

e. Do not remove the photo-cell cover while the equipment is running.

f. Add ink to the felt ink-reservoir roller inside the inker housing if the incoming message appears too faintly on the tape. Be sure not to put too much ink on the roller.

g. Make sure there is *always* paper between the

helix and printer bar. Never allow the detent knob to remain at PRINT while the equipment is turned on if the recorder tape is not in place.

h. Check the recorder tape supply from time to time by glancing through the small window in the side of the tape-reel cover. A full reel holds enough tape for approximately three hours of continuous recording operation.

i. Never turn the printer detent knob clockwise beyond PRINT position.

j. Do not change any controls unless faulty operation indicates the equipment to be out of adjustment. Reset controls only as outlined in servicing instructions, Section IV.

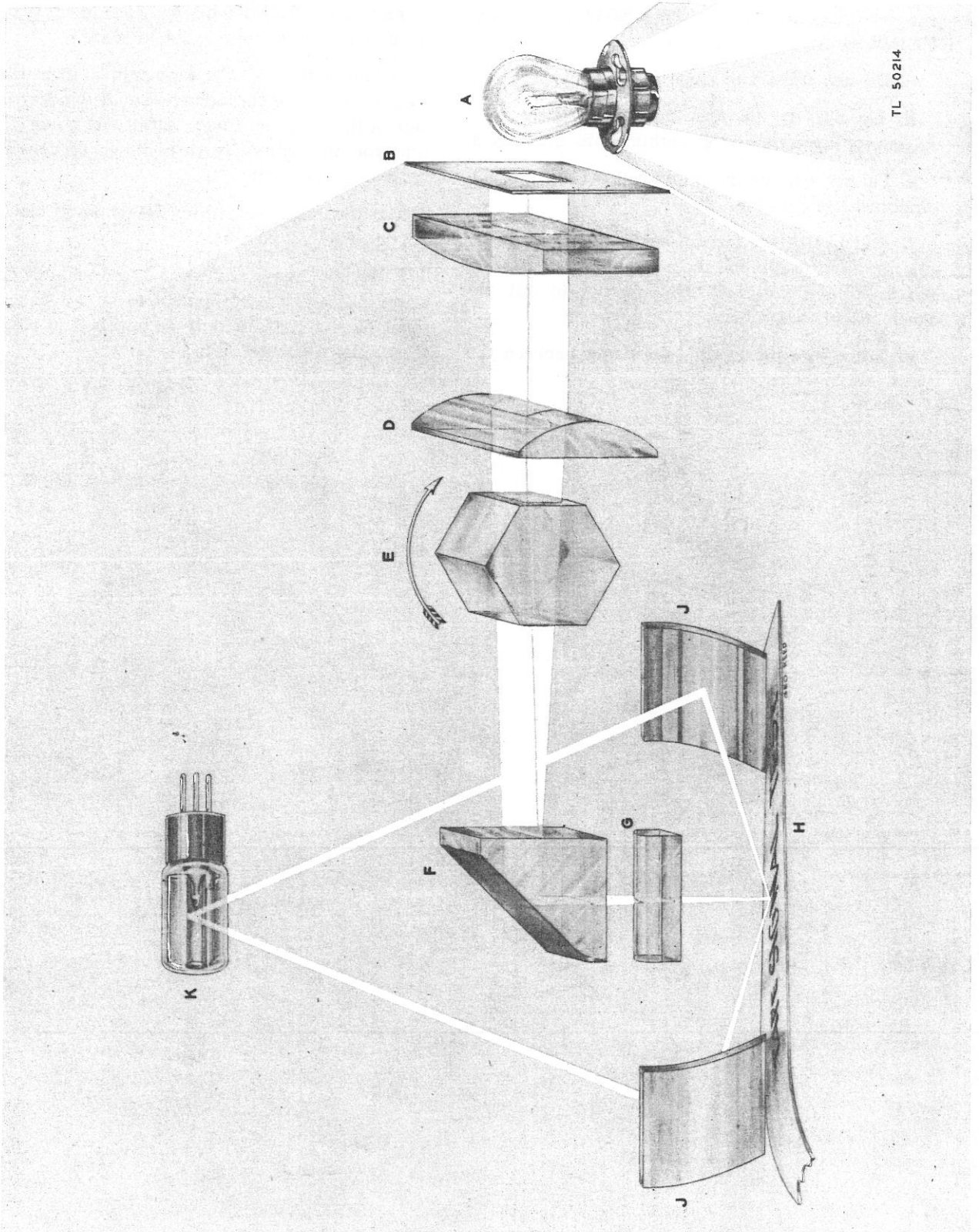


Figure 16—Optical-system light-beam path

SECTION III

FUNCTIONING OF PARTS

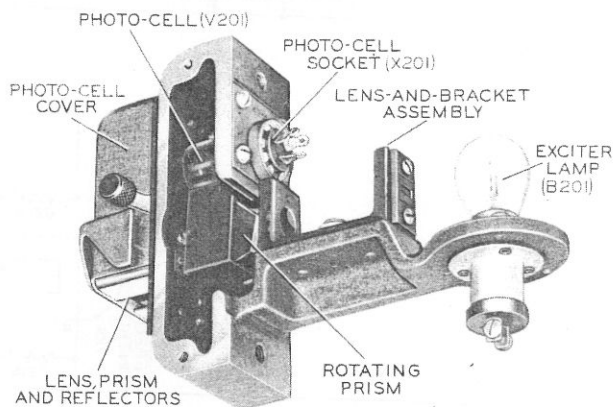
15. **OPTICAL SYSTEM.** *a.* As a message tape passes through the scanner head, the following occurs:

(1) Light from the exciter lamp A (B201)¹ (fig. 16) passes through the lenses C and D, prisms E and F, and lens G to the tape H. The lenses focus the light to a small spot. The triangular prism F bends the light so that its path is crossed by the tape. The rotating hexagonal prism E changes the path of the light, causing the scanning action across the tape (sub-par. *b* below).

(2) The light beam, as it strikes the tape, is reflected upward from the tape H to the two concave mirrors J, and from the mirrors to the sensitized portion of the photoelectric cell K (V201). Since the pinpoint of light traversing the surface of the tape alternately crosses black and white portions when a message has been written on the tape, the amount of light reflected to the photo-cell will vary.

(3) As a black line is crossed or scanned by the light beam, almost no light will be reflected to the photo-cell, and the photo-cell will pass very weak current. As a blank portion of the tape is scanned by the light beam, the white paper reflects a considerable amount of light to the photo-cell, resulting in the passing of a stronger current by the cell. These alternate *black* and *white* impulses are the

¹ Numbers in parentheses refer to part references as they appear in the table of replaceable parts (par. 45).



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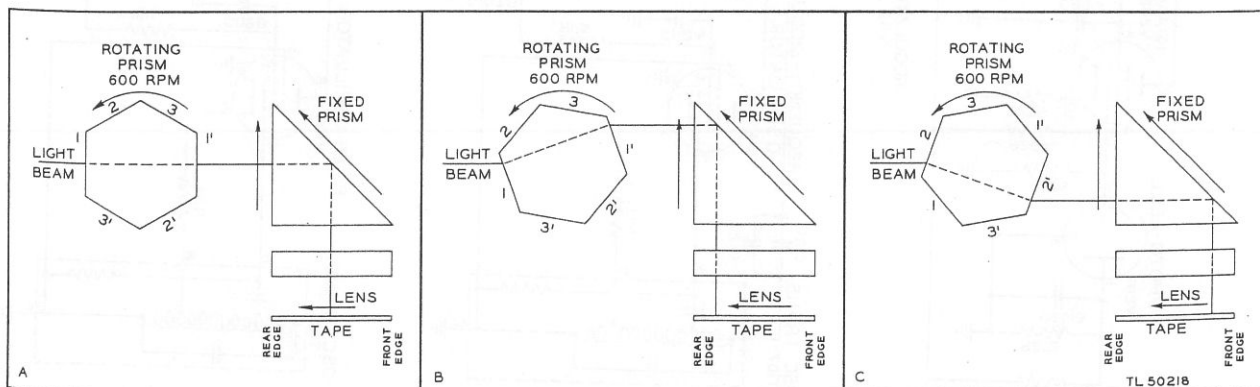
Figure 17—Optical system

basis of the signal that is transmitted to the distant tape-facsimile station for final conversion to a duplicate of the original message (par. 16 and 18).

b. Figure 18 illustrates the scanning action of the optical system.

(1) The rotating hexagonal scanner prism is in the path of the light beam coming from the exciter lamp (B201), which is focused to a spot by the lens assembly. At any given instant of rotation, the spot of light will fall upon some one face of the rotating prism at its lateral center.

(2) Assume that the rotating prism is in the position shown in figure 18A. The light beam is shown striking the prism at an angle perpendicular to face



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Figure 18—Progressive action of scanning beam

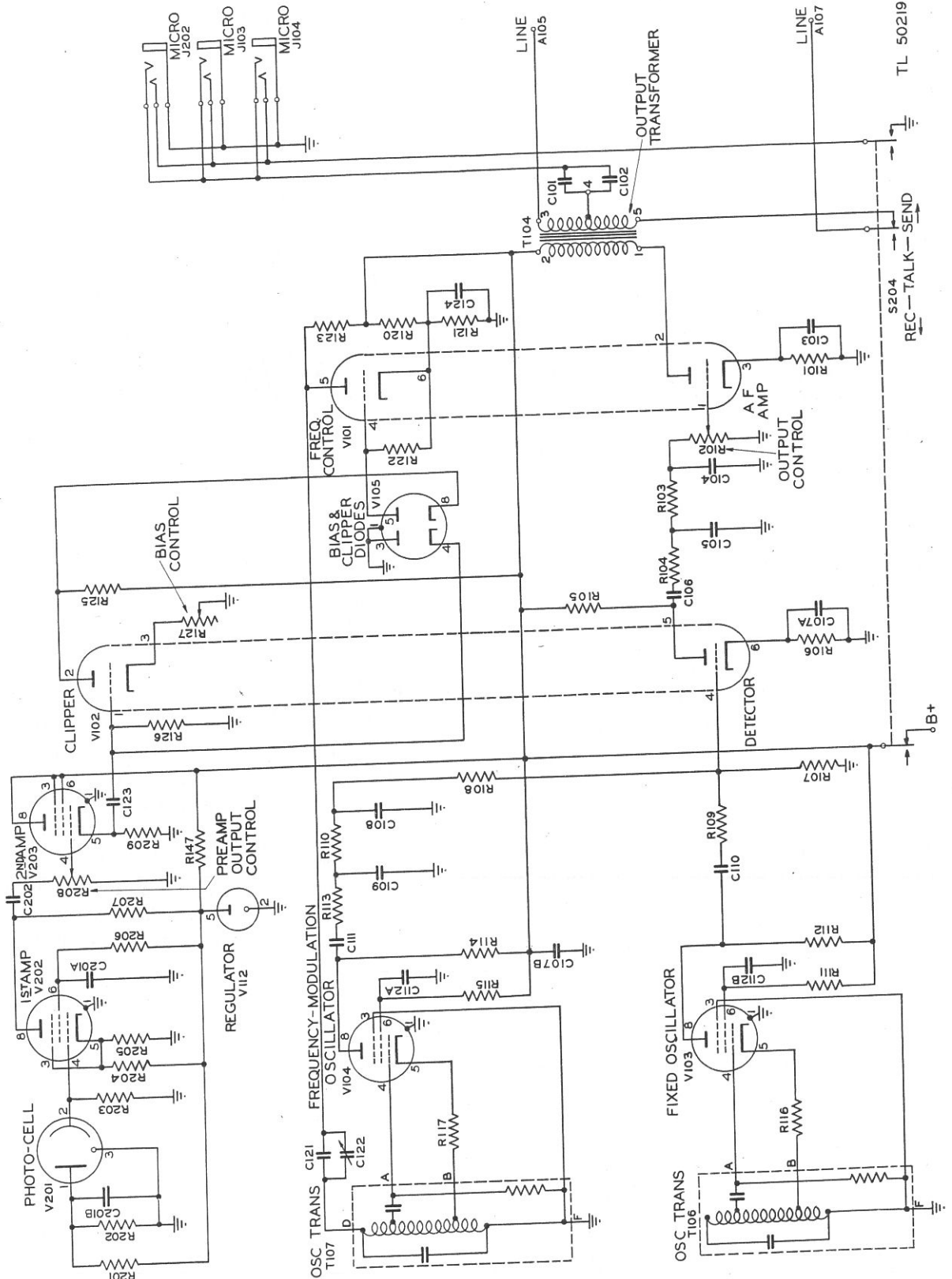


Figure 19—Sending circuit, schematic diagram

No. 1. At this position of the prism, the path of the beam does not deviate, and light emerging from the parallel face No. 1' is in the same line, in conformance with optical laws.

NOTE: According to certain laws of optics, when light passes from one medium to another (in this instance air to glass), the path of any single beam entering the new medium perpendicular to the surface is *not* changed, but the path of any single beam entering the new medium at an angle other than perpendicular to the surface is changed. The angle of the change is determined by the optical properties of the two mediums. The beam of light, when emerging into the original medium, following the same laws, again changes its path (on condition that the surface of emergence is not perpendicular to the emergent beam). It is also true that if the two opposite faces of the intermediate medium are exactly parallel, the path of the emergent beam is exactly parallel to its path upon entering. It is evident from these laws that the paths of the light beam, as it enters and leaves the hexagonal prism, are parallel at all times; and that the emergent path is constantly moving vertically as the prism rotates.

(3) Again referring to figure 18A, it can be seen that the light beam travels through the rotating prism to the fixed prism. The mirrored hypotenuse surface of the latter alters the path of the beam by 90° , and deflects it downward through a cylindrical lens, which converges the beam on the tape to be scanned.

(4) In figure 18B, the rotating prism is shown advanced a little less than 30° of rotation from the position shown in figure 18A. Since the position of the light source is fixed, and the position of face No. 1 with respect to the light beam has changed and is no longer perpendicular to the beam, the position of the beam emerging from face No. 1' has also changed. The emergent beam now strikes the hypotenuse of the fixed prism at a higher point, resulting in a spot of light nearer the edge of the tape.

(5) In figure 18C, the rotating prism has advanced still farther, to a position causing the light beam to strike face No. 2 and to emerge from face No. 2'. The beam now strikes a point low upon the slope of the triangular prism, and consequently is deflected to the opposite edge of the tape from that shown in figure 18B. As the rotating prism progresses, the beam travels across each face, out the opposite parallel face, up the slope of the fixed prism, and across the tape from front to rear.

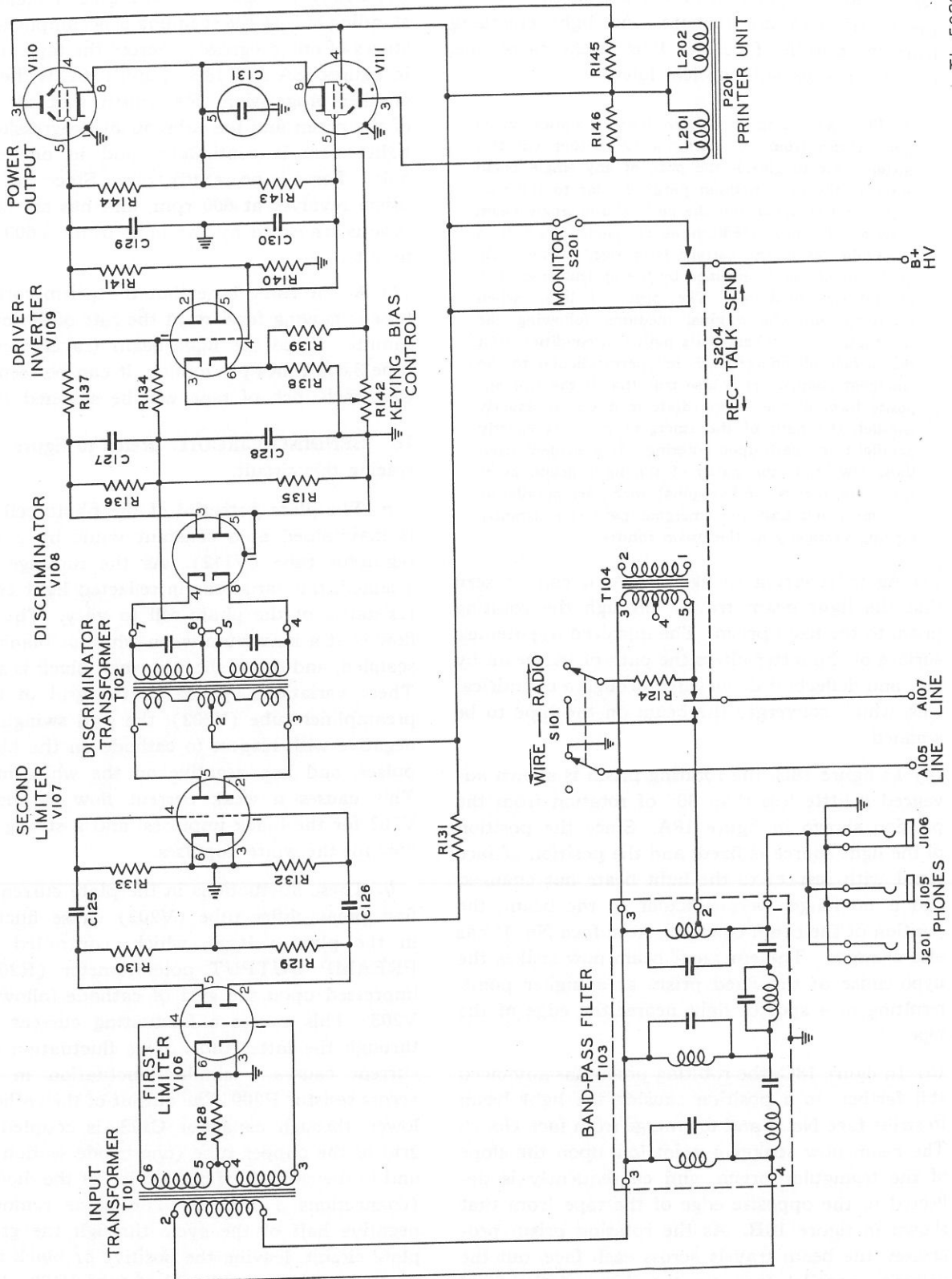
(6) Study of figure 18 will give a clear understanding of how the scanning is accomplished. Two stages of one progression across the tape are shown in figures 18A and 18B. Figure 18C is the start of another progression. Remember that the rotation of the prism and the subsequent progression of the light beam is continuous, and in one direction only. There is no return trace. Since the rotating prism revolves at 600 rpm, and has six faces, the tape is traversed by the light beam 3,600 times a minute.

(7) At the same time that the prism rotates, the tape is moving forward at the rate of 50 inches per minute. Since the light beam travels across the tape 3,600 times per minute, it can be seen readily that each inch of tape will be scanned 72 times.

16. SENDING CIRCUIT. Refer to figure 19 when tracing this circuit.

a. The plate potential of the photo-cell (V201) is maintained at a constant value by a voltage-regulator tube (V112). As the message tape is scanned, the variations in reflected light cause the resistance of the photo-cell to vary. The current flow is at a maximum when white or blank tape is scanned, and drops sharply when black is scanned. These variations appear on the grid of the first preamplifier tube (V202), the grid swinging more negative with respect to cathode on the black impulses, and less negative on the white impulses. This causes a weak current flow through tube V202 for the black impulses, and a strong current flow for the white impulses.

b. These fluctuations in the plate current of the first preamplifier tube (V202) cause fluctuations in the plate voltage, which, controlled by the PREAMP OUTPUT potentiometer (R208), are impressed upon the grid of cathode-follower tube V203. This causes a fluctuating current to flow through the latter tube. This fluctuation of tube current causes a similar fluctuation in voltage across resistor R209. The output of the cathode follower, through capacitor C123, is coupled to the grid of the clipper tube (one triode section V102), and to the cathode of one section of the diode V105 (connections 3 and 4). The diode removes the negative half of the cycle through the grounded plate circuit, leaving the positive or black impulse applied to the control grid of tube V102. (Bias in this tube is determined by the setting of the varia-



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Figure 20—Receiving circuit, schematic diagram.

Functioning of parts

ble resistance, R127, in the cathode circuit. This variable resistor, marked BIAS, is mounted on the amplifier front panel.)

NOTE: If the scanner is operating with no tape in the scanner head (which results in continuous black scanning by the light beam), the recording tape, which might be expected to print solid black, will leave the printer head perfectly blank. This is attributable to the action of capacitor C202. When a message tape is being scanned, the plate current through the first amplifier tube (V202) is constantly fluctuating, as explained above. The fluctuations cease whenever solid black (no tape under scanner) or solid white (blank tape under scanner) is being scanned. When the plate current of tube V202 is fluctuating, capacitor C202 is constantly charging or discharging, resulting in the voltage drop across the potentiometer (R208) that furnishes the varying voltage on the grid of the cathode-follower tube (V203). When the fluctuations cease, however, capacitor C202 quickly becomes fully charged, stopping current flow through potentiometer R208. With no current flowing through R208, there is no voltage drop across this resistor; and the grid of tube V203 drops below cathode potential, cutting down the current in the same manner as for white impulses as long as solid black or solid white is being scanned.

c. Normally the cathode potential of the second diode section (connections 5 and 8) of V105 is above the plate potential, with the result that no current flows in this circuit. At the same time, current is flowing through the frequency-control tube V101. As soon as a black impulse causes current to flow through the clipper tube V102, however, there is an appreciable voltage drop across resistor R125, which in turn drops the cathode potential of the second diode section of V105 sufficiently below the potential of the plate for current to flow in this section. This in turn causes a sufficient voltage drop across resistor R122 to swing the grid of the frequency-control tube V101 negative with respect to cathode to such an extent that current flow ceases in this section of tube V101.

d. The frequency-control tube is wired in series with a capacity (C121 and C122) and the high-potential end of the frequency-modulation oscillator-tube transformer (T107). The frequency-modulation oscillator is adjusted to a frequency of 56.15 kilocycles when current is flowing in the frequency-control tube plate circuit. (This occurs when white tape is scanned.) When a black impulse cuts off the current flow in the frequency-control tube, however, the change in plate resistance of this tube changes the effective impedance

of the oscillator circuit to such an extent that the frequency-modulation oscillator output changes to 56.65 kilocycles. The outputs of the frequency-modulation oscillator tube and the fixed oscillator tube are impressed simultaneously upon the grid of the detector (second triode section of tube V102). Since the frequency of the fixed oscillator is set at 55.00 kilocycles, the resultant beat frequency when current is flowing in the frequency-control tube plate circuit (when white tape is scanned) is a signal of 1,150 cycles, the difference between 55.00 and 56.15 kilocycles. The resultant beat frequency when the frequency-control-tube current is cut off, or triggered (when black tape is scanned), is a signal of 1,650 cycles, the difference between 55.00 and 56.65 kilocycles.

e. The output of the detector section of tube V102 is coupled to the amplifier tube (second triode section of V101), and from this tube the output is transformer-coupled to the line or to radio transmitter input.

17. SENDING-OPERATION SUMMARY. A brief summary of the sending operation described in paragraphs 15 and 16 is as follows: When a message tape passes through the scanner, the optical system scans black lines and blank white tape. This results in two types of impulses, one for black scanning, and one for white. Since the tape is scanned continuously, these two types of signals appear as an indeterminate series. It is the function of the preamplifier and clipper to separate the impulses and cancel the white signals, leaving the black signals to cut off the current of the frequency-control tube. When this occurs, the resistance of the frequency-control tube increases, and in turn raises the frequency of the variable oscillator. The frequency-control tube will raise the oscillator frequency when black is scanned, and will permit the frequency to return to normal when white is scanned. Two frequencies will appear at the output transformer as a result of the beating together of the two oscillators. One is a signal of 1,150 cycles (white), and the other is a signal of 1,650 cycles (black).

18. RECEIVING CIRCUIT. Refer to figure 20 when tracing this circuit. The two signals of 1,150 and 1,650 cycles are conducted either by field wires or radio to the remote tape-facsimile station or stations.

a. The signals enter through the band-pass filter (T103), which removes all frequencies except those between 1,000 and 1,800 cycles. The filtered input passes through the input transformer (T101) and two limiter stages (V106 and V107). The limiter tubes amplify the signal, holding peaks within a certain limit, thereby providing a reasonably steady signal for the discriminator transformer (T102). The limiting action of V106 and V107 is accomplished as follows:

(1) The incoming signal appearing across the secondary of the input transformer (T101) is impressed upon the grids of the push-pull limiter amplifier (V106). If the signal is fairly weak, it is amplified in the usual manner, and this amplified signal is in turn impressed on the grids of the second limiter. If the signal is over a certain strength, however, the tube becomes overloaded, and further increase in grid voltage can cause no further increase in output voltage.

(2) The action of limiter tube V107 is the same as that of tube V106. If the signal is still weak as it leaves tube V106, tube V107 provides further amplification. If the signal is over a certain strength, tube V107 becomes overloaded, cutting off further increase in output voltage.

(3) The purpose of the limiting action is to supply a signal of fairly constant amplitude to the discriminator transformer (T102), since the output of the discriminator would be affected by signal amplitude as well as signal frequency, and since the action of the equipment requires that this output vary only with the frequency.

(4) This type of limiting action results in considerable distortion of the output of the limiter tubes, but since the discriminator is not affected by harmonics of frequencies between 1,150 and 1,650 cycles, the distortion has no effect on its action.

b. The discriminator transformer has two tuned secondaries. One secondary is tuned to 1,000 cycles (terminals 6 to 7), and the other is tuned to 1,800 cycles (terminals 4 to 5). When the 1,150-cycle signal is received, the voltage in the winding tuned to 1,000 cycles will be relatively high, and the voltage in the winding tuned to 1,800 cycles will be low. When the 1,650-cycle signal is received, the reverse will be true.

c. When the 1,000-cycle tuned transformer secondary (terminals 6 to 7) produces a voltage, one

half of the duo-diode (connections 3 and 4) draws a current through the resistor R136, producing a voltage drop across this resistor. This affects the grid of one section of the driver-inverter tube (V109) (connections 1, 2, 3), swinging the grid negative with respect to the cathode, and preventing current flow in this section. With no current flowing in this section, there is no voltage drop across the resistor R144, which brings the grid of the power output tube V110 to the same potential as its cathode. This permits a current to flow through tube V110.

d. At the same time that the flow of current ceases in the first triode section of tube V109 (connections 1, 2, 3), the grid of the other section (connections 4, 5, 6) becomes positive with respect to its cathode. This allows current to flow in this section, causing a voltage drop across resistor R143. This swings the grid of power-output tube V111 negative with respect to cathode, preventing current flow through this tube.

e. When the 1,800-cycle tuned transformer secondary (terminals 4 to 5) produces a voltage, the second section of the duo-diode (connections 5 and 8) draws a current through resistor R135, producing a voltage drop across this resistor. This affects the grid of one section of the driver-inverter tube V109 (connections 1, 2, 3), this time swinging the grid positive with respect to its cathode, and starting a current flow through this section. With current flowing in this section, there is a voltage drop across resistor R144, which swings the grid of power output tube V110 negative with respect to cathode, stopping current flow through this tube.

f. At the same time that the voltage on the grid of tube V110 drops, there is also a drop in grid voltage in the second section of tube V109 (connections 4, 5, 6), stopping current in this section of the triode. With no current flowing, there is no voltage drop across resistor R143, which causes the grid voltage of tube V111 to rise to cathode potential, thereby allowing a current to flow through this tube.

g. A current is flowing through power-output tube V110 but not through tube V111 when the 1,000-cycle tuned transformer secondary is producing voltage (when a white impulse is picked up). A current is flowing through power-output tube V111 but not through tube V110 when the 1,800-cycle tuned transformer secondary is producing

voltage (when a black impulse is picked up) (sub-par. *c*, *d*, *e*, and *f* above). The output of tube V110 is in series with one coil (L202) of the printer unit. The output of tube V111 is in series with the other coil (L201) of the printer unit. It is evident from this that coil L202 will be energized on white signals, and coil L201 will be energized on black signals.

h. The KEYING control (R142) regulates the bias on the cathode of the first section of tube V109, eliminating high-frequency components from the signal delivered to the printer, and controlling the amount of power supplied to the printer.

19. PRINTER UNIT. The printer unit of the recorder-scanner is the means by which a facsimile of the original message is reproduced. As the drive rollers push the recording tape between the rotating helix and the printer knife edge, the message is printed upon the tape in the following manner: (See fig. 21.)

a. The printer knife edge is connected, through a drive pin, to the armature of the printer magnetic motor unit. The motor unit consists of a permanent-magnet field enclosing two coils (L201 and L202). The armature is suspended through the centers of the coils between two pole pieces.

b. When one of the coils (L201 or L202) is energized, the armature becomes magnetized. When neither of the coils is energized (fig. 21A), the armature is not magnetized, and the two ends of the armature are floating midway between the ends of

the pole pieces. As soon as coil L201 becomes energized, however, the armature becomes magnetized, so that the left end is an S pole and the right end an N pole. Since like magnetic poles repel each other, and unlike magnetic poles attract each other, the action of the armature between the two stationary pole pieces will be as shown in fig. 21B. When coil L202 is energized, since this coil is connected to draw current in the opposite direction to coil L201, the armature will be magnetized in the opposite direction, and it will move in the opposite direction (fig. 21C).

c. The recording tape, which is moving over the printer knife edge, is moved up against the threads of the printing helix when a black signal is received, and away from the threads when a white signal is received (fig. 21B and C). The threads of the helix, which are continuously in contact with an ink roller, will make an ink imprint on the tape whenever the tape touches the helix. The recording tape is moving forward at exactly the same speed as the original message tape, and any point on a helix thread directly above the knife blade moves backward at exactly the same speed as the scanning beam moves backward over the original message tape. Each mark made on the recording tape will be in the same relative position to the previous mark as the corresponding mark scanned on the message tape was to the previous mark scanned. The result is the printing of a duplicate of the original.

NOTE: When the SEND-TALK-RECEIVE switch is placed in RECEIVE position, the recording tape

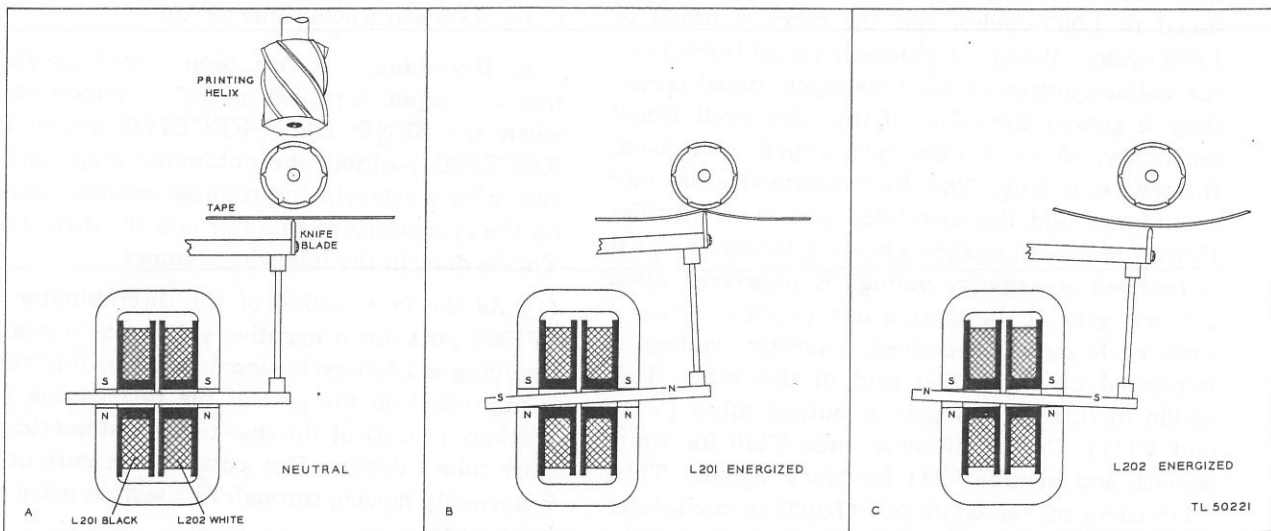
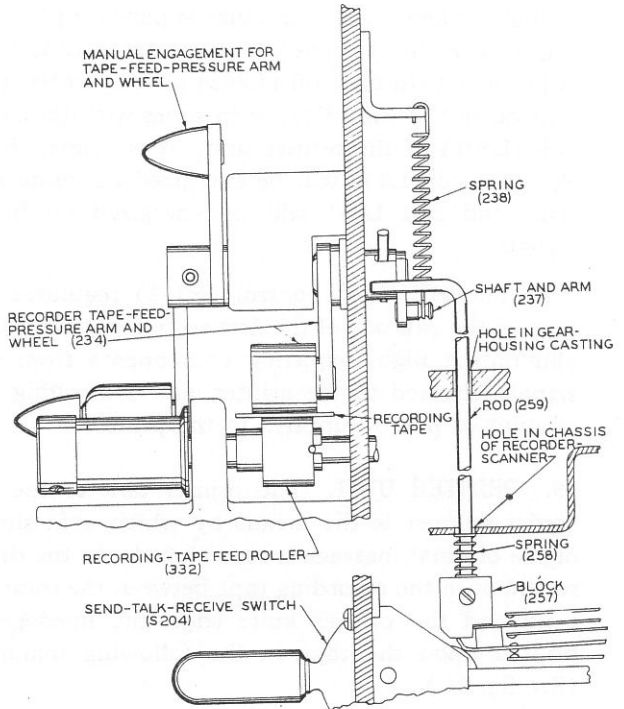


Figure 21—Action of printer armature

is fed automatically by movement of an extended switch-contact blade against a small block (257) attached to an L-shaped push rod (259) behind the recorder-scanner panel (fig. 22). As the switch knob is pushed down, the blade pushes up the block and rod. The short leg at the upper end of the rod pushes against the lever pin of the recorder tape-feed shaft-and-arm assembly (237), which in turn throws the recorder tape-feed-pressure arm-and-wheel assembly (234) into position on the tape by pushing on the tapered pin protruding from the shaft of the shaft-and-arm assembly (237). A small spring (258) returns the block and rod to normal position when the switch is not at RECEIVE, thus allowing the pressure roller to be moved out of contact with the tape if desired.

d. The message is printed twice on the recording tape in parallel lines. This results from the fact that the length of the helix body and the pitch of the helix threads are such that thread contact points are above the printer knife edge at two places at all times. The purpose of the double printing is to prevent loss of parts of the message if the printing drifts across the recording tape from one side to the other.

20. RECEIVING - OPERATION SUMMARY. A brief summary of the receiving operation (par. 18 and 19) is as follows: Incoming signals of 1,150 cycles (white) and 1,650 cycles (black) are picked up by a band-pass filter, which removes all frequencies except those between 1,000 and 1,800 cycles. The filtered signal passes through the input transformer (T101) and two limiter stages (V106 and V107) to a discriminator transformer (T102) that has two tuned secondaries. One secondary is tuned to 1,000 cycles, and the other is tuned to 1,800 cycles. When a 1,150-cycle signal is received, the voltage output of the 1,000-cycle tuned secondary is greater than that of the 1,800-cycle tuned secondary. When a 1,650-cycle signal is received, the reverse is true. The discriminator-transformer secondaries and the associated duo-diode rectifier (V108) are wired so that when a 1,150-cycle signal is received, a negative voltage is impressed upon the first grid of the dual triode (V109). When a 1,650-cycle signal is received, a positive voltage is impressed upon the first grid of this tube. This action in turn keys a pair of output tubes (V110 and V111). Current flows in tube V110 for white signals, and in tube V111 for black signals. Tube V110 energizes the white coil (L202) of the printer unit, pulling the printer knife blade down. Tube



TL 50222

Figure 22—Cross section of recorder-scanner front panel, showing recording-tape automatic feed

V111 energizes the black coil (L201) of the printer unit, raising the printer knife blade, and causing the receiving tape to make contact with the revolving helix. The up and down motion of the tape against the inked threads of the helix prints the incoming message on the tape.

21. AUTOMATIC STOP-START CIRCUIT. Refer to fig. 23 when tracing this circuit.

a. Receiving. It has been stated previously that as a signal is picked up from a remote station when the SEND-TALK-RECEIVE switch is in RECEIVE position, the automatic stop-start circuit trips a relay in the recorder-scanner, starting up the synchronizing vibrator and the drive motor. This is done in the following manner:

(1) As the first section of the discriminator tube (V108) puts out a negative voltage as a result of receiving a 1,150-cycle signal (white), this voltage is impressed on the grid of the first section (connections 1, 2, 3) of the duo-triode automatic-stop-start tube (V204). This cuts off the current that is normally flowing through this section when there is no signal.

(2) As soon as current stops flowing in the first section of tube V204, there is no longer a voltage drop across resistor R123, which is in the plate circuit of this section. This removes the negative bias from the grid of the second section of tube V204 (connections 4, 5, 6), raising the grid to cathode potential, and allowing current to flow through this section of the tube.

(3) Since the coil of the stop-start relay (E201) is in series with the plate circuit of the second section of tube V204, a flow of current through this section of the tube energizes the relay. This closes

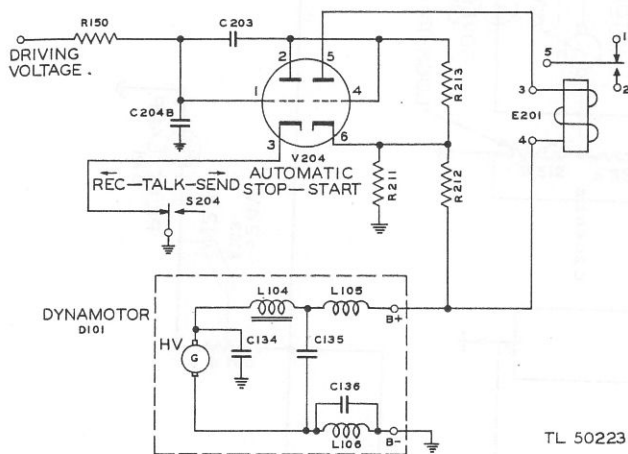


Figure 23—Automatic-stop-start circuit and dynamotor high-voltage circuit, schematic diagram

the power circuit to the recorder-scanner drive motor (D201) and vibrator (E204), putting them in action (fig. 24).

(4) When the incoming signal ceases, the discriminator tube V108 no longer supplies the negative bias to the grid of the first section (connections 1, 2, 3) of tube V204, again allowing current to flow in this section. This action produces a voltage drop across resistor R213, which supplies a negative bias to the grid of the second section (connections 4, 5, 6) of tube V204, and stops current flow in this section. This in turn opens relay E201, and stops the recorder-scanner drive motor and vibrator.

(5) Note that the motor and vibrator do not stop immediately. This is because the capacitor C204B is charged at the same time that the first section of tube V204 is driven negative by the incoming signal. As the negative voltage is removed, capacitor C204B discharges through the resistor R150. Because of the amount of resistance of resistor R150, this discharge action takes several seconds. The grid remains negatively biased with respect to

cathode as long as capacitor C204B holds a charge; therefore, current flow in the first section of tube V204, with the resultant breaking of the motor-and-vibrator circuit, cannot begin until capacitor C204B is entirely discharged.

(6) The purpose of this time-delay action is to prevent stoppage of motor-and-vibrator current as the black and white impulses alternate on the incoming signal. In sub-paragraph (1) above it was stated that a negative voltage is impressed on the grid of the first section of tube V204 when a 1,150-cycle (white) signal is picked up. It is apparent that a positive voltage is present when a 1,650-cycle (black) signal is picked up. Since a white signal is present a greater part of the time, the black signal cannot swing the grid positive, because the negatively charged capacitor C204B never has sufficient time to discharge to the point where it could become positively charged.

b. Sending. (1) Operation of the automatic stop-start circuit, when sending, is somewhat simpler than when receiving. With the SEND-TALK-RECEIVE switch at SEND, the cathode circuit of the first section of the triode V204 is disconnected from ground by the switch. This prevents current from flowing in the first section of tube V204, which results in the same automatic starting action as described above for receiving operation.

(2) If the sending operation is being monitored, with MONITOR-OFF switch at MONITOR, action of the automatic stop-start circuit will be the same as for receiving operation. Capacitor C204B will be negatively charged, and a time delay will occur in shutting off the motor and vibrator. Also, if the SEND-TALK-RECEIVE switch is switched immediately from SEND to RECEIVE, the automatic stop will not function if a signal is still being received from a distant station.

NOTE: In the descriptions of circuit functions for sending and receiving, frequent references are made to black and white signals, black and white impulses, black and white coils, etc. As used in this way, the words *black* and *white* do not refer to the color of the signals, impulses, coils, etc., but to the color of the portion of the original message tape that is under the scanning beam when the described circuit condition exists.

22. SPEED-AND-DRIFT-CONTROL CIRCUIT. *a.* It is desirable, for uniformity of transmission, that all scanners operate at the same speed. Therefore,

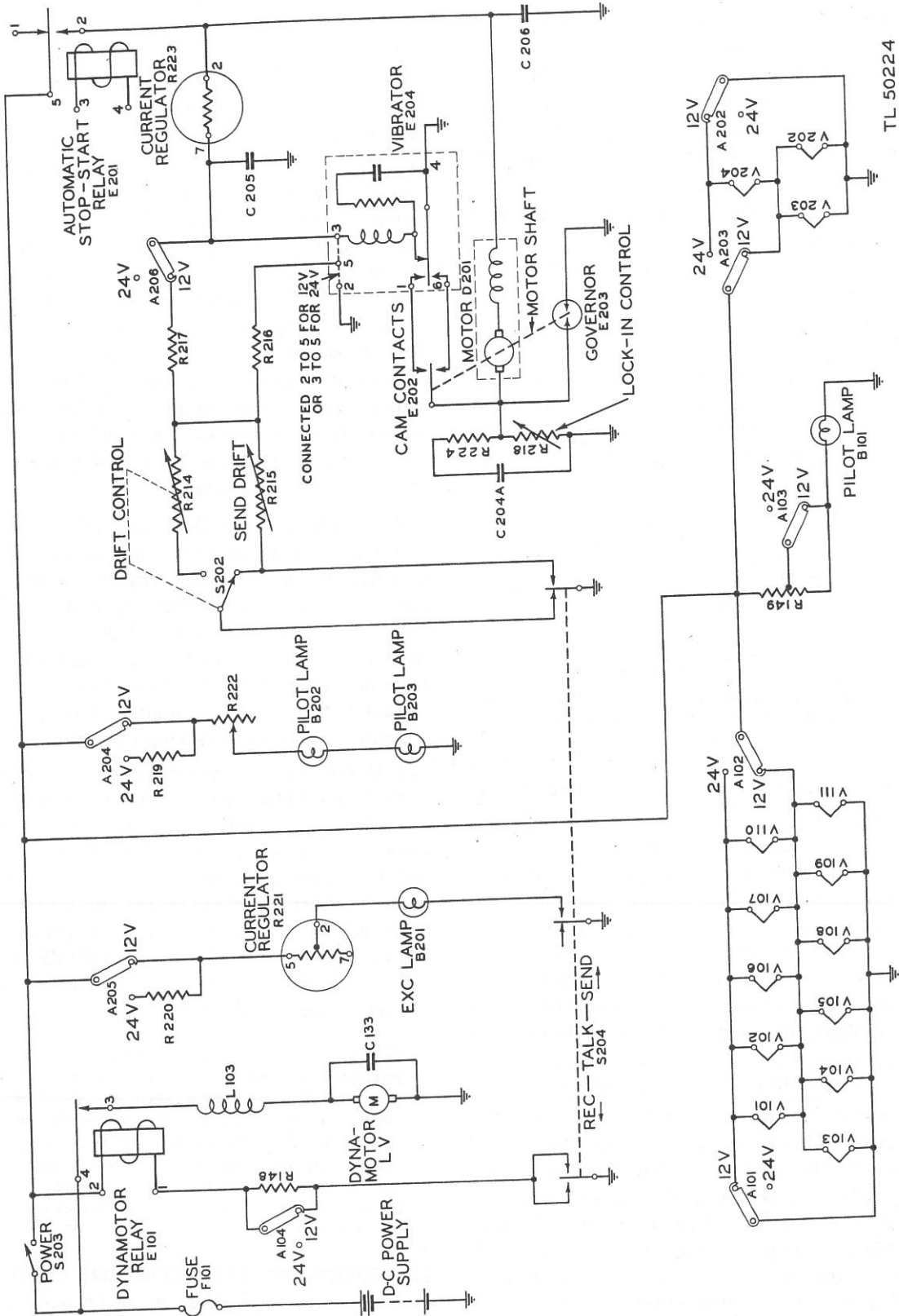


Figure 24—Low-voltage circuit, schematic diagram

some means of speed control is necessary. To insure constant speed of operation of the recorder-scanner, a speed-control circuit is incorporated in the drive-motor circuit. This control circuit consists of a single-pole, double-throw switch operated by a cam on the motor shaft; a single-pole, double-throw vibrator; a resistance-capacity shunt; and an adjustable resistance in series with a current-regulator tube.

b. Control of the motor speed depends primarily upon the action of the cam switch (E202) and the vibrator (E204). D-C voltage is applied to the motor (D201) and the vibrator (E204) through the contacts of a relay (E201) (fig. 24), the current through the vibrator being kept constant by a current regulator tube (R223). The current through the motor goes to ground, partially through the lock-in control (R224, C204A and R218) and partially through the cam-switch-and-vibrator circuit. The motor governor, E203, also functions in this circuit.

c. The lock-in control allows a minimum current to flow through the motor when the cam-switch-and-vibrator circuit and the governor circuit are open. The main flow of current when the motor is at operating speed, however, is through the cam-switch-and-vibrator circuit. The normal speed of the motor is 3,600 rpm. The cam operating the switch E202 is on the motor shaft, which results in the two switch contacts making and breaking 60 times each second. The vibrator E204 vibrates at the rate of 60 complete cycles each second, so that the two vibrator switch contacts also make and break 60 times each second.

d. Figure 25 shows the four main positions of the cam-switch contacts and vibrator contacts. When the motor is running at the correct speed of

3,600 rpm, the cam-switch and vibrator contacts are going through the steps shown, from A to D successively, 60 times per second. When the contacts are in positions A and C, the lock-in control is short-circuited to ground, so that the motor draws full power. In positions B and D the circuit is open, so that the lock-in control is in series with the motor, cutting down the power delivered to the motor to a minimum. It is apparent from following the circuit successively through positions A to D that the cam-switch contacts move to the opposite side of the circuit before the vibrator contacts. Thus the cam-switch contacts are leading the vibrator contacts. The percentage of time that the lock-in control is short-circuited depends on the amount that the cam-switch contacts lead the vibrator contacts. The design is such that the combination tends to reach a balance exactly at a speed determined by the vibrator.

e. If the voltage across the circuit is increased slightly, the motor receives more power. This tends to increase its speed, causing the cam-switch contacts to lead the vibrator contacts by a greater amount. This increases the proportionate amount of time that the lock-in control is in the motor circuit, thus cutting down the power to the motor, and allowing the system to reach stability again.

f. On the other hand, if the voltage across the circuit drops slightly, the motor receives slightly less power, which will tend to decrease its speed. This causes the cam-switch contacts to lead the vibrator contacts less than is normal. This increases the proportionate amount of time that the lock-in control is short-circuited out of the motor circuit, thus increasing the power delivered to the motor, bringing it back to rated speed.

g. If the voltage drops too low, the synchronizing system eventually reaches the limit of its range,

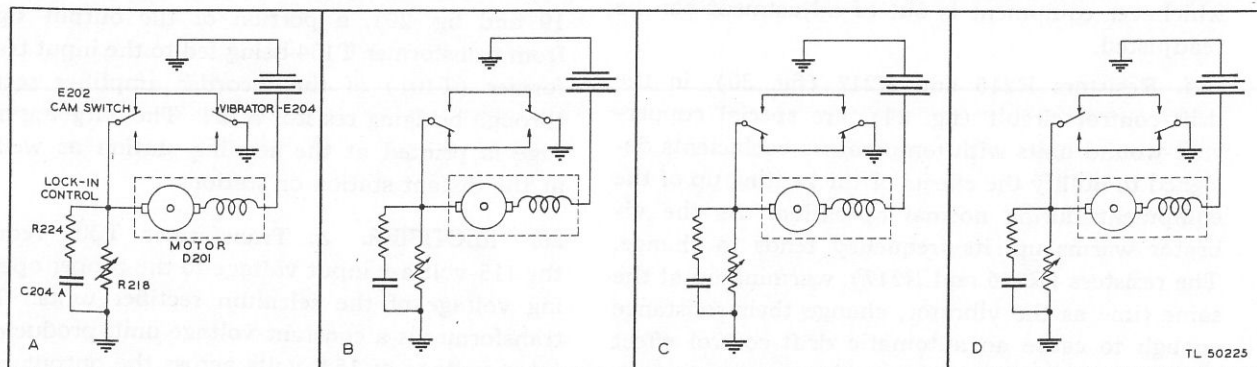


Figure 25—Progressive action of cam-switch and vibrator contacts

and the motor tends to slow down still further. As soon as motor speed drops slightly, however, the governor (E203) closes its contacts, again short-circuiting the lock-in control. The governor, which is mounted on the motor armature shaft, has a pair of contacts, centrifugally operated, that open at approximately 3,500 rpm. Thus, at speeds below 3,500 rpm, the contacts are closed, and full current flows through the motor, increasing its speed. At 3,500 rpm the contacts open, preventing further flow of current through the governor circuit.

NOTE: Bear in mind that the speed-control action described here is a continuous function, and that the effect of the pulses as maximum current is cut in and out is smoothed out by the flywheel effect of the armature and driven mechanism. For this reason, no unevenness is apparent in the motion of the tape as it travels through the recorder or the scanner.

h. Drift control. The two drift controls (R214 and R215), mounted on the front panel of the recorder-scanner (fig. 29), are for the purpose of adjusting the vibrator current. This vibrator current controls the speed of the vibrator, and ultimately the speed of the motor. The SEND DRIFT control (R215) has been adjusted, setting the vibrator speed to exactly 60 vibrations per second. The receive DRIFT control (R214) is intended for use during operation of the equipment, and is switched into the circuit by switch S202, which is on the same shaft as the control. (Switch S202 cuts SEND DRIFT control R215 out of the circuit at the same time.) When an incoming message drifts across the recording tape instead of printing in a straight line, parallel with the edges of the tape, it is because the drive motor at the receiving station is not running at the same speed as the motor at the remote station. Drift control R214 is used to change vibrator speed, and therefore motor speed, at one station to match the vibrator speed at the other station until whichever equipment is out of adjustment can be readjusted.

i. Resistors R216 and R217 (fig. 30), in the drift-control circuit (fig. 24), are special copper-wire-wound units with temperature coefficients designed to nullify the effects of the heating up of the equipment during normal operation. As the vibrator warms up, its frequency tends to change. The resistors (R216 and R217), warming up at the same time as the vibrator, change their resistance enough to cause an automatic drift-control effect that tends to hold the vibrator frequency constant.

23. LOW-VOLTAGE CIRCUIT. The low-voltage circuit (fig. 24) is for the most part self-explanatory. The battery or rectifier supplies a d-c voltage for tube filaments, for pilot lamps, for the optical-system exciter lamp, and for operating the vibrator, the drive motor, and the dynamotor. Connected in series with the exciter lamp (B201) is a ballast tube (R221) which regulates current flow through the lamp. For proper operation of the photo-cell (V201) circuit, the current through the exciter lamp (B201), and hence the brightness of this lamp, must be kept reasonably constant.

24. DYNAMOTOR. High voltage for plate circuits of the amplifier and recorder-scanner is supplied by the dynamotor (D101). The low-voltage input winding and the high-voltage output winding of the dynamotor are wound on a single armature shaft, with motor commutator and brushes at one end, and generator commutator and brushes at the other end (fig. 23 and 24). A filter section is used in both the motor and generator sections to smooth out voltage ripples, and to eliminate hash in the voltage supply, such as might be caused by brush arcing or slight fluctuations in speed.

25. MONITORING. If the MONITOR - OFF switch (S201) is at MONITOR when the SEND-TALK-RECEIVE switch is at TALK or RECEIVE, there is no effect, since switch S201 is short-circuited, or out of the circuit. (Switch S201 does apply plate voltage to the second preamplifier tube when at RECEIVE, but this has no effect, since plate voltage is not applied to the scanner amplifier section or to the photo-cell or first preamplifier section.) When the SEND-TALK-RECEIVE switch is placed at SEND, however, plate voltage is applied to the recorder-amplifier section through the monitoring switch. Under this condition, the receiving circuit functions (par. 18 and 19 and fig. 20), a portion of the output signal from transformer T104 being fed to the input transformer (T101) of the recorder amplifier section through bridging resistor R124. The outgoing message is printed at the sending station as well as at the distant station or stations.

26. RECTIFIER. *a.* Transformer T301 reduces the 115-volt a-c input voltage to the proper operating voltage of the selenium rectifier units. This transformer is a constant-voltage unit, producing a rated voltage of 15.8 volts across the output, with

input voltages varying approximately from 95 to 125 volts. The transformer is composed of four windings: the primary, an intermediate or resonant winding, a compensating winding, and the secondary. The primary and the compensating winding are layer-wound, the second over the first, on one leg of the transformer center core; the resonant winding and the secondary also are layer-wound, the second over the first, on the other leg of the center core. As a voltage is impressed across the primary, the intermediate winding (winding with series capacitor) reaches a resonant point, so that the voltage across this winding is higher than the normal turn-ratio voltage would be. This voltage is highly stable as long as the circuit is resonant, and changes in primary voltages have very little effect. Whatever effect is induced is counteracted by the compensating winding, which is connected in series with and in opposition to the secondary, resulting in a constant voltage across the secondary at all times.

b. The a-c output voltage of the transformer is impressed upon the two selenium rectifier units (RT301 and RT302), which are connected to form a bridge circuit (fig. 26). When the alternating current is in one direction, it enters at point B and proceeds to point C, and from there through the positive terminal (5) to the battery. The circuit from the battery is completed through negative terminal (4), from A to D, back to the transformer. It is the nature of selenium-disk rectifiers to pass current in only one direction, so current cannot pass from B to A or from C to D. When the alternating current is in the opposite direction, it enters at point D, and proceeds to point C, and from there to the positive battery terminal. Return is from the negative

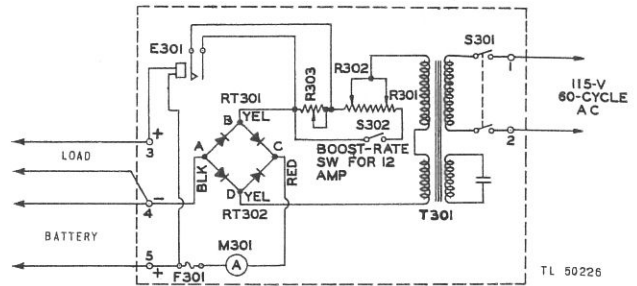


Figure 26—Rectifier, RA-54-A, schematic diagram

battery terminal through point A to B and then to the transformer. It can be seen that this alternating current has been transformed to full-wave rectified direct current.

c. When there is no load on the circuit (tape-facsimile equipment turned off), relay E301 is open, so that current has to pass through resistances R302 and R303, as adjusted. This allows only a trickle charge to pass to the battery. When a load is in the circuit, relay E301 is energized (closes at 7 amperes, opens at 4 amperes), which short-circuits resistor R303. Resistor R302 is adjusted to pass the proper amount of current to carry the load of the tape-facsimile equipment (approximately 9.5 amperes) without draining current from the battery.

d. When the booster switch is in BOOST position, current passes through resistor R301, bypassing resistor R303. Resistor R301 is adjusted so that the rectifier output current may be stepped up to 12 amperes. The contact arms of relay E301 are short-circuited at this time, so that the maximum current may be drawn whether or not the load is in the circuit.

SECTION IV MAINTENANCE

27. ROUTINE MAINTENANCE. A regular routine of inspection of the facsimile equipment will do much to eliminate operational failures. Check moving parts regularly on an hours-of-service basis, and make replacements when defects appear. Handle the equipment carefully to insure trouble-free operation for long periods. Regular maintenance procedures are:

a. General. When starting up the equipment, check operation of all pilot lamps. If any lamps are burned out, replace with new bulbs. (Recorder-scanner pilot lamps will not light if the brightness control, R222, is turned to its maximum counterclockwise position.) Check all switches to see that they are operating in good order. Check cable connections to see that plugs are all tightly in place. Check for noises not occurring during normal operation.

NOTE: Unless otherwise stated, items that have been disassembled are to be reassembled in order opposite to that of disassembly.

b. Lubrication. It is advisable to lubricate certain bearing points after approximately every 1,000 hours of use. Parts needing lubrication are gear teeth, the printer ball bearings, and the dynamotor ball bearings. All other ball bearings are sealed units and none requires lubrication during the life of the bearing.

(1) To lubricate gear teeth, remove the recorder-scanner from its case by turning the two slotted bolts at the back of the unit counterclockwise and pulling the chassis out at the front. Clean all gear faces with a lint-free cloth moistened with carbon tetrachloride to remove accumulated grease and dirt. After cleaning, apply a small amount of gear lubricant to all gear teeth (fig. 27). For temperatures above 0° F, use Grease, General Purpose No. 2, U S Army Spec 2-108. For temperatures between 67° below zero and 0° F, use Grease, Lubricating Special, U S Army Spec AXS-637.

(2) To oil the printer bearings, remove the detent knob and printer cover and add a few drops of

mineral oil (U S Army Spec AXS-777 Lubricating Preservative Special) to each bearing (fig. 40).

(3) To lubricate dynamotor bearings, remove the dynamotor assembly from the bottom of the amplifier (the amplifier must be removed from its case). Remove the two large flat end screws covering the bearings. Reach these screws through the holes in the sides of the dynamotor container (fig. 28). Clean the recessed holes of old grease, and add a small amount of lubricant (U S Army Spec 2-108 or U S Army Spec AXS-637; see preceding paragraph); then replace the flat screws and replace the dynamotor. It is not necessary to disconnect any wires.

CAUTION: Do not change any adjustments or the positions of any parts relative to each other when lubricating the equipment. If parts have become out of adjustment, refer to servicing instructions (par. 29). It is important to keep the equipment clean. Do maintenance or servicing work on the equipment only on a clean surface and in a dust-free location.

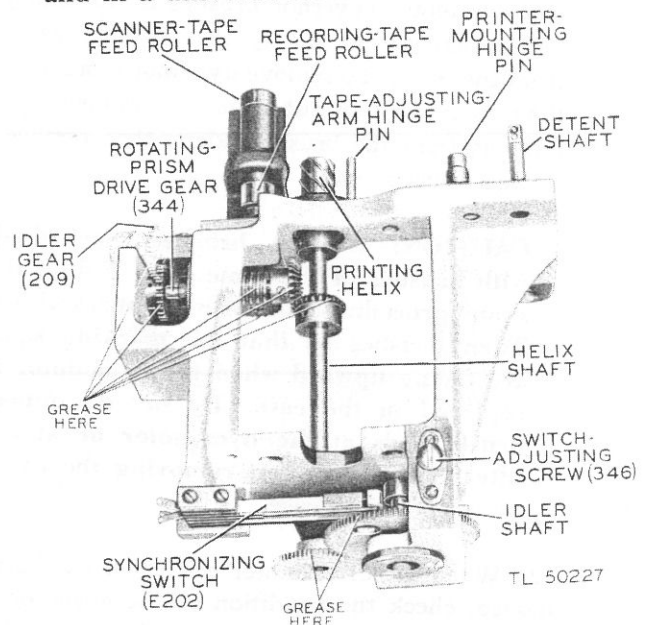


Figure 27—Gear-housing assembly

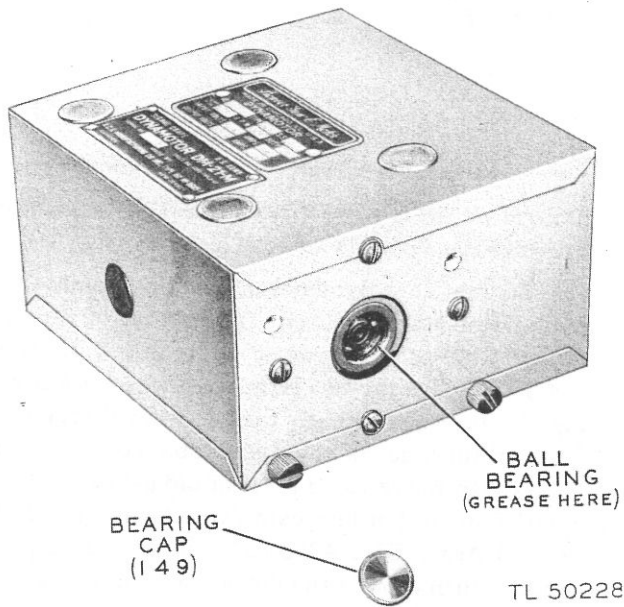


Figure 28—Dynamotor lubrication

c. Dynamotor and drive motor. (1) It will be necessary from time to time to replace brushes in the dynamotor and drive motor. Check brushes and replace if necessary after every 500 hours of use. Do not allow brushes to become shorter than $\frac{1}{8}$ inch of carbon. Brushes come in sets, and if replacing one, replace the entire set. Remove motor commutator brushes by unscrewing the brush caps. Remove motor governor brushes by loosening the hub setscrews and sliding the governor assembly from the shaft. To remove dynamotor brushes, slip the dynamotor unit out of its case; remove the cotter pins from the brush holders; then remove the slotted brush screws.

CAUTION: Replace brushes marked + with brushes of the same sign. Follow the same procedure for brushes marked —. Turn brushes so that the marking signs are facing upward when the dynamotor is replaced in the case. Do not disconnect brush leads at the dynamotor or at the filter terminals when removing the dynamotor from its case.

(2) When the drive motor end cover has been removed, check the condition of the governor contacts. Clean the contacts with carbon tetrachloride if necessary. Before reassembling the motor to the

gear housing, check the condition of the cam-switch contacts, and clean them if necessary.

(3) Check the condition of the motor and dynamotor commutators. If necessary, undercut the mica between the bars to a depth of approximately $\frac{1}{64}$ inch. If a commutator is worn or pitted, disassemble the unit and remove the armature. Turn down the commutator on a lathe as much as is necessary. Be sure to undercut the mica after turning down a commutator. Check carefully when removing and replacing the dynamotor armature to see that it is not reversed in position when the dynamotor is reassembled. The 45-bar commutator should be at the output end, and the 30-bar commutator at the input end. A reversed armature will make the unit inoperative. Do not replace brushes before the dynamotor is reassembled.

d. Optical system. The only regular maintenance necessary for the optical system is replacement of the exciter lamp when the lamp burns out, and cleaning of the lens and prism surfaces from time to time. To replace a lamp or to clean lens surfaces, remove the recorder-scanner chassis from its case. In addition loosen the two thumbscrews holding the optical-system front cover in place, and remove the cover by lifting outward and upward. Use a fine camel's-hair brush or optical paper for cleaning purposes. Be very careful when cleaning the two pickup reflectors, since these are front-surface reflectors having a delicate polished-aluminum coating. The length of time between lens cleanings will be determined by operating conditions. Equipment in a dusty location will need cleaning more often than equipment in an atmosphere free from dust.

CAUTION: Do not expose the photoelectric cell to strong light. The cell is extremely sensitive, and bright light on the active surface will damage the unit. Never use anything but a soft brush or optical paper for cleaning the lens, prism, and reflector surfaces of the optical system.

e. Tape feeds. Inspect tape passages whenever a new roll of recording tape is mounted in the recorder-scanner. Remove the phosphor-bronze cleaning strip from the inside of the recorder-scanner side cover. Pass this strip in and out of the tape passages for both recorder tape and scanner

tape, cleaning out lint and paper dust. Turn the printer detent knob to OFF before trying to clean out the tape passages.

f. Printer unit. Inspect the printer unit for ink, dust and dirt from time to time. Remove the printer cover by loosening the two thumbscrews holding it in place, and removing the detent knob. Pull the cover out carefully from the recorder-scanner front panel (fig. 29 and 40). Clean out paper dust with a soft brush. Give special attention to the air gap of the magnetic structure. Clean out any foreign material lodged in the openings with the brush, or with scotch tape or moistened gummed paper. If ink has accumulated on the knife blade, clean the blade with a cloth moistened in ethyl alcohol (Federal Spec. 4-1018A, any grade).

CAUTION: Do not clean the printer mechanism with the phosphor-bronze strip used for the tape passages. The printer unit may be damaged if attempt is made to clean out openings with this tool or with any other metal piece.

g. Helix. The threads of the printing helix may require cleaning occasionally. The need for this will be indicated by formations of gum along the helix threads. Remove the inker housing by unscrewing the two binder-head mounting screws. The inker assembly, inside the inker housing, will come off with the housing. To clean the helix, use a piece of wood or stiff fiber to remove the accumulation of dried ink or dirt around the helix. Use ethyl alcohol (Federal Spec. 4-1018A, see sub-par. f) to dissolve the ink accumulation, if necessary. Do not attempt to remove the helix. The helix is an integral part of its drive shaft and to remove it would necessitate disassembly of the entire gear housing.

h. Vacuum tubes. Check vacuum tubes after every 500 hours of use. To accomplish this, remove both the amplifier and the recorder-scanner from their cases, and turn the units upside down on a flat surface. Also remove the dynamotor from the amplifier to allow access to tube sockets. Check tube voltages with a standard test voltmeter (1,000 ohms per volt) (fig. 31, 32, and 33). Be sure switches and controls are at the positions indicated on the three voltage charts. Values within 10 per cent of those on the charts are satisfactory. If voltages for any tube appear to be wrong, replace the

tube with a new tube, and check the voltages again. If a second check gives normal voltages, the original tube is probably defective. If readings remain the same, however, there may be trouble in the circuit. (See servicing instructions, par. 28 to 42.)

28. DYNAMOTOR SERVICING. a. General. Replacement procedures for most dynamotor parts are apparent. Care must be taken in reassembly, however, in order to prevent input and output parts from being interchanged.

CAUTION: Ball bearings on the dynamotor armature shaft and on other shafts are pressed fits. Use an arbor press to remove bearings. Be careful, when removing or replacing bearings, not to damage the shafts or the bearings.

b. Brush holders. To remove brush holders, first remove brushes (par. 27c); then disassemble the dynamotor. Loosen the setscrew holding the brush holder to be replaced, and press the holder out toward the center of the end bracket. Brush holders are supplied in sets of four; replace all four when one is damaged. Note that all four brush holders are different. Install each holder in its proper place. The holders with the small brush holes are for the high-voltage output end; those with the large brush holes are for the low-voltage input end. Install the holders so that terminals will be on top when the dynamotor is in its case.

c. Yoke. The field-coil leads of the dynamotor yoke assembly come from the low-voltage end at the top of the yoke. Connect the yellow lead to the positive input brush, and the black lead to the negative input brush.

d. Brush leads and filter connections. Be very careful to make brush lead and filter connections correct. Be sure to thread the three leads from the filter to the amplifier through the rubber grommet in the side of the dynamotor case. Correct lead connections are as follows:

- (1) Yellow brush lead connects at dynamotor input end to same brush terminal as yellow field lead, and to filter terminal marked A+.
- (2) Black brush lead connects at dynamotor input end, to same brush terminal as black field lead, and to unmarked filter terminal.

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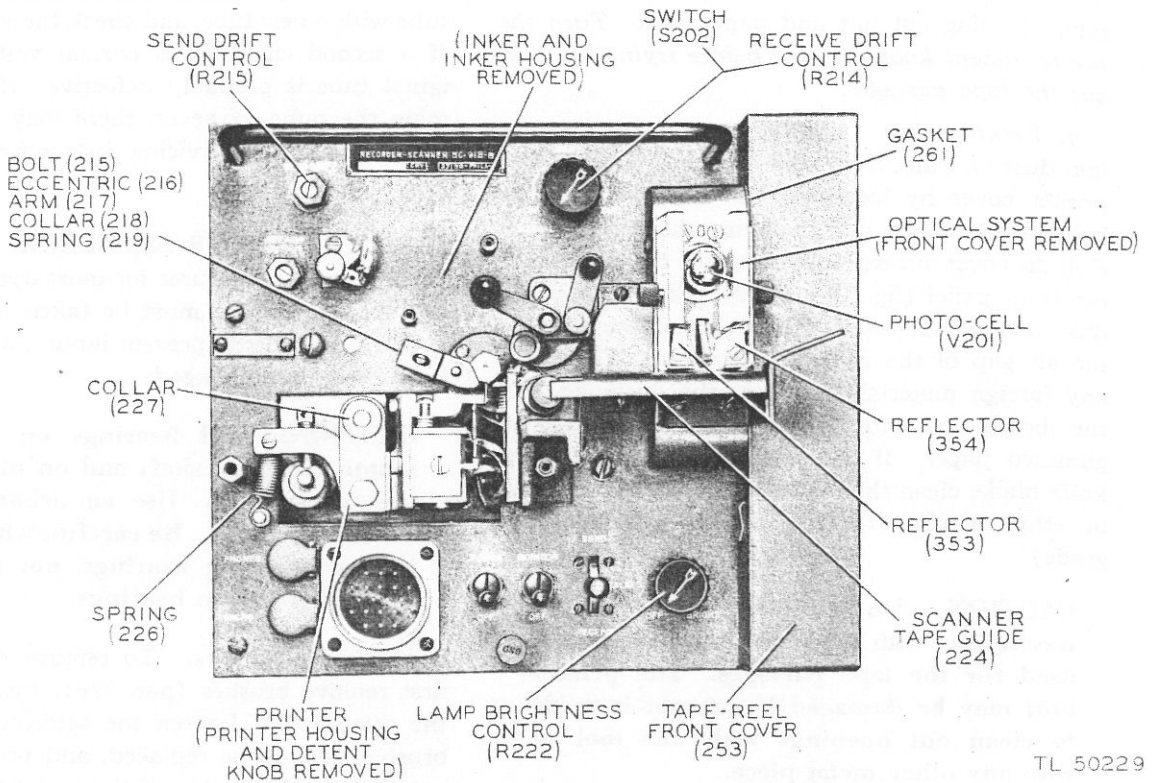


Figure 29—Recorder-scanner front panel

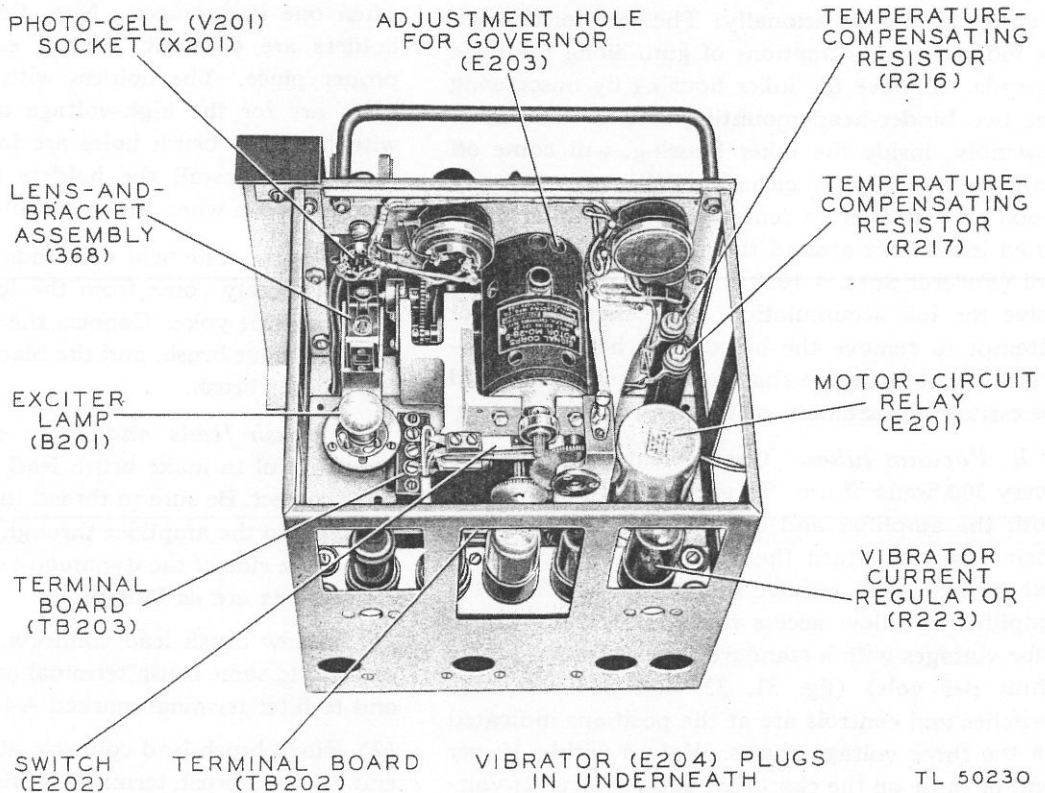


Figure 30—Recorder-scanner top (open view)

(3) Green brush lead connects at dynamotor output end to brush terminal near outside edge of dynamotor case, and to filter terminal marked No. 2.

(4) Red brush lead connects at dynamotor output end to brush terminal near filter unit, and to filter terminal No. 1.

(5) Red lead from amplifier connects to filter terminal marked B+.

(6) Brown lead from amplifier connects to filter terminal marked A+.

(7) Black lead from amplifier connects to filter terminal marked GRD.

(8) Jumper lead connects between filter terminals marked GRD and B—.

29. DRIVE-MOTOR SERVICING. *a.* The drive motor, like the dynamotor, needs little or no servicing beyond routine maintenance (par. 27*c*). It is necessary, however, to replace brush holders from time to time. The governor brush holders are mounted in place by brass nuts. The commutator brush holders are mounted in place by phosphor-bronze clips. Remove these clips with a small pair of longnose pliers in order to release the holders.

b. If the drive-motor leads have been disconnected from their terminal board (marked TB203 MOTOR), reconnect the leads as follows: (See fig. 30.)

(1) White lead (No. 1) to terminal No. 1.

(2) Green lead (No. 2) to terminal No. 2.

(3) Black lead (No. 3) to terminal No. 3.

30. GEAR-ASSEMBLY SERVICING. *a.* To replace parts of the gear-housing assembly, it may be necessary to remove the entire assembly from the recorder-scanner front panel. Proceed as follows: (See fig. 27 and 29.)

(1) Remove the printer detent knob and housing.

(2) Remove the printer unit by taking off the collar (227) and spring (226) and sliding the unit from its shaft.

(3) Remove the tape-reel front cover, which is held in place by two screws.

(4) Remove the inker housing and inker assembly.

(5) Loosen the eight nuts holding the front panel in place as far as possible without removing them.

(6) Loosen the setscrew on the collar (218) holding the tape adjusting arm (217) in place, and remove the collar, arm, spring (219), and eccentric (216). Be careful not to lose any of these small parts.

(7) Remove the drive motor from its place on the gear housing, if the motor has not been removed.

(8) Remove all tubes, relay E201, and exciter lamp B201.

(9) The gear housing is held in place by two standard screws and a square-headed bolt (215). Remove the nuts and washers from these bolts, and then remove the gear housing from the recorder-scanner. Be careful not to damage any parts of the unit.

b. After making necessary replacements, check adjustments of shafts and gears. Adjust shafts for as little end play as possible without binding. Adjust gears for as little backlash as possible without binding. Most of the adjusting collars and hubs for the shafts and gears are fastened by socket-type setscrews. Three hexagonal L wrenches are furnished with the equipment for turning setscrews. These wrenches are held in place by a clip inside the recorder-scanner chassis at the upper right rear.

31. CONTACT-POINT SERVICING. If contact points of the drive-motor governor, the cam-operated synchronizing switch, or the vibrator become badly pitted after long operation, replacements may be necessary. The drive-motor governor (E203), the cam switch (E202), and the vibrator (E204) each must be replaced as a unit (fig. 30). Adjust points and the drift control after replacements are made (par. 37 and 38).

32. OPTICAL-SYSTEM SERVICING. If it becomes necessary to remove the optical system for servicing, first remove the recorder tape chute by loosening the clamp inside the tape-reel cover, and pulling out the chute. Then remove the prism-drive-gear front cover (held in place by two screws), and disconnect the wires to the photo-cell and the exciter lamp (fig. 30). Remove the exciter lamp and the two fillister-head screws holding the optical assembly to the front panel of the recorder-scanner, and carefully remove the assembly through the front of the panel. Replace items requiring special handling as follows:

a. Photo-cell socket. If the photo-cell socket (X201) has been replaced, or if the optical system

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TL 50232

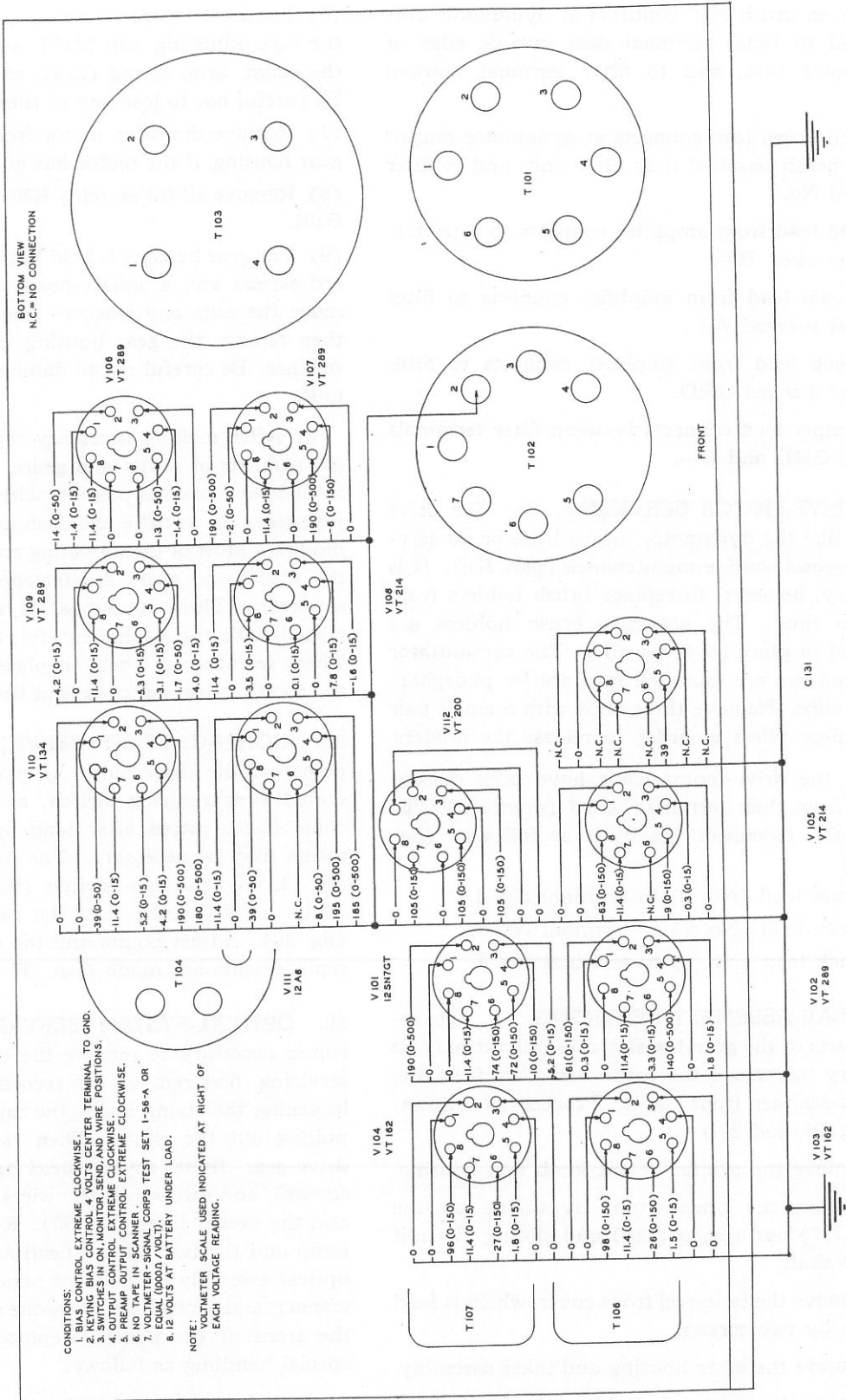


Figure 31—Amplifier tube-voltage chart (BIAS control extreme clockwise)

TL 50233

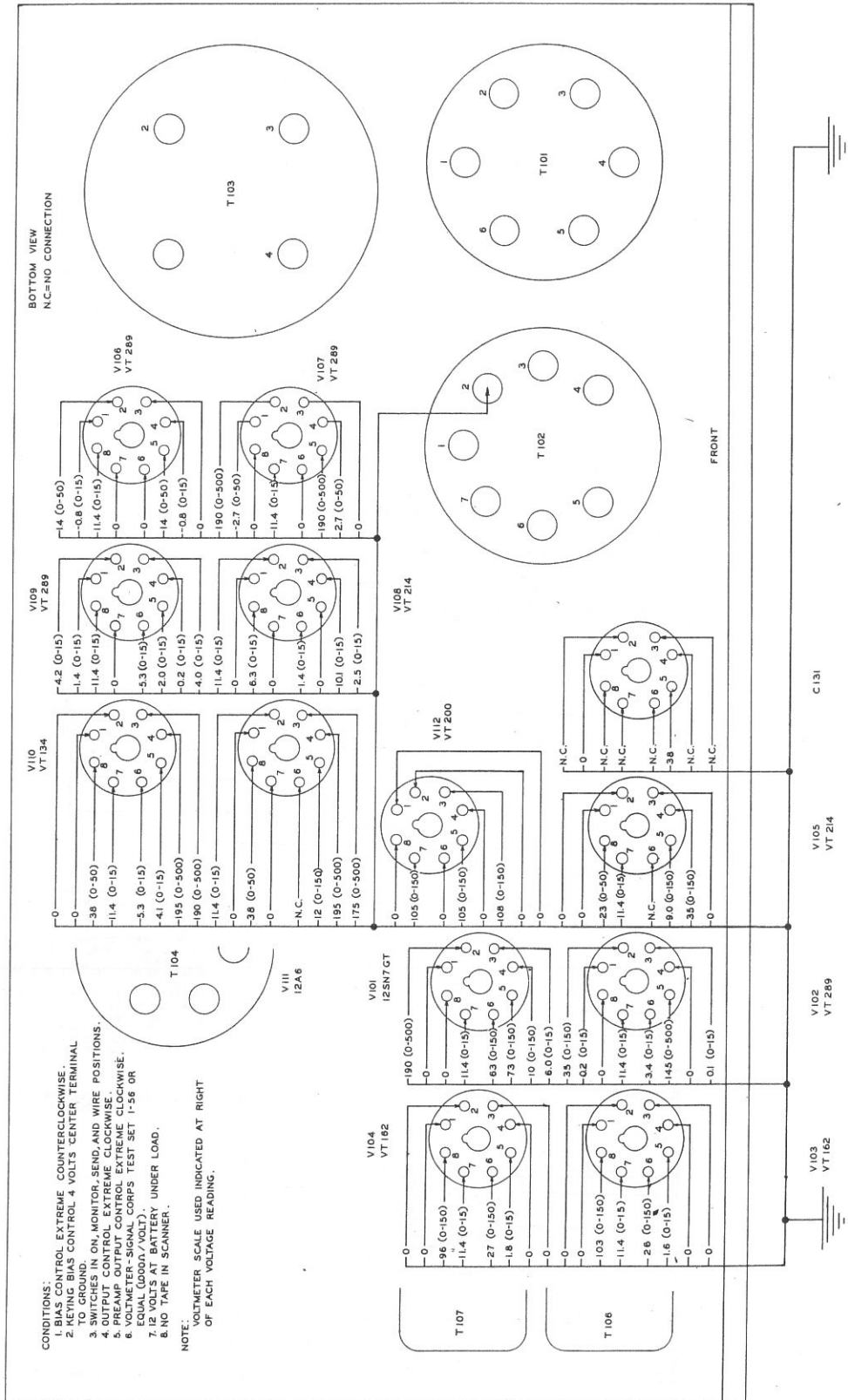


Figure 32—Amplifier tube-voltage chart (BIAS control extreme counterclockwise)

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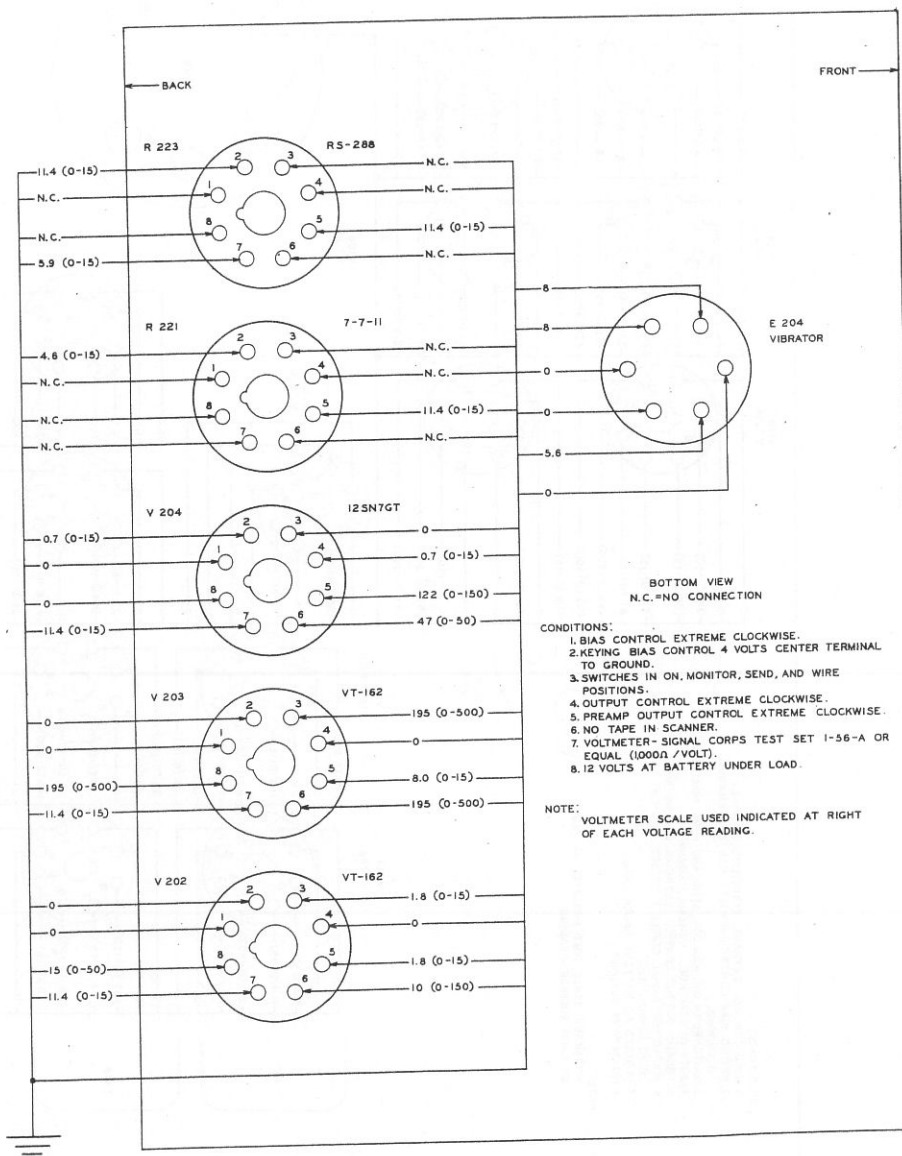
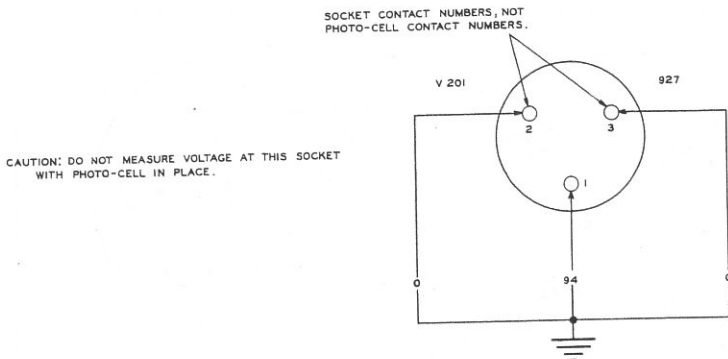


Figure 33—Recorder-scanner tube-voltage chart

TL 50234

has been disconnected and removed from the recorder-scanner for replacement of other parts, reconnect leads as follows:

- (1) White-red wire to terminal No. 1 (lower terminal).
- (2) Cable wire to terminal No. 2 (upper terminal—left as viewed from rear).
- (3) Cable shield wire to terminal No. 3 (upper terminal—right as viewed from rear).

b. Exciter-lamp socket. When connecting the exciter-lamp socket (X209), either lead wire may be connected to either terminal.

c. Hexagonal prism and drive gear. If either the hexagonal-prism assembly (359) or the drive gear (365) is replaced, drill and ream the two parts to match for insertion of a tapered locking pin (366). To do this, assemble the prism and shaft, bearings, bearing retainers, spacer washer, and drive gear (hub side out) in place on the optical housing (fig. 34). Adjust the position of the gear

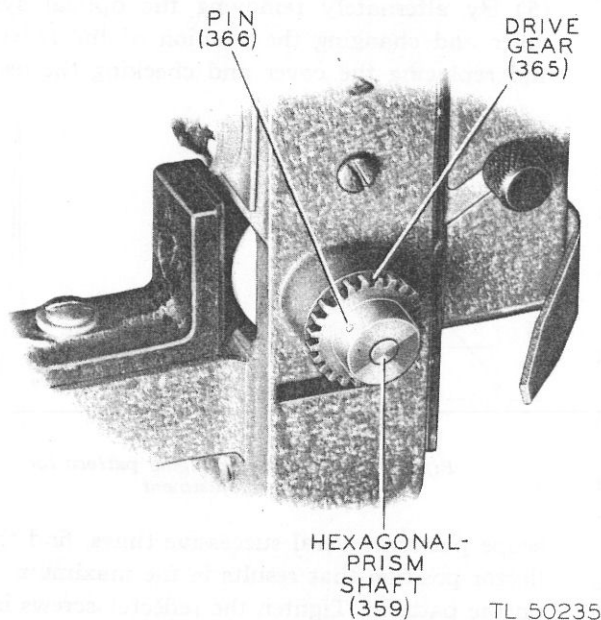


Figure 34—Optical system, showing drive gear

so that the shaft spins freely, but so that end play is not greater than 0.005 inch. Drill through the shaft at the already existing hole in the gear hub, and ream the entire length of the hole so that the taper pin (366) may be driven in tightly for its full length.

CAUTION: Do not allow metal dust or chips to fall into the opening of the optical

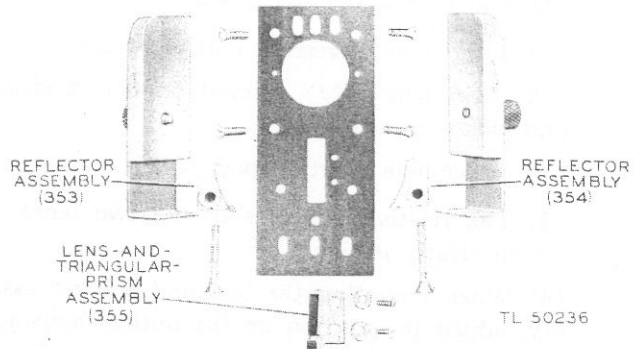


Figure 35—Optical system, partial (disassembled)

assembly or on lens, prism or reflector surfaces. If necessary, shield the assembly with a clean cloth while drilling.

d. Lens-and-triangular-prism assembly. When mounting the lens-and-triangular-prism assembly (355), be sure that the prism is as nearly vertical as possible before tightening its mounting screws (fig. 35).

e. Lens-and-bracket assembly. If it is necessary to remove the lens-and-bracket assembly

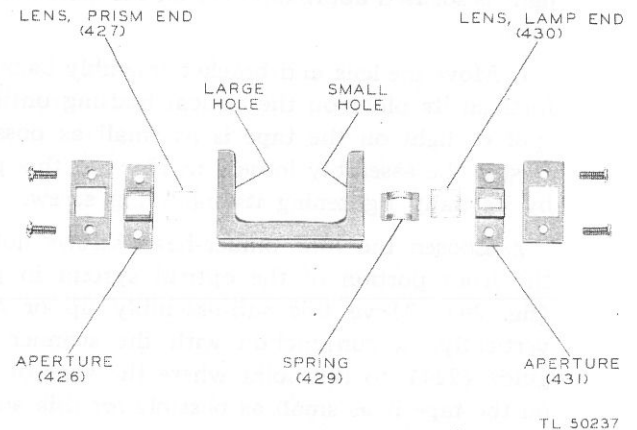


Figure 36—Lens-and-bracket assembly (disassembled)

(368) in order to replace the assembly or parts of the assembly, reassemble as follows: (See fig. 36.)

(1) End near exciter lamp:

- a. Small hole in vertical part of casting.
- b. Curved spring (429), curved portion vertical and facing outward.
- c. Thick lens (430), curved portion vertical and facing inward (against curved portion of spring).
- d. Small-hole aperture piece (431).

(2) End near hexagonal prism:

- a. Large hole in vertical part of casting.
- b. Thin lens (427), curved portion horizontal and facing inward.
- c. Large-hole aperture piece (426).

(3) The relative positions of the two lenses are shown clearly in figure 16.

(4) When mounting the lens-and-bracket assembly, adjust its position on the optical housing so that the exciter lamp is focused properly. Proceed as follows (with the optical system mounted in its normal position): (See fig. 29 and 30.)

a. Remove the motor-starting relay (E201) from its socket (fig. 30).

b. Remove the front cover of the optical system. Do not expose the photo-cell to strong light.

c. Place a piece of tape in position in the scanner head.

d. With the power on, place the SEND-TALK RECEIVE switch in SEND position.

e. Move the hexagonal prism so that the beam of light is focused approximately on the center of the tape.

f. Move the lens-and-bracket assembly back and forth in its place on the optical housing until the spot of light on the tape is as small as possible. Fasten the assembly loosely in place at this point by partially tightening its mounting screw.

g. Loosen the four binder-head screws holding the front portion of the optical system in place (fig. 29). Move this sub-assembly up or down vertically, in conjunction with the scanner tape guide (224), to the point where the spot of light on the tape is as small as possible for this adjustment. Partially tighten the four screws.

h. Check the positions of the lens-and-bracket assembly and the front portion of the optical system against each other several times, until the light spot is at an absolute minimum. Then securely tighten the mounting screws. Make sure that the tape guide is low enough to allow the scanner tape to pass through without binding.

f. Reflectors. The two reflector assemblies (353 and 354) (fig. 35) must be adjusted to such an angle that a maximum amount of light is reflected from the tape to the photo-cell. When an oscillo-

scope is not available, make this adjustment (approximately) by mounting each reflector so that the inner lower edge of the reflector holder is against the bottom part of the optical-system cover bracket. If an oscilloscope is available, proceed as follows with the equipment completely assembled and connected:

(1) Connect one lead from the vertical plate input of the oscilloscope to one of the terminals of capacitor C121 (fig. 48) and ground one lead to the amplifier chassis.

(2) Prepare a test tape by marking a black line about 1/32 inch wide down the center of a short strip of tape. Place the test strip in position in the scanning head.

(3) Turn on the power, and throw the SEND-TALK-RECEIVE switch to SEND.

(4) Observe the pattern on the oscilloscope. The pattern should appear approximately as in figure 37. (Optical-system cover should be in place).

(5) By alternately removing the optical system cover and changing the position of the reflectors, and replacing the cover and checking the oscillo-

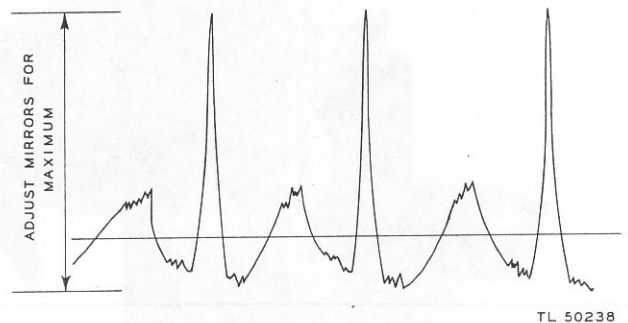


Figure 37—Oscilloscope signal pattern for reflector adjustment

scope pattern several successive times, find the reflector position that results in the maximum peaks on the pattern. Tighten the reflector screws in this position.

CAUTION: Do not touch the reflector surface any more than is necessary, and do not expose the photo-cell to a strong light while its cover is removed.

g. Mounting optical system. When mounting the optical assembly to the recorder-scanner front panel, it is important to mesh properly the drive

gear, idler gear, and driven gear for the rotating prism, and, at the same time, to keep the proper relationship between the rotating prism and the printing helix.

(1) The three gears must mesh with as little backlash as possible without binding. To accomplish this, loosen the two screws holding the idler gear assembly in place on the gear housing, and adjust the position of the idler assembly, in conjunction with the vertical position of the optical assembly, to the point where the gears are properly meshed. Be sure to tighten mounting screws after adjustment has been completed.

(2) The relative positions of the rotating prism and helix must be such that a line drawn between

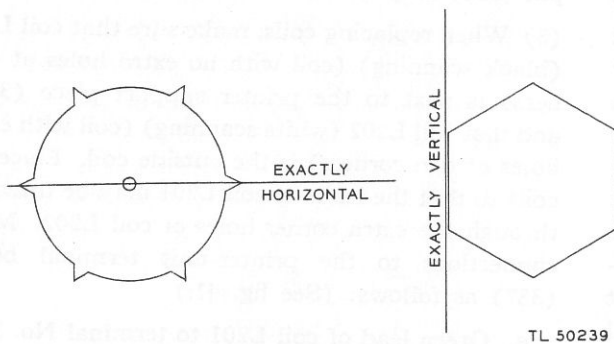


Figure 38—Relationship between printing helix and rotating prism

any two diametrically opposite threads of the helix, when viewed from the front, will be exactly horizontal when any two opposite faces of the prism are exactly vertical. This relationship is shown in figure 38. To accomplish this, loosen the setscrews in the hub of the rotating-prism drive gear (344) on the worm-gear shaft in the gear housing (fig. 27). Turn this gear on its shaft until the helix and the hexagonal prism reach their correct relationship. Then tighten the setscrews on the shaft. Make sure that the teeth of this gear and the idler gear (209) are fully engaged before tightening the setscrew.

(3) If the two round-head screws and two lock washers holding the gasket (261) and tape-reel front cover (253) in place against the optical housing have been removed, be sure to replace them (fig. 29).

33. TAPE-FEED ADJUSTMENT. *a.* If the recorder tape tends to pile up and jam at the print-

ing helix, or to chatter audibly at this point, the probability is that the feed adjustment is not correct. If either of these conditions exist, or if the tape feed needs adjustment because the mechanism has been disassembled, readjust the parts as follows:

- (1) Turn the printer detent knob to PRINT.
- (2) Loosen the setscrews in the square-head bolt (215), releasing the eccentric (216) that sets the adjusting arm (217). Turn the eccentric with a screwdriver until the tape-adjusting arm causes the recorder tape to dip slightly just after it passes over the printer knife blade (fig. 39).

NOTE: If necessary, remove the inker housing and inker assembly in order to reach the setscrews in the square-head bolt.

(3) Check the position of the recording-tape chute. This chute passes between the pressure plate (214) and the two setscrews in the top of the tape-chute adjusting bracket (223). The chute should be as far to the left as is possible without the tape weight (249) being clamped in its place in the tape-chute. To move the chute to the left or right, loosen the clamp screw on the clamp (251) at the right end of the chute (inside tape-reel front cover). Be sure to tighten the clamp after making the adjustment.

(4) Adjust the two setscrews in the plate (214) at the top of the tape-chute adjusting bracket (223), so that the tape dips slightly just before passing over the printer knife blade (fig. 39).

(5) Start the equipment with the SEND-TALK-RECEIVE switch at SEND, and thread a test

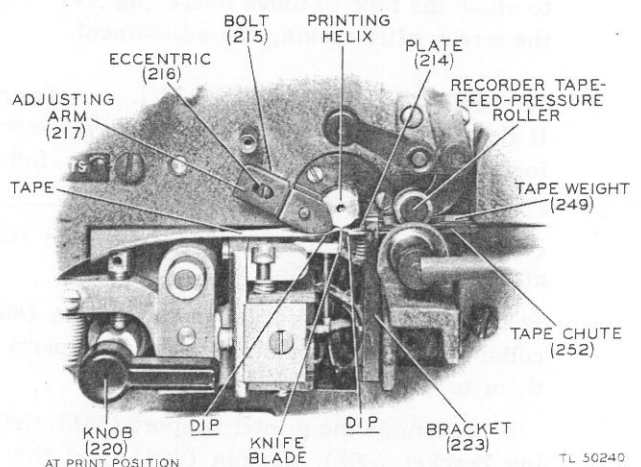


Figure 39—Recording-tape feed adjustment

message through the scanner head. Monitor the message with the recorder mechanism to check the accuracy of the recorder-tape adjustment. Make further adjustments if necessary, and tighten the setscrews locking the eccentric. The dip of the tape on each side of the knife blade should be as much as is possible without causing the tape to jam.

b. There is also an adjustment for tape tension as tape is pulled from the supply reel of the recorder-scanner. If the adjustment is too loose, the tape will tend to become slack inside the tape-reel chamber. This may result in tangling and tearing. If the adjustment is too tight, the tape may get ragged edges or may break from excess tension. Tape tension is supplied by a spring inside of the tape-reel hub. The spring is held in place by a round-head screw, which is stopped by a setscrew inside the tape-reel axle stud. The position of the setscrew determines how far the round-head screw may be tightened, and therefore how much the spring may be compressed. To set the spring for the desired friction adjustment of the tape reel, remove the recorder-scanner chassis from its case. Loosen the round-head screw, and then adjust the setscrew from the *inside* of the case with a screwdriver. Then tighten the round-head screw against the setscrew. Test the movement of the tape reel by hand, and repeat the adjustment procedure until the friction is satisfactory.

c. No adjustments are necessary for proper operation of the scanner tape feed, unless the tape sticks in passing under the scanner head. If this occurs, loosen the two screws holding the scanner tape guide (224), and lower the guide just enough to allow the tape to move freely (fig. 29). Tighten the screws after making the adjustment.

34. PRINTER - UNIT SERVICING. *a. Assembly.* If the printer unit (fig. 40) has been disassembled for replacement of parts, observe the following precautions when reassembling:

- (1) Replace the magnet (385) with the red dot at the bottom.
- (2) If the bearing-bracket mounting pin (402) or collar (395) are replaced with new parts, drill them to match. Proceed as follows:

- a. Assemble the printer support (381), the bearing bracket (397), the pin (402), and the collar (395). Clamp the assembly tightly together.

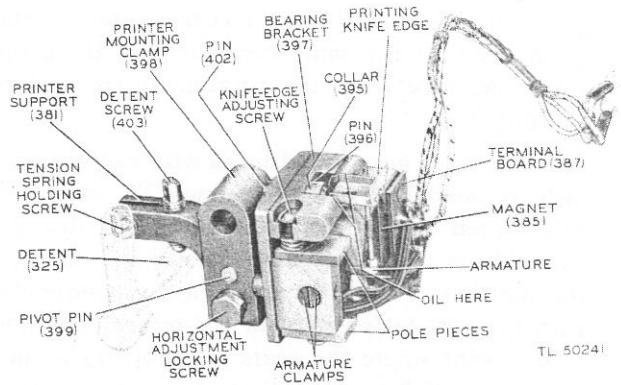


Figure 40—Printer unit

b. Drill and ream through the shaft at the already existing hole in the collar, so that the taper pin (396) may be driven in tightly its full length.

(3) When replacing coils, make sure that coil L201 (black scanning) (coil with no extra holes at corners) is next to the printer support piece (381), and that coil L202 (white scanning) (coil with extra holes at two corners) is the outside coil. Place the coils so that the leads of coil L201 may be threaded through the extra corner holes of coil L202. Make connections to the printer-unit terminal board (387) as follows: (See fig. 41.)

- a. Green lead of coil L201 to terminal No. 3.
- b. Black lead of coil L201 to terminal No. 1.
- c. Green lead of coil L202 to terminal No. 2.
- d. Black lead of coil L202 to terminal No. 4.

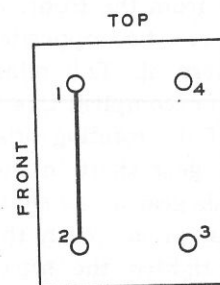


Figure 41—Printer-unit terminal-board connections

e. Yellow and black lead of lead assembly between terminal No. 3 of printer-unit terminal board and terminal B of recorder-scanner terminal board TB202 PRINTER (fig. 30).

f. Black-and-red lead of lead assembly between terminal No. 2 of printer-unit terminal board and terminal marked + on recorder-scanner terminal board TB202 PRINTER.

g. Blue lead of lead assembly between terminal No. 4 of the printer-unit terminal board and terminal W of recorder-scanner terminal board TB202 PRINTER.

h. Jumper wire between terminals No. 1 and 2 of printer-unit terminal board.

b. **Replacement.** When replacing the printer unit on the recorder-scanner front panel, check to see that the knife blade is in proper relationship

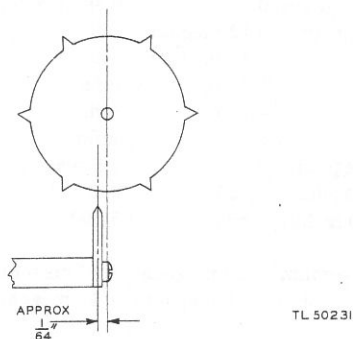


Figure 42—Relationship between printing helix and knife blade

to the printing helix. The blade should be set approximately $1/64$ inch to the left of the helix center-line (fig. 42) while in PRINT position. Make the adjustment by loosening the hexagonal-head clamping screw holding the printer mounting clamp (398) and moving the printer assembly on its pivot pin (399) until the knife edge is in the proper position. Then tighten the hexagonal-head screw.

c. **Adjustments.** Make adjustments of the printer mechanism while a message is being received from a remote station, or while monitoring. Remove the detent knob and printer cover first. There are two adjustments: (See fig. 40.)

(1) With the detent (325) turned so that the detent screw (403) is resting in the groove (PRINT position), loosen the screw clamping the ends of the printer support (381). Turn the detent screw to the right or left until the printing on the tape is well defined.

(2) If the printing seems to be darker at one edge of the tape, adjust the knife-adjusting screw by turning it to the right or left until the printing appears to be about the same weight from one side of the tape to the other. This screw adjusts the tilt of the printer knife-blade edge.

NOTE: An inadequate supply of ink on the felt ink roller will cause the printing on the tape to be indistinct, much the same as when the knife blade is out of adjustment. Do not readjust the printer knife blade unless certain that there is sufficient ink on the felt roller.

35. AMPLIFIER SERVICING. a. If the equipment completely fails to operate, check the positions of the recorder-scanner and rectifier power switches; check the battery, rectifier and a-c power-supply voltages; and check the fuses. If a fuse has blown, check the equipment for short circuits (par. b below). Do not replace a blown fuse without locating the cause of the trouble. Be sure not to replace a blown fuse by one of higher rating.

b. If it is suspected that a fault exists in the amplifier circuits, make a tube-socket voltage check in the same manner as outlined under routine maintenance (par. 27h). Should a tube-socket voltage check fail to locate the trouble, make a complete continuity check of the amplifier and preamplifier circuits. Refer to the d-c resistance chart (par. 36). Readings should be within 10 per cent of the values given in the chart. Faulty volume controls, open resistors, defective transformers, open or short-circuited capacitors, etc., should be discovered by this check. Frequent reference to functional schematics and the overall schematic will be helpful.

CAUTION: Do not pass a heavy current (1 ma is the maximum permissible) through the primary of the input transformer when testing. Never alter wiring of a unit in trying to locate a fault, since the units have been properly wired and tested during manufacture. If a part needs replacement, make a wiring diagram to indicate color coding, polarity or terminal numbers before disconnecting the part.

36. RESISTANCE MEASUREMENTS. Resistance measurements are taken with power OFF, monitor OFF, SEND-TALK-RECEIVE switch at TALK, DRIFT control at NORMAL, and RADIO-WIRE switch at WIRE. Cables are connected except for the readings taken from cable-connector sockets to ground. Cables are disconnected for the latter readings.

NOTE: Resistance to ground unless otherwise stated. All resistances are given in ohms.

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POINT-TO-POINT RESISTANCES

Symbol	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
X101	0.8 megohm	440	850	1 megohm	0.23 megohm	35,000	1	0
X102	1 megohm	0.22 megohm	4,500	5,500	0.12 megohm	34,000	1	0
X103	0	0	0	60,000	1,500	0.54 megohm	1	65,000
X104	0	0	0	60,000	1,500	0.46 megohm	1	70,000
X105	0	0	0	1 megohm	1 megohm	infin	1	0.22 megohm
X106	0.22 megohm	0.44 megohm	0	0.22 megohm	0.44 megohm	0	0	1
X107	1 megohm	330	0	1 megohm	330	0	1	0
X108	0	1	0.23 megohm	0.12 megohm	0	0.38 megohm	0	0.12 megohm
X109	0.38 megohm	0.12 megohm	170	0.2 megohm	0.12 megohm	800	0	1
X110	0	0	700	240	0.11 megohm	800	1	850
X111	0	1	650	240	0.12 megohm	infin	0	850
X112	infin	0	4,500	infin	4,500	infin	4,500	infin
X113	0	infin	infin	infin	800	infin	infin	infin
X202	0	0	320	4.7 megohm	320	1.5 megohm	1	0.22 megohm
X203	0	0	240	0.8 megohm	1,700	240	1	240
X204	0.7 megohm	0.46 megohm	0	0.46 megohm	5,500	5,000	1	infin
X201	50,000	4.7 megohm	0	.....	.....	.....	.....	.....
T101	infin	infin	0.22 megohm	0.22 megohm	0.22 megohm	0.22 megohm	.....	.....
T102	320	240	320	0.12 megohm	0.12 megohm	0.12 megohm	0.12 megohm	.....
T103	infin	infin	infin	infin	.....	.....	.....	.....
T104	440	240	infin	infin	infin	.....	.....	.....
	Term A	Term B	Term F	Term D				
T106	75,000	6.5	0	.....			
T107	60,000	6.5	0	17				

Across	Resistance ohms	Across	Resistance ohms
R101	820	R128	220,000
R102	800,000	R129	220,000
R103	27,000	R130	220,000
R104	27,000	R131	220,000
R105	120,000	R132	1 megohm
R106	33,000	R133	1 megohm
R107	56,000	R134	260,000
R108	47,000	R135	120,000
R109	47,000	R136	110,000
R110	47,000	R137	280,000
R111	470,000	R138	800
R112	68,000	R139	1,400
R113	47,000	R140	200,000
R114	68,000	R141	270,000
R115	470,000	R142	850
R116	1,500	R143	120,000
R117	1,500	R144	110,000
R118	56,000	R145	460
R119	56,000	R146	440
R120	35,000	R147	4,000
R121	35,000	R148	0
R122	1 megohm	R149	6
R123	230,000	R150	.44 megohm
R124	36		
R125	220,000	R201	50,000
R126	1 megohm	R202	52,000
R127	variable	R203	4.7 megohm

Across	Resistance ohms	Across	Resistance ohms
R204	5,000	C108	50,000
R205	320	C109	100,000
R206	1.5 megohm	C110	120,000
R207	220,000	C111	210,000
R208	800,000	C112A	470,000
R209	1,800	C112B	540,000
R211	5,000	C121	230,000
R212	5,500	C122	230,000
R213	.47 megohm	C123	1 megohm
R214	variable	C124	35,000
R215	variable	C125	1.4 megohm
R216	8	C126	1.4 megohm
R217	8	C127	110,000
R218	variable	C128	120,000
R219	0	C129	110,000
R220	17	C130	200,000
R222	variable	C131	850
R224	2.2	C132	250
C101	infin	C201A	1.5 megohm
C102	infin	C201B	50,000
C103	820	C202	1 megohm
C104	800,000	C203	1.2 megohm
C105	800,000	C204A	variable
C106	900,000	C204B	0.7 megohm
C107A	33,000	C205	3.5
C107B	240	C206	7

J203 Contact to gnd	Resistance ohms	J102 Contact to gnd	Resistance ohms
A	1,800	A	infin
B	infin	B	95
C	60,000	C	infin
D	60,000	D	infin
E	infin	E	infin
F	infin	F	infin
G	60,000	G	140,000
H	infin	H	infin
J	20,000	J	140,000
K	infin	K	700,000
L	4.0	L	1.2
M	4.0	M	1.2
N	60,000	N	250
P	infin	P	infin
Q	infin	Q	infin
R	infin	R	infin
S	infin	S	infin
T	infin	T	infin
U	0	U	0
V	60,000	V	infin

37. CAM ADJUSTMENT. The cam (221) must be adjusted on the drive-motor armature shaft, in proper relationship to the governor at the front end of the shaft, so that the governor brushes will not arc and damage the governor rings. Check this

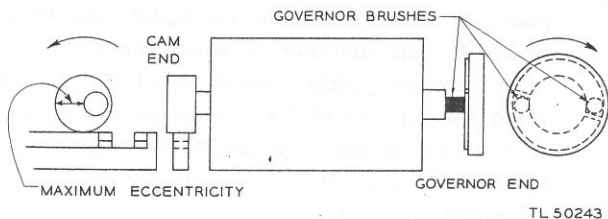


Figure 43—Relationship between cam and motor governor

adjustment if the governor, the cam, or other parts of the armature assembly have been replaced. Proceed as follows:

a. Mount the motor on a workbench, or other satisfactory working surface, in the normal position of the motor (two tapped mounting holes at cam end of motor in horizontal line).

b. Turn the shaft so that the cam is in its mid-position with respect to the cam switch (E202). This position must be determined accurately within about 5° of rotation (fig. 43).

c. Loosen the two setscrews holding the cam hub to the shaft.

d. Hold the cam in position, and turn the shaft in the direction of normal rotation (clockwise, as

viewed from governor end) until the slots between the two governor contact rings have just passed the governor brushes. The brushes should not be touching the slots.

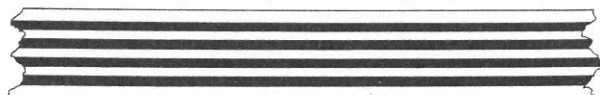
e. Tighten the cam setscrews.

CAUTION: This is not a field adjustment. The setting must be made where facilities for accurate determination of the cam position are available.

38. CONTACT AND DRIFT-CONTROL ADJUSTMENTS. A defective vibrator - current - regulator tube or maladjusted drive-motor-governor contacts, vibrator contacts, or cam-switch contacts at the local station will cause a message to drift across the tape when either station is receiving, provided that all adjustments at the distant station are correct. Maladjustment of the SEND DRIFT control at the local station will cause the transmitted message to drift across the recorder tape only at the distant station, provided that all adjustments at that station are correct. Check items in the following order:

a. Vibrator-current regulator. Remove the current-regulator tube (R223) and replace it with a new tube (fig. 30). If this corrects the drift condition, the old tube probably is defective.

b. SEND DRIFT control. The SEND DRIFT control (R215) (fig. 29) is connected in parallel with the vibrator coil. The setting of the control determines the voltage across the coil, and thus the frequency of vibration. The vibrator is factory adjusted for 60 cycles. To check the adjustment, remove the photo-cell cover, and place a low-power lamp operating from a 115-volt, 60-cycle a-c source in a position to illuminate the photo-cell. Do not illuminate the photo-cell with a bright light. Place the POWER-OFF switch at POWER, the RADIO-WIRE switch at WIRE, the MONITOR-OFF switch at MONITOR, and the SEND-TALK-RECEIVE switch at SEND. Lines should appear on the tape parallel with the edges, as shown in figure 44 below. If the lines drift across the tape,



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Figure 44—Test tape for SEND DRIFT adjustment

turn the SEND DRIFT adjustment with a screwdriver, either to the right or left, till the lines run parallel to the edges of the tape. If the vibrator itself is badly out of adjustment, so that the drift cannot be corrected by adjusting the drift control, replace the vibrator with a new unit. Re-check the SEND DRIFT control adjustment whenever either the vibrator or the vibrator current-regulator tube is changed.

NOTE: To adjust the screwdriver controls on the front panels of the recorder-scanner or amplifier, loosen the setscrews in the lock nuts before attempting adjustments. Be sure to tighten the setscrews after adjustments have been made.

CAUTION: The a-c source for the test lamp must have an accurate 60-cycle frequency, or the drift-control adjustment will be incorrect.

c. Motor-governor adjustment. To adjust the motor-governor contacts, set up the test lamp and set recorder-scanner switches as for the drift-control adjustment (sub-par. *b.* above). In addition remove the vibrator (E204) from its socket (fig. 30). Lines should appear on the recorder tape, running from inside to out opposite to the direction of tape travel, as shown in figure 45 below. The run-out should be in the distance of 2 inches as measured along the tape. If the run-out is greater

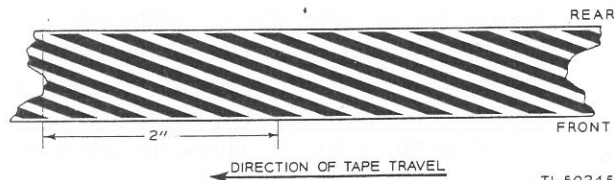


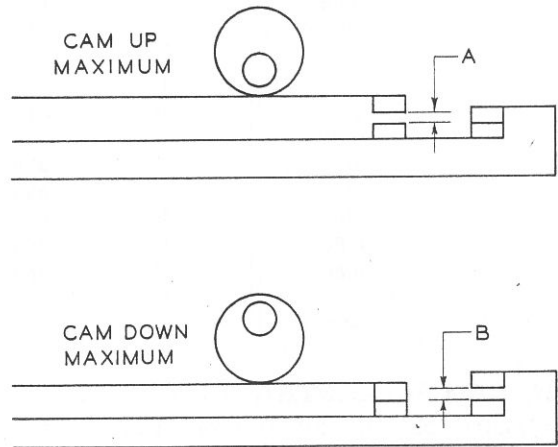
Figure 45—Test tape for motor-governor adjustment

or less than this measurement, turn the adjusting screw in the governor arm slightly to the right or left, turning a little at a time, until the correct run-out is achieved. The adjusting screw is reached through a hole in the motor cap; it is not necessary to remove the motor (fig. 30). Turn the SEND-TALK-RECEIVE switch to TALK to stop the motor while making an adjustment. Move the screw only a small fraction of a turn with each adjustment to avoid passing the correct setting.

d. Cam-switch adjustment. The cam-operated switch (E202) must be adjusted so that both sets

of contacts open the same distance at maximum open position. The adjustment may be made in the field by eye, but if an oscilloscope is available, a more accurate adjustment may be made.

(1) **FIELD ADJUSTMENT.** Remove the recorder-scanner from its case, and check the adjustment of the cam switch by turning the drive motor by hand. The maximum open position for the two



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Figure 46—Cam-switch adjustment

pairs of contacts should be equal. As shown in figure 46, the distance A when the cam is at its maximum up position must equal the distance B when the cam is at its maximum down position. Adjustment is made by turning the adjusting screw (346) with a screwdriver until the proper setting is reached (fig. 27).

(2) **OSCILLOSCOPE ADJUSTMENT.** If an oscilloscope is available, connect one of the vertical-plate leads to the center cam contact, and ground the other lead to the recorder-scanner chassis (this is, in effect, across rheostat R218). Switch on the tape-facsimile equipment so that the drive motor is running, and observe the oscilloscope pattern. The curve should appear as in figure 47, with distance A equal to distance B. If necessary, adjust the screw (346) (fig. 27), with the motor operating, until the two distances become equal.

CAUTION: Do not attempt to adjust the switch by bending the contact blades.

39. FIELD ALIGNMENT OF BEAT FREQUENCY. It may be necessary at times to align the amplifier

oscillator coils in the field where no beat-frequency oscillator is available. The procedure for field alignment is as follows:

- a. Switch POWER-OFF switch to POWER.
- b. Turn the RADIO-WIRE switch to WIRE.
- c. Switch the MONITOR - OFF switch to MONITOR.
- d. Switch the SEND-TALK-RECEIVE switch to SEND.
- e. Loosen the setscrew for the amplifier OUTPUT control, and turn this control to its maximum clockwise (to the right) position.
- f. Turn the screws that adjust the position of the oscillator transformer cores (T106 and T107) to their maximum counterclockwise (to the left) positions. Reach these screws from the bottom of the amplifier chassis (fig. 48).

CAUTION: When adjusting oscillator transformers T106 and T107, slip a piece of insulating tubing over the adjusting screwdriver to prevent short circuits to other parts of the amplifier.

g. Turn the core adjustment of transformer T106 clockwise $11\frac{1}{2}$ turns.

h. Loosen the setscrew for the BIAS control in the amplifier front panel, and turn this control to its maximum counterclockwise position.

i. Connect a standard d-c voltmeter (1,000 ohms per volt) across the discriminator output (use 100- or 150-volt scale). Connect positive lead to terminal No. 3 of socket X108; ground negative lead to amplifier chassis.

j. Turn the core-screw adjustment of oscillator

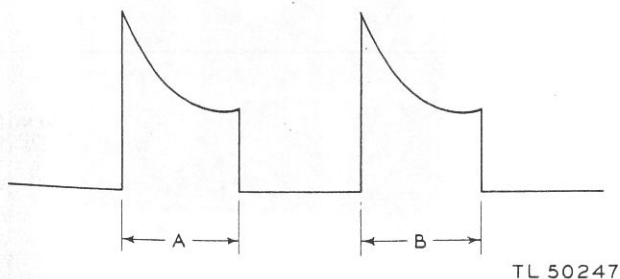


Figure 47—Oscilloscope signal pattern for cam-switch adjustment

transformer T107 clockwise until the voltage reading reaches a maximum. This should occur between 7 and 8 turns.

- k. Record this maximum voltage reading.
- l. Continue to turn the core-screw adjustment of transformer T107 clockwise, until the voltage reading drops to 80 per cent of the maximum reading recorded in step k. This reading should occur a fraction of a turn beyond the setting for maximum voltage reading.

CAUTION: As the resonant frequency of transformer T107 is lowered by turning the core screw clockwise, four peaks of voltage can be observed, two positive and two negative. *It is imperative that the first positive peak be used.* This peak will always occur with the core in the position requiring the least number of clockwise turns from the maximum counterclockwise position.

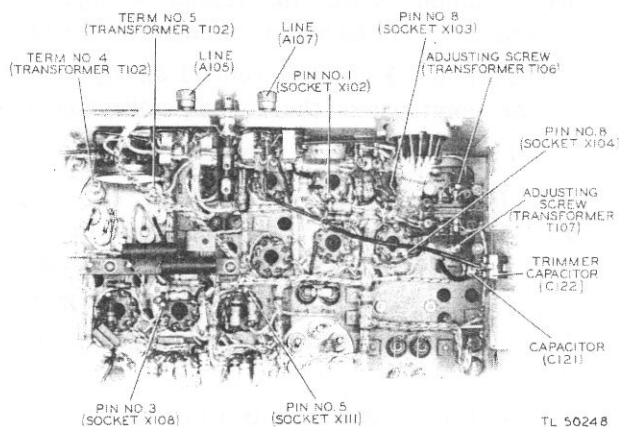


Figure 48—Amplifier sub-chassis, showing oscillator-transformer adjustments and oscilloscope connection points

m. Turn the BIAS control on the amplifier panel to its extreme clockwise position.

n. Reverse the voltmeter leads across the discriminator output, this time with the negative lead to terminal No. 3 of tube-socket X108 and the positive lead to ground.

o. Adjust trimmer capacitor C122 until a maximum voltage reading is obtained.

p. Record the voltage reading.

q. Turn the adjustment of capacitor C122 toward its minimum capacity until the voltage reading is 40 per cent of the value recorded in the

previous step. (Turn the adjustment so that the silver-plated semicircle visible through the adjustment hole moves away from the mounting screws.)

NOTE: If two points are obtainable for a reading of 40 per cent of maximum when capacitor C122 is adjusted, plug a pair of headphones into one of the PHONES jacks. The adjustment resulting in the higher-frequency audio tone at 40 per cent of maximum is the correct setting.

40. FIELD ALIGNMENT OF VARIABLE CONTROLS. When aligning beat frequency, always follow with alignment of the variable controls on the amplifier front panel. (Switches as in par. 39a, b, c, d.)

a. KEYING control. (1) Turn the PRINT-OFF lever to OFF.

(2) Loosen the setscrew for the KEYING control, and turn this control to its extreme counterclockwise position. With this setting, a high-pitched singing noise will be heard coming from the printer.

(3) Turn the KEYING control slowly clockwise to the point where the singing noise just stops.

(4) Tighten the setscrew for the control.

b. BIAS and PREAMP controls. (1) Turn the PREAMP control to its extreme clockwise position after loosening the setscrew for this control.

(2) Turn the printer detent knob to PRINT, and feed a prepared message tape through the scanner head.

(3) Adjust the BIAS control for the best possible duplication of the message on the recorder tape.

(4) Adjust the PREAMP control if necessary. It may be possible to obtain clearer reproduction by turning this control slightly counterclockwise.

(5) Tighten the setscrews for the BIAS and PREAMP controls.

c. Printer. Check adjustment of the printer, if necessary, as outlined in paragraph 34c.

d. OUTPUT control. Adjust the OUTPUT control as outlined in paragraph 13a(5).

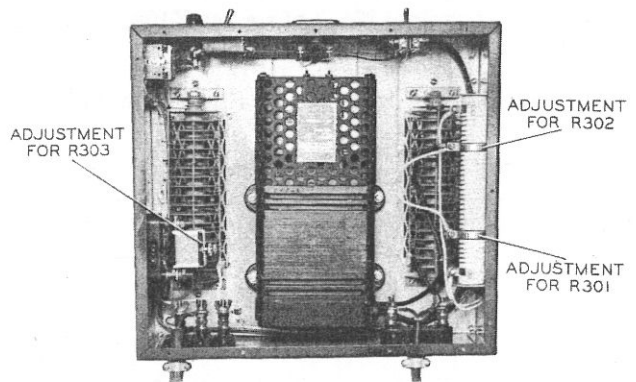
41. OSCILLOSCOPE ALIGNMENT. If an oscilloscope is available, a more accurate alignment of variable controls is possible. Procedure is outlined on the chart shown on pages 50 and 51.

42. RECTIFIER SERVICING. If replacements of rectifier parts are made, the variable resistors (fig. 49) for controlling output current may have to be readjusted.

CAUTION: The battery should be connected to the rectifier when rectifier power is turned on. The tape-facsimile equipment should be connected and operating when checking rectifier output current. Turn off rectifier power while adjusting the variable resistors.

a. Normal current. The amount of the current delivered to the battery by the rectifier when the equipment is operating is determined by the variable resistor R302. This is the front part of the cylindrical wire-wound resistor on the left side of the rectifier assembly. Adjust this resistor by loosening the terminal screw of the front movable clamp, and moving the clamp to the front or rear. The position of this clamp must be such that the rectifier ammeter reads 9.5 amperes when the rectifier power switch is turned to ON, the BOOST-NORMAL switch to NORMAL, and the recorder-scanner power switch to POWER. Be sure to tighten the terminal screw.

b. Trickle charge. The amount of trickle charge delivered to the battery by the rectifier when the tape-facsimile equipment is not operating is determined by the variable resistor R303, operating in conjunction with resistor R302. Adjust resistor R302 for normal operating current flow before adjusting resistor R303. Then turn off



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Figure 49—Rectifier RA-54-A, showing adjustable resistors

Maintenance

the tape-facsimile equipment. Resistor R303 is the slide-adjusted resistor at the right in the rectifier assembly. Loosen the thumbscrew, and adjust the slide so that the rectifier ammeter reads 3 amperes when the rectifier power switch is turned to ON, the BOOST-NORMAL switch to NORMAL, and the recorder-scanner power switch to OFF. Be sure to tighten the thumbscrew after making the adjustment.

c. Booster charge. The amount of current delivered by the rectifier when the BOOST-NOR-

MAL switch is in BOOST position is determined by resistor R301. This is the rear part of the cylindrical wire-wound resistor on the left side of the rectifier assembly. Adjust this resistor by loosening the terminal screw of the rear movable clamp, and moving the clamp to the front or rear. The position of the clamp must be such that the rectifier ammeter reads 12 amperes when the rectifier power switch is turned to ON, the booster switch to BOOST, and the recorder-scanner power switch to POWER. Be sure to tighten the terminal screw after making the adjustments.

43. TROUBLE CHART. The following chart is a quick-reference outline for locating troubles most likely to occur:

Description	Possible cause	Remedy
<i>a.</i> Equipment completely inoperative.	(1) Power turned off. (2) Fuse blown.	Switch power on. Correct trouble and replace fuse (see <i>m</i> below).
<i>b.</i> Tape feed rolls not turning.	(1) SEND-TALK-RECEIVE switch in TALK position. (2) Tubes not warmed up. (3) Automatic stop-start tube failure. (4) Automatic stop-start relay failure. (5) Gears, rollers or bearings jammed. (6) Weak signal (RECEIVE only).	Throw lever to SEND or RECEIVE as desired. Wait two minutes. Replace tube V204. Replace relay E201. Inspect rolls and gears for foreign material. Test for easy turning with fingers (power off). A very weak signal will not start the motor or will operate it intermittently. Check input connections and increase signal.
<i>c.</i> Recording tape stops feeding.	(1) End of roll of tape. (2) Tape chute clogged. (3) Recorder tape-feed-pressure roller not down. (4) Tape jammed at printer.	Install new roll of tape. Clean chute with cleaning strip clipped to inside of tape compartment cover. Drop roller into place. Clear away folded, split or jammed tape.
<i>d.</i> Sending tape stops feeding.	(1) Tape passage too narrow. (2) Scanner tape-feed-pressure roller not down. (3) Tape jammed.	Drop tape-guide shelf slightly by loosening screws under optical assembly. Drop roller into place. Clear away jammed tape.

Description	Possible cause	Remedy
<p>e. Recording tape not printed.</p>	<p>(1) No signal. (2) Printer not touching paper. (3) Inker dry. (4) KEYING control out of adjustment. (5) Battery voltage low.</p>	<p>Check input signal and connections. Check receiver tuning if on RADIO operation. Turn PRINT-OFF lever to PRINT. Replace inker assembly with new unit, or re-ink dry unit. (Allow one hour for ink to soak in after re-inking.) Adjust for proper operation. Charge batteries.</p>
<p>f. Recorder not monitoring.</p>	<p>(1) Monitor switch OFF. (2) Receiver not tuned to transmitter frequency (RADIO operation only). (3) Receiver connection off. (4) OUTPUT control turned fully counterclockwise.</p>	<p>Turn switch to MONITOR. Tune receiver to transmitter frequency. Check jacks, plugs and cord connections to receiver. Adjust control to required output.</p>
<p>g. Printed lines running toward front edge of tape at sharp angle (RECEIVE position).</p>	<p>(1) Drift control out of adjustment. (2) Battery voltage low. (3) Vibrator out of socket. (4) Vibrator out of adjustment or not vibrating. (5) Motor lock-in control out of adjustment. (6) Gears, rollers, or bearings jammed.</p>	<p>Adjust DRIFT control. Charge batteries. Check vibrator position and insert properly. Replace vibrator. Adjust lock-in control resistor R218. Clear any foreign material from rollers and gears. Check for free action. Readjust if necessary.</p>
<p>h. Printed lines running toward back edge of tape at sharp angle (RECEIVE position).</p>	<p>(1) Drift control out of adjustment. (2) High input voltage. (3) Vibrator out of adjustment.</p>	<p>Adjust DRIFT control. Turn power OFF; then on again. Reduce input voltage if drift still occurs. Replace vibrator.</p>
<p>i. Tape feeds when no message being received (RECEIVE position).</p>	<p>(1) Recorder-scanner at distant station switched to SEND with no message under scanner. (2) Static being received (RADIO operation only).</p>	<p>Ask operator at distant station to throw switch out of SEND position when not sending. Heavy static will sometimes operate the automatic stop-start circuit. Reduce level of incoming signal.</p>
<p>j. Recorder tape printed too heavily.</p>	<p>(1) Too much ink on helix.</p>	<p>Stop machine and clean excess ink and dirt from helix with soft cloth or paper.</p>

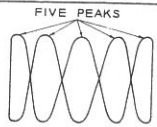
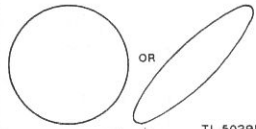

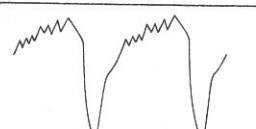
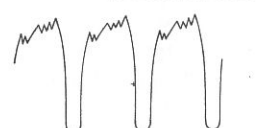
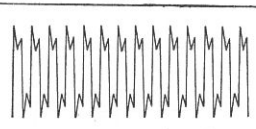
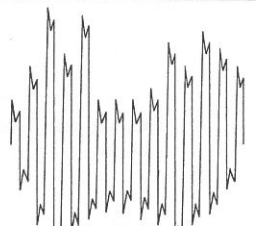
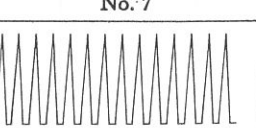
Description	Possible cause	Remedy
	(2) Printer out of adjustment. (3) KEYING control out of adjustment. (4) Sending station scanner out of adjustment. (5) Local station scanner bias out of adjustment (MONITOR only). (6) Local station scanner out of adjustment (MONITOR only).	Remove printer cover and make necessary adjustments. Readjust KEYING control for lighter printing. Report to sending station. Readjust BIAS control. Adjust optical system.
k. No signal being put out.	(1) OUTPUT control turned fully counterclockwise. (2) One or more of the following tubes or associated circuits are defective: V101, V102, V103, V104.	Adjust control to required output. Repair circuit or replace defective tubes.
l. Drive motor fails to operate although a strong signal is being received from distant station (RECEIVE position).	(1) One or more of the following tubes or associated circuits are defective: V106, V107, V108, V204. (2) Incoming signal may have too much black-frequency (1,650 cycles) component, caused by faulty BIAS control setting at distant station.	Repair circuit or replace defective tubes. Ask operator at distant station to turn BIAS control counterclockwise to proper position.
m. Fuse blown.	(1) Short circuit. (2) Defective dynamotor. (3) Defective drive motor.	Check circuits and repair. Repair or replace dynamotor. Repair or replace drive motor.
n. Exciter lamp out.	(1) Lamp burned out. (2) Ballast-resistor tube R221 burned out.	Replace lamp. Replace tube.
o. Pilot or panel lamp out.	(1) Lamp burned out. (2) Brightness control turned OFF (recorder-scanner only).	Replace lamp. Turn control knob clockwise.

Tape Facsimile Equipment RC-58-B

CHART OF ALIGNMENT USING OSCILLOSCOPE AND CALIBRATED OSCILLATOR

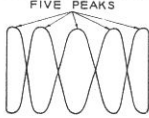
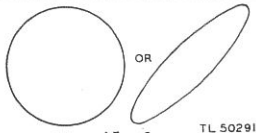
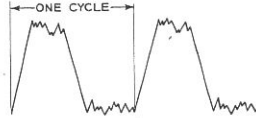
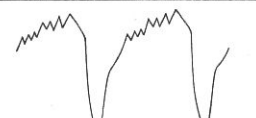
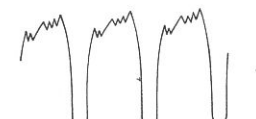
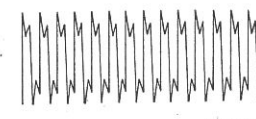
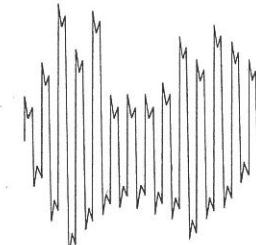
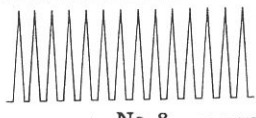
Step No.	Switch settings				Control settings					Material in scanner
	RADIO-WIRE	POWER-OFF	MONITOR-OFF	SEND-TALK-RECEIVE	KEY-ING	BIAS	OUTPUT	PRE-AMP OUTPUT	PRINT-OFF	
1	WIRE	POWER	OFF	SEND	Extreme clock-wise	Extreme counter-clock-wise	Extreme clock-wise	Extreme counter-clock-wise	OFF	None
2										
3										
4						Extreme clock-wise				
5								Extreme clock-wise		Clean blank paper tape held stationary in scanner. Not placed between drive rollers.
6										Single black pencil line approximately 1/16" wide centered on paper tape. Tape held stationary.
7			MONITOR							Clean blank paper tape held stationary in scanner. Not placed between drive rollers.
8						As adjusted in step 7		Extreme clock-wise if not adjusted in step 7		
9					As adjusted in step 8					Prepared tape printed with soft pencil. Tape set in motion through scanner.
10									PRINT	

CHART OF ALIGNMENT USING OSCILLOSCOPE AND CALIBRATED OSCILLATOR

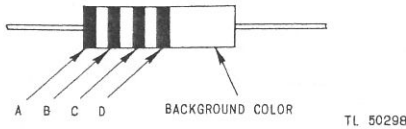
Oscilloscope connections			Adjustments	Oscillograms
Vertical		Horizontal		
High	Low			
X103 Pin 8	GND	Standard a-f oscillator at 11 kc	Turn core-adjusting screw on T106 until 5-to-1-ratio Lissajous figure, as in oscillogram No. 1, appears on scope.	 <p>No. 1 TL 50290</p>
X104 Pin 8	GND	↓	Repeat step No. 1 on T107.	
Line A105	Line A107	Standard a-f oscillator at 1,650 cycles	Turn core-adjusting screw on T107 slowly counterclockwise until circular or elliptical figure appears on scope. See oscillogram No. 2.	 <p>No. 2 TL 50291</p>
↓	↓	Standard a-f oscillator at 1,150 cycles	Using non-metallic screwdriver, adjust trimmer capacitor C122 until circular or elliptical pattern similar to oscillogram No. 2 appears on scope.	 <p>No. 3 TL 50292</p>
X102 Pin 1	GND	Internal timing	Pattern observed on scope should be similar to oscillogram No. 3. If pattern has sharp jagged peaks somewhat similar to oscillogram No. 4, optical assembly is out of adjustment and should be adjusted.	 <p>No. 4 TL 50293</p>
↓	↓		Pattern observed on scope should be similar to oscillogram No. 5. Peak deflection should be at least twice peak deflection of oscillogram No. 3. If not, photo-cell should be replaced. If replacement of photo-cell does not cure trouble, then optical assembly should be adjusted.	 <p>No. 5 TL 50294</p>
T102 Term 4	T102 Term 5		Pattern observed on scope should be similar to oscillogram No. 6. If pattern appears irregular as in oscillogram No. 7, or is unstable, first turn BIAS control approximately 45° (1/8 turn) counterclockwise, and then turn PREAMP OUTPUT control counterclockwise until irregularity in pattern just disappears and pattern becomes similar to oscillogram No. 6. If, without adjusting PREAMP OUTPUT control, pattern is as in oscillogram No. 6, turn BIAS control counterclockwise until irregularities just begin to appear, and then turn BIAS control clockwise just far enough to eliminate them.	 <p>No. 6 TL 50295</p>
X111 Pin 5	GND	↓	Turn KEYING control extreme counterclockwise. Pattern on scope should appear as in oscillogram No. 8. Now turn KEYING control slowly clockwise until sharp peaks just disappear and a relatively smooth horizontal line appears on scope.	 <p>No. 7 TL 50296</p>
Remove oscilloscope leads from equipment.			Thread recording tape through recorder mechanism and turn PRINT-OFF lever to PRINT. Set tape in motion. Equipment should now print clearly and cleanly. If not, printer head may be out of adjustment mechanically.	 <p>No. 8 TL 50297</p>
↓			To adjust printer head, remove PRINT-OFF lever and printer cover. Loosen clamping screw and turn detent screw (403) to right or left until print is clearly defined. If one edge of tape tends to print heavier than the other, turn bearing-bracket (397) adjusting screw until this condition is corrected. Tighten clamping screw, replace printer cover and PRINT-OFF lever, and tighten set screws on all controls.	

Maintenance

CHART OF ALIGNMENT USING OSCILLOSCOPE AND CALIBRATED OSCILLATOR

Oscilloscope connections			Adjustments	Oscillograms
Vertical		Horizontal		
High	Low			
X103 Pin 8	GND	Standard a-f oscillator at 11 kc	Turn core-adjusting screw on T106 until 5-to-1-ratio Lissajous figure, as in oscillogram No. 1, appears on scope.	 <p>No. 1 TL 50290</p>
X104 Pin 8	GND	↓	Repeat step No. 1 on T107.	
Line A105	Line A107	Standard a-f oscillator at 1,650 cycles	Turn core-adjusting screw on T107 slowly counterclockwise until circular or elliptical figure appears on scope. See oscillogram No. 2.	 <p>No. 2 TL 50291</p>
↓	↓	Standard a-f oscillator at 1,150 cycles	Using non-metallic screwdriver, adjust trimmer capacitor C122 until circular or elliptical pattern similar to oscillogram No. 2 appears on scope.	 <p>No. 3 TL 50292</p>
X102 Pin 1	GND	Internal timing	Pattern observed on scope should be similar to oscillogram No. 3. If pattern has sharp jagged peaks somewhat similar to oscillogram No. 4, optical assembly is out of adjustment and should be adjusted.	 <p>No. 4 TL 50293</p>
↓	↓		Pattern observed on scope should be similar to oscillogram No. 5. Peak deflection should be at least twice peak deflection of oscillogram No. 3. If not, photo-cell should be replaced. If replacement of photo-cell does not cure trouble, then optical assembly should be adjusted.	 <p>No. 5 TL 50294</p>
T102 Term 4	T102 Term 5		Pattern observed on scope should be similar to oscillogram No. 6. If pattern appears irregular as in oscillogram No. 7, or is unstable, first turn BIAS control approximately 45° (1/8 turn) counterclockwise, and then turn PREAMP OUTPUT control counterclockwise until irregularity in pattern just disappears and pattern becomes similar to oscillogram No. 6. If, without adjusting PREAMP OUTPUT control, pattern is as in oscillogram No. 6, turn BIAS control counterclockwise until irregularities just begin to appear, and then turn BIAS control clockwise just far enough to eliminate them.	 <p>No. 6 TL 50295</p>
X111 Pin 5	GND	↓	Turn KEYING control extreme counterclockwise. Pattern on scope should appear as in oscillogram No. 8. Now turn KEYING control slowly clockwise until sharp peaks just disappear and a relatively smooth horizontal line appears on scope.	 <p>No. 7 TL 50296</p>
Remove oscilloscope leads from equipment.			Thread recording tape through recorder mechanism and turn PRINT-OFF lever to PRINT. Set tape in motion. Equipment should now print clearly and cleanly. If not, printer head may be out of adjustment mechanically.	 <p>No. 8 TL 50297</p>
↓			To adjust printer head, remove PRINT-OFF lever and printer cover. Loosen clamping screw and turn detent screw (403) to right or left until print is clearly defined. If one edge of tape tends to print heavier than the other, turn bearing-bracket (397) adjusting screw until this condition is corrected. Tighten clamping screw, replace printer cover and PRINT-OFF lever, and tighten set screws on all controls.	

44. RESISTOR AND CAPACITOR COLOR CODING. a. Resistors. Colored portions A and B (see figure below) represent, respectively, 1st and 2nd significant figures of resistance in ohms, and portion C represents the multiplier for the first two figures. Portion D indicates tolerance.



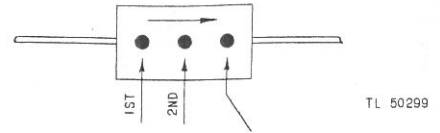
Color	A & B Significant Figures	C Multiplier	D Tolerance
NONE	—	—	20%
SILVER	—	—	10%
GOLD	—	—	5%
BLACK	0	1	—
BROWN	1	10	—
RED	2	100	—
ORANGE	3	1,000	—
YELLOW	4	10,000	—
GREEN	5	100,000	—
BLUE	6	1,000,000	—
PURPLE	7	10,000,000	—
GRAY	8	100,000,000	—
WHITE	9	—	—

Examples: A unit having portions A, B and C red, and portion D gold, has a resistance of 2,200 ohms, with a tolerance of 5%.

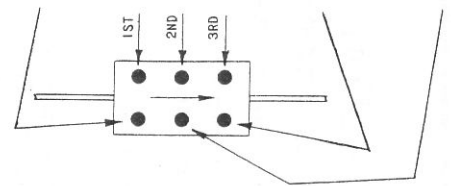
A unit having portion A red, portion B orange, portion C blue, and portion D silver, has a resistance $23 \times 1,000,000 = 23,000,000$ ohms, with a tolerance of 10%.

b. Capacitors. Units marked with three dots are understood to be of 500-volt rating and 10% tolerance. The first two dots represent significant figures of capacity in mmf, and the third dot

represents the multiplier. On units marked with six dots, the upper three dots represent significant figures of capacity in mmf multiplied by the figure indicated by the lower right-hand dot. The remaining dots represent voltage rating and tolerance.



Color	Volts	Significant Figures	Multiplier	Tolerance
NONE	500	—	—	20%
SILVER	2,000	—	0.01	10%
GOLD	1,000	—	0.1	5%
BLACK	—	0	1	20%
BROWN	100	1	10	1%
RED	200	2	100	2%
ORANGE	300	3	1,000	3%
YELLOW	400	4	10,000	4%
GREEN	500	5	100,000	5%
BLUE	600	6	1,000,000	6%
PURPLE	700	7	10,000,000	7%
GRAY	800	8	100,000,000	8%
WHITE	900	9	1,000,000,000	9%



1,000,000 mmf are equal to 1 mf.

Examples: A unit having three red dots has a capacity of 2,200 mmf (500 volts, 10% tolerance are inferred.)

A unit having six blue dots has a capacity $666 \times 1,000,000 = 666,000,000$ mmf = 666 mf, 600-volt rating, 6% tolerance.

Section V

SUPPLEMENTARY DATA

45. TABLE OF REPLACEABLE PARTS FOR FACSIMILE EQUIPMENT RC-58-B.

NOTE: Use the contractor's drawing or part number when requisitioning items contained in the following list.

† in quantity column indicates items included in maintenance spares group. * in quantity column indicates items included in equipment spares group.

Tot. quan. in equip.	Ref. No.	Signal Corps stock No.	Name of part and description	Function	Mfr. code	Contr's dwg or part No.
1	100		Amplifier BC-908-B (Tape Facsimile); 14½ long x 9¼ high x 8½ wide; fin olive-drab wrinkle enamel; vacuum tubes included (shock mounting not included)	Converts scanner impulses to frequency-modulated output; converts frequency-modulated input to keying pulses	RCA	MI-14004-A
† 2	101		Handle, steel rod ¼ diam; U shaped; ends threaded No. 8-32 x ¾; 3¼ between centers, 1 high; fin black enamel	Handle for removing amplifier from case	RCA	K-876882-1
† 2	102		Fuse holder, bakelite; panel type; length 2¼; mtg thread ½-24 x ½; two terminals; FUSE engraved on cap; mtg nut and neoprene washer included	For holding fuse in panel	BU RCA	HKM K-99088-2
* † 2	103		Fuse FU-11, glass cartridge type, ¼ diam x 1¼; 20 amp, 25 v (same as F101)	Spare fuse	IF RCA	1083C K-850339-19
6	104		Cover assembly, steel; cup ¾ diam x 2¼ high x ¼ deep; with spring hinge and felt pad; fin olive-drab wrinkle enamel (same as part 222)	Protection for phone jacks	RCA	K-185377-501
5	105		Terminal, phos bronze, .018 thk stock; ⅝ diam hole for wire; No. 8 diam toothed mtg hole; hot tin dipped (same as part 239)	Electrical connection point	SHA RCA	2103-8 K-30042-3
4	106		Washer, centering, bakelite, ⅛ thk stock; .170 ID, neck ¼ OD x ¼, rim ½ OD x ¼	Insulates binding post from panel	RCA	K-818845-3
1	107		Case, steel, .062 thk stock; 14½ wide x 9¼ high x 7½ deep; with locking studs, shock-mount clamps, and vents; fin olive-drab wrinkle enamel	Holds amplifier	RCA	T-021056-503
6	108		Lock nut, steel, hex stock ½ diam x .437 long; tap ⅝-32 x .156, bore ⅝ diam x .219; three holes for No. 8-32 setscrews; fin black oxidize (same as part 205)	Locks adjustment for variable control	RCA	K-856369-2

Tot. quan. in equip.	Ref. No.	Signal Corps stock No.	Name of part and description	Function	Mfr. code	Contr's dwg or part No.
† 6	109		Clamp, brass, .025 stock; 2¼ long, 1½ high x ¼ deep; two mtg ears slotted for No. 6 screws 1⅞ between centers; fin nickel plit (same as part 275)	Mounts capacitors C101, C102, C103, C123, C132	RCA	K-90545-1
† 17	110		Spring, retaining, steel, corrugated, split; 1½ ID, 1½ OD x .026; fin nickel plit (same as part 270)	Holds tube sockets to chassis	CM RCA	— K-881144-2
4	111		Spring, steel; two rivet holes 1 between centers for ¼ diam rivet; center hole drilled for ¼ diam stud; fin cad plit (same as part 263)	Provides anchor point for fastening amplifier case to chassis	SHA RCA	98-5-MS K-876880-2
† 2	112		Bracket, steel, ½ thk stock, 2½ long x ⅜ high x ¼ wide; center hole ⅜ x ⅜; two .154 diam mtg holes 1⅞ between centers; fin silver plit	Mounts capacitors C107, C112	RCA	K-69788-1
1	113		Bracket, steel, .062 thk stock; 1¼ long x 2½ high x ⅞ wide; three mtg holes .147 diam; fin zinc plit	Mounts terminal boards TB103, TB104	RCA	K-876894-1
2	114		Spacer, laminated insulation; .120 ID, ⅝ OD x ¼	Spaces C122 out from chassis	RCA	K-818950-12
4	115		Insulation, bakelite, paper base, ½ thk stock; ¾ x 1⅜; center hole .147 diam	Insulates terminal boards from chassis	RCA	K-876892-3
2	116		Can, zinc; .020 thk stock; 1⅜ sq x 3⅜; two mtg studs No. 6-32 x ⅞	Shield for oscillator transformers T106, T107	RCA	K-75981-511
2	117		Washer, vellutex; .120 ID, ⅝ OD x ½	Used with trimmer-capacitor mtg screws	RCA	K-860619-15
1	118		Bracket, steel, .064 thk stock; 1½ long x ⅞ wide; clamping ears at ends ⅝ and ⅝ high; mtg hole ⅜ diam; fin zinc plit	Clamps potentiometer R142 in position on amplifier panel	RCA	K-185585-1
1	121		Bracket, steel, .062 thk stock; 4½ long x 1½ wide x ⅞ deep; four mtg holes .173 diam; fin zinc plit	Mount for dynamotor	RCA	K-875725-1
1	122		Container assembly, steel, .031 thk stock; 5⅞ long x 5⅞ wide x 3⅞ high; with vents and safety nuts; fin lead plit (mtg bracket not included)	Case for dynamotor and filter	PG	AS-10057
1	124		Grommet, rubber; ⅜ ID, ⅝ OD x ¼; neck 15⅞ diam x ⅞	Wiring protection	PG	A-1097

		Ventilation	WAT RCA	1470 KX-381525-1
21	125	Vent, brass, $\frac{3}{4}$ diam x .205; center No. 1470 gauge screen; fin dull white nickel (same as parts 155, 460)	PG	B-10878
1	126	Cover, steel, .031 thk stock; $5\frac{3}{8}$ long x $5\frac{1}{8}$ wide x $\frac{1}{2}$ deep; four mtg holes $\frac{1}{8}$ diam; fin lead plt (circuit label not included)	PG	A-3105
2	127	Thumbscrew, steel, knurled hd; No. 6-32 x $1\frac{3}{8}$; fin nickel plt	PG	B-4024
2	128	Bracket, aluminum die-casting; $2\frac{1}{2}$ diam; two recesses $\frac{3}{8}$ ID for mtg bumpers; four mtg holes No. 6-32 tap	PG	A-1034
4	129	Bumper, mounting, rubber; $\frac{1}{8}$ ID, shoulder $\frac{3}{16}$ OD x $\frac{15}{64}$, neck $\frac{3}{8}$ OD x $\frac{1}{4}$	PG	A-3256
4	130	Locking screw, brass, headless; $\frac{1}{16}$ -27 x $\frac{5}{8}$; top slotted three ways for cotter pin; fin nickel plt	PG	OS-00-650/ group G-3355
1	131	Bracket assembly, zinc die-casting; 3 diam x $1\frac{1}{4}$ deep; two mtg holes .147 diam; with bearing cap (149) and two brush holders (parts 133 and 145) (does not include leads, brushes or brush screws)	PG	AS-C-6001 M-142269-3
*† 1	132	Brush assembly, carbon brush .277 x .091 cross section x $\frac{1}{2}$ long; with pigtail, spring and cap; overall length approx $1\frac{3}{8}$; + sign stamped on carbon (same as part 143 except stamping) (part of brush set RCA K-185506-501 — four brushes, for input and output)	PG RCA	
† 1	133	Brush-holder assembly, brass body with insulating sleeve, .625 diam x $1\frac{1}{64}$; brush slot .282 x .097; female thread $\frac{1}{16}$ -27 for brush cap; tapped hole No. 6-32 in lug for terminal screw; RH holder (same as part 145 except opposite hand) (part of holder set RCA K-185698-501 — four holders, for input and output)	PG RCA	OS-00-600/ group 3 M-142270-4
4	134	Terminal, copper, .025 thk stock; for wire $\frac{3}{16}$ diam; mtg hole $\frac{7}{32}$ diam; fin hot solder dip	PG	A-3559-2
6	135	Terminal, copper, .025 thk stock; for wire $\frac{3}{16}$ diam; mtg hole $\frac{13}{64}$ diam; fin hot solder dip	PG	P-3684
† 2	136	Ball bearing, single row, six $\frac{3}{4}$ diam balls; .1969 ID, .7480 OD x .2362 (part of bearing set RCA K-185696-501 — two bearings)	ND PG RCA	35 A-3319 K-35536-2

Tape Facsimile Equipment RC-58-B

Tot. quan. in equip.	Ref. No.	Signal Corps stock No.	Name of part and description	Function	Mfr. code	Contr's dwg or part No.
2	137		Washer, shim, steel; .005 thk or .010 thk	Armature end-play adjustment	PG	A-6925/6925-1
1	138		Armature, high-voltage output and low-voltage input windings on shaft; with 45-bar output commutator, 30-bar input commutator (does not include bearings or shims)	Dynamotor armature	PG	OS-20-500/ group G-3358/W-2508
2	139		Through-stud, steel; .138 diam x 4 7/8; ends threaded No. 6-32 x 5/8; fin nickel pl't	Holds dynamotor together	PG	A-4830
*† 1	140		Brush assembly, carbon brush .262 x .188 cross section x 1 9/32 long; with pigtail, spring and cap; overall length approx 1 9/16, + sign stamped on carbon (same as part 144 except stamping) (part of brush set RCA K-185506-501 — four brushes, for input and output)	Dynamotor low-voltage positive input brush	PG RCA	AS-C-6017 M-142269-1
† 1	141		Brush-holder assembly, brass body with insulating sleeve, .625 diam x 1 1/4; brush slot .267 x .193; female thread 7/16-27 for brush cap; tapped hole No. 6-32 in lug for terminal screw; RH holder (same as part 146 except opposite hand) (part of holder set RCA K-185508-501 — four holders, for input and output)	Holds dynamotor low-voltage positive input brush	PG RCA	OS-00-600/ group 1 M-142270-2
1	142		Field assembly; yoke 2 7/8 diam x 3.343; with field coils and pole pieces; fin black wrinkle enamel	Dynamotor field	PG	OS-20-000/ group G-3360/W-2508
*† 1	143		Brush assembly, carbon brush .277 x .091 cross section x 1 1/2 long; with pigtail, spring and cap; overall length approx 1 7/8; — sign stamped on carbon (same as part 132 except stamping) (part of brush set RCA K-185506-501 — four brushes, for input and output)	Dynamotor high-voltage negative output brush	PG RCA	AS-C-6001-1 M-142269-4
*† 1	144		Brush assembly, carbon brush .262 x .188 cross section x 1 9/32 long; with pigtail, spring and cap; overall length approx 1 9/16; — sign stamped on carbon (same as part 140 except stamping) (part of brush set RCA K-185508-501 — four brushes, for input and output)	Dynamotor low-voltage negative input brush	PG RCA	AS-C-6017-1 M-142269-2

† 1	145	Brush-holder assembly, brass body with insulating sleeve, .625 diam x 1 $\frac{1}{4}$; brush slot .282 x .097; female thread $\frac{1}{16}$ -27 for brush cap; tapped hole No. 6-32 in lug for terminal screw; LH holder (same as part 133 except opposite hand) (part of holder set RCA K-185698-501 — four holders, for input and output)	Holds dynamotor high-voltage neg output brush	PG RCA	OS-00-600/ group 4 M-142270-3
† 1	146	Brush-holder assembly, brass body with insulating sleeve, .625 diam x 1 $\frac{1}{4}$; brush slot .267 x .193; female thread $\frac{1}{16}$ -27 for brush cap; tapped hole No. 6-32 in lug for terminal screw; LH holder (same as part 141 except opposite hand) (part of holder set RCA K-185698-501 — four holders, for input and output)	Holds dynamotor low-voltage neg input brush	PG RCA	OS-00-600/ group 2 M-142270-1
1	147	Circuit label	Traces dynamotor circuit	PG	LA-A-9842-4
1	148	Bracket assembly, zinc die-casting; 3 diam x 1 $\frac{1}{4}$ deep; two mtg holes .147 diam; with bearing cap (149) and two brush holders (parts 141 and 146) (does not include leads, brushes or brush screws)	Supports bearing and holds brushes at low-voltage input end	PG	OS-00-650 group G-3354
2	149	Screw (bearing cap), aluminum; $\frac{3}{4}$ -20 x $\frac{3}{8}$; slotted for screwdriver	Covers dynamotor bearing	PG	A-3394
2	151	Holder, steel, .062 thk stock; 6 $\frac{3}{16}$ long x 1 $\frac{1}{2}$ wide x $\frac{3}{8}$ high; eight mtg holes .161 diam; two holes for locking-slide studs .129 diam; two holes for shock-mount pins .316 diam; fin zinc pl't	Holds slide clamping bottom of amplifier case to shock mounting	RCA	K-876829-1
12	152	Stud, steel; fl hd $\frac{1}{16}$ diam x .079; shoulder .185 diam x .078; tip $\frac{1}{8}$ diam x .109, hole .089 diam x $\frac{1}{64}$ drilled in tip; fin zinc pl't (same as part 453)	Holds slide for clamping bottom of amplifier case to shock mounting	RCA	K-876881-1
12	153	Washer, spring, phos bronze; .137 ID, $\frac{1}{16}$ OD x .01 (same as part 454)	Used with part 152	RCA	K-69129-23
2	154	Snap slide, steel, .050 thk stock, 6 $\frac{5}{8}$ long x .593 wide; slots for shock-mount pins; with angle handle 1 $\frac{3}{8}$ wide, $\frac{3}{16}$ high; welded assembly; fin zinc pl't	Locks bottom of amplifier case to shock mounting	RCA	K-877204-501
—	155	Vent, same as part 125	Ventilation	WAT RCA	1470 KX-381525-1
4	156	Stud, steel, ov hd $\frac{3}{16}$ diam; tip $\frac{1}{4}$ diam x $\frac{5}{8}$, hole $\frac{3}{8}$ diam for pin (same as part 458)	Anchors amplifier case to amplifier chassis; used in conjunction with part 157	SHA RCA	98-OS-5-17 K-876880-1

Tot. quan. in equip.	Ref. No.	Signal Corps stock No.	Name of part and description	Function	Mfr. code	Contr's dwg or part No.
4	157		Pin, steel, $\frac{3}{32}$ diam x $\frac{7}{16}$; center knurled, fin cad plt (same as part 459)	Anchors amplifier case to amplifier chassis; used in conjunction with part 156	SHA RCA	98-5-CP K-876880-3
2	158		Bracket, steel, .062 thk stock; $1\frac{15}{16}$ long x $1\frac{11}{32}$ wide x $\frac{3}{8}$ high; four .136 diam mtg holes; two .129 diam holes for locking-slide studs; one .343 diam hole for shock-mount pin; fin zinc plt (same as part 461)	Holds slide clamping back of amplifier case to shock mounting	RCA	K-880705-2
2	159		Snap slide, steel, .050 thk stock; $2\frac{1}{4}$ long x $\frac{7}{16}$ high x $\frac{7}{16}$ wide; slot $\frac{3}{16}$ wide x $1\frac{3}{4}$, hole .343 diam; fin zinc plt (same as part 462)	Locks back of amplifier case to shock mounting	RCA	K-880719-2
1	170		Cover BG-128-B, cotton duck, pre-shrunk; 15 long x $9\frac{7}{16}$ high x $8\frac{5}{8}$ wide; with two slide fasteners; has no bottom; olive drab	Weather and handling protection for Amplifier BC-908-B	RCA	MI-14006
1	200		Recorder-Scanner BC-918-B (Tape Facsimile), $11\frac{9}{16}$ long x $9\frac{15}{16}$ high x $11\frac{3}{8}$ wide; comprises printer system, optical system, first and second amplifier stages, gear train for operating mechanical parts and recording tape; fin olive-drab wrinkle enamel; tubes included (shock mounting not included)	Records incoming signals on message tape; scans outgoing messages with light beam, changing message to electrical energy for radio or wire transmission	RCA	MI-14001-A
1	201		Inker housing assembly, steel, .032 thk stock; $3\frac{1}{4}$ wide x $2\frac{5}{8}$ high x $1\frac{3}{4}$ deep; with hinged cover; knurled knob on cover; cover-lock clip on cover underside; two .156 diam mtg holes on front; two .272 diam mtg holes on rear of case; fin olive-drab wrinkle enamel	Holds ink in place; shields pilot lamp	RCA	M-440118-502
† 1	202		Guard rail, steel rod $\frac{5}{16}$ diam; U shaped; $8\frac{1}{8}$ long x $2\frac{3}{4}$ high + threaded ends No. 10-32 x $1\frac{13}{32}$; fin black enamel	Handle for removing recorder-scanner from case	RCA	K-875568-1
*† 1	203		Inker assembly, steel bracket with felt ink reservoir roller and rubber ink-transfer roller	Supplies ink to helix for printing on tape	RCA	K-877083-501
1	204		Spacer, steel, .199 ID, $\frac{5}{16}$ OD x $\frac{5}{8}$; fin zinc plt	Furnishes access to mounting-screw head at boss on gear housing	RCA	K-875428-5

Supplementary data

TM 11-374
Par. 45

—	205	Lock nut, same as part 108	Locks adjustment of send-drift and preamp output controls	RCA	K-856369-2
3	206	Bracket, steel, .064 thk stock, $\frac{7}{8} \times 1\frac{1}{4}$, with two clamping ears; center hole $\frac{13}{32}$ diam; fin zinc plating	Mounts potentiometer controls on recorder-scanner front panel	RCA	K-185585-1
2	207	Spring washer, phos bronze; .144 ID; $\frac{1}{4}$ OD x .010; fin black oxidize	Locks inkler hsg mtg screws	RCA	K-69129-21
1	208	Gear housing assembly, iron casting, with shafts, bearings, gears and synchronization-control switch	Gears drive recorder head and helix and optical system rotating prism; housing also mounts drive motor	RCA	T-161442-502
1	209	Gear assembly, laminated composition, $\frac{1}{8}$ thk stock; .375 ID, 1 PD, 1.0624 OD; $14\frac{1}{2}$ deg pressure angle, 32 pitch, 32 teeth; hub, screw steel, $\frac{1}{2}$ diam x $\frac{15}{64}$, two holes for No. 6-32 setscrews; shoulder .375 diam x $\frac{11}{64}$; center hole .180 diam	Hexagonal-prism drive-gear idler gear	RCA	K-185388-501
1	210	Idler assembly, steel; $2\frac{1}{8}$ long x $1\frac{1}{16}$ wide; arm .062 thk stock, bushing .437 thk; shaft .1875 diam x $1\frac{1}{16}$; with bearings and lock washers and rings; two mtg holes .228 diam (idler gear not included)	Mount for hexagonal-prism drive-gear idler gear	RCA	M-440140-501
1	211	Stud, steel; $\frac{3}{8}$ hex x 1.521, tapped axially for No. 10-32 screw; mtg tip No. 10-32 x .354; fin black oxidize	Mount for printer cover	RCA	K-877198-2
1	212	Stud, steel; $\frac{13}{64}$ diam x $\frac{1}{2}$ + shoulder $\frac{5}{16}$ diam x $\frac{1}{16}$ + mtg tip .186 diam x $\frac{3}{16}$; radial groove $\frac{1}{32}$ rad for spring $\frac{3}{32}$ from end; fin zinc plating	Anchors spring holding printer unit against release cam	RCA	K-877134-1
1	213	Spring, steel, .035 diam wire; $\frac{1}{32}$ ID x $1\frac{15}{32}$; seven coils; fin zinc plating	Holds recording-tape chute-adjusting plate against chute	RCA	K-877156-1
1	214	Plate, steel, .050 thk stock; .900 long x .265 wide; notched .190 x .040 each end; fin black oxidize	Pressure plate for vertical adjustment of recording-tape chute	RCA	K-877155-1
1	215	Bolt, steel, sq hd, one corner rounded; head drilled axially .251 diam x $\frac{3}{16}$, tapped radially for two No. 6-32 set screws; shank $\frac{1}{4}$ -20 x $\frac{5}{8}$; fin black oxidize	Mounts eccentric for recording-tape adjusting arm	RCA	K-880506-1

Tape Facsimile Equipment RC-58-B

Tot. quan. in equip.	Ref. No.	Signal Corps stock No.	Name of part and description	Function	Mfr. code	Contr's dwg or part No.
1	216		Eccentric, steel; shoulder .246 diam x $\frac{3}{16}$; neck .154 diam x $\frac{3}{8}$, eccentric by .032; screwdriver slot in tip; fin black oxidize	Adjusts recording-tape adjusting arm	RCA	K-880507-1
1	217		Arm, stainless steel, .051 thk stock, $1\frac{1}{32}$ long x $\frac{1}{2}$ high; $\frac{5}{8}$ between forks; pivot holes $\frac{3}{32}$ diam; adjustment slot .156 wide; fin black oxidize	Adjusts recording tape as tape leaves printer bar	RCA	M-440192-501
1	218		Collar, steel; .1594 ID, .375 OD x $\frac{3}{32}$; two holes No. 6-32 for setscrews; chamf edges $\frac{1}{32}$ x 45 deg; fin black oxidize (setscrews not included)	Holds recording-tape adjusting-arm on shaft	RCA	K-880505-1
1	219		Spring, steel, .029 diam wire; .265 OD x $\frac{1}{32}$; three coils; fin zinc plit	Holds recording-tape adjusting arm on shaft against collar	RCA	K-039888-15
† 1	220		Knob, cast iron; $\frac{1}{16}$ diam boss $\frac{5}{8}$ long, drilled .251 diam x $\frac{1}{2}$ deep for shaft, two holes tapped No. 8-32 at 120 deg apart for setscrews; lever $\frac{15}{32}$ x $\frac{1}{32}$ x $1\frac{1}{16}$; fin black enamel (setscrews not included)	Moving printer head between PRINT and OFF positions	RCA	K-184355-1
1	221		Cam, with single-row ball bearing, spun assembly; cam tapped No. 6-32 for two setscrews; $\frac{1}{4}$ ID; cam $\frac{1}{2}$ OD eccentric by .026; bearing $\frac{7}{8}$ OD (setscrews not included)	Operates speed-control switch	RCA	K-185321-501
—	222		Cover, same as part 104	Protection for phone jacks	RCA	K-185377-501
† 1	223		Bracket, steel, .050 thk stock; $2\frac{1}{4}$ high x .937 wide x $\frac{3}{8}$ deep; two No. 4-40 tapped holes in top plate; fin black oxidize	Provides vertical adjustment for recording-tape chute	RCA	M-440138-501
1	224		Tape guide, steel; guide and two brackets, welded assembly; $3\frac{1}{16}$ long x $1\frac{1}{32}$ wide x $2\frac{3}{32}$ high; fin black oxidize	Guides tape under scanner	RCA	K-880526-501
1	225		Spacer, steel; .390 ID, $\frac{3}{4}$ OD x .093; fin zinc plit	Spaces printer unit out from panel	RCA	K-185585-4
1	226		Spring, steel, .045 diam wire; $\frac{7}{32}$ ID x $1\frac{5}{16}$; 13 coils close wound + $\frac{7}{32}$ ID loops at each end; fin zinc plit	Holds printer unit against printer release cam (dent)	RCA	K-877245-1

		Locks printer unit on shaft	RCA	K-875549-2
1	227	Collar, steel; .3135 ID, $\frac{5}{8}$ OD x $\frac{1}{4}$; two holes No. 6-32 for setscrews; fin zinc pl't (setscrews not included)	RCA	K-875549-2
† 1	228	Cover, steel, .032 thk stock; $5\frac{1}{8}$ wide x $2\frac{5}{8}$ high x $2\frac{5}{16}$ deep; with tape guide and two No. 10-32 mtg thumbscrews 5.218 apart; $\frac{3}{8}$ diam hole for detent shaft; OFF and PRINT knob positions engraved in front; fin olive-drab wrinkle enamel	RCA	M-440152-501
1	229	Arm-and-wheel assembly, steel; wheel .500 diam x .625; mtg hub .1885 ID, $\frac{1}{16}$ OD x .312, one .067 diam hole for pin, one No. 6-32 tapped hole for setscrew; wheel fin black enamel (pin and setscrew not included)	RCA	K-876856-501
1	230	Arm-and-knob assembly, steel; mtg hub .1885 ID, $\frac{7}{16}$ OD x .312, one .067 diam hole for pin, one No. 6-32 tapped hole for setscrew; fin black oxidize (pin and setscrew not included)	RCA	K-876861-501
2	231	Taper pin, steel; .078 max diam; taper $\frac{1}{4}$ per ft; length $\frac{1}{2}$; fin zinc pl't	RCA	K-59127-5
1	232	Spacer, felt, $\frac{1}{16}$ thk; 1 long x $\frac{1}{2}$ wide; two $\frac{11}{32}$ diam holes $\frac{1}{2}$ apart	RCA	K-876887-1
1	233	Block assembly, steel; 1 wide x 1 high x 1 deep, step cut $\frac{17}{32}$ x $\frac{1}{4}$; with two .0622 diam dowel pins and two .1885 ID oilite bearings; two mtg holes .180 diam, counterbored .312 diam x $\frac{13}{64}$; fin olive-drab wrinkle enamel	RCA	K-875556-501
1	234	Arm-and-wheel assembly, steel; wheel .5000 diam x .468; hub neck $\frac{29}{64}$ diam x $\frac{13}{32}$ + shoulder $\frac{7}{16}$ diam x $\frac{1}{16}$, two slots in hub rim .072 wide x .134 deep; fin wheel black enamel, arm and hub black oxidize	RCA	K-876876-501
1	235	Spacer, steel; .190 ID, neck $\frac{5}{16}$ OD x .259, shoulder $\frac{3}{8}$ OD x $\frac{5}{8}$; fin zinc pl't	RCA	K-876888-1
1	236	Shaft-and-arm assembly, steel; shaft .1868 diam x 1.476 + shoulder .250 diam x .177; spring-anchor pin $\frac{1}{8}$ diam x $\frac{3}{16}$ with $\frac{1}{32}$ rad groove for spring; fin copper flash	RCA	K-875138-502

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1	237		Shaft-and-arm assembly, steel; shaft .1868 diam x 1.476 + shoulder .250 diam x .177, with taper pin protruding $\frac{3}{8}$ from shoulder; spring-anchor pin $\frac{1}{8}$ diam x $\frac{3}{16}$ with $\frac{1}{32}$ rad groove for spring; fin copper flash	Mount for recorder tape-feed-pressure arm-and-wheel assembly	RCA	K-875138-501
2	238		Spring, steel, .029 diam wire; $\frac{3}{4}$ ID x $1\frac{1}{16}$; 18 coils close wound + $\frac{3}{32}$ ID hook at each end; fin zinc plit	Tension for tape-feed-pressure rollers	RCA	K-880739-1
—	239		Terminal, same as part 105	Ground connection	RCA	K-30042-3
1	240		Knob, steel; $\frac{3}{8}$ diam x 1 long; tapped longitudinally No. 6-32 x $\frac{1}{2}$ for mtg; fin black oxidize	Operates SEND-TALK-RECEIVE switch	RCA	K-877289-1
† 2	241		Knob, molded composition, 1 diam x $\frac{25}{32}$; outer edge chamf $\frac{1}{16}$ x 45 deg; brass sleeve .252 ID; with set-screw No. 8-32 x $\frac{5}{16}$ in side; arrow engraved on face	Operates potentiometers on recorder-scanner panel	RCA	MX-244053-502
1	242		Case, steel, .062 thk stock, $10\frac{7}{8}$ wide x $9\frac{13}{16}$ high x $8\frac{1}{2}$ deep; with locking studs, tape-reel stud, bobbin stud, side-cover stud, shock-mount clamps and vents; fin olive-drab wrinkle enamel	Container for recorder-scanner	RCA	T-620775-503
† 1	243		Reel, steel; back plate 7 diam x .032 thk; bobbin $1\frac{1}{32}$ diam x .437 high; with four friction springs of .051 diam wire; fin zinc plit	Holder for recording-tape supply	RCA	M-142232-501
2	244		Washer, fiber, $\frac{25}{64}$ ID, $\frac{5}{8}$ OD x $\frac{1}{32}$	Thrust-bearing surface for tape reel	RCA	K-79921-26
1	245		Holder, steel; shoulder $\frac{3}{16}$ diam x .137 + neck .371 diam x .316 + lug .109 wide x $\frac{3}{32}$ high; hole for spring .312 diam x $1\frac{13}{32}$; mtg hole .147 diam; fin zinc plit	Holds recording-tape reel in place and provides friction adjustment	RCA	K-876845-1
1	246		Spring, steel, .024 diam wire; $\frac{5}{32}$ ID x $\frac{5}{16}$; four coils; fin zinc plit	Friction adjustment for tape reel	RCA	K-876846-1
1	247		Bobbin, wooden spool with steel flange and hub; .125 ID, $\frac{5}{8}$ spool OD, 1 flange OD x $1\frac{1}{8}$; spool fin varnish, flange fin zinc plit	Guides recording tape from tape reel to tape chute	RCA	K-877539-501

1	248	C washer, phos bronze, .0254 thk stock; opening slot .063, center hole .078 ID, $\frac{1}{4}$ OD	Holds tape guide bobbin on stud	RCA	K-61933-5
† 1	249	Weight, stainless steel; $1\frac{1}{8}$ long x .726 wide x .110 thk; prongs 1 long x .100 thk; bottom outer edges chamf $\frac{1}{4}$ x 45 deg; fin black oxidize	Keeps recording tape flat in tape chute	RCA	K-877144-1
1	250	Plate, steel, .020 thk stock; .937 long x $2\frac{3}{8}$ wide; slot .828 long x .140 wide; mtg hole .156 diam; fin zinc plt	Seal at right end of recording-tape chute	RCA	K-880740-1
† 1	251	Clamp, steel, .020 thk stock; $1\frac{1}{16}$ wide x $\frac{3}{8}$ deep x $1\frac{1}{16}$ high; clamp-screw holes .120 diam; mtg hole .156 diam; fin zinc plt	Holds right end of recording-tape chute to chassis	RCA	K-880741-1
† 1	252	Chute, stainless steel, .019 thk stock; $4\frac{1}{16}$ long x .765 wide x .131 deep; feed-roller hole .437 long x .500 wide; fin black oxidize	Guides recording tape to helix and printer bar	RCA	M-440137-1
1	253	Cover, steel, .062 thk stock; $1\frac{1}{8}$ wide x $9\frac{1}{16}$ high x $1\frac{1}{8}$ deep; mtg brackets tapped No. 8-32 with centers $8\frac{3}{16}$ apart; with two studs tapped No. 10-32 for side-cover thumbscrews; fin olive-drab wrinkle enamel	Covers recording tape at front of recorder-scanner; supports pilot lamp and right end of tape chute	RCA	M-440153-502
† 1	254	Optical system, comprises housing with exciter lamp, focusing lenses, rotating prism and drive gear, photo-cell and photo-cell cover, fin olive-drab wrinkle enamel	Produces light spot and scans spot across tape; picks up reflected light and transforms light into electrical energy through photo-cell	RCA	T-621048-502
2	255	Stud, steel; body $\frac{1}{4}$ diam x .954, tapped and csk longitudinally for No. 6-32 screw; mtg tip .186 diam x .140, drilled longitudinally .144 diam x $\frac{1}{8}$; fin zinc plt	Mount for inkler housing	RCA	K-877092-1
1	256	Cover, steel, .031 thk stock; .984 wide x $2\frac{1}{8}$ high x $1\frac{1}{16}$ deep; two mtg holes .156 diam; fin olive-drab wrinkle enamel	Covers hexagonal-prism drive gear	RCA	K-876809-1
1	257	Block, laminated phenolic, $\frac{1}{2}$ wide x $\frac{1}{16}$ high x $\frac{3}{8}$ deep; rear bottom step-cut $\frac{1}{8}$ high x $\frac{5}{32}$ deep; front bottom chamf $\frac{1}{16}$ x 45 deg; top drilled .096 diam x $\frac{5}{32}$ for part 259; side tapped No. 6-32 x $\frac{1}{4}$ for setscrew (setscrew not included)	Adjusts automatic engaging rod for recorder tape-feed-pressure roll	RCA	K-876277-1

Tape Facsimile Equipment RC-58-B

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1	258		Spring, steel, .025 wire diam; .175 OD x $\frac{3}{8}$; 5 coils; fin zinc pl't	Supplies tension for automatic engaging rod for recorder tape-feed-pressure roll	RCA	K-93988-12
1	259		Rod, steel, .093 diam stock; L shaped; long leg 4, flat $\frac{1}{64}$ for $\frac{9}{32}$ of tip; short leg $\frac{45}{64}$; fin zinc pl't	Automatic engagement of recorder tape-feed-pressure roll (operated by SEND-TALK-RECEIVE switch in RECEIVE position)	RCA	K-876215-1
† 1	260		Cover, steel, .031 thk stock; $1\frac{1}{2}$ wide x $9\frac{1}{16}$ high x $\frac{1}{16}$ deep; with plastic window $2\frac{3}{4}$ wide x $\frac{9}{16}$ high, handle 6 long x $\frac{11}{16}$ high, and two No. 10-32 mtg thumbscrews; fin olive-drab wrinkle enamel (phos bronze cleaning strip not included)	Covers recording-tape roll and right side of recorder-scanner chassis	RCA	M-440193-503
1	261		Gasket, fuller board, .025 thk stock; $1\frac{1}{8}$ wide x $4\frac{11}{16}$ high; two mtg holes .173 diam; slot cut for recording-tape passage	Seal between optical system and recording-tape-roll front cover	RCA	K-877185-1
† 1	262		Cleaner, phos bronze, .020 thk stock; $\frac{3}{4}$ wide x 7 long, bent tip $\frac{1}{4}$ high (not part of side cover)	For cleaning recorder-scanner-tape guides	RCA	K-187371-1
—	263		Spring, same as part 111	Provides anchor point for fastening recorder-scanner case to chassis	RCA	K-876880-2
5	264		Grommet, fiber; $\frac{3}{8}$ ID, $\frac{1}{16}$ OD x .176	Protects wiring passing through chassis shelf	RCA	K-99057-27
4	265		Spacer, steel; .154 ID, $\frac{5}{16}$ OD x $\frac{5}{8}$; fin zinc pl't	Separates terminal boards from chassis shelf	RCA	K-185585-6
4	266		Terminal, brass; top portion rd hd screw, No. 8-32 x $\frac{1}{4}$; bottom portion .120 diam x $\frac{7}{16}$, with three necks .093 diam x $\frac{3}{64}$ for solder connections; fin silver pl't	Electrical connection points	RCA	K-880535-1
4	267		Grommet, rubber; $\frac{17}{64}$ ID, $\frac{11}{16}$ OD x $\frac{11}{32}$; neck $\frac{29}{64}$ diam x $\frac{1}{16}$	Mounting cushion for tube shelf	RCA	K-65415-8

1	268	Clip, phos bronze, .016 thk stock; L shaped with two ear clips for holding wrenches; $1\frac{1}{8}$ wide x $1\frac{1}{2}$ high; two mtg holes .144 diam	Holds wrenches in place inside recorder-scanner chassis	RCA	K-185404-1
1	269	Shelf, steel, .062 thk stock; $9\frac{1}{8}$ long x $1\frac{1}{4}$ wide x $\frac{1}{4}$ deep; five tube-socket holes 1.172 diam with positioning tongues; four mtg holes $\frac{1}{2}$ diam; two terminal-mtg holes .173 diam; fin zinc pl't	Mount for tubes	RCA	M-422640-2
† —	270	Spring, retaining, same as part 110	Holds tube sockets in tube shelf	RCA	K-881144-2
† 1	271	Clamp, steel, .032 thk stock; $2\frac{5}{8}$ long x $2\frac{5}{16}$ wide; sides $1\frac{5}{16}$ and $\frac{5}{8}$ high; center hole $1\frac{5}{16}$ diam; two mtg holes .173 diam; fin zinc pl't	Holds vibrator unit	RCA	K-185444-1
3	272	Spacer, steel; .149 ID, $\frac{5}{16}$ OD x $1\frac{5}{8}$; fin zinc pl't	Separates terminal board from chassis shelf	RCA	K-185585-5
3	273	Bracket, steel, $\frac{1}{32}$ thk stock; $2\frac{1}{32}$ long x $\frac{3}{8}$ wide x $1\frac{1}{16}$ high; center hole $\frac{3}{8}$ long x $\frac{3}{16}$ wide; two mtg holes .154 diam; fin zinc pl't	Mounts capacitors C201, C202, C203	RCA	K-185585-3
1	274	Shield, steel, .032 thk stock, with fish-paper insulation; $1\frac{1}{16}$ wide, bent on $\frac{3}{4}$ rad x $1\frac{1}{2}$ high; $\frac{2}{64}$ diam mtg loop; two .173 diam clamp-screw holes; fin zinc pl't (clamp screw not included)	Shields motor rheostat	RCA	K-881492-501
† —	275	Clamp, same as part 109	Mounts capacitor C204	RCA	K-90545-1
8	276	Terminal, brass, .031 thk stock; .093 diam hole for wire; .144 diam mtg hole; hot tin dipped	Electrical connection point	PAT RCA	4019 K-823061-2
2	277	Washer, felt, $\frac{5}{32}$ ID, $\frac{3}{8}$ OD x $\frac{3}{16}$	Protection for lamp-socket wire passing through panel	RCA	K-843944-7
1	278	Terminal, brass, .020 thk stock; .100 diam hole for wire; .172 diam mtg hole; hot tin dipped	Pilot-lamp ground connection	SHA RCA	2506-8 K-67592-18
1	279	Spacer, steel; .170 ID, $\frac{1}{4}$ OD x .359; fin zinc pl't	Spaces pilot lamp out from panel	RCA	K-185585-2
1	280	Insulator, laminated phenolic, $\frac{1}{32}$ thk stock; $\frac{7}{8}$ high x $\frac{7}{16}$ wide; .173 diam mtg hole	Protects against short circuit to case during pilot-lamp insertion	RCA	K-877229-1

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† 1	281		Wrench, steel, .050 hex stock; L shaped, long leg 1 3/4, short leg 5/16; fin zinc pl't	Turns No. 4 Allen setscrews	AMC RCA	K-185475-1
† 1	282		Wrench, steel, 1/16 hex stock; L shaped, long leg 1 3/4; short leg 5/16; fin zinc pl't	Turns No. 6 Allen setscrews	AMC RCA	K-185475-2
† 1	283		Wrench, steel, 5/64 hex stock; L shaped, long leg 1 7/8; short leg 5/8; fin zinc pl't	Turns No. 8 Allen setscrews	AMC RCA	K-185475-3
† 4	284		Thumbscrew, steel; slotted knurled hd; shank neck .123 diam x 11/32; thread No. 10-32 x 3/8; flat cone point; fin black oxidize (part of part 228)	Secures printer cover and recorder-scanner side cover	RCA	K-877171-1
4	285		Washer, insulating, bakelite; .190 ID x 1/64; neck 5/16 diam x 3/64; shoulder 1/2 diam x 1/16	Insulates vibrator temperature-compensating resistor	RCA	K-90541-7
2	286		Stud, steel; .164 diam x 4 1/2; ends threaded No. 8-32 x 3/4; fin zinc pl't	Mounts vibrator temperature-compensating resistor	RCA	K-90498-13
1	291		Cap, cast aluminum; 2.300 diam x 1/2 deep; two holes 1/64 diam, c-bored 5/16 diam x 3/16 for motor-assembly screws; two holes No. 10-24 tap for mfg motor to recorder-scanner case	Holds motor front bearing; mounts motor to recorder-scanner case	SG	A-7055
† 1	292		Ball bearing, single row, double seal, seven 3/32 diam balls; .2756 ID, .8661 OD x .2756	Motor armature-shaft front bearing	ND SG RCA	77037 A-5589 K-185448-4
1	293		Fan, aluminum; .313 ID, 1 1/16 OD x 1/2; eight blades; with slotted setscrew No. 8-32 x 1/8	Cools drive motor	SG	AA-149
1	294		Armature assembly, shaft and winding, with commutator; shaft flat at one end for governor mfg, 10-tooth drive pinion cut at other end (bearings and fan not included)	Drive-motor armature	SG	AA-150
† 1	295		Ball bearing, single row, double seal, six 9/64 diam balls; .1969 ID, .748 OD x .2362	Motor armature-shaft rear bearing	ND SG RCA	77035 A-7098 K-185448-3

Quantity	Part Number	Description	Material	Notes
2	296	Spring washer, steel; .495 ID, $\frac{3}{4}$ OD x .006	SG	A-6510
1	297	Yoke assembly, steel center housing, aluminum rear housing; with pole pieces, field coils, brush holders and leads; fin black wrinkle enamel (terminals on exterior leads not included)	SG	AA-148
2	298	Cap, brush, bakelite with brass insert; tapped $\frac{5}{16}$ -40 x $\frac{5}{32}$ for mtg (part of part 301)	SG	A-6109
*† 2	299	Brush assembly, carbon brush $\frac{3}{16}$ sq x $\frac{3}{8}$ long; with pigtail, spring and cap; overall length approx $1\frac{1}{8}$ (part of brush set RCA K-185507-501 — four brushes, for commutator and governor)	SG RCA	AA-116 K-185741-1
*† 2	300	Brush assembly, carbon brush $\frac{1}{4}$ diam x $\frac{1}{2}$ long; with pigtail, spring and cap; overall length approx $\frac{3}{4}$ (part of brush set RCA K-185507-501 — four brushes, for commutator and governor)	SG RCA	AA-124 (less holder parts) K-185741-2
† 2	301	Brush-holder-and-cap assembly, brass body with fiber insulator, cap bakelite with brass insert; cap to body threads $\frac{5}{16}$ -40; body drilled and broached longitudinally .195 square; length $\frac{25}{32}$ (part of brush-holder set RCA K-185697-501 — four holders, for commutator and governor brushes)	SG RCA	AA-125 (less brush parts) K-185749-1
† 2	302	Brush-holder assembly, brass body with insulating washers and bushing and brass nut; mtg threads $\frac{1}{4}$ -32; body drilled longitudinally .182 diam x $\frac{3}{16}$ (flat-bottom hole); length $\frac{5}{16}$ (part of brush-holder set RCA K-185697-501 — four holders, for commutator and governor brushes)	SG RCA	AA-124 (less brush parts) K-185750-1
2	303	Terminal, brass, .018 thk stock; for $\frac{5}{16}$ diam wire; mtg hole $\frac{1}{4}$ diam	SG	A-7066
6	304	Terminal, brass, .025 thk stock; mtg slot .144 wide; clamp $\frac{5}{16}$ wide for wire, $\frac{5}{16}$ wide for wire insulation; length $\frac{3}{4}$; fin hot solder dip (same as part 404)	RCA	K-61580-1
1	305	Cover, aluminum, .032 thk stock; 2.300 diam x $1\frac{5}{8}$ deep; fin black wrinkle enamel	SG	A-7058
2	306	Clip, phos bronze, .041 diam wire; $\frac{5}{32}$ ID; opening $\frac{3}{16}$; length $\frac{1}{32}$	SG	A-7058

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1	307		Grommet, fiber; $\frac{5}{16}$ ID, c-bored $\frac{3}{8}$ diam x $\frac{1}{8}$; shoulder $\frac{1}{2}$ OD x $\frac{1}{16}$; neck .428 OD x $\frac{5}{32}$ (part of part 297)	Protects drive-motor external wires passing through motor housing	SG	A-4974
1	311		Gear, steel; .250 ID, 1.250 PD, 1.2916 OD, $\frac{3}{32}$ thk; $14\frac{1}{2}$ deg pressure angle, 48 pitch, 60 teeth; hub $\frac{5}{8}$ diam x $\frac{1}{4}$, two holes tapped No. 6-32 for setscrews; fin zinc pl't (setscrews not included)	Helix-shaft driven gear	RCA	K-875681-1
1	312		Retainer, bearing, steel, $\frac{1}{32}$ ID, $1\frac{1}{16}$ OD x .093; three csk mtg holes .147 diam; fin zinc pl't	Retains rear bearing for gear-housing idler shaft	RCA	K-185320-2
1	313		Retainer, bearing, steel $\frac{2}{32}$ ID, $1\frac{1}{4}$ OD x .093; three csk mtg holes .147 diam; fin zinc pl't	Retains rear bearing for helix shaft	RCA	K-185320-1
4	314		Ball bearing, single row, double seal, ten $\frac{1}{8}$ diam balls; .190 ID, .625 OD x .203 outer race width, .245 hub width	Supports gear-housing idler shaft and tape-feed roller shaft	FA RCA	K3-L K-185448-1
1	315		Gear, idler, laminated composition; .1904 ID, 2.000 PD, 2.0416 OD, $\frac{3}{32}$ thk; $14\frac{1}{2}$ deg pressure angle, 48 pitch, 96 teeth; steel hub $\frac{9}{16}$ diam x $\frac{1}{4}$, two holes tapped No. 6-32 for setscrews (setscrews not included)	Intermediate gear between drive motor and helix shaft gear	RCA	K-185389-501
2	316		Ball bearing, single row, double seal, thirteen $\frac{1}{8}$ diam balls; .250 ID, .750 OD x .219 outer race width, .281 hub width	Supports helix shaft	FA RCA	K4-A K-185448-2
1	317		Shaft, stainless steel; .1900 diam x $1\frac{9}{16}$; ends chamf $\frac{1}{32}$ x 45 deg	Shaft for gear-housing idler gear	RCA	K-875545-3
2	318		Collar, steel, .1904 ID, $\frac{1}{16}$ OD x $\frac{1}{4}$; neck $\frac{1}{4}$ OD x $\frac{1}{16}$; two tapped holes for No. 6-32 setscrews; fin zinc pl't (setscrews not included)	Holds gear-housing idler-shaft and tape-feed-shaft inner bearings in place	RCA	K-185382-4
2	319		Collar, steel; .251 ID, $\frac{9}{16}$ OD x $\frac{1}{4}$; neck $\frac{2}{64}$ OD x $\frac{1}{16}$; two tapped holes No. 6-32 for setscrews; fin zinc pl't (setscrews not included)	Holds helix shaft in place	RCA	K-185382-2
1	320		Miter gear, steel; .2503 ID, .750 PD, gear height .169, bevel 45 deg, 32 pitch, 24 teeth; hub .670 diam x .312, two holes tapped for No. 6-32 setscrews; fin zinc pl't (setscrews not included)	Drives optical-system drive shaft	RCA	K-185631-1

1	321	Anchor nut, steel stamping; $\frac{3}{32}$ long x $\frac{25}{64}$ wide x $\frac{1}{32}$ high; thread No. 10-32; two mtg holes in wings .098 diam; fin zinc pl't	Holds motor-synchronizing switch adjusting screw	SCO RCA	96B9033 K-863306-1
1	322	Housing, gear, iron casting; fin gray enamel (dowel pins not included)	Housing for shafts and gears; mount for drive motor	RCA	T-161464-1
1	323	C washer, spring steel, .024 thk stock; opening slot .155, center hole .185 ID, $\frac{1}{16}$ OD; fin zinc pl't	Holds detent shaft in place	RCA	K-61933-1
2	324	Bearing, porous bronze, oil impregnated; .2503 ID, .377 OD x $\frac{5}{16}$; ends chamf	Bearing for detent shaft	OIL RCA	A304-9 K-99605-3
1	325	Detent, stainless steel; .250 ID, $\frac{9}{16}$ OD x $\frac{3}{4}$; longitudinal groove $\frac{1}{8}$ rad to depth $\frac{1}{16}$ from ID; two holes tapped No. 8-32 for setscrews; (setscrews not included)	For disengaging printer unit	RCA	K-875656-1
1	326	Shaft, steel; .2496 diam x $3\frac{1}{32}$; one end chamf $\frac{1}{32}$ x 45 deg; neck .185 diam x .047 at other end; two spot-drilled holes $\frac{3}{16}$ diam x 90 deg for setscrew points .375 apart; fin zinc pl't	Holds detent and knob for disengaging printer unit	RCA	K-875651-1
2	327	Pin; stainless steel; .2498 diam x $\frac{3}{8}$; ends chamf $\frac{1}{64}$ x 45 deg	Aligns gear housing on recorder-scanner front panel	RCA	K-875700-2
1	328	Shaft, steel; .3746 diam x .282; ends chamf $\frac{1}{32}$ x 45 deg; fin zinc pl't	Hinge for printer unit	RCA	K-877208-1
1	329	Pin, steel; .155 shaft diam x $\frac{3}{32}$, chamf at end $\frac{1}{32}$ x 45 deg; shoulder .210 diam x .062; fin black oxidize	Hinge pin for tape-adjusting arm	RCA	K-880504-1
1	330	Shaft, helix, stainless steel; helix six threads equally spaced, $\frac{3}{32}$ lin pitch, $1\frac{1}{16}$ lead LH, .487 root diam, .537 OD x .593; neck .2299 diam x $\frac{1}{16}$; shaft diam .2499, and chamf $\frac{1}{64}$ x 45 deg; overall length $6\frac{1}{16}$	Helix prints on recording tape; shaft drives optical-system drive shaft	RCA	M-440125-2
† 1	331	Wheel; steel hub, rubber covered; .1904 ID, shoulder $\frac{9}{16}$ OD, rubber .526 OD, flange $\frac{43}{64}$ OD, length $1\frac{9}{64}$; shoulder tapped two holes No. 6-32 for setscrews; fin black oxidize (setscrews not included)	Feed roller for scanner tape	RCA	K-876395-502
† 1	332	Wheel, steel hub, rubber covered; .1904 ID, neck .250 OD, hub $\frac{3}{16}$ OD, rubber .526 OD, length .719; slot in hub .078 wide x $\frac{1}{16}$ deep for shaft pin; fin brass	Feed roller for recording tape	RCA	K-875618-502

Tot. quan. in equip.	Ref. No.	Signal Corps stock No.	Name of part and description	Function	Mfr. code	Contr's dwg or part No.
1	333		Shaft and pin, steel; shaft .1900 diam x 3/16, ends chamf 1/64 x 45 deg; pin .0625 diam protruding 1/16 from shaft each side	Tape-feed drive shaft	RCA	K-875622-504
1	334		Spacer, steel; .192 ID, 5/16 OD x .319; fin zinc pl't	Spacer between recording-tape-feed roller and inner bearing on tape-feed shaft	RCA	K-875428-4
1	335		Retainer, bearing, steel, .125 thk stock; .625 wide, 2.078 high; two csk mtg holes .128 diam; arcs .266 rad and .148 rad for shafts; top half as viewed from front; fin black oxidize	Retains outer ball bearing for helix and feed shafts	RCA	K-185323-1
1	336		Retainer, bearing, steel, .125 thk stock; .625 wide, 2.078 high; two csk mtg holes .128 diam; hole .1594 diam for hinge pin (part 329); arcs 266 rad and .148 rad for shafts; bottom half as viewed from front; fin black oxidize	Retains outer ball bearing for helix and feed shafts	RCA	K-185323-2
1	337		Worm gear, phos bronze; .1904 ID, .6250 PD, .6874 OD, 7/32 thk; 14 1/2 deg pressure angle, 32 pitch, 20 teeth, helix angle 4 deg, 5 min; hub 1/2 diam x 8/32, two holes tapped No. 6-32 for setscrews (setscrews not included)	Driven gear on tape-feed shaft	RCA	K-185381-1
1	338		Miter gear, bronze, .1879 ID, .750 PD, gear height .164, bevel 45 deg, 32 pitch, 24 teeth; hub .500 diam x .281, two holes tapped No. 6-32 for setscrews (setscrews not included)	Driven gear on optical-system drive shaft	RCA	K-185631-2
1	339		Shaft and worm, steel; shaft .1875 diam x 2 3/4, ends chamf 1/64 x 45 deg; worm lead .098 LH, .4375 PD, .4999 OD, .500 long; 14 1/2 deg pressure angle, 32 pitch, single thread, thread angle 4 deg, 5 min; fin zinc pl't	Drive for optical-system and tape-feed shaft	RCA	K-875622-501
2	341		Washer, felt; 1/4 ID, 1/2 OD x 1/16	Dust seal for optical-system drive-shaft bearing	RCA	K-90438-17
6	342		Ball bearing, single row, single seal, seven .093 diam balls; 1.875 ID, .500 OD x .156 (same as parts 360, 407)	Supports optical-system drive shaft	FA RCA	33-K5 K-855083-11

6	343	Ring, retaining, steel, .035 diam wire; $\frac{3}{64}$ OD; $\frac{1}{4}$ opening, fin zinc plit (same as parts 361, 408)	Retains optical-system drive-shaft bearing in position in gear housing	RCA	K-875446-1
1	344	Gear, steel; .1879 ID, .750 PD, .8124 OD, $\frac{3}{32}$ thk; 32 pitch, 24 teeth; hub $\frac{1}{16}$ diam x $\frac{1}{4}$, two holes tapped No. 6-32 for setscrews; fin zinc plit (setscrews not included)	Drives idler gear to optical system	RCA	K-877105-1
1	345	Collar, steel; .1885 ID, $\frac{1}{16}$ OD x $\frac{1}{4}$; neck $\frac{1}{4}$ OD x $\frac{1}{16}$; two tapped holes No. 6-32 for setscrews; fin zinc plit (setscrews not included)	Retains outer bearing on optical-system drive shaft	RCA	K-185382-1
1	346	Screw and insulator, steel screw, laminated phenolic insulator; screw fl hd, No. 10-32 x 2 with insulating button .125 diam x $\frac{1}{16}$ in tip; fin zinc plit	Adjusts recorder-scanner gear-hsg switch	RCA	K-877041-1
1	351	Block and bracket, steel; 2.593 high x $\frac{7}{16}$ wide x .955 deep; tapped hole No. 6-32 in side for thumbscrew; .0618 diam dowel pin, and two tapped holes No. 4-40 in back for mtg plate; LH viewed from front of panel; fin cad plit (thumbscrew not included)	Supports photo-cell cover	RCA	M-422978-502
1	352	Plate, steel, .093 thk stock; $\frac{7}{8}$ diam hole for photo-cell; $\frac{5}{64}$ x .218 hole for prism and lens; various tapped and drilled holes for mtg parts; fin chrom plit	Supports mtg blocks, triangular prism, lens and reflector	RCA	K-876774-1
† 1	353	Reflector and holder, pyrex glass reflector with aluminized outer surface curved 1 rad, steel holder; .646 high, .750 deep; csk mtg hole .147 diam; LH viewed from front of panel; fin zinc plit	Reflects light to photo-cell	RCA	K-876765-502
† 1	354	Reflector and holder, pyrex glass reflector with aluminized outer surface curved 1 rad, steel holder; .646 high, .750 deep; csk mtg hole .147 diam; RH viewed from front of panel; fin zinc plit	Reflects light to photo-cell	RCA	K-876765-501
1	355	Lens, prism and bracket; optical glass lens and prism, steel bracket; lens .500 long x .125 high x .125 thk; prism .500 x .500 x .125 thk; silvered and lacquered on hypotenuse; two mtg holes .156 diam in bracket; fin zinc plit	Bends light at right angle and focuses it on message tape	RCA	K-876767-501

Tot. quan. in equip.	Ref. No.	Signal Corps stock No.	Name of part and description	Function	Mfr. code	Contr's dwg or part No.
1	356		Block and bracket, steel; 2.593 high x $\frac{7}{16}$ wide x .955 deep; tapped hole No. 6-32 in side for thumbscrew; .0618 diam dowel pin and two tapped holes No. 4-40 in back for mtg plate; RH viewed from front of panel; fin cad plt (thumbscrew not included)	Supports photo-cell cover	RCA	M-422978-501
† 2	357		Thumbscrew, steel, knurled hd; shank neck .097 diam x $\frac{5}{32}$; thread No. 6-32 x $\frac{1}{4}$; flat point; fin black oxidize	Fastens photo-cell cover in place against mtg blocks	RCA	K-876796-1
1	358		Bracket, steel, .031 thk stock; $2\frac{1}{32}$ long x $\frac{3}{4}$ wide x 1 high; two mtg holes .156 diam .718 apart; fin black lacquer	Shield for hexagonal prism	RCA	K-185595-1
1	359		Prism, holder and shaft, optical glass prism, steel holder, stainless steel shaft; hex prism .924 across flats x $\frac{1}{2}$ thk; holder $1\frac{1}{8}$ diam x .281; shaft .1871 diam x $1\frac{3}{8}$, end chamf $\frac{1}{4}$ x 45 deg; fin on holder zinc plt	Causes light spot to scan across message tape	RCA	K-876772-501
—	360		Ball bearing, same as part 342	Support for hexagonal prism and shaft	RCA	K-855083-11
—	361		Ring, retaining, same as part 343	Retains ball bearing in position in boss on optical-system housing	RCA	K-875446-1
1	363		Housing, iron casting; fin olive-drab wrinkle enamel (dowel pins not included)	Supports parts of optical-system	RCA	T-161512-1
2	364		Pin, stainless steel; .1875 diam x $\frac{5}{16}$; ends chamf $\frac{1}{4}$ x 45 deg	Guide for bracket and lens assembly	RCA	K-875700-7
1	365		Gear, steel; .1879 ID, .750 PD, .8124 OD, $\frac{3}{32}$ thk; $14\frac{1}{2}$ deg pressure angle, 32 pitch, 24 teeth; hub $\frac{1}{2}$ diam x $\frac{1}{4}$, hole drilled .063 diam for locking pin; fin zinc plt (locking pin not included)	Turns hexagonal-prism shaft	RCA	K-875637-1
1	366		Taper pin, stainless steel; .078 max diam, taper $\frac{1}{4}$ per ft; length $\frac{1}{2}$	Locks hexagonal-prism drive gear to shaft	RCA	K-845979-5
1	367		Grommet, rubber, $1\frac{1}{32}$ ID, $1\frac{3}{16}$ OD x $\frac{5}{16}$; neck $1\frac{1}{16}$ diam x $\frac{1}{16}$	Cushions photo-cell socket	RCA	K-65415-13

1	368	Bracket and lenses, steel bracket with two optical glass lenses; $2\frac{1}{2}$ long x $\frac{3}{4}$ wide x $1\frac{1}{8}$ high; mtg slot $\frac{1}{2}$ x .1730; fin black lacquer	Focuses light spot from exciter lamp to hexagonal prism	RCA	M-422982-501
1	369	Plate, steel, .031 thk stock; $\frac{3}{4}$ diam socket hole; three mtg holes .173 diam; fin zinc pl't	Mounts photo-cell socket	RCA	K-876795-1
2	370	Pin, stainless steel; .1250 diam x $1\frac{1}{32}$; ends chamf $\frac{1}{4}$ x 45 deg	Stop for front optical adjustment	RCA	K-875700-6
† 1	371	Cover, steel, .031 thk stock with stainless-steel tape guide; $2\frac{3}{4}$ wide x $2\frac{5}{8}$ high x $\frac{7}{8}$ deep; extrusion 1 diam x $\frac{1}{8}$ on front; mtg slots $\frac{3}{16}$ wide on sides; fin white enamel inside, olive-drab wrinkle enamel outside	Provides access to photo-cell; protects photo-cell from external light	RCA	K-185380-501
1	381	Support, brass casting; $2\frac{5}{8}$ long x $1\frac{7}{8}$ wide x $1\frac{1}{16}$ high	Mounting for printer assembly parts	RCA	M-422608-1
1	382	Spacer, brass; 1.030 long x .812 wide x .375 thk; hole .315 diam for armature clamps; two holes tapped No. 8-32 for pole-piece screws, hole tapped No. 10-32 for printer-support screw, hole tapped No. 8-32 for clamp setscrew, hole tapped No. 8-32 x $\frac{1}{4}$ for printer-knife-edge adjusting screw	Separates pole pieces and secures armature	RCA	K-875567-2
1	383	Spacer, brass; 1.030 long x .812 wide x .375 thk; hole .315 diam for armature clamps; two holes tapped No. 8-32 for pole-piece screws, hole tapped No. 10-32 for printer-support screw, hole tapped No. 8-32 for clamp setscrew	Separates pole pieces and secures armature	RCA	K-875567-1
1	384	Pole piece, iron pole piece with steel crossbar; $2\frac{1}{2}$ long x .718 high x .875 wide; two .180 diam holes for mtg screws, one csk .180 diam hole for magnet screw; fin zinc pl't (bottom pole piece)	Directs flux of permanent magnet	RCA	M-422687-501
† 1	385	Magnet, alnico, .998 long x $\frac{3}{4}$ high x $\frac{7}{8}$ wide; $\frac{7}{32}$ diam hole through center long way; N pole marked with red dot	Furnishes permanent magnetic field in printer head	RCA	K-875689-1
1	386	Armature and spring, armature nickel-alloy steel, spring nickel silver; armature $1\frac{1}{8}$ long x .156 wide x .098 thk; spring 1.718 long x .351 wide x .032 thk; bushing on top drilled .062 diam for armature pin (part 388)	Actuates printer assembly	RCA	K-875606-501

Tot. quan. in equip.	Ref. No.	Signal Corps stock No.	Name of part and description	Function	Mfr. code	Contr's dwg or part No.
1	387		Terminal board, laminated bakelite, 1/32 thk stock, with two brass brackets and four stud terminals; mtg holes in brackets .257 diam	Connection points for printer coils and leads to connection receptacle	RCA	K-876818-501
1	388		Pin, stainless steel, .062 diam x .938; ends rounded	Transfers force of armature to printer knife edge	RCA	K-875700-11
1	389		Spring, steel, .013 diam wire; .070 ID x 1; 19 coils close wound + 3/16 ID loop at each end; fin zinc plit	Ties printer arm to armature	RCA	K-880791-1
1	390		Pole piece, iron pole piece with steel crossbar, 2 1/2 long x .718 high x .875 wide; two csk .187 diam holes for mtg screws, one .180 diam hole for magnet screw, one .180 diam hole for printer-knife-edge adjusting screw; fin zinc plate (top pole piece)	Directs flux of permanent magnet	RCA	M-422687-502
2	391		Ball bearing, single row, eight 1/16 diam balls; .078 ID, .250 OD x .093	Supports printer arm	MIN RCA	K-875710-1
† 1	392		Knife edge, spring steel, .032 thk stock; trapezoidal shape, top 2 5/16 wide, bottom 1 1/2 wide, height 2/64; two holes .049 diam for dowel pins, one hole .076 diam for mtg screw; fin zinc plit	Moves recording tape into contact with helix to mark tape	RCA	K-875580-1
1	393		Arm, stainless steel; arm .010 thk stock, with shaft .0781 diam x 1; two dowel pins .0468 diam x 3/64 for knife edge; knife edge mtg hole tapped No. 0-80; bushing on bottom drilled .062 diam for armature pin (part 388)	Supports knife edge	RCA	K-875687-501
1	394		Retainer, bearing, brass rod, .375 diam; 9/16 hole drilled longitudinally .250 diam x .156 for bearing; mtg hole No. 6-32	Retains ball bearing supporting printer arm	RCA	K-875579-1
1	395		Collar, brass; .221 ID, 3/8 OD x 3/16; one edge chamf 1/32 x 45 deg; hole in side .067 diam for pin	Mounts bearing bracket against printer support in conjunction with pin 402	RCA	K-875549-1
1	396		Taper pin, stainless steel; .078 max diam, taper 1/4 per ft; length 1/2	Fastens bearing-bracket mtg collar to pin 402	RCA	K-845979-3

1	397	Bracket, brass piece; $1\frac{1}{4}$ long x $1\frac{1}{16}$ wide x $\frac{3}{8}$ thk; notched and drilled for mtg in printer assembly	Retains ball bearing supporting printer arm	RCA	K-875657-1
1	398	Clamp, mounting, brass piece; $1\frac{5}{16}$ high x 1 wide x $\frac{3}{4}$ deep; notched and drilled for mtg in printer assembly	Mounts printer unit to recorder-scanner panel	RCA	K-875662-1
1	399	Pin, stainless steel; .2496 diam x 1; ends chamf $\frac{1}{64}$ x 45 deg	Secures mtg clamp to printer support	RCA	K-875700-10
1	400	Spring, steel, .051 wire diam; .281 OD x $\frac{3}{8}$; 3 coils; fin zinc plt	Holds bearing bracket against adjusting screw	RCA	K-93988-14
4	401	Clamp, steel; partial cylinder, .154 rad curve; $\frac{3}{8}$ high x .265 wide x .141 thk; fin zinc plt	Clamps armature in place	RCA	K-845035-2
1	402	Pin, stainless steel; fl hd $\frac{5}{16}$ diam x $\frac{3}{16}$; shaft .2184 diam x .750, with neck one end .1984 diam x $\frac{1}{16}$, chamf one end $\frac{1}{32}$ x 45 deg	Mounts bearing bracket against printer support in conjunction with collar 395	RCA	K-875555-1
† 1	403	Detent screw, stainless steel; spade hd $\frac{3}{16}$ thk with drilled hole $\frac{1}{8}$ diam; thread $\frac{5}{16}$ -24; end rounded $\frac{1}{8}$ rad; overall length $1\frac{1}{16}$	Adjusts spacing between knife edge and helix	RCA	K-877075-1
—	404	Terminal, same as part 304	Connects printer-unit cable from printer unit to terminal board TB202	RCA	K-61580-1
1	405	Ring, retaining, steel, .035 diam wire; $1\frac{3}{64}$ OD; opening $\frac{1}{32}$; fin zinc plt	Holds idler shaft in place	RCA	K-875446-4
1	406	Shaft, steel, .1875 diam x $1\frac{1}{16}$; .020 rad groove for retaining ring; .032 wide x .0473 deep for C washer; ends chamf $\frac{1}{64}$ x 45 deg	Shaft for hexagonal-prism drive-gear idler gear	RCA	K-877133-1
—	407	Ball bearing, same as part 342	Supports idler shaft	RCA	K-855083-11
—	408	Ring, retaining, same as part 343	Holds ball bearing in idler assembly	RCA	K-875446-1
1	409	Arm and bushing, steel; $2\frac{1}{8}$ long x $1\frac{1}{16}$ wide; arm .062 thk stock, bushing .437 thk; two mtg holes .228 diam; fin zinc plt	Mounts idler shaft, bearings and gear	RCA	M-440144-501
1	410	C washer, phos bronze, .0254 thk stock; opening slot .075, center hole .093 ID, $\frac{5}{16}$ OD	Holds idler shaft in place	RCA	K-61933-4

Tot. quan. in equip.	Ref. No.	Signal Corps stock No.	Name of part and description	Function	Mfr. code	Contr's dwg or part No.
2	425		Holder, steel, .125 thk stock; 1/16 high x .520 wide; center hole .396 sq; two mtg holes .128 diam centered .718 apart; fin black oxidize	Holds lens in lens bracket	RCA	K-876784-1
1	426		Aperture, phos bronze, .010 thk stock; 1/16 high x .394 wide x .138 deep; center hole .250 high x .312 wide; two mtg holes .128 diam centered .718 apart; fin black nickel plt	Aperture for lens near hexagonal prism	RCA	K-876785-1
1	427		Lens, optical glass; .394 high x .374 wide x .050 thk; beveled corners; focal length .123	Focuses light spot from exciter lamp to hexagonal prism (this lens near hexagonal prism)	RCA	K-849494-3
1	428		Bracket, iron casting; 1.861 long x 3/4 wide x 1/8 high; ends grooved .521 wide x .046 deep for lens holders; four holes tapped No. 4-40 for lens-holder screws; mtg slot 1/2 x .1730; fin black lacquer	Supports lenses and holders	RCA	M-422696-1
1	429		Spring, phos bronze, .010 thk stock; 3/64 high x .374 wide x .046 deep; center hole .300 high x .200 wide; fin black oxidize	Holds lens near exciter lamp against aperture	RCA	K-876783-1
1	430		Lens, optical glass; .374 sq x .10 thk; beveled corners; focal length 1.50	Focuses light spot from exciter lamp to hexagonal prism (this lens near exciter lamp)	RCA	K-849494-1
1	431		Aperture, phos bronze, .010 thk stock; 1/16 high x .394 x .138 deep; center hole .125 high x .300 wide; two mtg holes .128 diam centered .718 apart; fin black nickel plt	Aperture for lens near exciter lamp	RCA	K-876786-1
1	433		Clip, phos bronze, .020 thk stock; 7/16 high x 1/4 wide; clamp portion 7/16 ID; mtg hole .136 diam	Holds inkler-housing cover closed	RCA	K-61121-1
1	435		Bracket and shield, steel, .062 thk stock bracket, .031 thk stock shield; 2 1/4 high x 1 1/16 wide x 3/4 deep; holes .097 diam for felt-roller axle; slots .097 wide for rubber-roller axle; fin zinc plt	Holds inkler rollers	RCA	K-185375-501

1	436	Hub, steel; $\frac{7}{16}$ diam x .703, with two shoulders $\frac{1}{2}$ diam x .023; two axle pins .090 diam protruding .047; pins held in place by retaining ring and coil spring in center of hub; fin zinc pl't	Hub for felt ink roller	RCA	K-877018-501
† 1	437	Roller, felt; $\frac{7}{16}$ ID, $1\frac{1}{4}$ OD x $\frac{7}{16}$	Ink reservoir	RCA	K-841553-1
† 1	438	Roller, rubber molded on steel shaft; $\frac{5}{8}$ diam x .641; axle diam .090; overall length .838	Transfers ink to helix	RCA	K-877020-501
*† —	439	Ink, ticker-tape purple; in 4 oz can equipped with brush in cover	Medium for printing messages on recording tape	CJ RCA	44-20 K-185502-2
2	442	Clamp, spring steel, .032 thk stock; $\frac{3}{8}$ wide x $1\frac{7}{16}$ long; two mtg holes .136 diam	Clamps tape-cleaning strip to recorder-scanner side cover	RCA	K-187371-2
1	445	Window, transparent plastic, .060 thk stock; 3 long x $\frac{13}{16}$ wide	For inspection of recording-tape supply	RCA	K-877599-1
† 1	446	Handle, steel rod $\frac{3}{16}$ diam; Ushaped; 6 long x $1\frac{1}{16}$ high + threaded ends No. 10-32 x $\frac{1}{2}$, fin black enamel	For removing recorder-scanner side cover	RCA	K-836390-1
4	451	Spring, steel, .032 thk stock; $1\frac{3}{8}$ long x $\frac{3}{8}$ wide x $\frac{1}{4}$ high; mtg hole .161 diam; fin zinc pl't	Clamps recorder-scanner side cover to case	RCA	K-880503-1
1	452	Stud, steel; mtg rim .368 ID, .435 OD x .125; shoulder $\frac{1}{16}$ diam x .062; neck .371 diam x .531, with slot .128 wide x $\frac{3}{8}$ deep; tapped longitudinally No. 6-32 for tape-reel mtg screw; fin zinc pl't	Axle for recording-tape reel	RCA	K-876841-1
—	453	Stud, same as part 152	Holds slide for clamping bottom of recorder-scanner case to shock mounting	RCA	K-876881-1
—	454	Washer, spring, same as part 153	Used with part 453	RCA	K-69129-23
1	455	Stud, steel; mtg tip .133 diam x $\frac{1}{8}$; shoulder $\frac{1}{4}$ diam x .078; shaft .122 diam x .968, with neck .078 diam x .032 for C washer; end chamf $\frac{1}{4}$ x 45 deg	Axle for recording-tape guide bobbin	RCA	K-877525-1
2	456	Snap slide, steel, .050 thk stock; $7\frac{7}{16}$ long x .593 wide; slots for shock-mount pins; with angle handle $1\frac{3}{8}$ wide, $\frac{9}{16}$ high; welded assembly; fin zinc pl't	Locks bottom of recorder-scanner case to shock mounting	RCA	K-877204-502

Tot. quan. in equip.	Ref. No.	Signal Corps stock No.	Name of part and description	Function	Mfr. code	Contr's dwg or part No.
2	457		Holder, steel, .062 thk stock; $7\frac{1}{8}$ long x $1\frac{1}{2}$ wide x $\frac{3}{8}$ high; eight mtg holes .161 diam; two holes for locking-slide studs .129 diam; two holes for shock-mount pins .316 diam; fin zinc pl't	Holds slide clamping bottom of recorder-scanner case to shock mounting	RCA	K-877574-1
—	458		Stud, same as part 156	Anchors recorder-scanner case to recorder-scanner chassis; used in conjunction with part 459	RCA	K-876880-1
—	459		Pin, same as part 157	Anchors recorder-scanner case to recorder-scanner chassis; used in conjunction with part 458	RCA	K-876880-3
—	460		Vent, same as part 125	Ventilation	WAT RCA	1470 KX-381525-1
—	461		Bracket, same as part 158	Holds slide clamping back of recorder-scanner case to shock mounting	RCA	K-880705-2
—	462		Snap slide, same as part 159	Locks back of recorder-scanner case to shock mounting	RCA	K-880719-2
1	463		Cover BG-118-B, cotton duck, pre-shrunk; $11\frac{1}{4}$ long x $9\frac{7}{8}$ high x $11\frac{1}{8}$ wide; with two slide fasteners; has no bottom; olive drab	Weather and handling protection for Recorder-Scanner BC-918-B	RCA	MI-14003
† 1	465		Mounting FT-318-B, steel, with rubber shock mounts; mount centers are at corners of rectangle $11\frac{5}{8}$ x $4\frac{29}{32}$ on bottom of base; mount on rear bracket centered $8\frac{51}{64}$ from floor of base; fin olive-drab wrinkle enamel	Base for amplifier	RCA	MI-14005-A
† 1	466		Mounting FT-328-B, steel, with rubber shock mounts; mount centers are at corners of rectangle $8\frac{1}{2}$ x $5\frac{7}{32}$ on bottom of base; mount on rear bracket centered $8\frac{51}{64}$ from floor of base; fin olive-drab wrinkle enamel	Base for recorder-scanner	RCA	MI-14002-A

10	467	Shock-mount, rubber grommet mounted on plate with stud for fastening to case; grommet 1 diam x 3/4; four mtg holes .141 diam at corners of 1-in. square in mtg plate; stud has 1/8 rad head, neck for locking slide .185 diam x .056	Absorbs shock	RCA	K-880726-501
1	469	Rectifier RA-54-A, selenium type; a-c input 115 v, 60 cycles; d-c output 13.5 v, 12 amp; includes two selenium rectifier units, transformer, relay, meter, toggle switches, and cables and plugs; enclosed in steel case with shock-mounts; 18 wide x 9 1/16 high x 15 1/2 deep; fin olive-drab wrinkle enamel	Furnishes rectified power supply for facsimile equipment	FS RCA	1280/Form B MI-14010
1	470	Cable, two conductors, rubber covered; leads stripped and tinned; length 96	Connects rectifier to a-c power source	FS	Q-10144
1	471	Plug, two poles, male, 10-amp capacity; for 5/16 to 9/16 diam cable; with two rd-hd clamp screws No. 6-32 x 7/16, and two binder-hd terminal screws No. 6-40 x 5/16	Connects rectifier a-c cable to a-c power receptacle	HUB FS RCA	7057 Q-10141 K-184435-1
1	472	Grille, steel, .078 thk stock expanded metal, with edge 1 wide; 16 holes 3/4 diam in edge for mtg; 16 wide x 15 deep; fin olive-drab wrinkle enamel	Rectifier-case cover	FS	D-4409 (partial)
4	473	Shock-mount, rubber grommet and washers mounted on steel cup; four mtg holes for No. 8 screws in cup flange	Absorbs shock	FS	Q-10380
2	474	Bracket, steel, .078 thk stock; 18 long x 1 3/8 wide x 9/16 high; two holes 9/16 diam 13 1/2 apart for shock-mounts, two mtg holes 9/16 diam 17 apart; fin zinc pl't	Mounting base for rectifier case	FS	Q-10301
1	475	Nameplate, steel, .020 thk stock; 2 1/2 long x 3/4 wide; mtg hole 1/2 diam; engraved NORMAL-BOOST; fin nickel pl't	Indicator for toggle switch	FS	Q-10518
*† 2	476	Fuse, glass cartridge type, 9/16 diam x 1 1/4; 15 amp, 25 v (same as F301)	Spare fuse	LF RCA	4AG K-55544-31
2	477	Grille, steel, .078 thk stock expanded metal; 7 long x 2 3/4 wide; fin olive-drab wrinkle enamel	Vent in bottom of rectifier case	FS	D-4409 (partial)
1	478	Grille, steel, .078 thk stock expanded metal; 10 1/2 long x 3 3/16 wide; fin olive-drab wrinkle enamel	Vent in bottom of rectifier case	FS	D-4409 (partial)

Tot. quan. in equip.	Ref. No.	Signal Corps stock No.	Name of part and description	Function	Mtr. code	Contr's dwg or part No.
1	479		Clamp, cable, steel; threaded 1/2-14 pipe thread x 1 3/16, with nut; clamp portion fits max 5/8 diam cable; movable jaw fastened by two fl-hd clamp screws No. 6-32 x 5/8; fin zinc plit	Clamps rectifier a-c cable to case	FS	Q-10149
† 2	480		Clamp, cable, steel; threaded 3/4-14 pipe thread x 7/16, with nut; clamp portion fits max 3/4 diam cable; movable jaw fastened by two fl-hd clamp screws No. 10-32 x 3/4; fin zinc plit (same as part 504)	Clamps rectifier battery cable to case	RCA	K-187575-1
2	481		Mount, molded composition; with nickel-pltd brass screws, washers and nuts No. 14-24 for mtg resistor; 3 3/8 long x 1 wide x 2 1/16 high; two mtg holes 1 apart, 5/16 diam, c-bored 1/2 diam x 1/2	Terminal connections for a-c power cable; mount for wire-wound resistor R303	FS	H-7328
11	482		Terminal, phos bronze, .018 thk stock; eyelet type; 7/32 diam mtg hole, clip fits 1/8 diam wire; hot tin dipped	Connection points for rectifier internal wiring terminal blocks	FS	31256
6	483		Terminal, brass, .036 thk stock; mtg slot .257 wide; clamp 7/32 wide for wire; length 1 1/4; hot tin dipped (same as part 507)	Connects rectifier a-c cable and battery cable to rectifier terminal blocks	PAT FS RCA	2021 Q-10438 K-818337-20
8	484		Terminal, phos bronze, .018 thk stock; eyelet type; 5/32 diam mtg hole, clip fits 1/8 diam wire; hot tin dipped	Connection points for rectifier internal wiring to meter and adjustable resistance	FS	30993
8	485		Terminal, phos bronze, .018 thk stock; mtg hole for No. 6 screw, int teeth; two holes 3/32 diam for wires; hot tin dipped (part of S301, S302)	Connection points for rectifier internal wiring to switches	SHA RCA	2102-6 K-99061-2
15	486		Nut, brass; hex, with neck 1/16 diam x 1/8; No. 14-24; fin nickel plit (part of 481, 490)	Used on rectifier terminal-block connection studs	FS	E-5514
4	487		Bracket, steel, .048 thk stock; 2 5/8 wide x 2 high x 9/16 deep; two mounting holes 3/16 diam for bracket, one hole 1/32 diam for rectifier through-stud	Mount for selenium rectifier unit in rectifier case	FS	H-7777-3
*† 1	488		Fuse holder, bakelite; panel type; length 2 3/32; mounting thread 5/8-18 x 1/2; two terminals; FUSE engraved on cap; mounting nut and leather washer included (same as 489 except engraving)	For holding fuse in rectifier panel	FS RCA	Q-10440 K-99088-1

1	489	Fuse holder, bakelite; panel type; length 2 $\frac{3}{8}$; mounting thread $\frac{5}{8}$ -18 x $\frac{1}{2}$; two terminals; SPARE FUSE engraved on cap; mounting nut and leather washer included (same as 488 except engraving)	For holding spare fuse in rectifier panel	FS	Q-10440-1
1	490	Terminal block, molded composition; in three sections, each section with three flat washers, one standard nut, two special nuts (486), and terminal screw No. 14-24 thread	Rectifier d-c output connection points	FS	Q-10163-3
1	491	Cable assembly, two conductors, shielded, rubber covered; with two terminals (483) and pigtail at one end, two battery clips (492 and 493) at other end; length 84 (cable clamp not included)	Connects rectifier to battery	FS	Q-10442
1	492	Clip, steel; hinged jaw type, with spring and binder-hd terminal screw No. 8-32 x $\frac{1}{4}$; 25 amp capacity; length 2 $\frac{3}{4}$; marked + on side; fin zinc plit (same as part 493 except marking)	Connection point for rectifier to pos battery terminal	MU	24A plus
1	493	Clip, steel; hinged jaw type, with spring and binder-hd terminal screw No. 8-32 x $\frac{1}{4}$; 25 amp capacity; length 2 $\frac{3}{4}$; marked - on side; fin zinc plit (same as part 492 except marking)	Connection point for rectifier to neg battery terminal	MU	24A minus
† 1	494	Cord CD-606-B, 18 conductors, shielded, neoprene covered; with 20-contact female elbow plug at each end; length 96	Connects Amplifier BC-908-B circuits with Recorder-Scanner BC-918-B circuits	RCA	M-440587-502
† 2	495	Connector, aluminum, 20 contacts, female; body 90 deg elbow, one end male threaded 1 $\frac{7}{16}$ -18 x $\frac{3}{8}$; other end with sleeve female threaded 1 $\frac{3}{4}$ -18; with two clamp screws (509) (Army-Navy type AN-3108-28-16S)	Connection plug for amplifier-to-recorder-scanner cable	AP RCA	M-253374-17
† 2	496	Clamp, cable, aluminum; body with female threads 1 $\frac{7}{16}$ -18; 1 $\frac{5}{8}$ OD x 1 $\frac{5}{16}$; clamp portion fits max 1 $\frac{1}{8}$ diam cable; movable jaw fastened by two fil hd clamp screws No. 8-32 x $\frac{7}{8}$, and rubber gasket (Army-Navy Type AN-3057-16)	Clamps amplifier-to-recorder-scanner cable to connection plug	AP RCA	M-253375-15
2	497	Bushing, rubber, .655 ID, $\frac{7}{8}$ OD x 1 $\frac{3}{16}$; shoulder 1 $\frac{3}{8}$ OD x $\frac{5}{8}$	Cushions cable clamp from cable	RCA	K-251894-9
4	498	Washer, brass; .687 ID, 1.359 OD x .031; fin nickel plit	Connects to shield inside cable connector	RCA	K-252455-3

Tot. quan. in equip.	Ref. No.	Signal Corps stock No.	Name of part and description	Function	Mfr. code	Contr's dwg or part No.
1	499		Cable, 18 conductors, shielded, neoprene covered; leads stripped and tinned; length 96 (plugs not included)	Connects amplifier circuits with recorder-scanner circuits	RCA	M-440585-2
† 1	500		Cord CD-608-B, two conductors, shielded, neoprene covered; with two-contact female elbow plug at one end, cable clamp and fork terminals at other end; length 102	Connects Amplifier BC-908-B to battery box or to Rectifier RA-54-A	RCA	M-440709-502
† 1	501		Connector, aluminum, two contacts, female; body 90 deg elbow, one end male threaded 1-20 x 3/8, other end with sleeve female threaded 1 1/8-18 with two clamp screws (509) (Army-Navy Type AN-3108-18-3S)	Connects d-c power cable to amplifier receptacle	AP RCA	M-253474-4
† 1	502		Clamp, cable, aluminum; body with female threads 1-20; 1 3/8 OD x 1 1/8; clamp portion fits max 1/2 diam cable; movable jaw fastened by two 3/4-long clamp screws, rubber gasket and fiber washer (Army-Navy Type 97-3057-10-6)	Clamps d-c power cable to amplifier connection plug	AP RCA	P-255073-34
†	504		Clamp, cable, same as part 480	Clamps d-c power cable to battery-box or rectifier case	RCA	K-187575-1
1	505		Washer, brass; .531 ID, .937 OD x .031; fin nickel plit	Connects to shield inside cable connector	RCA	K-252455-11
—	507		Terminal, same as part 483	Connects d-c power cable to battery or rectifier terminals	PAT FS RCA	2021 Q-10438 K-818337-20
1	508		Cable, two conductors, shielded, neoprene covered; leads stripped and tinned; length 102 (plugs not included)	Connects equipment to battery box or rectifier	RCA	M-440707-3

			AP	
6	509	Machine screw, steel; fl hd, hd drilled for locking wire; shank No. 8 diam x 1/2, threaded No. 8-32 x 3/4; fin nickel pl't	Clamps two halves of cable connectors	RCA M-440536-503
† 1	510	Cord CD-1018, two conductors, shielded, rubber covered; with two-circuit jack-type plug at each end; length 120	Connects Amplifier BC-908-B or Recorder-Scanner BC-918-B to radio receiver	RCA M-440536-503
† 2	511	Plug PL-55, jack type, two circuits; plug portion 1 15/64 long; base 1/2 diam x 1 5/8, 17/64 diam hole for cable	Jack plug for radio-receiver cable	AL RCA K-880793-1
1	512	Cable, two conductors, shielded, rubber covered; leads stripped and tinned; length 120 (plugs not included)	Connects equipment to radio-receiver	RCA M-440567-4
† 1	520	Cord CD-1019, two conductors, shielded, rubber covered; with three-circuit jack-type plug at each end; length 120	Connects Amplifier BC-908-B or Recorder-Scanner BC-918-B to radio transmitter	RCA M-440536-504
† 2	521	Plug PL-68, jack type, three circuits; plug portion 1 7/64 long; base 1/2 diam x 2 1/8, 17/64 diam hole for cable	Jack plug for radio-transmitter cable	AL RCA K-880793-2
1	522	Cable, two conductors, shielded, rubber covered; leads stripped and tinned; length 120 (plugs not included)	Connects equipment to radio transmitter	RCA M-440567-3
† 1	530	Writing Stand MC-308-B, steel, .031 thk stock; 9/4 long x 8 1/2 wide x 1 1/4 high; with tape bobbins and guides; hinged cover; fin olive-drab wrinkle enamel (tape not included)	Holds tape roll and guides tape for hand-written message	RCA MI-14008
1	531	Guide, stainless steel, .063 thk stock; 1 31/64 long x 1 9/64 wide x 6/64 high; with guide post .125 diam x 57/64; two csk mtg holes .134 diam	Guides tape	RCA K-185711-501
1	532	Plate, stainless steel, .031 thk stock, with .0187 thk spacer plate; 6 7/8 long x 1 3/4 wide; four mtg holes .128 diam	Writing surface	RCA K-880951-501
2	533	Guide rail, stainless steel, .062 thk stock, 6 3/4 long x 3/4 wide; step cut underside .255 wide x .030 deep; two csk mtg holes .161 diam; fin olive-drab wrinkle enamel	Guides writer to center of tape	RCA K-880952-1

Tape Facsimile Equipment RC-58-B

Tot. quan. in equip.	Ref. No.	Signal Corps stock No.	Name of part and description	Function	Mfr. code	Contr's dwg or part No.
4	534		Catch, spring steel, .020 thk stock; $\frac{1}{16}$ long x $\frac{1}{4}$ wide x $\frac{1}{8}$ high; mtg hole .113 diam; fin zinc plt	Holds writing-stand cover closed	RCA	K-877265-2
2	535		Pin, steel; fl hd $\frac{3}{8}$ diam x $\frac{1}{16}$; shaft .187 diam x $1\frac{1}{8}$, end chamf $\frac{1}{32}$ x 45 deg; hole for cotter pin .093 diam; fin zinc plt	Axle for wooden roller	RCA	K-877132-1
4	536		Catch, spring steel, .032 thk stock; L shaped, short leg $\frac{1}{32}$, long leg $\frac{13}{16}$; width $\frac{3}{8}$; two mtg holes .136 diam; fin zinc plt	Holds writing-stand cover closed	RCA	K-877265-1
1	537		Spring, phos bronze, .0159 thk stock; $1\frac{3}{32}$ long x $\frac{1}{2}$ wide; two mtg holes .102 diam	Holds tape against wooden roller	RCA	K-185403-2
1	538		Pin, steel; fl hd .250 diam x .118; shoulder $\frac{1}{2}$ diam x .063; shaft .187 diam x $\frac{25}{32}$; tip .121 diam x .093, drilled longitudinally .073 diam; fin zinc plt	Axle for tape-holding roller	RCA	K-877132-3
1	539		Roller, maple, .199 ID, $1\frac{1}{2}$ OD x $\frac{3}{4}$; fin varnish	Holds roll of tape	RCA	K-877122-3
2	540		Roller, maple, .199 ID, $\frac{3}{4}$ OD x $\frac{27}{32}$; fin varnish	Guides tape being fed from writing-stand case	RCA	K-877122-1
*† 1	545		Tape M-298, paper, $\frac{3}{4}$ wide; on roll 7 diam, with chipboard core $1\frac{1}{8}$ ID (set of 48 rolls)	Medium for recording incoming messages or for writing messages to be transmitted	RCA	MI-14016-A
1	550		Chest CH-108-B, pine; $14\frac{3}{4}$ long x 9 wide $8\frac{3}{4}$ high; with hinged top, six partitions for tape rolls, tray for spare parts, two catch locks, carrying handle on top; fin olive-drab flat enamel	Holds spare parts and paper-tape rolls supplied with equipment (does not carry rectifier spares)	RCA	T-621203-501
*† —	551		Pencil, mechanical	For writing messages on tape for transmission	SC RCA	77 K-185504-1
*† —	552		Lead, thin, B black; half gross in box	Replacement lead for pencil (part 551)	EP RCA	75-17 K-185505-1
9	A101		Link, brass, .031 thk stock; $\frac{3}{4}$ long, $\frac{5}{16}$ wide; slot and mtg hole for No. 6 screws, $\frac{1}{16}$ between centers (part of TB101) (same as A102, A103, A104, A201, A202, A203, A204, A205)	Tube-heater changeover from 12 to 24-v operation	RCA	K-61746-2

Supplementary data

TM 11-374

Par. 43

—	A102	Link, same as A101 (part of TB101)	Tube-heater changeover from 12 to 24-v operation	RCA	K-61746-2
—	A103	Link, same as A101 (part of TB101)	Pilot-lamp changeover from 12 to 24-v operation	RCA	K-61746-2
—	A104	Link, same as A101 (part of TB101)	Dynamotor control-relay changeover from 12 to 24-v operation	RCA	K-61746-2
† 2	A105	Binding post, brass, knurled hd; 1/2 diam, 1/16 high closed, 7/8 high open; 1/8 slot for wire; mtg stud No. 8-32 x 1/16; head engraved LINE; fin black enamel (same as A107)	Line connection	EB	Sergeant SS- No. 14 K-865218-3
† 2	A106	Binding post, same as A105 except engraved GND (same as A201)	External ground connection	EB	Sergeant SS- No. 14 K-865218-2
† —	A107	Binding post, same as A105	Line connection	EB	Sergeant SS- No. 14 K-865218-3
† —	A201	Binding post, same as A106	External ground connection	EB	Sergeant SS- No. 14 K-865218-2
—	A202	Link, same as A101 (part of TB201)	Tube-heater changeover from 12 to 24-v operation	RCA	K-61746-2
—	A203	Link, same as A101 (part of TB201)	Tube-heater changeover from 12 to 24-v operation	RCA	K-61746-2
—	A204	Link, same as A101 (part of TB201)	Pilot-lamp changeover from 12 to 24-v operation	RCA	K-61746-2
—	A205	Link, same as A101 (part of TB201)	Exciter-lamp changeover from 12 to 24-v operation	RCA	K-61746-2
—	A206	Link, same as A101 (part of TB201)	Vibrator changeover from 12 to 24-v operation	RCA	K-61746-2
*† 3	B101	Lamp, pilot, incandescent, 6 to 8 v, .20 amp; G 3 1/2 bulb, miniature bayonet base (same as B202, B203)	Indicates power on	GE RCA	Mazda 51 K-61114-11
*† 1	B201	Lamp, exciter, incandescent, 4 v, .75 amp; prefocused; S-8 bulb, C-6 filament, double-contact bayonet base with three-hole mtg flange	Exciter-light source for scanner system	GE RCA	75A/S8SC K-180599-2

Tot. quan. in equip.	Ref. No.	Signal Corps stock No.	Name of part and description	Function	Mfr. code	Contr's dwg or part No.
*† —	B202		Lamp, same as B101	Pilot lamp for reading recording tape	GE RCA	Mazda 51 K-61114-11
*† —	B203		Lamp, same as B101	Pilot lamp for recorder-scanner lower right	GE RCA	Mazda 51 K-61114-11
† 1	C101		Capacitor, castor-oil filled; 1.75 mf ± 10%; 50 v d-c working voltage; sealed in can 1 5/16 x 1/16 x 1 7/8 high; stamped C101 on side; fin silver-gray lacquer (same as C102, C123 except ref No.)	Direct-current blocking in microphone circuit	RCA	P-171727-1
† 1	C102		Capacitor, castor-oil filled; 1.75 mf ± 10%; 50 v d-c working voltage; sealed in can 1 5/16 x 1/16 x 1 7/8 high; stamped C102 on side; fin silver gray lacquer (same as C101 except ref No.)	Direct-current blocking in microphone circuit	RCA	P-171727-2
† 1	C103		Capacitor, castor-oil filled; 1 mf ± 10%; 400 v d-c working voltage; sealed in can 1 5/16 x 1/16 x 1 7/8 high; stamped C103 on side; fin silver gray lacquer (same as C132, C202 except ref No.)	Cathode by-pass in audio-frequency stage V101	RCA	P-171727-4
† 6	C104		Capacitor, molded mica, with toothpick leads; 500 mmf ± 10%; 500 v d-c working voltage (same as C105, C125, C126, C129, C130)	Radio-frequency attenuator in detector output V102	SM RCA	MOBW P-720473-36
† —	C105		Capacitor, same as C104	Radio-frequency attenuation in detector output V102	SM RCA	MOBW P-720473-36
† 1	C106		Capacitor, metal tube, paper covered, with toothpick leads; .01 mf ± 20%; 600 v d-c working voltage; stamped C106 on side (same as C110, C111, C124, C127, C128, C205, C206 except ref No.)	Coupling between detector V102 and audio-frequency stage V101	FT RCA	A-7456 M-142215-4
† 1	C107		Capacitor, castor-oil filled; two sections, each .5 mf ± 10%; 400 v d-c working voltage; sealed in can 1 5/16 x 1/16 x 1 7/8 high; stamped C107 on side; fin silver gray lacquer (same as C112, C201, C204 except ref No.)	A: Cathode by-pass in detector stage V102 B: Filter in oscillator B+ supply	RCA	P-171727-7
† 3	C108		Capacitor, ceramic, with toothpick leads; 39 mmf ± 5%; 500 v d-c operating voltage (same as C109, C121)	Radio-frequency attenuator in frequency-modulation oscillator stage V104	ER, RCA	N680K39-2 M-428801-34

† —	C109	Capacitor, same as C108	Radio-frequency attenuator in frequency-modulation-oscillator stage V104	ER RCA	N680K39 =2 M-428801-34
† 1	C110	Capacitor, metal tube, paper covered, with toothpick leads; .01 mf = 20%; 600 v d-c working voltage; stamped C110 on side (same as C106 except ref No.)	Coupling between fixed oscillator and detector stage	FT RCA	A-7456 M-142215-5
† 1	C111	Capacitor, metal tube, paper covered, with toothpick leads; .01 mf = 20%; 600 v d-c working voltage; stamped C111 on side (same as C106 except ref No.)	Coupling between frequency-modulation oscillator and detector stage	FT RCA	A-7456 M-142215-6
† 1	C112	Capacitor, castor-oil filled; two sections, each .5 mf = 10%; 400 v d-c working voltage; sealed in can $1\frac{1}{16} \times \frac{1}{16} \times 1\frac{1}{8}$ high; stamped C112 on side; fin silver gray lacquer (same as C107 except ref No.)	A: Screen by-pass for frequency-modulation oscillator B: Screen by-pass for fixed oscillator	RCA	P-171727-8
† 2	C113	Capacitor, molded mica, with toothpick leads; 240 mmf = 5%; 500 v d-c working voltage (part of T106) (same as C114)	Direct-current blocking in fixed-oscillator transformer T106	AV RCA	1469 P-720538-32
† —	C114	Capacitor, same as C113 (part of T107)	Direct-current in frequency-modulation-oscillator transformer T107	AV RCA	1469 P-720538-32
† 6	C115	Capacitor, molded mica, with toothpick leads; 800 mmf = 2%; 500 v d-c working voltage (part of T106) (same as C116, C117, C118, C119, C120)	Tank capacitor in fixed-oscillator transformer T106	SM RCA	MOSDW P-720537-28
† —	C116	Capacitor, same as C115 (part of T106)	Tank capacitor in fixed-oscillator transformer T106	SM RCA	MOSDW P-720537-28
† —	C117	Capacitor, same as C115 (part of T106)	Tank capacitor in fixed-oscillator transformer T106	SM RCA	MOSDW P-720537-28
† —	C118	Capacitor, same as C115 (part of T107)	Tank capacitor in frequency-modulation transformer T107	SM RCA	MOSDW P-720537-28
† —	C119	Capacitor, same as C115 (part of T107)	Tank capacitor in frequency-modulation transformer T107	SM RCA	MOSDW P-720537-28

Tot. quan. in equip.	Ref. No.	Signal Corps stock No.	Name of part and description	Function	Mfr. code	Contr's dwg or part No.
† —	C120		Capacitor, same as C115 (part of T107)	Tank capacitor in frequency-modulation transformer T107	SM RCA	MOSDW P-720537-28
† —	C121		Capacitor, same as C108	Frequency changer in frequency-modulation-transformer circuit	ER RCA	N680K39 #2 M-428801-34
† 1	C122		Capacitor, ceramic, variable; 7-45 mmf; 500 v d-c working voltage; two mtg holes .120 diam, spaced .445 apart	Trimmer capacitor used in conjunction with C121 for adjustment of "white" (1,150 cps) frequency	CL RCA	822-N K-186009-1
† 1	C123		Capacitor, castor-oil filled; 1.75 mf ± 10%; 50 v d-c working voltage; sealed in can 1 ⁵ / ₁₆ x 1 ¹ / ₁₆ x 1 ⁷ / ₁₆ high; stamped C123 on side; fin silver gray lacquer (same as C101 except ref No.)	Coupling between second amplifier V203 and clipper V102	RCA	P-171727-3
1	C124		Capacitor, metal tube, paper covered, with toothpick leads; .01 mf ± 20%; 600 v d-c working voltage; stamped C124 on side (same as C106 except ref No.)	Cathode by-pass on frequency-control tube V101	FT RCA	A-7456 M-142215-1
† —	C125		Capacitor, same as C104	Coupling between first limiter V106 and second limiter V107	SM RCA	MOBW P-720473-36
† —	C126		Capacitor, same as C104	Coupling between first limiter V106 and second limiter V107	SM RCA	MOBW P-720473-36
† 1	C127		Capacitor, metal tube, paper covered, with toothpick leads; .01 mf ± 20%; 600 v d-c working voltage; stamped C127 on side (same as C106 except ref No.)	Audio-frequency by-pass in discriminator output circuit V108	FT RCA	A-7456 M-142215-2
† 1	C128		Capacitor, metal tube, paper covered, with toothpick leads; .01 mf ± 20%; 600 v d-c working voltage; stamped C128 on side (same as C106 except ref No.)	Audio-frequency by-pass in discriminator output circuit V108	FT RCA	A-7456 M-142215-3
† —	C129		Capacitor, same as C104	Suppressor in driver-inverter stage V109	SM RCA	MOBW P-720473-36
† —	C130		Capacitor, same as C104	Suppressor in driver-inverter stage V109	SM RCA	MOBW P-720473-36

† 1	C131	Capacitor, dry electrolytic, in can, octal base; 30 mf; 100 v d-c working voltage; stamped C131 on side		Cathode by-pass in power-output stage V110 and V111	AV RCA	Type AP K-876562-1							
† 1	C132	Capacitor, castor-oil filled; 1 mf = 10%; 400 v d-c working voltage; sealed in can 1 $\frac{5}{16}$ x 1 $\frac{1}{16}$ x 1 $\frac{7}{8}$ high; stamped C132 on side; fin silver gray lacquer (same as C103 except ref No.)		Filter in dynamotor B = supply circuit	RCA	P-171727-5							
† 1	C201	Capacitor, castor-oil filled; two sections, each .5 mf = 10%; 400 v d-c working voltage; sealed in can 1 $\frac{5}{16}$ x 1 $\frac{1}{16}$ x 1 $\frac{7}{8}$ high; stamped C201 on side; fin silver gray lacquer (same as C107 except ref No.)		A: Screen by-pass 1st amplifier stage B: B = filter	RCA	P-171727-9							
† 1	C202	Capacitor, castor-oil filled; 1 mf = 10%; 400 v d-c working voltage; sealed in can 1 $\frac{5}{16}$ x 1 $\frac{1}{16}$ x 1 $\frac{7}{8}$ high; stamped C202 on side; fin silver gray lacquer (same as C103 except ref No.)		2nd amplifier-stage grid coupling	RCA	P-171727-6							
† 1	C203	Capacitor, castor-oil filled; .25 mf = 10%; 400 v d-c working voltage; sealed in can 1 $\frac{5}{16}$ x 1 $\frac{1}{16}$ x 1 $\frac{7}{8}$ high; stamped C203 on side; fin silver gray lacquer		Automatic stop-start time delay	RCA	P-171727-11							
† 1	C204	Capacitor, castor-oil filled; two sections, each .5 mf = 10%; 400 v d-c working voltage; sealed in can 1 $\frac{5}{16}$ x 1 $\frac{1}{16}$ x 1 $\frac{7}{8}$ high; stamped C204 on side; fin silver gray lacquer (same as C107 except ref No.)		A: By-pass, motor lock-in resistor B: Automatic stop-start time delay	RCA	P-171727-10							
† 1	C205	Capacitor, metal tube, paper covered; with toothpick leads; .01 mf = 20%; 600 v d-c working voltage; stamped C205 on side (same as C106 except ref No.)		Vibrator filter	FT RCA	A-7456 M-142215-7							
† 1	C206	Capacitor, metal tube, paper covered, with toothpick leads; .01 mf = 20%; 600 v d-c working voltage; stamped C206 on side (same as C106 except ref No.)		Motor filter	FT RCA	A-7456 M-142215-8							
† 1	D101	Dynamotor, input voltage 11 to 14 v, output voltage 230 to 240 v; with filter unit T105; mounted in ventilated metal can 6 long x 5 $\frac{1}{2}$ wide x 3 $\frac{1}{8}$ high, removable cover (Type DM-21S/FL-6)		B supply	PG RCA	W-2508/SS-3029 P-721746-501							
† 1	D201	Motor MO-28-B, d-c, series, 12 v, 2 amp, 3,600 rpm; 2 $\frac{5}{16}$ diam x 3 $\frac{15}{16}$; shaft extension $\frac{1}{4}$ diam x 1, with 10-tooth pinion cut in end of shaft; mtg holes on motor mtg plate tapped No. 10-24 and 1 $\frac{5}{8}$ apart		Drives scanner prism, tape feeds and helix drum	SG RCA	BA-102 (terminals not included) K-187353-501 (terminals included)							

Tot. quan. in equip.	Ref. No.	Signal Corps stock No.	Name of part and description	Function	Mfr. code	Contr's dwg or part No.
† 1	E101		Relay, d-c, 12 v, 1 3/4 w; in can 7/8 diam x 1 9/16; mtg ears with .147 diam mtg holes; stamped E101 on top; fin black enamel	Dynamotor control	GE RCA	CR-2791M100A2 K-877238-1
† 1	E201		Relay, d-c, 12 v; closes at 2 ma, opens at 1 ma; in can 1 7/8 diam x 2 1/8; 5-prong plug in base	Automatic stop-start	GE RCA	CR-2791C103C22 M-440633-1
† 1	E202		Switch assembly, with double contacts; mtg bracket mtg slots for No. 8 screws .375 apart	Controls synchronization of motor	MY RCA	B-134450 K-187329-1
† 1	E203		Governor, centrifugal breaker type, 2 diam; for 1/4 diam shaft; contacts open at approx 3,500 rpm; adjustable; two No. 8-32 set screws in collar	Brings motor up to speed	SG LE RCA	A-7060 CSX K-185694-1
*† 1	E204		Vibrator VB-3-B, 12 v, 60 cycles; in can 5 3/8 long, 2 1/8 wide, 2 3/8 high; 6-prong plug in base; fin zinc plate and clear lacquer	Controls synchronization of motor	RCA	M-422641-1
*† 1	E301		Relay, d-c, 12 v, 10 amp; double contacts, normally open; closes at 7 amp, opens at 4 amp; No. 8-32 mtg holes 1 1/8 apart	Short-circuits charge-dropping resistor R303 when rectifier is loaded	GD FS RCA	Series 105 Q-10379 K-185725-1
*† —	F101		Fuse FU-11, same as part 103	Power-supply overload safety	LF RCA	1083C K-850339-19
*† —	F301		Fuse, same as part 476	Protects rectifier from overload	BU RCA	4AG K-55544-31
† 1	J101		Connector, male, double contact, mtg flange 1 3/8 square, mtg holes for No. 6 screws at corners 1 1/16 square; male coupling thread 1 1/16-18 x 3/4; (Army-Navy Type AN-3102-18-3P)	Receptacle for connecting battery cable to amplifier chassis	AP RCA	Special P-255262-24
† 2	J102		Connector, male, 20 contacts; mtg flange 2 square, mtg holes for No. 6 screws at corners of 1 9/16 square; male coupling thread 1 3/4-18 x 1 9/16; (Army-Navy Type AN-3102-28-16P) (same as J203)	Receptacle for connecting main cable from recorder-scanner to amplifier	AP RCA	Special P-720971-4
† 3	J103		Jack JK-33-A, triple contact; mtg bushing 3/8-32 x .272; (mtg nut and washer not included) (same as J104, J202)	Microphone connections or radio-transmitter input connections	RCA	K-850654-2

† —	J104	Jack, same as J103	Microphone connections or radio-transmitter input connections	RCA	K-850654-2
† 3	J105	Jack JK-34-A, double contact; mtg bushing $\frac{3}{8}$ -32 x .272; (mtg nut and washer not included) (same as J106, J201)	Headphone or radio-receiver output connection	RCA	K-850654-1
† —	J106	Jack, same as J105	Headphone or radio-receiver output connection	RCA	K-850654-1
† —	J201	Jack, same as J105	Headphone or radio-receiver output connection	RCA	K-850654-1
† —	J202	Jack, same as J103	Microphone connection or radio-transmitter input connection	RCA	K-850654-2
† —	J203	Connector, same as J102	Receptacle for connecting main cable from amplifier to recorder-scanner	AP RCA	Special P-720971-4
† 2	L101	Oscillator coil, comprises seven coil sections wound on bakelite form; each section 104 turns No. 30 glass-enamel-covered wire; start leads brought out between sections 5 and 2; fin leads brought out between sections 6 and 7; overall d-c resistance 15 ohms \pm 10% (part of T106) (same as L102)	Fixed oscillator coil	MC RCA	Special M-422536-501
† —	L102	Coil, oscillator, same as L101 (part of T107)	Frequency-modulation oscillator coil	MC RCA	Special M-422536-501
† 1	L201	Coil, 3,000 turns .0035 diam copper wire on spool 1 x 1 x .172 thk; start lead black, fin lead green; leads emerge from diagonally opposite corners	Actuates printer armature	RCA	M-142213-501
† —	L202	Coil, 3,000 turns, .0035 diam copper wire on spool 1 x 1 x .172 thk; start lead black, fin lead green, leads emerge from diagonally opposite corners; holes in remaining two corners for threading through leads of L201	Actuates printer armature	RCA	M-142213-502
*† 1	M301	Ammeter, d-c, iron-vane type, 0 to 15 amp; case $1\frac{5}{16}$ diam x $\frac{3}{4}$; face $2\frac{3}{8}$ wide x $2\frac{1}{2}$ high with two mtg holes for No. 6 screws $2\frac{3}{8}$ apart; half-circle glass window in face; terminal studs $\frac{1}{4}$ -32 x $\frac{5}{8}$ with terminal nuts and washers	Indicates rectifier output current	FS RCA	Q-10377 K-185730-1

Tot. quan. in equip.	Ref. No.	Signal Corps stock No.	Name of part and description	Function	Mfr. code	Contr's dwg or part No.
† 1	P201		Printer assembly, comprises magnet, coils and armature mounted on supporting parts and actuating printer arm and knife edge; adjustable	Forces recording tape against helix to print message	RCA	P-721512-501
† 2	R101		Resistor, carbon, insulated, with toothpick leads; 820 ohms ± 10%, ½ w (same as R138)	Cathode bias in audio-amplifier stage V101	IRC RCA	Type BT K-850981-61
† 1	R102		Potentiometer, 800,000 ohms max ± 20%; mtg bushing threads ⅜-32 x ⅜ + shaft ¼ diam x ¼; screwdriver slot in shaft; stamped R102 on back (mtg nut and washer not included) (same as R208 except ref No.)	Output volume control in audio-amplifier stage V101	CT RCA	Series 35 K-185530-1
† 2	R103		Resistor, carbon, insulated, with toothpick leads; 27,000 ohms ± 10%, ½ w (same as R104)	Radio-frequency attenuator between detector V102 and audio amplifier V101	IRC RCA	Type BT K-850981-79
† —	R104		Resistor, same as R103	Radio-frequency attenuator between detector V102 and audio amplifier V101	IRC RCA	Type BT K-850981-79
† 5	R105		Resistor, carbon, insulated, with toothpick leads; 120,000 ohms ± 10%, ½ w (same as R135, R136, R143, R144)	Plate-load resistor in detector circuit V102	IRC RCA	Type BT K-850981-87
† 1	R106		Resistor, carbon, insulated, with toothpick leads; 33,000 ohms ± 10%, ½ w	Cathode bias in detector circuit V102	IRC RCA	Type BT K-850981-80
† 3	R107		Resistor, carbon, insulated, with toothpick leads; 5,600 ohms ± 10%; ½ w (same as R139, R211)	Grid resistor in detector circuit V102	IRC RCA	Type BT K-850981-71
† 4	R108		Resistor, carbon, insulated, with toothpick leads; 47,000 ohms ± 10%, ½ w (same as R109, R110, R113)	Attenuator between frequency-modulation oscillator V104 and detector V102	IRC RCA	Type BT K-850981-82
† —	R109		Resistor, same as R108	Attenuator between fixed oscillator V103 and detector V102	IRC RCA	Type BT K-850981-82
† —	R110		Resistor, same as R108	Attenuator between frequency-modulation oscillator V104 and detector V102	IRC RCA	Type BT K-850981-82

† 4	R111	Resistor, carbon, insulated, with toothpick leads; 470,000 ohms \pm 10%, $\frac{1}{2}$ w (same as R115, R150, R213)	Screen-dropping resistor for fixed oscillator V103	IRC RCA	Type BT K-850981-94
† 2	R112	Resistor, carbon, insulated, with toothpick leads; 68,000 ohms \pm 10%, $\frac{1}{2}$ w (same as R114)	Plate-load resistor for fixed oscillator V103	IRC RCA	Type BT K-850981-84
† —	R113	Resistor, same as R108	Attenuator between frequency-modulation oscillator V104 and detector V102	IRC RCA	Type BT K-850981-82
† —	R114	Resistor, same as R112	Plate-load resistor for frequency-modulation oscillator V104	IRC RCA	Type BT K-850981-84
† —	R115	Resistor, same as R111	Screen-dropping resistor for frequency-modulation oscillator V104	IRC RCA	Type BT K-850981-94
† 2	R116	Resistor, carbon, insulated, with toothpick leads; 1,500 ohms \pm 10%, $\frac{1}{2}$ w (same as R117)	Cathode bias for fixed oscillator V103	IRC RCA	Type BT K-850981-64
† —	R117	Resistor, same as R116	Cathode bias for frequency-modulation oscillator V104	IRC RCA	Type BT K-850981-64
† 5	R118	Resistor, carbon, insulated, with toothpick leads; 56,000 ohms \pm 10%, $\frac{1}{2}$ w (part of T106) (same as R119, R121, R201, R212)	Grid resistor for fixed oscillator V103	IRC RCA	Type BT K-850981-83
† —	R119	Resistor, same as R118 (part of T107)	Grid resistor for frequency-modulation oscillator V104	IRC RCA	Type BT K-850981-83
† 1	R120	Resistor, carbon, insulated, with toothpick leads; 82,000 ohms \pm 10%, $\frac{1}{2}$ w	Voltage-dropping resistor for frequency-control stage V101	IRC RCA	Type BT K-850981-85
† —	R121	Resistor, same as R118	Cathode bias for frequency-control stage V101	IRC RCA	Type BT K-850981-83
† 4	R122	Resistor, carbon, insulated, with toothpick leads; 1 meg-ohm \pm 10%, $\frac{1}{2}$ w (same as R126, R132, R133)	Grid resistor for frequency-control stage V101	IRC RCA	Type BT K-850981-98
† 8	R123	Resistor, carbon, insulated, with toothpick leads; 220,000 ohms \pm 10%, $\frac{1}{2}$ w (same as R125, R128, R129, R130, R131, R140, R207)	Plate-dropping resistor for frequency-control stage V101	IRC RCA	Type BT K-850981-90

Tot. quan. in equip.	Ref. No.	Signal Corps stock No.	Name of part and description	Function	Mfr. code	Contr's dwg or part No.
† 1	R124		Resistor, carbon, insulated, with toothpick leads; 2,200 ohms \pm 10%, $\frac{1}{2}$ w	Line-bridging resistor	IRC RCA	Type BT K-850981-66
† —	R125		Resistor, same as R123	Plate-dropping resistor for clipper triode V102	IRC RCA	Type BT K-850981-90
† —	R126		Resistor, same as R122	Grid resistor for clipper triode V102	IRC RCA	Type BT K-850981-98
† 1	R127		Potentiometer, 10,000 ohms max \pm 10%; mtg bushing threads $\frac{3}{8}$ -32 x $\frac{3}{8}$ + shaft $\frac{1}{4}$ diam x $\frac{1}{4}$; screwdriver slot in shaft; stamped R127 on back (mtg nut and washer not included)	Bias control for clipper triode V102	CT RCA	Series 35 K-185530-2
† —	R128		Resistor, same as R123	Grid resistor for first limiter V106	IRC RCA	Type BT K-850981-90
† —	R129		Resistor, same as R123	Plate-load resistor for first limiter V106	IRC RCA	Type BT K-850981-90
† —	R130		Resistor, same as R123	Plate-load resistor for first limiter V106	IRC RCA	Type BT K-850981-90
† —	R131		Resistor, same as R123	De-coupling between first and second limiter V106 and V107	IRC RCA	Type BT K-850981-90
† —	R132		Resistor, same as R122	Grid resistor for second limiter V107	IRC RCA	Type BT K-850981-98
† —	R133		Resistor, same as R122	Grid resistor for second limiter V107	IRC RCA	Type BT K-850981-98
† 2	R134		Resistor, carbon, insulated, with toothpick leads; 390,000 ohms \pm 10%, $\frac{1}{2}$ w (same as R202)	Grid resistor for driver-inverter stage V109	IRC RCA	Type BT K-850981-93
† —	R135		Resistor, same as R105	Load resistor for discriminator V108	IRC RCA	Type BT K-850981-87
† —	R136		Resistor, same as R105	Load resistor for discriminator V108	IRC RCA	Type BT K-850981-87

† 1	R137	Resistor, carbon, insulated, with toothpick leads; 560,000 ohms \pm 10%, $\frac{1}{2}$ w	Series grid resistor for driver-inverter V109	IRC RCA	Type BT K-850981-95
† —	R138	Resistor, same as R101	Cathode bias for driver-inverter V109	IRC RCA	Type BT K-850981-61
† —	R139	Resistor, same as R107	Voltage divider for driver-inverter V109 cathode	IRC RCA	Type BT K-850981-71
† —	R140	Resistor, same as R123	Grid resistor for driver-inverter V109	IRC RCA	Type BT K-850981-90
† 1	R141	Resistor, carbon, insulated, with toothpick leads, 1.2 megohms \pm 10%, $\frac{1}{2}$ w	Voltage divider for driver-inverter V109 grid	IRC RCA	Type BT K-850981-99
† 1	R142	Potentiometer, 1,000 ohms max \pm 10%, 2 w; mtg bushing threads $\frac{3}{8}$ -32 x $\frac{1}{16}$ + shaft $\frac{1}{4}$ diam x $\frac{1}{4}$; screwdriver slot in shaft; stamped R142 on back (mtg nut, washer, and bracket not included)	Keeping bias control for driver-inverter V109	WC RCA	WI-1000 K-877004-1
† —	R143	Resistor, same as R105	Grid resistor for power output stage V111	IRC RCA	Type BT K-850981-87
† —	R144	Resistor, same as R105	Grid resistor for power output stage V110	IRC RCA	Type BT K-850981-87
† 2	R145	Resistor, carbon, insulated, with toothpick leads; 12,000 ohms \pm 10%, $\frac{1}{2}$ w (same as R146)	Screen resistor for power output stage V110	IRC RCA	Type BT K-850981-75
† —	R146	Resistor, same as R145	Screen resistor for power output stage V111	IRC RCA	Type BT K-850981-75
† 1	R147	Resistor, molded, wire wound; 10,000 ohms \pm 10%, 8 w; tapped for 5,000, 3,000 and 2,000 ohms; with mtg clamp, mtg holes .148 diam $3\frac{1}{2}$ apart; stamped R147 on clamp	Voltage drooping for voltage regulator V112	IRC RCA	MW-3 K-875149-1
† 1	R148	Resistor, molded, wire wound; 82 ohms \pm 10%; 4 w; with mtg clamp, mtg holes .148 diam $2\frac{1}{2}$ apart; stamped R148 on clamp	Voltage drooping for dynamotor for 24-v operation (normally out of circuit)	IRC RCA	MW-2 K-877240-1
† 1	R149	Resistor, molded, wire wound; 88 ohms \pm 10%, 4 w; tapped for 33 ohms, 55 ohms; with mtg clamp, mtg holes .148 diam $2\frac{1}{2}$ apart; stamped R149 on clamp	Voltage drooping for pilot lamp B101	IRC RCA	MW-2 K-877240-2
† —	R150	Resistor, same as R111	Time delay for automatic stop-start V204	IRC RCA	Type BT K-850981-94

Tot. quan. in equip.	Ref. No.	Signal Corps stock No.	Name of part and description	Function	Mfr. code	Contr's divg or part No.
† —	R201		Resistor, same as R118	Voltage divider for photo-cell V201 anode	IRC RCA	Type BT K-850981-83
† —	R202		Resistor, same as R134	Voltage divider for photo-cell V201 anode	IRC RCA	Type BT K-850981-93
† 1	R203		Resistor, carbon, insulated, with toothpick leads; 4.7 megohms ± 10%, 1/2 w	Photo-cell load	IRC RCA	Type BT K-850981-106
† 1	R204		Resistor, carbon, insulated, with toothpick leads; 22,000 ohms ± 10%, 1/2 w	Voltage divider for first amplifier V202 cathode	IRC RCA	Type BT K-850981-78
† 1	R205		Resistor, carbon, insulated, with toothpick leads; 330 ohms ± 10%, 1/2 w	Voltage divider for first amplifier V202 cathode	IRC RCA	Type BT K-850981-56
† 1	R206		Resistor, carbon, insulated, with toothpick leads; 1.5 megohms ± 10%, 1/2 w	Screen-dropping resistor for first amplifier V202	IRC RCA	Type BT K-850981-100
† —	R207		Resistor, same as R123	Plate-load resistor for first amplifier V202	IRC RCA	Type BT K-850981-90
† 1	R208		Potentiometer, 800,000 ohms max ± 20%; mtg bushing threads 3/8-32 x 3/8 + shaft 1/4 diam x 1/4; screwdriver slot in shaft; stamped R208 on back (mtg nut and washer not included) (same as R102 except ref No.)	Preamplifier output control	CT RCA	Series 35 K-185530-3
† 1	R209		Resistor, carbon, insulated, with toothpick leads; 1,800 ohms ± 10%, 1/2 w	Cathode load resistor for second amplifier V203	IRC RCA	Type BT K-850981-65
† —	R211		Resistor, same as R107	Voltage divider for automatic stop-start V204 cathode	IRC RCA	Type BT K-850981-71
† —	R212		Resistor, same as R118	Voltage divider for automatic stop-start V204 cathode	IRC RCA	Type BT K-850981-83
† —	R213		Resistor, same as R111	Dropping resistor for automatic stop-start V204	IRC RCA	Type BT K-850981-94

† 1	R214	Potentiometer, 30 ohms max \pm 10%; 2 w; with SPDT switch; mtg bushing threads $\frac{3}{8}$ -32 x $\frac{1}{16}$ + shaft $\frac{1}{4}$ diam x $\frac{1}{2}$, flat on shaft for $\frac{3}{8}$; stamped R214 on back (mtg nut and washer not included)	Receive-drift control	WC RCA	WI-30 K-877523-1							
† 1	R215	Potentiometer, 30 ohms max \pm 10%, 2 w; mtg bushing threads $\frac{3}{8}$ -32 x $\frac{1}{8}$ + shaft $\frac{1}{4}$ diam x $\frac{1}{4}$; screwdriver slot in shaft; stamped R215 on back (mtg nut and washer not included)	Send-drift control	WC RCA	WI-30 K-877004-2							
† 1	R216	Resistor, wire wound; 30 ohms \pm 5%; tinned terminals $\frac{3}{16}$ wide each end; stamped R216 on side	Vibrator temperature compensation	WC RCA	Special K-880753-1							
† 1	R217	Resistor, wire wound; 12 ohms \pm 5%; tinned terminals $\frac{3}{16}$ wide each end; stamped R217 on side	Vibrator temperature compensation	WC RCA	Special K-880753-2							
† 1	R218	Rheostat, wire wound, 25 ohms max, 25 w; mtg bushing threads $\frac{3}{8}$ -32 x $\frac{1}{4}$ + shaft $\frac{1}{4}$ diam x $\frac{5}{16}$, screwdriver slot in shaft; stamped R218 on side (mtg nut and washer not included)	Motor lock-in control	OM RCA	Model H K-877554-1							
† 1	R219	Resistor, molded, wire wound; 60 ohms \pm 10%, 4 w; with mtg clamp, mtg holes .148 diam $2\frac{1}{2}$ apart; stamped R219 on clamp	Voltage dropping for pilot lamps B202 and B203 for 24-v operation (normally out of circuit)	IRC RCA	MW2 K-185531-2							
† 1	R220	Resistor, molded, wire wound; 17.3 ohms \pm 10%, 8 w; with mtg clamp, mtg holes .148 diam $3\frac{1}{2}$ apart; stamped R220 on clamp	Voltage dropping for current regulator R221	IRC RCA	MW3 K-185531-1							
*† 1	R221	Resistor, element sealed in type T-9 bulb with octal base	Current regulator for exciter lamp	AM RCA	7-7-11 K-185146-3							
† 1	R222	Potentiometer, 200 ohms max \pm 10%, 2 w; mtg bushing threads $\frac{3}{8}$ -32 x $\frac{1}{16}$ + shaft $\frac{1}{4}$ diam x $\frac{1}{2}$, stamped R222 on back (mtg nut and washer not included)	Brightness control for pilot lamps B202 and B203	WC RCA	WI-200 K-877230-1							
*† 1	R223	Resistor, element sealed in type T-9 bulb with octal base	Current regulator for vibrator	AM RCA	6-7 K-185146-1							
† 1	R224	Resistor, wire wound, insulated, with toothpick leads; 2.2 ohms \pm 10%, $\frac{1}{2}$ w	Limits arcing at contact points of switch E202	IRC RCA	Type BW $\frac{1}{2}$ K-182169-12							
*† 1	R301 R302	Resistor, wire wound on ceramic form 1 diam x $8\frac{1}{16}$; 0.6 ohms, 200 w; two fixed, two adjustable terminal bands $\frac{3}{8}$ wide; with four No. 10-32 x $\frac{1}{2}$ terminal screws and nuts, through-stud and nut, and mtg brackets	Controls charging rate of rectifier	FS RCA	Q-10376 K-185723-1							

Tot. quan. in equip.	Ref. No.	Signal Corps stock No.	Name of part and description	Function	Mfr. code	Contr's dwg or part No.
*† 1	R303		Resistor, wire wound on ceramic form $1\frac{1}{16}$ long x $\frac{3}{4}$ wide x 1 high; .75 ohms, 25 w; with adjustable slide with locking thumb nut and thumbscrew; terminal mtg lugs for screws $2\frac{5}{16}$ apart	Reduces rectifier charging rate when relay E301 is closed	FS RCA	H-2915 K-185726-1
*† 2	RT301		Rectifier element, selenium, rated 9.5 amp at 12 v d-c (when two units used in bridge rectifier circuit); 18 plates; $2\frac{5}{8}$ diam x 7; terminals are radial strips extending outward $\frac{1}{16}$ beyond plates; with through-stud, washers, and nuts (mtg brackets not included)	Changes a-c output of transformer T301 to d-c to furnish d-c power for equipment	FS RCA	Q-10378 M-142275-1
*† —	RT302		Rectifier element, same as RT301	Changes a-c output of transformer T301 to d-c to furnish d-c power for equipment	FS RCA	Q-10378 M-142275-1
† 1	S101		Switch, rotary, single section, two position; mtg bushing threads $\frac{3}{8}$ -32 x $\frac{3}{8}$ + shaft $\frac{1}{4}$ diam x $\frac{1}{4}$; screwdriver slot in shaft (mtg nut and washer not included)	Switches over for radio or wire operation	OK RCA	Special M-422385-1
† 2	S201		Switch, toggle, SPST; 10 amp, 125 v; mtg bushing $\frac{15}{32}$ -32 x $\frac{3}{8}$; terminal lugs tapped No. 4-40 (mtg nut and washer, terminal screws and washers not included) (same as 203)	Monitor switch	AH RCA	80323-B K-849299-4
† —	S202		Switch, SPDT, part of R124	Drift-control switch	WC RCA	WI-30 K-877523-1
† —	S203		Switch, same as S102	Power switch	AH RCA	80323-B K-849299-4
† 1	S204		Switch, toggle, 3 positions; lower locking position has two form-A contacts, two form-B contacts, two form-C contacts; lower locking position has two form-B contacts, two form-C contacts; four mtg holes tapped No. 3-48 at corners of .812 x .531 rectangle; toggle stud No. 6-32 x $\frac{3}{8}$ (knob not included)	Provides change of electrical connections for sending and receiving operations	CC RCA	Type G K-877239-1
*† 2	S301		Switch, toggle, DPST, 12 amp, 125 v; mtg bushing $\frac{15}{32}$ -32 x $\frac{5}{16}$; with ON-OFF escutcheon mtg nut and washer and No. 6-32 x $\frac{1}{4}$ terminal screws and terminals	Rectifier power switch	CU FS RCA	7360 Q-10148 K-185727-1

*† —	S302	Switch, same as S301	Rectifier booster switch	CU FS RCA	7360 Q-10148 K-185727-1
† 1	T101	Transformer, input, primary d-c resistance (terminals 1 to 3) 131 ohms; two-section secondary, each section d-c resistance (terminals 3 to 4 and 5 to 6) 565 ohms; sealed in can 2 $\frac{5}{8}$ diam x 3 $\frac{1}{4}$; four mtg holes .180 diam at corners of 2 $\frac{7}{16}$ square; fin silver gray lacquer	Matches output of band-pass filter to limiter grids in recorder amplifier	RCA	M-441063-1
† 1	T102	Transformer, discriminator, total primary d-c resistance (terminals 1 to 3) 192 ohms, center tapped; tuned secondary; section No. 1 (terminals 6 to 7) tuned to 1,000 cycles \pm 20, d-c resistance 52 ohms; section No. 2 (terminals 4 to 5) tuned to 1,800 cycles, d-c resistance 30 ohms; sealed in can 2 $\frac{5}{8}$ diam x 3 $\frac{1}{4}$; four mtg holes .180 diam at corners of 2 $\frac{7}{16}$ square; fin silver gray lacquer	Discriminator for frequency modulation signal	RCA	P-722240-1
† 1	T103	Filter, band-pass; terminals 1 to 3 and 1 to 4, 8,000 ohms each; terminals 2 to 3, 500 ohms; terminals 4 to 3, 8,000 ohms; sealed in can 3 $\frac{1}{16}$ diam x 4; four mtg holes .180 diam at corners of 2 $\frac{3}{4}$ square; fin silver gray lacquer	Input filter	RCA	P-722229-1
† 1	T104	Transformer, output, primary d-c resistance (terminals 1 to 2) 213 ohms; secondary d-c resistance (terminals 3 to 5) 17 ohms; secondary tapped; sealed in can 2 $\frac{1}{16}$ diam x 2 $\frac{3}{4}$; four mtg holes .180 diam at corners of 1 $\frac{1}{8}$ square; finish silver gray lacquer	Matches output of scanner amplifier to line	RCA	M-441085-1
1	T105	Filter, reactance and capacitance circuit, sealed in can; with terminal board; terminal board has seven terminals and terminal screws (part of D101)	Dynamotor filter	PG	OS-00-930 Group 1
† 2	T106	Transformer, oscillator; comprises seven-section coil, three molded-mica capacitors 800 mmf, one molded-mica capacitor 240 mmf, one carbon resistor 56,000 ohms; in can 1 $\frac{3}{8}$ x 1 $\frac{3}{8}$ x 3 $\frac{1}{4}$ high; mtg studs on can No. 6-32 x $\frac{7}{16}$, centers 1.312 apart	Fixed-oscillator transformer	MC RCA	Special P-721670-501
† —	T107	Transformer, oscillator, same as T106	Frequency-modulation-oscillator transformer	MC RCA	Special P-721670-501

Tot. quan. in equip.	Ref. No.	Signal Corps stock No.	Name of part and description	Function	Mfr. code	Contr's dwg or part No.
*† 1	T301		Transformer, constant voltage, single phase; 95 to 125 v primary, 60 cycles, 260 v-amp; secondary rated 15.8 v no load, 18 amp full load; 11 7/8 long x 5 1/8 wide x 5 high; four mtg lugs with 7/16 diam holes spaced at corners of 6 x 4 rectangle	Voltage step-down for rectifier	SO FS RCA	Special Q-10439 K-185728-1
1	TB101		Terminal board, bakelite, 3/32 thk stock, 6 5/8 x 2 1/2; with 12 screw terminals and terminal screws, four 12 to 24-v changeover links, 30 stud terminals; two steel mtg brackets have .173 diam mtg holes; board stamped with pertinent circuit symbols (capacitors and resistors not part of terminal-board assembly)	Carries 12 to 24-v operation changeover links and bank of resistors and capacitors	RCA	M-440107-504
1	TB102		Terminal board, bakelite, 3/32 thk stock, 6 3/4 x 7/16; with seven stud terminals; three mtg holes .173 diam; board stamped with pertinent circuit symbols (capacitor and resistors not part of terminal-board assembly)	Carries C127, R129, R130, R136	RCA	M-440107-505
1	TB103		Terminal board, bakelite, 3/32 thk stock, 1 3/8 x 3/4; with four stud terminals; mtg hole .147 diam; board stamped TB103, R111, R112 (resistors not part of terminal-board assembly) (same as TB104, TB105, TB106, except stamping)	Connection points for R111 and R112	RCA	K-881665-504
1	TB104		Terminal board, same as TB103 except stamped TB104, R114, R115 (resistors not part of terminal-board assembly)	Connection points for R114 and R115	RCA	K-881665-503
1	TB105		Terminal board, same as TB103 except stamped TB105, R123, R125 (resistors not part of terminal-board assembly)	Connection points for R123 and R125	RCA	K-881665-501
1	TB106		Terminal board, same as TB103 except stamped TB106, C110, R109 (capacitor and resistor not part of terminal-board assembly)	Connection points for C110 and R109	RCA	K-881665-505
1	TB201		Terminal board, bakelite, 3/32 thk stock, 6 3/4 x 1 1/8; with 13 screw terminals and terminal screws, five 12 to 24-v changeover links, 11 stud terminals; three mtg holes .173 diam; board stamped with pertinent symbol numbers (resistors not part of terminal-board assembly)	Connection points and resistor mount — recorder-scanner sub-chassis	RCA	M-440187-501

1	TB202	Terminal board, bakelite, $\frac{3}{32}$ thk stock, $2\frac{3}{4} \times \frac{3}{4}$; with three screw terminals and terminal screws; two mtg holes .173 diam; board stamped TB202 PRINTER (same as TB203 except stamping)	Connection points—recorder-scanner chassis top	RCA	K-880539-503	
1	TB203	Terminal board, same as TB202 except stamped TB203 MOTOR	Connection points—recorder-scanner chassis top	RCA	K-880539-502	
* 2	V101	Tube, vacuum, JAN-12SN7GT (VT-268), twin-triode amplifier; glass tube; eight-prong base (same as V204)	Audio-frequency amplifier stage and frequency-control	RCA	VT-268	
* 4	V102	Tube, vacuum, JAN-12SL7GT (VT-289), twin-triode amplifier; glass tube; eight-prong base (same as V106, V107, V109)	Detector and clipper	RCA	VT-289	
* 4	V103	Tube, vacuum, JAN-12SJ7(VT-162), triple-grid detector amplifier; metal tube; eight-prong base (same as V104, V202, V203)	Fixed oscillator	RCA	VT-162	
*	V104	Tube, vacuum, JAN-12SJ7(VT-162), same as V103	Frequency-modulation oscillator	RCA	VT-162	
* 2	V105	Tube, vacuum, JAN-12H6(VT-214), twin diode, metal tube; eight-prong base (same as V108)	Bias and clipper	RCA	VT-214	
*	V106	Tubes, vacuum, JAN-12SL7GT(VT-289), same as V102	First limiter stage	RCA	VT-289	
*	V107	Tube, vacuum, JAN-12H6(VT-214), same as V102	Second limiter stage	RCA	VT-289	
*	V108	Tube, vacuum, JAN-12SL7GT(VT-289), same as V105	Discriminator	RCA	VT-214	
*	V109	Tube, vacuum, JAN-12SL7GT(VT-289), same as V102	Driver-inverter	RCA	VT-289	
* 2	V110	Tube, vacuum, JAN-12A6(VT-134), beam-power amplifier, metal tube; eight-prong base (same as V111)	Power output	RCA	VT-134	
*	V111	Tube, vacuum, JAN-12A6(VT-134), same as V110	Power output	RCA	VT-134	
* 1	V112	Tube, vacuum, JAN-0C3/VR-105 (VT-200), voltage regulator, glass tube; octal base with six prongs	Regulator	RCA	VT-200	
* 1	V201	Tube, gas, photo-cell, JAN-927, glass tube; three-prong base	Transforms reflected light into electrical energy	RCA	927	
*	V202	Tube, vacuum, JAN-12SJ7(VT-162), same as V103	First amplifier stage	RCA	VT-162	

Tot. quan. in equip.	Ref. No.	Signal Corps stock No.	Name of part and description	Function	Mfr. code	Contr's dwg or part No.
*	V203		Tube, vacuum, JAN-12SJ7(VT-162), same as V103	Second amplifier stage	RCA	VT-162
*	V204		Tube, vacuum, JAN-12SN7GT(VT-268), same as V101	Automatic stop-start	RCA	VT-268
4	X101		Socket assembly, bakelite, octal, spring mtg type; with mtg plate and spring; No. 6-32 holes in mtg plate at four corners on 1.625 circle (same as X106, X108, X110)	Holds audio-frequency amplifier tube V101	RCA	M-422515-501
†	X102		Socket, bakelite, octal, spring mtg type (does not include spring) (same as X103, X104, X105, X107, X109, X111, X112, X113, X202, X203, X204, X205, X206)	Holds detector tube V102	CM RCA	Special K-881144-1
†	X103		Socket, same as X102	Holds fixed oscillator tube V103	CM RCA	Special K-881144-1
†	X104		Socket, same as X102	Holds frequency-modulation-oscillator tube V104	CM RCA	Special K-881144-1
†	X105		Socket, same as X102	Holds bias-and-clipper tube V105	CM RCA	Special K-881144-1
—	X106		Socket, same as X101	Holds first limiter tube V106	RCA	M-422515-501
†	X107		Socket, same as X102	Holds second limiter tube V107	CM RCA	Special K-881144-1
—	X108		Socket, same as X101	Holds discriminator tube V108	RCA	M-422515-501
†	X109		Socket, same as X102	Holds driver-inverter tube V109	CM RCA	Special K-881144-1
—	X110		Socket, same as X101	Holds power-output tube V110	RCA	M-422515-501
†	X111		Socket, same as X102	Holds power-output tube V111	CM RCA	Special K-881144-1
†	X112		Socket, same as X102	Holds regulator tube V112	CM RCA	Special K-881144-1

† —	X113	Socket, same as X102	Holder recorder-amplifier output cathode bias capacitor C131	CM RCA	Special K-881144-1
† 1	X114	Socket, bracket and jewel; miniature bayonet base socket; ruby jewel $\frac{5}{16}$ diam; socket and jewel joined by L-shaped bracket; with mtg nut $\frac{7}{16}$ -27	Holds power-indicator lamp B101	MY RCA	B310R K-876209-1
† 1	X201	Socket, bakelite, three contacts; with retaining ring	Holds photoelectric cell V201	AP RCA	S3S K-863347-1
† —	X202	Socket, same as X102	Holds first amplifier tube V202	CM RCA	Special K-881144-1
† —	X203	Socket, same as X102	Holds second amplifier tube V203	CM RCA	Special K-881144-1
† —	X204	Socket, same as X102	Holds automatic stop-start tube V204	CM RCA	Special K-881144-1
† —	X205	Socket, same as X102	Holds exciter-lamp current-regulator tube R221	CM RCA	Special K-881144-1
† —	X206	Socket, same as X102	Holds vibrator current-regulator tube R223	CM RCA	Special K-881144-1
† 1	X207	Socket, miniature bayonet base; with bracket; mtg hole .173 diam	Holds pilot lamp B202 for recording tape	AR RCA	1540 K-877227-2
† 1	X208	Socket, miniature bayonet base; with clip-type mtg bracket	Holds recorder-scanner lower pilot lamp B203	AR RCA	1540 K-877227-1
† 1	X209	Socket, bayonet, double contact; with lamp-mounting flange; flange has three pineapple-type locking pins with springs; two terminals on bottom of socket with No. 4-40 x $\frac{1}{8}$ binder-hd screws	Holds exciter lamp B201	CH RCA	Special K-189058-1
† 1	X210	Socket, bakelite; five contacts; mounted on steel cup; $2\frac{3}{16}$ diam x $1\frac{5}{16}$ high; three mtg holes in cup rim for No. 6 screws equally spaced on 2-in. circle; hole for leads in cup	Holds automatic-stop-start relay E201	AP RCA	ACS-5 K-880751-1
† 1	X211	Socket, bakelite; six contact; with flange with two mtg holes for No. 6 screws $1\frac{1}{16}$ apart	Holds vibrator unit E204	AP RCA	R56-6-C K-880756-1

Quantity	Description	Size	Length	Thread	Where used
4	Cotter pin, brass; fin nickel pl't	1/32	3/4		Locks dynamotor brush-holding screws
2	Cotter pin, steel; fin zinc pl't	1/16	1/2		Holds axle pins for writing-stand tape-feed rollers in place
37	Nut, steel; hex; fin zinc pl't	No. 4		USS 40	Used with mtg screws for amplifiers and recorder-scanner oil-capacitor and wire-wound-resistor brackets; used with mtg screws for amplifier terminal-board mtg brackets and cable connector; used with mtg screws for recorder-scanner relay socket and tape-chute bracket clamp; used with writing-stand tape-guide and tape-guide-rail mtg screws
65	Nut, steel; hex; fin zinc pl't	No. 6		USS 32	Used with screws for mtg shock mounts to shock-mount bases, mtg screws for amplifier and recorder-scanner cable connectors, mtg screws for amplifier terminal board and terminal-board mtg bracket and relay, mtg studs for amplifier oscillator transformers, mtg screw for recorder-scanner rheostat shield, mtg screws for optical system rotating-prism shield, dynamotor through-studs
3	Nut, brass; hex	No. 8		USS 32	Used with screw holding recorder-scanner printer magnet, pole pieces and terminal board together; terminal nut for rectifier ammeter
52	Nut, steel; hex; fin zinc pl't	No. 8		USS 32	Used with mtg studs for amplifier and recorder-scanner binding posts, mtg screws for amplifier front panel; mounts amplifier panel handles, recorder-scanner resistor assemblies, recorder-scanner stud terminals; used with mtg screws for rectifier cylindrical resistor, load relay, rectifier units, and rectifier shock-mounts
4	Nut, brass; hex	No. 10		SAE 32	Used with terminal screw for rectifier adjustable resistor band
19	Nut, steel; hex; fin zinc pl't	No. 10		SAE 32	Used with mtg screws for recorder-scanner front panel; mounts recorder-scanner panel bracket and side-cover handle; used with mtg screws for mtg blocks for rectifier a-c cable and adjustable-resistor terminals, and for rectifier d-c output terminal block
7	Nut, brass; hex; fin nickel pl't	No. 14		24	Holds rectifier terminal-block studs in place
4	Nut, steel; wing; fin zinc pl't	No. 14		24	Locks terminals for rectifier a-c and battery cables
7	Nut, steel; hex; fin zinc pl't	1/4		USS 20	Used with mtg screws for recorder-scanner gear housing; used with screws mtg rectifier brackets to shock-mounts

2	Nut, brass; hex, thin, switch-mtg type	1/4	USS 32	Mounts drive-motor governor-brush holders
8	Nut, steel; hex; fin zinc pl't	5/16	USS 18	Used with mtg screws for rectifier transformer; anchors selenium rectifier units to brackets
9	Nut, steel; hex, thin, switch-mtg type; fin zinc pl't	3/8	USS 32	Mounts amplifier and recorder-scanner jacks to panels; mounts recorder-scanner rheostat
1	Nut, brass; hex, thin, switch-mtg type	7/16	USS 27	Mounts amplifier pilot-lamp bracket
6	Nut, brass; hex, thin, switch-mtg type; fin black oxidize	15/32	USS 32	Mounts recorder-scanner and rectifier toggle switches
4	Cap screw, steel; hex hd; fin zinc pl't	1 1/4	USS 18	Mounts rectifier transformer
1	Machine screw, steel; rd hd; fin zinc pl't	1/8	SAE 80	Attaches recorder-scanner printer knife blade to printer arm
2	Machine screw, brass; binder hd	3/16	USS 56	Mounts optical-system lens-prism-and-bracket assembly to plate
2	Machine screw, steel; rd hd; fin zinc pl't	3/16	USS 56	Fastens recorder-scanner gear-housing anchor nut for switch adjustment screw to housing
4	Machine screw, steel; rd hd; fin black oxidize	1/4	USS 48	Mounts recorder-scanner SEND-TALK-RECEIVE switch
2	Machine screw, brass; binder hd; fin cad pl't	1/8	USS 40	Terminal screw for optical-system exciter-lamp socket
2	Machine screw, steel; rd hd; fin nickel pl't	1/8	USS 40	Fastens drive-motor rear cover to yoke
4	Machine screw, brass; binder hd	3/16	USS 40	Mounts wiring terminals to recorder-scanner power and monitor toggle switches
2	Machine screw, brass; ov hd; fin black oxidize	1/4	USS 40	Mounts writing-stand tape guide
4	Machine screw, steel; rd hd; fin zinc pl't	1/4	USS 40	Mounts recorder-scanner relay; locks recorder-scanner tape-chute clamp
3	Machine screw, steel; rd hd; fin zinc pl't	1/4	USS 40	Mounts exciter-lamp socket to optical-system housing
4	Machine screw, brass; binder hd	5/16	USS 40	Fastens optical-system lens holders and lenses to bracket
33	Machine screw, steel; fl hd; fin zinc pl't	5/16	USS 40	Mounts amplifier and recorder-scanner wire-wound-resistor and oil-capacitor brackets to chassis; mounts amplifier terminal-board bracket; holds recorder-scanner gear-housing bearing retainers; mounts photo-cell cover-support brackets to lens-and-reflector mounting plate
4	Machine screw, steel; fl hd; fin black oxidize	3/8	USS 40	Mounts amplifier cable connector

Quantity	Description	Size	Length	Thread	Where used
2	Machine screw, steel; fl hd; fin zinc plt	No. 4	3/8	USS 40	Mounts recorder-scanner wire-wound-resistor bracket
4	Machine screw, brass; ov hd; fin black oxidize	No. 4	3/8	USS 40	Mounts writing-stand tape-guide rail
2	Machine screw, steel; rd hd, self tapping; fin zinc plt	No. 4	3/8	USS 40	Mounts rectifier ammeter
2	Machine screw, steel; fl hd; fin zinc plt	No. 4	3/4	USS 40	Mounts amplifier trimmer capacitor
2	Machine screw, brass; fl hd; fin cad plt	No. 5	5/8	USS 40	Holds down movable clamp jaw on cable clamp for power cable, battery end
2	Machine screw, steel; rd hd; fin black oxidize	No. 6	5/32	USS 32	Mounts recorder-scanner optical-housing rotating-prism gear cover
8	Machine screw, brass; binder hd	No. 6	1/4	USS 32	Terminal screw for rectifier power switch and booster switch
8	Machine screw, steel; binder hd; fin nickel plt	No. 6	1/4	USS 32	Fastens dynamotor in container
4	Machine screw, steel; rd hd; fin black oxidize	No. 6	1/4	USS 32	Mounts recorder-scanner ink-housing cover and tape guide
4	Machine screw, steel; rd hd; fin nickel plt	No. 6	1/4	USS 32	Fastens dynamotor lead terminals to brush holders
59	Machine screw, steel; rd hd; fin zinc plt	No. 6	1/4	USS 32	Fastens shock mounts to shock-mount bases; mounts amplifier tube sockets, recorder-scanner vibrator socket and tape-chute clamp
2	Machine screw, brass; binder hd	No. 6	5/16	SAE 40	Terminal screw for rectifier a-c power-cable plug
31	Machine screw, steel; binder hd; fin cad plt	No. 6	5/16	USS 32	Terminal-board terminal screws
27	Machine screw, steel; rd hd; fin zinc plt	No. 6	5/16	USS 32	Mounts amplifier and recorder-scanner oil capacitors; mounts amplifier relay, terminal board and dynamotor mounting brackets; fastens recorder-scanner tape-reel front cover and photo-cell socket-mounting plate to optical-system housing
4	Machine screw, steel; binder hd; fin black oxidize	No. 6	3/8	USS 32	Mounts lens-and-reflector mounting plate to optical-system housing
7	Machine screw, steel; binder hd; fin nickel plt	No. 6	3/8	USS 32	Dynamotor-filter terminal screw
2	Machine screw, steel; fl hd; fin nickel plt	No. 6	3/8	USS 32	Fastens dynamotor cover to container
2	Machine screw, steel; fl hd; fin zinc plt	No. 6	3/8	USS 32	Mounts amplifier terminal-board bracket

2	Machine screw, steel; binder hd; fin black oxidize	No. 6	1/16	USS 32	Mounts optical-system rotating prism shield to housing
6	Machine screw, steel; rd hd; fin black oxidize	No. 6	1/16	USS 32	Mounts recorder-scanner cable connector; clamp screw for movable jaw on rectifier a-c power-cable plug
2	Machine screw, steel; binder hd; fin zinc plt	No. 6	1/2	USS 32	Mounts amplifier terminal board
4	Machine screw, steel; fl hd; fin black oxidize	No. 6	1/2	USS 32	Mounts amplifier cable connector
3	Machine screw, steel; rd hd; fin zinc plt	No. 6	1/2	USS 32	Mounts dynamotor; mounts recorder-scanner tape reel to case
2	Machine screw, steel; fl hd; fin zinc plt	No. 6	5/8	USS 32	Clamp screw for movable-jaw cable connector for rectifier a-c cable
1	Machine screw, brass; fl hd	No. 6	3/4	USS 32	Attaches recorder-scanner printer-unit bearing retainer to bearing bracket
4	Machine screw, steel; rd hd; fin zinc plt	No. 6	7/8	USS 32	Mounts synchronizing switch to recorder-scanner gear housing; mounts reflector-and-holder assembly to plate in optical system
4	Machine screw, steel; rd hd; fin zinc plt	No. 6	1	USS 32	Mounts recorder-scanner terminal boards
3	Machine screw, steel; rd hd; fin zinc plt	No. 6	2	USS 32	Mounts recorder-scanner 12 to 24-volt-changeover terminal board
5	Machine screw, steel; fl hd; fin cad plt	No. 6	2	USS 40	Holds recorder-scanner drive motor together
2	Machine screw, steel; binder hd; fin zinc plt	No. 8	1/4	USS 32	Terminal screw for battery cable clip
2	Machine screw, steel; rd hd; fin zinc plt	No. 8	1/4	USS 32	Mounts recorder-scanner tape-chute adjusting bracket to gear housing
16	Machine screw, steel; rd hd; fin zinc plt	No. 8	5/16	USS 32	Mounts amplifier transformers
4	Machine screw, steel; binder hd; fin zinc plt	No. 8	3/8	USS 32	Mounts amplifier front panel to chassis
32	Machine screw, steel; rd hd; fin zinc plt	No. 8	3/8	USS 32	Mounts recorder-scanner tape-reel front cover; mounts rectifier resistor, load relay, rectifier units, and rectifier shock-mounts
16	Machine screw, steel; rd hd, self tapping; fin zinc plt	No. 8	3/8	USS 32	Mounts rectifier top grille
2	Machine screw, brass; fl hd	No. 8	7/16	USS 32	Holds recorder-scanner printer pole piece against spacer blocks
2	Machine screw, brass; binder hd	No. 8	1/2	USS 32	Holds recorder-scanner printer pole piece against spacer blocks

Quantity	Description	Size	Length	Thread	Where used
1	Machine screw, steel; binder hd; fin black oxidize	No. 8	1/2	USS 32	Mounts lens-and-bracket assembly to optical-system housing
1	Machine screw, steel; fl hd; fin zinc plt	No. 8	5/8	USS 32	Holds spring from recorder-scanner panel to printer support
1	Machine screw, steel; rd hd; fin zinc plt	No. 8	5/8	USS 32	Mounts recorder-scanner upper pilot lamp
2	Machine screw, brass; fl hd; fin cad plt	No. 8	3/4	USS 32	Holds down movable clamp-jaw on cable clamp for d-c power cable, amplifier end
1	Machine screw, brass; rd hd	No. 8	3/4	USS 32	Adjusts recorder-scanner printer knife edge
4	Machine screw, steel; rd hd; fin zinc plt	No. 8	3/4	USS 32	Mounts recorder-scanner tube shelf
4	Machine screw, brass; fl hd; fin cad plt	No. 8	7/8	USS 32	Holds down movable clamp jaw on cable clamps for amplifier-to-recorder-scanner cable
2	Machine screw, steel; fl hd; fin black oxidize	No. 8	7/8	USS 32	Mounts block holding tape-feed-pressure control mechanism
1	Machine screw, brass, fl hd	No. 8	1 5/8	USS 32	Holds recorder-scanner printer magnet, pole pieces and terminal board together
1	Machine screw, steel; hex hd; fin zinc plt	No. 10	1/2	USS 24	Mounts recorder-scanner drive motor
1	Machine screw, steel; hex hd; fin zinc plt	No. 10	5/8	USS 24	Mounts recorder-scanner drive motor
4	Machine screw, brass; rd hd	No. 10	5/8	SAE 32	Terminal screw for rectifier adjustable resistor band
6	Machine screw, steel; fl hd; fin zinc plt	No. 10	7/16	SAE 32	Mounts recorder-scanner front panel to chassis
2	Machine screw, brass; fl hd	No. 10	1/2	SAE 32	Attaches recorder-scanner printer pole-piece spacers to support
4	Machine screw, steel; fl hd; fin zinc plt	No. 10	3/4	SAE 32	Clamp screw for movable jaw for cable connector for rectifier battery cable and for amplifier d-c input cable
6	Machine screw, steel; binder hd; fin zinc plt	No. 10	1	SAE 32	Mounts mounting blocks for a-c cable terminals and adjustable resistor in rectifier, and terminal block for d-c output
2	Machine screw, steel; fl hd; fin zinc plt	1/4	1/2	USS 20	Mounts recorder-scanner optical system
2	Machine screw, steel; fl hd; fin zinc plt	1/4	3/4	USS 20	Mounts recorder-scanner gear housing to panel
1	Machine screw, steel; hex hd; fin zinc plt	1/4	1 1/4	USS 20	Locks horizontal adjustment on recorder-scanner printer unit

4	Machine screw, steel; rd hd; fin zinc pl't	1/4	1 1/4	USS 20	Mounts rectifier brackets to shock-mounts
2	Setscrew, stainless steel; socket type (Allen); cup point	No. 4	1/4	USS 40	Holds recorder-scanner plate for tape-chute adjusting bracket in place
24	Setscrew, stainless steel; socket type (Allen); cup point	No. 6	1/8	USS 32	Holds recorder-scanner synchronizing-switch-cam hub, idler-gear hub, eccentric-adjusting bolt, tape-adjusting-arm collar, feed-roller-arm hubs, and gear-housing collars and gears
1	Setscrew, steel; screwdriver-slot type; cup point; fin black oxidize	No. 6	1/4	USS 32	Locks recorder-scanner tape-reel friction-adjustment screw
3	Setscrew, steel; screwdriver-slot type; cup point; fin black oxidize	No. 6	3/16	USS 32	Holds recorder-scanner automatic recording-tape-feed block to rod; holds printer-unit locking-collar to shaft
10	Setscrew, stainless steel; socket type (Allen); cup point; fin zinc pl't	No. 6	3/16	USS 32	Holds recorder-scanner gears, collars and wheel assembly to shafts
3	Setscrew, steel; screwdriver-slot type; cup point; fin cad pl't	No. 8	1/8	USS 32	Holds drive-motor fan to armature shaft; holds drive-motor governor to armature shaft
10	Setscrew, stainless steel; socket type (Allen); cup point; fin zinc pl't	No. 8	1/8	USS 32	Anchors amplifier and recorder-scanner variable-control lock nuts; holds recorder-scanner gear-housing detent to shaft; holds recorder-scanner printer armature clamps
2	Setscrew, steel; screwdriver-slot type; cup point; fin black oxidize	No. 8	1/4	USS 32	Anchors detent knob on shaft
2	Setscrew, steel; screwdriver-slot type; cup point, fin parkerize	No. 8	5/16	USS 32	Anchors bakelite control knobs on recorder-scanner front panel
1	Set screw, stainless steel; socket type (Allen); cup point; fin zinc pl't	No. 8	1/2	USS 32	Holds recorder-scanner printer mounting-clamp pin
2	Lock washer, steel; int teeth (Shakeproof), reg. flat	No. 2			Locks mtg screw for anchor nut for recorder-scanner gear-housing switch-adjusting screw
4	Lock washer, steel; split, reg; fin parkerize	No. 3			Locks mtg screws for recorder-scanner SEND-TALK-RECEIVE switch
2	Lock washer, steel; ext teeth (Shakeproof), reg. flat	No. 4			Locks mtg screws for rectifier ammeter

Quantity	Description	Size	Length	Thread	Where used
46	Lock washer, steel; int teeth (Shakeproof), reg, flat	No. 4			Locks mtg screws and nuts for amplifier and recorder-scanner oil capacitors and wire-wound resistors, for amplifier cable connector and terminal-board bracket and trimmer capacitor, for recorder-scanner tape-chute bracket clamp and relay, for optical-system exciter-lamp socket, for writing-stand tape guide and tape-guide rail; locks terminal screws for recorder-scanner toggle switches and exciter lamp
126	Lock washer, steel; int teeth (Shakeproof), reg, flat	No. 6			Locks mtg screws and nuts for amplifier and recorder-scanner oil capacitors and cable connectors and terminal boards for amplifier terminal-board bracket and relay and oscillator transformers, for recorder-scanner rheostat shield and tape guide and tape chute and SEND-TALK-RECEIVE switch, for optical-system prism-drive-gear cover and prism shield and lens-and-reflector mtg plate and photo-cell socket mtg plate, for shock-mounts; locks through-stud nuts for drive motor and dynamotor
23	Lock washer, steel; split, reg; fin nickel plit	No. 6			Locks screws mtg dynamotor in container; locks hold-down screws for cable clamp; locks dynamotor-filter terminal screws and screws mtg dynamotor lead terminals to brush holders
60	Lock washer, steel; ext teeth (Shakeproof), reg, flat	No. 8			Locks mtg screws for rectifier cylindrical resistor, load relay, rectifier units, shock-mounts; locks rectifier ammeter terminal nuts
45	Lock washer, steel; int teeth (Shakeproof), reg, flat	No. 8			Locks mtg screws and nuts for amplifier front panel and handles and binding posts and transformers, for recorder-scanner gear-housing idler-gear assembly and stud terminals and tube shelf and pilot lamp and tape-adjusting bracket and tape-reel front cover, for lens-and-bracket assembly to optical-system housing
4	Lock washer, phos bronze; split, reg	No. 8			Locks screw holding recorder-scanner printer magnet, pole pieces, and terminal board together; locks screw holding spring from recorder-scanner panel to printer support; locks binder-hd screws holding recorder-scanner printer pole piece against spacer blocks
12	Lock washer, steel; split, reg; fin cad plit	No. 8			Locks hold-down screws for cable clamps; locks nuts for vibrator temperature-control resistors; locks mtg screws for mtg block for tape-feed-pressure arm-and-shaft assemblies

12	Lock washer, steel; ext teeth (Shakeproof), reg, flat	No. 10	Locks mtg screws for rectifier mounting blocks for a-c cable terminals and adjustable resistor, and terminal block for d-c output; locks terminal screw for rectifier adjustable resistor band
13	Lock washer, steel; int teeth (Shakeproof), reg, flat; fn black oxidize	No. 10	Locks mtg screws and nuts for recorder-scanner drive motor, front panel, panel bracket and side-cover handle
2	Lock washer, phos bronze; split, reg	No. 10	Locks screws attaching recorder-scanner printer pole-piece spacers to support
8	Lock washer, steel; ext teeth (Shakeproof), reg, flat	1/4	Locks screws mtg rectifier brackets to shock-mounts
1	Lock washer, phos bronze; int teeth (Shakeproof), reg, flat	1/4	Used with screw locking horizontal adjustment on recorder-scanner printer unit
5	Lock washer, steel; int teeth (Shakeproof), reg, flat; fn black oxidize	1/4	Locks mtg screws and nuts for recorder-scanner gear housing and optical system
8	Lock washer, steel; ext teeth (Shakeproof), reg, flat	5/16	Locks mtg nuts for selenium rectifier units
8	Lock washer, steel; split, reg	5/16	Locks mtg screws for rectifier transformer
1	Lock washer, steel; int teeth (Shakeproof), reg, flat; fn zinc plit	7/16	Locks mtg nut for amplifier pilot-lamp mtg bracket
7	Lock washer, steel; int teeth (Shakeproof), reg, flat	3/8	Locks mtg nuts for amplifier and recorder-scanner variable controls
2	Washer, brass; reg	No. 2	Used with mtg screw for optical-system lens-prism-and-bracket assembly
2	Washer, brass; reg	No. 4	Used with mtg screw for amplifier trimmer capacitor
1	Washer, steel; reg; fn zinc plit	No. 4	Used with axle pin for writing-stand tape-mounting roller
2	Washer, steel; light; fn zinc plit	No. 6	Spacer for dynamotor mtg bracket
32	Washer, steel; reg; fn zinc plit	No. 6	Used with mtg screws and nuts for amplifier and recorder-scanner terminal boards, for amplifier oil capacitors, for recorder-scanner tape guide, for optical-system lens-and-reflector mounting plate

Quantity	Description	Size	Length	Thread	Where used
4	Washer, brass, light; fin nickel plt	No. 8			Bearing surface for dynamotor mtg bumper
5	Washer, brass; reg	No. 8			Used with recorder-scanner knife-edge adjusting screw; used with terminal nuts for rectifier ammeter
12	Washer, steel; reg; fin zinc plt	No. 8			Used with mtg screws for recorder-scanner tape-reel front cover and gear-housing idler-gear assembly, for optical-system lens-and-bracket assembly; used with amplifier binding-post nuts; spaces drive gear on optical-system rotating-prism shaft; used in vibrator temperature-control resistor assemblies
2	Washer, steel; light; fin zinc plt	No. 10			Used with axle pins for writing-stand tape-feed rollers
8	Washer, brass, reg	No. 10			Used with terminal screw for rectifier adjustable resistor band
2	Washer, steel; reg; fin zinc plt	No. 10			Used with mtg nuts for recorder-scanner front-panel guard rail
21	Washer, copper; reg; fin nickel plt	1/4			Used with terminal nuts on rectifier mtg blocks or a-c cable and adjustable resistor, and for d-c output terminal block
8	Washer, steel; reg; fin zinc plate	5/16			Used with nuts anchoring selenium rectifier units to brackets
8	Washer, steel; light; fin zinc plt	3/8			Used with mtg nuts for amplifier and recorder-scanner variable controls
2	Washer, steel; light; fin black oxidize	7/16			Used with mtg nut for recorder-scanner toggle-switches

Supplementary data

46. LIST OF MANUFACTURERS.

Code	Name	Address
AH	Arrow, Hart & Hegeman Electric Co.....	Hartford, Conn
AL	Alden Products Co.....	Brockton, Mass
AM	Amperite Co	New York, N Y
AMC	Allen Mfg Co.....	Hartford, Conn
AP	American Phenolic Corp.....	Cicero, Ill
AR	American Radio Hardware Co.....	New York, N Y
AV	Aerovox Wireless Corp.....	New Bedford, Mass
BU	Bussman Mfg Co.....	St. Louis, Mo
CC	C P Clare & Co.....	Chicago, Ill
CH	Henry Cole—F C Hersee Co.....	Boston, Mass
CJ	Charles Eneu Johnson & Co.....	Philadelphia, Pa
CL	Centralab Div of Globe-Union, Inc.....	Milwaukee, Wis
CM	Cinch Mfg Co.....	Chicago, Ill
CT	Chicago Telephone Supply Co.....	Elkhart, Ind
CU	Cutler-Hammer	Milwaukee, Wis
EB	Hugh H Eby Co.....	Philadelphia, Pa
EP	Eagle Pencil Co.....	New York, N Y
ER	Erie Resistor Corp.....	Erie, Pa
FA	Fafnir Bearing Co.....	New Britain, Conn
FS	Fansteel Metallurgical Corp.....	North Chicago, Ill
FT	John E Fast & Co.....	Chicago, Ill
GD	Guardian Electric Corp.....	Chicago, Ill
GE	General Electric Co.....	Schenectady, N Y
HUB	Harvey Hubbell, Inc.....	Bridgeport, Conn
IRC	International Resistance Corp.....	Philadelphia, Pa
LE	Lee Engineering & Mfg Co.....	Milwaukee, Wis
LF	Littelfuse, Inc.	Chicago, Ill
MC	Meissner Mfg Co.....	Mt. Carmel, Ill
MIN	Miniature Precision Bearings.....	Keene, N H
MU	Mueller Electric Co.....	Cleveland, Ohio
MY	P R Mallory Co, Inc.....	Indianapolis, Ind
ND	New Departure Mfg Co.....	Detroit, Mich
OIL	Amplex Div of Chrysler Corp.....	Detroit, Mich
OK	Oak Mfg Co.....	Chicago, Ill
OM	Ohmite Mfg Co.....	Chicago, Ill
PAT	Patton-MacGuyer Co	Providence, R I
PG	Pioneer Gen-E-Motor Co	Chicago, Ill
RCA	Radio Corporation of America.....	Camden, N J
SC	Scripto Mfg Co.....	Atlanta, Ga
SCO	Scoville Mfg Co.....	Chicago, Ill
SG	Signal Electric Mfg Corp.....	Menominee, Mich
SHA	Shakeproof, Inc	Chicago, Ill
SM	Solar Mfg Corp.....	New York, N Y
SO	Sola Electric Co.....	Chicago, Ill
WAT	Waterbury Brass Goods Branch of American Brass Co.....	Waterbury, Conn
WC	Wirt Co	Philadelphia, Pa

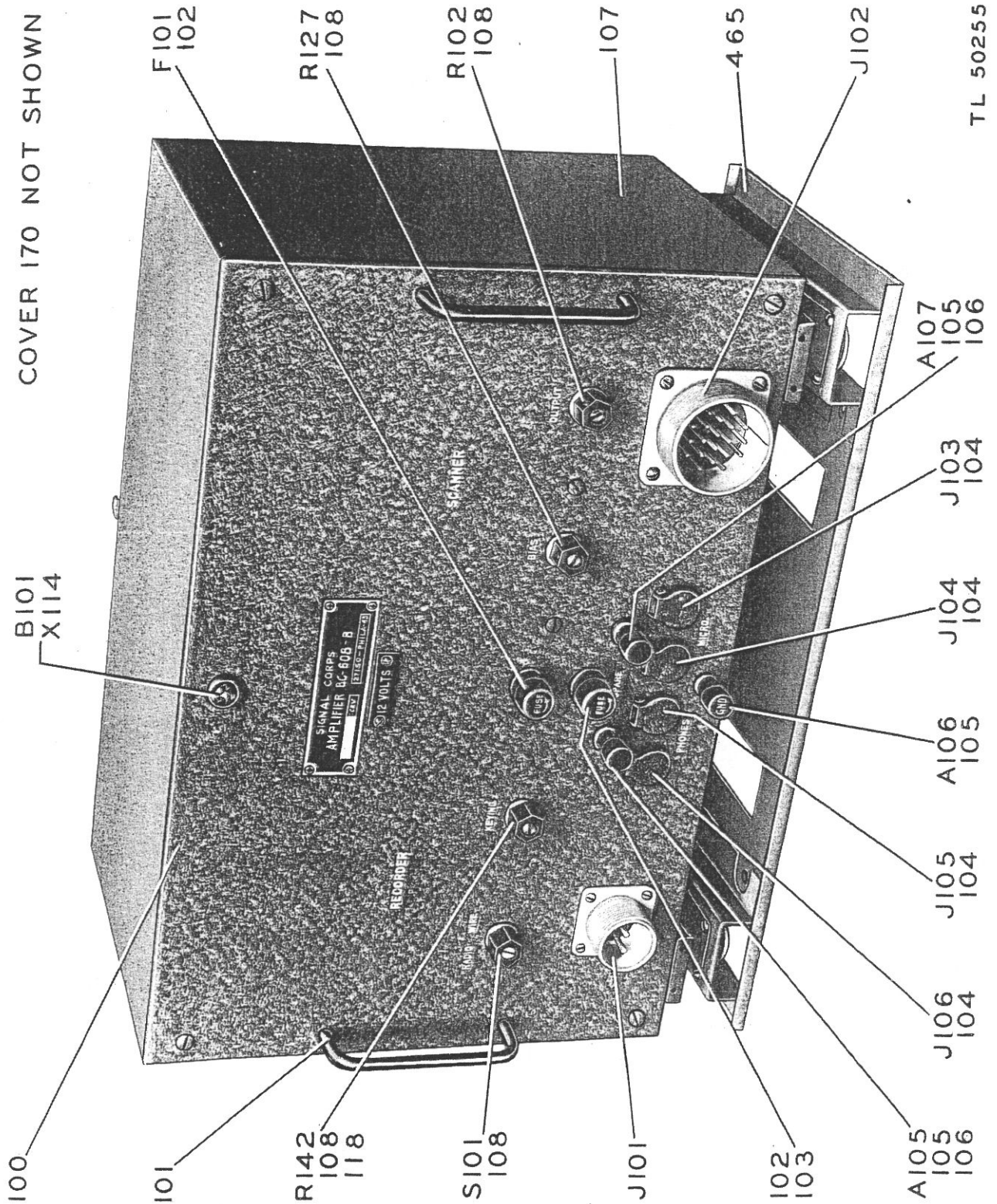


Figure 50—Amplifier BC-908-B and Mounting FT-318-B (front view)

Supplementary data

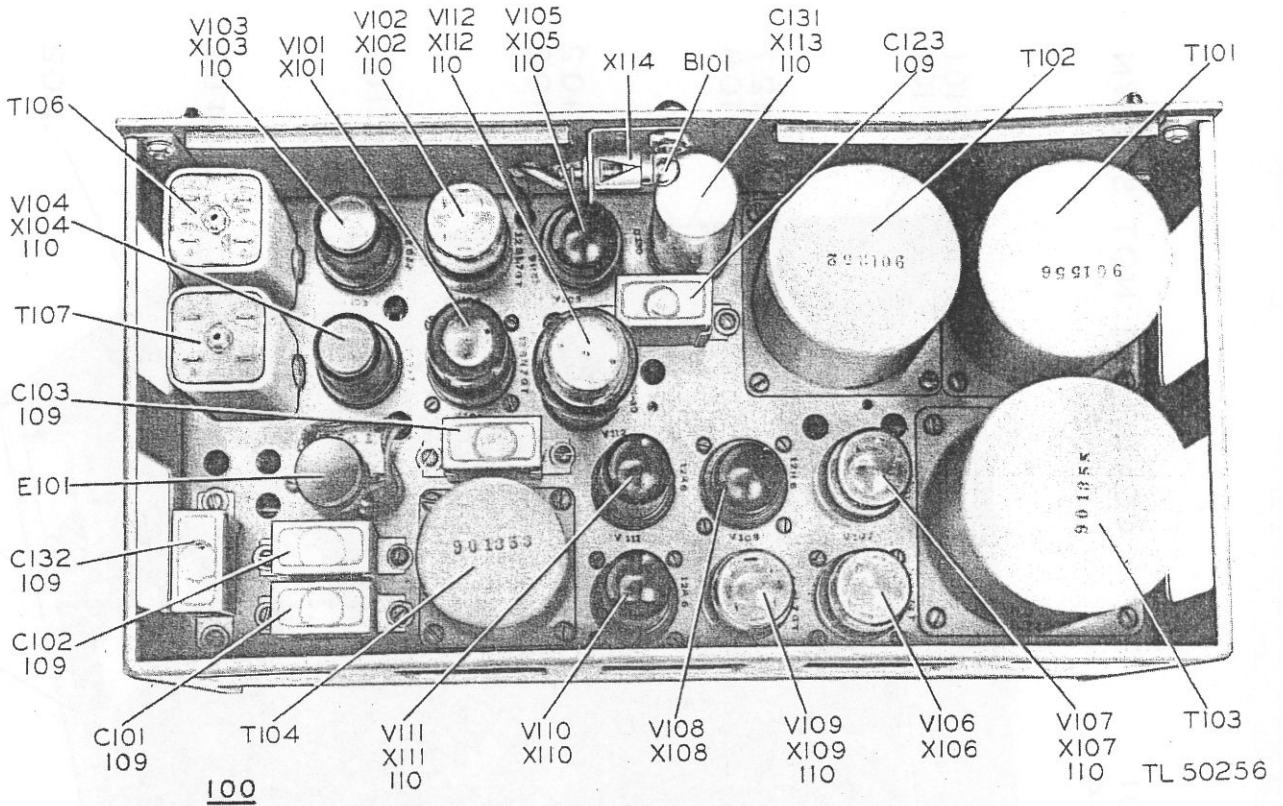


Figure 51—Amplifier BC-908-B, removed from case (top view)

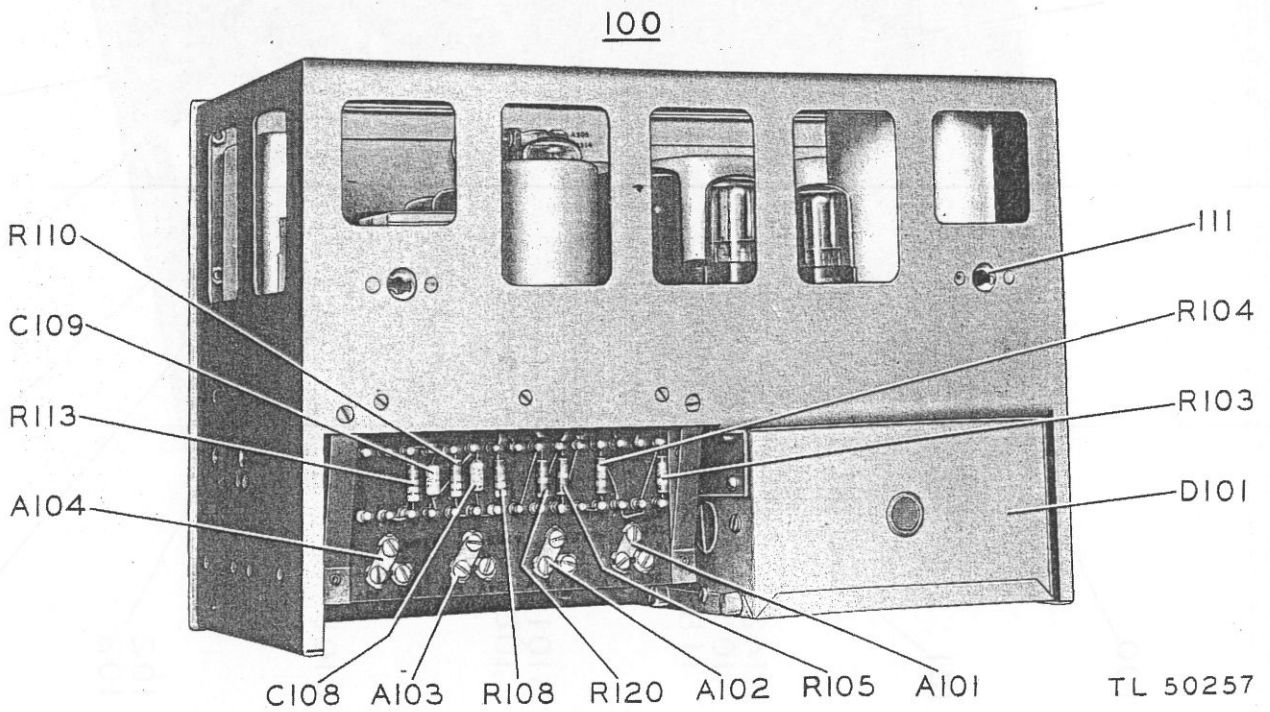
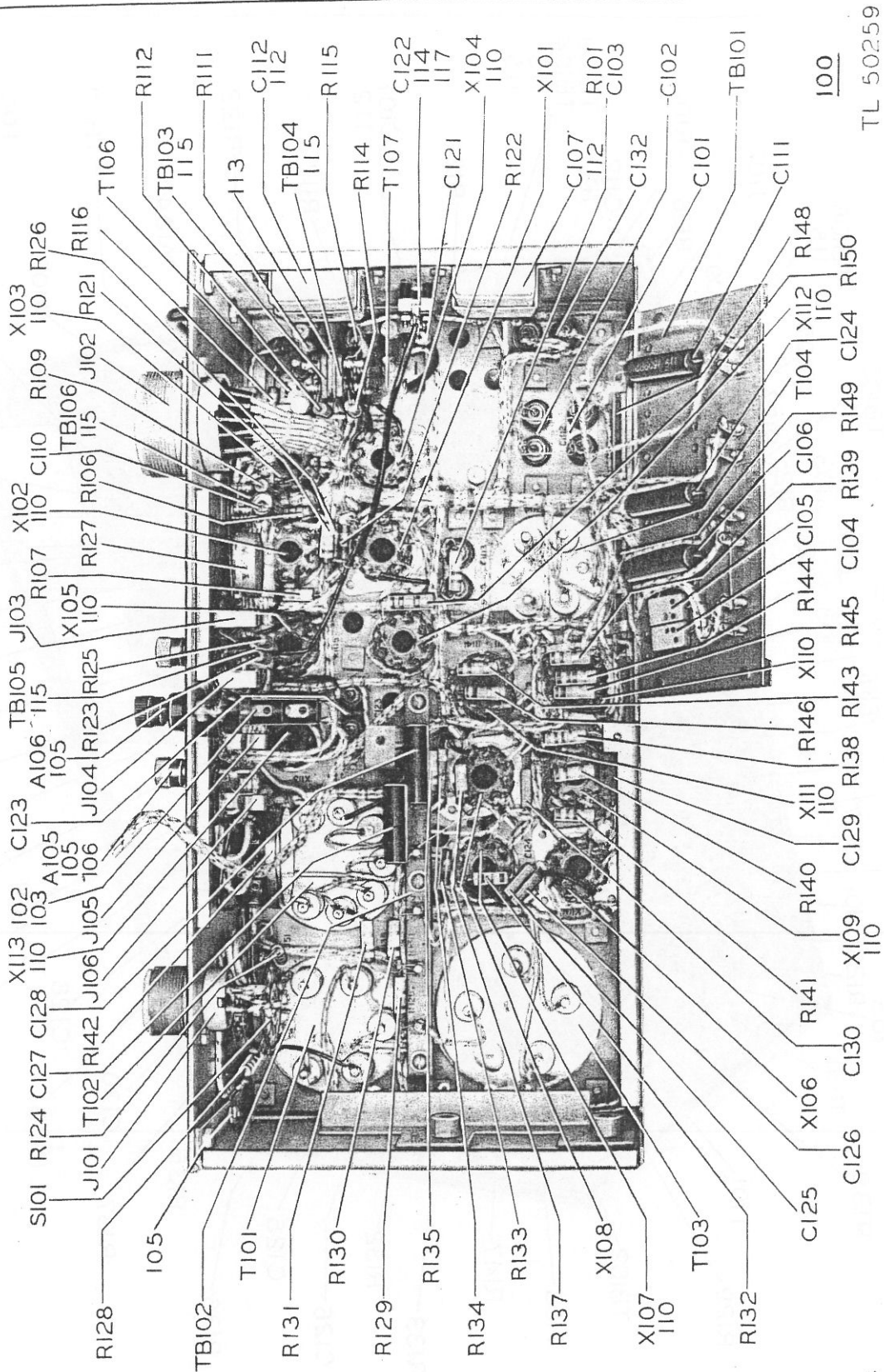


Figure 52—Amplifier BC-908-B, removed from case (rear view)

Supplementary data



TL 50259

Figure 54—Amplifier BC-908-B, removed from case (sub-chassis view No. 2, dynamotor removed)

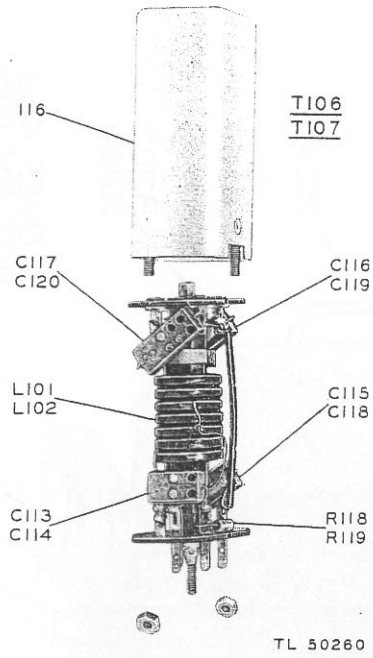


Figure 55—Oscillator transformer (disassembled)

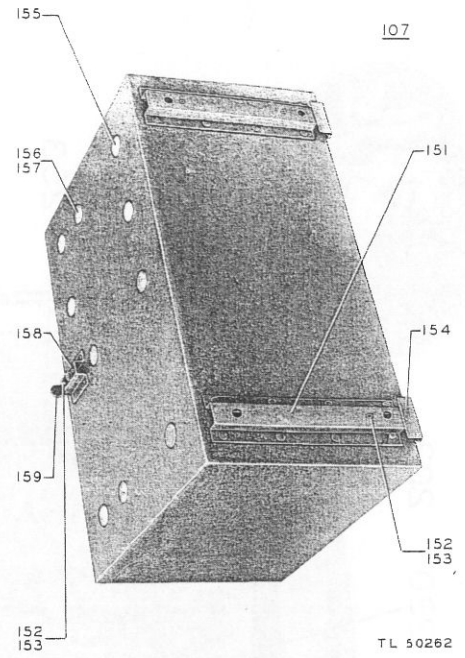


Figure 56—Amplifier case

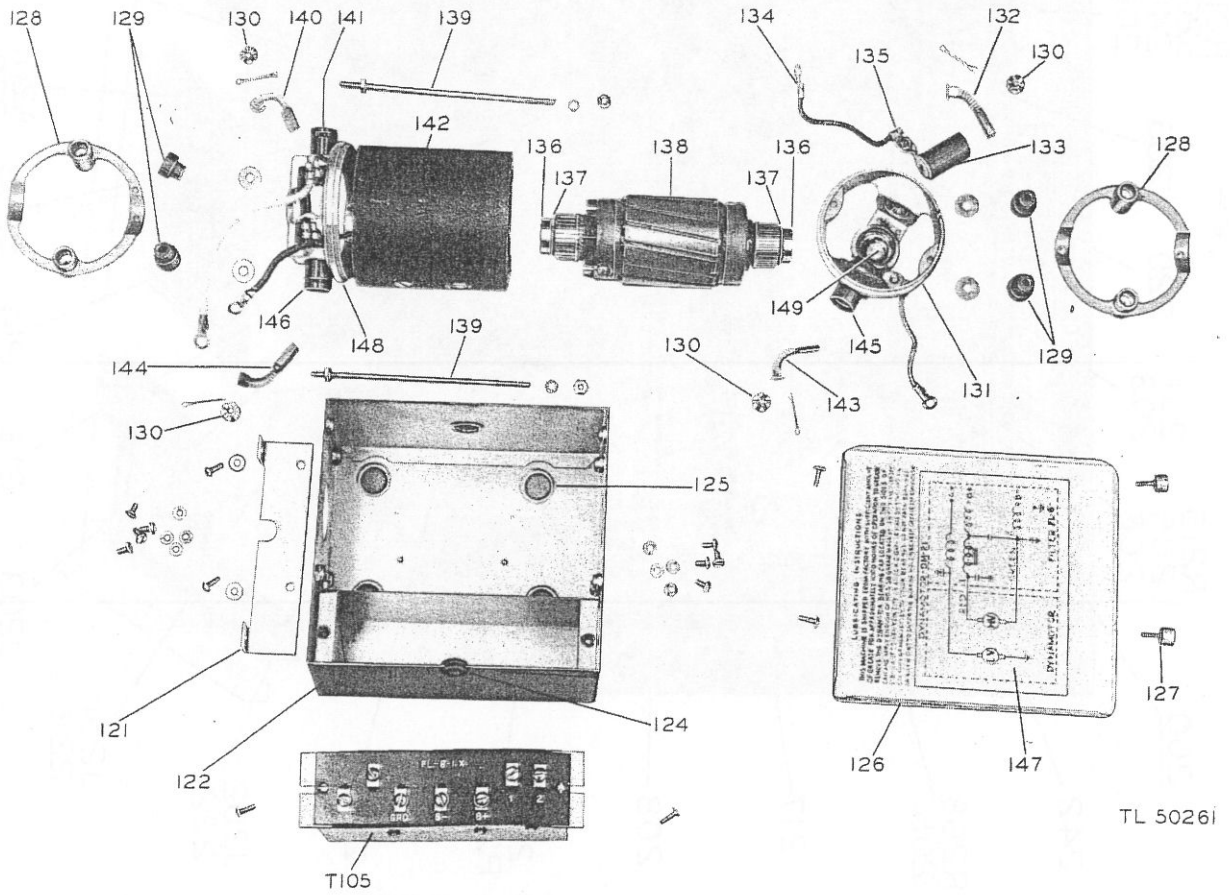
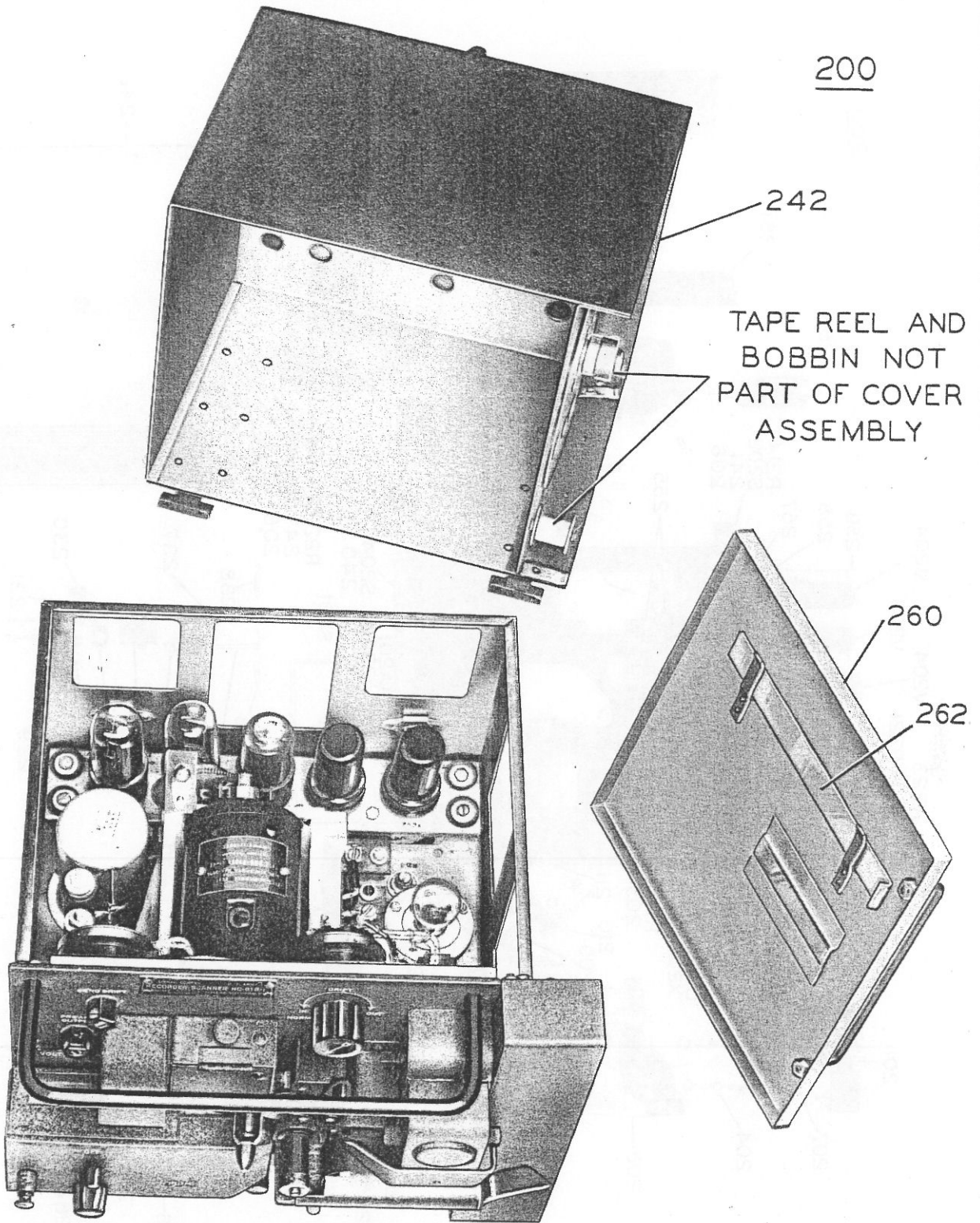


Figure 57—Dynamotor (disassembled)



TL 50264

Figure 59—Recorder-Scanner BC-918-B, removed from case (partially disassembled)

Supplementary data

TL 50265

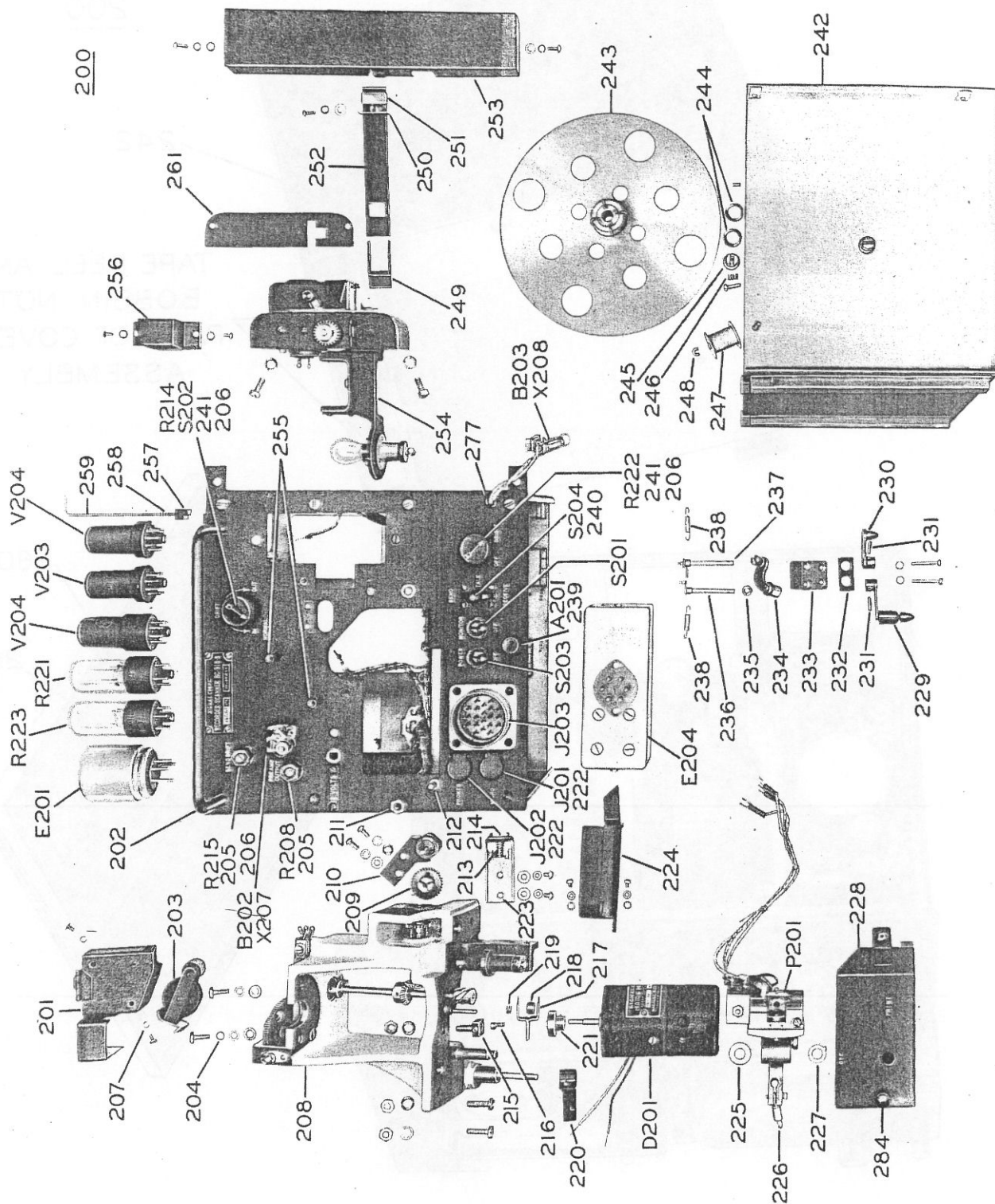


Figure 60—Recorder-Scanner BC-918-B, removed from case (completely disassembled)

Tape Facsimile Equipment RC-58-B

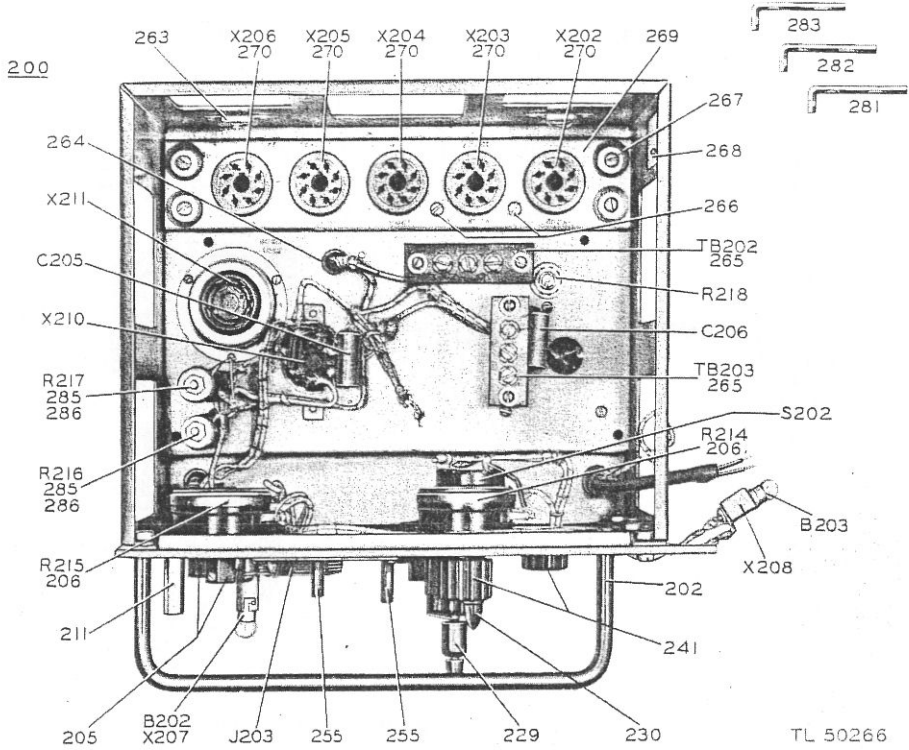


Figure 61—Recorder-Scanner BC-918-B, removed from case (top view—gear housing, motor and optical system removed)

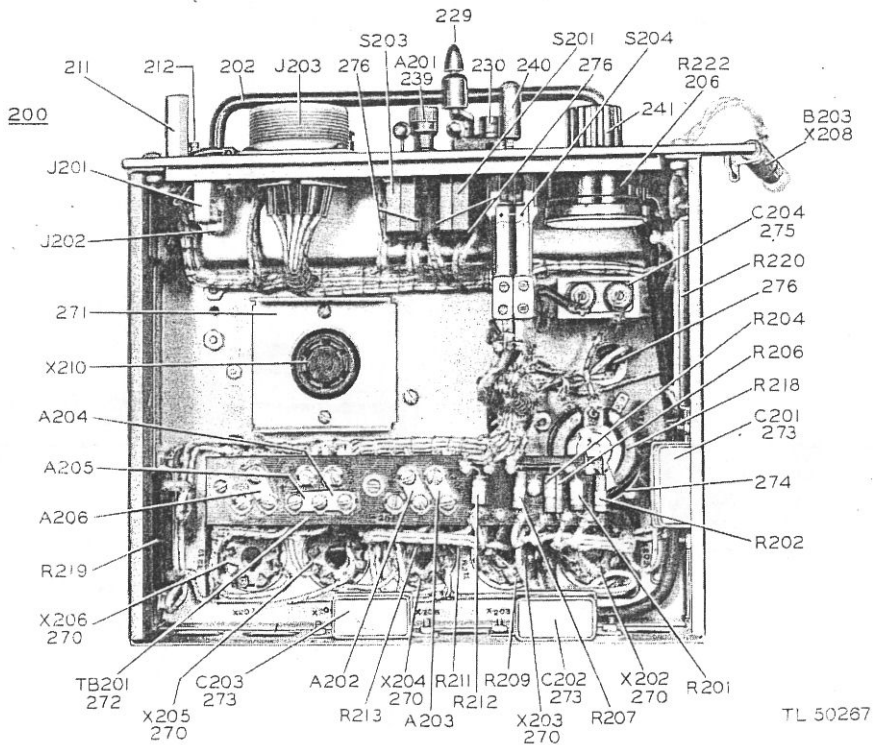


Figure 62—Recorder-Scanner BC-918-B, removed from case (sub-chassis view, vibrator removed)

Supplementary data

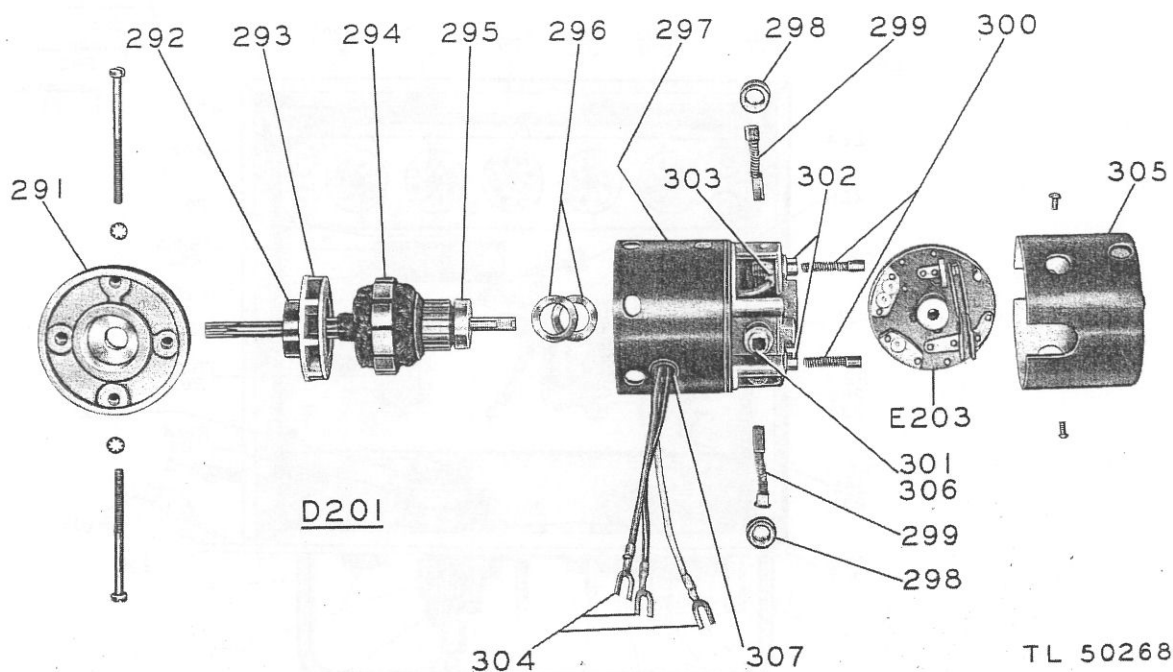


Figure 63—Drive motor (disassembled)

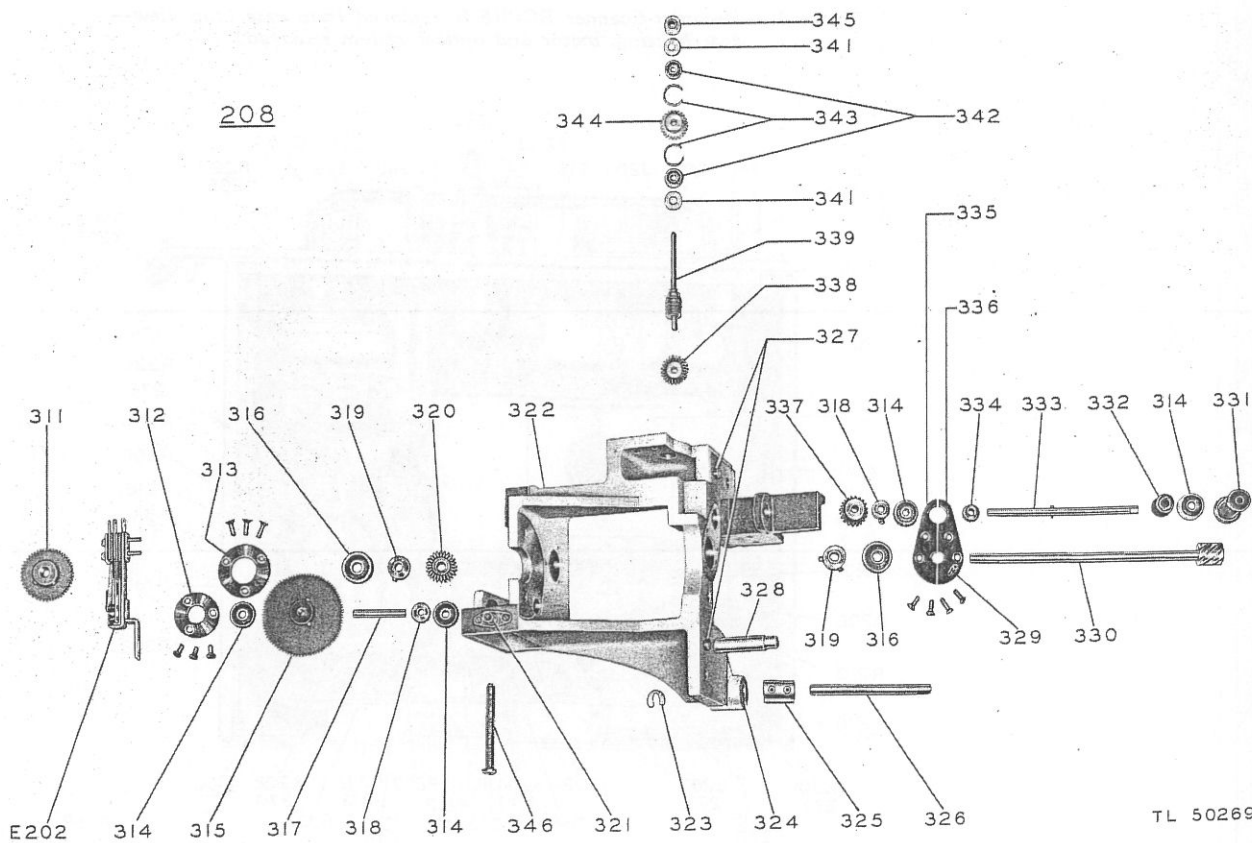


Figure 64—Gear housing (disassembled)

Supplementary data

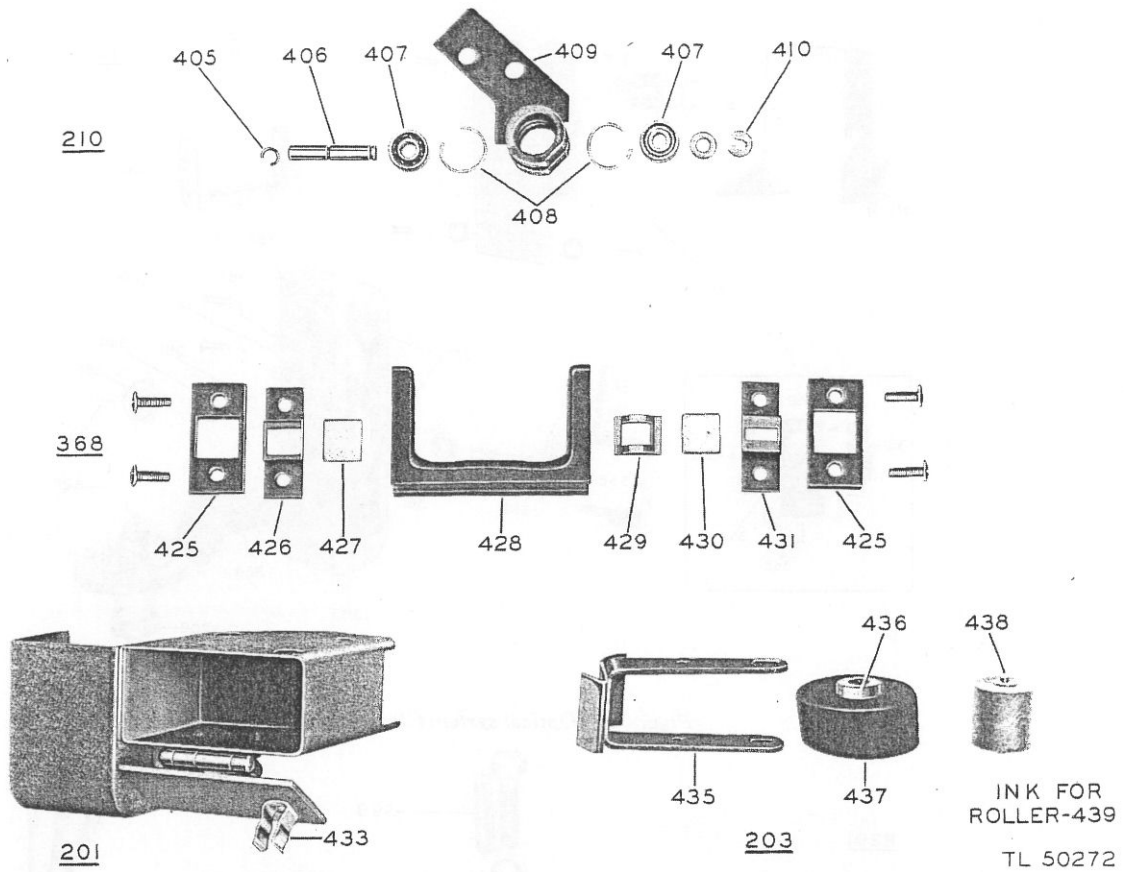


Figure 67—Idler assembly, bracket-and-lens assembly, inker housing, and inker assembly (disassembled)

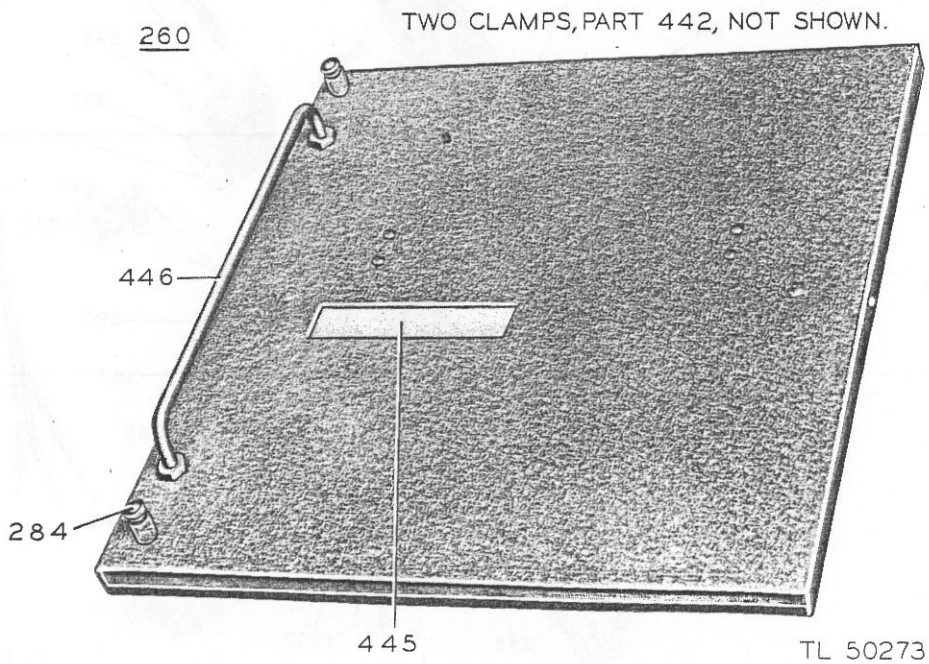


Figure 68—Recorder-scanner side cover

Tape Facsimile Equipment RC-58-B

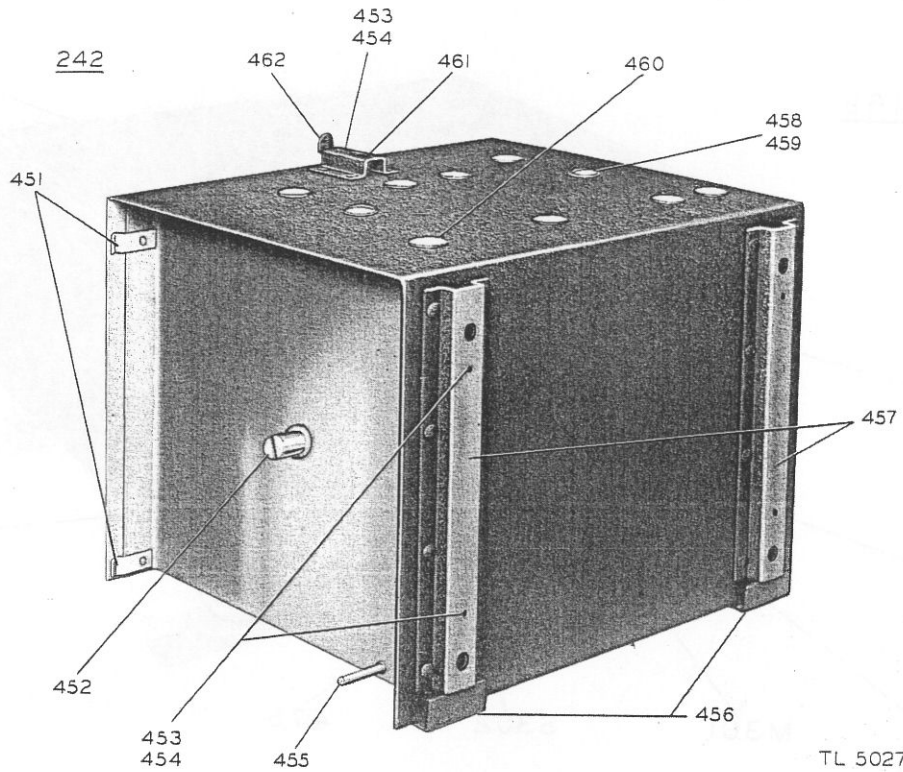


Figure 69—Recorder-scanner case

TL 50274

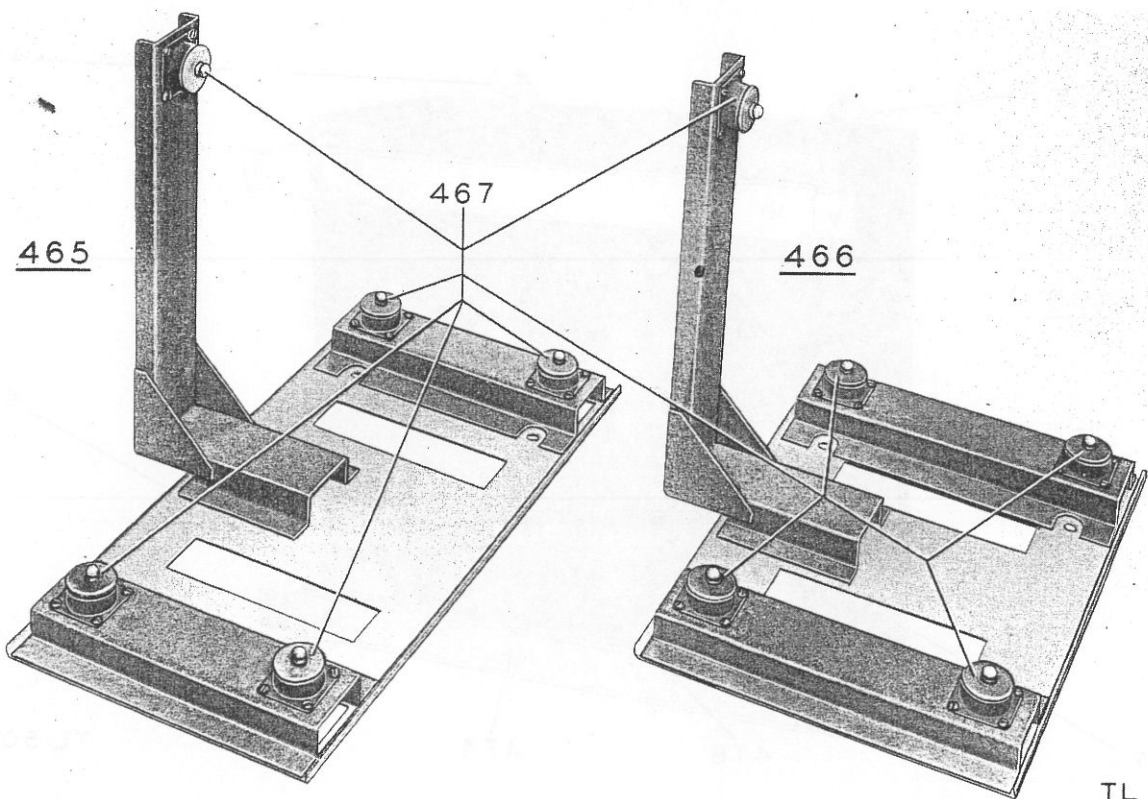


Figure 70—Mountings FT-318-B and FT-328-B

TL 50275

Supplementary data

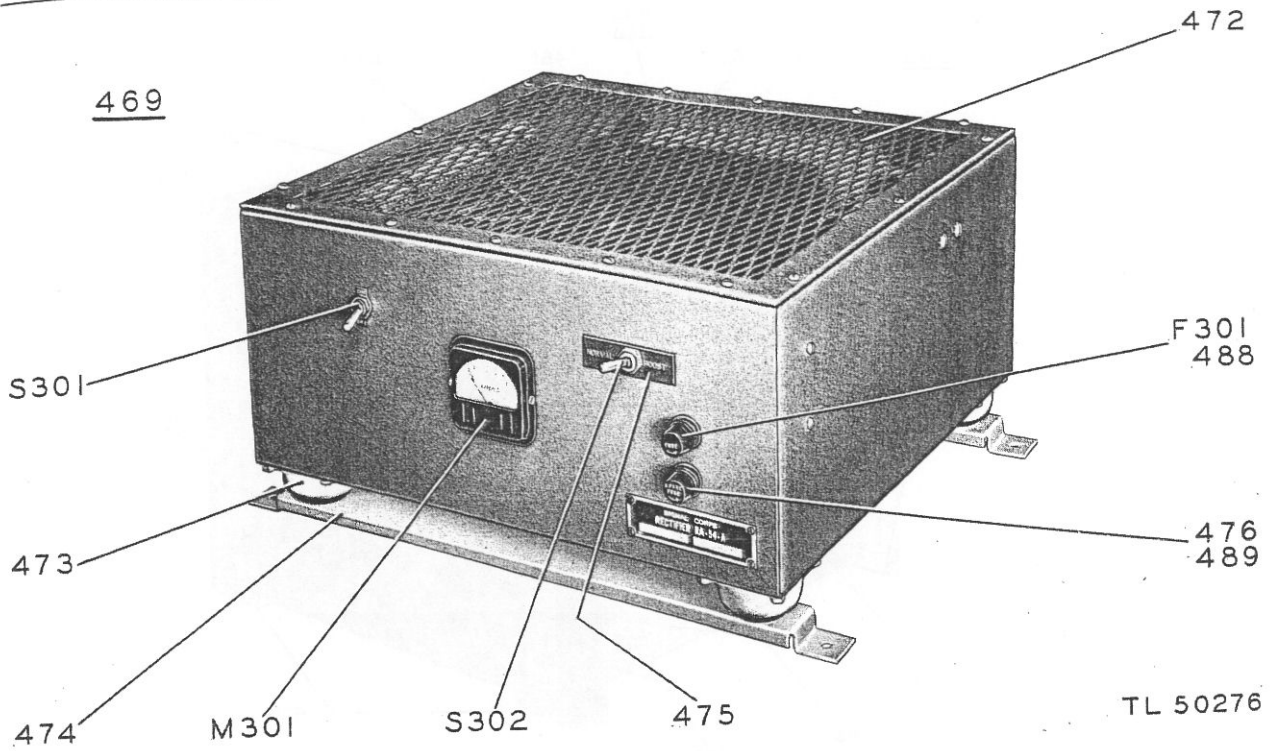


Figure 71—Rectifier RA-54-A (front view)

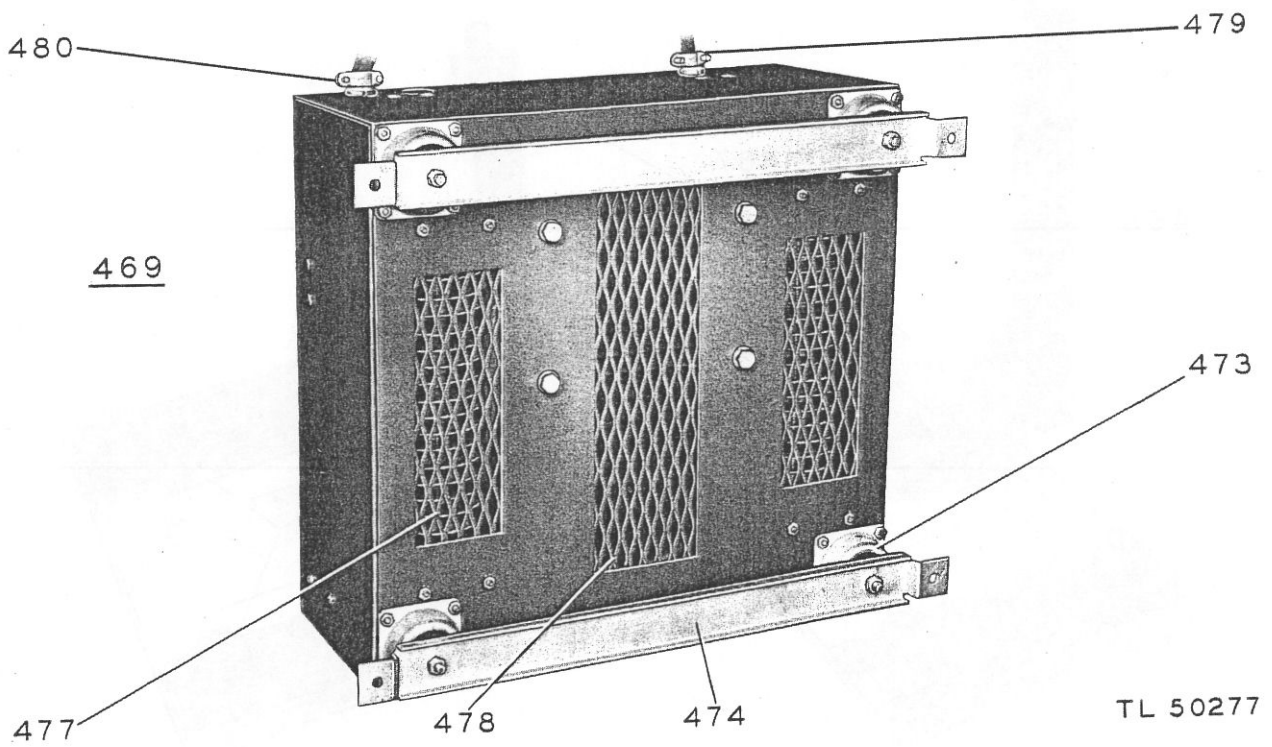


Figure 72—Rectifier RA-54-A (bottom view)

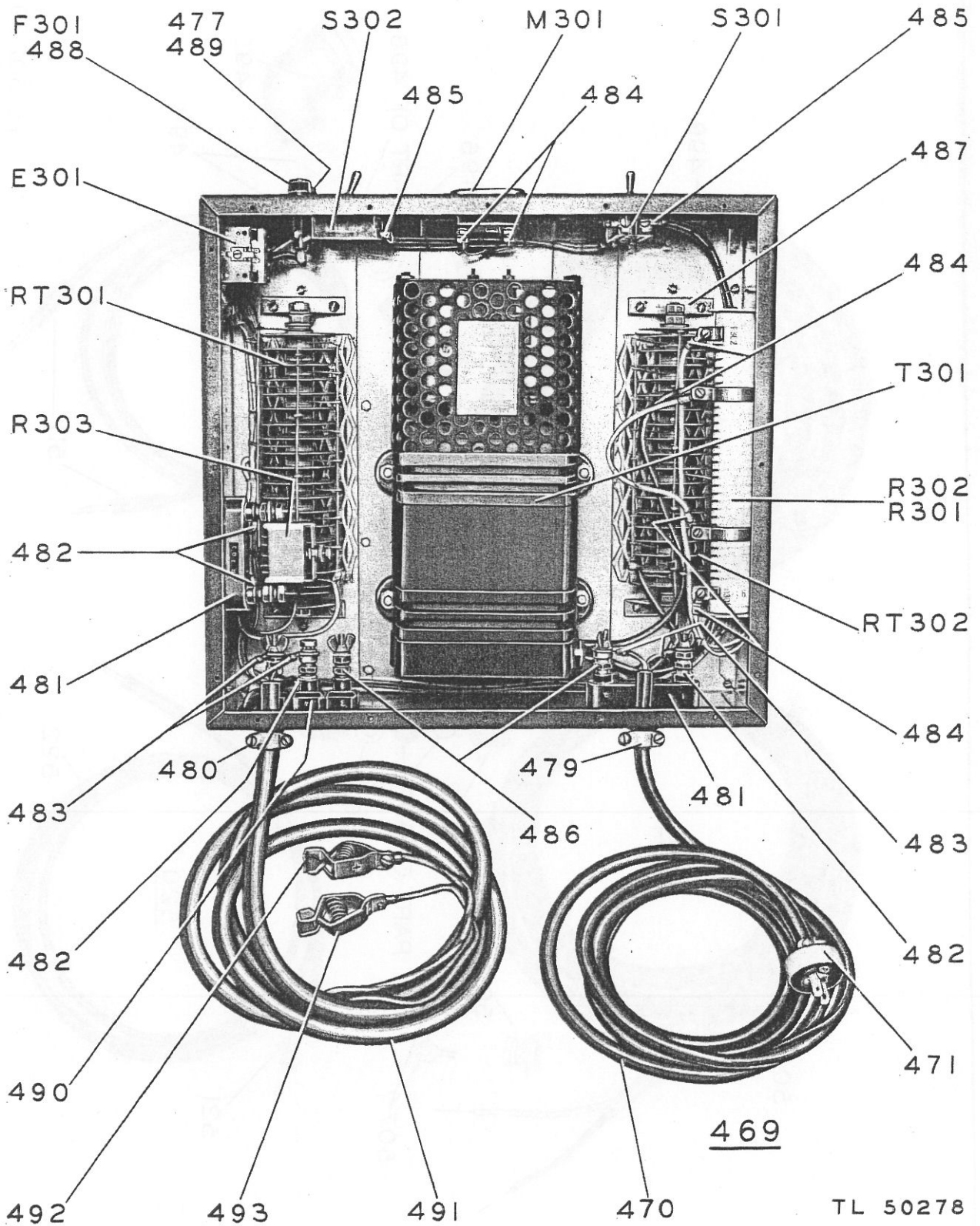
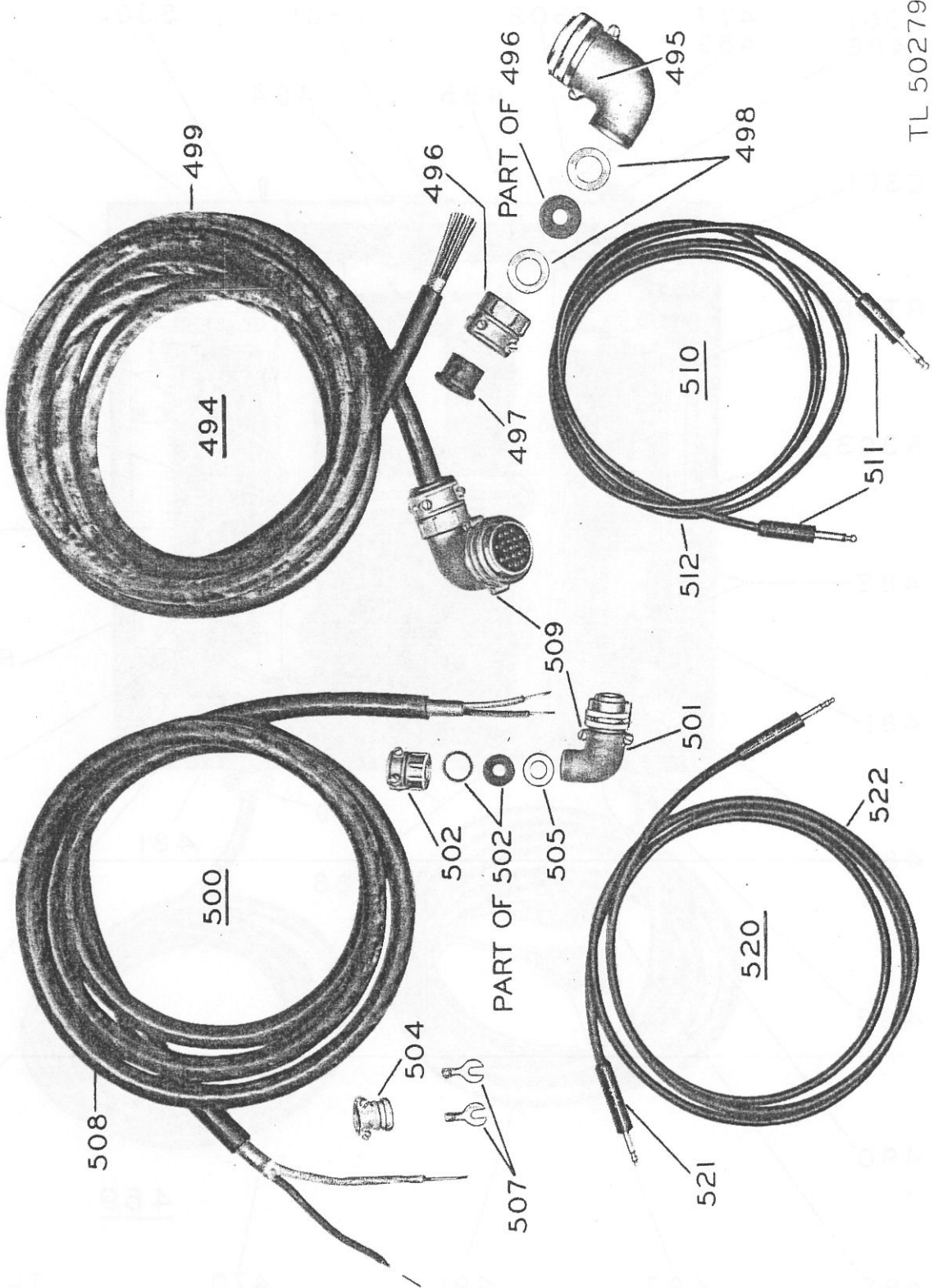


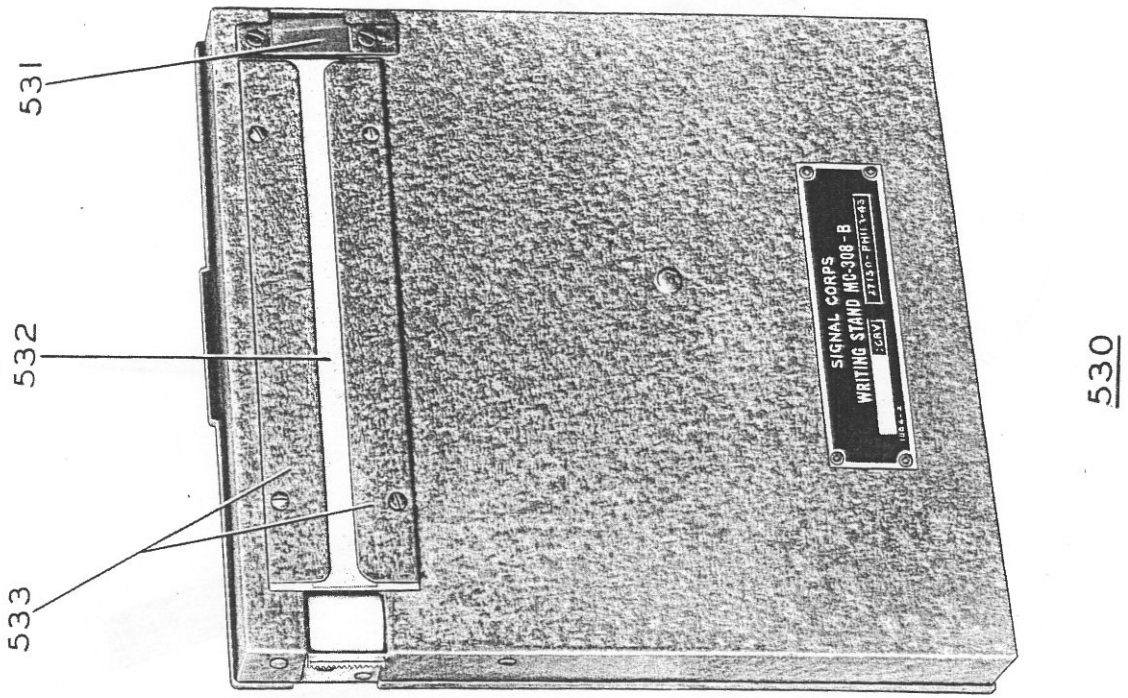
Figure 73—Rectifier RA-54-A (open view)

Supplementary data



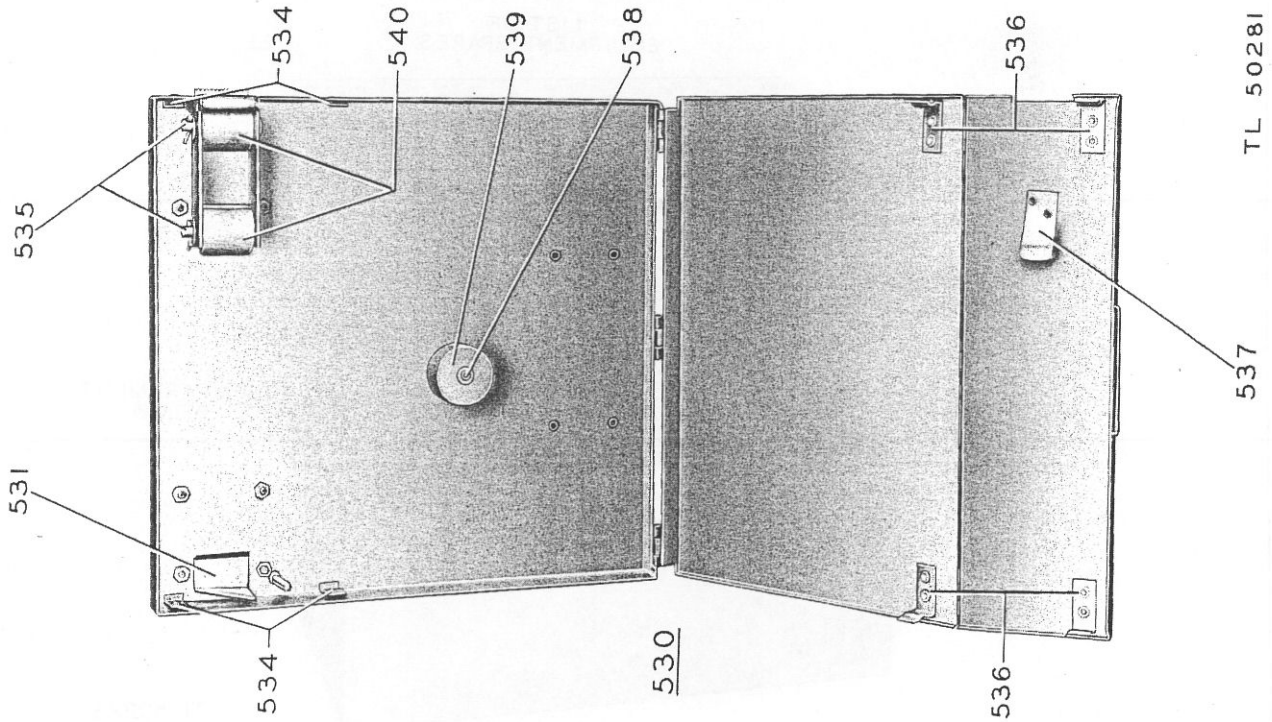
TL 50279

Figure 74—Connector-cord assemblies



TL 50280

Figure 75—Writing Stand MC-308-B



TL 50281

Figure 76—Writing Stand MC-308-B (open view)

Supplementary data

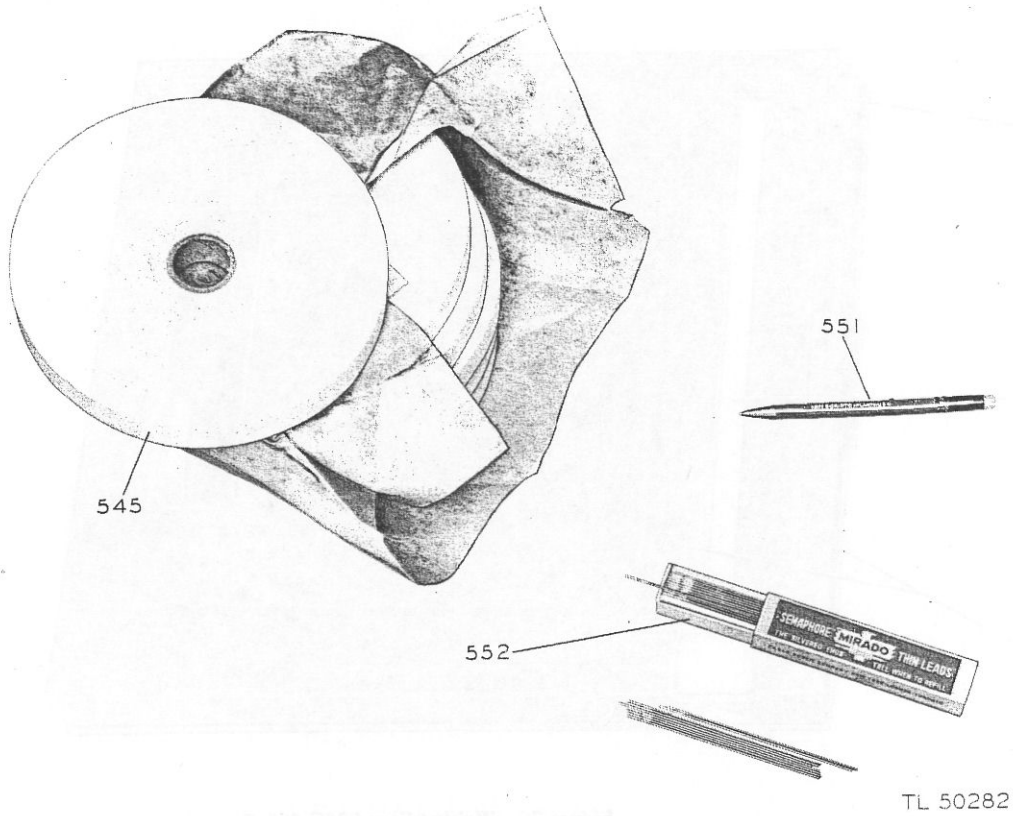


Figure 77—Miscellaneous items

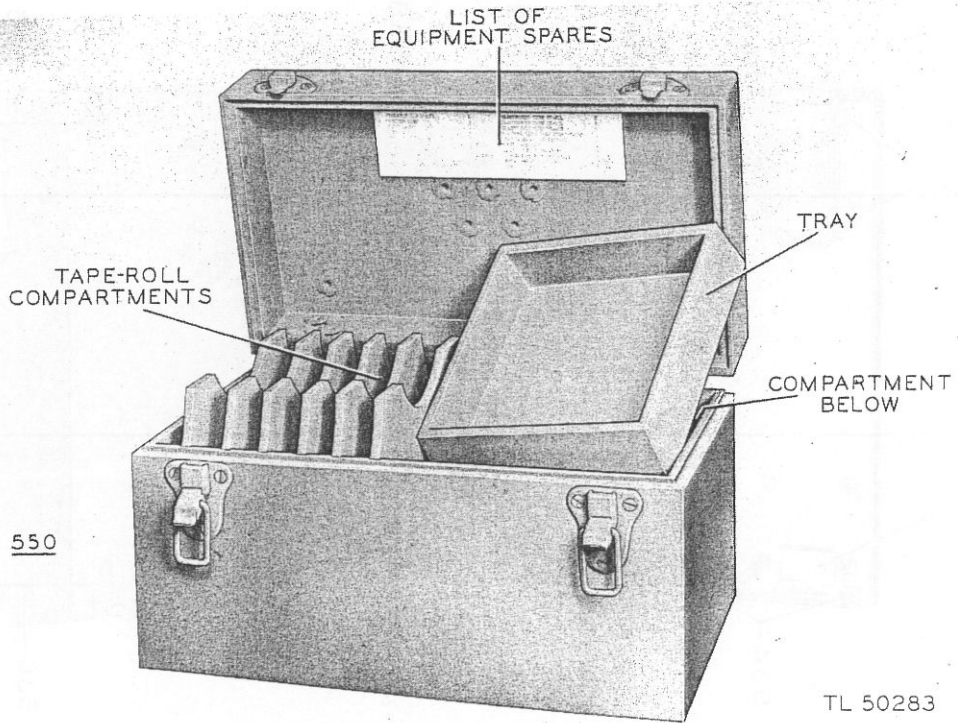
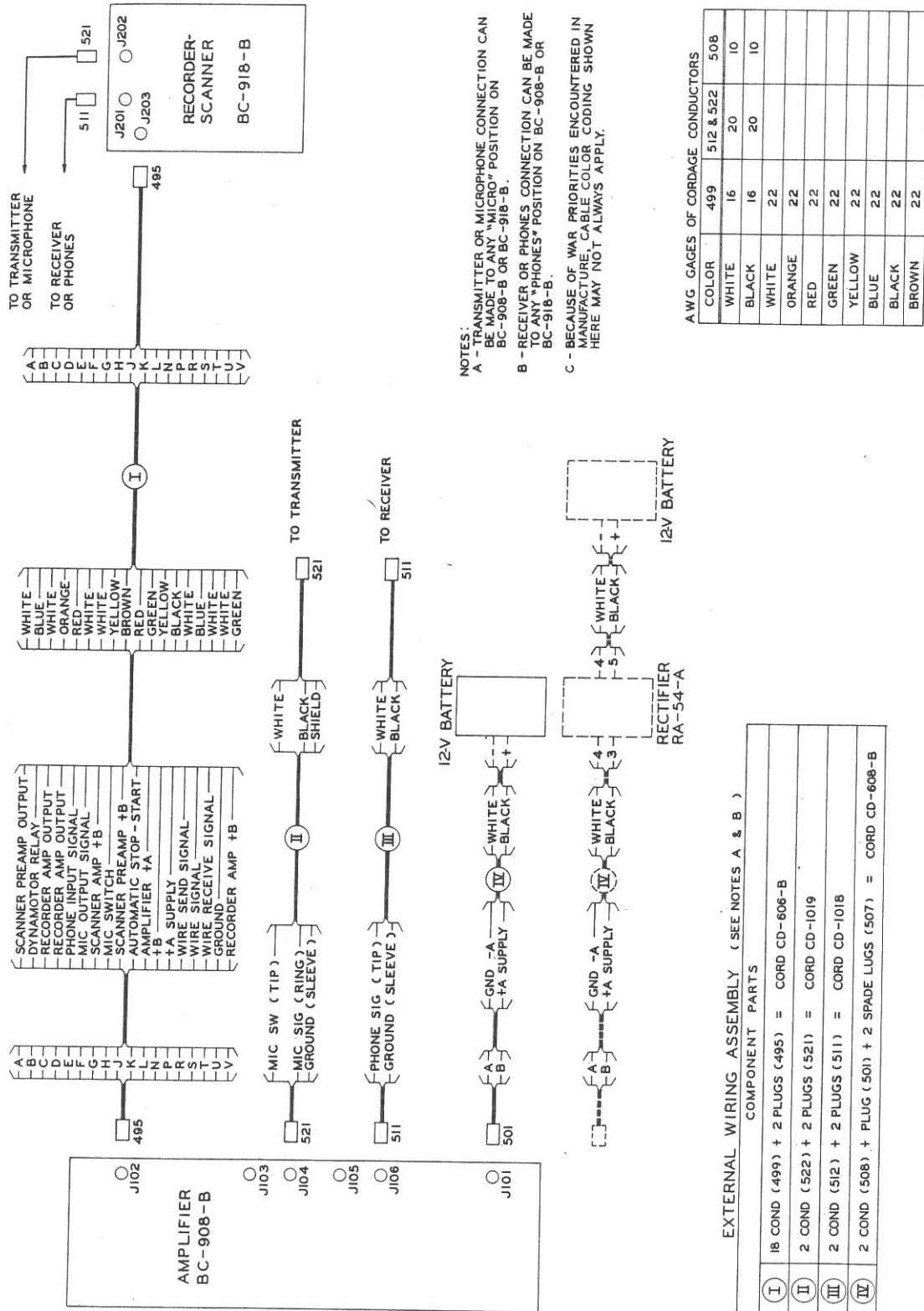
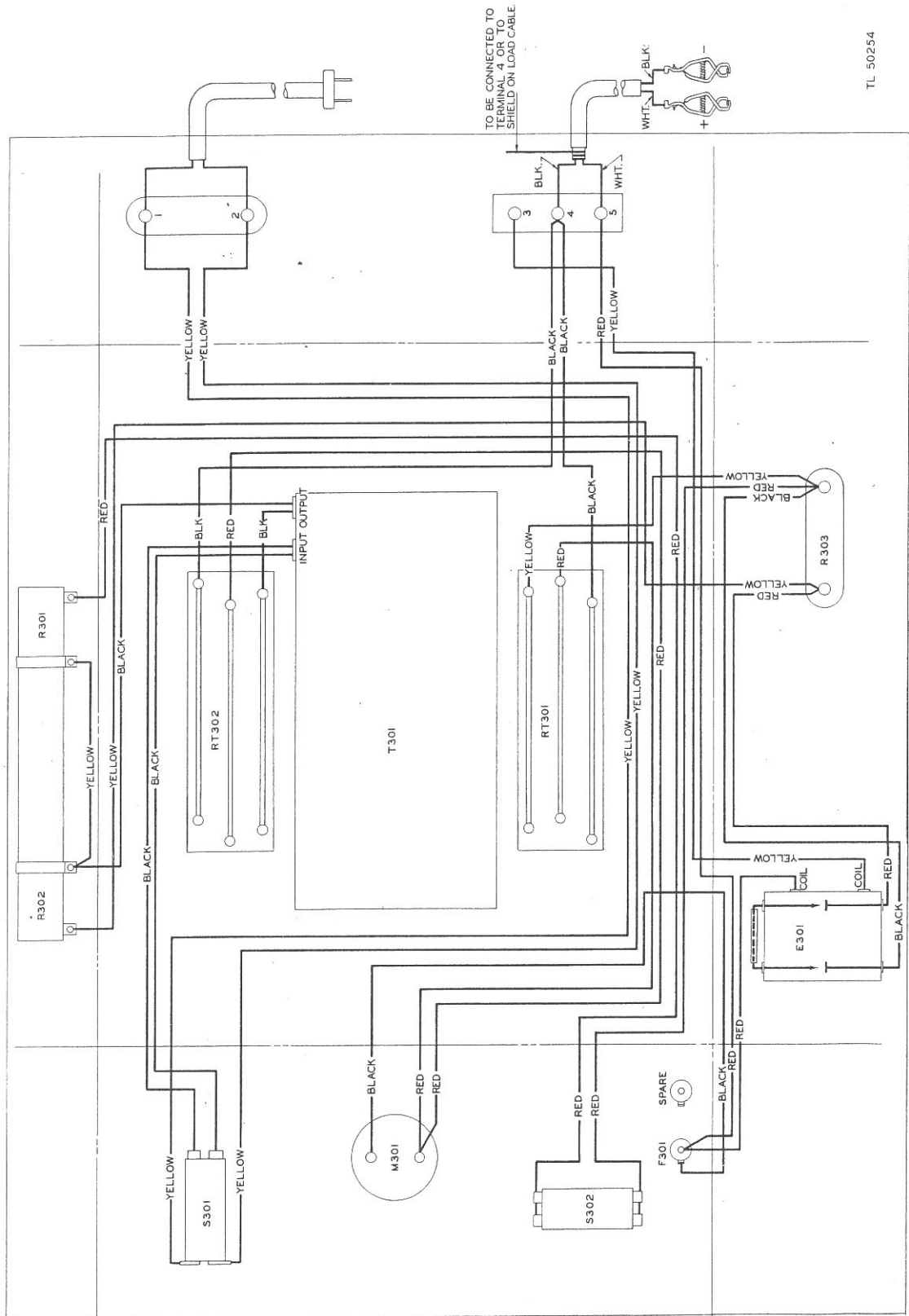


Figure 78—Chest CH-108-B



TL 50250

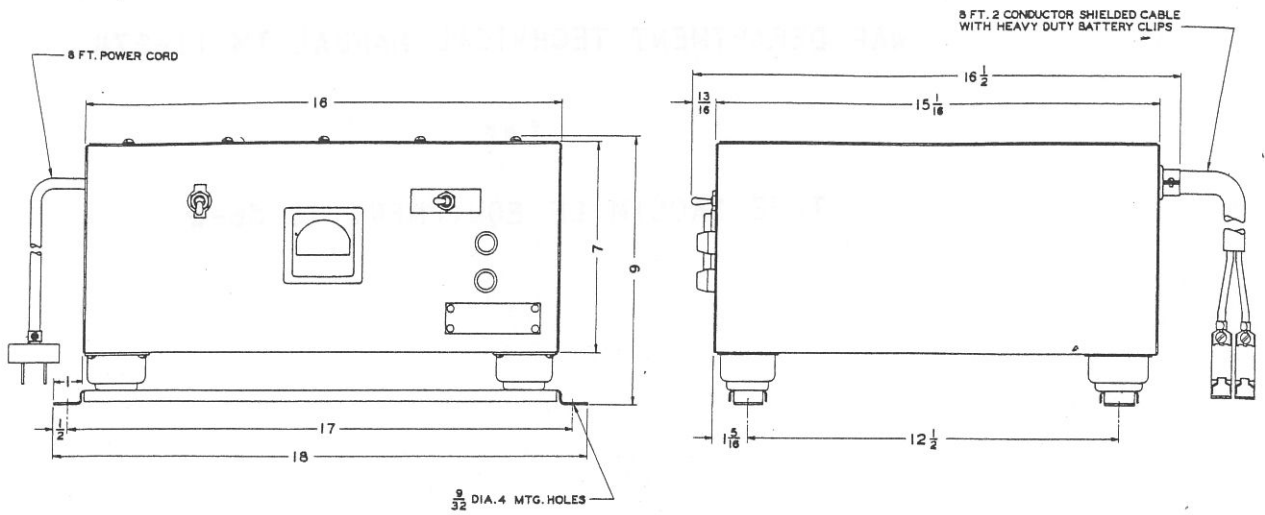
Figure 84—Cording diagram



TO BE CONNECTED TO
TERMINAL 4 OR TO
SHIELD ON LOAD CABLE

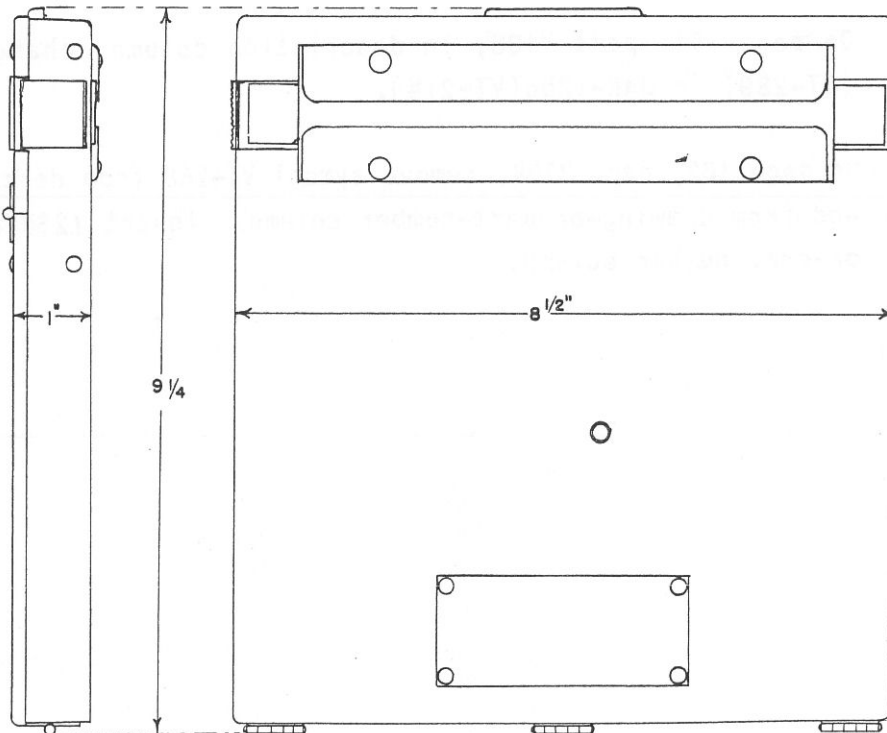
TL 50254

Figure 87—Rectifier RA-54-A, wiring diagram



TL 50286

Figure 81—Rectifier RA-54-A, outline drawing



TL 50287

Figure 82—Writing Stand MC-308-B, outline drawing

ERRATA

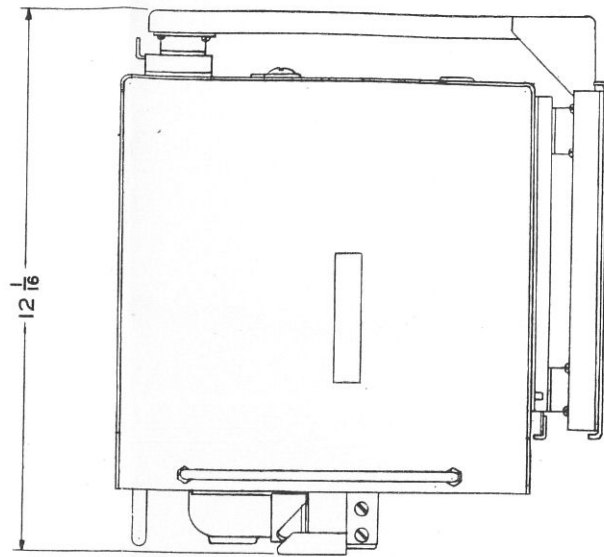
to

WAR DEPARTMENT TECHNICAL MANUAL TM 11-374

for

TAPE FACSIMILE EQUIPMENT RC-58-B

1. On page 101, part VI01, remove symbol VT-268 from description column and from drawing-or-part-number column. Insert 12SN7GT in drawing-or-part-number column.
2. On page 101, part VI07, in description column, change JAN-12H6 (VT-214) to JAN-12SL7GT(VT-289).
3. On page 101, part VI08, in description column, change JAN-12SL7GT (VT-289) to JAN-12H6(VT-214).
4. On page 102, part V204, remove symbol VT-268 from description column and from drawing-or-part-number column. Insert 12SN7GT in drawing-or-part-number column.



TL 50285

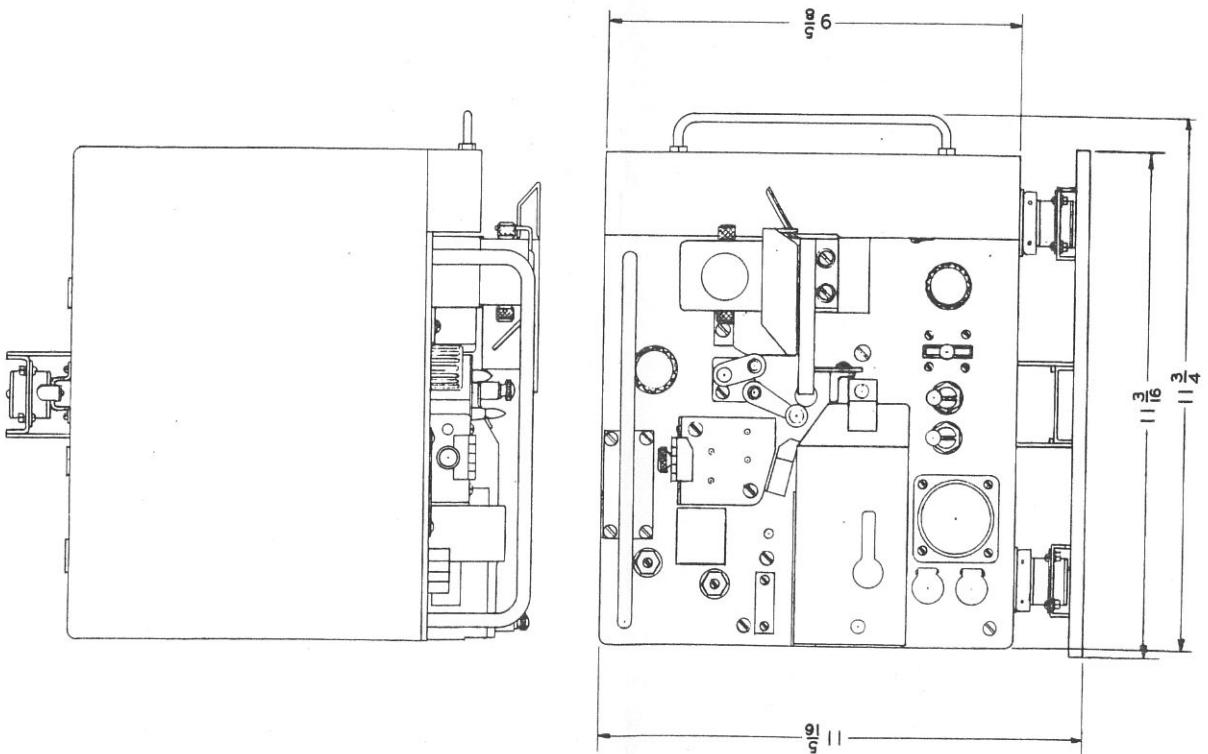


Figure 80—Recorder-Scanner BC-918-B and Mounting FT-328-B, outline drawing

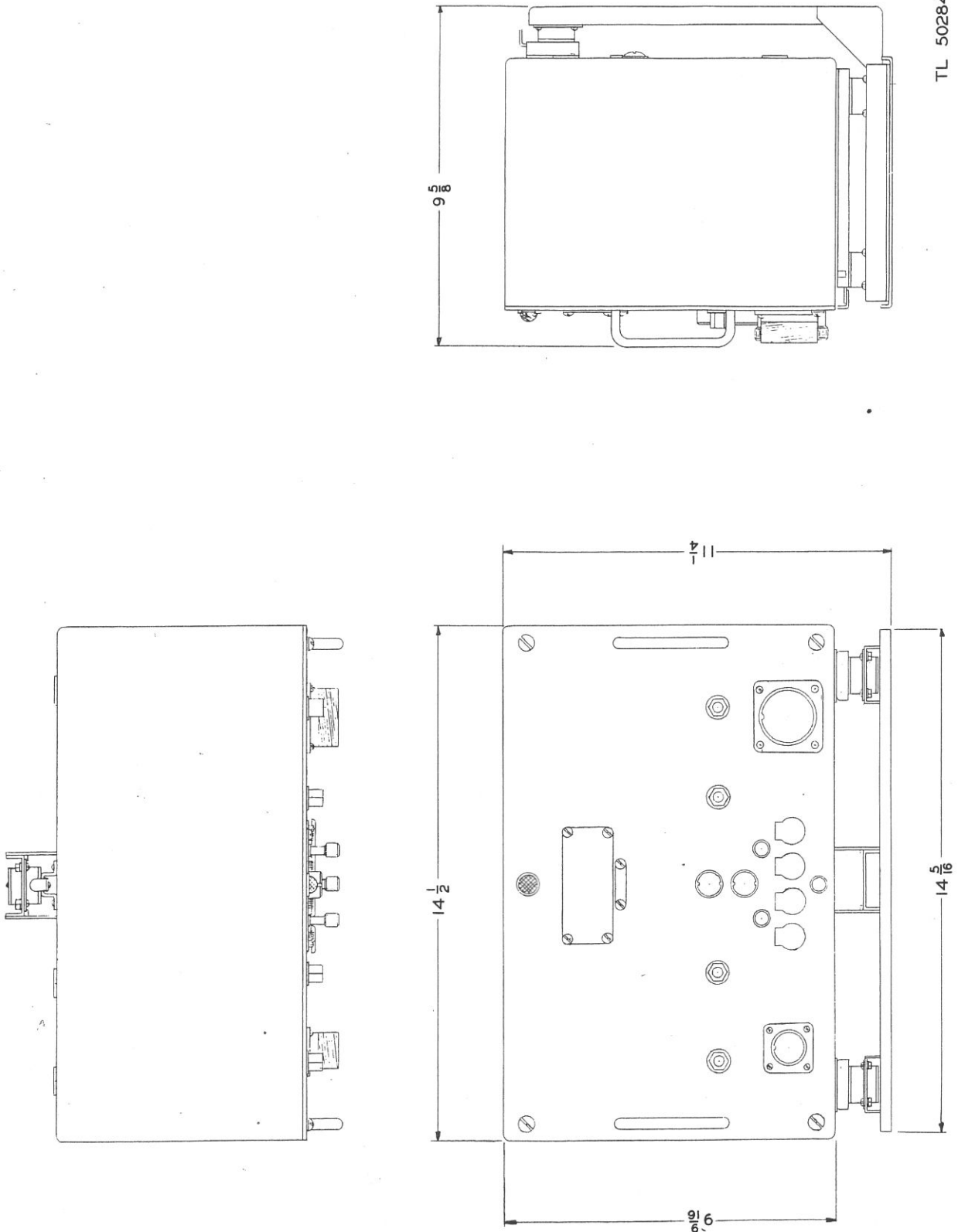


Figure 79—Amplifier BC-908-B and Mounting FT-318-B, outline drawing

AMPLIFIER BC-908-B

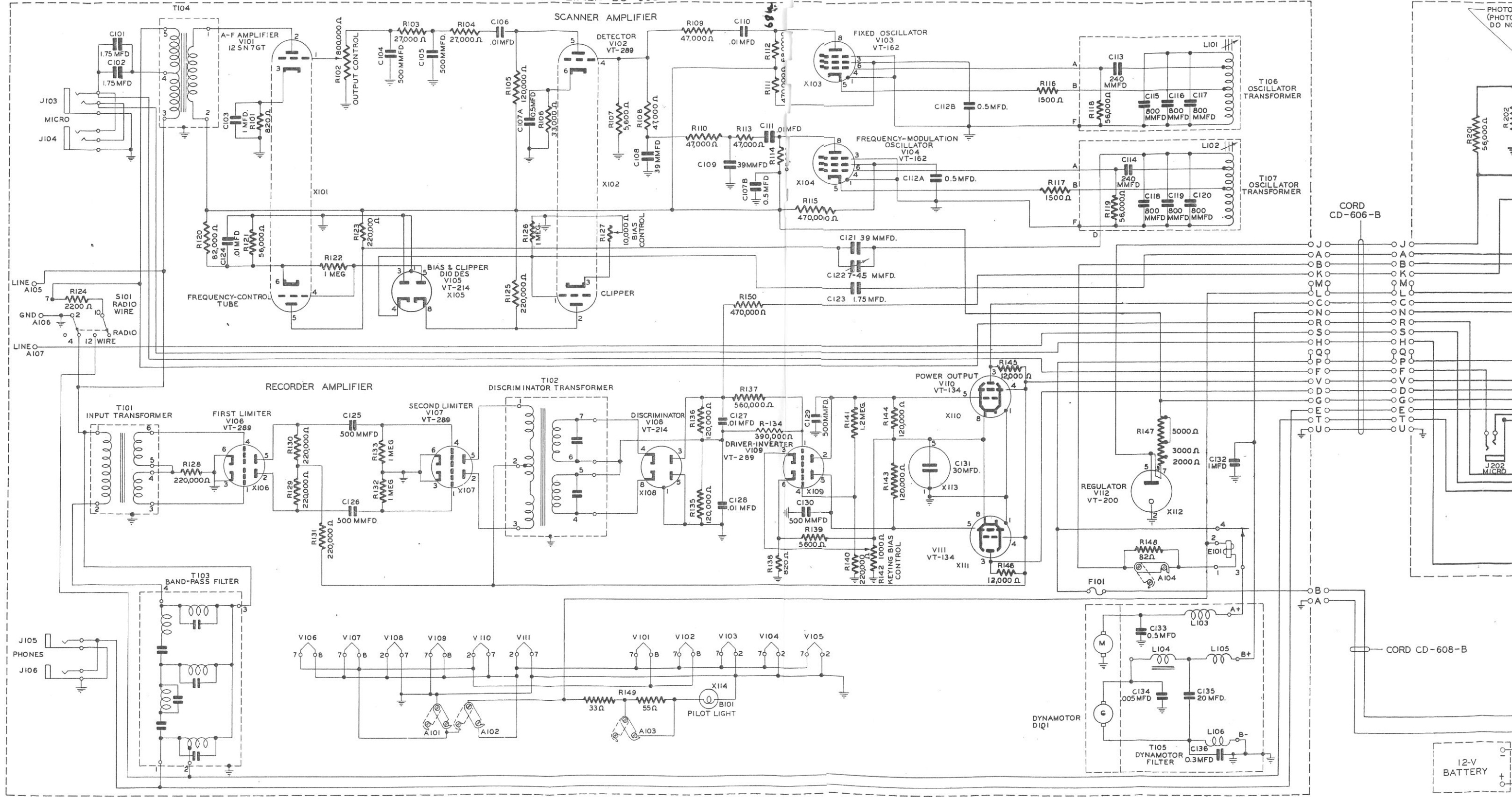
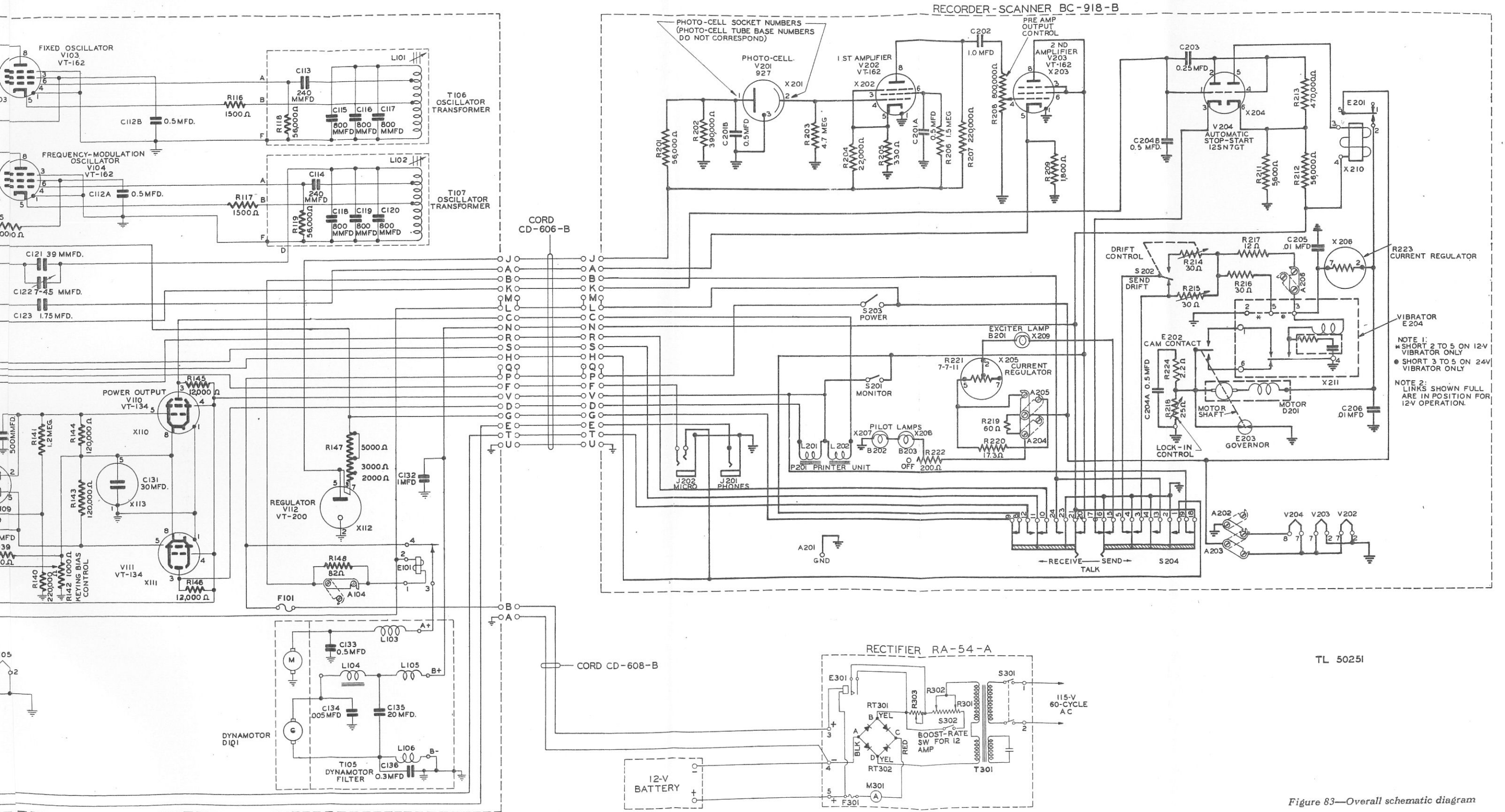


PHOTO-CORD (PHOTO-DO NOT)

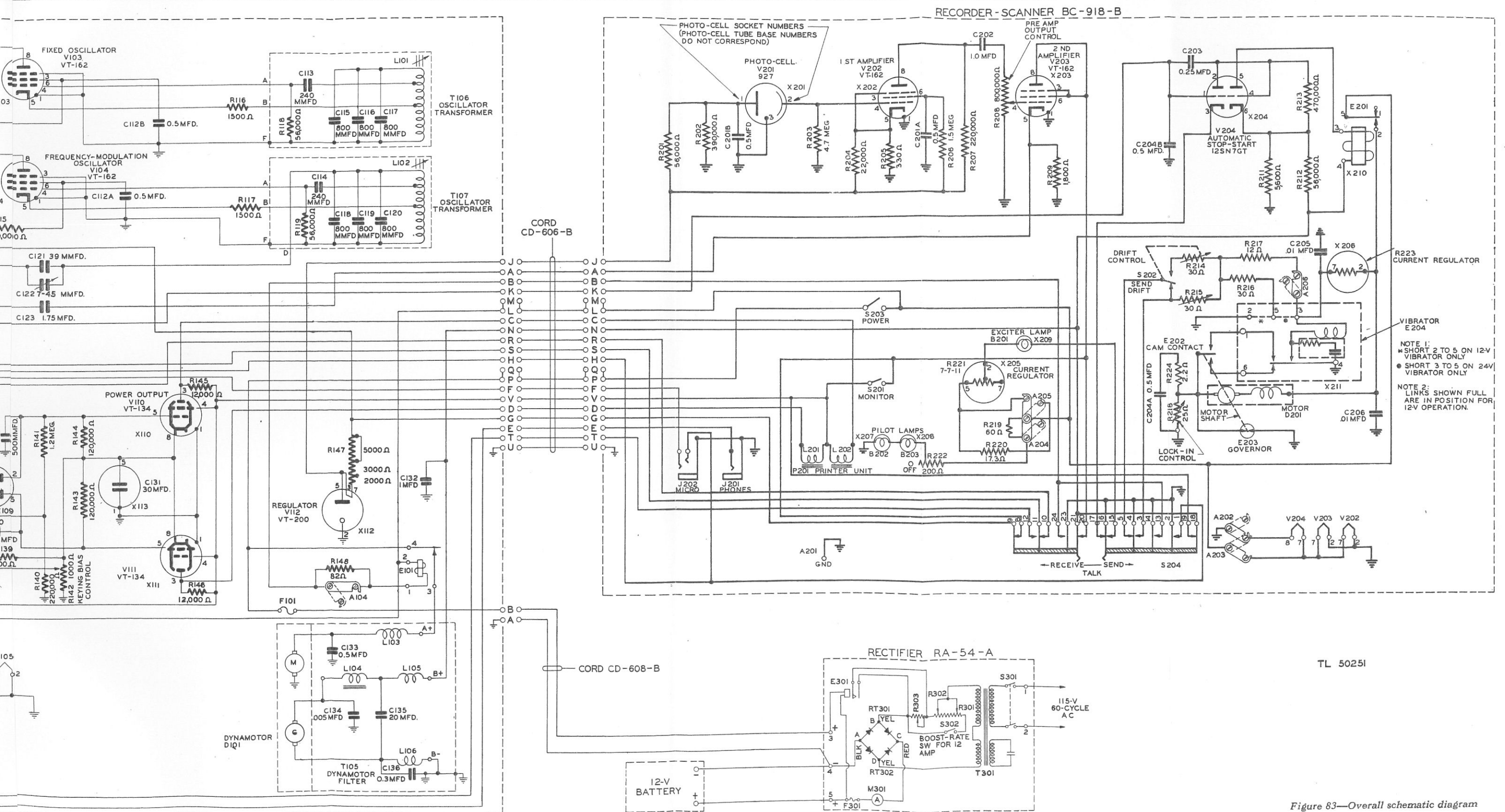
12-V BATTERY

Supplementary data



TL 50251

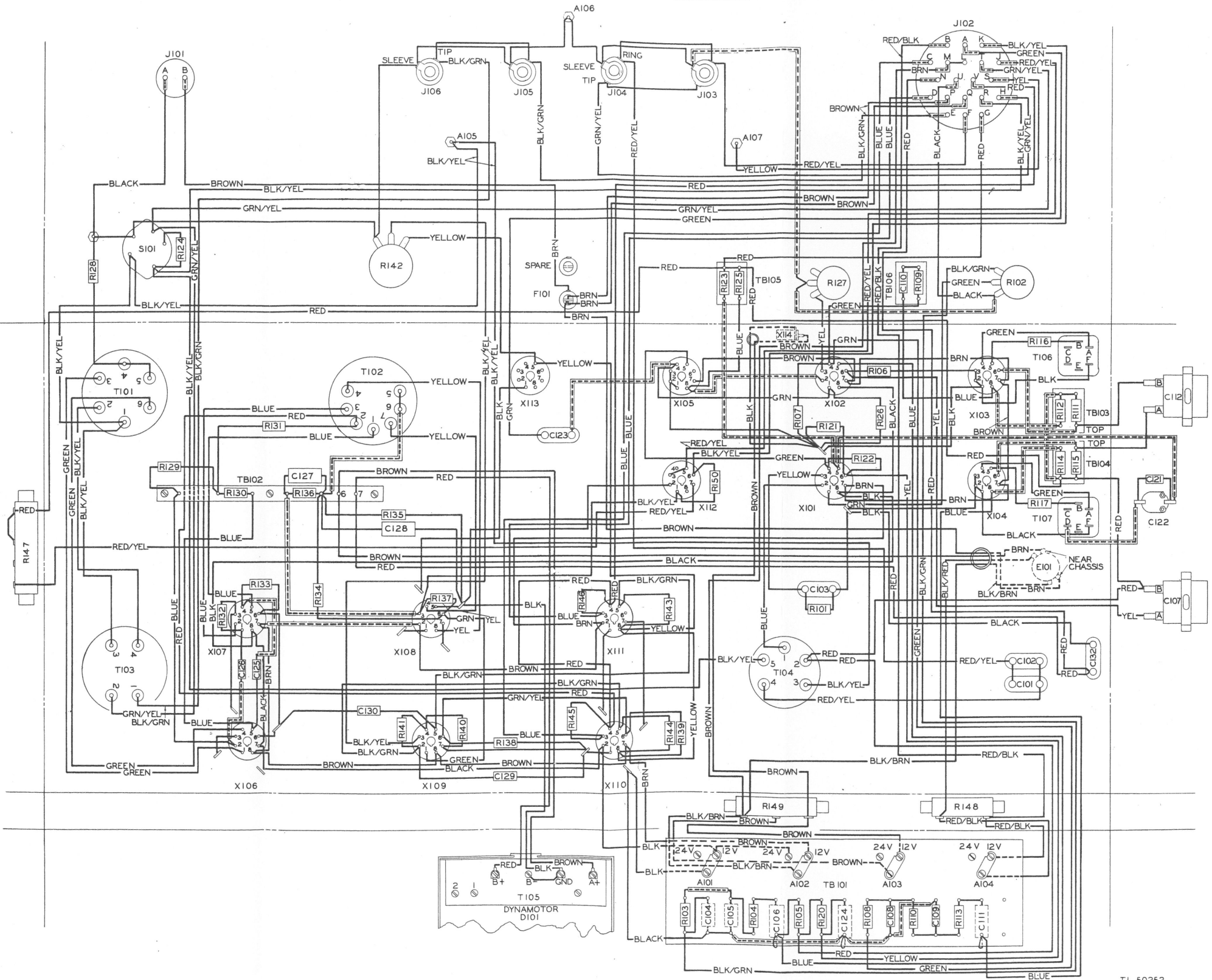
Figure 83—Overall schematic diagram



TL 50251

Figure 83—Overall schematic diagram

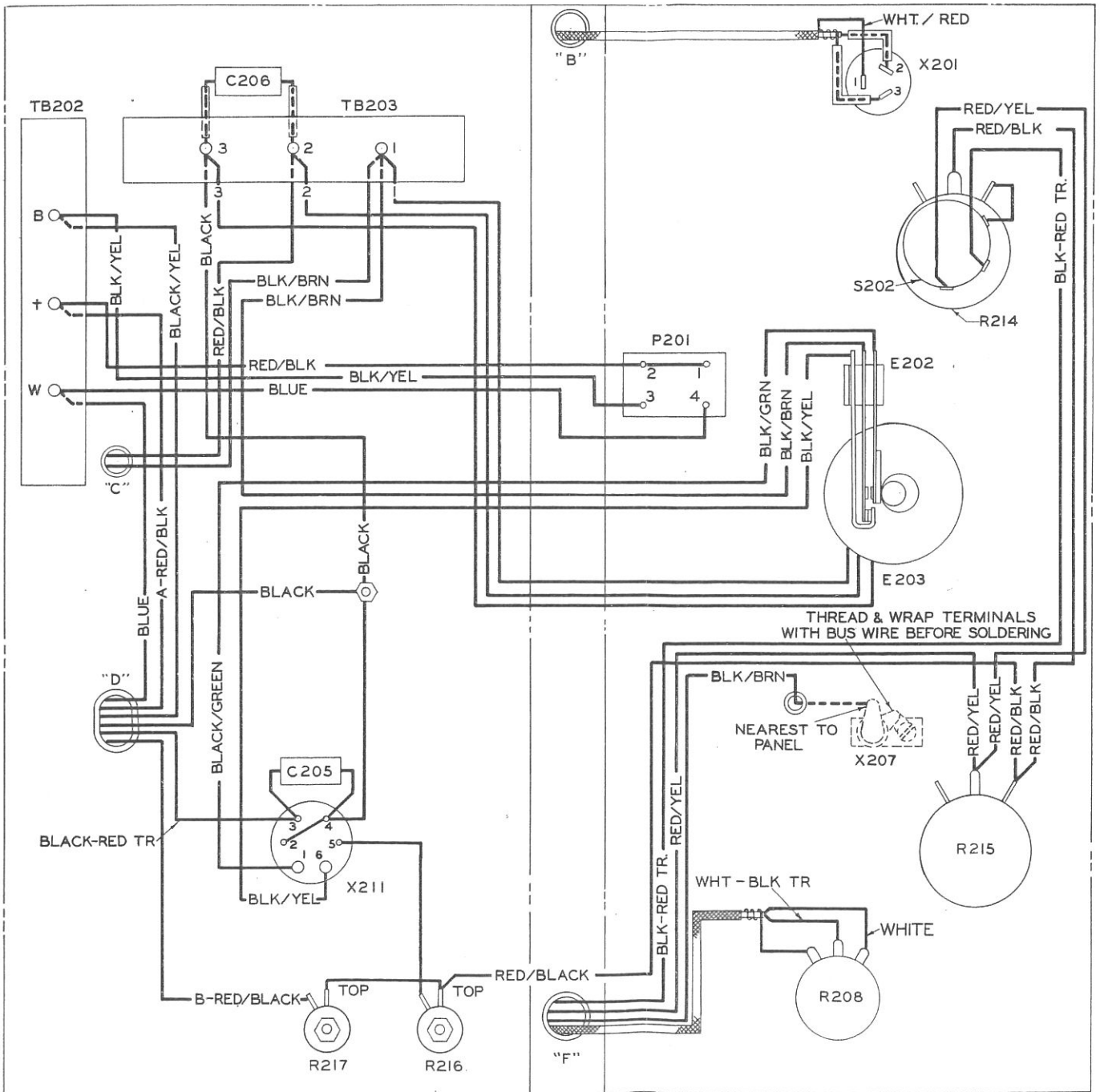
Supplementary data

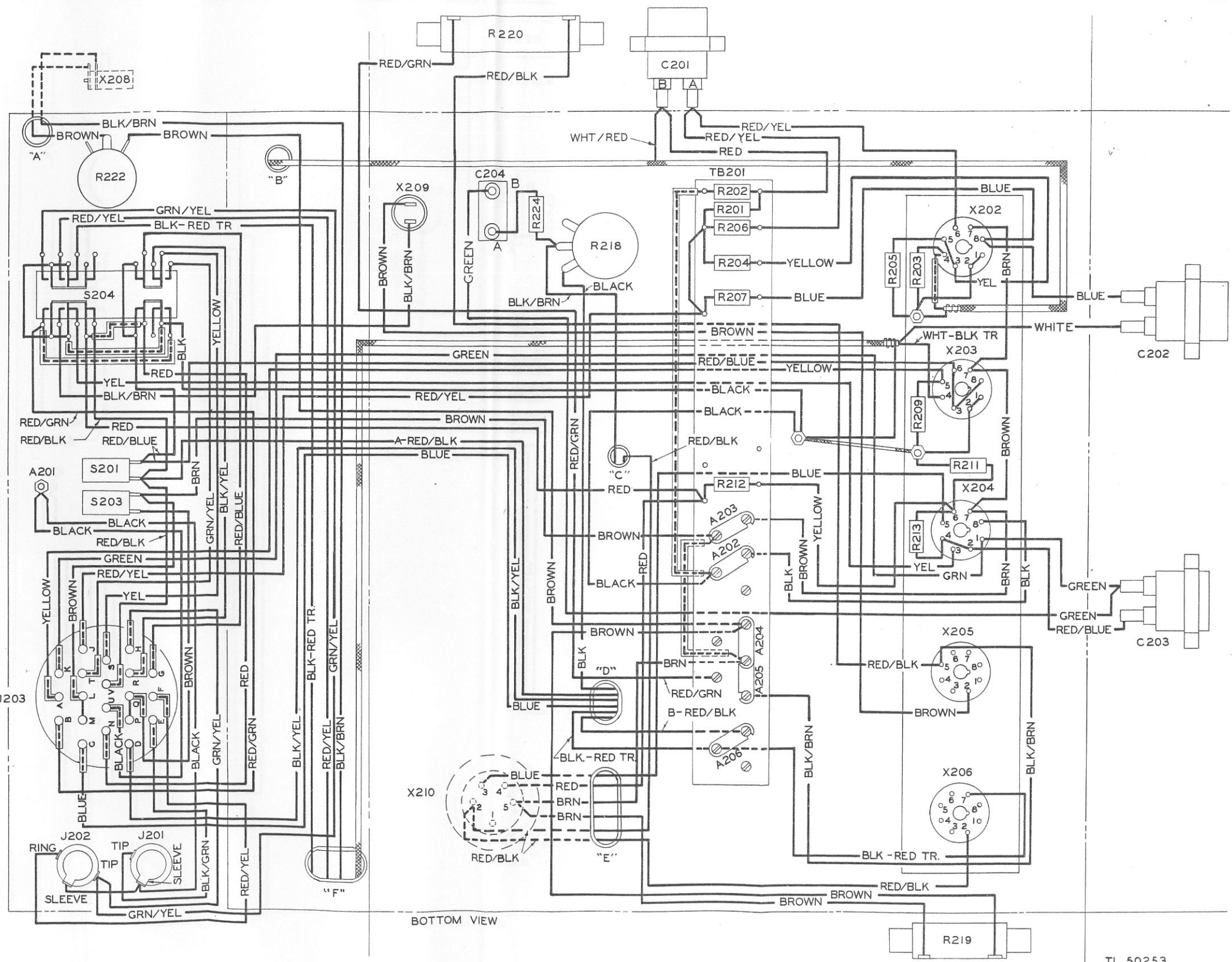


TL 50252

Figure 85—Amplifier BC-908-B, wiring diagram

NOTE:
HOLES B,C,D&F ARE
SHOWN IN 2 PLACES EACH





TL 50253

Figure 86—Recorder-Scanner BC-918-B, wiring diagram