

*Complementary  
Copy*

*Date Recd.*

WAR DEPARTMENT  
TECHNICAL MANUAL

**TM 11-443**

---

STATION  
LIAISON

**KEYER  
TG-34-A**

TM 11-443 KEYER TG-34-A

---

WAR DEPARTMENT 25 OCTOBER 1943

*War Department Technical Manual*

*TM 11-443*

---

**KEYER  
TG-34-A**

---

*War Department*

*25 October 1943*

WAR DEPARTMENT,  
WASHINGTON 25, D. C., 25 OCTOBER 1943.

TM 11-443, Keyer TG-34-A, is published for the information and guidance of all concerned.

[A. G. 062.11 (11 January 1943).]

By order of the Secretary of War:

G. C. MARSHALL,  
*Chief of Staff.*

Official:

J. A. ULIO,  
*Major General,*  
*The Adjutant General.*

Distribution: IBn & H7, 17(2); IBn 1, 11, 18(2); IC 6, 7, 11, 17, 18(2).  
(For explanation of symbols see FM 21-6.)

## TABLE OF CONTENTS

SECTION I.	Description.	Page
Paragraph	1. General .....	1
	2. Components, weights, and dimensions.....	1
	3. Source of power .....	1
	4. Power output .....	1
	5. Tube complement .....	3
	6. Controls .....	3
II.	Installation and operation.	
	7. Installation .....	5
	8. Preparation for use .....	6
	9. Operation .....	7
III.	Functioning of parts.	
	10. Theory of operation .....	9
	11. Functioning of circuit components .....	9
IV.	Maintenance.	
	12. Inspection and minor adjustment .....	13
	13. Lubrication .....	15
	14. Removal and assembly of parts .....	15
	15. Table of operating voltages, resistances, and currents .....	21
	16. Trouble-location and remedy chart .....	26
V.	Supplementary data.	
	17. RMA Standard Resistor Color Code .....	31
	18. Table of replaceable parts .....	32
	19. List of manufacturers .....	50

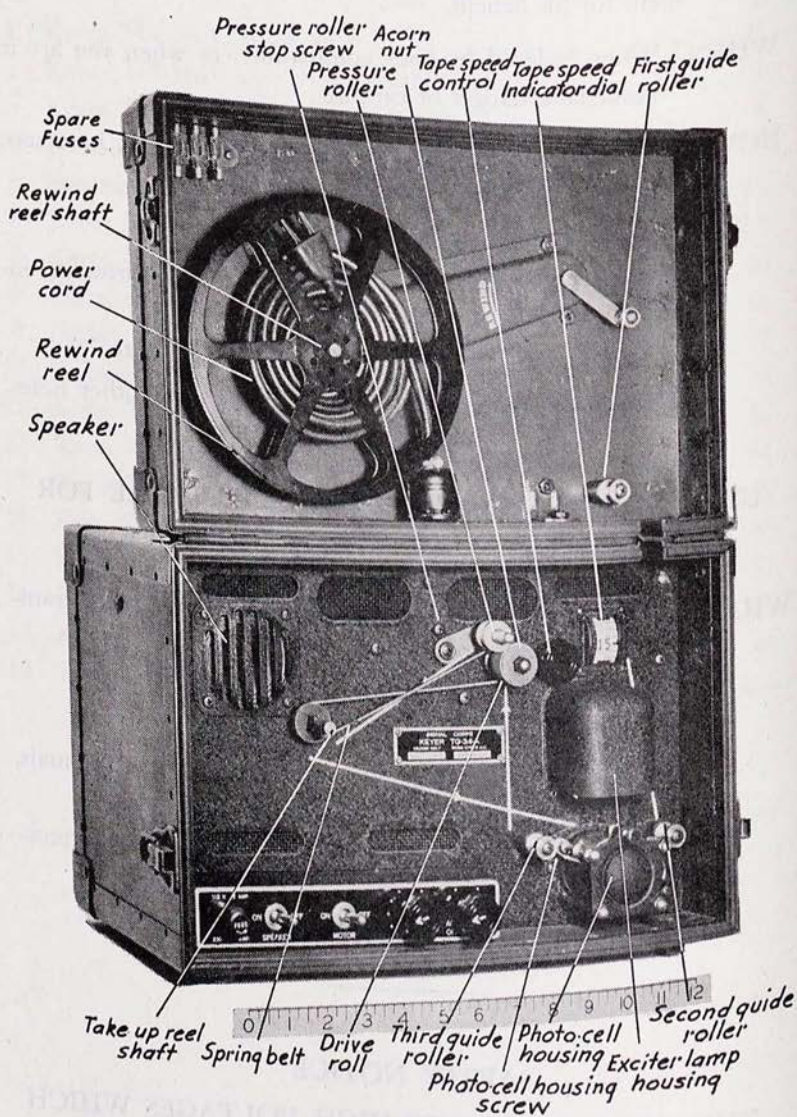


Figure 1.—Keyer TG-34-A, front view.

# SECTION I

## DESCRIPTION

	Paragraph
General .....	1
Components, weights, and dimensions .....	2
Source of power .....	3
Power output .....	4
Tube complement .....	5
Controls .....	6

**1. GENERAL.**—Keyer TG-34-A, (fig. 1) is an automatic unit for reproducing audible code practice signals previously recorded in ink on paper tape. The unit is a component of Code Practice Equipment EE-94-C, EE-95-C, and EE-96-C. The unit can be used to provide code practice signals in permanent classrooms, for small groups in the field, or to provide a keying oscillator for use with a hand key. The unit is compact and portable, and reasonably weatherproof. It is self-contained, but requires an external a-c power source. Ventilation for the cabinet is provided by a fan which is attached to the lower motor shaft.

### 2. COMPONENTS, WEIGHTS, AND DIMENSIONS.—

*a.* The dimensions of Keyer TG-34-A are 10-9/16 inches high, 10-1/2 inches wide, and 15-13/16 inches long. The unit weighs 38.5 pounds.

*b.* To operate the keyer the following additional equipment is necessary:

- (1) Inked-paper tape recordings.
- (2) Telegraph key.

**3. SOURCE OF POWER.**—*a.* Normal supply is 115 or 230-volt, 50 to 60-cycle alternating current.

(1). The unit will operate satisfactorily on any voltage between 95 and 120 volts or between 190 and 240 volts.

**4. POWER OUTPUT.**—Under normal operating conditions the power output is approximately 3.5 watts, when the AC OFF VOLUME control is adjusted for maximum volume. Output impedances are 4, 8, and 15 ohms.

\*This manual supersedes preliminary TM 11-443, 25 Sept. 43.

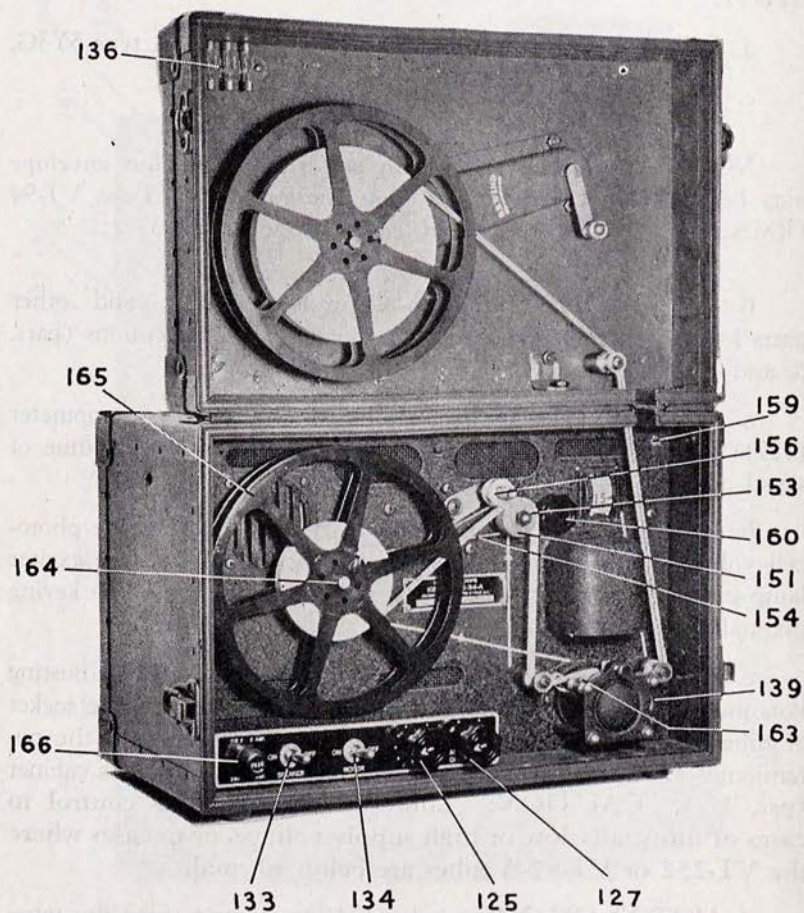


Figure 3.—Keyer TG-34-A, ready for operation.

f. Tape-speed control knob (160), located on the upper right of the front panel, varies the speed of the drive roll (153).

**CAUTION:** If the tape drive is running, you can vary the speed of the drive roll without disengaging the pressure roller (156). If the TAPE DRIVE IS NOT RUNNING, NEVER VARY THE CONTROL without first disengaging the pressure roller by pushing it up against stop screw.

g. Tape-speed indicator dial (162) (figs. 1, 6) shows speed in feet-per-minute.

h. Photocell aperture and anvil adjusting screw (fig. 4).

i. Tape-rewind mechanism located in the cover.

j. Tape reels (165).

k. Tape drive roll (153).

l. Tape pressure roller (156).

m. Take-up reel drive belt (154).

n. Tape guide rollers (fig. 1).

o. Jack for keying (139).

## SECTION II

# INSTALLATION AND OPERATION

	Paragraph
Installation .....	7
Preparation for use .....	8
Operation .....	9

**7. INSTALLATION.**—*a. Setting up equipment.*—To open the cover of the cabinet, release the catches, raise the front cover to vertical, and be sure to snap it into locking position. This provides easy access to the tape reel and controls. Slide up the rear cover catch and raise this small cover (fig. 11) to its upper locking position. Lock in place by sliding the catch down. This gives access to the output terminal strip (140) (fig. 11), the a-c input receptacle (135) (fig. 11), and the voltage change-over switch (132) (fig. 11).

(1) *Power.*—

*b. Connections to Unit.*—



(a) *Power Source.*—The unit is designed for operation from either 115 volts or 230 volts, 50 or 60 cycles. To match the supply voltage, use a small screw driver to set the voltage change-over switch (132) (fig. 11), located at extreme right of rear opening. Indicator on switch shows voltage setting: 230-volt position has red background, 115-volt position has black background.

(b) *Proper Fuse.*—For operation on 115 volts use a 2-ampere fuse; for 230-volt operation use a 1-ampere fuse. Install proper fuse in FUSE holder (166) (fig. 3) located at lower left on front of unit. The unit is shipped with a 2-ampere fuse in holder.

(c.) Remove power cord from rewind tape reel in cover (fig. 1), and plug it into a-c input receptacle (135) (fig. 11) located near center of rear opening.

**CAUTION:** Voltage and fuse adjustments must be made before you connect power cord to power source. If switch setting and fuse size are not correct you'll blow a fuse.

(2) *Speaker.*—No other connections are required to operate the unit with the speaker (141) which is located behind the metal grille on upper left corner of front panel.

(3) *Headsets and Instruction Tables.*—To supply code signals to headsets or instruction tables, make connections to terminal strip (140) (fig. 11) located at left side of rear opening. Connect to C and one other terminal (4, 8 or 15), choosing the one which gives best performance. For average headset load, the 15-ohm terminal will be the most suitable connection. The 4 and 8 terminals will be found more useful for speaker loads.

(4) *Hand Key.*—To use the TG-34-A with a hand key, connect key to terminals of a PL55 or similar plug and insert in jack (139) (fig. 3) located at lower right corner of front panel. Be sure the PE CELL control is turned to off position when keying manually.

**8. PREPARATION FOR USE.**—a. *Adjusting photocell aperture.*—(fig. 4) To adjust this aperture, cut or fold a piece of practice tape at a point between letters or words and lay it in the right tape guide and roller in such a position that the end of the tape comes just even with the aperture (small opening) in the tape

anvil. Turn the anvil-adjusting screw in or out until the aperture centers on the inked base line on the tape. After making this adjustment, if the light spot does not center over aperture, refer to paragraph 12g, and make necessary correction.

b. *Mounting practice tapes.*—(figs. 1, 3) Place an empty 400-foot reel (165) on the take-up shaft (164) located on the left center of the front panel. Mount the reel of practice tape on the rewind reel shaft located in the left center of the upraised cover. Be sure to place reel in such manner that tape comes off the top of reel, inked side down. Thread tape over first guide roller (lower right corner of cover) under second roller, over tape anvil (163), and under third

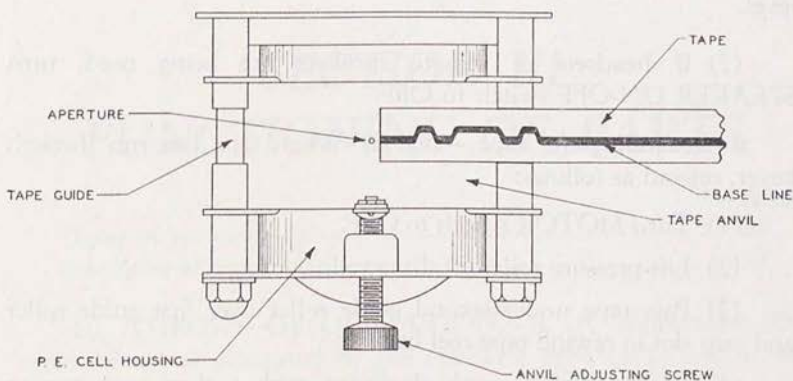


Figure 4.—Photocell aperture adjustment.

roller. Lift the pressure roller (156) and thread tape between pressure roller and drive roll (153) to under side of take-up reel (165). Place pressure roller against tape on drive roll.

9. OPERATION.—a. *Step-by-step procedure.*—(fig. 3) (1) Turn AC OFF VOLUME control (127) to the right to point about halfway around dial. Panel light (137) will illuminate tape speed indicator dial (162) (fig. 6).

(2) Turn SPEAKER ON-OFF switch (133) to ON.

(3) Mount and thread practice tape (par. 8b.).

(4) Turn MOTOR ON-OFF switch (134) to ON. Move the pressure roller downward until it contacts the tape on the drive roll. Tape will start to move over anvil.

(5) Turn PE CELL control (125) to the right until keyed signal is heard. Exciter lamp (138) (fig. 6) will light. Adjust PE CELL control to position which gives clear-cut signals. Additional cell voltage can be obtained by adjusting potentiometer (126) located on the chassis near the socket of tube VT-87-A (fig. 6) (par. 12h).

**CAUTION:** Limit your use of the control to cases of unusually low or high supply voltage or to cases where the VT-252 or VT-87-A tubes are below normal.

(6) Adjust tape-speed control knob (160) to desired operating position, and AC OFF VOLUME control (127) to desired signal level.

(7) If headsets or remote speakers are being used, turn SPEAKER ON-OFF switch to OFF.

*b. Rewinding the tape.*—(fig. 3) When tape has run through keyer, rewind as follows:

(1) Turn MOTOR switch to OFF.

(2) Lift pressure roller off drive roll.

(3) Pass tape under second guide roller over first guide roller and into slot in rewind tape reel hub.

(4) Rotate rewind crank clockwise, with a slow even motion until sufficient tape is rewound.

*c. Normal operation.*—(1) Tape speed indicator dial (162) is lighted up.

(2) Soft "whirring" of motor and drive gears is heard.

(3) Tape reel and take-up reel revolve slowly.

(4) Tape moves over tape anvil (163) at uniform rate of speed.

(5) Small bright spot of light is visible near center of tape anvil.

(6) Keyed signal is clear and clean cut.

*d. Precautions during operation.*—(1) Keep the aperture in the tape anvil (163) clean at all times. Stoppages, indicated by uncertain keying, may be caused occasionally by lint from paper tape and usually can be cleared by blowing sharply below front edge of tape anvil between photocell housing and anvil (par. 12f).

(2) Don't grasp drive roll (153) in an effort to stop its rotation. Roll will stop automatically if pressure roller (156) is raised against the stop screw.

(3) Rewind tape at a moderate rate to avoid tape breakage or stacking up.

(4) When keying manually, place MOTOR ON-OFF switch in ON position and raise pressure roller against stop screw. This is done so that the motor fan can ventilate the cabinet.

(5) Do not vary the tape-speed control, unless the tape drive is running, without first disengaging pressure roller (156), by pushing it up against its stop screw.

## SECTION III

### FUNCTIONING OF PARTS

	Paragraph
Theory of operation .....	10
Functioning of circuit components .....	11

**10. THEORY OF OPERATION.**—*a.* A continuous 800-cycle voltage is generated by the oscillator tube (101) and is impressed on one grid of the pentagrid keying tube (102).

*b.* Keying of tube (102) is accomplished photoelectrically by means of the light variation through a moving inked tape.

*c.* Resulting code signal is then amplified through tube (103) for code practice use.

#### **11. FUNCTIONING OF CIRCUIT COMPONENTS.**—

*a. Oscillator.*—Tube VT-65-A (101) (figs. 5, 6 and 18), with its associated resonant circuit [coil (128) and capacitor (106)] oscillates at approximately 800 cycles. This signal voltage is fed from the grid of Tube VT-65-A (101) through capacitor (107-2) and stabilizing resistor (117-1), to grid 1 of Tube VT-87-A (102) keying tube.

*b. Mixer-amplifier.*—(1) Grid 3 of Tube VT-87-A (102) is normally biased to cut off when the black base line shuts off the light from the aperture.

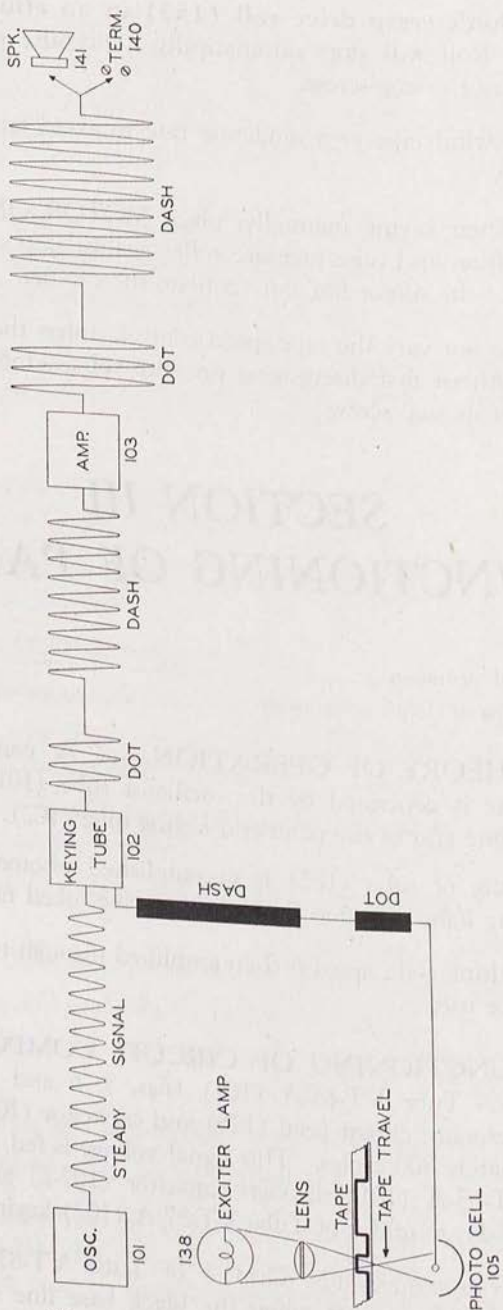


Figure 5.—Functional block diagram.

(2) When the tape moves over the anvil the quantity of light received by photocell varies as the inked base line (fig. 4) or white space passes over the aperture.

(3) Photocell Tube VT-252 (105) permits current to flow when light from the exciter lamp (138) passes through the white portion of the tape and activates the photocell. This reduces the bias on grid 3 of the Tube VT-87-A (102).

*NOTE: Use potentiometer (125) to control the photocell voltage, making the cell respond properly to the light variations through the tape. Additional range of cell voltage may be obtained by adjusting potentiometer (126).*

(4) Tube (102) then functions as an amplifier and the resultant signal in its plate circuit takes the form of the recorded dots and dashes. The signal feeds through capacitor (110-1) into volume control (127), is adjusted to the desired level, and reaches the grid of Tube (103).

*c. Amplifier.*—Beam-power Tube VT-107-A (103) further amplifies the signal and feeds output transformer (131). Output transformer (131) transfers signal to low impedance output terminals (140). Capacitor (110-2) resonates output transformer primary to approximately 800 cycles.

*d. Power supply.*—D-C operating voltage is supplied by conventional full wave rectifier and filter system consisting of transformer (130), Tube VT-197-A (104), capacitor (113-1), filter choke (129), and capacitor (113-2).

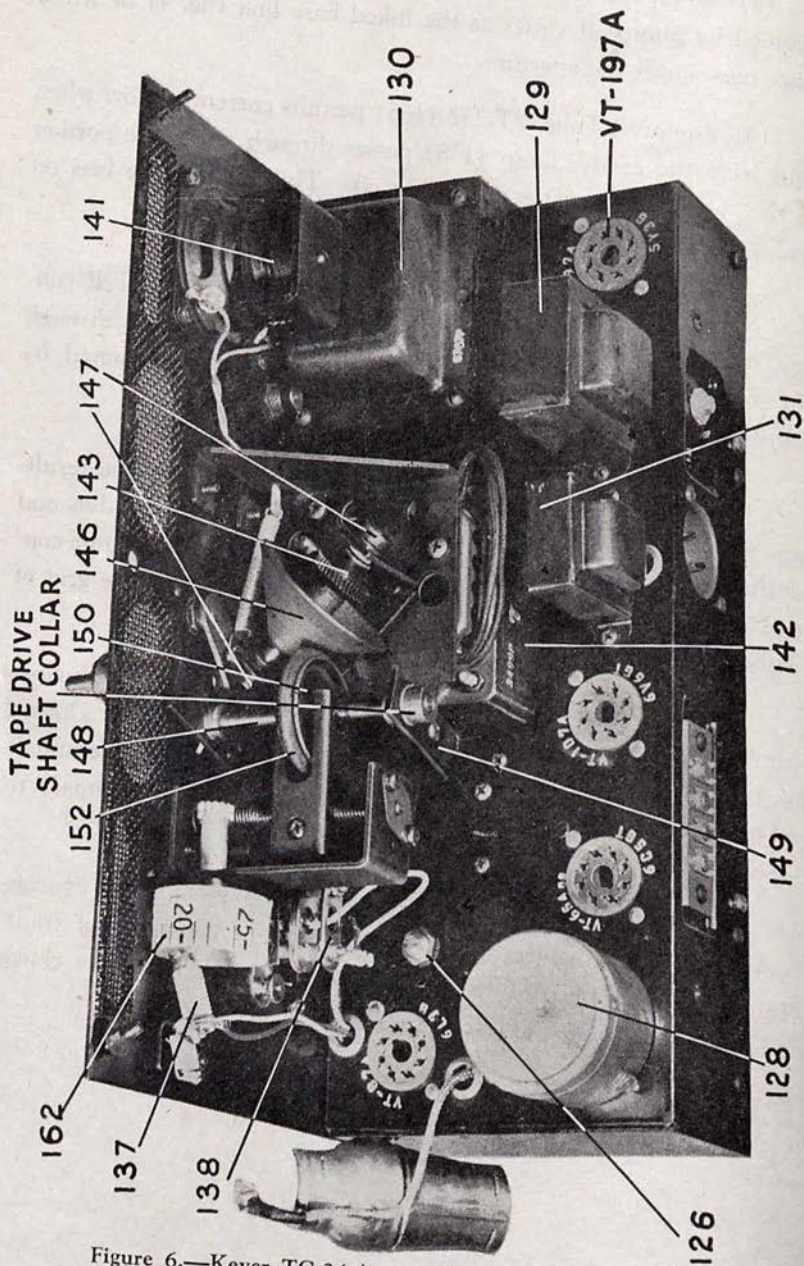


Figure 6.—Keyer TG-34-A, top view, cabinet removed.

## SECTION IV

# MAINTENANCE

	Paragraph
Inspection and minor adjustment .....	12
Lubrication .....	13
Removal and assembly of parts .....	14
Table of operating voltages, resistances, and currents .....	15
Trouble-location and remedy chart .....	16

**12. INSPECTION AND MINOR ADJUSTMENT (figs. 2, 3, and 6).**—*a.* To remove chassis from cabinet, loosen two holding screws located on upper corners of front panel and two holding screws located at sides of access cover in rear. Slide unit forward out of cabinet. An Allen wrench, spare exciter lamp, neoprene ring and spare belt are located in the upper right rear corner inside the cabinet. They are not available until the unit is removed from the cabinet.

*b.* Check all knobs to see that they are properly positioned, and tighten setscrews, if loose, with Allen wrench provided in cabinet.

*c.* Examine all guide rollers and be sure they rotate freely and evenly. For lubrication instructions see paragraph 13*a*.

*d.* Examine drive roll (153). If badly worn, pitted, or hardened, it should be replaced (par. 14*e*).

*e.* Check condition of spring take-up belt (154) and take-up reel (165). Under normal conditions these two parts should last indefinitely, but they must be replaced if they become damaged.

*f.* Inspect aperture in tape anvil (163). Blow sharply below front edge of anvil to clear any ordinary obstruction. If blowing proves unsuccessful, use fine wire to clear opening.

*g.* Set aperture for proper centering on tape base line (par. 8*a*). Turn on exciter lamp (138) (pars. 6*a* and *b*) and examine light spot to see if it centers on aperture. If spot is not properly centered, proceed as follows:

(1) Remove Tubes VT-87-A (102) and VT-65-A (101) from their sockets and loosen two knurled lamp bracket-mounting nuts located on studs at rear of panel.



(2) If spot is incorrectly positioned front to back.—

(a.) Slip lamp mounting bracket out from under nuts.

(b.) To move spot forward on anvil, shift spacing washers so as to move lamp bracket slightly farther back from panel.

(c.) To move spot farther back on anvil, shift washers so as to move lamp bracket slightly closer to panel.

(d.) Re-mount lamp bracket and partially tighten nuts.

(3) Move lamp bracket slightly up or down to obtain sharpest possible focus on tape anvil.

(4) Tighten mounting nuts.

NOTE: *When source of power is 115 volts, it is suggested that the 230-volt position of the voltage change-over switch (132) be used during this adjustment. The light spot is then of subdued intensity and is far easier to examine.*

h. If no signal is obtained, Tube VT-87-A (102) is still biased to cut-off, and cell voltage must be increased to start keying. If steady signal is obtained, photocell is permitting too much current to flow, and cell voltage must be reduced to start keying. If adjustment of PE CELL control (125) does not provide the necessary correction, a larger photocell voltage change may be obtained by adjusting potentiometer (126). First, remove the chassis from the cabinet (par. 12a). Set the PE CELL control (125) about mid-way. A screw-driver slotted control (126) is located on the chassis near the socket of Tube VT-87-A (fig. 6). Adjust this control until the proper signal is heard. This is a coarse adjustment (126) and PE CELL control (125) is the fine adjustment. Once potentiometer (126) is properly adjusted, use the PE CELL control (125) to obtain the desired signal.

NOTE: *Use of control (126) should be necessary only in cases of unusually low or high supply voltage or in cases where the performance of Tubes VT-252 (105) or VT-87-A (102) varies considerably from usual standards. If the supply voltage is known to be all right, try a new Tube VT-252, and/or VT-87-A to see if this will correct the trouble before making any adjustment of control (126).*

13. LUBRICATION.—*a.* After each 500 hours apply one or two drops of light oil to the bearing surfaces of each guide roller. Be careful not to get oil on rollers.

*b.* After each 500 hours oil the cone shaft bearing (145) and rape drive shaft bearings (149) with light oil.

*c.* Once a month renew the light oil in felt oilers on motor shaft, at top and bottom of motor (142). The fan requires no lubrication.

*d.* Keep motor worm and drive gear coated with a small amount of light grease or petrolatum.

*e.* Renew the light grease on rewind mechanism every 6 months. (See paragraph 14*d* for instructions on removal and assembly.)

**CAUTION:** Oil or grease on steel cone, neoprene drive ring, or rubber drive roll will impair operation. Remove any such lubricant with carbon tetrachloride or benzine.

14. REMOVAL and ASSEMBLY OF PARTS (figs. 2, 3, and 6).—*a.* *Tape-drive shaft, and driven-wheel assembly.*—(1) Remove spring belt (154).

(2) Loosen setscrew on rear tape-drive shaft collar (fig. 6). An Allen wrench (168) for this purpose is part of maintenance kit in upper right-hand corner of keyer cabinet.

(3) Hold driven-wheel assembly (150) with your left hand and pull shaft (148) forward with right hand to release driven-wheel, which then may be lifted upward.

(4) If drive ring (152) is to be replaced, remove it by cutting and roll a new neoprene ring into place, being careful not to twist it in the process. Spare drive ring is also supplied in the maintenance kit.

*b.* *Cone, cone shaft, and gear and hub assembly (fig. 2).*—(1) Loosen setscrew in gear and hub assembly (143). Also loosen setscrews on cone (146) and cone shaft collars (147).

(2) Slide out cone shaft (144).

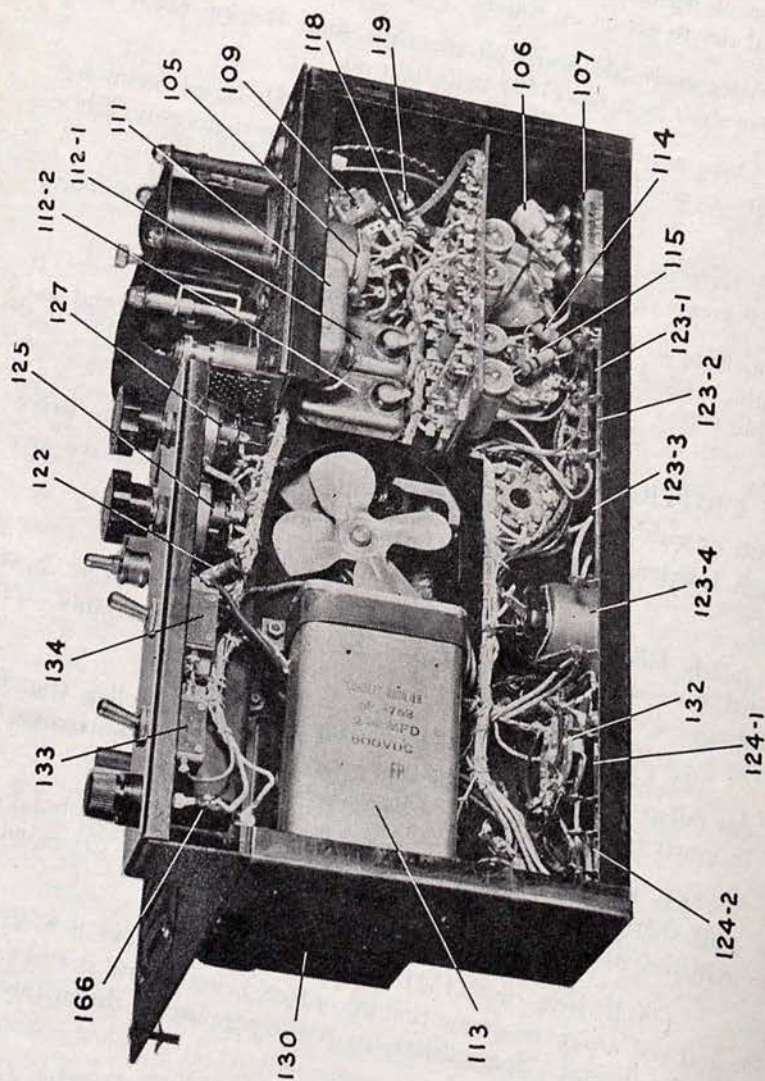


Figure 7.—Keyer TG-34-A, bottom view.

(3) Replace gear and hub (143) or cone (146) if worn, and slide the shaft back in place.

*NOTE: Do not attempt to clean surface of cone by means of any abrasive material. If cleaning is necessary use a suitable solvent, such as carbon tetrachloride.*

(4) Tighten the cone shaft collars in such a position as to allow a very slight end play in the shaft.

(5) Engage the fiber gear of gear and hub assembly (143) with worm on top end of motor shaft, and adjust position of gear so that it will run freely and have no tendency to bind.

*NOTE: This adjustment may often be facilitated by loosening the screws which hold cone drive shaft bracket (145) to motor support, and slightly shifting position of bracket.*

c. *Motor (142).*—(1) Disconnect the four motor leads, two from voltage change-over switch (132) and two from motor switch (134) (figs. 2 and 7).

(2) Remove the speed control knob (160).

(3) Remove the tape-drive shaft (148) (figs. 2 and 6). This operation is described in paragraph 14a.

(4) Free the pressure-roller cam spring from motor support.

(5) Remove the four screws which hold motor support to panel. This will permit removal of motor and motor support.

(6) Remove the three screws equidistant from the motor shaft to separate motor from support.

(7) Reassemble in the reverse order, adjusting motor worm and gear and hub assembly (par. 14b.). Connect motor leads as shown in figure 8.

d. *Rewind mechanism.*—(1) Remove four screws which hold rewind mechanism to cover. This releases mechanism.

(2) Insert screw driver into slots in back and bend the ears against chain to take up any slack which may have developed. For lubrication instructions see paragraph 13e.

(3) Reassemble on unit and tighten the four screws securely.

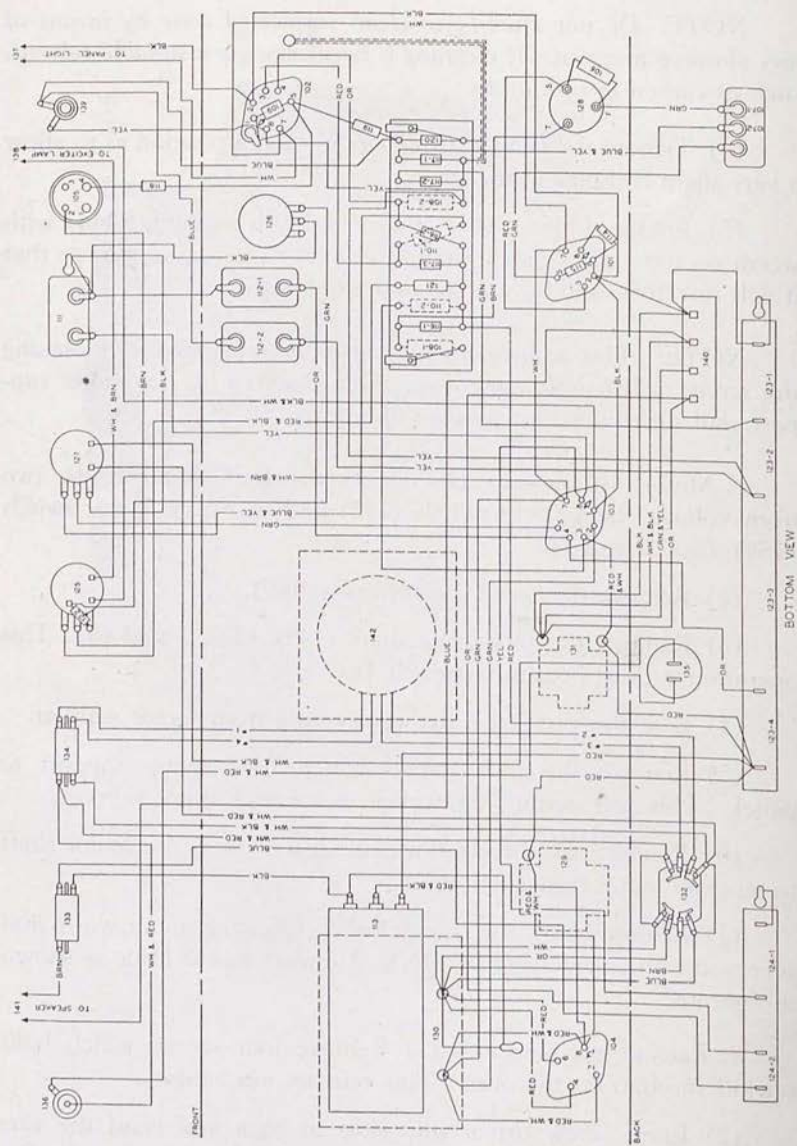


Figure 8.—Practical wiring diagram.

*e. Drive roll.*—(1) Remove acorn nut (fig. 1) on outer end of tape-drive shaft (148).

(2) Remove washer (151) (fig. 3) and drive roll (153).

(3) Replace with new roll and reassemble.

*f. Exciter-lamp socket assembly.*—(1) Remove Tubes VT-65-A (101) and VT-87-A (102) from their sockets.

(2) Loosen knurled nuts which secure exciter-lamp socket.

(3) Lift up on exciter-lamp socket and pull outward with a slight twisting motion to unhook first one supporting ear and then the other.

(4) Turn exciter lamp (138) slightly to the left to release it from the socket.

(5) Insert new lamp and turn slightly to the right to lock it in socket.

(6) Reinstall exciter-lamp socket. For detailed instructions on proper positioning of exciter-lamp, see paragraph 12g.

*g. Photocell housing assembly.*—(1) Loosen two screws (fig. 1), on lower right portion of front panel, which secure photocell housing.

(2) Lift housing upward with slight twisting motion. This will release the assembly.

(3) Photocell may then be removed for inspection by pulling it straight out.

*NOTE: Photocells last a long time. If used properly, replacements are seldom necessary.*

(4) Before reinstalling photocell housing, make sure that the opening beneath tape anvil is clear of any lint or other obstruction.

(5) Reinstall housing and tighten two screws securely.

*h. Tape anvil.*—(1) Remove photocell housing. For detailed instructions, see paragraph 14g.

(2) Remove C-washer and small flat washer from groove on anvil adjusting screw (fig. 4).

*NOTE: These two washers may easily be lost. Be careful when handling them.*

- (3) Remove four acorn nuts and photocell housing end plate.
- (4) Slide the tape anvil from tape guides.
- (5) Spring the tape guides slightly to slide the new anvil into place.
- (6) Reinstall cell housing end plate and four acorn nuts.
- (7) Install flat washer and C-washer.
- (8) Place cell housing in position and secure by tightening two holding screws.

*i. Power transformer.*—(1) Disconnect speaker (141) by unsoldering the two wires.

(2) Remove four screws that secure speaker to panel and remove speaker.

(3) Remove two mounting-bracket screws, nuts and lock washers on capacitor (113) (fig. 7).

(4) Slip capacitor from its clip and swing it over the fan opening without disconnecting capacitor wiring.

(5) Disconnect 11 transformer wires (fig. 8).

(6) Remove four transformer mounting nuts and lock washers, and lift out transformer (130) (fig. 6).

(7) Replace transformer and reassemble in the reverse order, finally reinstalling speaker (141) and reconnecting two speaker wires.

*j. Oscillator coil.*—(1) Loosen two nuts that hold resistor-card brackets (fig. 7) to chassis, and tip resistor card toward front of unit.

(2) Unsolder the five wires which are connected to the oscillator coil (128). These wires include leads to capacitor (106).

(3) Remove two coil holding nuts and lock washers; this will release the strap-mounted capacitor (106) which may then be removed.

(4) Lift oscillator coil (128) from top of chassis.

(5) Install new coil, making sure that the tap which has a mounting lug close beside it is so positioned as to connect to the

brown wire (fig. 8). In reassembling take steps in reverse order. Remember to finish by securely tightening two resistor-card mounting nuts.

**CAUTION:** When tightening coil mounting nuts, do not exert pressure enough to distort shield can.

*k. Auxiliary cell control.*—(1) Remove photocell housing and photocell (105) (par. 14g).

(2) Unsolder two wires that connect to auxiliary cell control (126).

(3) Remove two screws, nuts and lock washers that hold photocell socket to chassis apron, and swing socket toward resistor card.

(4) Remove nut and lock washer that secure control to chassis, and take out control.

(5) Install new control and reassemble in reverse order, finally reinstalling photocell housing.

*l. Capacitors (112-1 or 112-2).*—(1) Unsolder wires which connect to capacitor (111).

(2) Remove photocell housing (par. 14g).

(3) Take out two screws, nuts and lock washers that hold capacitor (111) to chassis apron, and remove the capacitor.

(4) Unsolder wires connecting to capacitor (112-1 or 112-2) (fig. 8).

(5) Remove two holding screws on capacitor to be replaced, and lift out capacitor.

(6) Replace with new capacitor and resolder connecting wires.

(7) Reinstall capacitor (111) and reconnect wires.

(8) Reinstall photocell housing.

**15. TABLE OF OPERATING VOLTAGES, RESISTANCES, AND CURRENTS.**—All d-c voltages measured with 20,000 ohms/volt voltmeter. Resistances measured with standard ohm-meter. Before making tests, adjust AC OFF VOLUME (127)



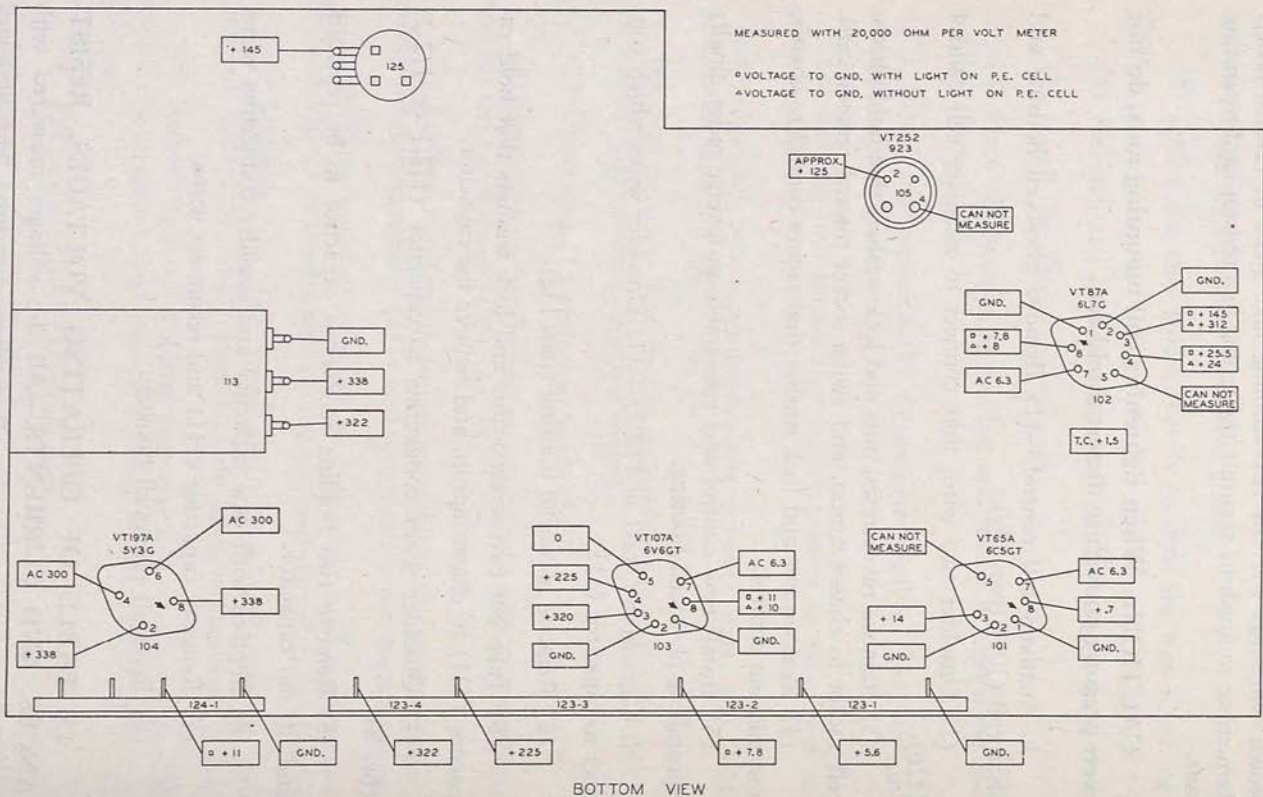


Figure 9.—Socket lay-out, voltage diagram.

to full clockwise position and PE CELL (125) and auxiliary cell control (126) to approximate center positions. All ohms readings made with power disconnected.

a. Oscillator Tube VT-65-A (101).

Voltage and Resistance		
Pin	Volts	Ohms
1 to ground	—	0.0
2 to ground	—	0.0
3 to ground	+14.0	1.02 meg
3 to capacitor (113-2)	+308.0	1 meg
4 (no connection)	—	—
5 to ground	Cannot measure	50,000
6 (no connection)	—	—
7 to ground	6.3 (a-c)	—
8 to ground	+0.7	2,000

Current	
Plate current	0.32 ma

b. Amplifier Tube VT-87-A (102).

Voltage and Resistance		
Pin	Volts	Ohms
1 to ground	—	0.0
2 to ground	—	0.0
3 to ground	+145.0 □ +312.0 △	520,000
4 to ground	+25.5 □ +24.0 △	1 meg

□ Indicates voltage or current when light is on photocell.

△ Indicates voltage or current when no light is on photocell.

## b. Amplifier Tube VT-87-A (102) (continued)

Voltage and Resistance		
Pin	Volts	Ohms
5 to ground	Cannot measure	10 megs
6 (no connection)	—	—
7 to ground	6.3 (a-c)	—
8 to ground	+7.8 □ +8.0 △	490
Top cap to ground	+1.5	500,000

Current	
Plate current	0.32 ma □ 0.0 ma △
Screen current	0.3 ma □ 0.32 ma △

## c. Amplifier Tube VT-107-A (103).

Voltage and Resistance		
Pin	Volts	Ohms
1 to ground	—	0.0
2 to ground	—	0.0
3 to ground	+320.0	20,000
3 to capacitor (113-2)	+2.0	280
4 to ground	+225.0	15,500
5 to ground	—	100,000
6 (no connection)	—	—
7 to ground	6.3 (a-c)	—
8 to ground	+11.0 □ +10.0 △	285

□ Indicates voltage or current when light is on photocell.

△ Indicates voltage or current when no light is on photocell.

## c. Amplifier Tube VT-107-A (103) (continued)

Current	
Plate current	32.2 ma
Screen current	2.9 ma

## d. Rectifier Tube VT-197-A (104).

Voltage and Resistance		
Pin	Volts	Ohms
1 (no connection)	—	—
2 to ground	+338.0	20,000
3 (no connection)	—	—
4 to ground	300.0 (a-c)	100
5 (no connection)	—	—
6 to ground	300.0 (a-c)	100
7 (no connection)	—	—
8 to ground	+338.0	20,000
8 to pin 2	5.0 (a-c)	—
8 to capacitor (113-2)	+16.0	235

Current	
Direct current to filter	55.0 ma

## e. Photocell Tube VT-252 (105).

Voltage and Resistance		
Pin	Volts	Ohms
1 (no connection)	—	—
2 to ground	+125.0 (approx.)	46,000 (approx.)
3 (no connection)	—	—
4 to pin 5 of (102)	Do not attempt to measure. Damage to (105) may result.	5 megs
4 to ground		15 megs

f. Resistors (121 and 122) and potentiometers (125 and (126).—Total current, 2.0 ma.

g. Resistor (123-1).—Total current, 18.0 ma.

h. Oscillator coil (128).—Resistance: S to T, 375 ohms; T to F, 435 ohms; S to F, 810 ohms.

NOTE: Due to variations in transparency of tape and opacity of inked line, readings may deviate slightly from those shown.

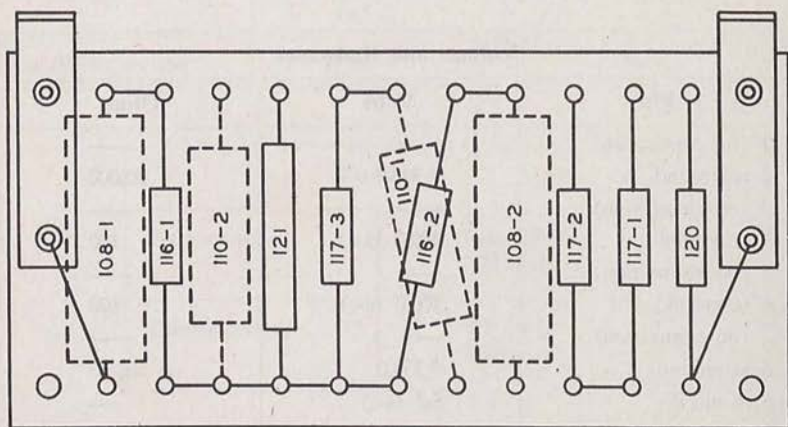


Figure 10.—Resistor card.

## 16. TROUBLE-LOCATION AND REMEDY CHART.—

a. No signal in speaker or at terminals. Tubes, exciter lamp, and panel lamp fail to light. Motor will not run.

Possible trouble	Suggested Remedy
(1) No voltage from a-c input supply.	Check to make certain that power is available.
(2) Blown fuse. (If voltage change-over switch (132) is set for 115 volts and unit is plugged in on 230 volts, the fuse will blow. The exciter and pilot lamps may also burn out.)	Make certain that the power supply used agrees with that shown on name plate, and that voltage change-over switch is in proper position. Replace fuse, and test again. Repeated failure indicates more serious trouble.
(3) Poor contact in a-c input receptacle (135) or in power cord (167).	Test each for proper operation. Make sure that contact springs have proper tension. Replace parts if necessary.

Possible trouble	Suggested Remedy
(4) Broken or worn AC OFF VOLUME switch on volume control and switch assembly (127).	Replace AC OFF VOLUME control and switch assembly (127). (In an emergency, switch may be temporarily shorted out by soldering a wire across switch terminals.)

b. No signal in speaker or at terminals. Tubes, exciter lamp and panel lamp fail to light. Motor runs.

Possible trouble	Suggested Remedy
(1) Defective or broken voltage change-over switch (132).	Replace defective part.
(2) Burned out power transformer (130).	Replace defective part (par. 14i).

c. No signal in speaker or at terminals. Tubes, exciter lamp and panel lamp light. Motor runs.

Possible trouble	Suggested Remedy
(1) One or more controls or switches are improperly adjusted.	See paragraph 9a.
(2) One or more tubes may be inoperative.	Replace tubes one at a time with new ones until inoperative one is located.
(3) Filter capacitor (113) may be shorted.	Check each section with ohmmeter or by substitution and replace part, if one is shorted.
(4) Filter choke (129) may be open.	Check at capacitors (113-1) and (113-2) for voltage. If found at capacitor (113-1) and not at capacitor (113-2) replace filter choke (129).
(5) Output transformer (131) may have open primary.	Check for plate voltage at pin 3 of Tube VT-107-A (103). If no plate voltage appears, replace output transformer.
(6) May have improper voltage on pin 2 of photocell (105):	Adjust PE CELL control (125) and auxiliary cell control (126) (par. 9a). Check for voltage indicated in paragraph 15. If excessively low voltage is found, replace resistor (121) and/or PE CELL control (125).

Possible trouble	Suggested Remedy
(7) May have insufficient light reaching photocell (105).	Adjust and clean aperture (par. 12f). Adjust and refocus exciter lamp (par. 12g).
(8) Photocell (105) may not function to remove blocking bias on grid 3 (pin 5) of Tube VT-87-A (102).	Check photocell by substitution (par. 14g).
(9) Capacitor (109) may be shorted.	Check with ohmmeter from pin 5 on Tube VT-87-A (102) to ground. If resistance is less than 8 megohms, replace capacitor (109).
(10) Resistor (118) may be open.	Check with ohmmeter from pin 5 on Tube VT-87-A (102) to pin 4 on photocell (105). If more than 6 or less than 4 megohms, replace resistor (118).
(11) Resistor (116-1) may be open.	Check with ohmmeter from brown lead of tap of oscillator coil (128) (fig. 8) to capacitor (113-2). If more than 1.1 megohms or less than .9 megohms, replace resistor (116-1).
(12) Oscillator coil (128) may be open.	Check with ohmmeter from terminal S to terminal T and from terminal T to terminal F. (fig. 8). If resistance does not approximate that shown in paragraph 15, replace oscillator coil.
(13) Top cap clip of Tube VT-87-A (102) may be shorted to shielding braid of connecting lead.	Slide varnished tubing down along wire to expose end of shielding braid. Make certain that no loose strands can contact the top cap clip.

d. Steady signal. No keying even though tape runs past aperture properly and exciter lamp is on.

Possible trouble	Suggested Remedy
(1) PE CELL control (125) and auxiliary cell control (126) set too high.	Adjust as indicated in paragraph 12h.
(2) Photocell Tube VT-252 (105) shorted.	Replace photocell, and adjust as in paragraph 9a.
(3) Defective Tube VT-87-A (102).	Check by substitution and replace if indicated.

## e. Poor keying.

Possible trouble	Suggested Remedy
(1) PE CELL control (125) too low.	Adjust as indicated in paragraph 9a. and 12h.
(2) Aperture clogged with lint.	Clean as in paragraph 12f.
(3) Exciter lamp out of focus.	Adjust as in paragraph 12g.
(4) Poor tape.	Excessively dirty, faded, or worn tape requires careful adjustment of all controls and will seldom produce perfect keying.
(5) Defective Tube VT-87-A (102).	Check by substitution and replace if necessary.
(6) Unusually low or high power line voltage.	See paragraphs 3 and 12h.

## f. Low power output.

Possible trouble	Suggested Remedy
(1) Defective Tube VT-87-A (102).	Check by substitution and replace if necessary.
(2) Low power line voltage.	See paragraphs 3 and 4.

## g. Motor fails to start.

Possible trouble	Suggested Remedy
(1) Motor or other running parts need lubrication.	See paragraph 13.
(2) Low power line voltage.	Lift pressure roller (156) to lighten load. When motor starts release pressure roller and operate as usual.



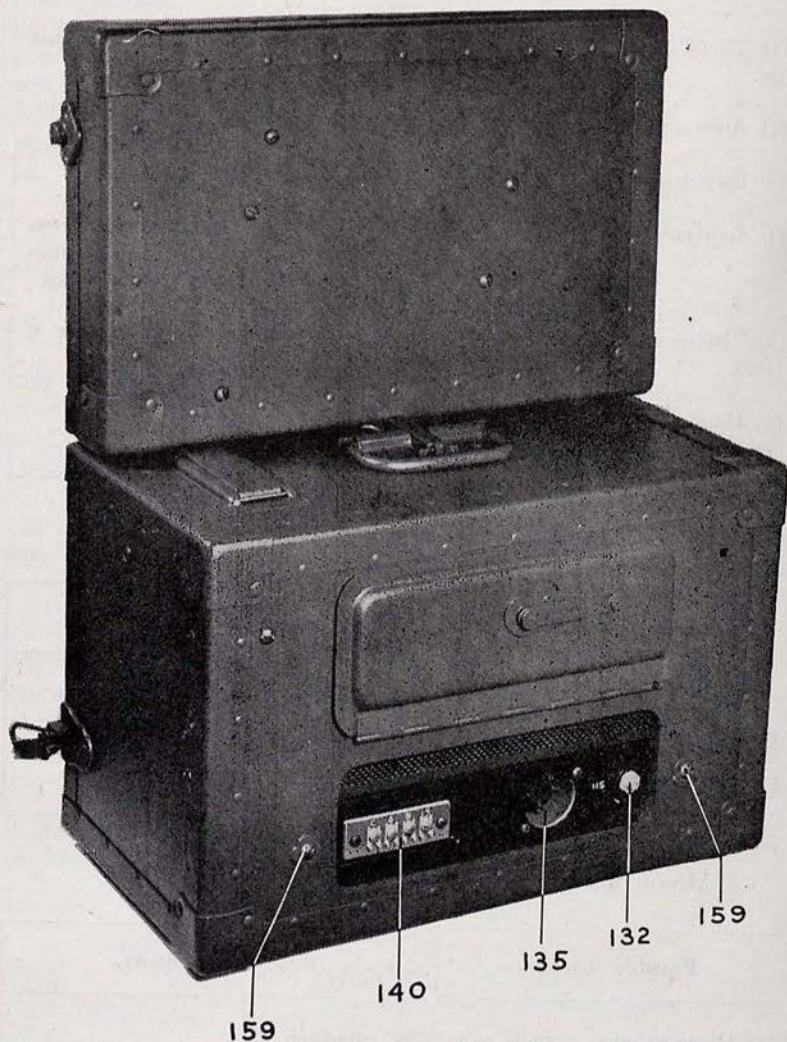


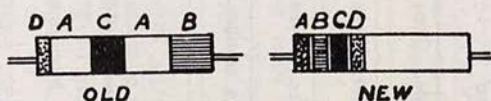
Figure 11.—Keyer TG-34-A, rear view.

# SECTION V

## SUPPLEMENTARY DATA

	Paragraph
RMA standard resistor color code .....	17
Table of replaceable parts .....	18
List of manufacturers .....	19

### 17. RMA STANDARD RESISTOR COLOR CODE



- A—Color for 1st significant figure.
- B—Color for 2nd significant figure.
- C—Color for No. of Ciphers or Multiplier.
- D—Gold or silver indicates tolerance, when applied.

Color	Significant Figure	Multiplying Value
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
Violet	7	10,000,000
Gray	8	100,000,000
White	9	1,000,000,000
Gold	5% Tolerance	0.1
Silver	10% Tolerance	0.01
No Color	20% Tolerance	—

#### EXAMPLES

500,000 ohms	Green (5)	Black (0)	Yellow (x10,000)
25,000 ohms	Red (2)	Green (5)	Orange (x1000)
100 ohms	Brown (1)	Black (0)	Brown (x10)

## 18. TABLE OF REPLACEABLE PARTS FOR KEYER TG-34-A

NOTE: The list of stock numbers is intended to supplement the Signal Corps General Catalog until such time as the Catalog is revised to include the stock numbers herein. ORDER REPLACEMENT PARTS BY STOCK NUMBERS AND DESCRIPTION.

Ref. Symbol	Quan. in Equip.	Sig. C. Stock No.	Name of Part and Description	Function	Mfr's. Code	Contr's. Part No.
101	*#1	2T65A	Tube, VT65A, detector amplifier, triode. Type 6C5GT.	Oscillator.	KR	5106P
102	*#1	2T87A	Tube, VT87A, pentagrid mixer, amplifier. Type 6L7G.	Keying tube.	KR	5105P
103	*#1	2T107A	Tube, VT107A, beam power amplifier. Type 6V6GT.	Output tube.	RA	5107P
104	*#1	2T197A	Tube, VT197A, full wave, high vacuum rectifier. Type 5Y3G.	Power supply.	KR	5108P
105	*#1	2T252	Photocell, VT252, gas. Type 923.	Automatic keyfng.	CE	2995P
106	#1	3DA16	Capacitor, fixed, paper, tubular, metal cased, .016 mfd., (minus 10% plus 20%), 600 volt, 1-1/8" x 1/2", with 1-3/8" tinned leads. Mounting strap. Type TVC.	Oscillator tuning.	CD	2914P
107-1	#1	3DA100-28	Capacitor, fixed, oil filled, metal cased, .1 mfd., (minus 10% plus 20%), 600 volt, 1" x 1-13/16" x 7/8". Cased with 107-2. Type DYRT.	Grid block-ing 101.	CD	2910P

# Available in depot stock.

\*Furnished with equipment as a "running" or "equipment" spare.

107-2			Capacitor, fixed, oil filled, metal cased, .1 mfd. (minus 10% plus 20%), 600 volt. Cased with 107-1.	Coupling 101 to 102.		
108-1	#2	3DA100-69	Capacitor, fixed, paper, tubular, metal cased, .1 mfd. (minus 10% plus 20%), 400 volt. Same as 108-2. Type TVC.	By-pass oscillator.	CD	2909P
108-2			Capacitor, same as 108-1.	By-pass, screen 102.		
109	#1	3K2051112	Capacitor, fixed, mica, .0005 mfd., (plus or minus 10%), 500 volt, 7/16" x 11/16" x 3/16" with 1" tinned leads. Type 5.	Keying filter. Grid of 102.	CD	2915P
110-1	#2	3DA16-1	Capacitor, fixed, paper tubular, metal cased, .016 mfd., (minus 10% plus 20%), 600 volt, 1-1/8" x 1/2" with 1-3/8" tinned leads. Same as 110-2. Type TVC.	Coupling 102 to 103.	CD	2908P
110-2			Capacitor, same as 110-1.	Resonating output.		
111	#1	3DB10-45	Capacitor, fixed, electrolytic, metal cased, hermetically sealed, 10 mfd., 50 volts, (minus 0% plus 150%), 1" x 1-13/16" x 7/8". Type AVLT.	By-pass cathode 103.	CD	2912P
112-1	#2	3DKA500-68	Capacitor, fixed, oil filled, metal cased, .5 mfd. (minus 10% plus 20%), 600 volt, 1" x 1-13/16" x 7/8". Same as 112-2. Type DYRT.	By-pass screen 103	CD	2911P
112-2			Capacitor, same as 112-1.	By-pass key.		

Ref. Symbol	Quan. in Equip.	Sig. C. Stock No.	Name of Part and Description	Function	Mfr's. Code	Contr's. Part No.
113-1	#1	3DB4-72	Capacitor, fixed, oil filled, 2 mfd. (minus 10% plus 30%), 600 volt, 2-1/2" x 4-3/4" x 1-3/16". Cased with 113-2. Type MC753.	Filter, power supply.	CD	2913P
113-2			Capacitor, fixed, oil filled, 4 mfd. (minus 10% plus 30%), 600 volt. Cased with 113-1.	Filter, power supply.		
114	#1	3Z6200-40	Resistor, insulated carbon, 2000 ohm (plus or minus 10%), 1/2 watt, 3/16" dia. x 5/8" with 1-1/2" tinned leads. Type C1/2, MB1/2.	Cathode 101.	CO ST	2815P
115	#1	3Z6650-52	Resistor, insulated carbon, 50,000 ohm (plus or minus 10%), 1/2 watt, 3/16" dia. x 5/8" with 1-1/2" tinned leads. Type C-1/2, MB1/2.	Grid 101.	CO ST	2816P
116-1	#2	3Z6801-36	Resistor insulated carbon, 1 megohm (plus or minus 10%), 1/2 watt, 3/16" dia. x 5/8" with 1-1/2" tinned leads. Same as 116-2. Type C1/2, MB1/2.	Voltage dropping, oscillator.	CO ST	2817P
116-2			Resistor, same as 116-1.	Screen 102.		
117-1	#3	3Z6750-31	Resistor, insulated carbon 500,000 ohm (plus or minus 10%), 1/2 watt, 3/16" dia. x 5/8" with 1-1/2" tinned leads. Same as 117-2 and 117-3. Type C1/2, MB1/2, BT1/2.	Isolating, oscillator output.	CO ST IR	2809P

117-2			Resistor, same as 117-1.	Grid No. 1, 102.		
117-3			Resistor, same as 117-1.	Plate 102.		
118	#1	3Z6805-13	Resistor, insulated carbon, 5 megohm (plus or minus 20%). 1/2 watt, 3/16" dia. x 5/8" with 1-1/2" tinned leads. Type C1/2, MB1/2.	Current limiting, 105.	CO ST	2818P
119	#1	3Z6810-20	Resistor, insulated carbon, 10 megohm (plus or minus 20%), 1/2 watt, 3/16" dia. x 5/8" with 1-1/2" tinned leads. Type C1/2, MB1/2.	Grid No. 3, 102.	CO ST	2819P
120	#1	3Z6610-57	Resistor, insulated carbon, 10,000 ohm (plus or minus 10%), 1/2 watt, 3/16" dia. x 5/8" with 1-1/2" tinned leads. Type C1/2, MB1/2, BT1/2.	Keying, cathode 102.	CO ST IR	2803P
121	#1	3Z6690-4	Resistor, insulated carbon, 90,000 ohm (plus or minus 10%), 1 watt, 1/4" dia. x 1-1/4" with 1-1/4" tinned leads. Type C1, MB1.	Voltage divider, 105.	CO ST	2820P
122	#1	3Z6625-37	Resistor, insulated carbon, 25,000 ohm (plus or minus 10%), 1/2 watt, 3/16" dia. x 5/8" with 1-1/2" tinned leads. Type C1/2, MB1/2, BT1/2.	Voltage divider, 105.	CO ST IR	2821P
123-1	#1	3Z6615-76	Resistor, metal clad, wire wound, 360 ohm (plus or minus 5%), 1/2 watt. Cased with 123-2, 123-3, 123-4. 13/16" x 1/4" x 6-15/16". Special design. Type MMR.	Voltage divider.	CL	2899P

Ref. Symbol	Quan. in Equip.	Sig. C. Stock No.	Name of Part and Description	Function	Mfr's. Code	Contr's. Part No.
123-2			Resistor, metal clad, wire wound, 135 ohm (plus or minus 5%), 1/2 watt. Cased with 123-1, 123-3, 123-4.	Voltage divider.		
123-3			Resistor, metal clad, wire wound, 15,000 ohm (plus or minus 10%), 8 watt. Cased with 123-1, 123-2, 123-4.	Voltage divider.		
123-4			Resistor, metal clad, wire wound, 5,000 ohm (plus or minus 10%), 6 watt. Cased with 123-1, 123-2, 123-3.	Voltage divider.		
124-1	#1	3Z6028E5-1	Resistor, metal clad, wire wound, 285 ohm (plus 10% minus 5%), 2 watt. Cased with 124-2. 13/16" x 1/4" x 3-7/16". Special design. Type MMR.	Self bias, 103.	CL	2891P
124-2			Resistor, metal clad, wire wound, 50 ohm (plus or minus 20%), 3 watt. Cased with 124-1.	Output load.		
125	#1	2Z7270.11	Potentiometer, 25,000 ohm, (plus or minus 10%), carbon, linear taper, with 6 ampere 6 volt SPST switch. Navy specs. 1-1/8" D.; shaft 1/4" D. x 1/2". Type 37W.	PE CELL control.	CL	2892P

126	#1	2Z7270.12	Potentiometer, 50,000 ohm (plus or minus 20%), carbon, linear taper. Navy specs. 1-1/8" D.; shaft 1/4" D. x 1/4" with screwdriver slot. Type 37W.	Auxiliary cell voltage adjustment.	CL	2893P
127	#1	2Z7271-18	Potentiometer, 100,000 ohm, (plus or minus 20%), carbon, audio taper, with 3 ampere 125 volt, 1 ampere 250 volt SPST switch. Navy specs. 1-1/8" D.; shaft 1/4" D. x 1/2". Type 37W.	AC OFF VOLUME control.	CL	2894P
128	#1	2Z9638-3	Coil, oscillator, assembly, 2.3 henry, center tapped audio choke in shield can, 2-3/16" D. x 1-7/16" H. with two mounting lugs spaced 2-5/16". Special design.	101 oscillator circuit.	WC	4230S
129	#1	3C325-7	Choke, filter, 10 henry, 70 milliamper, fully shielded, upright mounting. 2-3/8" H. x 2" W. x 2" L. with 2-1/2" mounting centers. Flexible leads, color coded. 235 ohm. Special design. Type A3737C.	Power supply.	AD	2709P
130	#1	2Z9608-3	Transformer, power, dual voltage, fully shielded. Primary 115/230 volts, 50/60 cycles. Three secondary windings: 620 volts, C.T., 60 M.A.; 5 volt, 2 ampere; 6.3 volt, 7.8 ampere, 3-7/8" H. x 3-1/8" W. x 3-3/4" L. with 3-1/8" x 2-1/2" mounting centers. Flexible leads. Color coded. Special design. Type A3736F.	Power supply.	AD	2707P

37 The words SPECIAL DESIGN indicate part made for, or by the contractor, especially for this equipment.



Ref. Symbol	Quan. in Equip.	Sig. C. Stock No.	Name of Part and Description	Function	Mfr's. Code	Contr's. Part No.
131	#1	2Z9632.59	Transformer, output, single VT107 to 4, 8, 15 ohms, fully shielded, upright mounting 2" H., 1-5/8" W., 1-9/16" L. with 2-1/16" mounting centers. Flexible leads, color coded. Special design. Type A3738C.	Plate of 103 to output terminals.	AD	2708P
132	#1	3Z9825-62.30	Switch, voltage change-over, rotary with 115/230 volt indicator flag, 1/4" dia., short shaft, screw-driver slotted. 3/8" x 32 thread for mounting in 3/8" hole. Special design. Type 25589-53.	Line voltage switch.	OA	2560P
133	#1	3Z9857.23	Switch, bat handle, toggle, SPDT, 3 ampere, 125 volt, 1 ampere, 250 volt. Type 21350CF.	SPEAKER ON OFF.	HH	2540P
134	#1	3Z9858-8.12	Switch, bat handle, toggle, DPST, 3 ampere, 125 volt; 1 ampere, 250 volt. Type 20902DN.	MOTOR ON OFF.	HH	2541P
135	1		Receptacle, AC input, flush mounting, male. Steel shell, parkerized. Type 61M10.	For AC power cord.	AM	2742P
136	*1	3Z3291-1	Fuse, set of 2: 250 volt, 2 ampere, 250 volt, 1 ampere. Type 3AG.	2 ampere for 115 volt operation. 1 ampere for 230 volt operation.	BU	2561P 2562P

137	#1	2Z5952	Lamp, panel, bayonet base, 6-8 volt, .15 ampere, 15/32" D. x 1-1/8" L. Type 47.	Illumines tape speed indicator.	GE	2552P
138	*1	6Z6806.7	Lamp, exciter, 6-8 volt, 32 candlepower, 1-3/8" x 2-3/32". Type 1133.	Illumines aperture.	GE	5120P
139	#1	2Z5581-3	Jack, key, 1-1/4" H. x 21/32" W. x 1-3/16" L., 3/8"-32 thread, mounts in 3/8" hole. Type A-1.	Key circuit.	MA	2570P
140	1		Strip, terminal, bakelite, 7/8" x 1/8" x 2-11/16" with 2-1/16" mounting centers. Four screw terminals marked C, 4, 8, 15. Type 4-60.	Output terminals.	JO	2737P
141	#1	6C34	Speaker, permanent magnet, dynamic, 2.5" x 2.5" x 1-5/8" D. Type 2ZM.	Output circuit.	CI	2200P
142	#1	3H3000-9	Motor, shaded pole, induction, dual voltage, single phase, 50/60 cycle, 115/230 volt, .36/.18 ampere, 1725 rpm at 60 cycles. 2-3/4" H. x 3-3/8" W. x 3-3/8" L. with 5/16" dia. x 5-1/8" shaft. Shaft extends 1/2" at bottom and has 1" worm at top. Four numbered flexible leads. Special design. Type 23200.	Powers tape puller.	GI	2499P
143	#1	4A1200D/514	Gear and hub, assembly, fiber and steel, parkerized. Gear .974" O.D., hub .50" O.D. Drilled for 1/4" shaft; tapped for 6-32 set screw. Type 61250.	Engages motor worm.	GI	2493P
144	#1	4A1200D/516	Shaft, cone, steel, parkerized. 1/4" dia. x 2.89".	Mounts cone.	WC	4121M

Ref. Symbol	Quan. in Equip.	Sig. C. Stock No.	Name of Part and Description	Function	Mfr's. Code	Contr's. Part No.
145	#1	4A1200D/513	Bracket, cone, with bearings; steel, parkerized, with bronze (oilite) bearings. "U" shaped, 1.62" H. x .625" W. x 2.33" L.	Mounts cone shaft on motor.	WC	4111S
146	#1	4A1200D/515	Cone, cast, iron, parkerized. 2.25" dia. x 1.185" L. drilled for 1/4" shaft.	Provides variable speed for tape puller.	WC	4122M
147	#2	4A1200D/579	Collar, cone shaft, steel, parkerized. 1/2" O.D., 1/4" I.D., 3/16" thick. Tapped for 6-32 set screw.	Secures cone.	WC	4123M
148	#1	4A1234A/4131	Shaft, tape drive, with sleeve: steel, parkerized. Shaft: 1/4" dia. x 5", end threaded 10-32 x 3/16". Sleeves 3/8" O.D., 1/4" I.D., .66" long. Special design.	Mounts drive roll and driven wheel.	WC	4131S
149	#1	4A1234A/4105	Rocker and bearings, steel, parkerized, with bronze (oilite) bearings. 2.5" H. x .75" W. x 3.25" L. Special design.	Mounts tape drive shaft.	WC	4105S
150	#1	4A1234A/4135	Wheel, cone driven, assembly; steel, parkerized, with neoprene ring. 1-3/4" O.D. Special design.	Mounts on tape drive shaft.	WC	4135S
151	#2	6L58024-2	Washer, steel, parkerized, .94" O.D., .25" I.D., thickness .062".	Supports tape drive roll.	WR	2508P

152	*#1	4A1200D/527	Ring, drive, neoprene, 1-1/2" O.D. x 1" I.D., 1/4" dia. stock. Type 1815.	Part of driven wheel assembly.	AT	2519P
153	#1	4A1200D/532	Roll, drive, gum rubber, 1" dia. x 1/2" with 1/4" hole. Type K-88.	Pulls paper tape.	AT	2515P
154	*#1	4A1200B/573	Belt, spring, steel music wire, zinc plated. Wire dia. .016", spring dia. .11", length 11-3/4".	Drives take-up reel.	AV	2666P
155	#1	4A1234A/4146	Cam, assembly, steel, parkerized, 5/8" x 1-9/16". Special design.	Disengages tape drive shaft.	WC	4146S
156	#1	4A1234A/4160	Roller, pressure, assembly. Arm: steel, parkerized 5/8" x 1-9/16". Roller: brass, nickel plated 3/4" D. x 5/8". Special design.	Holds tape against drive roll.	WC	4160S
157	#1	4A1234A/4145	Bushing, pressure roller, panel, steel, parkerized. 9/16" hex. stock, 5/16" I.D. x .405", threaded 15/32"-32. Special design.	Provides bearing for cam assembly.	WC	4145M
158	#3	4A1234A/707	Screw, special shouldered, steel parkerized, 8-32 x 1/4". Special design.	Secure rocker and pressure roller spring.	WC	707P
159	#4	4A1234A/705	Screw, special relieved, steel parkerized, 8-32 x 25/32". Special design.	Secure unit in cabinet.	WC	705P

Ref. Symbol	Quan. in Equip.	Sig. C. Stock No.	Name of Part and Description	Function	Mfr's. Code	Contr's. Part No.
160	#1	2Z5748.18	Knob, fluted, black plastic, 1-1/8" dia. x 5/8" with metal insert for 1/4" shaft.	Tape speed control.	CR	2564P
161	#2	2Z5748.17	Knob, fluted, black plastic, with white arrow, 1-1/8" dia. x 5/8", with metal insert for 1/4" shaft.	AC OFF VOLUME and PE CELL.	CR	2563P
162	#1	4A1200D/566	Dial, speed indicator, assembly. Dial, cellulose acetate. Support, steel parkerized. 1-1/2" O.D., 3/4" W., punched for No. 6 mounting screw.	Indicates tape speed.	WC	4109S
163	#1	4A1234A/4034	Anvil, tape, steel, nickel plated, polished. Thickness .050", aperture .020" dia. Special design.	Provides photocell aperture.	WC	4034M
164	#1	4A1234A/4141	Shaft, take-up reel, assembly, steel, parkerized, includes 5/32" steel ball and spring. 5/16" square stock. 2.11" L. Special design.	Mounts take-up reel.	WC	4141S
165	#1	4A1234A/2393	Reel, tape, steel, parkerized and painted. 7" dia. 3/4" W. Type 16 M.M.	Tape take-up.	IT	2393P
166	#1	3Z1939.1	Fuseholder, black bakelite, fits 3AG or 4AG fuse. 5/8" mounting hole. Type HCM.	Mounts line fuse.	BU	2740P

167	#1	3E7183	Cord, power, No. 18 two-conductor, type SV, rubber covered, 1/4" D. x 8 ft. with molded rubber male plug and Amphenol 61-F11 female connector.	Connects to power source.	WC	4037S
168	*#1	6R57400-6	Wrench, Allen head, tool steel, blued, 1/16" hexagon stock, 1-3/4" x 9/16". Type 5 & 6.	Fits various set screws.	PK	2971P
169	#	6R15421	Screwdriver, wood handle, Phillips, 3" blade. Type P-101.	Small tool.	PA	2974P
170	#	6R15465	Screwdriver, insulating handle, blade 1/8" x 3". Type R-183.	Small tool.	PA	2973P
171	#	6L80013	Set, nuts, screws, and washers.	Standard commercial items.		
172	*#2		Manual, technical, TM 11-443, 5-1/2" x 8-1/2".	Instruction book.		6071P

# Available in depot stock.

\*Furnished with equipment as a "running" or "equipment" spare.

The words SPECIAL DESIGN indicate part made for, or by the contractor, especially for this equipment.

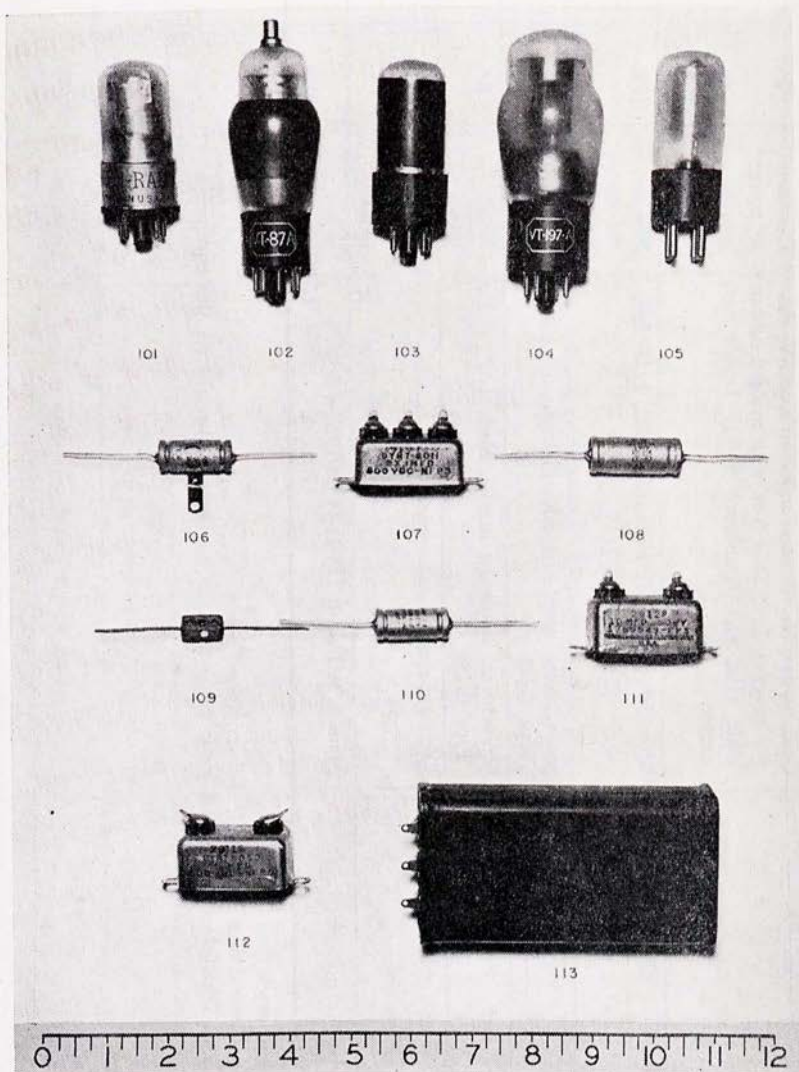


Figure 12.—Keyer TG-34-A, replaceable parts 101 to 113.

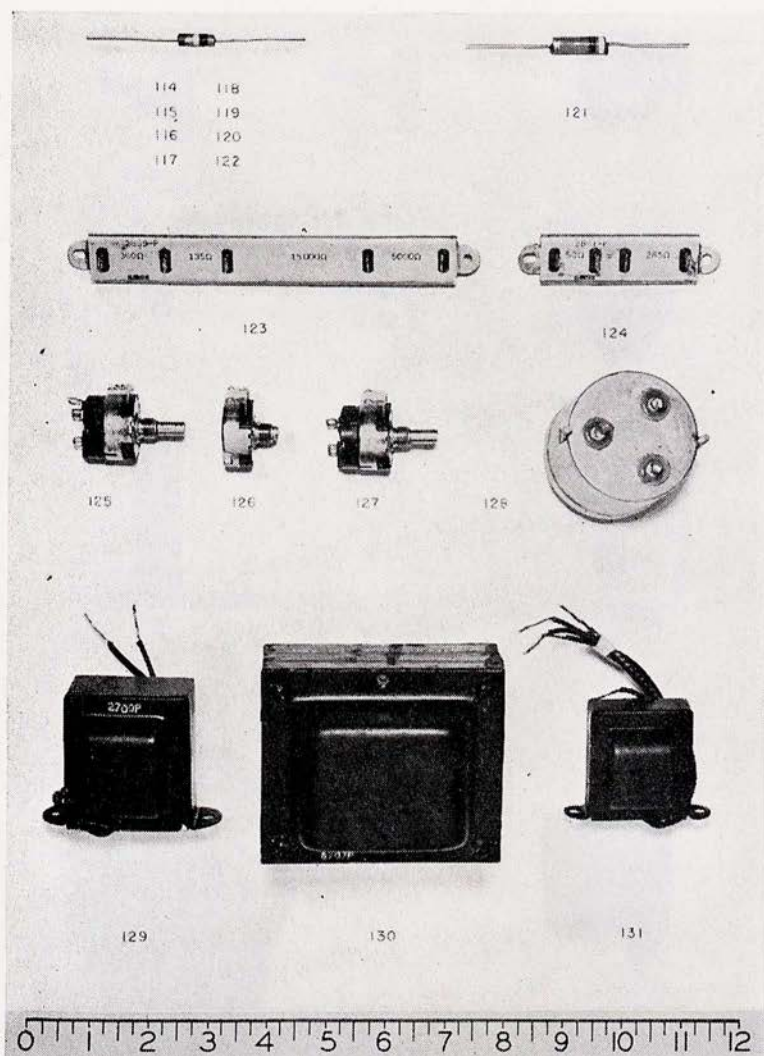


Figure 13.—Keyer TG-34-A, replaceable parts 114 to 131.



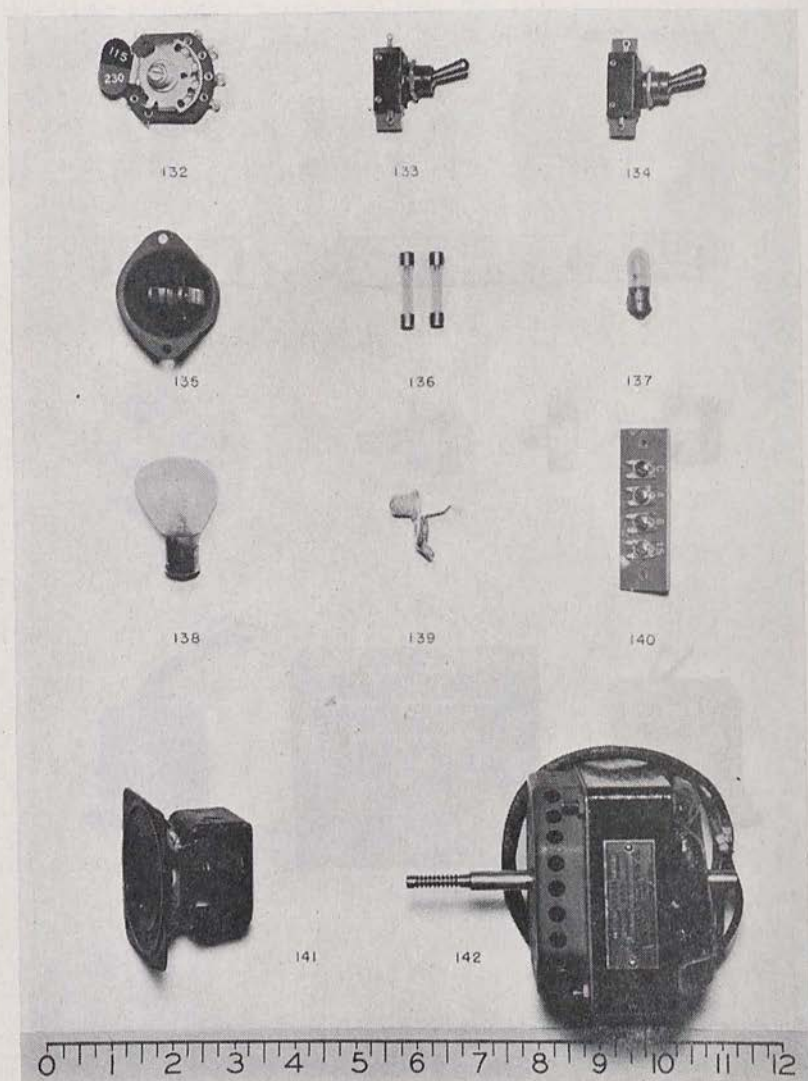


Figure 14.—Keyer TG-34-A, replaceable parts 132 to 142.

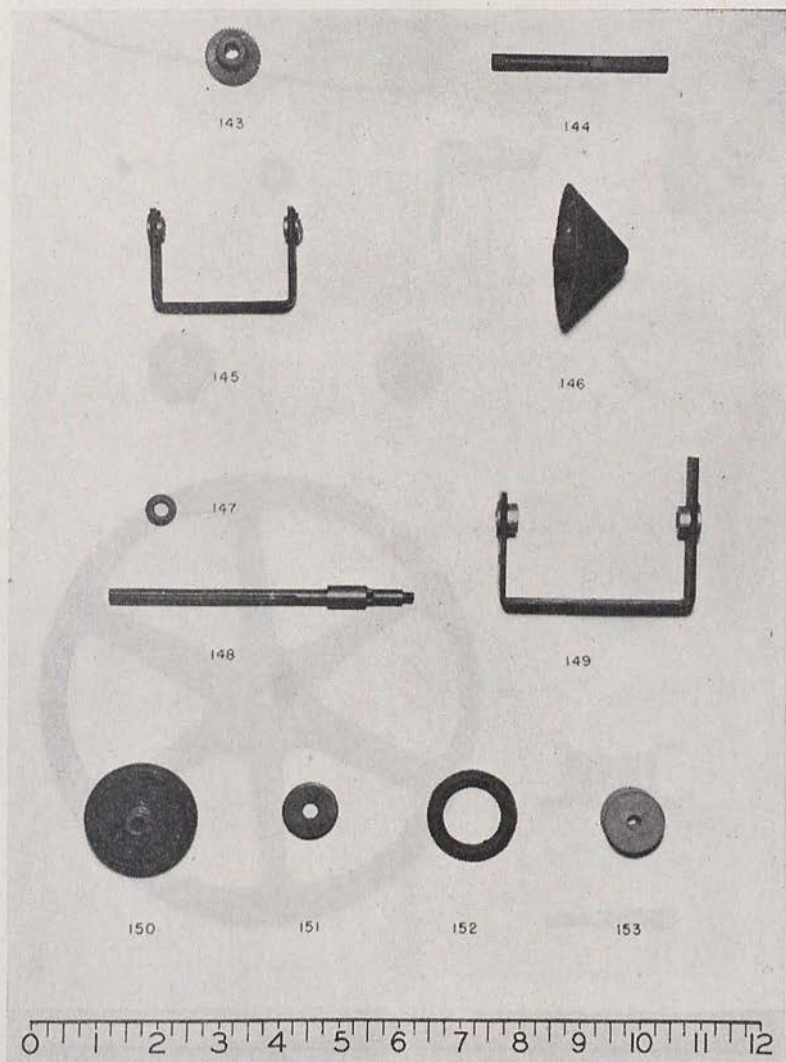


Figure 15.—Keyer TG-34-A, replacable parts 143 to 153.

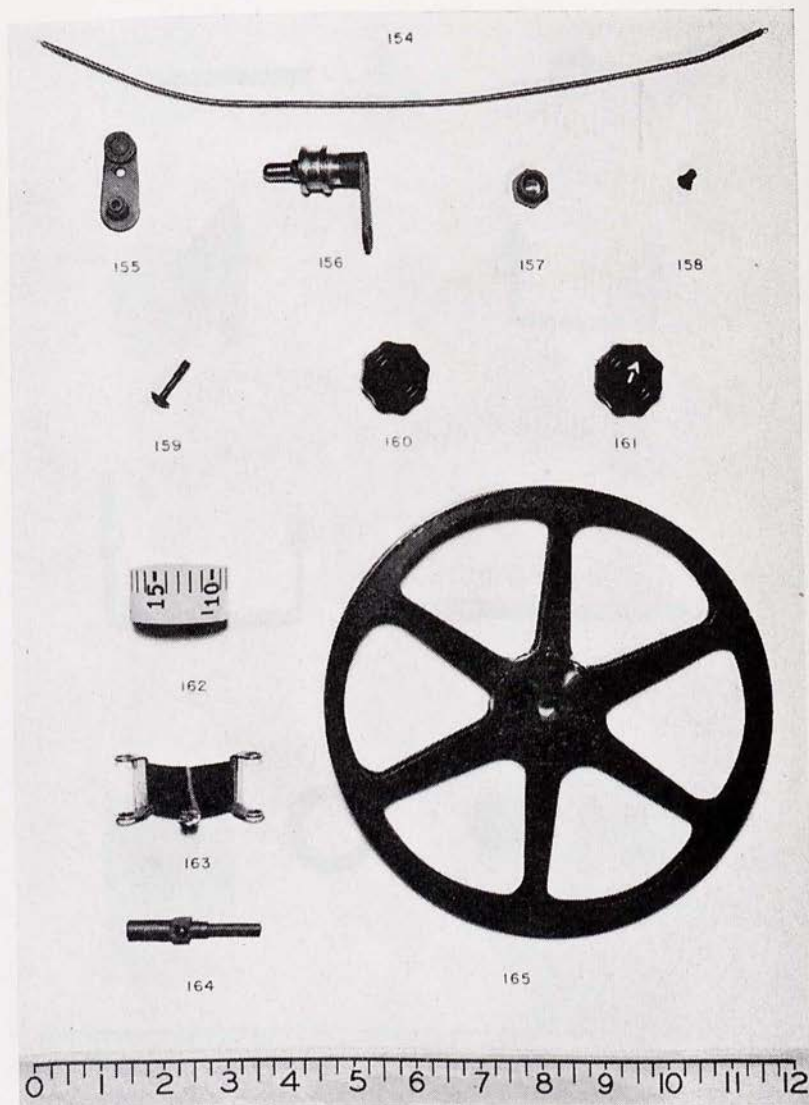


Figure 16.—Keyer TG-34-A, replaceable parts 154 to 165.

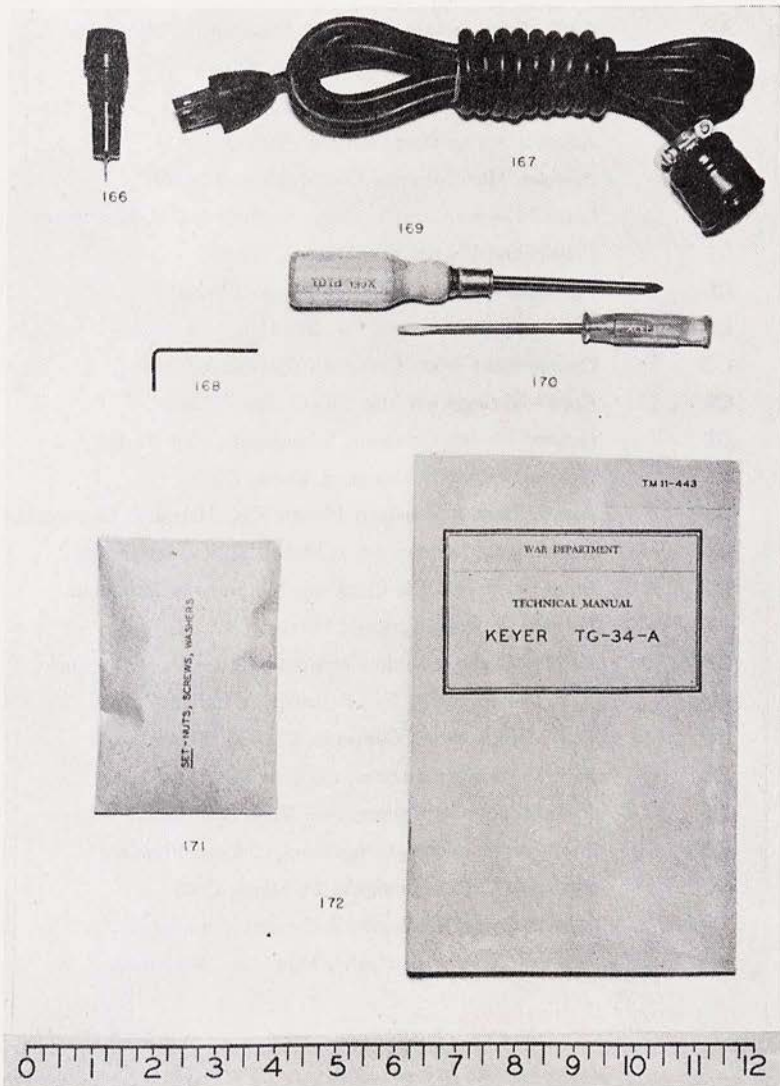


Figure 17.—Keyer TG-34-A, replaceable parts 166 to 172.

## 19. LIST OF MANUFACTURERS

Abbreviation	Name and Address
AD	Audio Development Company, Minneapolis, Minnesota
AM	American Phenolic Corp., Chicago, Illinois
AT	Atlantic India Rubber Co., Chicago, Illinois
AV	Advance Spring Corp., Chicago, Illinois
BU	Bussman Manufacturing Co., St. Louis, Missouri
CD	Cornell-Dubilier Electric Corp., South Plainfield, New Jersey
CE	Continental Electric Co., Geneva, Illinois
CI	Cinaudagraph Speakers Inc., Chicago, Illinois
CL	Clarostat Manufacturing Co., Brooklyn, New York
CO	Continental Carbon Company, Cleveland, Ohio
CR	Crowe Nameplate & Mfg. Co., Chicago, Illinois
GE	General Electric Company, Schenectady, New York
GI	General Industries Company, Elyria, Ohio
HH	Arrow, Hart & Hegeman Electric Co., Hartford, Connecticut
IR	International Resistance Co., Philadelphia, Pennsylvania
IT	Industrial Tool & Die Company, Minneapolis, Minnesota
JO	Howard B. Jones, Chicago, Illinois
KR	Ken-Rad Tube & Lamp Corporation, Owensboro, Kentucky
MA	P. R. Mallory & Co., Inc., Indianapolis, Indiana
OA	Oak Manufacturing Company, Chicago, Illinois
PA	Park Metalware Company, Orchard Park, New Jersey
PK	Parker-Kalon Corporation, New York, New York
RA	Raytheon Production Corporation, Chicago, Illinois
ST	Stackpole Carbon Company, St. Marys, Ohio
WC	Waters Conley Company, Rochester, Minnesota
WR	Wrought Washer Company, Milwaukee, Wisconsin

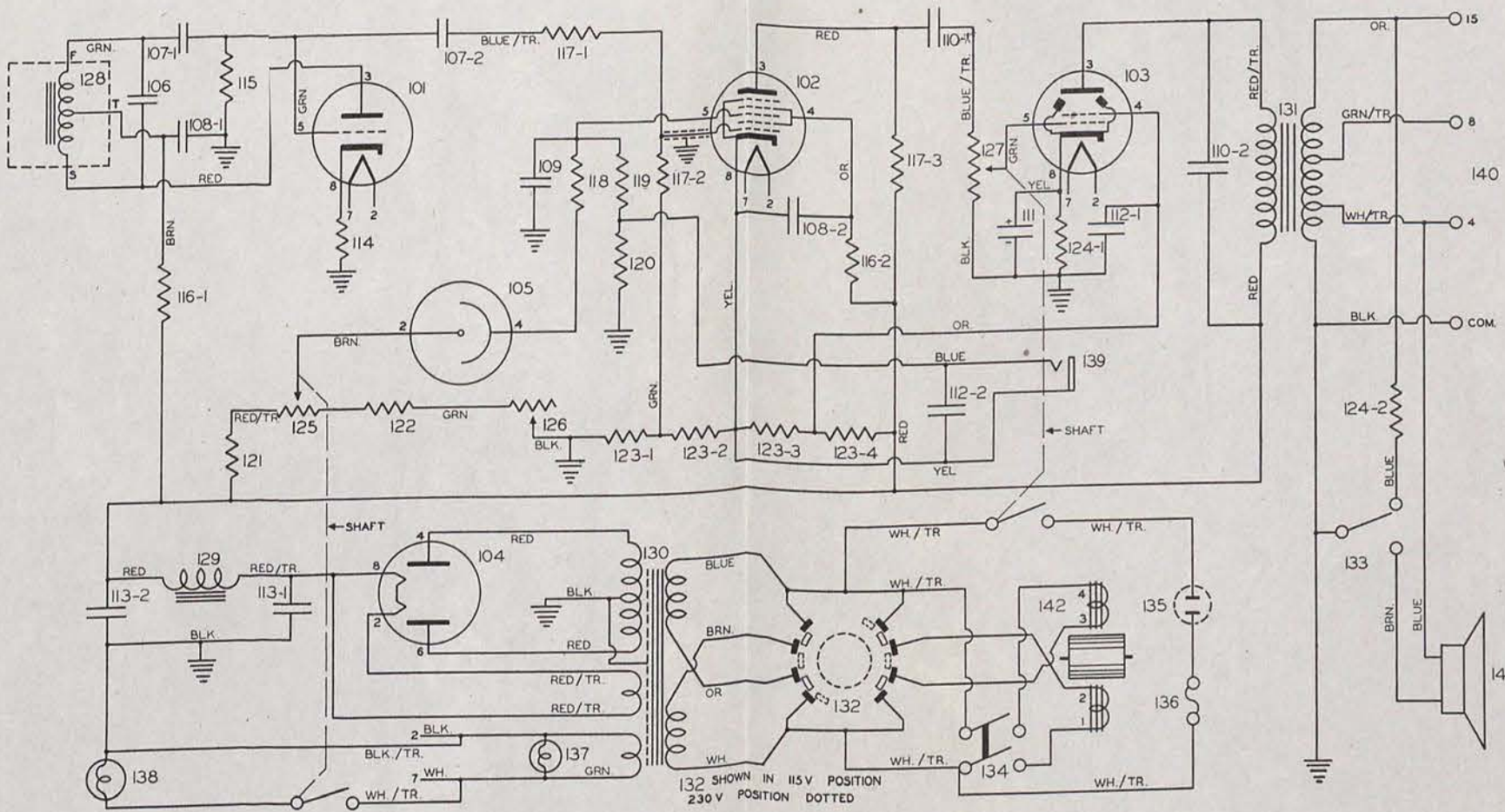


Figure 18.—Keyer TG-34-A, circuit diagram.