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TECHNICAL MANUAL

TELEPHONE REPEATER TP-14

CHANGES No. 1

DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., *8 November 1950*

TM 11-2007, 19 February 1945, is changed as follows:

Section I. DESCRIPTION

Note (added). Telephone Repeater TP-14 procured on Order Nos. 12013-Phila-49 and 19576-Phila-49 is similar to Telephone Repeater TP-14 described in this technical manual except as noted in these changes.

8.1 Noise Suppression
(Added)

To reduce vibrator noise on the telephone repeaters procured on Order Nos. 12013-Phila-49 and 19576-Phila-49, a resistor R53 has been inserted between C24 and the common connection of terminal 10 of power transformer T3 and the rectifier. The description of resistor R53 is as follows: fixed; carbon; 8,200 ohms ±5%; ½ watt; 9/64 inch diameter by ⅜ inch long; Signal Corps stock No. RC20BF822J. Refer to figures 22 and 23.1 for the location of this resistor.

37. Wiring Diagram

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b. To become familiar * * * of the socket. **On figure 23.1 these wires are designated 60 WH/O-RED and 58 WH/O-RED, respectively.** Remember that it * * * the feed lines.

* * * * * * *

46. Identification Table of Parts for Telephone Repeater TP-14
(Superseded)

Note. The fact that a part is listed in this table is not sufficient basis for requisitioning the item. Requisitions must cite an authorized basis, such as T/O & E, TE, T/A, T/BA, SIG 6, SIG 7 & 8, SIG 7-8-10, SIG 10, list of allowances of expendable material, or another authorized supply basis. The Department of the Army Supply Catalog applicable to the equipment covered in this manual is SIG 7 & 8-TP-14. For an index of available supply catalogs in the Signal portion of the Department of the Army Supply Catalog, see the latest issue of SIG 1, Introduction and Index.

912257—50

Fig. No. and ref symbol	Name of part and description	Function of part	Signal Corps stock No.
TP–14, Fig. 3	REPEATER, telephone: Sig C TP–14; 22-type incl amplifiers, filters, equalizers, line balancing networks, and power supply equipment; plywood portable case w/carrying strap.	Provides two-way amplification terminal or at intermediate points with any Signal Corps wire facilities.	4B3250–14
	ARRESTER, lightning: carbon block porcelain body type; 2 clip term; steel holder w/cover containing 2 ea protector blocks; WECo #27 and #28.	Protects circuit	4E4550
E1	BLOCK, protector: porcelain, grooved; 500 v; 1¼″ lg x ⅜″ wd x 5/16″ thk o/a; WECo #27.	Part of arrester	4E927
E2	BLOCK, protector: carbon; 500 v; 1¼″ lg x ⅜″ wd x 5/32″ h o/a; WECo #26.	Same as E1	4E926
TBA, TBB, TBD	BOARD, terminal: bakelite; 3 flattened post type term; 1½″ lg x 5/16″ wd x 3/32″ h o/a; Jones HB part #3–3.	Connects amplifier and network circuits.	2Z9403.57
	BOARD, terminal: 2 brass cad pl solder lug term w/ears to hold wire under screw; 1 61/64″ lg x ⅞″ wd x ⅛″ thk o/a; Jones HB part #2–56.	Tie point for a-c cord connection	2Z9463.1
Fig. 1	CABLE ASSEMBLY, power: type SJ; two #18 AWG stranded cond; 300 v working; rubber jacketed; .31″ diam; equipped w/Hubbell #7–57 plug cap on one end.	For power connection	3E4390–15
C23	CAPACITOR, fixed: electrolytic; 1000 uf +150%, −10%; 25 vdcw; JAN type CE31C102F.	Filters power supply	3DB1000–23
C25, C26	CAPACITOR, fixed: electrolytic; 25 uf +150% −10%; JAN type CE310250P.	Same as C23	3DB25–112

C1A, C1B, C2A, C2B, C3A, C3B, C4A, C4B, C5A, C5B.	CAPACITOR, fixed: paper dielectric; 5 sect; 15,000, 30,000, 45,000, 60,000, and 120,000 uuf ±10%; 600 vdcw; HS metal case; 6 lug term, 3 ea side; Fed Tele & Rad part #W3–105.	Balance nonloaded entrance cables under one mile. Part of building-out circuit.	3DA60–12
C6A, C6B, C10A, C10B.	CAPACITOR, fixed: paper dielectric; 2 sect; ea 200,000 uuf ±5%; 600 vdcw; HS metal case; 3 lug term on side; Fed Tele & Rad part #W3–107.	Assist in providing line balance for variety of lines. Part of balancing network circuit.	3DA200–34
C7A, C7B, C8A, C8B.	CAPACITOR, fixed: paper dielectric; 2 sect; ea 150,000 uuf ±5%; 600 vdcw; HS metal case; 3 lug term on side; Fed Tele & Rad part #W3–108.	Same as C6A	3DA150–13
C9A, C9B, C12A, C12B.	CAPACITOR, fixed: paper dielectric; 2 sect; 200,000 and 300,000 uuf ±5%; 600 vdcw; HS metal case; 3 lug term on side; #W3–106.	Same as C6A	3DA300–13
C11A, C11B, C13A, C13B.	CAPACITOR, fixed: paper dielectric; 2 sect; 300,000 and 500,000 uuf ±5%; 600 vdcw; HS metal case; 3 lug term on side; Fed Tele & Rad part #W3–109.	Same as C6A	3DA500–286
C14A, C14B, C15A, C15B.	CAPACITOR, fixed: paper dielectric; 2 sect; 150,000 and 200,000 uuf ±5%; 600 vdcw; HS metal case; 3 lug term on side; Fed Tele & Rad part #W3–118.	Assist in limiting the transmission of frequencies above and below the useful voice range. Part of equalizer circuit.	3DA200–35
C16A, C16B	CAPACITOR, fixed: paper dielectric; 20,000 uuf ±5%; 600 vdcw; 2 lug term on side; Fed Tele & Rad part #W3–122.	Part of equalizer filter network	3DA20–133
C17A, C17B, C18A, C18B.	CAPACITOR, fixed: paper dielectric; 2 sect; 30,000 and 40,000 uuf ±5%; 600 vdcw; HS metal case; 3 lug term on side; Fed Tele & Rad part #W3–119.	Same as C16A	3DA40–20

Fig. No. and ref symbol	Name of part and description	Function of part	Signal Corps stock No.
C19A, C19B, C20A, C20B.	CAPACITOR, fixed: paper dielectric; 2 sect; 200,000 and 300,000 uuf ±5%; 600 vdcw; 3 lug term on side.	Part of equalizer circuit	3DA300–13
C21A, C21B, C22A, C22B.	CAPACITOR, fixed: paper dielectric; 600 vdcw; HS metal case; 2 uf +20%, −10%; JAN type CP53B1DF205V.	C21: Cathode bypass; part of amplifier circuit. C22: Assists bypassing 20-cycle ringing current around the repeater; part of ringing bypass circuit.	3DB2–142
C24	CAPACITOR, fixed: paper dielectric; 1000 vdcw; HS metal case; 100,000 uuf +20%, −10%; JAN type CP53B1EG104V.	Buffer	3DA100–839
Fig. 13	CLAMP: capacitor; steel, cad pl and iridited; 1½″ diam, .032″ thk; Dubilier part #17842.	Provides means for securing C25 and C26.	2Z2635.89
Fig. 13	CLAMP: capacitor; steel, cad pl and iridited; 1⅜″ diam, .032″ thk; Dubilier part #17843.	Provides means for securing C23.	2Z2635.88
Fig. 13	CLAMP: capacitor; steel; collar type w/1 clamp bolt; 1½″ diam, .032″ thk; Dubilier part #17844.	Provides means for securing V1B	2Z2635.90
Fig. 2	CLIP: earphone; phosphor bronze, nickel pl	Provides means for securing earphone on panel.	2Z2724–21
T4	COIL, telephone repeating: 4 wnd; wnd 1–2 and 3–4, 35 ohms; wnd 5–6 and 7–8, 42 ohms; electrostatic shield; impedance ratio, 1:1;1:1; hipot 100 v RMS 1–3 and 5–7, 500 v RMS other; UTC part #E–2686.	Used to derive simplex circuits. Part of ringing bypass circuit.	3C315–79
F1	FUSE, cartridge: ½ amp; 110% life, 135% 1 hr, 200% 2 min; 250 v; one-time; glass body; Littelfuse part #312.500.	Circuit protection	3Z1946

F2	FUSE, cartridge: 2 amp; 110% life, 135% 1 hr, 200% 2 min; 250 v; one-time; glass body; Littelfuse part #312002.	Same as F1	3Z1927
F3	FUSE, cartridge: 1/16 amp; 110% life, 135% 1 hr, 200% 2 min; 250 v; one-time; glass body; Littelfuse type 3AG, part #1322.	Same as F1	3Z2576-1
Fig. 2	GASKET: tubular; amber gun; 7/32" OD x 3/64" wall x 55" lg; Fed Tele & Rad part #W-38-10.	Seals front panel to carrying case	4Z4380
Fig. 3	HOLDER, fuse: extractor post type; for single 3AG cartridge fuse; Littlfuse part #342001.	Provides means for contacting and securing F1, F2, and F3.	3Z3275-1
Fig. 13	INSULATOR, plate: oval; brown, XXX plastic; 1/32" thk; Ucinite part #115016-1.	Insulates V1B socket from chassis	3G1838-36.12
Fig. 3	KNOB: bar type; molded black bakelite; for 1/4" diam shaft; Fed Tele & Rad part #W26-12.	Facilitates operation of S7	2Z5786.41
Fig. 3	KNOB: round type; molded black bakelite; white arrow; for 1/4" diam shaft; Fed Tele & Rad part #W26-11.	Facilitates operations of the following switches: S1A, S1B, S2A, S2B, S3A, S3B, S4A, S4B, S5A, S5B, and S8.	2Z5786.42
Fig. 3	POST, binding: Sig C TM-146A; screw type; brass, nickel pl; 1/2" diam x 15/16" lg o/a above panel; Eby part #7371.	Provides connection to line, simplex, ground, and monitor circuits.	3Z246A
Fig. 3	POST, binding: Sig C TM-146A; screw type; brass; straight knurled cap; black rubber cap; Eby part # 7639.	Provides connections to external batteries.	3Z246A
L1	REACTOR: AF filter choke; single sect; 400 mh at 1 amp; 1.7 ohms dc; UTC part #E-2683.	Part of power supply filter	3C315-46
L2	REACTOR: AF filter choke; single sect; 9300 mh at 25 ma; 580 ohms dc; UTC part #E-2684.	Same as L1	3C315-23
L3	REACTOR: AF filter choke; dual sect; 2700 mh at 12.5 ma; 68 ohms dc on ea; UTC part #E-2685.	Used to derive simplex circuits. Part of ringing bypass circuit.	3C315-78

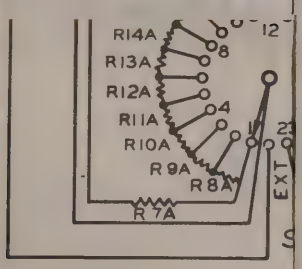
Fig. No. and ref symbol	Name of part and description	Function of part	Signal Corps stock No.
L4A, L4B	REACTOR: AF audio choke; dual sect; wnd 1–2, 43 mh at 1.4 v, 4 ohms dc; wnd 3–4, 32 mh at 1.4 v, 2.6 ohms dc; UTC part #E–2688.	Assist in counteracting the tendency of the line to attenuate the higher frequencies.	3C315–77
Fig. 2	RECEIVER, telephone: 1700 ohms dc; 2 ft two-conductor cordage; Trimm part #161–5.	Provides means for hearing sound output equipment.	4B3030.1
Rect	RECTIFIER, metallic: selenium type; input 180 v ac, 50–60 cyc; output 173 v dc, 25 ma max; Fed Tele & Rad #2D1084.	Rectifies ac to dc. Part of power supply circuit.	3H4838–16
R1A, R1B	RESISTOR, fixed: composition; 2200 ohms ±5%; ½ w; JAN type RC20BF222J.	Assist in providing line balance for variety of lines. Part of balancing network circuit.	3RC20BF222J
R2A, R2B	RESISTOR, fixed: composition; 200 ohms ±5%; ½ w; JAN type RC20BF201J.	Same as R1A	3RC20BF201J
R3A, R3B	RESISTOR, fixed: composition; 620 ohms ±5%; ½ w; JAN type RC20BF621J.	Same as R1A	3RC20BF621J
R4A, R4B	RESISTOR, fixed: composition; 910 ohms ±5%; ½ w; JAN type RC20BF911J.	Same as R1A	3RC20BF911J
R5A, R5B, R36A, R36B.	RESISTOR, fixed: composition; 240 ohms +5%; ½ w; JAN type RC20BF241J.	R5: Same as R1A R36: Part of equalizer circuit.	3RC20BF241J
R6A, R6B, R37A, R37B.	RESISTOR, fixed: composition; 300 ohms ±5%; ½ w; JAN type RC20BF301J.	R6: Same as R1A R37: Part of equalizer circuit.	3RC20BF301J
R8A, R8B, R9A, R9B, R14A, R14B, R15A, R15B, R16A, R16B, R17A, R17B.	RESISTOR, fixed: composition; 10 ohms ±5%; ½ w; JAN type RC20BF100J.	Same as R1A	3RC20BF100J

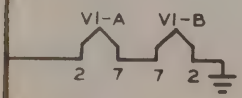
R10A, R10B	RESISTOR, fixed: composition; 15 ohms ±5%; ½ w; JAN type RC20BF150J.	Same as R1A	3RC20BF150J
R11A, R11B, R12A, R12B, R18A, R18B.	RESISTOR, fixed: composition; 30 ohms ±5%; ½ w; JAN type RC20BF300J.	Same as R1A	3RC20BF300J
R19A, R19B, R20A, R20B, R21A, R21B, R22A, R22B, R23A, R23B, R24A, R24B, R25A, R25B.	RESISTOR, fixed: composition; 51 ohms ±5%; ½ w; JAN type RC20BF510J.	Same as R1A	3RC20BF510J
R26A, R26B, R27A, R27B, R28A, R28B, R29A, R29B, R35A, R35B, R38A, R38B.	RESISTOR, fixed: composition; 100 ohms ±5%; ½ w; JAN type RC20BF101J.	Same as R1A	3RC20BF101J
R31A, R31B	RESISTOR, fixed: composition; 270 ohms +5%; ½ w; JAN type RC20BF271J.	Assist in counteracting the tendency of the line to attenuate the higher frequencies. Part of equalizer circuit.	3RC20BF271J
R32A, R32B	RESISTOR, fixed: composition; 120 ohms ±5%; ½ w; JAN type RC20BF121J.	Same as R31A	3RC20BF121J
R33A, R33B	RESISTOR, fixed: composition; 430 ohms ±5%; ½ w; JAN type RC20BF431J.	Same as R31A	3RC20BF431J
R34A, R34B	RESISTOR, fixed: composition; 2,400 ohms ±5%; ½ w; JAN type RC20BF242J.	Same as R31A	3RC20BF242J
R39A, R39B, R46A, R46B.	RESISTOR, fixed: composition; 33,000 ohms ±5%; ½ w; JAN type RC20BF333J.	Assist in function of adjustable gain control. Part of amplifier circuit.	3RC20BF333J
R40A, R40B, R53	RESISTOR, fixed: composition; 8,200 ohms ±5%; ½ w; JAN type RC20BF822J.	R40: Same as R39A R53: Part of power supply circuit; assists in filtering.	3RC20BF822J

Fig. No. and ref symbol	Name of part and description	Function of part	Signal Corps stock No.
R41A, R41B	RESISTOR, fixed: composition; 10,000 ohms ±5%; ½ w; JAN type RC20BF103J.	Assist in function of adjustable gain control.	3RC20BF103J
R42A, R42B	RESISTOR, fixed: composition; 13,000 ohms +5%; ½ w; JAN type RC20BF133J.	Same as R41A	3RC20BF133J
R43A, R43B	RESISTOR, fixed: composition; 16,000 ohms ±5%; ½ w; JAN type RC20BF163J.	Same as R41A	3RC20BF163J
R44A, R44B, R50A, R50B.	RESISTOR, fixed: composition; 20,000 ohms ±5%; ½ w; JAN type RC20BF203J.	R44; Same as R41A R50: Assist in operation of the monitoring and talking circuit.	3RC20BF203J
R45A, R45B	RESISTOR, fixed: composition; 27,000 ohms ±5%; ½ w; JAN type RC20BF273J.	Assist in function of adjustable gain control.	3RC20BF273J
R47A, R47B	RESISTOR, fixed: composition; 43,000 ohms ±5%; ½ w; JAN type RC20BF433J.	Same as R45A	3RC20BF433J
R48A, R48B	RESISTOR, fixed: composition; 51,000 ohms ±5%; ½ w; JAN type RC20BF513J.	Same as R45A	3RC20BF513J
R49A, R49B	RESISTOR, fixed: composition; 750 ohms ±5%; ½ w; JAN type RC20BF751J.	Develop V1A cathode-biasing voltage	3RC20BF751J
R51, R52	RESISTOR, fixed: composition; 82,000 ohms ±5%; ½ w; JAN type RC20BF823K.	Power supply bleeder	3RC20BF823K
R7A, R7B	RESISTOR, fixed: WW; 65 ohms ±1%; ¼ w; 2 axial leads; JAN type RB51BF65ROOF.	Assist in providing line balance for variety of lines. Part of balancing network circuit.	3RB3–6500
R13A, R13B	RESISTOR, fixed: WW; 220 ohms ±1%; ¼ w; JAN type RB51B220ROF.	Same as R7A	3RB4–2200.2
Fig. 13	SOCKET, tube: Sig C socket SO–62; oval; 4 cont; porcelain body; phosphor bronze; silver pl cont; Unicite part #1150286–NS.	Provides means of contact and mounting for vibrator VIB.	2Z8162

Fig. 11	SOCKET, tube: octal; round plastic body; one piece saddle mtg; phosphor bronze; silver pl cont; JAN type TSB8T101.	Provides means of contact and mounting for types V1A and V1B, and spares.	2Z8678.326
Fig. 2	STRAP, carrying: olive drab cotton webbing type III; one and terminated w/grip tongue steel tip 2″ wd; Fed Tele & Rad part #W92–354.	Facilitates hand carrying of equipment in carrying case.	6Z8448–5
S1A, S1B	SWITCH, rotary: 5 pole, 12 position; special; 4 sect; bakelite body; silver pl brass cont; Oak part #28529–H4.	Assist with S2 to form appropriate balancing network for the facility desired.	3Z9825–62.166
S2A, S2B	SWITCH, rotary: 1 pole, 24 position; 2 sect; bakelite body; silver pl brass cont; Oak part #28267–QH2.	Assist with S1 to form appropriate balancing network for the facility desired. Part of balancing network circuit.	3Z9825–62.163
S3A, S3B	SWITCH, rotary: 1 pole, 12 position; 1 sect; bakelite body; silver pl brass cont; Oak part #28238–H1.	Building-out capacitor switch	3Z9825–62.160
S4A, S4B	SWITCH, rotary: 1 pole, 11 position; 2 sect; bakelite body; silver pl brass cont; Oak part #28236–H2.	Assist in function of variable gain control. Part of amplifier circuit.	3Z9825–62.159
S5A, S5B	SWITCH, rotary: 5 pole, 3 position; 2 sect; bakelite body; silver pl brass cont; Oak part #28404–H2.	Enable the operation of adjustable equalizer.	3Z9825–62.164
S6	SWITCH, rotary: 4 pole, 4 position; 2 sect; bakelite body; silver pl brass cont; Oak part #28235–H2.	Enables the selection of proper voltage from ac or battery source.	3Z9825–62.158
S7	SWITCH, rotary: 1 pole, 3 position; 1 sect; bakelite body; silver pl brass cont; Oak part #28240–27.	Enables the operation of monitoring and talking.	3Z9825–62.161
S8	SWITCH, rotary: 3 pole, 2 position; 2 sect; bakelite body; silver pl brass cont; Oak part #28241–54.	Connects power source to unit (power ON-OFF switch).	3Z9825–62.162

Fig. No. and ref symbol	Name of part and description	Function of part	Signal Corps stock No.
T1A, T1B	TRANSFORMER, AF: input type; c/o high impedance and low impedance wnd; wnd 1–2 and 3–4, 75 ohms; wnd 5–6, 300 ohms; wnd 7–8, 433 ohms; wnd 9–10, 600 ohms; wnd 11–12, 250,000 ohms impedance; electro-static shield; freq response 300 to 10,000 cyc; UTC part #E–2689.	As output transformer enables the operation in pairs of a hybrid arrangement; part of amplifier circuit.	2Z9631.228
T2A, T2B	TRANSFORMER, AF: input type; wnd 1–2 and 3–4, 75 ohms; wnd 5–6, 300 ohms; wnd 7–8, 23 ohms; wnd 8–9, 300 ohms; wnd 10–11, 13,000 ohms impedance; electrostatic shield; freq response 300 to 10,000 cyc; UTC part #E–2690.	Same as T1A	2Z9632.319
T3	TRANSFORMER, power: filament and plate type; input 115–230 v, 60 cyc, single phase; 2 output wnd; wnd 1, 135–145 v ac at 25 ma dc; wnd 2, 12.6 v ac at .15 amp; electrostatic shield; UTC part #E–2687.	Furnishes plate and filament voltages	2Z9613.359
V1A, V1B	TUBE, electron: 6G6–G; pentode	Amplifier tube	2J6G6G
V1B	VIBRATOR, nonsynchronous: input 12 v dc, 2.5 amp; single reed 115 cps ±5%.	Converts d-c voltage of storage battery into ac.	3H6694–13





TM2007-C1-1

ematic diagram.

Fig. No. and ref symbol	Name of part and description	Function of part	Signal Corps stock No.
T1A, T1B	TRANSFORMER, AF: input type; c/o high impedance and low impedance wnd; wnd 1–2 and 3–4, 75 ohms; wnd 5–6, 300 ohms; wnd 7–8, 433 ohms; wnd 9–10, 600 ohms; wnd 11–12, 250,000 ohms impedance; electro-static shield; freq response 300 to 10,000 cyc; UTC part #E–2689.	As output transformer enables the operation in pairs of a hybrid arrangement; part of amplifier circuit.	2Z9631.228
T2A, T2B	TRANSFORMER, AF: input type; wnd 1–2 and 3–4, 75 ohms; wnd 5–6, 300 ohms; wnd 7–8, 23 ohms; wnd 8–9, 300 ohms; wnd 10–11, 13,000 ohms impedance; electrostatic shield; freq response 300 to 10,000 cyc; UTC part #E–2690.	Same as T1A	2Z9632.319
T3	TRANSFORMER, power: filament and plate type; input 115–230 v, 60 cyc, single phase; 2 output wnd; wnd 1, 135–145 v ac at 25 ma dc; wnd 2, 12.6 v ac at .15 amp; electrostatic shield; UTC part #E–2687.	Furnishes plate and filament voltages	2Z9613.359
V1A, V1B	TUBE, electron: 6G6–G; pentode	Amplifier tube	2J6G6G
V1B	VIBRATOR, nonsynchronous: input 12 v dc, 2.5 amp; single reed 115 cps ±5%.	Converts d-c voltage of storage battery into ac.	3H6694–13

[AG 300.7 (6 Oct 50)]

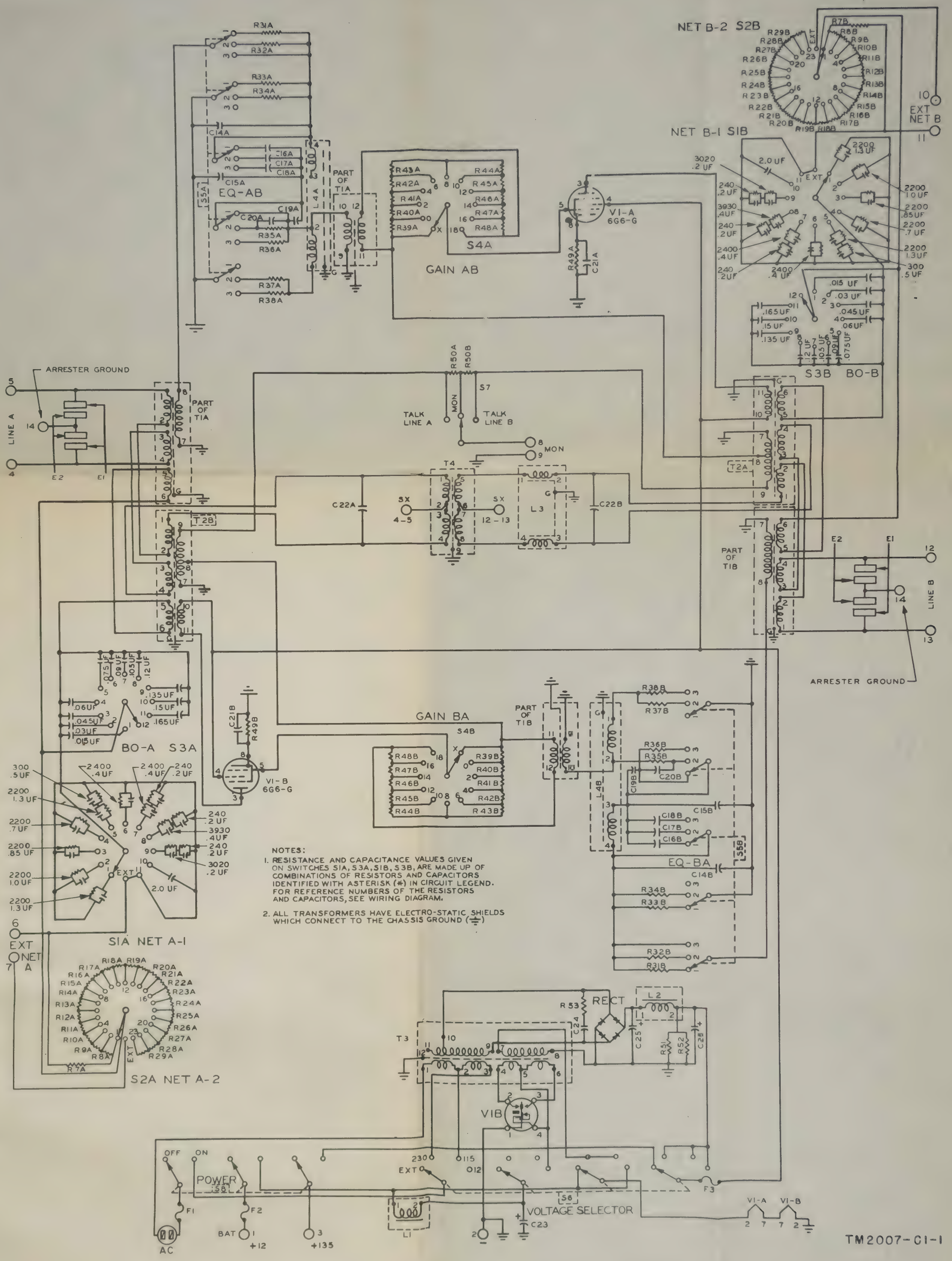


Figure 22.1 (added). *Telephone Repeater TP-14 (Order Nos. 12013-Phila-49 and 19576 Phila-49) schematic diagram.*







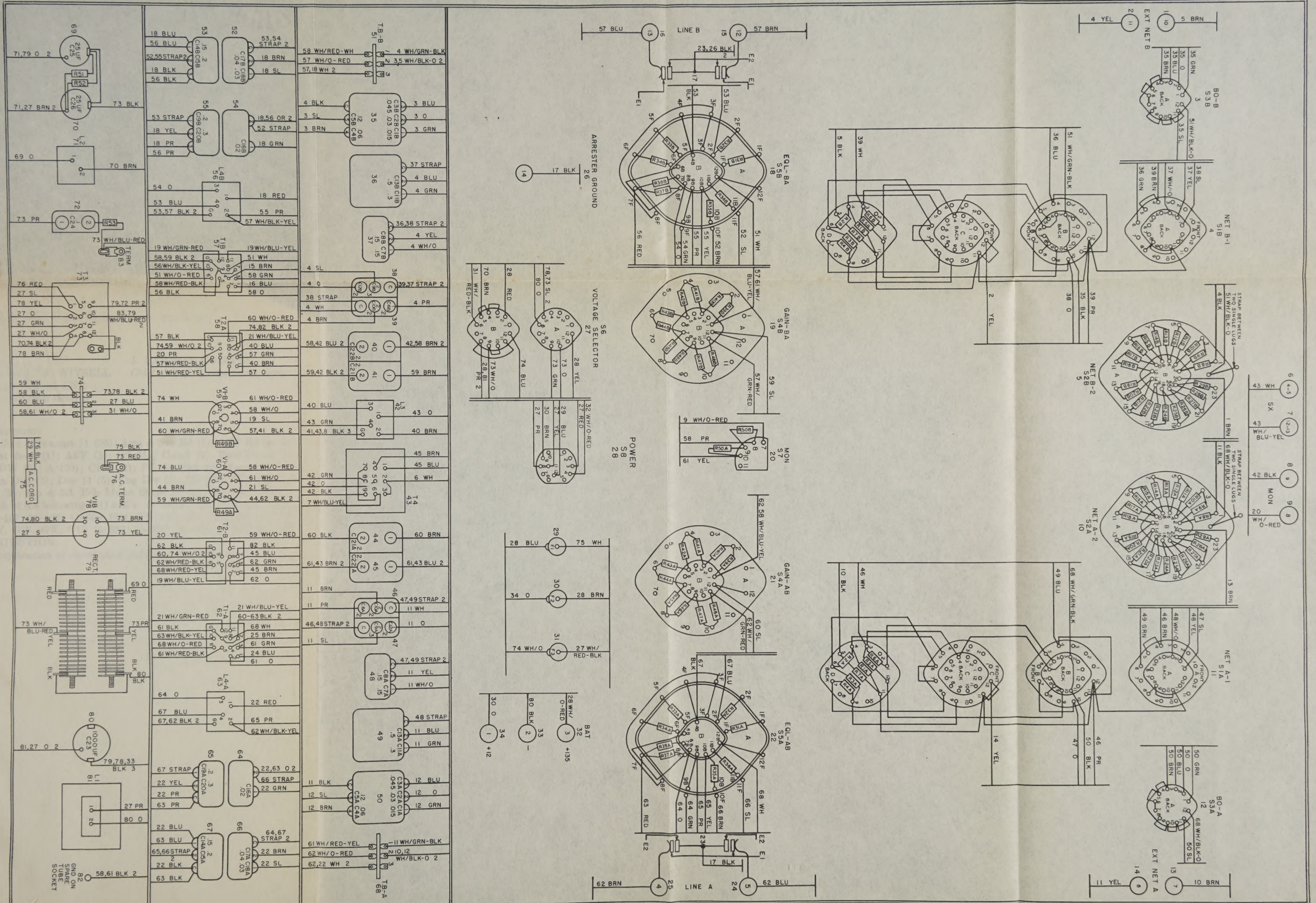
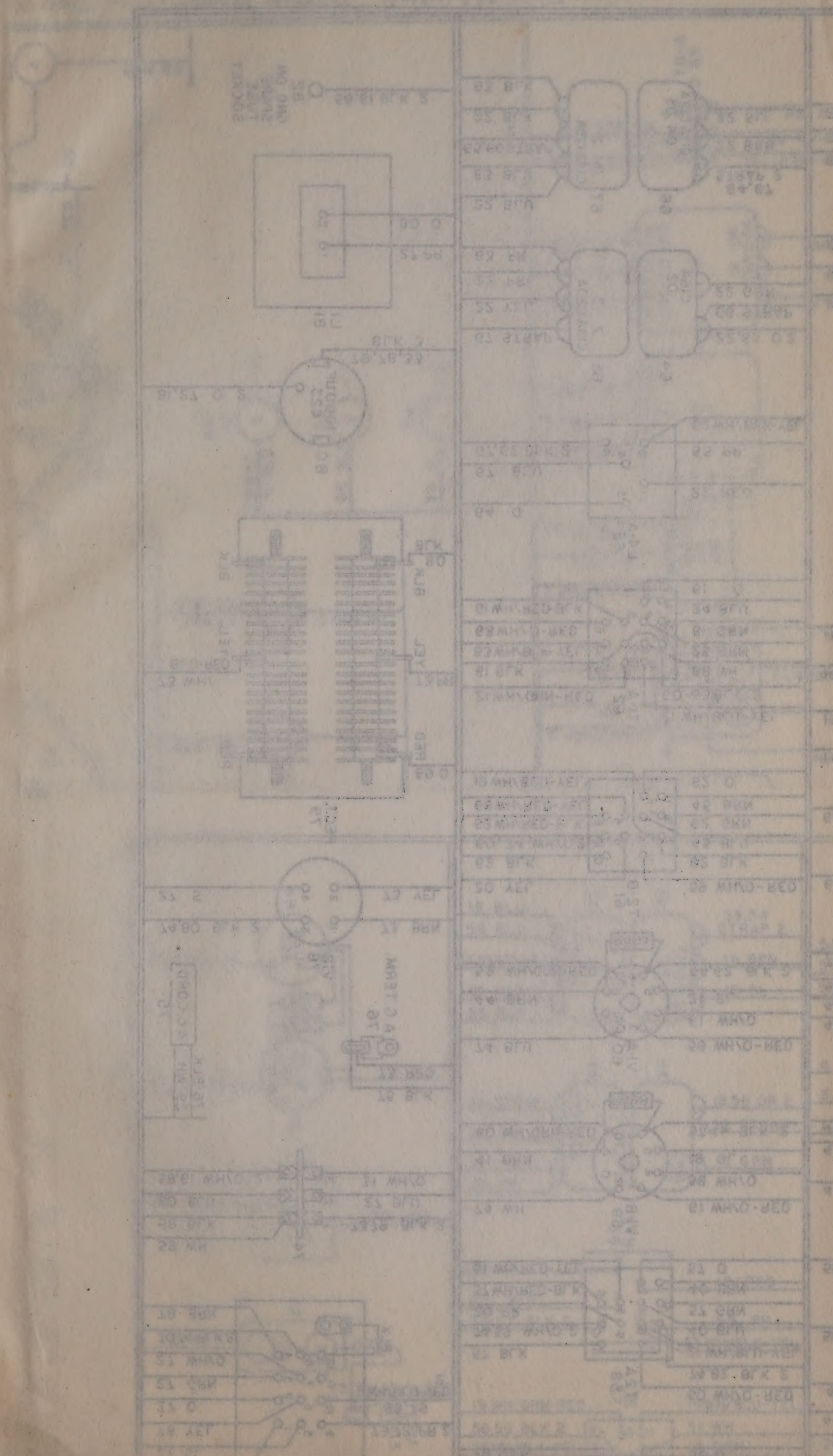


Figure 23.1 (added). *Telephone Repeater TP–14 (Order Nos. 12013–Phila–49 and 19576–Phila–49) wiring diagram.*



By order of the Secretary of the Army:

J. LAWTON COLLINS
Chief of Staff, United States Army

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EDWARD F. WITSELL
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The Adjutant General

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For explanation of distribution formula, see SR 310–90–1.

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