

RESTRICTED

Section 13
NAVY TYPE NUMBERED COMPONENTS

COMMUNICATION EQUIPMENT MAINTENANCE BULLETIN

RESTRICTED

SECTION 13. NAVY TYPE NUMBERED COMPONENTS

TYPE CAY-20167 COPPER OXIDE RECTIFIERS

A quantity of Navy type CAY-20167 high-voltage copper oxide rectifier power units for use in lieu of motor-generator sets or tube rectifiers are being procured. These rectifiers are designed for connection to 220- or 440-volt, 3-phase, 50- to 60-cycle supply lines. The units are of the same height and type of construction as the transmitters and include all necessary auxiliaries in one cabinet, with facilities for mounting a voltage selector switch, calibrated from 50% to 110% of the rated voltage in either the rectifier cabinet or in a separate position near the transmitter.

Data pertinent to procurement and installation follows:

(1) Sets for use with TAB-6, -7, and TBU-4 are identical and are now being delivered.

(2) Procurement will follow for a set to be used with TBM, TBK-8, -12, TAJ-11, -12, -13, -14 by means of connection changes.

(3) A set will be furnished with TBL-10 and -11 which may also be used with any TBL-7 or subsequent a-c operated TBL.

It is claimed that this type of rectifier is reliable and has an efficiency similar to that of an M-G set—usually about 70% when new and about 60% when old. It is air cooled and includes a thermally operated interlock. Regulation exceeds that of an M-G set, but instantaneous regulation from keying is less (better).

The advantages claimed for this type of rectifier over a motor-generator are as follows:

- (1) The blower is the only rotating element.
- (2) Lower starting current.
- (3) Gradual failure rather than sudden burn-out.
- (4) Performance not as susceptible to frequency changes.
- (5) No starter is required.

The advantages claimed for this type of rectifier over tube rectifiers are as follows:

- (1) No contactors for filament voltage adjustment and time delay.

- (2) No time delay.
- (3) More rugged.
- (4) Fewer transformers.

FIELD CHANGE NO. 1 TO LELAND MOTOR GENERATORS, NAVY TYPE CLL-21806

Forces afloat report considerable difficulty is being found with the speed regulator contacts in Leland generator, type CLL-21806. As a result, the manufacturer recommends that the speed regulator and associated parts be removed. Production of these motor-generators is divided into four groups as follows:

(1) Equipments bearing serial numbers 1-297. These units, when leaving the factory, contained the original circuit consisting of speed governor, radio-frequency filters and a 200-ohm fixed resistor, "B", in series with the motor shunt field. Connections are shown in drawing A-5248, Figure 1.

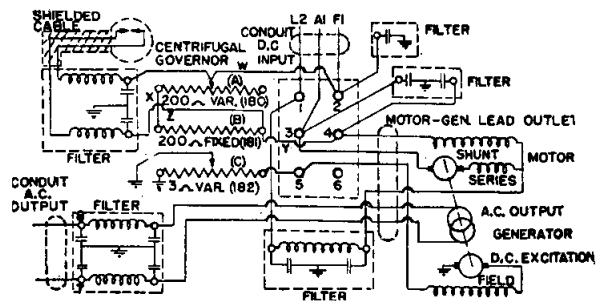


FIGURE 1.—Connection diagram A-5248.

(2) Equipments bearing serial numbers 298-342. In these equipments the value of the series resistor "B" was changed from 200 ohms to 15 ohms, and it was wired in series with the speed governor instead of in parallel. Connections for these equipments are shown in drawing A-5085, Figure 2.

(3) Equipments bearing serial numbers 343-

560. In these units the speed governor and associated filters were disconnected from the circuit but were still supplied with the machine. Resis-

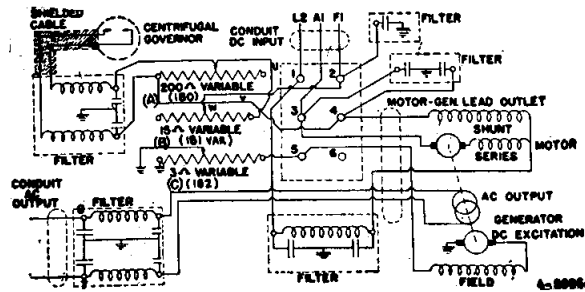


FIGURE 2.—Connection diagram A-5085.

tor "B" was 15 ohms and still remained in the circuit. Connections are shown in drawing AX-2106, Figure 3.

Inasmuch as it was found that operation of the equipments without the speed governor was much more satisfactory, it is desired that all field activities modify the Leland generators in order to make them the same as group 4. These modifications may be made as follows:

(1) Remove resistor "B" located in the center of the junction box.

(2) Adjust the top resistor "A" (200-ohm 50-watt adjustable) until approximately all the resistance is in the circuit.

(3) Refer to Figure 1, 2 or 3 and change all connections to conform with those of Figure 4 (drawing A-5141).

(4) Remove the governor protector and governor cap, loosen setscrews holding the governor rotating unit to the shaft, and slip off governor rotating unit.

(5) Remove the two governor brushes. This cuts the governor out of the circuit.

(6) Remove the shielded leads from the governor and also remove the external filter mounted outside the junction box.

(7) Replace the governor cover and the governor protective cap.

(8) Remove all unused leads.

(9) Check the wiring against Figure 4. Cut out the extra copy of Figure 4 (diagram A-5141) and attach it to the inside cover of the junction box with Glyptol.

(10) Adjust the position of the motor brushes and top resistor "A" and the generator voltage control resistor (lower resistor "C") until optimum position is reached for the speed and voltage at the load. Moving the slider on resistor "A" will lower or raise the generator speed. This should be adjusted to give approximately 1740 RPM with the normal connected load and the frequency of the generated AC will be approximately 58 cycles per second. Adjusting the slider on resistor "C" will lower or raise the generator output voltage. This should be adjusted to give approximately 110 volts with the normal load. After adjusting the voltage, check the generator speed and if changed appreciably from 1740 RPM, it should be corrected by changing the location of the slider on resistor "A". All adjustments should be carried out with the d-c input voltage at the value normally used on shipboard.

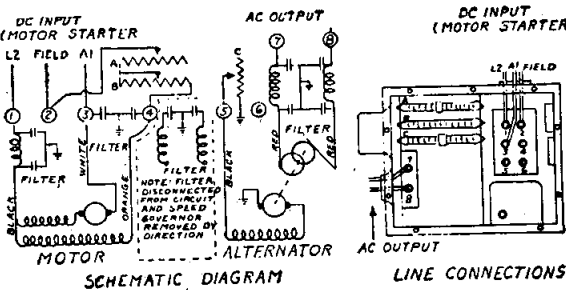


FIGURE 3.—Connection diagram AX-2106.

(4) Equipments bearing serial numbers 561 and higher. This group had the speed governor, the associated radio-frequency filters, and resistor "B" removed entirely from the circuit. Connections are shown in drawing A-5141, Figure 4.

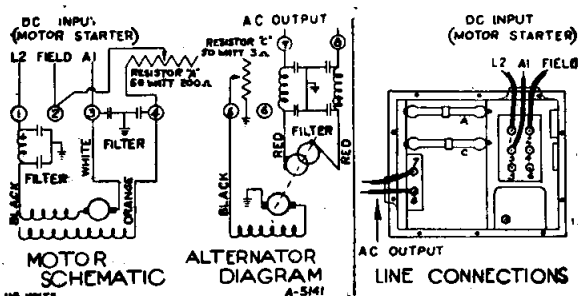
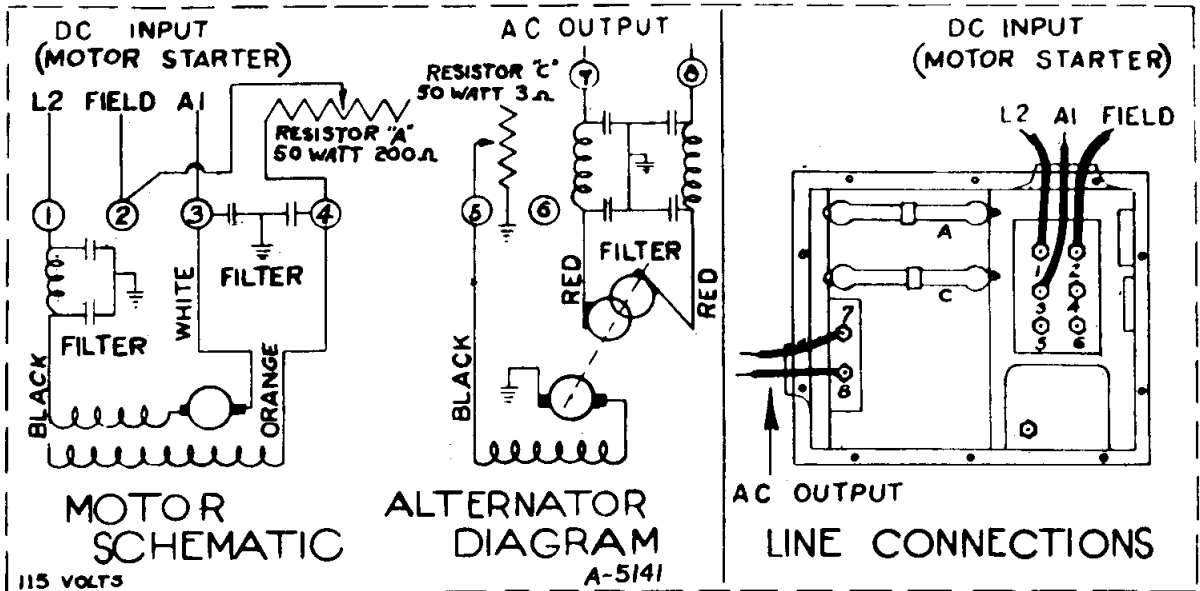


FIGURE 4.—Connection diagram A-5141.



Connection diagram A-5141.

USE OF LINE UNITS, TYPE COQ-23403

The line unit is a device for connecting neutral-operated telegraph lines to teletypewriter station sets. It repeats the telegraph signals from the line to the teletypewriter and provides a means of measuring and adjusting line current, of measuring the voltage of the d-c power supply, and of measuring and adjusting the bias of the incoming signals.

When the COQ-23403 line unit is used, the Western Electric Co. line relay must be disconnected from the printer. This change should be made in accordance with the wiring diagram for M-15 printer, table XRT-115, REC-29 rectifier, and line unit COQ-23403, as shown in Figure 1.

There are a quantity of line units, type COQ-28403 being procured and shipped for use in the teletypewriter system.

INSTALLATION OF 49120 JACKS IN TYPE 29017 ATTENUATOR UNITS

Type 29017 receiver attenuator units, as supplied with type 50064 modulator equipments, do not have the necessary concentric jacks to facilitate the use of concentric antenna patchcords. Practically all shipboard receiving antenna transmission line systems installed within the past four years require the use of the type 49123 concentric patchcords for connections between the

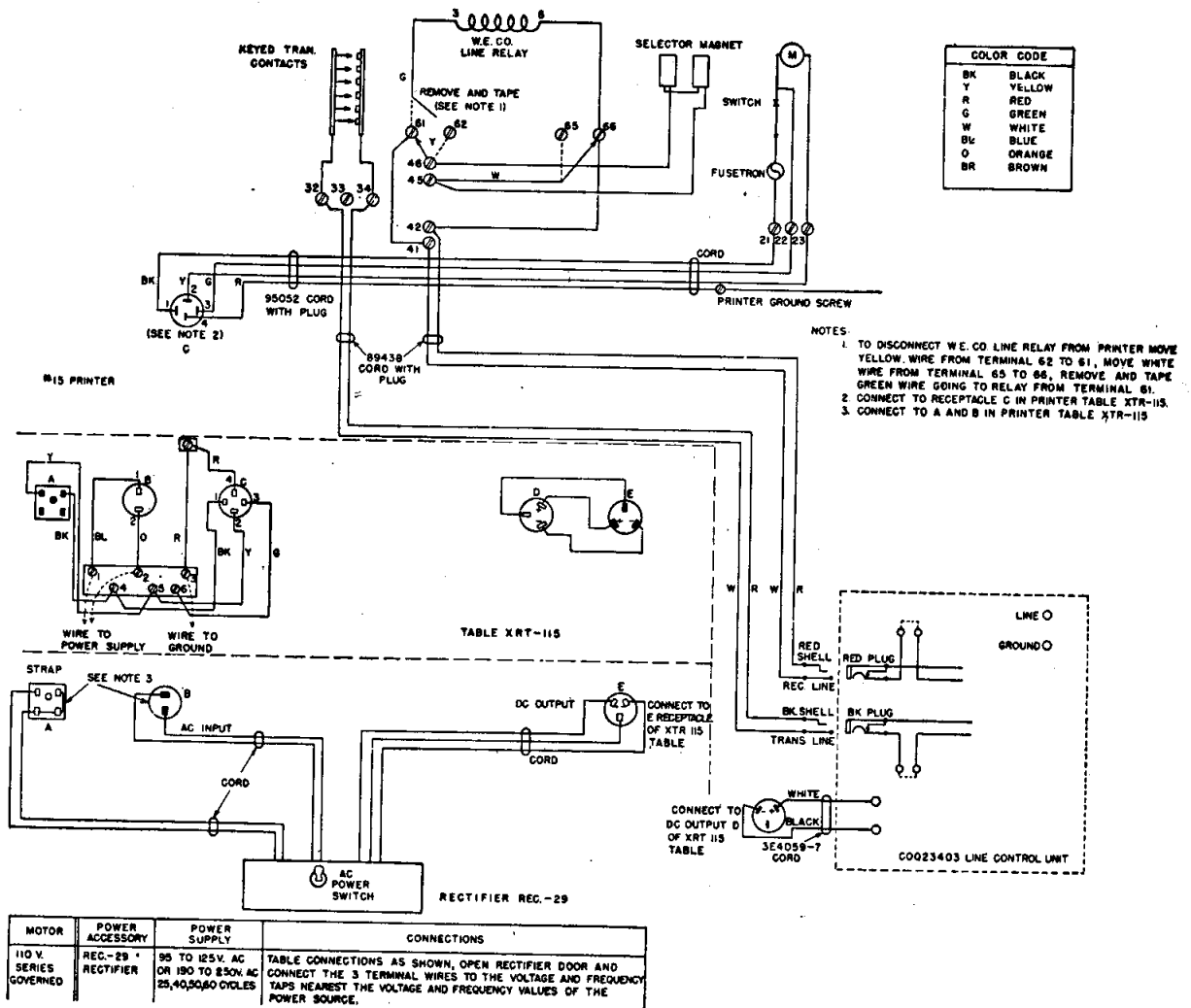


FIGURE 1.—Connection for M-15 printer, table XRT-115, rec-29, and line unit COQ-28408.

systems and the receivers. In order to retain the shielding effect provided by these patchcords when inserting the type 29017 attenuator units in the antenna circuit, it is necessary to install

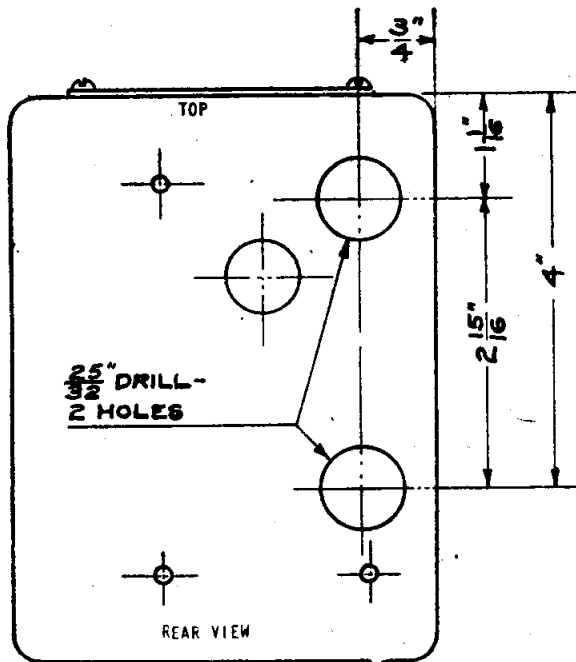


FIGURE 1.—Drilling plan for attenuator case.

two type 49120 jacks in each attenuator unit. After these jacks are installed, two standard patchcords can be utilized; one between the transmission line terminal box and the attenuator unit and the other between the attenuator unit and the receiver.

Figure 1 shows the proper location and size of holes to be drilled in the back of the attenuator

case to accommodate the type 49120 jacks. The location of the bottom hole is rather critical and care should be exercised to insure correct drilling; otherwise the jack will not have proper clearance when the unit is inserted in the case. Greater clearance is available for the top jack. Figure 2

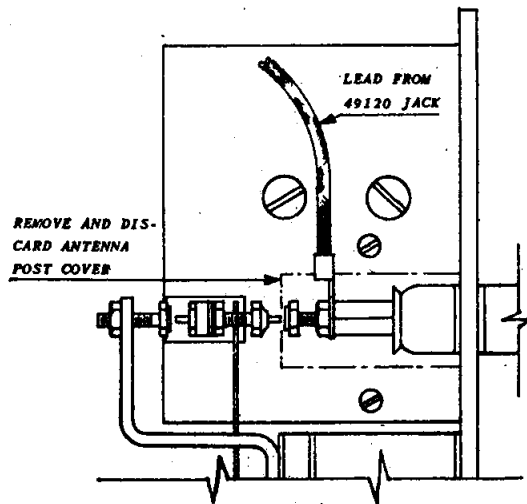


FIGURE 2.—Connection of type 49120 jack to the antenna post.

indicates the proper method of connecting the top jack to the antenna post. The antenna post cover, installed in the original units, should be removed and discarded when making this connection. The leads from the bottom jack shall be connected to the terminal screw to which the receiver is normally connected. Both leads should be as short as practicable; an experiment indicates that 4" leads will allow sufficient separation of the case and chassis to make the connections.

MODIFICATION TO TYPE 49131 SPEAKER-AMPLIFIERS

When type 49131 speaker-amplifiers for the model RBO entertainment system are installed in crew and troop quarters, the channel selector switch takes a terrific amount of abuse due to continual switching in search of programs.

The U. S. S. *General M. C. Meigs* (AP-116) has installed a double-pole double-throw toggle switch in place of the rotary switch in such units. The toggle switch is entirely satisfactory for a RBO system where only two RBO receivers are used, and the toggle switch is more sturdy than the rotary switch and better able to stand up under extreme abuse.

This modification is recommended for other ships having two RBO receivers where the channel selector switch has been damaged due to misuse.

the unit has been installed and it is believed desirable to reproduce the applicable lists and diagrams herein for ready reference.

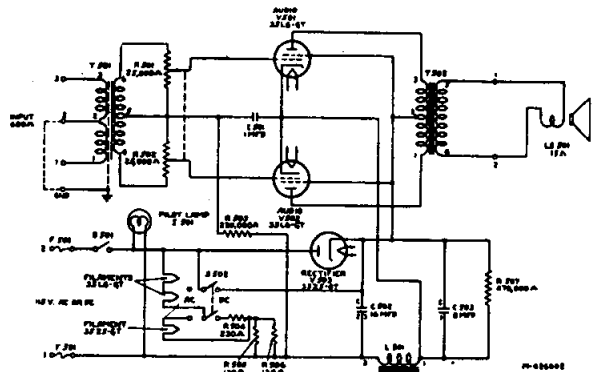


FIGURE 1.—Speaker-amplifier 49131.

TYPE 49131 SERIES SPEAKER-AMPLIFIER UNITS

The Bureau has received numerous requests from installation and maintenance yards for instruction books or data sheets covering the type 49131 series speaker-amplifier units. Such information was not obtained with these units and is therefore not available for distribution.

A wiring diagram and parts list is secured inside the cabinet of each speaker-amplifier. However, the examination of this diagram and parts list is usually not very convenient after

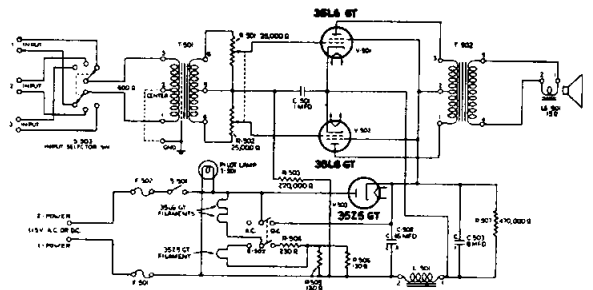


FIGURE 2.—Speaker-amplifier 49131A and 49131B.

Figures 1 and 2 covers the types 49131, 49131A, and 49131B speaker-amplifier units as indicated. Parts lists for the units follow:

PARTS LIST FOR TYPE 49131 SPEAKER-AMPLIFIER UNIT

Schematic symbol	Description	Navy type No.	RCA Manufacturing Co., Inc., part No.	Quantities of spare parts furnished
C501	Capacitor, 1-mfd. -3 percent +10 percent, 400 v. d. c. working.	-48595-A	P-720555-2	
C502	Capacitor—consists of 3 sections, each section 8 mfd. -3 percent +10 percent, 500 v. d. c. working. C502 denotes 2 of the sections connected in parallel totaling 16 mfd.; C503 denotes 1 section, 8 mfd.		K-90549-1	
C503				
F501	Fuse, 1 ampere, 250 v., cartridge type		K-55544-14	8
F502	Same as F501			
I501	Pilot light assembly socket, candelabra screw base lamp, candelabra screw—115-v., 0.1-ampere. Reflector, red jewel, complete with nut.	CS-5/17	K-857431-1 K-866645-1 K-99013-1	1
L501	Reactor, plate filter, impedance 2000 ohms at 60 cycles.	CRV-30764	K-901021-1	1

PARTS LIST FOR TYPE 49131 SPEAKER-AMPLIFIER UNIT—Continued

Schematic symbol	Description	Navy type No.	RCA Manufacturing Co., Inc., part No.	Quantities of spare parts furnished
R501, 502	Potentiometer, dual section, each section 25,000 ohms \pm 10 percent, wire-wound.		K-858187-1	1
R503	Resistor, 220,000 ohms \pm 10 percent, 1/2-watt, insulated type.		K-850981-90	1
R504	Resistor, 230 ohms, wire-wound, ferrule type, style E.		M-420664-36	1
R505	Resistor, 130 ohms \pm 5 percent, 1-watt, insulated type.		K-845949-34	2
R506	Same as R505.			
R507	Resistor, 470,000 ohms \pm 10 percent, 1/2-watt, insulated type.		K-850981-94	1
S501	Switch, s.p.s.t., toggle type.	CHH-24000	M-420278-1	
S502	Switch, d.p.d.t., toggle type.	CHH-24003	M-420278-4	
T501	Transformer, audio input, center-tapped primary and secondary. D.-c. resistance of primary (between terminals 1 and 3) 26 ohms; d.-c. resistance of secondary (between terminals 4 and 6) 2000 ohms.	CRV-30765	K-901022-501	
T502	Transformer, audio output, center-tapped primary. D.-c. resistance of primary (between terminals 1 and 3) 104 ohms; d.-c. resistance of secondary (between terminals 4 and 5) 0.57 ohms.	CRV-30766	K-901023-501	
X501	Socket, octal base.	CPH-49351	M-421395-506	
X502	Same as X501.			
X503	Same as X501.			
V501	35L6GT tube.			4
V502	Same as V501.			
V503	35Z5GT tube.		P-712594-504	2
LS501	Loudspeaker cone assembly.		P-712678-504	

PARTS LIST FOR TYPES 49131A AND 49131B SPEAKER-AMPLIFIER UNITS

C501	Capacitor, 1-mfd. -3 percent + 10 percent, 400 v. d.-c. working.	-48595-A	P-720555-2	1
C503 <i>f</i>	Capacitor—consists of 3 sections, each section 8 mfd. -3 percent + 10 percent, 500 v. d.-c. working. C502 denotes 2 of the sections connected in parallel totaling 16 mfd.; C503 denotes 1 section 8 mfd.		K-90549-1	1
F501	Fuse, 1 ampere, 250 v., cartridge type.		K-55544-14	8
F502	Same as F501.			
I501	Pilot light assembly socket, candelabra screw base lamp, candelabra screw—115 v., 0.1 ampere. Reflector, red jewel, complete with nut.	CS-5/17	K-857431-1 K-866645-1 K-99013-1	1
L501	Reactor, plate filter, impedance 2000 ohms at 60 cycles.	CRV-30764	K-901021-1	
R501, 502	Potentiometer, dual section, each section 25,000 ohms \pm 10 percent, wire-wound.		K-858187-1	1
R503	Resistor, 220,000 ohms \pm 10 percent, 1/2-watt, insulated type.		K-850981-90	1
R504	Resistor, 230 ohms, wire-wound, ferrule type, style E.		M-420664-36	1
R505	Resistor, 130 ohms \pm 5 percent, 1-watt, insulated type.		K-845949-34	2
R506	Same as R505.			

PARTS LIST FOR TYPES 49131B SPEAKER-AMPLIFIER UNITS—Continued

Schematic symbol	Description	Navy type No.	RCA Mfg. Co., Inc., part No.	Quantities of spare parts furnished
R507	Resistor, 470,000 ohms \pm 10 percent, 1/2-watt, insulated type.		K-850981-94	1
S501	Switch, s.p.s.t., toggle type	CHH-24000	M-420278-1	
S502	Switch, d.p.d.t., toggle type	CHH-24003	M-420278-4	
S503	Switch		K-180411	
T501	Transformer, audio input, center-tapped primary and secondary. D.-c. resistance of primary (between terminals 1 and 3) 26 ohms; d.-c. resistance of secondary (between terminals 4 and 6) 2000 ohms.	CRV-30765	K-901022-501	
T502	Transformer, audio output, center-tapped primary. D.-c. resistance of primary (between terminals 1 and 3) 104 ohms; d.-c. resistance of secondary (between terminals 4 and 5) 0.57 ohms.	CRV-30766	K-901023-501	
X501	Socket, octal base	CPH-49351	M-421395-506	
X502	Same as X501			
X503	Same as X501			
V501	35L6GT tube			4
V502	Same as V501			
V503	35Z5GT tube			2
LS501	Loudspeaker cone assembly		P-712594-504 P-712678-504	

SCHEMATIC DRAWING OF NAVY TYPE CMX-49131C SPEAKER-AMPLIFIER UNITS

The schematic drawing for the Navy type CMX-49131C speaker amplifier unit is pasted inside the case of the equipment. Since this may not be convenient for reference, the drawing and parts list are reproduced herewith as figures 1 and 2.

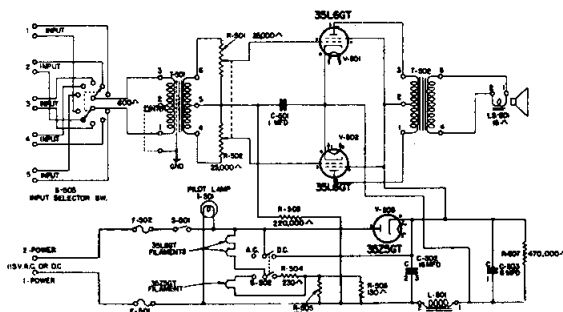


FIGURE 1.—Speaker-amplifier CMX-49131C.

Schematic symbol	Description	Navy type No.	Magnavox Co. drawing and part No.	Quantities of spares furnished
C501	Capacitor, 1mfd. ± 10 percent 400 v. d.-c. working	C-48595A-10	B-250091	1
C502	Capacitor, consists of 3 sections, each section 8 mfd. ± 20 percent 500 v. d.-c. working C-502 denotes 2 of the sections connected in parallel totaling 16 mfd. C-503 denotes 1 section 8 mfd.	C-481337	B-290008	1
C503				
F501	Fuse, 1 ampere, 250 v. cartridge type		A-180157G6	8
F502	Same as F501			
I501	Pilot light assembly:			
	Socket, candelabra, screw base		A-180233	
	Lamp, candelabra screw, 115 v. 0.1A	CS-5/17	A-180161G2	1
	Reflector, red jewel, with nut		A-180235G1	
L501	Reactor, plate filter, impedance 2000 ohms at 60 cycles.	C-30764	B-350007	
R501	Potentiometer, dual section, each section 25,000 ohms ± 10 percent wire-wound.		A-220040	1
R502				
R503	Resistor, 220,000 ohms ± 10 percent, $\frac{1}{2}$ w. insulating type		B-230063G90	1
R504	Resistor, 230 ohms, wire-wound, ferrule type		A-240020	1
R505	Resistor, 130 ohms ± 10 percent 1 w. insulated type		B-230065G257	2
R506	Same as R505			
R507	Resistor, 470,000 ohms ± 10 percent, $\frac{1}{2}$ w. insulated type		B-230063G94	1
S501	Switch, s. p. s. t., toggle type	C-24000	C-160037G4	
S502	Switch, d. p. d. t., toggle type	C-24003	C-160037G5	
S503	Switch		A-160064	
T501	Transformer, audio input, center-tapped primary and secondary. d.-c. resistance of primary (between terminals 1 and 3): 26 ohms; d.-c. resistance of secondary (between terminals 4 and 6): 2000 ohms.	C-30765	B-320007	
T502		Transformer, audio output, center-tapped primary, d.-c. resistance of primary (between terminals 1 and 3): 104 ohms; d.-c. resistance of secondary (between terminals 4 and 5): 0.57 ohms.	C-30766	B-330009
X501	Socket, octal base	C-49351	A-180232	
X502	Same as X501			
X503	Same as X501			
V501	35L6GT tube			4
V502	Same as V501			
V503	35Z5GT tube			2
LS501	Loudspeaker		16C10G2	
	Conehead assembly		16C11G2	

FIGURE 2.—Parts list for speaker-amplifier CMX 49131 C.

TYPE 49620 SPEAKER-AMPLIFIER UNITS

The production of type 49131 series speaker-amplifier units has ceased and deliveries of this specific unit have been completed. The type 49620 speaker-amplifier units will be furnished for an interim period and shall be used, in lieu of the 49131 series, to fill shipboard allowances.

The design of the 49131C speaker-amplifier unit has been slightly modified to accommodate an improved type of speaker unit and will hereafter be identified by the Navy type number 49620. The over-all and mounting dimensions of the 49620 units are identical to those of the 49131C units and they can be installed in any locations or on any existing mounting brackets which have been planned or prepared for the older units. The wiring diagram and parts list are shown in figures 1 and 2.

The type 49620 speaker-amplifier units do not have blastproof and waterproof speaker cones. These features were waived in this interim unit in favor of improved operation. This fact should be considered when selecting locations for the new units.

The type 49620 speaker-amplifier is considered to be a stop-gap unit and will be discontinued when more suitable units now under development become available. This unit is in-

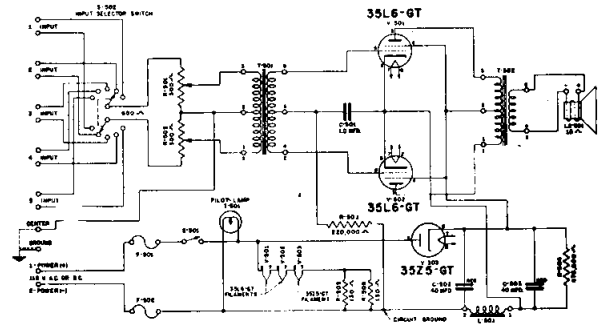


FIGURE 1.—Speaker-amplifier 49620.

tended, primarily, for use on the broadcast entertainment circuit pending availability of the completely new type 49545 speaker-amplifier unit which will be standard for this circuit; however, due to the unavailability of the new type 50210 amplifier, for use with the type 49546 speaker, it will be necessary also to install the unit on communication circuits in the meantime. Therefore, the 49620 becomes an interim speaker-amplifier for both communication and broadcast entertainment circuits. However, it is anticipated that this unit will be superseded about July 1945, when the types 49545 and 50210 units are expected to become available.

Schematic symbol	Description	Navy type No.	Magnavox Co. drawing and part No.	Quantities of spares furnished
C-501	Capacitor, 1.0 mfd. \pm 10 percent, 400 v.	C-48595A	16A114-G1	1
C-502	Capacitor, dry electrolytic F. P., 40 mfd., 400 v., d. c.	C-482292	16B10-G1	2
C-503	Same as C-502.			
F-501	Fuse, cartridge, 1.0 amp., 250 v.		M-600-G1	40
F-502	Same as F-501.			
I-501	Pilot lamp assembly:			
	Socket, candelabra, screw base		16A83-G1	1
	Lamp, candelabra screw, 115 v., 0.1 a.	CS-5/17	M-603-G1	2
	Reflector, red jewel		16C45-G1	1
L-501	Reactor, plate filter, 2000 ohms impedance at 60 c. p. s.	C-30764	16A124-G1	1
R-501	} Potentiometer, dual-section, each section 300 ohms } \pm 10 percent, wire-wound.	CMA632148	} 16C46-G1	1
R-502		CTC632175		
		CMC632176		
R-503	Resistor, 220,000 ohms \pm 10 percent, $\frac{1}{2}$ watt, insulated type.		16A110-G1	1
R-504	Resistor, 470,000 ohms \pm 10 percent, $\frac{1}{2}$ watt, insulated type.		16A110-G2	1
R-505	Resistor, 130 ohms \pm 10 percent, 1 watt, insulated type.		16A126-G1	1
R-506	Same as R-505.			
V-501	Tube, amplifier, type 35L6-GT			4
V-502	Same as V-501.			
V-503	Tube, rectifier, type 35Z5-GT			2
X-501	Socket, octal base tube	C-49351	16A111-G1	2
X-502	Same as X-501.			
X-503	Same as X-501.			
S-501	Switch, s. p. s. t., toggle type	C-24000	16C47-G1	1
S-502	Switch, 2 circuit, 5 positions		16C48-G1	1
T-501	Transformer, audio input, center-tapped primary and secondary, d.-c. resistance of primary (between terminals 1 and 3): 29 ohms; d.-c. resistance of secondary (between terminals 4 and 6): 1884 ohms.	C-301307	16A122-G2	1
T-502	Transformer, audio output, center-tapped primary, d.-c. resistance of primary (between terminals 1 and 3): 104 ohms; d.-c. resistance of secondary (between terminals 4 and 5): 0.57 ohms.	C-301308	16A123-G2	1
LS-501	Loudspeaker		16B11-G1	1

FIGURE 2.—Parts list for speaker-amplifier 49620.

TYPE 50153 TRANSMISSION LINE COUPLING UNITS

The purpose of this unit is to provide a means of coupling transmitting equipment having an unbalanced (single-ended) output and nominal carrier output of not more than 3 kw. to a two-wire, balanced line of approximately 650 ohms impedance over a frequency range of 4.0 to 18.1 megacycles.

It is housed in a metal cabinet about 16 inches wide, 8 inches high and 14 inches deep—neglecting dimensions of the four feed-through insulators which are mounted two on a side.

A radio-frequency peak potential of up to 3,000 volts can safely be applied without arc-over or corona between any part of the circuit and the metal housing.

IMPROVEMENT IN TYPE COA-66089 ANTENNA SYSTEMS

The Port Director, Third Naval District, reports failure of the type COA-66089 antenna system (used with model TBY equipment) due to leakage of water into the box at the base of the vertical radiator. This difficulty may be overcome by the following means:

- (1) Disassemble the antenna rod, Lucite insulator and Lucite washer.
- (2) Cut a rubber gasket one inch in diameter which will fit around the shoulder on the bottom of the Lucite antenna insulator (this requires a $\frac{3}{4}$ " hole in the center).
- (3) Coat the inside and bottom of the Lucite insulator with Glyptol, also the top of the inside Lucite washer, and assemble with the rubber gasket, placing a coating of Glyptol between the rubber washer and the metal box.
- (4) Make sure that a flat washer and a lock washer are used under the nut on the end of the antenna, and that the nut is drawn up tight.
- (5) Put a ridge of Glyptol around the junction between the antenna rod and the top of the Lucite insulator, and a ridge of Glyptol around the junction between the metal box and the bottom of the Lucite insulator. This insures a water-tight seal around the two possible entrances for moisture.

FAILURE OF TYPE 27172 RADIOPHONE UNITS

U. S. S. *Massachusetts* (BB-59) has pointed out that the rod operating the switch S-206 frequently becomes bent due to careless handling of the unit by operators and requires frequent straightening to maintain the unit in operating condition. Maintenance personnel and communication officers are requested to instruct operators to use care in replacing the receivers on the hook to prevent failure of the unit at a critical time when loss of communication might delay Naval operations.

ALTERING CABLE CLAMP ON TYPE 23972 RADIOPHONE UNIT

Reports have reached the Bureau that failures are occurring on the hand-set cable of the type 23972 radiophone unit due to the pinching action of the cable clamp. The U. S. S. *Portland* has remedied this trouble by removing the clamp and attaching a length of chain between the control box and cable as shown in the photograph of figure 1.



FIGURE 1.—A method of preventing failures of the hand-set cable of type 23972 radiophone unit.

FIELD CHANGE #2 TO LELAND MOTOR GENERATORS, NAVY TYPE CLL-21806

The power dissipation rating of an adjustable or tapped resistor is based on its entire resistance and thus will decrease as the portion of resistance used is decreased. Experience has shown that after elimination of the speed regulator for the type 21806 motor generator (Field Change #1), the 200-ohm 50-watt resistor *A*, and the 3-ohm 50-watt resistor *B* overheat and often burn out due to their insufficient power-handling capacity.

This condition can be relieved by replacing resistor *A* with a type 63262 200-ohm 120-watt resistor, and resistor *B* with a type 63375 2.5-ohm 120-watt resistor. Both are type A resistors tapped in ten equal parts.

The resistors should be mounted in such a manner as to protect them from mechanical damage, accidental contact by personnel, and in a position that will insure adequate ventilation. Due to the increased size, they cannot be satisfactorily mounted in the generator junction box. Once installed, the location of the proper tap connection is determined in the same manner as for previous resistors.—12/1/45

INSTALLATION OF JUMPERS ACROSS THE INPUT TERMINAL STRIP OF TYPE 49131 SPEAKER-AMPLIFIERS

The type 49131 series of speaker-amplifier units, except the basic 49131, contain either 3-channel or 5-channel selector switches. These switches are essential when the speaker-amplifier units are used in conjunction with the standard multi-channel broadcast distribution system but are not required, and are objectionable in certain instances, when these units are used on single communication circuits. Several reports reaching the Bureau indicate that unauthorized personnel frequently operate the switch, either thinking that the unit is connected in the broadcast circuit, or just for their amusement. The

¹This field change is based on a suggestion received by the Bureau from Darragh E. Johnston, CRM, U. S. S. Azimech (AK-124).

switch is sometimes left in an open channel and the speaker fails to function when the communication circuit is energized.

To eliminate the possibility of the above condition, it is recommended that all type 49131 units installed on single communication circuits

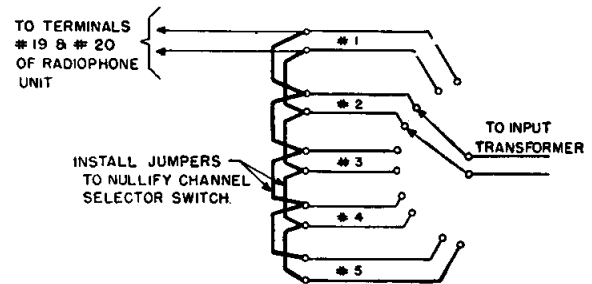


FIGURE 1.—Jumpers installed across input terminals of type 49131 speaker-amplifiers.

be modified according to Figure 1. Jumpers are installed across the input terminals as indicated, permitting the speaker to operate regardless of the position of the switch.—12/1/45

ELIMINATION OF FEEDBACK IN TYPE 49131 SPEAKER-AMPLIFIERS

Occasionally feedback is present between the 49131 series speaker-amplifier unit and a microphone or handset connected to the same circuit or a radiophone unit. The press-to-talk switch in the microphone or handset operates a relay in the associated 23211 or 23423 radiophone unit. The relay is intended to cut out the speaker, but actually only breaks one side of the line, leaving the speaker not entirely inoperative due to a sneak circuit through ground. The center-tap of the speaker-amplifier input winding is grounded. Therefore, when the receiver connected to the particular radiophone unit has a grounded output, the circuit will be completed through ground and one-half of the input winding. The condition can be eliminated by disconnecting the center-tap lead on the input transformer from ground, as indicated in Figure 1.

It should be noted that this method applies only to the type 49131 series units used on communication circuits. Similar units used on

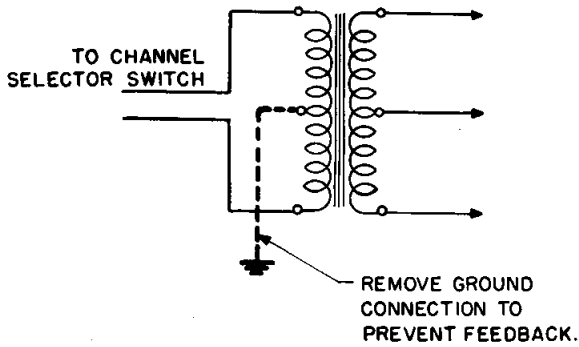


FIGURE 1.—The center-tap lead on the primary of input transformer should be removed.

standard broadcast reception systems should not be altered in this manner.—12/1/45

TYPE CME-60069 SIGNAL GENERATOR FIELD CHANGE NO. 1

ADDITION OF OUTPUT CONTROL

Equipments affected.—Type CME-60069 signal generator used with Loran skyway trainer; Type 60069A is not included in this change.

Purpose.—To allow use with other than DAS-1, DAS-3, or DAS-4 Loran receiving equipment, and to allow use in Loran skywave trainer as described in enclosure to BuPers ltr Pers 42e6/427/fs Serial 2472-5 of 7 November 1945 to various NavTrSch (Electronics). This change shall be used in lieu of paragraph II A-2 of the enclosure to that letter.

Action required.—The change should be made as required by activities holding equipment.

Time required.—About ½ man-hour.

Material required.—One 2000-ohm, 2-watt wire wound potentiometer to be obtained from stock.

Procedure.—Install the potentiometer on the front panel. Disconnect the lead from pin 4

of the interconnecting cable socket and connect this lead to the contact arm of the potentiometer. Ground one end of the potentiometer, so that the clockwise rotation decreases the resistance in the circuit.

General.—This change covers only part of the special connections necessary for using the type CME-60069 with other than models DAS-1, DAS-3, or DAS-4. See paragraph II-3 of Instruction Book for Type CME-60069 and 60069A Signal Generators (SHIPS 369) for connection of normal use or paragraph II A-1 of enclosure to BuPers letter referenced above for connection for skywave trainer.

This change using available material is within the scope of the training activity's personnel and should be accomplished at the earliest opportunity. A record of completion should be made on the equipment Modification Log. Completion of this change should be reported on the NBS-383 card. 4/1/46

POTENTIOMETER FAILURES IN TYPE 49131 SERIES SPEAKER-AMPLIFIER UNITS

Excessive failures of potentiometers R-501 and R-502, have been reported from the field. Investigation discloses that the failures in the large majority of cases are broken stops. This allows the sliding contact to travel farther than it should, causing damages to the winding and also to the coupling link between the sections.

Personnel are cautioned to use these potentiometers with greater care in order that such failures be reduced to a minimum. Every effort should be exerted to inform all hands who have access to the speaker-amplifier that such caution must be practiced. It is suggested that a tag or label be attached to the unit to warn against rough usage. 8/1/46

REPORTING FAILURES OF TYPE CABL-74039 PORTABLE FREQUENCY STANDARD

The type CABL-74039 portable frequency standard, used to calibrate the frequency meter and recorder of the models RAU and AN/FMQ-1A Radiosonde equipments, has been reported as failing. The Bureau is particularly interested in this type frequency standard at this time and all failures of parts as well as failure of the equipment to operate properly should be reported on the NBS-383 failure report card immediately.

10/1/46

VOLUME CONTROL FOR 49546 TYPE SPEAKERS

Several activities have suggested a modification of the type -49546 loudspeaker unit to

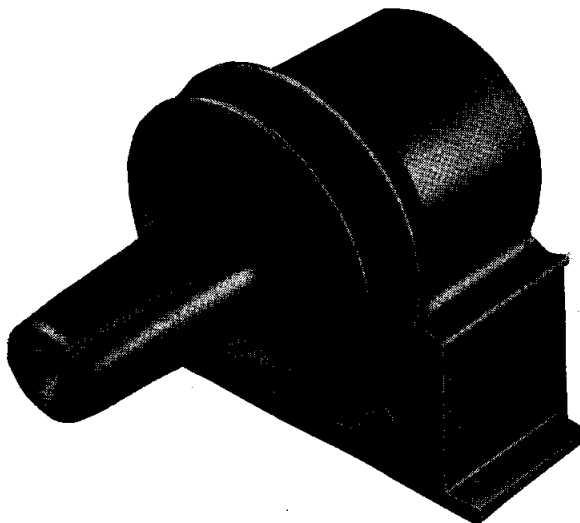


FIGURE 1.—The type 49546 speaker unit. Plug on the right must be removed to gain access to the volume control.

eliminate the necessity for removing the threaded plug in order to gain access to the volume control. In view of these suggestions, it is believed that the intended ultimate installation of these units is not generally understood by the field.

The type -49546 unit is provided with a built-in T-pad volume control connected between the matching transformer and the driver unit as shown in the photograph. The shaft is slotted

for screw driver adjustment and is accessible upon removal of a 1/2" pipe plug. This control was provided only as a secondary means of controlling speaker volume and is not intended for use as the primary or regular control. This secondary control will be found convenient, and in some cases essential, for limiting the maximum volume to the desired value at certain locations. In a location such as an open bridge, the volume would be set at maximum level. Conversely, if a speaker is mounted in a very small, relatively quiet space, the level would be correspondingly lower. The proper control setting for each individual speaker installation should be determined by trial under actual or simulated operating conditions. After the desired setting has been determined, the plug should be installed and the primary volume control used thereafter for all normal adjustments. The recessed shaft and pipe plug was adopted in lieu of a protruding shaft and packed gland to insure a permanent, trouble-free control which would not be tampered with, and to maintain the watertight integrity of the unit.

All standard shipboard installations of the type -49546 loudspeaker unit as originally and presently planned call for a small, compact audio amplifier (type -50210 or equivalent) to be placed in the circuit between the source of signal and the speaker unit. The source will be either a remote control unit, radiophone control unit, or a basic receiver. The amplifier in each case is to be installed in a protected location convenient to the proper operating personnel for power on/off and volume adjustments. The conveniently located amplifier with all the necessary controls permits installation of the speaker unit in the most efficient location without regard to accessibility. This feature is of particular importance when it becomes necessary to locate a speaker at a considerable height on an open bridge or other inaccessible location. The ever increasing number of installations in such locations was the principal reason for abandoning the combination speaker-amplifier units of the 49131- and 49620-types. In a few instances where a speaker is connected directly to the output of a single receiver (having sufficient power output) the volume control incor-

porated in the receiver unit should be used as the primary control.

A summation of the foregoing indicates that the T-pad incorporated in the 49546-type unit should be used only as a secondary or fixed-setting control and that the volume adjustment provided in the associated amplifier unit, control unit, or receiver unit should be used as the primary or regular control.

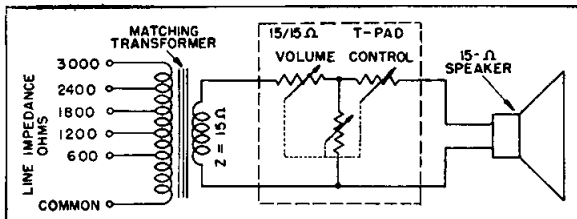


FIGURE 2.—Schematic diagram showing T-pad network connected in circuit between sources and 49546-type loudspeaker.

The above represents the general intended use of the -49546 loudspeaker unit and will be applicable in practically all installations. However, the Bureau recognizes the fact that there may be a small number of special installations wherein it will be desirable to utilize the volume control in the loudspeaker unit as the "primary" control. For these special cases, the Bureau has

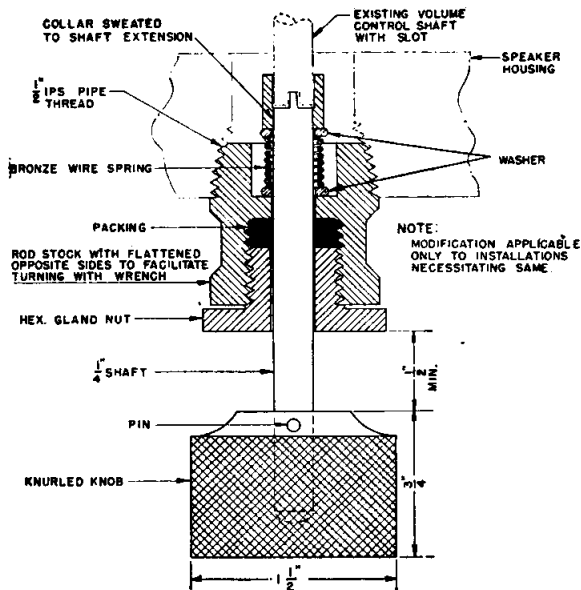


FIGURE 3.—Details of modification to volume control shaft.

prepared a sketch to indicate the preferred method of extending the volume control shaft through the housing in order to make it readily accessible. This method permits retention of the weatherproof features and does not require any modification of the speaker housing or the volume-control assembly. Vessels and activities finding it necessary to make this modification should proceed with the fabrication of the necessary device in accordance with the accompanying drawing. This is BuShips drawing RE 49A-446A and copies may be obtained upon request from BuShips code 982. 12/1/46.

IMPROVING PERFORMANCE OF TYPE CAGW-66132 ANTENNA

It has been brought to the attention of the Bureau that some of the CAGW-66132 stub-mast antennas have reached the fleet with two coats of Navy light grey enamel on the section between the termination of the metal sheath and the coax conductor located on the end of the mast. It has also been found that fleet maintenance crews have in some cases painted this section.

Lead-base paint on this section lowers the resistance between the antenna and ground under certain conditions of humidity and causes a loss in the antenna sensitivity. To correct this situation the enamel paint should be scraped off and the phenolic section treated with two coats of grey spar varnish. 2/1/47

→ TYPE-23496 CONTROL INDICATOR UNIT—MODIFIED FOR HANDSET EXTENSION

To fulfill the need in some ships for an extension handset for a type -23496 remote-control indicator unit, a method has been devised to connect a terminal strip in parallel to one of the handset receptacles. Because of difficulty in connecting additional conductors to the receptacle lugs, other solder points were found which facilitate wiring. The back of these points is indicated on BuShips Drawing RE 23AA 255A

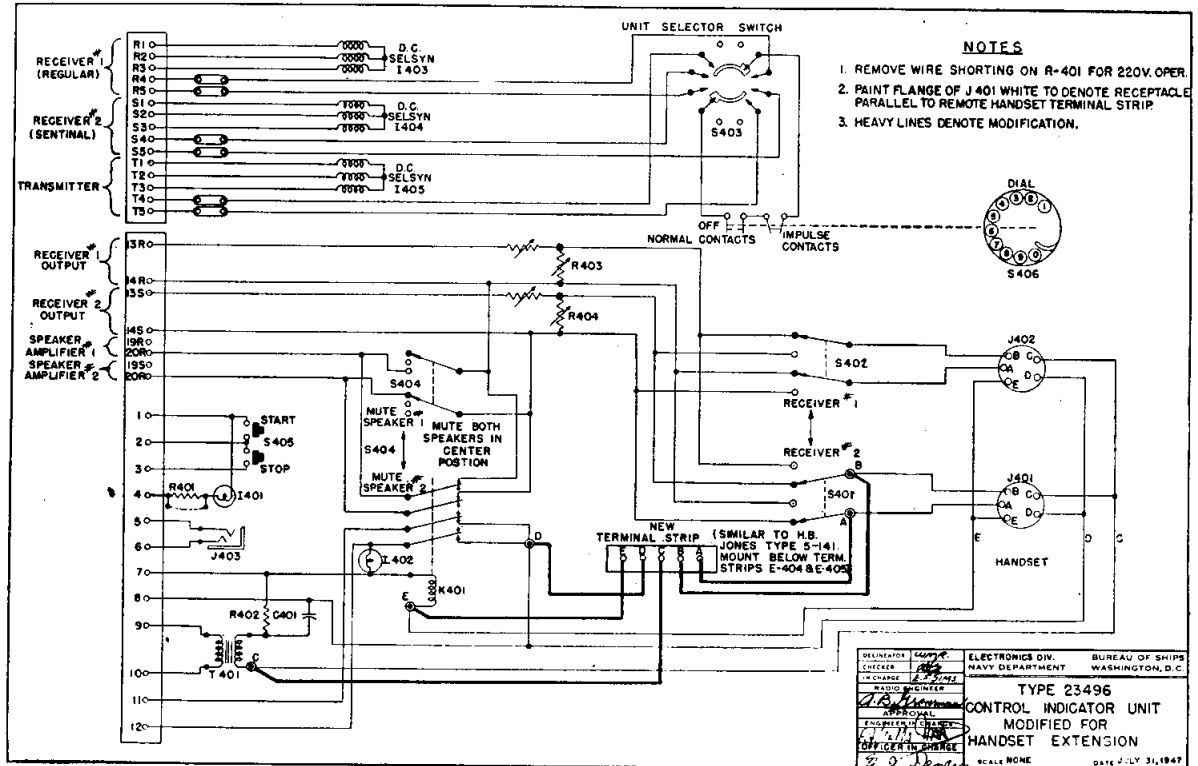


FIGURE 1.—Type -23496 control indicator unit modified for handset extension.

RE 23AA 255A

by a circle and designated by a letter which corresponds to the pin designation in the handset jack. The wiring to the new terminal strip is drawn in heavy lines. (See Figure 1). Inasmuch as there are two handset receptacles in the -23496, the Bureau desires that the flange of receptacle J-401, to which the new terminal strip is set parallel, be painted white. 10/1/47

→ SPARE PARTS FOR TYPE -49546 LOUDSPEAKERS

Inquiries have been received by the Bureau regarding spare parts for the type -49546 loud-speaker. Equipment spares are not provided for this speaker. However, the latest contract NObsr-39331 provides tender and stock spares which include cover-gaskets, driver units, volume-controls and matching-transformers. In the event of failure such that the unit cannot be repaired using parts from the tender or stock spares furnished on contract NObsr-39331 or from local stock, the speaker should be replaced with a new unit at the first opportunity. 4/1/48

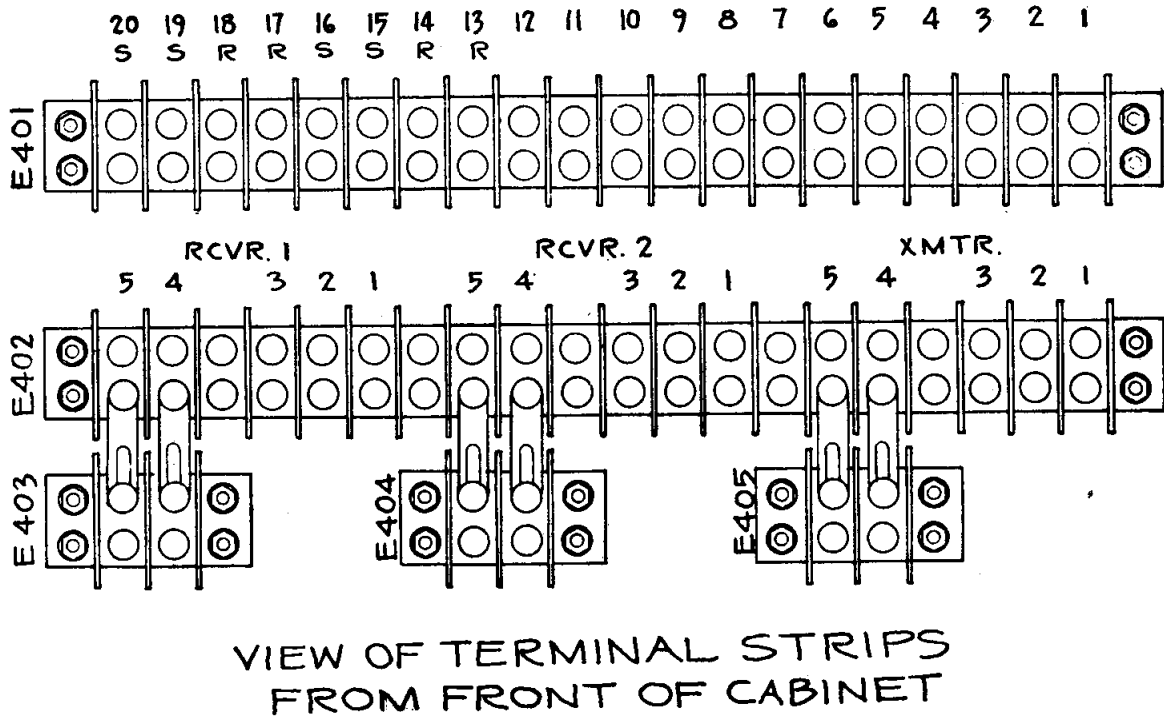


FIGURE 1.—Terminal strip markings on type CQC-23496 remote-control indicator unit. Drawing RE 23A264-A.

→ TERMINAL STRIP MARKINGS ON TYPE-23496 REMOTE-CONTROL INDICATOR UNITS

The Bureau has recently received information that several Type -23496 Remote-Control Indicator Units were found to have no identification markings for the terminal strips mounted in the back of the cabinets. For the convenience of those installing activities finding this condition, the accompanying diagram is published. Additional copies are available from the Bureau of Ships, Code 932b. 4/1/48

1. This improvement is within the scope of the ships force, and should be accomplished at the first opportunity. 4/1/48 ←

DRAINAGE HOLE FOR TYPE 66046 AND 66047 WHIP ANTENNAS

It has been reported that moisture has accumulated in the type 66046 and 66047 whip antennas, in some instances to the extent of damaging the antennas when freezing occurs.

In order to overcome this difficulty, a 1/8-inch hole should be drilled in the base of each antenna. The hole should penetrate the adapter base and lowest mast section as shown in figure

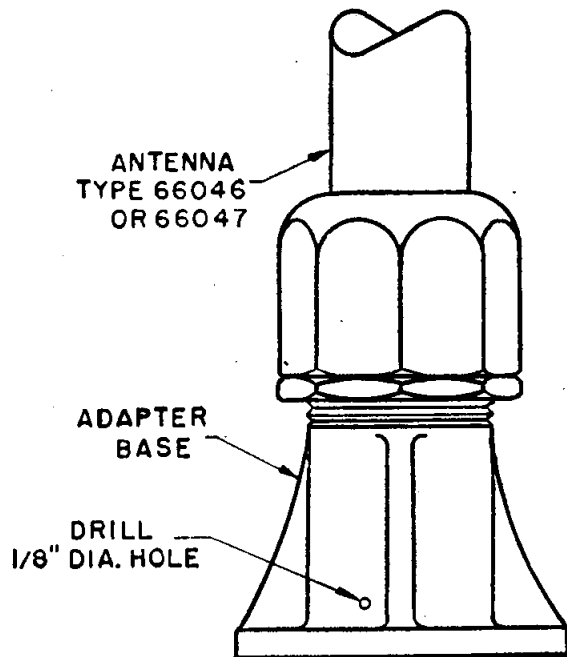


FIGURE 2.—Prevention of moisture accumulation by drilling a small hole in the whip antenna base.

ADDITIONAL PROCUREMENT OF TYPE 49546 LOUD SPEAKERS

An additional quantity of 5000 Type 49546 Loudspeakers are being furnished under contract NObsr-39331. These speakers are physically and electrically similar to the speakers supplied on contract NXsr-55603, the only difference being in the type of volume control. The same installation and operation instructions apply to both, and the component parts are directly interchangeable. 7/1/48

LOUDSPEAKER CONES FOR TYPE -49545 SPEAKER-AMPLIFIERS

Several reports have been received by the Bureau stating that the loudspeaker cones for the type -49545 speaker-amplifiers contained in the spare parts boxes have been found damaged and unfit for use. The dehydrating bag has been found resting on the cone, and with the vibration incident to the handling of the spare parts boxes and the cone container itself, the bag has caused the cone to wrinkle and become unusable.

All vessels and activities using the type -49545 speaker-amplifier are requested to check the loudspeaker cones of their spare parts boxes for possible damage. Two cones are included in each set of equipment spares and tender spares and three cones are included in each set of stock spares.

Cones that are found to be undamaged should be retained in the original container and the container should be stored in an inverted position; i. e., with the dehydrating bag on the bottom of the container. The gasket will retain the cone at the top away from the bags resulting in less chance of damage. The outside of each container should be marked accordingly. Damaged cones should be turned over to the Electronics Officer for disposal and a Failure Report Card, NBS-383, submitted to the Bureau.

WATERTIGHT COVER ON TYPE -49546 LOUDSPEAKER

It has been reported to the Bureau that the watertight covers on the type -49546 loudspeakers have been found to be loose. In one instance three screws had been left out of the cover when the unit had been replaced after servicing. The cone was found to contain about $\frac{1}{4}$ pint of water and the interior was rusted to the extent that the unit was beyond repair.

All installation and maintenance personnel are cautioned to check and make certain that the watertight cover is properly installed in order to prevent moisture from entering the unit.

DISTRIBUTION OF TYPE -10695 SOLDERING GUNS

A quantity of 1760 Navy Type No. -10695 Soldering Guns (shown in fig. 1) and 1760 packages of six long-life tips each have been procured by the Bureau of Ships. They have been distributed in equal amounts to E. S. B., N. S. D., Bayonne, N. J., and S. S. D., N. S. C., Oakland, Calif., and are now ready for issue. This type of soldering gun incorporates a pre-focused spotlight to illuminate the work, and a flexible tip to facilitate soldering in difficult spots. This feature is shown in figure 2. Another feature is the dual-heat switch. A normal heat of 100 watts is available when the switch is triggered to the first position, while the second position allows 135 watts of heat for soldering to chassis, etc. Heating in five seconds is possible, thereby saving time and power.

The dimensions of the gun are: reach (housing to tip end)—4" horizontal length— $8\frac{1}{4}$ ", vertical length— $6\frac{1}{4}$ ", and thickness— $2\frac{1}{4}$ ". These soldering guns will be issued and drawn in accordance with the allowances shown in the Electronic Equipment Type Allowance Book, NavShips 900,115. 10/1/48.

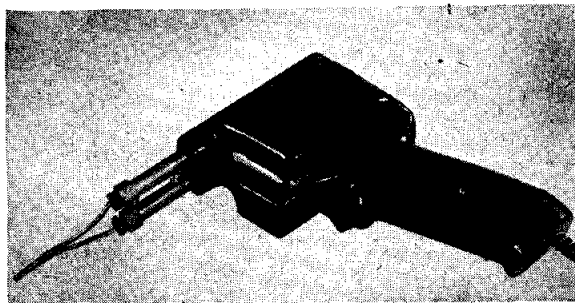


FIGURE 1.—Soldering gun.

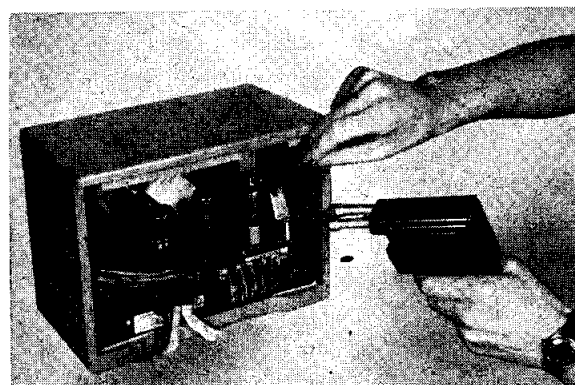


FIGURE 2.—Use of soldering gun.

OPERATION OF TYPE -23497 SELECTOR CONTROL UNITS ON 400 CPS

It has been found that the type -23497 selector control units, employed for remote channel-selection on RDZ, AN/URR-9, MAR, and RDR receivers, work equally on *either* 60-cps or 400-cps line supply-voltages. No modification is required for operation on the 400-cps source. 4/1/49

INSTALLATION OF NAVY TYPE -51085 HAND-SET CRADLE ASSEMBLIES

Reports have been received by the Bureau of difficulty encountered with type -51085 cradles and associated hand-sets when the cradles are installed with the amphenol jacks on the bottom. In such instances, the press-to-talk switch

on the hand-set is actuated as it comes in contact with either the cradle switch plunger or the yoke itself. This switch action results in continuous-carrier current.

In order to overcome this difficulty, it is recommended that the press-to-talk switch on the hand-set be reversed, which will result in the switch button being nearer to the microphone. Care must be exercised in handling the leads to the switch when making this change. With the press-to-talk switch button in such a position, handling of the hand-set will be affected only to a small degree. 4/1/49

NAVY TYPE -49992 ADAPTER KITS

→ Navy Type 49992 adapter kits have been procured and are on the allowance lists of many ships. These adapters enable a technician to make connections to electron tube pins from above the chassis and should find extensive application in servicing chassis whose tube sockets are not conveniently located below the chassis or when the chassis cannot be rotated to a convenient servicing position. Although the instruction pamphlet issued with the kits states that they were designed to be put into Navy Model OE radio receiver analyzing equipments, the Bureau does not desire that they be so mounted. Instead the adapters should be kept separate and a box fabricated locally to hold them. This adapter kit will be a valuable adjunct to Test-Tool Set AN/USM-3 in making emergency tests and repairs. 7/1/49

SCHEMATIC AND PARTS LIST FOR TYPE 49131-C SPEAKER-AMPLIFIER

Due to numerous requests, the schematic and parts list of the speaker-amplifier, N. T. 49131-C has been reprinted. The number NAVSHIPS 91202 has been assigned, and these schematics and parts lists are available at all District Publications and Printing Offices. 7/1/49 ←

**→VOLUME CONTROL OPERATION OF NAVY
TYPE 23500 RADIOPHONE UNITS**

Several reports have been received by the Bureau stating that the leads to the volume control of the type 23500 radiophone unit have been found to be reversed resulting in a decrease of volume when the control was advanced in a clockwise direction. Such a condition is not too serious except from an operational standpoint. Standard operating procedure calls for an increase in volume when the volume control is rotated in a clockwise direction. It is recommended that maintenance personnel check all of their type 23500 radiophone units for proper operation of the volume control and correct as found necessary. 1/1/50

**NEW TIPS FOR THE TYPE 10695
SOLDERING GUN**

A quantity of new improved tips for the type 10695 soldering gun have been procured for issue. These new tips, manufacturers part No. 7300 and known as "Duratips" should be requisitioned and used in the type 10695 soldering gun. The original tips (Long life) furnished

with the guns should be discarded upon receipt of the new "Duratips".

The new tips have been assigned the stock No. N16-T-3496-150 and have been stocked at NSD NBA, Bayonne, N. J., and at SSD NSC, Oakland, Calif.

The new tips are not tinned. Therefore, personnel using the gun with new tips should tin the working area before heating to a high temperature. The new tips are preshaped with a spaded focal soldering point. This design allows for increased heating capacity, decreases the chances of breakage at the soldering point and increases the tip life substantially.

Retaining nuts are not included with the new tips. The old nuts should be used with the new tips. Before use, the retaining nuts should be tightened securely to assure proper operation. Frequent checks to insure nut tightness will eliminate possible casualties.

It is requested that all vessels and activities using the type 10695 soldering guns include information on the performance of the new tips in their operational reports stating whether the "Duratip" or "Longlife" tip was installed in the gun reported on. 1/1/50 ←

TYPE NUMBERED COMPONENTS TROUBLE SHOOTING NOTES

DIFFICULTY ENCOUNTERED	CAUSE AND REMEDY
Type 23211-A Equipment.—Remote radiophone unit failed to operate from any transmitter. Relay K-201 vibrated as if actuated by a-c current.	Trouble caused by four wires becoming disconnected from terminal #6 on type RN-23206 radiophone transfer panel, due to poor soldering job. Normal operation restored by resoldering wires to terminal lug.—U. S. S. <i>Solomons</i> (CVE-67)
Type 50064 Equipment.—Keying solenoid contacts temporarily stuck.	Moving contacts manually caused them to work again.—U. S. S. <i>Raymond W. Herndon</i>
Type 49131 Equipment.—Speaker-amplifier unit failed due to exposure to the weather, resulting in the volume control potentiometer becoming disabled.	To prevent future failure, a sheet metal hood has been installed over the unit and a canvas cover placed over the unit.—U. S. S. <i>Gillett</i>
Type CME-50063 Preselector.—Inoperative. Condenser C5 shorted.	Voltage rating of this condenser apparently too low. Replaced with higher voltage rated condenser.
Type 49131 Speaker-Amplifier.—Damaged channel selector switch on model 49131 series speaker-amplifiers used with RBO systems.	Usually caused by crew members trying to find out what is on the other "censored" channels when the stop is set for 1, 2, or 3 channels as the case may be. After replacing or repairing switch, set the stop so that the knob can be turned to all 5 channels.
Type 21523 Motor-Generator.—Erratic and unstable a-c output. Speed regulator contacts pitted by sparking.	The resistor in motor field cut in and out by regulator contacts was reduced from 1000 ohms to 300 ohms. Operation satisfactory with machine running at 1800 RPM and contacts closing at 1830 RPM.—U. S. S. <i>Barnes</i>
Type 49131 Speaker-Amplifier.—Internal temperature of speaker-amplifier during operation melted solder seal on cap at terminal (lower) end of reactor case, allowing insulating tar to run out, leaving reactor loose in case. In two previous similar instances in other speaker-amplifiers on the ship, the reactor dropped out of the case, breaking the leads and causing failure of the unit.	As a temporary modification only, to preclude the possibility of this trouble recurring, the reactor was removed and replaced with a 250-ohm 2-watt composition resistor. No noticeable hum in the output with either a-c or d-c power supply. Equipment now operates satisfactorily.—U. S. S. <i>Raleigh</i>
Type 49131 Speaker-Amplifier.—Intermittent operation or dead.	Check power and audio leads between terminal board and front panel. These frequently break or ground to shielding at the hinge joint.—U. S. S. <i>Kasaan Bay</i>
Type 49131-B Speaker-Amplifier.—On a-c power, a loud hum is noticed. No noticeable effect when on d-c.	Wiring harness from input transformer to volume control was found to be faulty. At each spot where the individual shielded wires were soldered together, the insulation was damaged by the heat of the soldering iron. Replaced defective wiring.—U. S. S. <i>Calvert</i>
Type 23211 Radiophone Unit.—Mounting screw for relay K-201 vibrated loose due to gun fire.	Removed original screws and replaced with screw $\frac{1}{8}$ " longer to permit peening the thread on the end above the securing base. Original screws loosened in spite of tight screws and locked washers. By peening the ends, absolutely prevented loosening of the relay.—U. S. S. <i>Portland</i> (CA-33).

Type 49131 Speaker-Amplifier.—Output very disorted and volume low.

Found to be due to volume control R-501 and R-502 being damaged by oil leaking from oil filled components. Repaired by cleaning control with carbon tetrachloride and seraping away defective insulation.—U. S. S. *Bolivar* (APA-34).

→
Type CMX 49131C Speaker-Amplifier—Extreme 60-cycle hum and distortion noted. Normally this would indicate faulty capacitors.

This trouble was caused by the dual potentiometer having its shaft broken between the two sections. This caused the lower section, R-501, to remain stationary while the upper section, R-502 rotated. The potentiometer was replaced and the equipment operated normally.—U. S. S. *Webster* (ARV-2) 8/1/46 ←
