

TYPE 49131 SERIES SPEAKER-AMPLIFIER UNITS

The Bureau has received numerous requests from installation and maintenance yards for technical manuals 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.

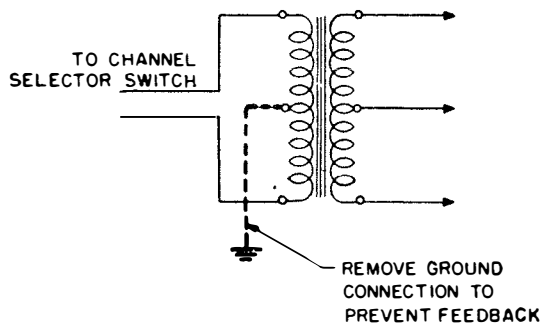


FIGURE 1. --The center-tap lead on the primary of input transformer should be removed

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

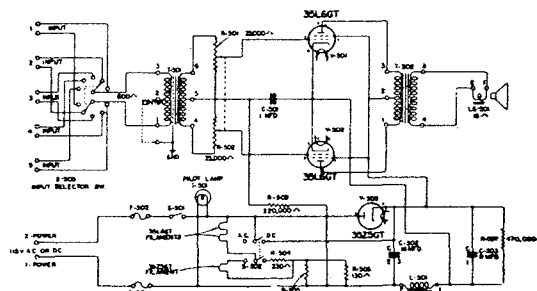


FIGURE 1.--Speaker-amplifier CMX-49131C

Figures 1 and 2 cover 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.		K-90549-1	
C503	C502 denotes 2 of the sections connected in parallel totaling 16 mfd.; C503 denotes 1 section, 8 mfd.			
F501	Fuse, 1 ampere, 250-v., cartridge type		K-55544-14	8
F502	Same as F501			
L501	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
R501, 502	Potentiometer, dual section, each section 25,000 ohms ± 10 percent, wire-wound.		K-858176-1	1
R503	Resistor, 220,000 ohms ± 10 percent, 1/2-watt, insulated type.		K-850981-90	1
R504	Resistor, 230 ohms, wire-wound, ferrule type, type E		M-420664-36	1
R505	Resistor, 130 ohms ± 5 percent, 1-watt, insulated type.		K845949-34	2
R506	Same as R505			
R507	Resistor, 470,000 ohms ± 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	

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
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
C502	Capacitor -- consists of 3 sections, each section 8 mfd. -3 percent + 10 percent, 500 v. d.-c. working.		K-90549-1	1
C503	C502 denotes 2 of the sections connected in parallel totaling 16 mfd.; C503 denotes 1 section 8 mfd.			
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 ±10 percent, wire-wound.		K-858187-1	1
R503	Resistor, 220,000 ohms ±10 percent, 1/2-watt, insulated type.		K-850981-90	1
R504	Resistor, 230 ohms, wire-wound, ferrule type, stype E		M-420664-36	1
R505	Resistor, 130 ohms ±5 percent, 1-watt, insulated type.		K-845949-34	2
R506	Same as R505			
R507	Resistor, 470,000 ohms ±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	

Parts List for Types 49131A and 49 31B Speaker-Amplifier Units--Continued

Schematic symbol	Description	Navy type No.	RCA Manufacturing Co., Inc., part No.	Quantified of spare parts furnished
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		R-712678-504	

INSTALLATION OF JUMPERS ACROSS INPUT TERMINAL STRIP

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 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 types 49131 units installed on single communication circuits 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.

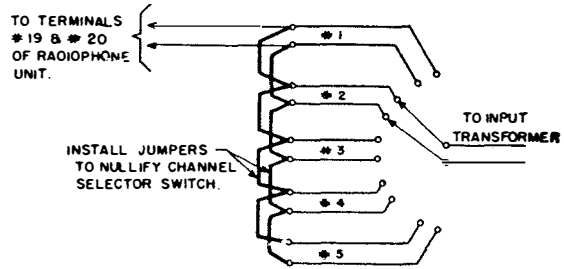


FIGURE 1.--Jumpers installed across input terminals of type 49131 speaker-amplifiers

FEEDBACK ELIMINATION

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 standard broadcast reception systems should not be altered in this manner.

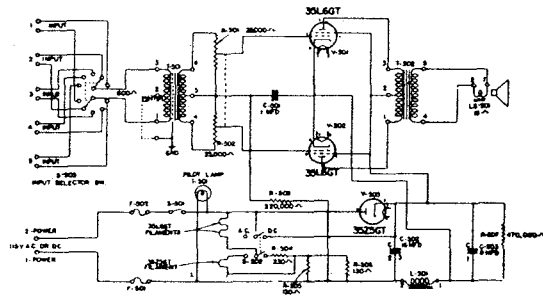


FIGURE 1.--Speaker-amplifier CMX-49131C

POTENTIOMETER FAILURES

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.

MODIFICATION OF CHANNEL SELECTOR

When type 49131 speaker-amplifiers for the 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.

A double-pole double-throw toggle switch in place of the rotary switch has been installed 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 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.

Schematic symbol	Description	Navy type No.	Magnavoc Co. dwg. and part No.	Quantities of spares furnished
C-501	Capacitor, 1 mfd. \pm 10 percent, 400 v.d.c. working.	C-48595A-10	B-250091	1
C-502	Capacitor, consists of three sections, each section 8 mfd. \pm 20 percent, 500 v.d.c. working	C-481337	B-290008	1
C-503	C-502 denotes two of the sections connected in parallel totalling 16 mfd. C-503 denotes one section 8 mfd.			
F-501	Fuse, 1 ampere, 250 v., cartridge type.		A-180157G6	8
F-502	Same as F-501.			
I-501	Pilot light assembly: Socket, candelabra, screw base. Lamp, candelabra screw, 115 v., 0.1 a. Reflector, red jewel, with nut.	CS-5/17	A-180233 A-180161G2 A-180235G1	1
L-501	Reactor, plate filter, impedance 2000 ohms at 60 cycles.	C-30764	B-350007	
R-501	Potentiometer, dual-section, each section 25,000 ohms \pm 10 percent, wire wound.		A-220040	1
R-502				
R-503	Resistor, 220,000 ohms \pm 10 percent, 1/2 watt insulating type.		B-230063G90	1
R-504	Resistor, 230 ohms, wire wound, ferrule type.		A-240020	1
R-505	Resistor, 130 ohms \pm 10 percent, 1 watt insulated type.		B-230065G257	2
R-506	Same as R-505.			
R-507	Resistor, 470,000 ohms \pm 10 percent, 1/2 watt insulated type.		B-230063G94	1
S-501	Switch, s.p.s.t., toggle type.	C-24000	C-160037G4	
S-502	Switch, d.p.d.t., toggle type.	C-24003	C-160037G5	
S-503	Switch.		A-160064	
T-501	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	
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 terminal 4 and 5): 0.57 ohms.	C-30766	B-330009	
X-501	Socket, octal base.	C-49351	A-180232	
S-502	Same as X-501.			
X-503	Same as X-501.			
V-501	35L6GT tube.			4
V-502	Same as V-501.			
V-503	35Z5GT tube.			2
L-S501	Loudspeaker. Conehead assembly.		16C10G2 16C11G2	

TYPE NUMBER 49131 TROUBLE SHOOTING NOTES

Difficulty Encountered

Equipment Type 49131.--Speaker-amplifier unit failed due to exposure to the weather, resulting in the volume control potentiometer becoming disabled.

Speaker-Amplifier Type 49131.--Damaged channel selector switch on model 49131 series speaker-amplifiers used with RBO systems.

Speaker-Amplifier Type 49131.--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.

Speaker-Amplifier Type 49131.--Intermittent operation or dead.

Speaker-Amplifier Type 49131-B.--On a-c power, a loud hum is noticed. No noticeable effect when on d-c.

Speaker-Amplifier Type 49131.--Output very distorted and volume low.

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

Cause and Remedy

To prevent future failure, a sheet metal hood has been installed over the unit and a canvas cover placed over the unit.

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.

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.

Check power and audio leads between terminal board and front panel. These frequently break or ground to shielding at the hinge joint.

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.

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 scraping away defective insulation.

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.

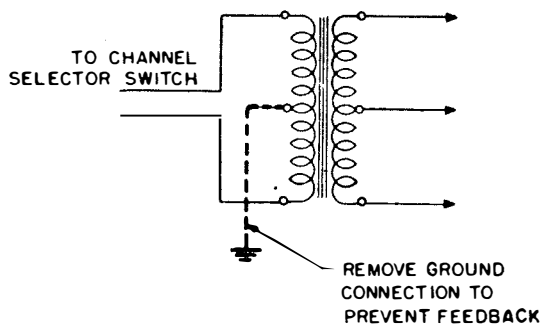


FIGURE 1.--The center-tap lead on the primary of input transformer should be removed