

44 U113

12
JM
1942

RESTRICTED

TM 11-715

WAR DEPARTMENT
U.S. Dept of Army

LIBRARY
 APR 25 1947
 UNIVERSITY OF CALIFORNIA

TECHNICAL MANUAL

INTERPHONE EQUIPMENT RC-38

April 13, 1942

Handwritten text, possibly a signature or name, written in cursive script.

U 113

TM 11-715 TM 11-715

1942



RESTRICTED

TECHNICAL MANUAL }
No. 11-715 }

WAR DEPARTMENT,
WASHINGTON, April 13, 1942.

INTERPHONE EQUIPMENT RC-38

SECTION I. General.	Paragraph
Purpose	1
Power	2
List of components showing weights	3
Mechanical features	4
Electrical features	5
 II. Employment.	
Installation	6
Operation	7
 III. Maintenance.	
General	8
Repair	9
 IV. Supplementary data and list of replaceable parts.	
Tube VT-107	10
List of replaceable parts	11
Manufacturers and their addresses	12

**SECTION I
GENERAL**

	Paragraph
Purpose	1
Power	2
List of components showing weights	3
Mechanical features	4
Electrical features	5

1. Purpose.—Interphone equipment RC-38 is a four-station, intravehicular communication system for use in the light tank M2A3. In addition to providing voice communication between all members of the vehicular crew, the interphone equipment enables the radio operator and tank commander to retain partial control of the vehicular radio apparatus for intervehicular and base-station voice communication.

M558431

2. **Power.**—*a. Input.*—The primary source of power required to operate the interphone equipment is the 12-volt, 168 ampere-hours, 6-hour rate, vehicular storage battery (not an interphone component). Normal storage battery current consumption of the interphone equipment is 3.2 to 3.75 amperes.

b. Output.—The interphone amplifier has a nominal output rating of 2 watts.

3. **List of components showing weights.**

Quantity	Article	Unit weight (pounds)
4	Brush HV, for dynamotor DM-25-(); spare	
4	Brush, LV, for dynamotor DM-25-(); spare	
2	Control box BC-368	2. 2
1	Control box BC-369	1. 3
2	Cord CD-307-A (48'' long) ¹	
2	Cord CD-307-A (65'' long) ¹	
3	Cord CD-318 ²	
1	Cord CD-416 ²	
4	Fuse FU-21-A; spare	
4	Headset HS-18 ¹	1. 6
1	Interphone amplifier BC-367	18. 5
1 set	Interconnecting conduit, wire and clamps	11. 5
1	Jack box BC-370	2. 3
1	Junction box TM-188	3. 6
6	Lamp LM-33; spare	
4	Microphone T-30-A ²	0. 3
6	Tube VT-107 (RCA 6V6 or equal); 2 in use, 4 spare	0. 1

¹ Headsets P-19 may be substituted for headsets HS-18. When this is done, cords CD-307-A are not used.

² Microphones T-17 may be substituted for microphones T-30-A. When this is done, cords CD-318 and CD-416 are not used.

4. **Mechanical features.**—The major components, which are all housed in sheet metal boxes 5/16 inch thick, are mounted directly on the body of the vehicle. All of the control equipment except interphone amplifier BC-367 is permanently mounted and wired to the terminal strips in each box. The interphone amplifier BC-367 has rubber shock-mountings and is a "plug-in" type for convenience in servicing. All units are interconnected by wires which are drawn through flexible metallic conduit and soldered to the terminal strips.

a. Interphone amplifier BC-367 (fig. 1).—This unit consists of a panel and tube chassis assembly fitting into a sheet steel box. The entire unit can be removed from the box as electrical connections are made by the use of plugs and jacks. Two guide angles on the sides

of the box and chassis assure proper alinement of the plugs when entering the jacks. In the box, which is approximately $8\frac{3}{4}$ inches long by $8\frac{3}{4}$ inches wide by $4\frac{1}{2}$ inches deep, is mounted a 14-point terminal

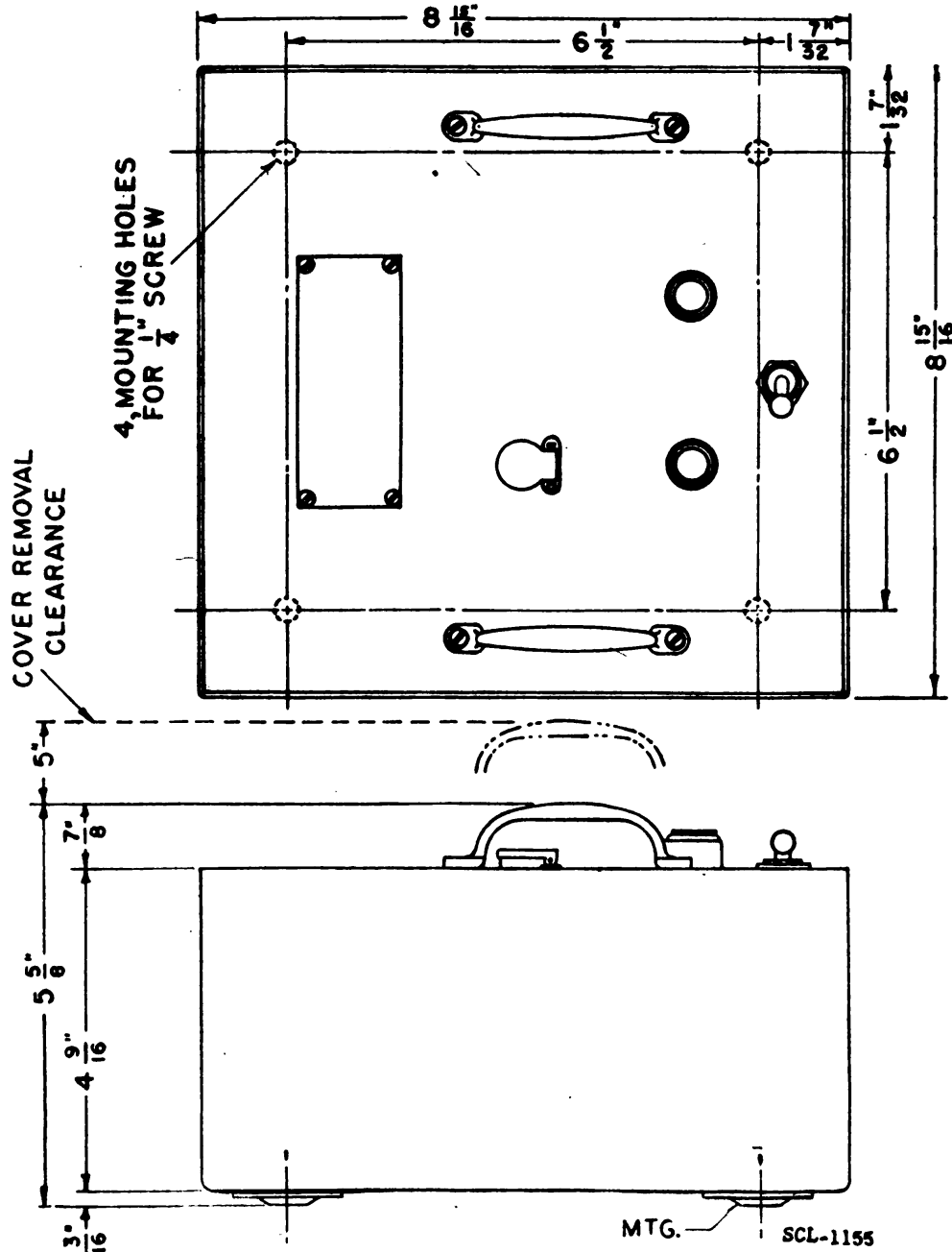


FIGURE 1.—Interphone amplifier BC-367 or BC-667.

block on which the external interconnecting wires of the system terminate. The back of the box contains four rubber shock-mountings by means of which the amplifier is mounted on the vehicle. The panel and chassis assembly consists of a tube shelf riveted to a sheet steel front panel approximately $8\frac{3}{4}$ inches long by $8\frac{3}{4}$ inches wide.

The front panel provides the mounting for the dynamotor and its associated filter, an OFF-ON switch, two fuse posts, and an opening for adjustment of a volume control with a screw driver. On the tube shelf are mounted two beam amplifier tubes VT-107, one input transformer, one output transformer, one oscillator transformer, and two capacitors. The volume control is mounted on a bracket supported from the tube shelf and consists of a 500,000-ohm potentiometer equipped with a special knob which may be adjusted through the panel with a screw driver. A spring provides friction on the knob to prevent turning under vibration. Mounted on brackets and supported from the tube shelf is a terminal board located in the back of the box.

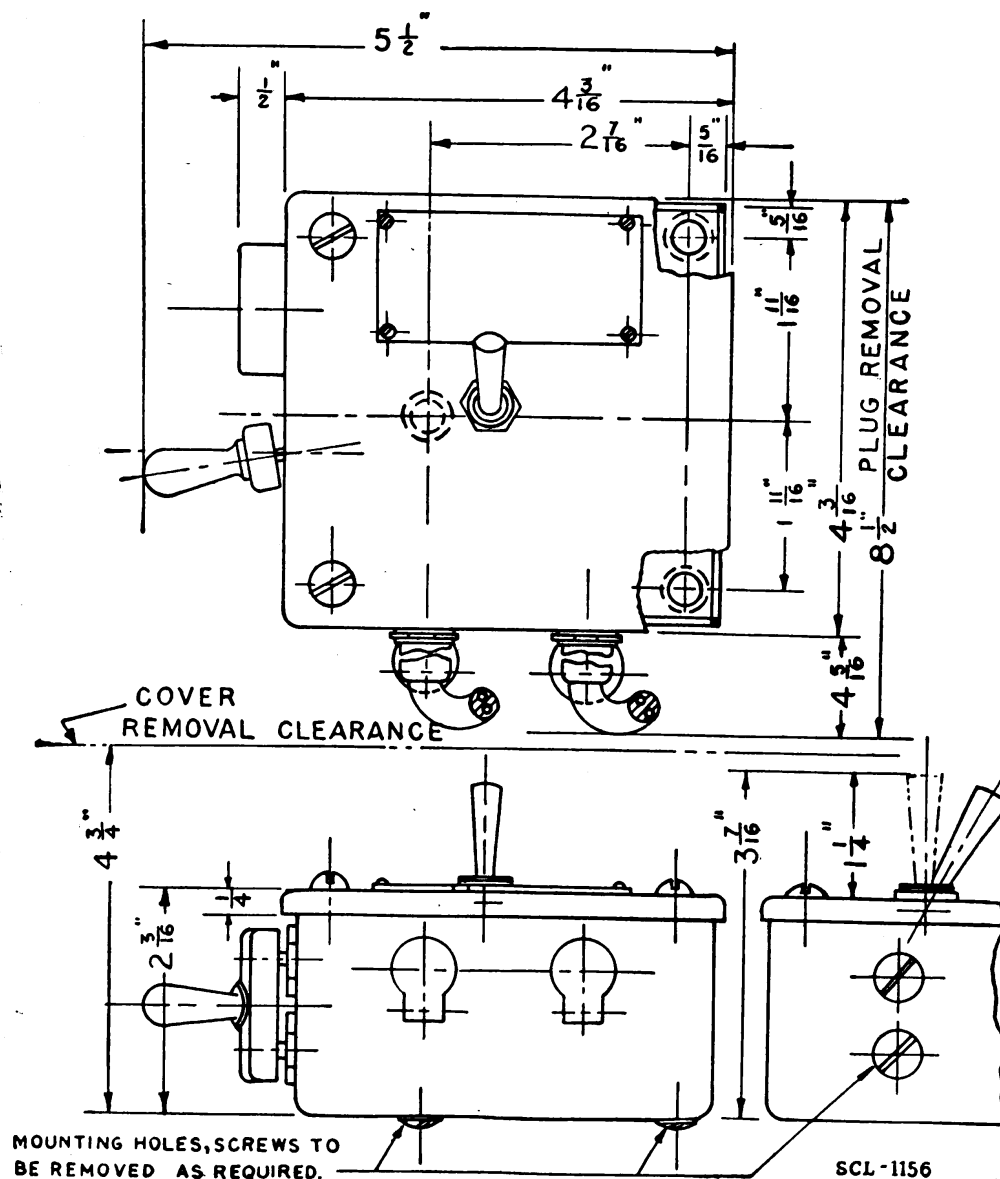


FIGURE 2.—Control box BC-368.

b. *Control box BC-368* (fig. 2).—Two control boxes BC-368 are used in this installation, one for the tank commander and one for the radio operator. Control box BC-368 consists of a sheet steel box approximately 4 inches long by 4 inches wide by 2 inches deep, with a cover. In it are mounted—one 10,000-ohm, wire-wound potentiometer for volume control; one INTERPHONE-RADIO transfer switch consisting of two double-pole, double-throw toggle switches operated together by a common switch handle; one double-pole,

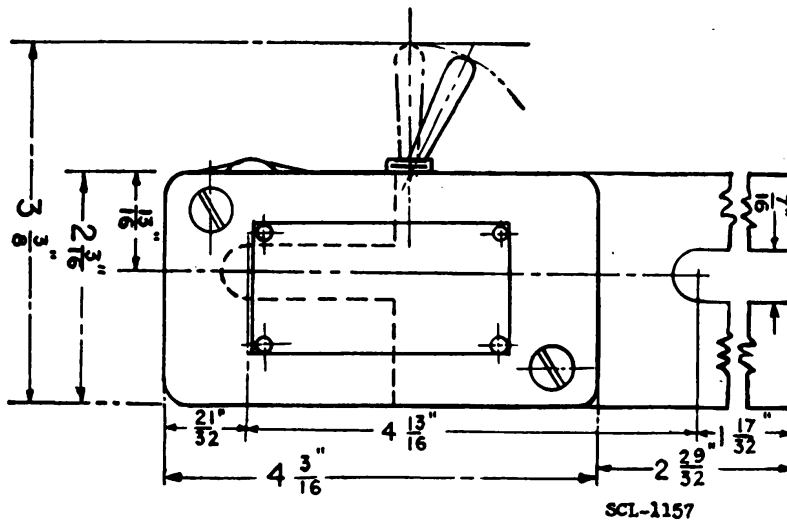
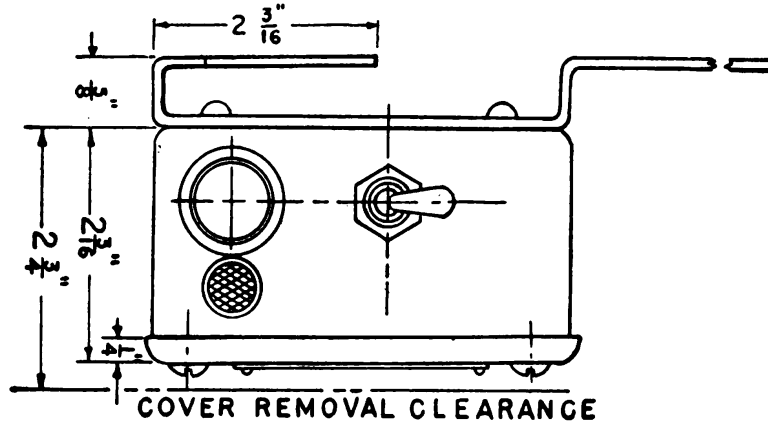


FIGURE 3.—Control box BC-369.

single-throw toggle switch for turning the transmitter on and off; two jacks, one for a headset and one for a microphone; and one 16-point terminal block which connects the unit to the rest of the system.

c. *Control box BC-369 (driver)* (fig. 3).—This control box consists of a sheet steel box approximately 4 inches long by 2 inches wide by 2 inches deep, with a cover. In it are mounted one push-button signal

switch; one microphone switch consisting of one double-pole, single-throw, toggle switch; one red pilot light; and one 6-point terminal block which connects the unit to the rest of the system.

d. Jack box BC-370 (driver and bow gunner) (fig. 4).—This unit

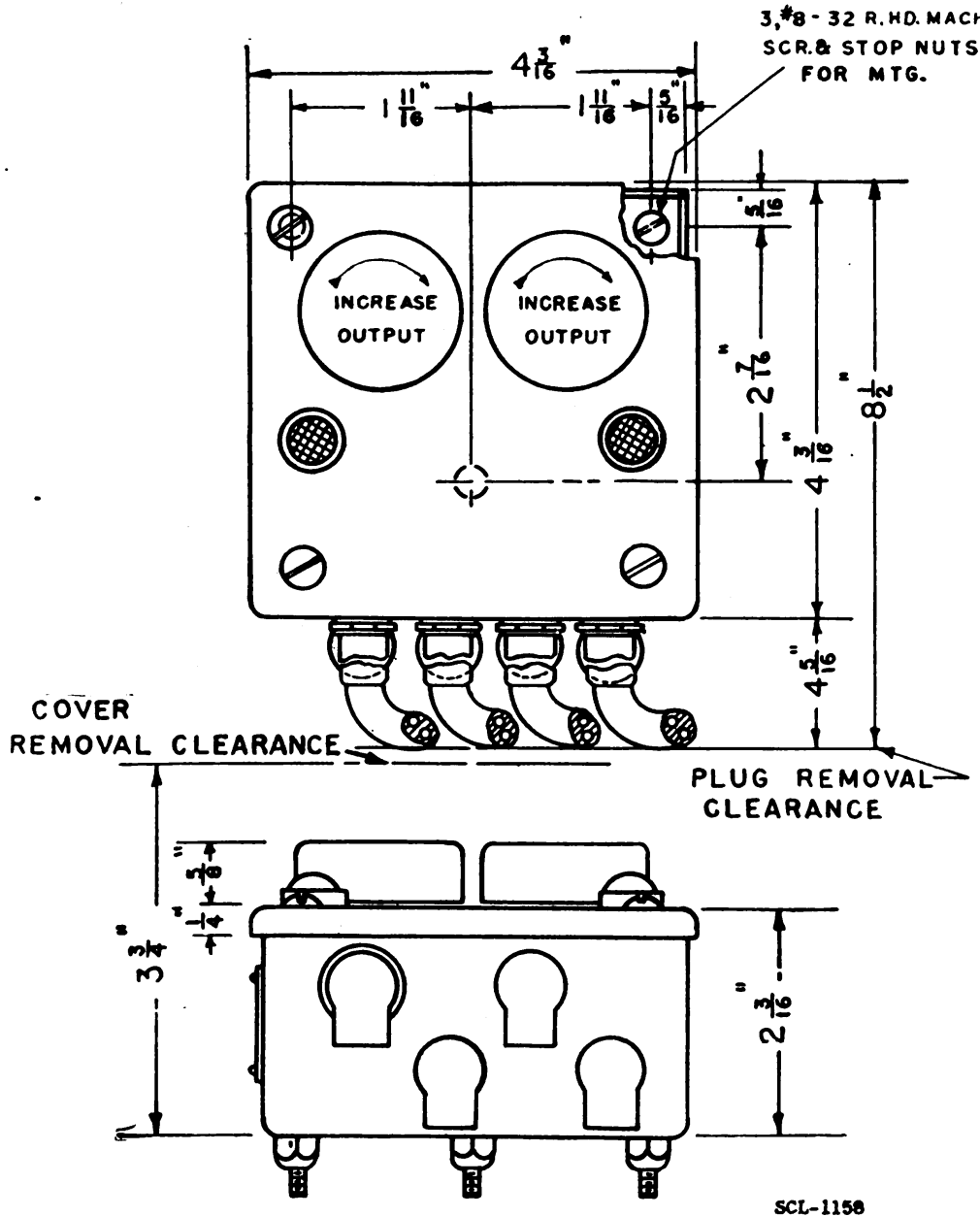
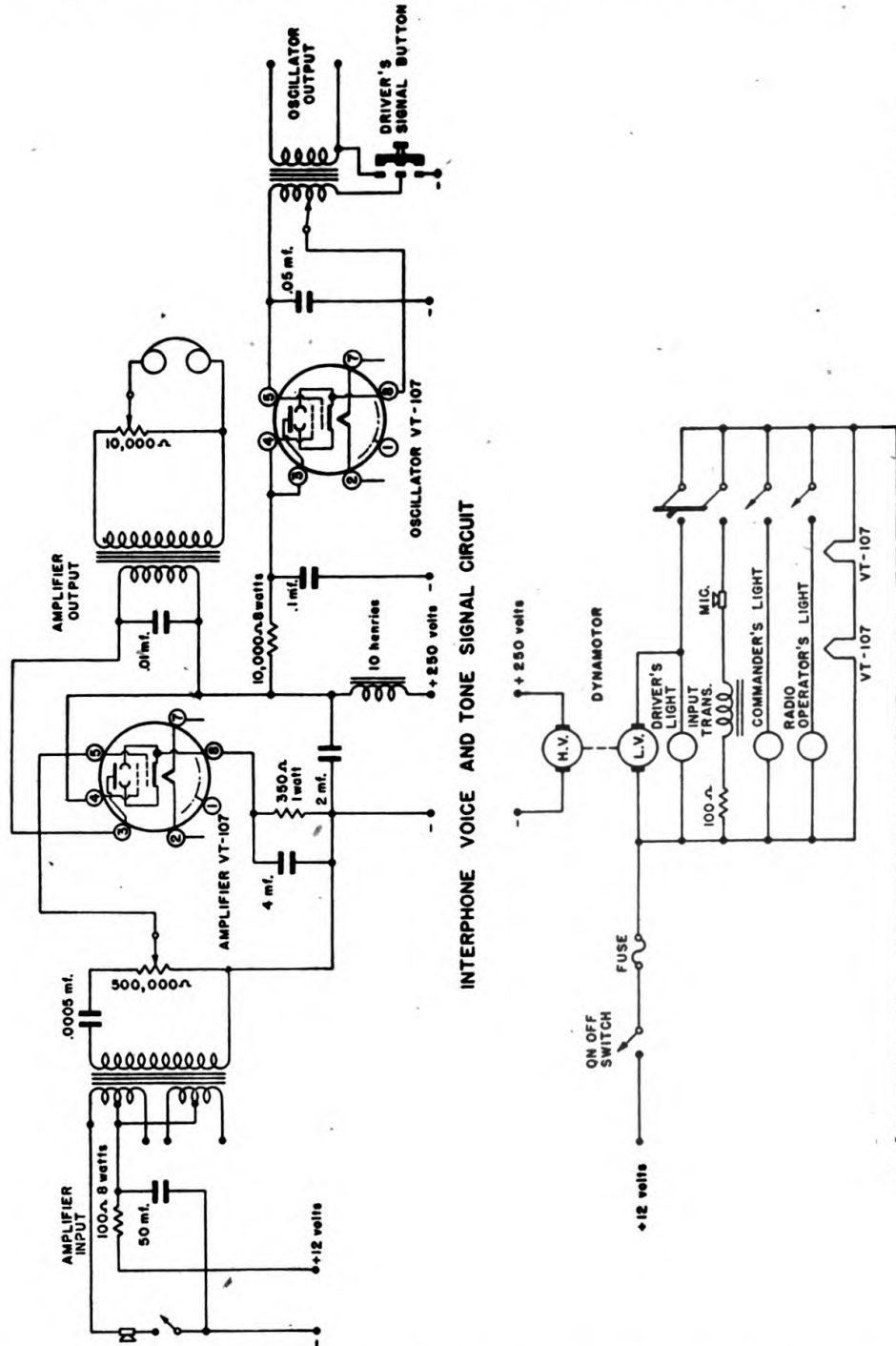


FIGURE 4.—Jack box BC-370.

consists of a sheet steel box approximately 4 inches long by 4 inches wide by 2 inches deep, with a cover. In it are mounted four jacks, two for headsets and two for microphones; two 10,000-ohm wire-wound potentiometers for volume control, one for the driver and one for the bow gunner; one green pilot indicating lamp; one red pilot

indicating lamp; and one 16-point terminal block which connects the unit to the rest of the system.

5. Electrical features.—a. *Interphone amplifier BC-367.*—(1) This



SCL-1180

INTERPHONE LOW VOLTAGE CIRCUIT
 FIGURE 5.—Interphone amplifier BC-367, schematic circuit.

unit contains two separate circuits, an oscillator, and an amplifier (fig. 5). The oscillator circuit is used to generate an audio signal of approximately 600 cycles to provide a means for the driver to signal

Generated on 2015-10-22 20:03 GMT / http://hdl.handle.net/2027/uc1.b3243873
 Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google

when he wishes to speak to anyone on the radio side of the system. When the driver's push-button switch is pressed, this audio voltage is impressed across the input of the second audio if radio receiver BC-312-() is used, or across the output if other type radio receivers are used. The amplifier is of the transformer-coupled type and provides a maximum output of over 2 watts. The rising fidelity characteristic from 100 cycles to 2,500 cycles (attenuation at lower frequencies) tends to compensate for the poor high-frequency response of microphone T-30-A and to prevent excessive noise pick-up. The input transformer consists of a two-winding primary with each winding center-tapped, and a single-wound secondary. The audio-frequency voltage, after being stepped up by the input transformer, is applied through a potentiometer volume control to the grid of the amplifier tube. The output of this tube appears across the secondary of the output transformer. Various output impedances of this transformer can be obtained by use of the proper tap. The amplifier is shipped with an output impedance of 2,500 ohms in use. The d-c microphone current is obtained from the car-battery source through a 100-ohm dropping resistor. A 50- μ f, 25-volt, electrolytic capacitor bypasses the audio component of the microphone current through the dropping resistor.

(2) In the oscillator circuit, the grid is inductively coupled to the plate and tuned by a 0.05 μ f capacitor across the grid and ground. Tube VT-107 is a beam power amplifier with screen and plate connected together to form a triode. The oscillator transformer has a secondary winding which is connected to the output of the radio receiver.

(3) The plate and screen voltage for both the amplifier and oscillator circuits are obtained by the use of a dynamotor (12-volts input to 250-volts output) mounted on the front panel of the interphone amplifier chassis. The negative 12-volt terminal of this dynamotor is kept above ground potential and used as the dynamotor control lead; depressing any microphone switch connects it to ground, thus starting the dynamotor. A filter unit, consisting of a 10-henry choke coil with a 2 μ f paper capacitor across the load side, is mounted on the front panel of the interphone amplifier chassis and provides filtered direct current for the tube plates and screens. The filaments of tubes VT-107 are connected in series across the battery supply.

b. Control box BC-368.—Two control boxes BC-368 are used in this installation, one for the tank commander and one for the radio operator. Control box BC-368 is wired so that the headset and microphone for either the tank commander or radio operator can be

switched to either the radio system or the interphone system by means of a 4-pole, double-throw switch. A potentiometer controls the output from the radio or interphone amplifier, and a transmitter switch is provided.

c. Control box BC-369 (driver).—The driver operates a 2-pole, single-throw toggle switch which connects the driver's microphone to the interphone system. A red indicating lamp lights when the microphone switch is turned ON or when any other member of the crew depresses his microphone button. This lamp when lighted serves as a warning to the driver to prevent him from leaving the microphone switch ON for long periods of time. The push-button signal switch is wired so that pushing the button starts the dynamotor in the interphone amplifier and grounds the cathode circuit of the oscillator tube, causing an audio signal to be set up in the radio output circuit.

d. Jack box BC-370 (driver and bow gunner).—This box provides means for insertion of headsets and microphones for the driver and bow gunner. The VOLUME potentiometers are connected directly across the output of the interphone amplifier. The green indicating lamp lights whenever the tank commander operates his INTERPHONE-RADIO switch on control box BC-368 to the INTERPHONE position. The red indicating lamp lights whenever the radio operator operates his INTERPHONE-RADIO switch on control box BC-368 to the INTERPHONE position.

SECTION II

EMPLOYMENT

	Paragraph
Installation.....	6
Operation.....	7

6. Installation.—*a. Drilling data.*—Light tank M2A3 does not come with all the necessary mounting holes. Figures 6 and 7 give complete drilling details.

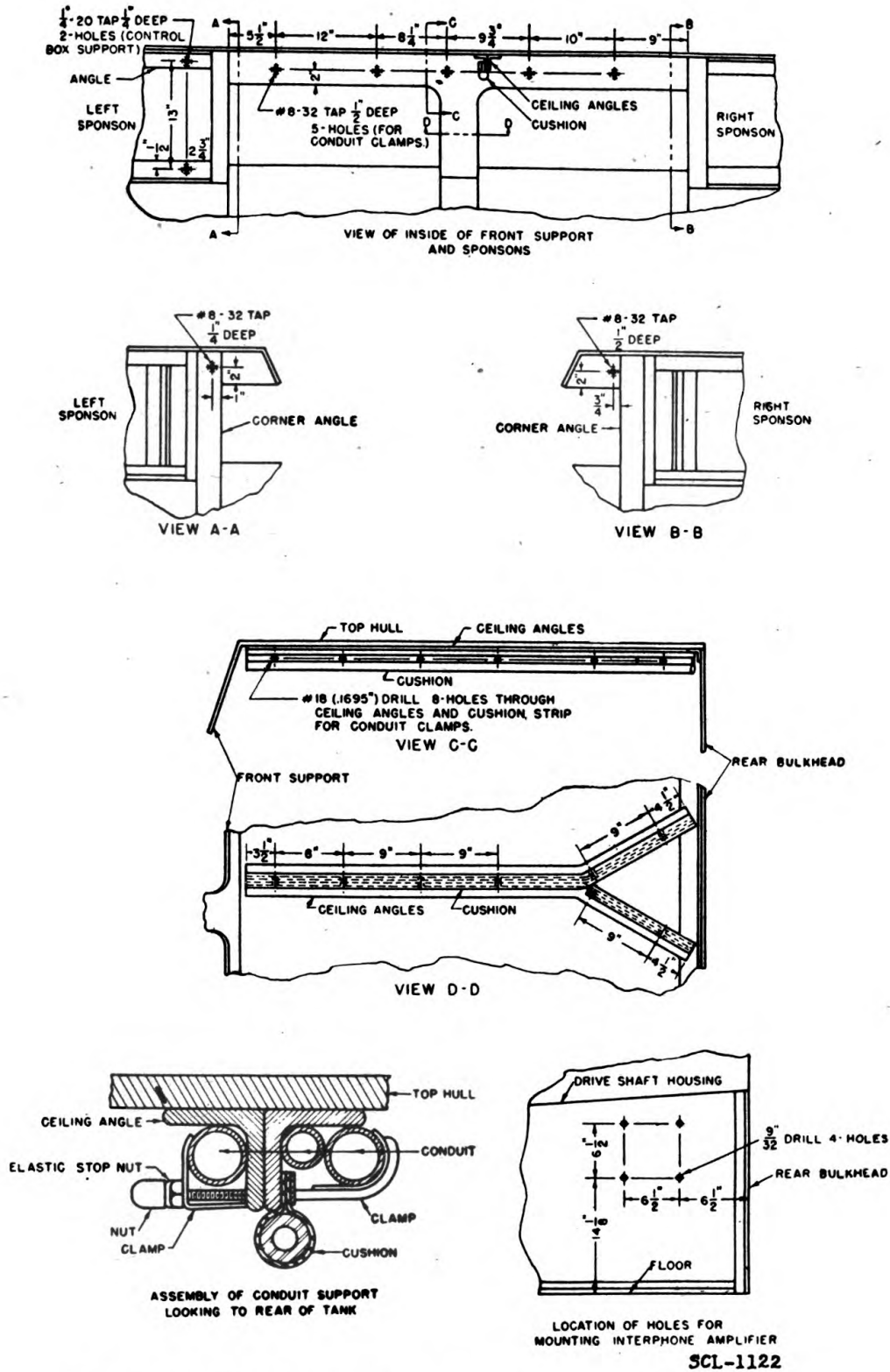


FIGURE 6.—Mounting holes and location for interphone equipment in light tank M2A3.

b. Clamps, screws, etc.—All clamps, screws, nuts, and lock washers needed to install the various components in this vehicle are shown in figure 7. Care will be taken to use the exact screw specified, and all screws, clamps, etc., left over will be placed in a cloth bag and secured to a bracket. It is important to have the holes in the vehicle and the brackets line up with the drilling in the interphone equipment. Be sure to use lock washers where stop nuts are not called for. *Do not change hole line-up on the interphone parts unless absolutely necessary.*

c. Initial procedure.—(1) *Interphone equipment RC-38.*—This comes completely wired and with the requisite mounting plates and brackets attached for installation in light tank M3.

(2) *Interphone amplifier BC-367.*—The amplifier assembly is mounted on the underside of the cover. Remove the cover assembly from the box by removing the eight screws which fasten the cover and pulling it straight out. Install two tubes VT-107 on the amplifier assembly and one spare tube VT-107 in the amplifier box.

(3) *Junction box TM-188.*—Remove the four cover screws and the cover.

(4) *Control box BC-369 (driver).*—Remove the two cover screws and the cover. Unsolder the six conduit wires from the terminal block. Unscrew coupling nut and separate conduit from 45° elbow. Do not remove 45° elbow from box.

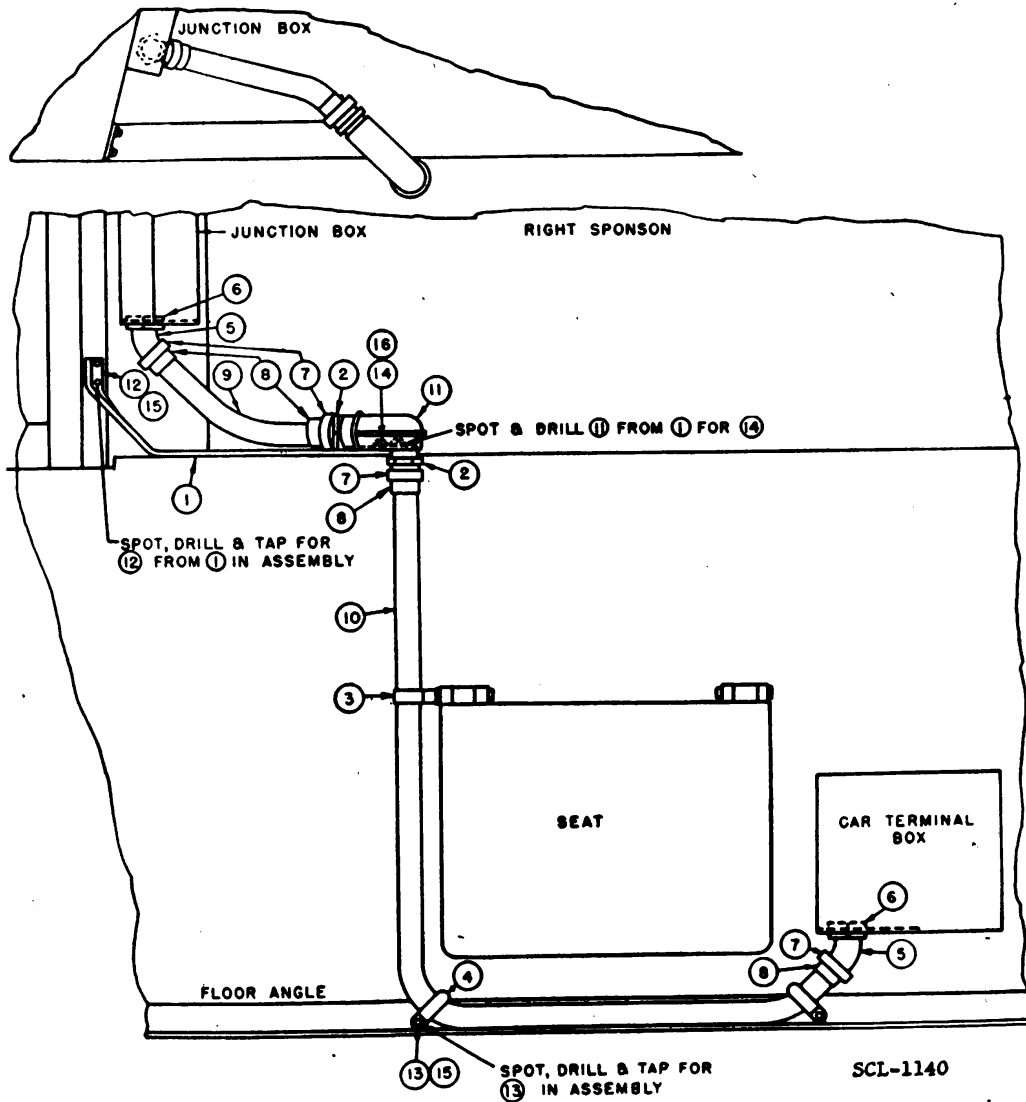
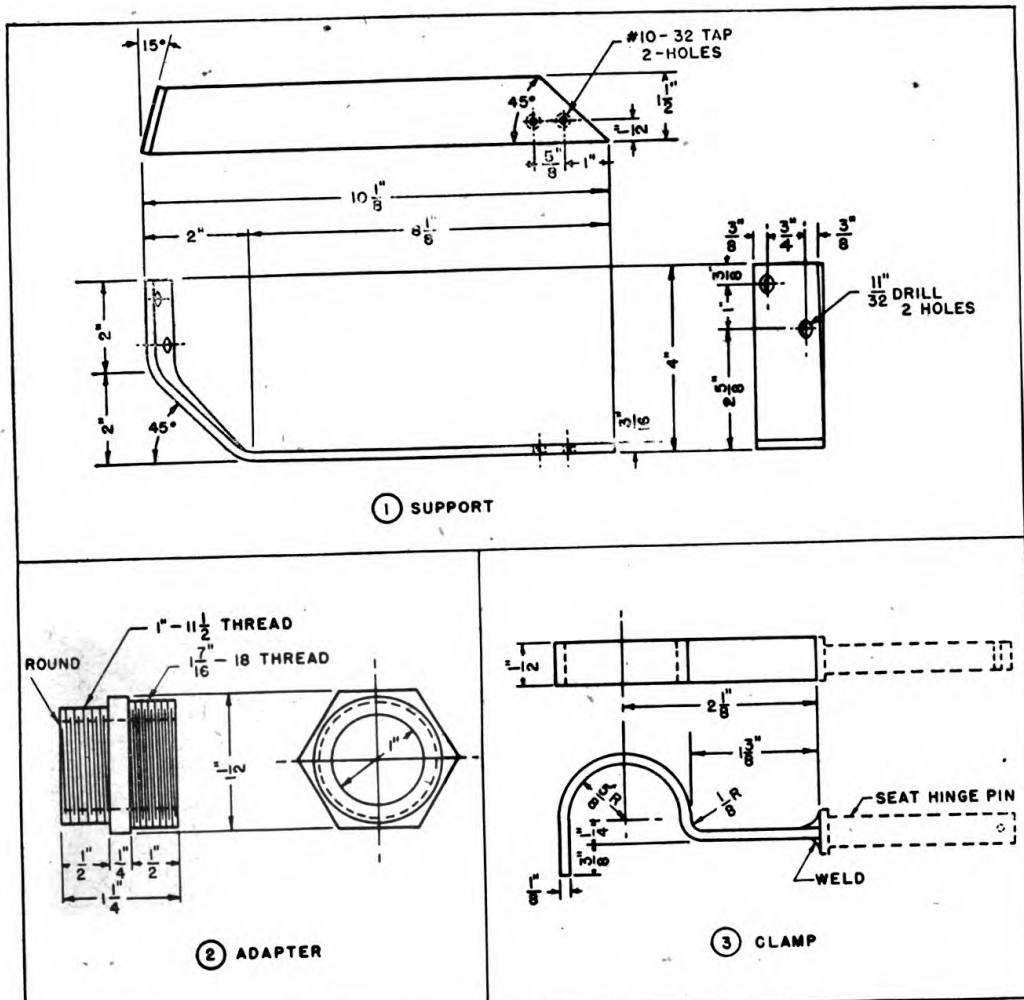


FIGURE 7.—Conduit connection in light tank M2A3.



2	SPLIT SPRING WASHER	STEEL, .001"	16	#10 STD
4	SPLIT SPRING WASHER	NICKEL PLATE	15	5/16 STD
2	RD. HD. MACH. SCREW	BRASS, DULL WHITE NICKEL FINISH	14	#10-32 X 5/16" LONG
2	HEX. HD. BOLT	STEEL	13	5/16" - 18 X 3/4" LONG
2	HEX. HD. BOLT		12	5/16" - 18 X 5/8" LONG
1	SERVICE ELL	IRON	11	1" STD
1	CONDUIT		10	49" LONG
1	CONDUIT		9	6" LONG
4	FERRULE		8	
4	COUPLING NUT		7	
2	LOCKNUT		6	
2	ELBOW		5	
2	PIPE CLAMP		4	
1	CLAMP	STEEL	3	
2	ADAPTER	ALUM. ALLOY	2	
1	SUPPORT	STEEL	1	
QUAN. REQ.	NAME OF ITEM	MATERIAL	ITEM NO.	REMARKS

SCI-1140

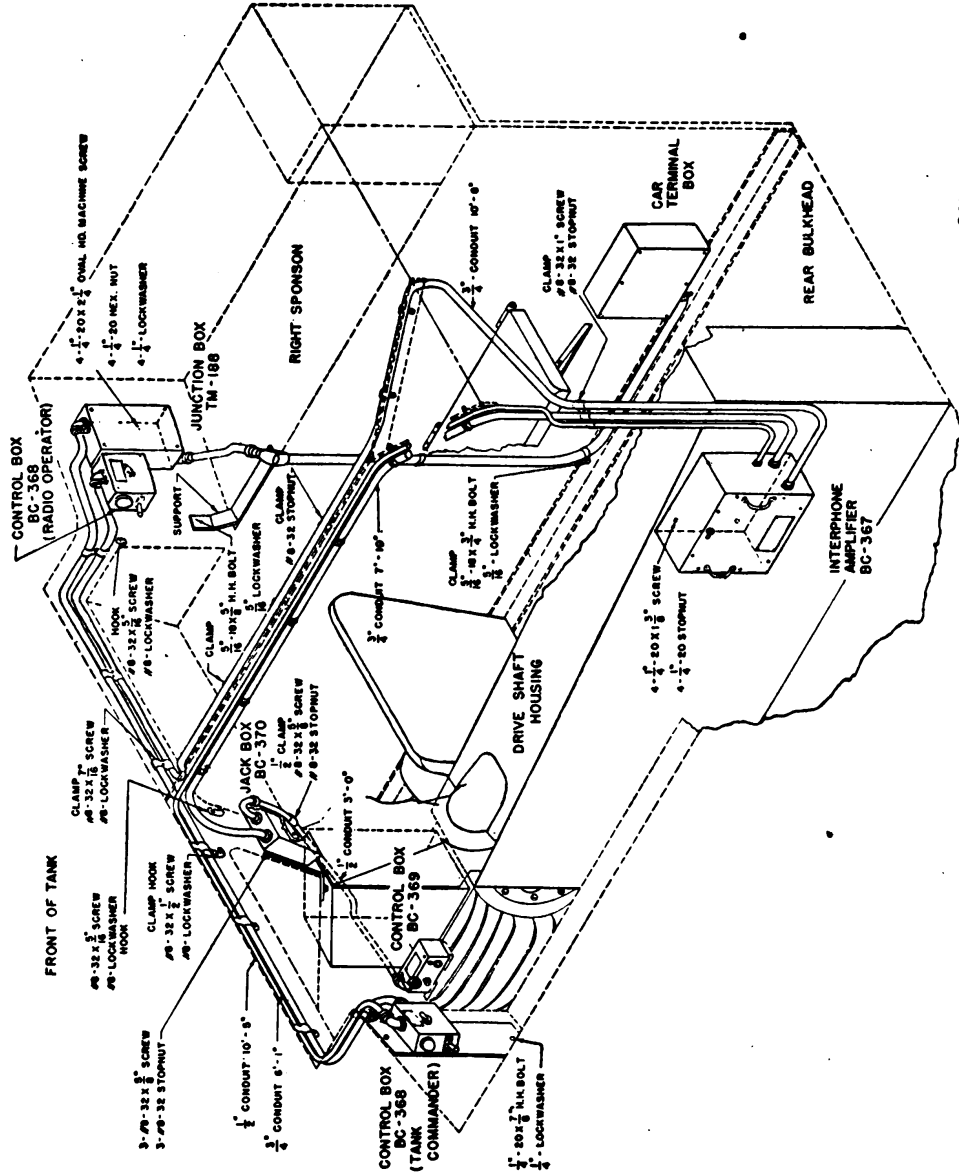
FIGURE 7.—Conduit connection in light tank M2A3—Continued.

d. Details of installation.

Part	Place	Method and material
Junction box TM-188.	Front wall of right sponson.	This box, with its attached control box BC-368, is mounted by means of four oval head machine screws ($\frac{1}{4}$ inch-20 by $2\frac{1}{4}$ inch) and stop nuts. The screws are inserted from the outside of the tank. Connect the elbow terminating the car terminal box conduit to the lower left knock-out hole of TM-188 by means of the coupling nut. Connect the elbow at the other end of the conduit to the lower left knock-out hole of the car terminal box in the same manner. Holes are spotted, drilled, and tapped; and supporting bracket, conduit, and clamps installed as shown in figure 7. Solder wires to terminals in TM-188, pull through conduit and connect to terminal block TM-183 in car terminal box as shown in figure 9. All shielded leads should have the shielding terminated within the conduit or be taped so as to prevent the accidental grounding of terminals on terminal block TM-183.
Control box BC-368 (radio operator).	Front wall of right sponson.	This box comes attached to junction box TM-188.
Jack box BC-370 (driver and bow gunner).	Front center support...	The box comes attached to its mounting bracket. Remove the two $\frac{3}{4}$ -inch nuts holding the center support and secure bracket in place with same $\frac{3}{4}$ -inch nuts.
Control box BC-368 (tank commander).	Front wall of left sponson.	This box comes attached to its mounting plate. Secure plate with two hexagonal head bolts ($\frac{1}{4}$ -inch-20 by $\frac{3}{8}$ -inch) and lock washers.

Part	Place	Method and material
Control box BC-369 (driver).	On transmission housing in front of tachometer.	Remove the two ¼-inch hexagonal head bolts in the transmission housing plate in front of tachometer and mount the box with the same bolts. Couple the conduit to the elbow and solder the wires to their respective points within the box as follows: black to 1, green to 2, blue to 3, yellow to 4, white to 5, brown to 6.
Interphone amplifier BC-367.	Rear left side wall of driveshaft housing.	Remove the driveshaft housing cover. Secure the amplifier box in place at the holes provided, with four hexagonal head bolts (¼-inch-20 by 1½ inches) and stop nuts. The mounting-bolt heads should be inside the amplifier box.
Microphone T-30-A	To be strapped comfortably around throat above the larynx.	
Cord CD-318	Microphone cords for tank commander, radio operator, and bow gunner.	
Cord CD-416	Microphone cord for driver.	
Headset HS-18	Installed in crash helmets.	
Cord CD-307-A (48'')	Headset cords for driver and bow gunner.	
Cord CD-307-A (65'')	Headset cords for tank commander and radio operator.	
Tube VT-107	Three spares to be carried in box BX-21; 1 spare in amplifier BC-367.	
Lamp LM-33	Three spares to be carried in box BX-21.	
Box BX-21 for spare tubes, headsets, etc.	Supplied as part of normal radio equipment of vehicle.	

NOTE.—If radio control box BC-321 or junction box, or both, are used in the present radio installation, they must be removed before the interphone equipment RC-38 is installed. The remote control features of radio control box BC-321 have been incorporated in the radio-interphone system and the junction box TM-188, provided with the interphone equipment, replaces the old junction box.



SCL-1170
 FIGURE 8.—Installation of interphone equipment RC-38 in light tank M2A3.

e. *Conduit and wiring* (fig. 9).—(1) The conduits are secured along the walls and ceiling with clamps, screws, etc., provided.

(2) The radio receiver cord CD-269 (not part of the interphone equipment) is connected to junction box TM-188 at the bottom center knock-out hole by means of the box connector. The connections are as follows: Yellow to 6, natural to 2, black to 4, green to 7, red to 8, shield to 10, blue to 12.

NOTE.—It will greatly facilitate the installation to metal stamp the terminals on cord CD-269 with the correct numbers, before installation.

(3) The wiring between the car terminal box and junction box TM-188 is connected as shown in figure 9. Like numbers of ter-

inals are connected together. Strip the end of each conductor approximately $\frac{1}{2}$ inch; insert the wire through the smaller hole in the terminal, bend around, and solder. To prevent grounding of the terminals, tape or strip back the metal braid of the shielded leads, and terminate it within the conduit.

(4) Plug in cord CD-314 (not an interphone component) between the SPEAKER SECOND AUDIO jack of radio receiver BC-312- () and the jack in junction box TM-188.

7. Operation.—Insert headsets HS-18 or P-19 in all phone jacks of the system. Insert a microphone T-30-A or T-17 in all microphone jacks of the system.

a. Operation of the interphone system.—(1) Operate the OFF-ON switch of interphone amplifier BC-367 to ON and allow time for the tubes to heat up (usually 25 seconds).

(2) Set the INTERPHONE-RADIO selector switches of both control box BC-368 (radio operator) and control box BC-368 (tank commander) to the INTERPHONE position.

(3) Set all volume controls of the individual boxes to maximum and turn back approximately one-quarter turn. Press any of the microphone buttons; check that this starts the dynamotor and that a slight hum is heard in all headsets. Speak into the microphone in a normal tone of voice; this should cause the amplifier output to be heard in the headsets.

(4) Adjust the volume of the interphone amplifier BC-367 by inserting a screw driver through the opening marked VOLUME on the front panel and engaging the shaft of the volume control mounted directly behind the panel. Turning clockwise will increase the volume. Adjust the volume so that the output heard in the headsets is at a suitable level. Keep the volume below that level which would cause headsets to chatter.

(5) Start the tank engine and when it is running at approximately 1,800 revolutions per minute, check the operation of the amplifier. Speak into the microphone more forcefully now. If the volume is too high, readjust the amplifier volume control to a more comfortable level. Check the output of all the headsets to see that they are all operating satisfactorily. The red indicating lamp in control box BC-369 (driver) should be lighted.

(6) Test the controls at the driver's position by turning the microphone switch ON and speaking into the microphone. Adjust the microphone snugly around the neck if a T-30-A.

(7) Set the INTERPHONE-RADIO selector switch in control box BC-368 (tank commander) and control box BC-368 (radio operator) to the INTERPHONE position and check that the indicating

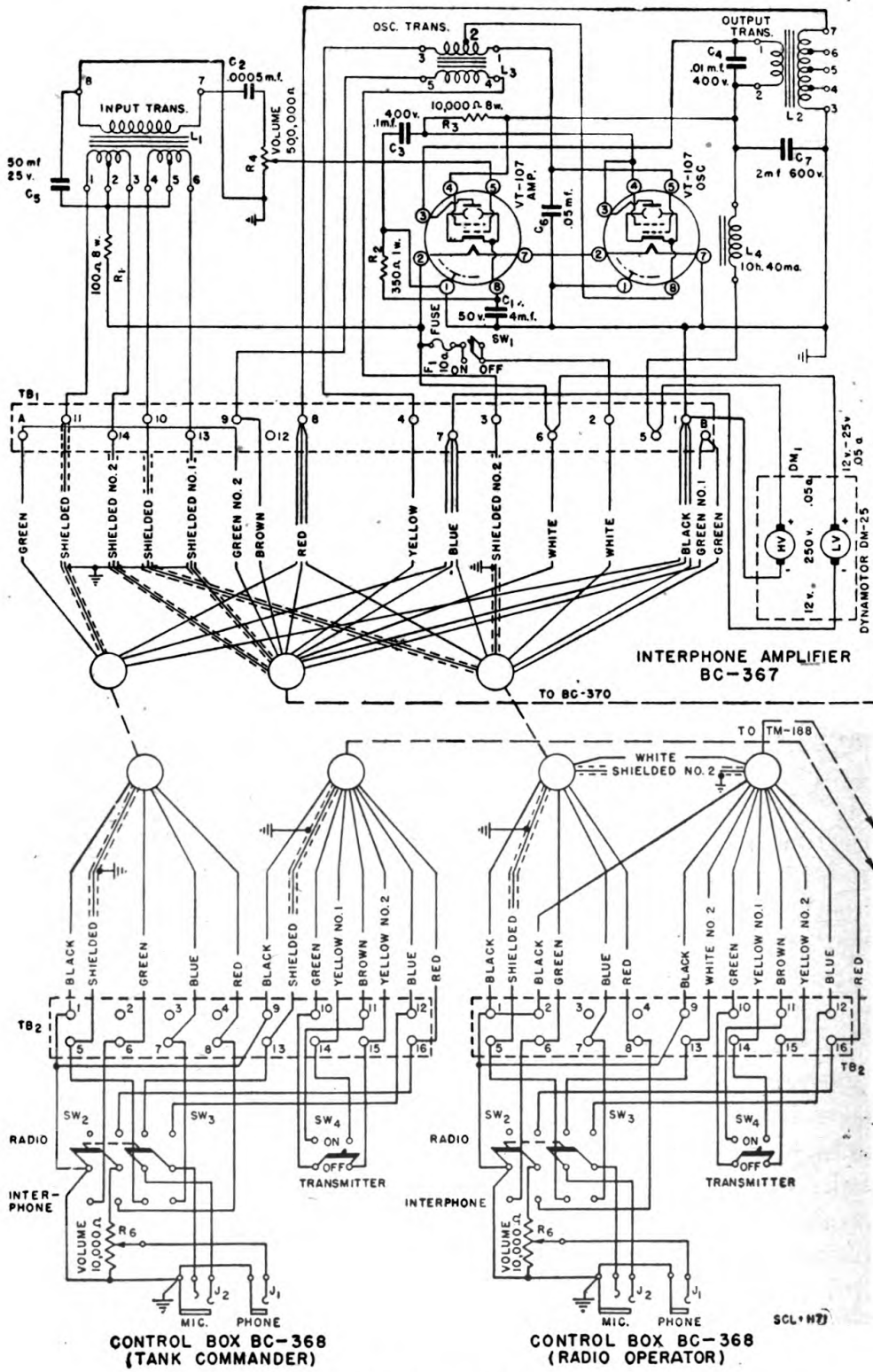


FIGURE 9.—Interphone equipment RC-38, wiring diagram.

INTERPHONE EQUIPMENT RC-38

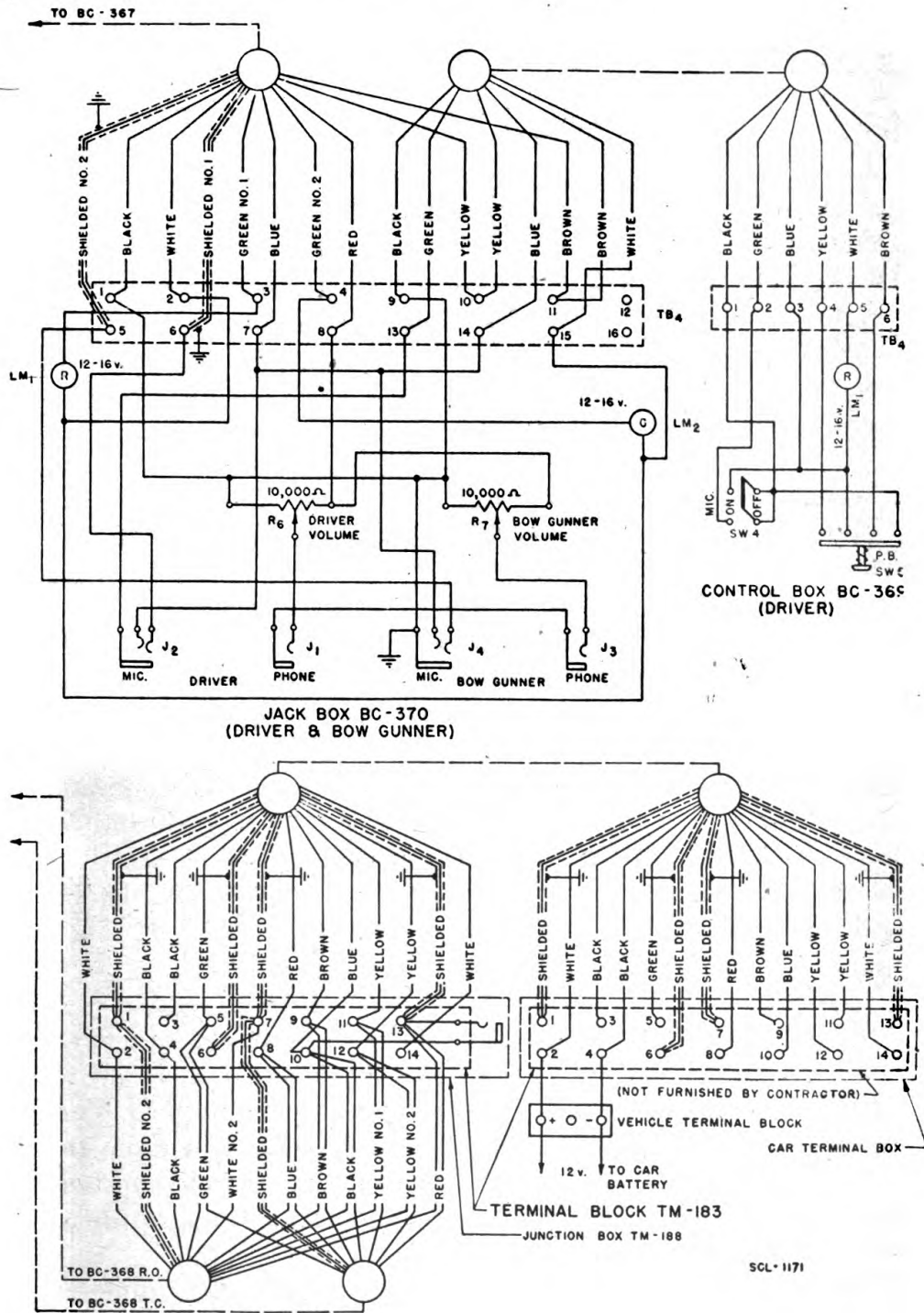


FIGURE 9.—Interphone equipment RC-38, wiring diagram—Continued.

lamps in jack box BC-370 (driver and bow gunner) light. The green lamp should light when the tank commander is on the interphone side of the circuit and the red lamp should light when the radio operator is on the interphone side of the circuit.

Generated on 2015-10-23 02:44 GMT / http://hdl.handle.net/2027/uc1.b3243873
 Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google

b. Operation of the radio control system.—Turn either the radio operator's or tank commander's INTERPHONE-RADIO selector switch to RADIO.

(1) *Radio receiver BC-312-()*, (radio sets SCR-193-A, SCR-210-A, and SCR-245-B).—Turn the OFF-ON switch of radio receiver BC-312-() to ON. With a strong signal being received either from a permanent station or another tank located in the vicinity, adjust the volume control of the radio receiver so that the signal received in both the radio operator's and tank commander's headsets is at a comfortable level. Do not change setting of individual volume controls on control boxes BC-368 to effect this as they have been properly set for interphone duty.

(2) *Radio transmitter BC-223-A (radio set SCR-245-B).*—Since radio transmitter BC-223-A has a "push-to-talk" microphone control, its OFF-ON switch may be left ON. With the TONE-VOICE-CW selector switch of radio transmitter BC-223-A in the VOICE position, transmitter plate and filament voltages are not applied until either the radio operator's or tank commander's microphone button is pressed. Radio transmitter BC-223-A may be completely controlled by means of the selector switch and either microphone button. It is to be noted that interphone equipment RC-38 has no provisions for keying radio transmitter BC-223-A; CW and TONE communication is carried on only by the radio operator from the transmitter in the normal manner. Depressing the microphone switch and talking modulates the transmitter. Transmitter sidetone should be heard at the radio operator's headset when he is on RADIO. If the tank commander is on RADIO, he also will hear sidetone.

(3) *Radio transmitter BC-191-A (radio set SCR-193-A).*—The OFF-ON switch of radio transmitter BC-191-A should be left OFF. Turning the radio transmitter OFF-ON switch of either the radio operator's or tank commander's control box to ON applies filament voltage to the tubes and starts dynamotor BD-77-A of radio transmitter BC-191-A. Depressing the microphone switch and talking modulates the transmitter. When not transmitting, both radio transmitter switches should be left OFF.

(4) When interphone equipment RC-38 is used with other radio sets than those previously described, no control of the transmitting elements of these sets is ordinarily provided. However, when the audio output of the receiving elements of these sets is connected to terminal block TM-183 in the car terminal box, receiver output can be heard as indicated in paragraph 7*b*(1).

c. Driver's position.—When the driver wishes to speak to the tank commander, he glances to see whether the green light in jack box

BC-370 (driver and bow gunner) is lighted. If so, he then turns the microphone switch ON and speaks. If the tank commander is not on the interphone system, as indicated by the green light being off, the driver presses the signal button. This causes an audio signal in the radio output, heard by the tank commander. If the tank commander desires to interrupt his radio reception, he operates his INTERPHONE-RADIO selector switch to INTERPHONE. The driver, by watching the indicating lamp, will know that the transfer has been made and he may proceed with his message. The red light in control box BC-369 (driver) remains lighted as long as any microphone switch of the interphone system is turned on. It is not necessary for the driver to turn his microphone switch OFF each time to receive conversation. However, when the entire conversation is completed, the driver's microphone switch should be turned OFF as steady current for long periods is liable to damage the microphone.

d. General.—(1) When microphones T-30-A are used, all except the driver's microphone should have control switches. Their operation is identical to that of microphone T-17, except that the switches can be locked ON for short periods of time. When using throat microphones, talk naturally—*do not shout*.

(2) When using microphone T-17, with the tank in motion some noise will enter the amplifier directly through the microphone. Therefore, personnel should be instructed to talk louder into microphone T-17 as the engine speed increases. This increases the signal-to-noise ratio and improves communication.

(3) Headsets HS-18 should be checked occasionally to maintain proper operating conditions. A simple way to check this is to listen to each of the headset receivers independently while someone is speaking on the interphone system. Both receivers should be approximately the same strength. If the entire headset response is believed to be weak, it may be compared with that of another headset known to be good. Care must be exercised in the operation of the interphone system to prevent damage to the headphones. Continued chattering of the headphones caused by excessive volume output will damage them if it happens over a long period of time.

(4) The filament switch of the interphone amplifier should be turned off at the end of each communication.

SECTION III

MAINTENANCE

General.....	Paragraph 8
Repair.....	9

8. **General.**—Provided the component units of interphone equipment RC-38 are properly installed and interconnected, little or no maintenance will be required.

9. **Repair.**—Low volume at any listening position indicates trouble in the amplifier circuit or its associated circuits. Low audio oscillator signals may be caused by a faulty radio set, where the radio is utilized as the oscillator signal amplifier. When difficulty is experienced with the amplifier, the vacuum tubes should be checked first. Usually, they will be the cause of the trouble. If the tubes are normal, check the output voltage at the headset jacks with a test set I-56, I-56-A, or I-56-C. The measurements are made as follows: Using any standard audio frequency oscillator apply 0.5 volts, 1,000-cycle alternating current, at any microphone jack of the system. With all switches in the INTERPHONE position and the system operating, the voltage at any headset jack should be about 75 volts. With the switches in the RADIO position and the driver's signal button depressed, the voltage at either the radio operator's or tank commander's headset jack should not be less than 22 volts. If the trouble is found to be in the amplifier chassis assembly, steps should be taken to replace the defective unit. All cover chassis assemblies for interphone amplifier BC-367 are interchangeable. Repairs other than replacing defective tubes should not be attempted except by authorized Signal Corps repair shops and radio repair sections.

SECTION IV

SUPPLEMENTARY DATA AND LIST OF REPLACEABLE PARTS

	Paragraph
Tube VT-107.....	10
List of replaceable parts.....	11
Manufacturers and their addresses.....	12

10. **Tube VT-107.**—Typical operating characteristics for tube VT-107 (RCA 6V6 or equal) operating as a pentode:

Heater voltage (a-c or d-c).....	6.3 volts
Heater current.....	0.45 ampere
Plate voltage (typical operation).....	250 volts
Screen voltage.....	250 volts
Grid bias.....	—12.5 volts
Plate current (zero signal).....	45.0 milliamperes
Screen current (zero signal).....	4.5 milliamperes
Plate resistance.....	52,000 ohms
Transconductance.....	4,100 microhms

INTERPHONE EQUIPMENT RC-38

11. List of replaceable parts.—a. List of parts, interphone equipment RC-38.

Stock No.	Name	Description	Function
-----	Brush HV	For dynamotor DM-25-()	Spare
-----	Brush LV	For dynamotor DM-25-()	Spare
-----	Control box BC-368		
2C659	Control box BC-369		
3E1307A	Cord CD-307-A	48 inches long	
3E1307A	Cord CD-307-A	65 inches long	
3E1318	Cord CD-318		
3E1416	Cord CD-416		
3Z1921	Fuse FU-21-A	10 amp, 25 v, 5-sec delay	Spare
2B818	Head set HS-18		
2C1614	Interphone amplifier BC-367		
-----	Interconnecting conduit, wires and clamps		
-----	Jack box BC-370		
2C2217	Junction box TM-188		
-----	Lamp LM-33	12-16 v, G4 ½ bulb, Mazda	Spare
2B1630A	Microphone T-30-A		
2T107	Tube VT-107	(RCA 6V6, or equal)	

b. *Interphone amplifier BC-367.*

Reference No.	Stock No.	Name	Description	Function	Manufacturer	Manufacturer's part No.	Signal Corps drawing No.
C ₁	3D275	Capacitor CA-275	Fixed paper, 4.0 μf, 50 v, d-c.	Bias capacitor			SC-D-512
C ₂	3D193	Capacitor CA-193	Fixed mica, 0.0005 μf, 250 v, d-c.	Blocking capacitor			SC-D-1993
C ₃	3D277	Capacitor CA-277	Fixed paper, 0.1 μf, 400 v, d-c.	Filter capacitor			SC-D-1995
C ₄	3D353	Capacitor CA-353	Fixed paper, 0.01 μf, 400 v, d-c.	Bypass capacitor			SC-D-1995
C ₅	3D308	Capacitor CA-308	Electrolytic, 50 μf, 25 v, d-c.	Bypass capacitor			SC-D-2246
C ₆	3D284	Capacitor CA-284	Fixed paper, 0.05 μf, 400 v, d-c.	Oscillator tuning capacitor			SC-D-1995
C ₇	3D374	Capacitor CA-374	Fixed paper, 2.0 μf, 600 v, d-c.	Filter capacitor	C-D	TLA-6020	
DM ₁		Dynamotor DM-25	12 v input; 0.05 amp, 250 v output	Plate supply			
F ₁	3Z1921A	Fuse FU-21-A	10 amp, 25 v, 5-sec delay	Supply fuse	Littlefuse	Type 3 AG	SC-D-4366
I ₁		Transformer C-253	Primary resistance, terminals 1-3 and 4-6, 70 ohms max; turns ratio secondary winding to each primary winding 10 to 1.	Input transformer		1081-10A.	SC-D-4365
L ₁		Transformer C-255	Primary resistance 210 ohms max; secondary resistance, terminals 3-7, 190 ohms max.	Output transformer			SC-D-4365
L ₂		Transformer C-254	Primary resistance, terminals 1-2, 45 ohms max, terminals 2-3, 115 ohms max; secondary resistance, terminals 4-5, 215 ohms max.	Oscillator transformer			SC-D-4364
L ₄		Coil C-279	Iron core, 10 henrys, 50 ma, 500 ohms max.	Filter choke			SC-D-4347
R ₁		Resistor RS-242	Wire-wound, 100 ohms, 8 w.	Dropping resistor			RL-D-6223
R ₂		Resistor RS-244	Molded, 350 ohms, 1 w.	Bias resistor			SC-D-970
R ₃		Resistor RS-243	Wire-wound, 10,000 ohms, 8 w.	Dropping resistor			RL-D-6223
R ₄		Potentiometer RS-239	Linear, 500,000 ohms	Gain control			SC-D-1923
SW ₁		Socket	8 prong, octal	Tube socket	American	MIPS	SC-D-4187
TB ₁		Switch SW-151	Toggle, DPST	Power switch			SC-D-4361-GR-2
		Terminal strip	Phenolic plate, 14 terminals	Connection board			

c. Control box BC-368.

Reference No.	Stock No.	Name	Description	Function	Manufacturer	Manufacturer's part No.	Signal Corps drawing No.
J ₁	2Z5544	Jack JK-44	Two-terminal jack	Headset jack			SC-D-1585
J ₂	2Z5543	Jack JK-43	Three-terminal jack	Microphone jack			SC-D-1585
R ₁		Potentiometer RS-241	Wire-wound, linear, 10,000 ohms	Volume control			SC-D-1982
SW ₁		Switch SW-142	Toggle, DPDT	INTERPHONE - RADIO switch.			SC-D-4187
SW ₂		Switch SW-142	Toggle, DPDT	INTERPHONE - RADIO switch.			SC-D-4187
SW ₃		Switch SW-152	Toggle, DPST	TRANSMITTER switch			SC-D-4187
TB ₁		Terminal block	Phenolic plate, 16 terminals	Terminal board			SC-D-4360

d. Control box BC-369.

Reference No.	Stock No.	Name	Description	Function	Manufacturer	Manufacturer's part No.	Signal Corps drawing No.
LM ₁		Jewel pilot light	Red pilot lens	Pilot light	Radio	K6420	
LM ₂	2Z5933	Lamp LM-33	12-16 v, G4½, bulb, Mazda	Pilot light socket	Westinghouse	57	
LM ₃		Socket, pilot light	Bayonet base, for G4½ bulb	Microphone switch	Dial	707	
SW ₁		Switch SW-152	Toggle, DPST	Signal button			SC-D-4187
SW ₂		Push-button SW-153	Push-button switch	Terminal board			SC-A-4376
TB ₁		Terminal block	Phenolic plate, six terminals				SC-D-4375

e. Jack box BC-370.

Reference No.	Stock No.	Name	Description	Function	Manufacturer	Manufacturer's part No.	Signal Corps drawing No.
J ₁	2Z5544	Jack JK-44	Two-terminal jack	Headset jack			SC-D-1585
J ₂	2Z5543	Jack JK-43	Three-terminal jack	Microphone jack			SC-D-1585
J ₃	2Z5544	Jack JK-44	Two-terminal jack	Headset jack			SC-D-1585
J ₄	2Z5543	Jack JK-43	Three-terminal jack	Microphone jack			SC-D-1585
LM ₁		Jewel pilot light	Red pilot lens		Radio	K6429	
LM ₂		Jewel pilot light	Green pilot lens		Radio	K6430	
LM ₃	2Z5983	Lamp LM-33	12-16 v, G4½, bulb, Mazda	Red pilot light	Westinghouse	57	
LM ₄	2Z5983	Lamp LM-33	12-16 v, G4½, bulb, Mazda	Green pilot light	Westinghouse	57	
		Socket, pilot light	Bayonet base, for G4½ bulb	Pilot light socket	Dial	707	
R ₄		Potentiometer RS-241	Wire-bound, linear, 10,000 ohms	Volume control			SC-D-1982
R ₇		Potentiometer RS-241	Wire-wound, linear, 10,000 ohms	Volume control			SC-D-1982
TB ₄		Terminal block	Phenolic plate, 16 terminals	Terminal board			SC-D-4379

12. Manufacturers and their addresses.

Abbreviation	Name	Address
Amphenol.....	American Phenolic Corporation.	1250 Van Buren St., Chicago, Ill.
C-D.....	Cornell-Dubilier Electric Co.	South Plainfield, N. J.
Dial.....	Dial Light Company of America, Inc.	136 Liberty St., New York, N. Y.
Littlefuse.....	Littlefuse, Inc.....	4757 Ravenswood Ave., Chicago, Ill.
Radio.....	Radio Wire Television, Inc.	100 Sixth Ave., New York, N. Y.
Westinghouse..	Westinghouse Electric Mfg. Co.	1180 Raymond Ave., Newark, N. J.

[A.G. 062.11 (2-21-42).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:

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

DISTRIBUTION:

D 17 (2); IBn 11 (3), 17(2); IC 11 (2), 17 (2), and 10 copies to each signal depot company and signal repair company.
(For explanation of symbols see FM 21-6.)

