



TECHNICAL DATA FILE #2

I. C. INSTRUCTION BOOK No. 82-A

U. S. NAVY
DIVING AMPLIFIER EQUIPMENT



CONTRACT NXss-39978

Manufactured by
GUIDED RADIO CORPORATION
NEW YORK 13, N. Y.

CONTRACT GUARANTEE CLAUSE

The contractor warrants that at the time of delivery thereof the articles provided for under this contract will conform to the specifications herein and will be free from defects in material or workmanship. Notice of any such defect or nonconformance shall be given by the Government to the contractor within one year after delivery. If required by the Government, the contractor shall, with all possible speed and diligence, correct or replace any articles or parts thereof which are defective in material or workmanship, or which otherwise are not in conformity with the specification requirements. Where such correction or replacement requires return of the article to the contractor's plant, shipping costs, if any, to the plant from the delivery point provided for in the contract and back from the plant to such delivery point shall be paid by the contractor; all other shipping costs shall be paid for by the Government. This warranty shall then continue as to corrected or replaced articles until one year after the re-delivery. When for any reason the Government does not require correction or replacement of any article which is defective or not in conformity with the specifications, it may pay for such article at such reduced price as shall be fair and equitable under the circumstances, or it may exercise any other remedy available to it by law.

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DIVING AMPLIFIER EQUIPMENTGENERAL DESCRIPTION:Introduction:

This Diving Amplifier equipment is designed to provide for communication between a diver's tender station on the surface and one to three divers. Provision is also made for selective communication between divers, the selection being controlled at the tender's station. Both pick-up and reproduction of speech are obtained through the reproducers, these units being used both as loudspeakers and as microphones.

The system is normally set up for transmission of speech from all connected divers to the tender. Switching facilities are provided on the tender's control panel to select and talk to any one or all divers from the surface station. Additional switches are provided to select inter-diver communication. Tone and volume controls are also provided to clarify the speech, both to and from the divers, to suit varying conditions of voice and pressure.

Amplifier and Tender's Reproducer:

The amplifier is housed in a heavy formed steel cabinet suitably treated and painted to resist corrosion. The front of the case incorporates the control panel on which are mounted the eleven (11) manual controls and the POWER ON indicator light. The normal operation and adjustment of these controls is explained in the section "Theory of Operation". On the top of the cabinet, as an integral unit, is mounted

the tender's reproducer. Two (2) handles on either side of the cabinet are provided for ease in carrying. The amplifier itself is mounted on a chassis of special design which is secured to the back of the bakelite control panel. This panel is secured to the front cover of the cabinet which is gasketed and bolted to the cabinet making the whole assembly splash-proof.

Connection to the three (3) divers cables is made through three (3) receptacles along the bottom of one side of the amplifier cabinet. These receptacles are designed to accommodate a standard Navy Diving Equipment plug. On the other side of the cabinet, arranged vertically, are the three (3) receptacles for connection to a source of power for operation of the amplifier.

The amplifier is designed to operate from 115 volts D.C. 115 volts A.C., or 12 volts D.C. Plugs and power cables, for connection to any one of these three power sources, are supplied with the system. The plugs are so polarized and connected as to prevent the insertion of any plug in the wrong receptacle. Only one of these power cables should be connected to its receptacle at any one time. Caps for all receptacles are provided for their protection when not in use.

The tender's speaker unit is of the permanent magnet, direct radiator type. This is mounted in a heavy spun steel case which is secured to the cabinet by means of a suitable mounting bracket bolted to the cabinet top. A protective screen is provided for the front of the reproducer to protect

it against mechanical damage. The driver unit is secured in the case by means of eight (8) fillister head machine screws which also secure the screen.

The unit is provided with an impregnated fabric cone and a metal voice coil form treated to resist corrosion. The coil suspension is of the diaphragm type which effectively shields the voice coil and air gap in the magnet structure against the entrance of foreign material. The coil suspension is formed in the coil material itself making this a one piece unit except for the small dust cap in the center. Connection to the speaker unit is made through a rubber covered cable which enters the cabinet through a water-tight coupling in the bottom of the speaker housing.

Divers Reproducers:

The divers reproducers, which mount in the diving helmets, consist of small permanent magnet driver units with suitable mounting brackets and protective grilles. These speakers have an impregnated fibre cone. All metal parts used are of either non-corrosive material or are suitably treated to resist corrosion.

THEORY OF OPERATION:Amplifier Circuit:

The amplifier is a three stage, balanced resistance-capacitance coupled circuit using two (2) type 12SC7 vacuum tubes for the first two stages, each functioning as a push-pull voltage amplifier. The second of these stages is coupled to four (4) type 7A5 vacuum tubes, push-pull parallel connected, which serve as the output stage. The speech input circuits are coupled to the amplifier circuit through two (2) input transformers isolated from each other by Delta T pad type volume controls. Tone controls, consisting of a condenser and an inductor with suitable variable resistances, are introduced between the first and second voltage amplifier stages. These provide means for continuously varying the tone of the output from a condition where low frequencies are predominant and the high frequencies suppressed to the condition in which the high frequencies are boosted and low frequencies suppressed. Separate volume and tone controls are provided for the Divers and Tenders speech input circuits, each being connected in proper sequence by the operation of the speech control switches. The output is coupled to the reproducer circuits by means of a suitable output transformer.

Provisions are made for operation of this amplifier from any one of three different power supplies, namely, 115 volts D.C., 115 volts A.C., or 12 volts D.C. For 115 volt A.C. operation, a power transformer and a rectifier tube with a

single section condenser input filter circuit are provided to supply the necessary plate voltage. The heaters of the tubes are connected in a series parallel circuit and lighted directly from the line through suitable voltage dropping resistors. For operation on 115 volt D.C., the heaters are lighted in the same manner as for A.C., and the necessary plate voltage is secured by introducing the positive side of the power line to the filter input.

For 12 volt D.C. operation, the heater circuits are split into two sections, each section being connected directly across the 12 volt supply. A synchronous vibrator type of voltage converter is used to secure the necessary plate voltage. This converter is supplied as a unit mounted on the chassis. Incorporated in this unit is a self driven vibrator, a transformer and the necessary filter chokes and condensers to remove the high transient voltages developed by the rapid switching of the battery current by the vibrator. The transformer has two (2) center tapped windings, a low voltage winding and a high voltage winding. One side of the battery supply voltage connects to the center tap of the low voltage winding, while the other polarity is switched by contacts on the vibrator from one end of this winding to the other, thus producing an effective alternating current in the winding. On the high voltage secondary a similar switching operation is performed by another set of contacts operating on the same arm of the vibrator. This effects a synchronous rectification, thus providing a pulsating direct current at

approximately 120 volts. Final filtering of this D.C. is accomplished by the two condensers and choke provided for A.C. operation.

From the above description it can be seen that the polarity of the battery supply to the vibra-pack must be correct in order to secure the proper polarity for amplifier operation. For this reason, the polarity of the battery clips for the 12 volt power cable is distinctly marked to avoid wrong connection.

Proper cross connections for operation under the three voltage supply conditions are obtained by cross strapping in the three power plugs supplied with the system. These plugs are of such design and are so polarized as to prevent the insertion of any one of them into the wrong receptacle. Insertion of more than one plug into its receptacle at any one time may result in an internal short circuit causing the fuses to blow and should thus be avoided.

Each power supply is fused individually and is controlled on the amplifier control panel by means of an ON-OFF power switch. A POWER ON indicator light is provided on the control panel to indicate when the system is turned on and in readiness for operation. This light is bridged across the 12 volt heater circuit through a suitable voltage dropping resistor. Reference should be made to drawing No. H-2344 for all amplifier connections.

Control Circuits:

The eleven (11) manually adjusted controls for this

system are located on the control panel. These consist of two (2) volume controls, two (2) tone controls, three (3) switches for controlling transmission of speech between tender and diver, three (3) switches for controlling speech between divers, and the power switch.

The volume controls are provided so as to obtain the correct level on either the tender's or the divers reproducers. These are entirely independent of each other, and the adjustment of one does not affect the operation of the other. They are connected in proper operating sequence by means of the switching circuits.

The function of the two (2) tone controls is to vary the frequency response of the amplifier for maximum intelligibility for both directions of transmission. These controls also are independent and properly connected by the switching circuits.

The three 2-position switches, one for each diver, located at the top of the panel, provide means for transferring the divers reproducers from the amplifier input to output, and the tender's reproducer from output to input, while simultaneously introducing into the circuit the proper volume and tone controls. These switches are so connected that the normal or unoperated position provides speech transmission from all connected divers to the tender's reproducer.

The three (3) switches mounted directly below the previously mentioned divers switches are so arranged that when depressed the associated diver's reproducer is connected to

the output of the amplifier in parallel with the tender's reproducer. The remaining two divers are still connected to the amplifier input. In this manner, speech from one or both of these divers is transmitted to the diver for whom the switch has been depressed. The tone and volume controls remain operative in the circuit the same as for speech transmission from the divers to the tender. The tender's reproducer is left connected to the amplifier output so that he may monitor speech between divers and perform the necessary switching operations for intercommunication between divers.

The power switch provides means for turning on or off the power supply to the amplifier while it is still connected ready for use. This must be turned to the "ON" position in order to apply the proper operating voltages to the amplifier components.

The POWER ON signal lamp provides a visual indication of the application of power to the amplifier.

OPERATING TECHNIQUE:Initial Set-Up:

In order to set up this system for operation, it is first necessary to ascertain what power supply is available. Once this has been established, select the proper power cord and insert the polarized plug into its receptacle. The other end of the power supply cable may then be connected to the available power mains. In the case of the 115 volt A.C. supply, the polarity of the two conductors of the power supply cable is not ordinarily important, unless it is found that a reversal of polarity reduces the hum in the speakers. However, the amplifier will not function at all if the correct polarity is not observed in the case of the 115 volt D.C., or the 12 volt D.C. cables. No harm to the equipment will result from improper connection to these cables, but if the amplifier fails to function after setting up the system according to instructions, the polarity of the D.C. power connections should be checked.

To connect the divers cables to the system, it is only necessary to insert the Navy type divers plugs into the receptacles provided along the bottom of the amplifier cabinet. The system may be operated with one, two or three divers cables so connected. After all necessary plugs are inserted into their proper receptacles, it is important that the locking rings be screwed on to the receptacle bushings in order to insure permanent and positive continuity of these circuits.

Operation:

To put this system into operation, it is first necessary to energize the amplifier by means of the amplifier power switch. With this switch in the "ON" position, the POWER ON indicator lamp should light up indicating that the proper voltage is applied to the vacuum tube heaters. Approximately 30 seconds should be allowed for the vacuum tubes to become heated to their proper operating temperature.

The volume controls and tone controls should first be adjusted to approximately their mid-point positions. The system is now completely set-up for operation.

As communication is established the volume control should be adjusted so that a condition of maximum intelligibility is secured. It will be found that this condition exists with these controls set for as low an output level as can be heard over the surrounding noise. Tone controls should next be adjusted to such position as will further increase intelligibility. It may be found necessary after adjusting the tone controls, to readjust the volume controls to compensate for the frequency response characteristics of the ear. Experience in operating these sets will also demonstrate that "naturalness" of any particular voice is not necessarily the condition of maximum intelligibility.

Observance of the following rules is necessary for satisfactory results in the use of the system:

- 1) Speak distinctly and as close to the transmitting

speaker as practical. Remember that the reproducer at the other end can reproduce only what is picked up at the transmitting speaker. Thus, if the amplifier is used in a noisy location it will be necessary to speak closer to the tender's speaker and to articulate each syllable carefully. Adjustment of the tone and volume controls to the diver will help to compensate for certain types of noise and to improve intelligibility. However, these controls cannot compensate for poor enunciation or slurred syllables.

2) Do not shout into the speaker. This will only result in blasting at the other speaker. If speech cannot be heard at the receiving end because of noisy conditions at the transmitting end, speak closer to the transmitter with the volume control turned down slightly. This will lower the amplified noise and the closer speaking will raise the signal output.

3) Do not clip off sentences by releasing the talk switches too soon. When any of the three "Tender to Diver" or "Diver to Diver" switches are pressed, the selected diver is connected to the amplifier output. As long as this switch is held inoperative, the selected diver will receive whatever signal is being sent. If this switch is released too soon, the last word or syllable of the sentence may be cut off.

CARE AND MAINTENANCE:Amplifier and Tender's Reproducer:

The Diving Amplifier Equipment is designed to be sufficiently rugged to withstand a considerable amount of abuse such as might be expected in normal operation. However, it should be remembered that the unit is essentially a vacuum tube amplifier, and care should be used in handling the cabinet to prevent it from being dropped, or from receiving unusually rough usage.

Should trouble be experienced in operation of the unit, it will be found that the nature of the trouble will present definite leads for intelligent servicing. First, the power supply should be checked. The POWER ON signal light provides a good indication as to the proper application of power to the amplifier. If this light remains dark with the power supply switch in the "ON" position, and the power cable properly connected, the source of trouble may be either a faulty power source, a blown fuse within the amplifier, or possibly a burned-out indicator light. If, after checking the supply voltage to the amplifier, and the polarity in case of D.C. operation, the system still fails to function, the amplifier should be withdrawn from its case by removing the six machine screws which secure the front panel of the amplifier to the case and sliding the amplifier forward. The vacuum tubes thus will be made available for replacement. These should all be replaced by a new set and the system again tested for operation. If the defect is thus located, the new

set of tubes should next be replaced by the original set, one by one, until the defective tube or tubes are found. Under normal operation, a slight hum or buzz should be heard in the speaker which is connected to the output. If such amplifier noise is not heard on either speaker upon operation of the proper diver's switch, the indication is a faulty amplifier. If such noise is heard in the diver's speaker and not in the tender's speaker, a faulty tender's reproducer unit or connections thereto are indicated. In a similar manner, a fault in the diver's cable or reproducer can be located.

In servicing the amplifier, after having checked the vacuum tubes, voltages at the various sockets should be checked against the values given in the Socket Terminal Voltage Chart. Any extreme variation from the voltages shown on this chart at these points indicates defective circuit components. If it becomes necessary to remove the amplifier from the cabinet for servicing, the power may be applied for any of the three power supply conditions by observing the following procedures:

1. 115 volts A.C. - strap terminals 15 and 16 at the terminal strip and apply power to terminals 15 and 17.
2. 115 volts D.C. - strap terminals 19 and 21 and apply power to 20 and 21.
3. 12 volts D.C. - strap terminal 22 to 27, 23 to 24, and 26 to 27. Apply power to 22 and 25.

In normal use, the above strapping is done in the indi-

vidual plugs for each power supply. Drawing No. H-2344 shows all connections to the terminal strips, as well as a schematic of the amplifier and switching circuits.

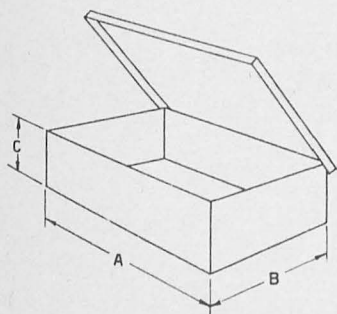
The amplifier assembly and tender's reproducer are shown on Drawing No. H-2345. It can be seen from this drawing that in order to reach the driver unit and wiring to the tender's reproducer, it is necessary to remove the eight (8) #8-32 machine screws around the periphery of the speaker. The driver unit can then be removed from its case and the wiring from the voice coil to the terminal strip and to the cable connecting to the amplifier may be inspected. A defective unit can be detected by disconnecting the voice coil at the terminal strip and testing for continuity of the unit with an ohmmeter. Connection of the ohmmeter to the voice coil terminals should cause a slight click in the speaker if it is functioning properly. A defective unit should be replaced by one in good condition.

Divers Reproducers:

The divers reproducers are small permanent magnet type units contained in a bracket suitable for mounting in the divers helmets. Connections to these units are made on terminals mounted on the frame of the speaker cone support. Should a defective unit be suspected, test the divers speaker cable for continuity through the voice coil. If the speaker is not defective, a click should be heard upon application of the ohmmeter to the two cable conductors. If such a test does not locate the fault, the cable leads

should be unsoldered from the voice coil terminals at the speaker and a similar test made at these terminals. A defective unit should be replaced by a new one. This may be done by removing the four (4) #6-32 elastic stop nuts holding the protective screen, mounting bracket, and speaker unit assembly together. In replacing with a new unit, the rubber magnet cushion (Part No. 7 - Dwg.No. G-882) should be removed from the old speaker and placed on the new unit. The re-assembly should be made as shown in the above drawing.

SPARE PARTS BOX SPECIFICATION



NOTE:
1-BOX CONSTRUCTED IN ACCORDANCE
WITH NAVY SPECIFICATION 42B9.

SPECIFICATIONS OF WEIGHTS AND DIMENSIONS				
BOX NO.	A	B	C	WEIGHT PACKED
SB-107	18 1/8	15 1/8	6 1/16	77 LBS.
SB-				LBS.
SB-				LBS.
SB-				LBS.
SB-				LBS.
SB-				LBS.
SB-				LBS.
SB-				LBS.
SB-				LBS.
SB-				LBS.

LIST OF SPARE PARTS AND TOOLS

REPRODUCED FROM MANUFACTURER'S DRAWING NO. H-2513
BUREAU OF SHIPS NO.

NAMES AND NUMBERS OF VESSELS

APPLICATION-DIVING AMPLIFIER EQUIPMENT

APPLIANCE

NAVY CONTRACT OR SHIPBUILDERS ORDER NO.-NX-39978

MANUFACTURER - GUIDED RADIO CORPORATION

ITEM NO.	NUMBER OF SETS	NUMBER PER SET	NAME OF PART OR TOOL	MANUFACTURER'S DATA		
				CATALOG OR SERIAL ORDERING DATA	DRAWING NO.	PIECE NO. BUREAU OF SHIPS DRAWING NUMBER
1	1	1	SPARE PARTS BOX	SB-107	H-2513	
2	1	1	RESISTOR 75 OHM 1 WATT (NOTE 1 SHEET 4)	A.B. GB-7505	H-2344 R-10	
3	1	1	RESISTOR 100 OHM 1 WATT (NOTE 1 SHEET 4)	A.B. GB-1015	H-2344 R-17	
4	1	1	RESISTOR 200 OHM 1 WATT (NOTE 1 SHEET 4)	A.B. GB-2015	H-2344 R-18	
5	1	1	RESISTOR 3000 OHM 1 WATT (NOTE 1 SHEET 4)	A.B. GB-3025	H-2344 R-1	
6	1	1	RESISTOR 10M OHM 1 WATT (NOTE 1 SHEET 4)	A.D. GB-1035	H-2344 R-20	
7	1	1	RESISTOR 51M OHM 1 WATT (NOTE 1 SHEET 4)	A.B. GB-5135	H-2344 R-28	
8	1	1	RESISTOR 240M OHM 1 WATT (NOTE 1 SHEET 4)	A.B. GB-2445	H-2344 R-7	
9	1	1	RESISTOR 510M OHM 1 WATT (NOTE 1 SHEET 4)	A.B. GB-5145	H-2344 R-2	
10	1	1	RESISTOR 1MEG. OHM 1 WATT (NOTE 1 SHEET 4)	A.B. GB-1055	H-2344 R-4	
11	1	1	RESISTOR 100 OHM 8 WATT	M. LEONARD NAVY SPEC. 25F500	H-2344 R-19	
12	1	1	RESISTOR 500 OHM 25 WATT	M. LEONARD NAVY SPEC. 25F500	H-2344 R-11	
13	1	1	CONDENSER 4 MFD.	ELEC. UTIL. 106 B 2	H-2344 C-6	
14	1	1	CONDENSER .25 MFD.	ELEC. UTIL. 104 15	H-2344 C-8	

THESE ITEMS ARE CONTAINED IN
SPARE PARTS BOX SB-107

WHEN REORDERING ALWAYS REFER TO
W.O. 957
ALSO THE SERIAL NUMBER OF THE UNIT
NUMBER OF SHEETS 4 SHEET NO. 1

LIST OF SPARE PARTS AND TOOLS

REPRODUCED FROM MANUFACTURER'S DRAWING NO. H-2513
BUREAU OF SHIPS NO.

NAMES AND NUMBERS OF VESSELS

APPLICATION-DIVING AMPLIFIER EQUIPMENT

APPLIANCE

NAVY CONTRACT OR SHIPBUILDERS ORDER NO.-NX-39978

MANUFACTURER - GUIDED RADIO CORPORATION

ITEM NO.	NUMBER OF SETS	NUMBER PER SET	NAME OF PART OR TOOL	MANUFACTURER'S DATA		
				CATALOG OR SERIAL ORDERING DATA	DRAWING NO.	PIECE NO. BUREAU OF SHIPS DRAWING NUMBER
15	1	1	CONDENSER .004 MFD. (NOTE 2 SHEET 4)	CORN-DUB. 4L-12040	H-2344 C-3	
16	1	1	CONDENSER .002 MFD. (NOTE 2 SHEET 4)	CORN-DUB. 4L-12020	H-2344 C-1	
17	1	1	CONDENSER .001 MFD. (NOTE 2 SHEET 4)	CORN-DUB. 4L-12010	H-2344 C-4	
18	1	1	CONDENSER .0001 MFD.	CORN-DUB. SR-5T1	H-2344 C-10	
19	1	2	VACUUM TUBE	R.C.A. 125 C 7	H-2344 V-1	
20	1	4	VACUUM TUBE	R.C.A. 7A5	H-2344 V-3	
21	1	1	VACUUM TUBE	R.C.A. 5U4 G	H-2344 V-7	
22	1	1	POWER TRANSFORMER	U.T.C. 63033	H-2344 T-4	
23	1	1	OUTPUT TRANSFORMER	U.T.C. 63831	H-2344 T-3	
24	1	1	INPUT TRANSFORMER	U.T.C. 63830	H-2344 T-2	
25	1	1	INPUT MATCHING TRANSFORMER	U.T.C. 63029	H-2344 T-1	
26	1	1	CHOKE	U.T.C. 63834	H-2344 L-1	
27	1	1	CHOKE	U.T.C. 63832	H-2344 L-2	
28	1	1	SWITCH D.P.S.T.	ARROW H.E.H. 80600 AY	H-2344 SW-4	

THESE ITEMS ARE CONTAINED IN
SPARE PARTS BOX SB-107

WHEN REORDERING ALWAYS REFER TO
W.O. 957
ALSO THE SERIAL NUMBER OF THE UNIT
NUMBER OF SHEETS 4 SHEET NO. 2

LIST OF SPARE PARTS AND TOOLS

REPRODUCED FROM MANUFACTURER'S DRAWING NO. H-2513
BUREAU OF SHIPS NO.

NAMES AND NUMBERS OF VESSELS

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APPLIANCE

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MANUFACTURER - GUIDED RADIO CORPORATION

ITEM NO.	NUMBER OF SETS	NUMBER PER SET	NAME OF PART OR TOOL	MANUFACTURER'S DATA		
				CATALOG OR SERIAL ORDERING DATA	DRAWING NO.	PIECE NO. BUREAU OF SHIPS DRAWING NUMBER
29	1	1	SWITCH D.P.D.T.	ARROW H.E.H. 81042-G	H-2344 SW-5	
30	1	1	SWITCH ROTARY	OAK MFG CO. #26038-D.HZ	H-2344 SW-1	
31	1	1	TONE CONTROL	CENTRALAB 1-010-861	H-2344 TC-1	
32	1	1	VOLUME CONTROL	CENTRALAB 1-010-960	H-2344 VC-1	
33	1	1	DRIVER UNIT (TENDER)	CINADAGRAM MZ610	H-2345 2	
34	1	3	DRIVER UNIT (DIVER)	CINADAGRAM 307 M4	G-882 6	
35	1	1	DIVERS RECEPTACLE	G.R.C.	H-2345 9	
36	1	1	VIBRAPACK	MALLOY VIB 300 SFC VIBRATOR SFC	H-2344 VB	
37	1	1	POWER LIGHT ASSEMBLY	MALLOY B-310F	H-2345 26	
38	1	3	PILOT LIGHT	GEN. ELEC. MARZA-49	H-2344 SL	
39	1	1	POSITIVE BATTERY CLIP	MUELLER 28A	G-2357 10	
40	1	1	NEGATIVE BATTERY CLIP	MUELLER 28A	G-2357 11	
41	1	1	CHASSIS CONNECTOR 115V. A.C.	CANNON AP-4-14	H-2344 J-4	
42	1	1	CHASSIS CONNECTOR 115V. D.C.	CANNON AP-3-14	H-2344 J-5	

THESE ITEMS ARE CONTAINED IN
SPARE PARTS BOX SB-107

WHEN REORDERING ALWAYS REFER TO
W.O. 957
ALSO THE SERIAL NUMBER OF THE UNIT
NUMBER OF SHEETS 4 SHEET NO. 3

LIST OF SPARE PARTS AND TOOLS

REPRODUCED FROM MANUFACTURER'S DRAWING NO. H-2513
BUREAU OF SHIPS NO.

NAMES AND NUMBERS OF VESSELS

APPLICATION-DIVING AMPLIFIER EQUIPMENT

APPLIANCE

NAVY CONTRACT OR SHIPBUILDERS ORDER NO.-NX-39978

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43	1	1	CHASSIS CONNECTOR 12V. D.C.	CANNON AP-6-14	H-2344 J-6	
44	1	1	CABLE CONNECTOR 115V. A.C.	CANNON AP-4-CO11	H-2344 J-7	
45	1	1	CABLE CONNECTOR 115V. D.C.	CANNON AP-3-CO11	H-2344 J-8	
46	1	1	CABLE CONNECTOR 12V. D.C.	CANNON AP-6-CO11	H-2344 J-9	

NOTES:

1. ALL ALLEN BRADLEY TYPE "GB" 1 WATT RESISTORS MAY BE SUBSTITUTED BY ERIE TYPE "S10".
2. ALL CORNELL-DUBILLIER TYPE "4L" MICA CONDENSERS MAY BE SUBSTITUTED BY SANGAMO TYPE "HL" OR AERVOX TYPE "1443L".

THESE ITEMS ARE CONTAINED IN
SPARE PARTS BOX SB-107

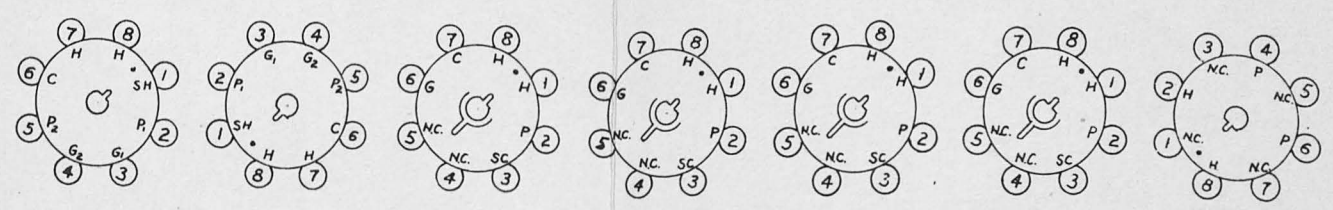
WHEN REORDERING ALWAYS REFER TO
W.O. 957
ALSO THE SERIAL NUMBER OF THE UNIT
NUMBER OF SHEETS 4 SHEET NO. 4

DIVING AMPLIFIER EQUIPMENT

SOCKET TERMINAL VOLTAGE AND RESISTANCE CHART

VT-1 12SC7	VT-2 12SC7	VT-3 7A5	VT-4 7A5	VT-5 7A5	VT-6 7A5	VT-7 5U4G
1-NO READING 2-22V-50V SCALE 3-NO READING 4-NO READING 5-22V-50V SCALE 6-0.4V-2.5V SCALE 7-NO READING 8-12V-AC-50V SCALE	1-NO READING 2-37V-50V SCALE 3-NO READING 4-NO READING 5-37V-50V SCALE 6-0.5V-2.5V SCALE 7-24V-AC-50V SCALE 8-12V-AC-50V SCALE	1-6V-AC-10V SCALE 2-105V-250V SCALE 3-105V-250V SCALE 4-NOT CONNECTED 5-NOT CONNECTED 6-NO READING 7-8.5V-10V SCALE 8-NO READING	1-12V-AC-50V SCALE 2-105V-250V SCALE 3-105V-250V SCALE 4-NOT CONNECTED 5-NOT CONNECTED 6-NO READING 7-8.5V-10V SCALE 8-6V-AC-10V SCALE	1-18V-AC-50V SCALE 2-105V-250V SCALE 3-105V-250V SCALE 4-NOT CONNECTED 5-NOT CONNECTED 6-NO READING 7-8.5V-10V SCALE 8-12V-AC-50V SCALE	1-24V-AC-50V SCALE 2-105V-250V SCALE 3-105V-250V SCALE 4-NOT CONNECTED 5-NOT CONNECTED 6-NO READING 7-8.5V-10V SCALE 8-18V-AC-50V SCALE	1-NOT CONNECTED 2-120V-250V SCALE 3-NOT CONNECTED 4-130V-AC-250V SCALE 5-NOT CONNECTED 6-130V-AC-250V SCALE 7-NOT CONNECTED 8-120V-250V SCALE

ALL VOLTAGE READINGS TAKEN FROM SOCKET TO GROUND



ALL RESISTANCE READINGS TAKEN FROM SOCKET TO GROUND

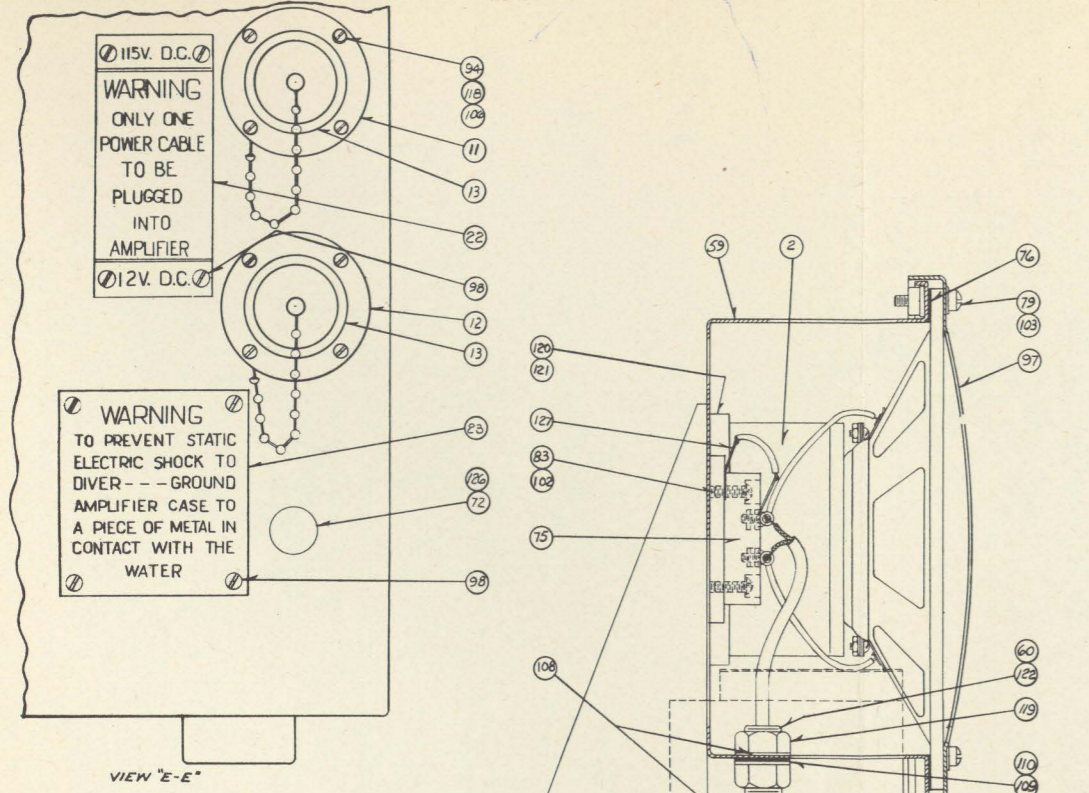
1-GROUND 2-NO READING 3-1200 OHMS 4-1200 OHMS 5-NO READING 6-3000 OHMS 7-GROUND 8-2.5 OHMS	1-GROUND 2-NO READING 3-1 MEGOHM 4-1 MEGOHM 5-NO READING 6-3000 OHMS 7-4.5 OHMS 8-2.5 OHMS	1-1.5 OHMS 2-NO READING 3-NO READING 4-NOT CONNECTED 5-NOT CONNECTED 6-520 M OHMS 7-100 OHMS 8-GROUND	1-2.5 OHMS 2-NO READING 3-NO READING 4-NOT CONNECTED 5-NOT CONNECTED 6-520 M OHMS 7-100 OHMS 8-1.5 OHMS	1-3.5 OHMS 2-NO READING 3-NO READING 4-NOT CONNECTED 5-NOT CONNECTED 6-520 M OHMS 7-100 OHMS 8-2.5 OHMS	1-4.5 OHMS 2-NO READING 3-NO READING 4-NOT CONNECTED 5-NOT CONNECTED 6-520 M OHMS 7-100 OHMS 8-3.5 OHMS	1-NOT CONNECTED 2-NO READING 3-NOT CONNECTED 4-40 OHMS 5-NOT CONNECTED 6-35 OHMS 7-NOT CONNECTED 8-NO READING
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ALL VOLTAGES MEASURED ON 5000 OHM PER VOLT METER

VOLTAGES MEASURED WITH AMPLIFIER CONNECTED TO 115 VOLT 60 CYCLE LINE
NOTE: OPERATION ON 115 VOLTS D.C. OR 112 VOLTS D.C. MAY CAUSE
SOME VARIATION FROM ABOVE VOLTAGES

ALL RESISTANCE VALUES MEASURED WITH NO POWER CONNECTION TO
AMPLIFIER AND ALL CONTROLS IN EXTREME CLOCKWISE-ROTATED POSITION

Fig. 1
Socket Terminal Diagram and Voltage Chart - Dwg. No. G-1004



POWER REQUIREMENTS

12 VOLTS D.C. ----- 3-4 AMPERES.
 115 VOLTS A.C. ----- 8 AMPERES.
 115 VOLTS 60 CYCLES ----- 1/4 VA AT 50% LAGGING
 AUDIO OUTPUT ----- 8 WATTS
 HEAT DISSIPATION 115 V.D.C. ----- 88 WATTS
 HEAT DISSIPATION 115 V.A.C. ----- 140 WATTS
 HEAT DISSIPATION 12 V.D.C. ----- 36.8 WATTS

NOTES:

1-VOICE COIL DIAMETER ----- 1.041 O.D.
 VOICE COIL THICKNESS ----- .015
 AIR GAP THICKNESS ----- .032
 VOICE COIL RESISTANCE ----- 8.50 OHMS
 VOICE COIL TURNS ----- 5 OHMS AT 1000 CYCLES
 VOICE COIL IMPEDANCE ----- 36 COPPER ENAMELLED
 HEIGHT OF WINDING ----- .859
 DIAPHRAGM MATERIAL ----- PHENOLIC IMPREGNATED FABRIC
 POWER REQUIRED FOR 30 BEARS OUTPUT AT 18 INCHES ----- 4 WATTS AT 1000 CYCLES

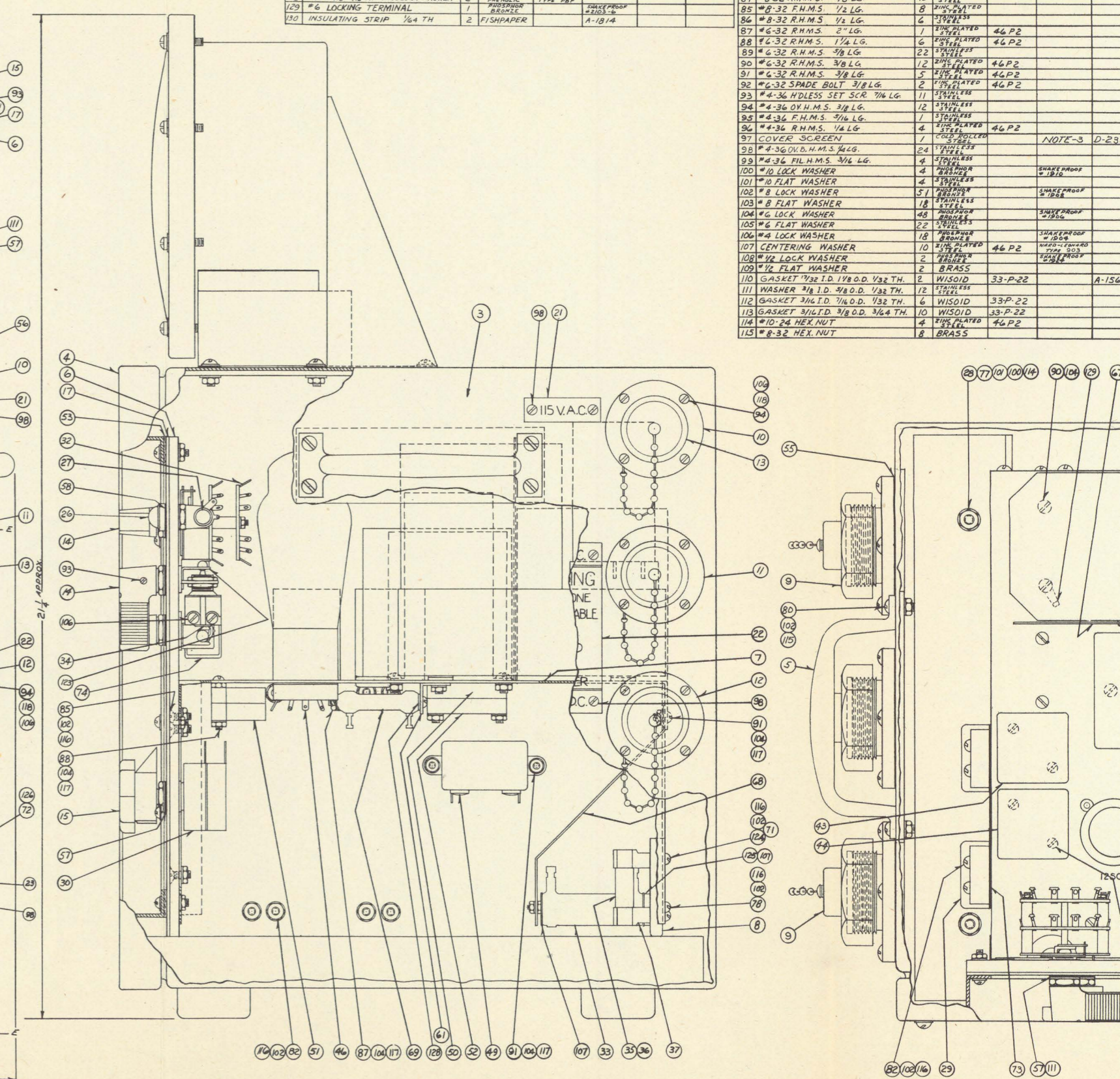
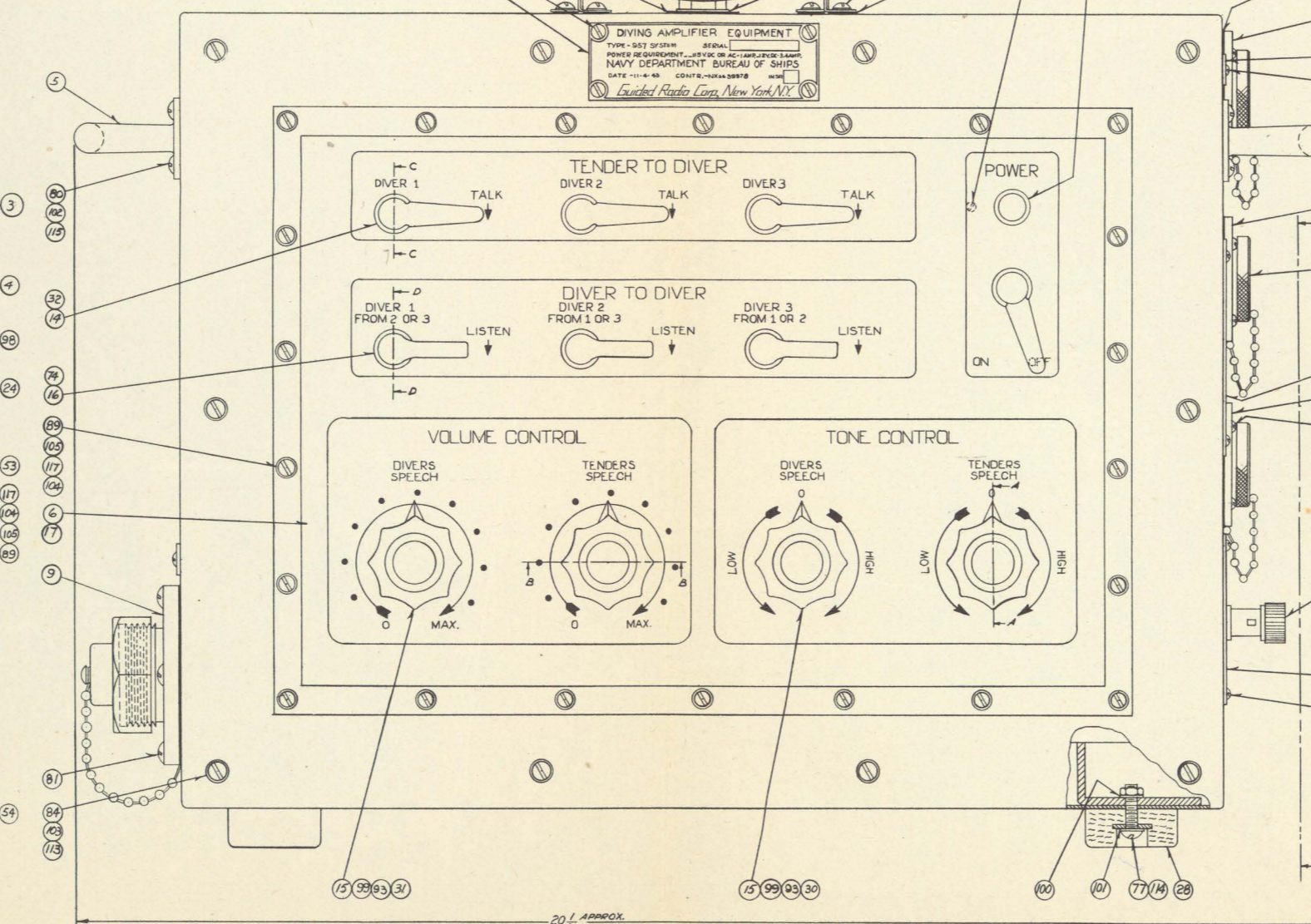
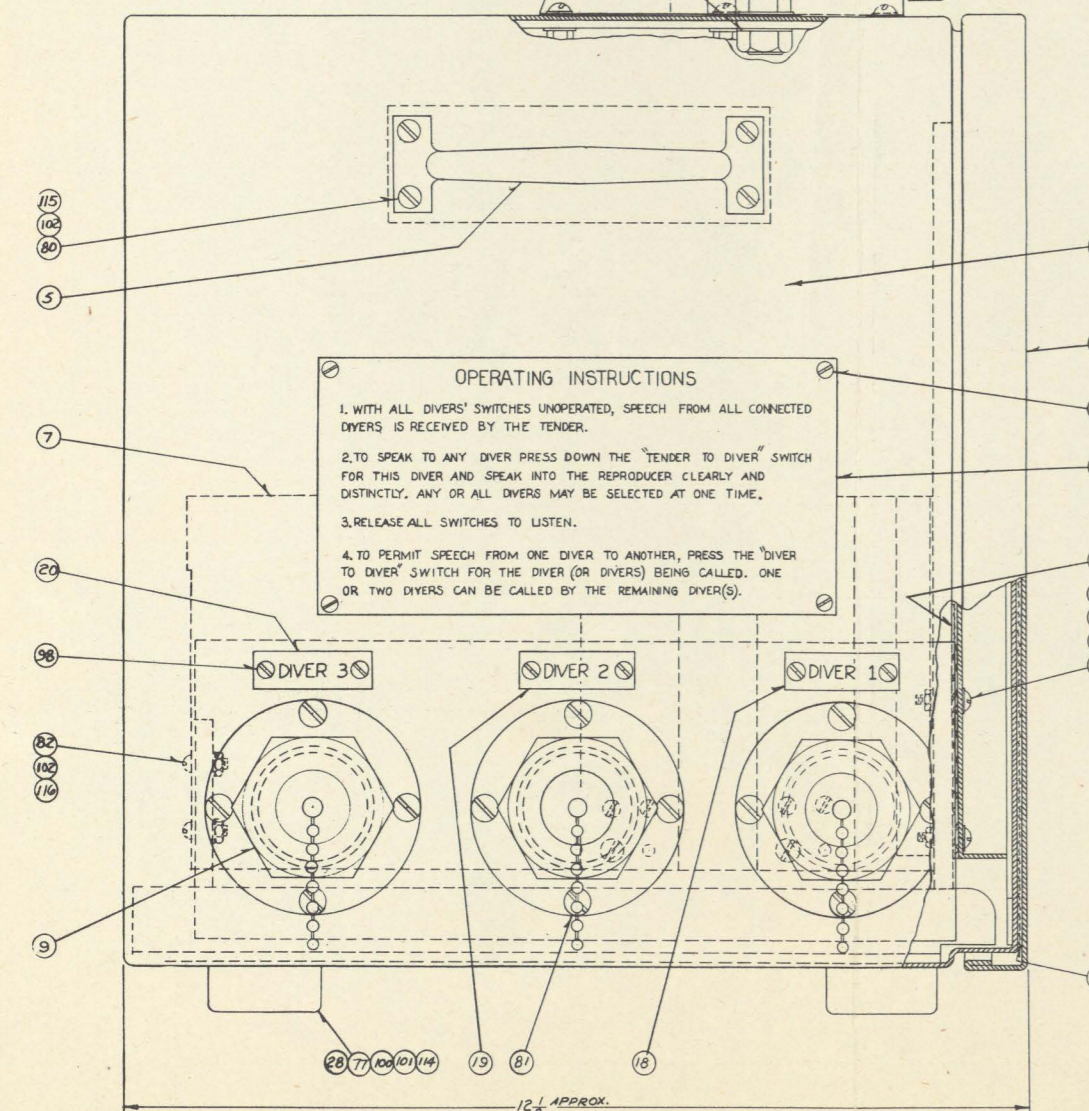
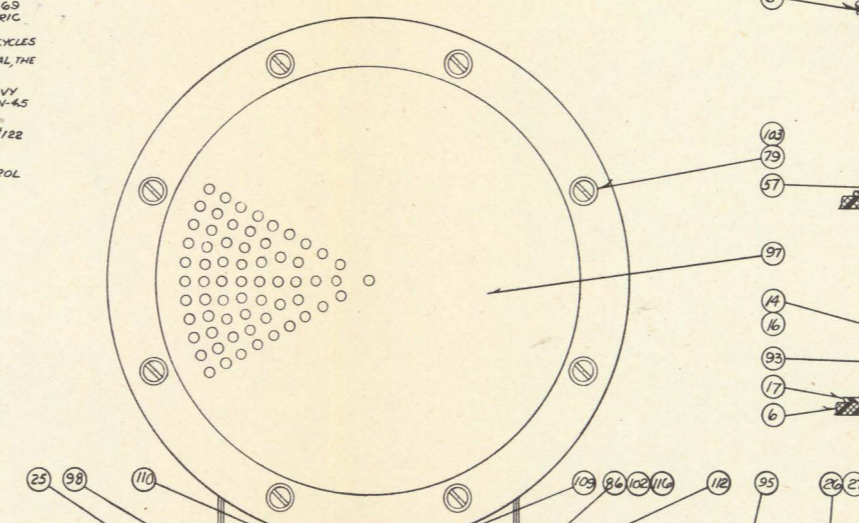
2-WHERE NO NAVY SPECIFICATION IS DESIGNATION IN LIST OF MATERIAL, THE MATERIAL IS OF THE BEST COMMERCIAL GRADE.

3-FINISH BEFORE ASSEMBLY: BONDPRIME, THEN APPLY TWO COATS OF NAVY GRAY PRIMER, GLYCEROL PHTHALATE BASE, SHADE MUNSSELL RATINGS N-45 OVER ONE COAT OF ZINC CHROMATE PRIMER.

4-SUFFICIENT QUANTITY OF PIECE #40 IS APPLIED TO PIECE #118 TO #122 TO INSURE A WATER TIGHT FIT.

5-PIECE #120 IS CEMENTED BY PIECE #121 TO PIECE #29.

6-PIECE #42 TO BE CUT IN HALF TO FIT BETWEEN CHASSIS & CONTROL PANEL.



PIECE NO.	NAME OF PIECE	NO. REQ.	MATERIAL	MATERIAL SPECIFICATION	REMARKS	DRAWING NO. CONTRACTOR BUREAU	PIECE NO.	NAME OF PIECE	NO. REQ.	MATERIAL	MATERIAL SPECIFICATION	REMARKS	DRAWING NO. CONTRACTOR BUREAU
116	#8-32 HEX NUT	41	STEEL	#6 P2			72	BINDING POST	1	STEEL PLATED BRASS			
117	#4-36 HEX NUT	30	STEEL	#6 P2			73	INSULATING STRIP 1/4 TH.	1	FISH PAPER			B-2105-1
118	#4-36 HEX NUT	12	STAINLESS	#6 P2			74	SWITCH D.P.D.T.	3				
119	1/2-20 HEX JAM NUT	4	BRASS		NOTE 4		75	TERMINAL STRIP 2 POINT	1	STAINLESS	TYPE 316		B-1752-1
120	BACK CUSHION	1	FELT		SEE REFERENCE # 2	A-1427	76	GASKET 1/32 THICK	1	WISGID	33P-22		A-2331
121	GASKET CEMENT	1	BRASS		NOTE 4	B-2355-2	77	#10-24 R.H.M.S. 3/8 LG.	4	STAINLESS			
122	CABLE DUCT	1	BRASS		NOTE 4		78	#8-32 R.H.M.S. 3/16 LG.	5	STAINLESS	#6 P2		
123	BRACKET	4	STEEL	#6 P2			79	#8-32 FL.H.M.S. 3/16 LG.	8	STAINLESS			
124	#8-32 R.H.M.S. 1/2 LG.	6	STEEL	#6 P2			80	#10-32 O.H.M.S. 3/8 LG.	8	BRASS			
125	WASHER 1/4 I.D. 1/8 O.D. 1/8 TH.	5	STAINLESS				81	#8-32 O.H.M.S. 3/8 LG.	12	STAINLESS			
126	#10 LOCK WASHER	1	STAINLESS				82	#8-32 R.H.M.S. 3/8 LG.	12	STAINLESS	#6 P2		
127	#8 LOCKING TERMINAL	1	STAINLESS				83	#8-32 R.H.M.S. 3/8 LG.	6	STAINLESS	#6 P2		
128	3/16 x 1/4 x 1/4 TH. SHOULDER WASHER	2	LAMINATED PHENOLIC				84	#8-32 R.H.M.S. 3/8 LG.	10	STAINLESS			
129	#6 LOCKING TERMINAL	1	STAINLESS				85	#8-32 R.H.M.S. 1/2 LG.	8	STAINLESS			
130	INSULATING STRIP 1/4 TH.	2	FISH PAPER			A-1814	86	#8-32 R.H.M.S. 1/2 LG.	4	STAINLESS	#6 P2		
							87	#6-32 R.H.M.S. 2 LG.	1	STAINLESS	#6 P2		
							88	#6-32 R.H.M.S. 1 1/4 LG.	6	STAINLESS	#6 P2		
							89	#6-32 R.H.M.S. 3/8 LG.	22	STAINLESS			
							90	#6-32 R.H.M.S. 3/8 LG.	12	STAINLESS	#6 P2		
							91	#6-32 R.H.M.S. 3/8 LG.	5	STAINLESS	#6 P2		
							92	#6-32 SPADE BOLT 3/8 LG.	2	STAINLESS	#6 P2		
							93	#4-36 HDLESS SET SCR 1/4 LG.	11	STAINLESS			
							94	#4-36 O.H.M.S. 3/8 LG.	12	STAINLESS			
							95	#4-36 F.H.M.S. 1/4 LG.	1	STAINLESS			
							96	#4-36 R.H.M.S. 1/4 LG.	4	STAINLESS	#6 P2		
							97	COVER SCREEN	1	STAINLESS			NOTE-3 D-2328-2
							98	#4-36 O.H.M.S. 3/8 LG.	24	STAINLESS			
							99	#4-36 FL.H.M.S. 3/8 LG.	4	STAINLESS			
							100	#8 LOCK WASHER	4	STAINLESS			
							101	#8 FLAT WASHER	4	STAINLESS			
							102	#8 LOCK WASHER	51	STAINLESS			
							103	#8 FLAT WASHER	18	STAINLESS			
							104	#6 LOCK WASHER	48	STAINLESS			
							105	#6 FLAT WASHER	22	STAINLESS			
							106	#4 LOCK WASHER	18	STAINLESS			
							107	CENTERING WASHER	10	STAINLESS	#6 P2		
							108	1/2 LOCK WASHER	2	STAINLESS			
							109	1/2 FLAT WASHER	2	BRASS			
							110	GASKET 3/8 I.D. 1 1/8 O.D. 1/32 TH.	2	WISGID	33-P-22		A-1568
							111	WASHER 1/4 I.D. 9/16 O.D. 1/8 TH.	12	STAINLESS			
							112	GASKET 3/16 I.D. 7/16 O.D. 1/32 TH.	6	WISGID	33P-22		
							113	GASKET 3/16 I.D. 3/8 O.D. 1/4 TH.	10	WISGID	33-P-22		
							114	#10-24 HEX NUT	4	STAINLESS	#6 P2		
							115	#8-32 HEX NUT	8	BRASS			

REQUIREMENTS
 3.4 AMPERES
 9 AMPERES
 .44 VA AT 3000 CYCLES
 4 WATTS
 25 WATTS
 140 WATTS
 30 WATTS

1.041 O.D.
 .015
 .032
 .50 OUNCS

6 OHMS AT 1000 CYCLES
 36 COPPER ENAMELLED
 .163
 PHENOLIC IMPREGNATED FABRIC

WAS 4 WATTS AT 1000 CYCLES

ATION IS DESIGNATION IN THE LIST OF MATERIAL, THE COMMERCIAL GRADE.

BONDERITE, THEN APPLY TWO COATS OF NAVY
 PHENOLIC BASE, SHADE MINERAL RATING W-45
 CHROMATE PRIMER.

PIECE #60 IS APPLIED TO PIECE #110 & #112
 BY FIT.

PIECE #81 TO PIECE #59
 HALF TO FIT BETWEEN CHASSIS & CONTROL

NO.	NAME OF PIECE	NO.	MATERIAL	MATERIAL SPECIFICATION	REMARKS	DRAWING NO.	CONTRACTOR BUREAU
72	BINDING POST	1	FISHPAPER				
73	INSULATING STRIP 1/4 THK.	1	FISHPAPER			B-2185-1	
74	SWITCH D.P.D.T.	3					
75	TERMINAL STRIP 2 POINT	1	INSULATED BRASS			B-732-1	
76	GASKET 1/32 THICK	1	WISOID	33P-22		A-2331	
77	1/2-24 R.H.M.S. 1/16 LG.	4	STAINLESS				
78	8-32 R.H.M.S. 3/16 LG.	5	STAINLESS	46P2			
79	8-32 FIL.H.M.S. 3/16 LG.	8	STAINLESS				
80	10-32 O.K.H.M.S. 3/8 LG.	2	BRASS				
81	8-32 O.K.H.M.S. 3/8 LG.	12	STAINLESS	46P2			
82	8-32 R.H.M.S. 3/8 LG.	12	STAINLESS	46P2			
83	8-32 R.H.M.S. 3/8 LG.	6	STAINLESS	46P2			
84	8-32 R.H.M.S. 3/8 LG.	10	STAINLESS	46P2			
85	8-32 R.H.M.S. 1/16 LG.	8	STAINLESS	46P2			
86	8-32 R.H.M.S. 1/16 LG.	6	STAINLESS	46P2			
87	8-32 R.H.M.S. 2 LG.	1	STAINLESS	46P2			
88	8-32 R.H.M.S. 1/16 LG.	6	STAINLESS	46P2			
89	6-32 R.H.M.S. 3/8 LG.	22	STAINLESS	46P2			
90	6-32 R.H.M.S. 3/8 LG.	12	STAINLESS	46P2			
91	6-32 R.H.M.S. 3/8 LG.	5	STAINLESS	46P2			
92	6-32 SPAN BOLT 3/8 LG.	2	STAINLESS	46P2			
93	4-36 NUTLESS SET SCR 1/16 LG.	11	STAINLESS				
94	4-36 O.K.H.M.S. 3/8 LG.	12	STAINLESS				
95	4-36 F.H.M.S. 3/16 LG.	1	STAINLESS				
96	4-36 R.H.M.S. 1/16 LG.	4	STAINLESS	46P2			
97	COVER SCREWS	7	STAINLESS		NOTE-3	D-2322	
98	4-36 O.K.H.M.S. 3/8 LG.	24	STAINLESS				
99	4-36 FIL.H.M.S. 3/16 LG.	4	STAINLESS				
100	10 LOCK WASHER	4	BRASS				
101	1/8 FLAT WASHER	4	BRASS				
102	1/8 LOCK WASHER	5	BRASS				
103	1/8 FLAT WASHER	18	BRASS				
104	1/8 LOCK WASHER	48	BRASS				
105	1/8 FLAT WASHER	22	BRASS				
106	1/8 LOCK WASHER	18	BRASS				
107	CENTERING WASHER	10	BRASS				
108	1/8 LOCK WASHER	2	BRASS				
109	1/8 FLAT WASHER	2	BRASS				
110	GASKET 1/32 I.D. 1 1/8 O.D. 1/32 TH.	2	WISOID	33P-22		A-1568	
111	WASHER 1/8 I.D. 1/8 O.D. 1/32 TH.	12	STAINLESS				
112	GASKET 3/16 I.D. 1 1/8 O.D. 1/32 TH.	6	WISOID	33P-22			
113	GASKET 1/8 I.D. 1/8 O.D. 1/32 TH.	10	WISOID	33P-22			
114	10-24 HEX NUT	4	STAINLESS	46P2			
115	8-32 HEX NUT	8	BRASS				

NO.	NAME OF PIECE	NO.	MATERIAL	MATERIAL SPECIFICATION	REMARKS	DRAWING NO.	CONTRACTOR BUREAU
28	FOOT	4	RUBBER				
29	TERMINAL STRIP 7 POINT	4	RUBBER				
30	TOUR CONTROL	2					
31	VOLUME CONTROL	2					
32	ROTARY SWITCH	3					
33	RESISTOR 500 OHM 25 WATTS	5					
34	SWITCH D.P.S.T.	1					
35	FUSE CAMPS	1					
36	FUSE CAMPS	2					
37	FUSE CLIPS	6	PHENOLIC BINDER				
38	VIBRATOR	1					
39	POWER TRANSFORMER	1					
40	OUTPUT TRANSFORMER	1					
41	FILTER CHOKE	1					
42	CHOKE	1					
43	INPUT TRANSFORMER	1					
44	INPUT TRANSFORMER	1					
45	FILTER CONDENSER 4 MFD.	2					
46	SOCKET	3					
47	SOCKET	4					
48	GROMMET	1	RUBBER				
49	CONDENSER 25 MFD.	1					
50	CONDENSER .001 MFD.	3					
51	CONDENSER .001 MFD.	2					
52	CONDENSER .004 MFD.	1					
53	GASKET 1/16 THICK	1	RUBBER	33R4		D-2360-2	
54	GASKET 1/16 THICK	1	RUBBER	33R4		D-2360-1	
55	GASKET 1/32 THICK	3	WISOID	33P-22		D-2360-5	
56	GASKET 1/32 THICK	3	WISOID	33P-22		D-2360-6	
57	GASKET 1/32 THICK	11	WISOID	33P-22		D-2360-3	
58	GASKET 1/32 THICK	1	WISOID	33P-22		D-2360-4	
59	B-233 SPEAKER MTR BRACKET	1	STAINLESS				
60	SEALING COMPOUND	1	WHITE LEAD		NOTE-3	D-2322	
61	RESISTOR MTR BRACKET	1	STAINLESS				
62	GROMMET	3					
63	VACUUM TUBE	2					
64	VACUUM TUBE	4					
65	VACUUM TUBE	1					
66	EYELET	16	BRASS				
67	SHIELD	1	STAINLESS				
68	BAFFLE PLATE	1	BRASS				
69	RESISTOR 5 WATTS 100 OHMS	1	STAINLESS				
70	INSULATING STRIP 1/4 THK.	1	FISHPAPER				
71	8 LOCKING TERMINAL	7	BRASS				

LIST OF MATERIAL
 QUANTITIES ARE FOR ONE UNIT

PIECE NO.	NAME OF PIECE	NO. REQ.	MATERIAL	MATERIAL SPECIFICATION	REMARKS	DRAWING NO.	CONTRACTOR BUREAU
1	ASSEMBLY	1					
2	D-131 DRIVER UNIT ASSEMBLY	1					
3	CA-116 AMPLIFIER CABINET	1				F-2346-1	
4	COVER	1				F-2346-2	
5	HANDLE	2	BRASS			F-2346-3	
6	PA-158 CONTROL PANEL	1				D-2333	
7	CA-116 AMPLIFIER CHASSIS	1				F-896	
8	PA-111 AMPLIFIER MTR. PANEL	1				C-893-1	
9	DIVERS JACK	3				C-2332	
10	CHASSIS CONNECTOR	1					
11	CHASSIS CONNECTOR	1					
12	CHASSIS CONNECTOR	1					
13	DUST CAP WITH CHAIN	3	BRASS				
14	K-101 BAR KNOB	4	BRASS			C-901-3	
15	K-102 KNOB AND POINTER	4	BRASS			C-901-4	
16	K-104 KNOB	3	BRASS			A-2329	
17	DESIGNATION PLATE	1	FORMICA			D-2334	
18	DESIGNATION PLATE	1	FORMICA			A-2339	
19	DESIGNATION PLATE	1	FORMICA			A-2340	
20	DESIGNATION PLATE	1	FORMICA			A-2341	
21	DESIGNATION PLATE	1	FORMICA			A-2335	
22	DESIGNATION PLATE	1	FORMICA			A-2343	
23	DESIGNATION PLATE	1	FORMICA			A-2371	
24	DESIGNATION PLATE	1	FORMICA			B-2342	
25	IMP-15 NAME PLATE	1	STAINLESS				
26	POWER LIGHT	1	STAINLESS				
27	POWER LIGHT	1	STAINLESS				

WEIGHT

COMPLETE ASSEMBLY	APPROX. 74 LBS.		
NO. PART	DESCRIPTION	APPROVED DATE	INITIALS
	ALTERATIONS		

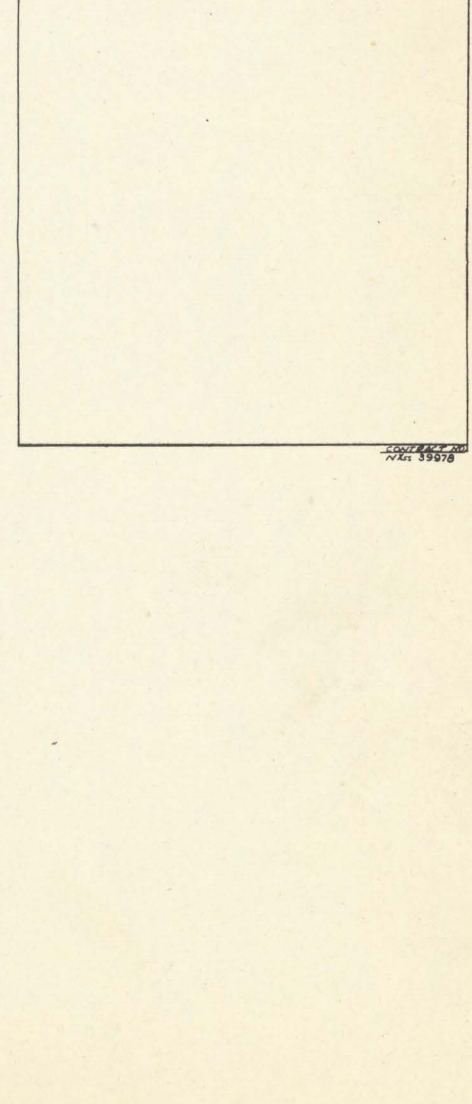
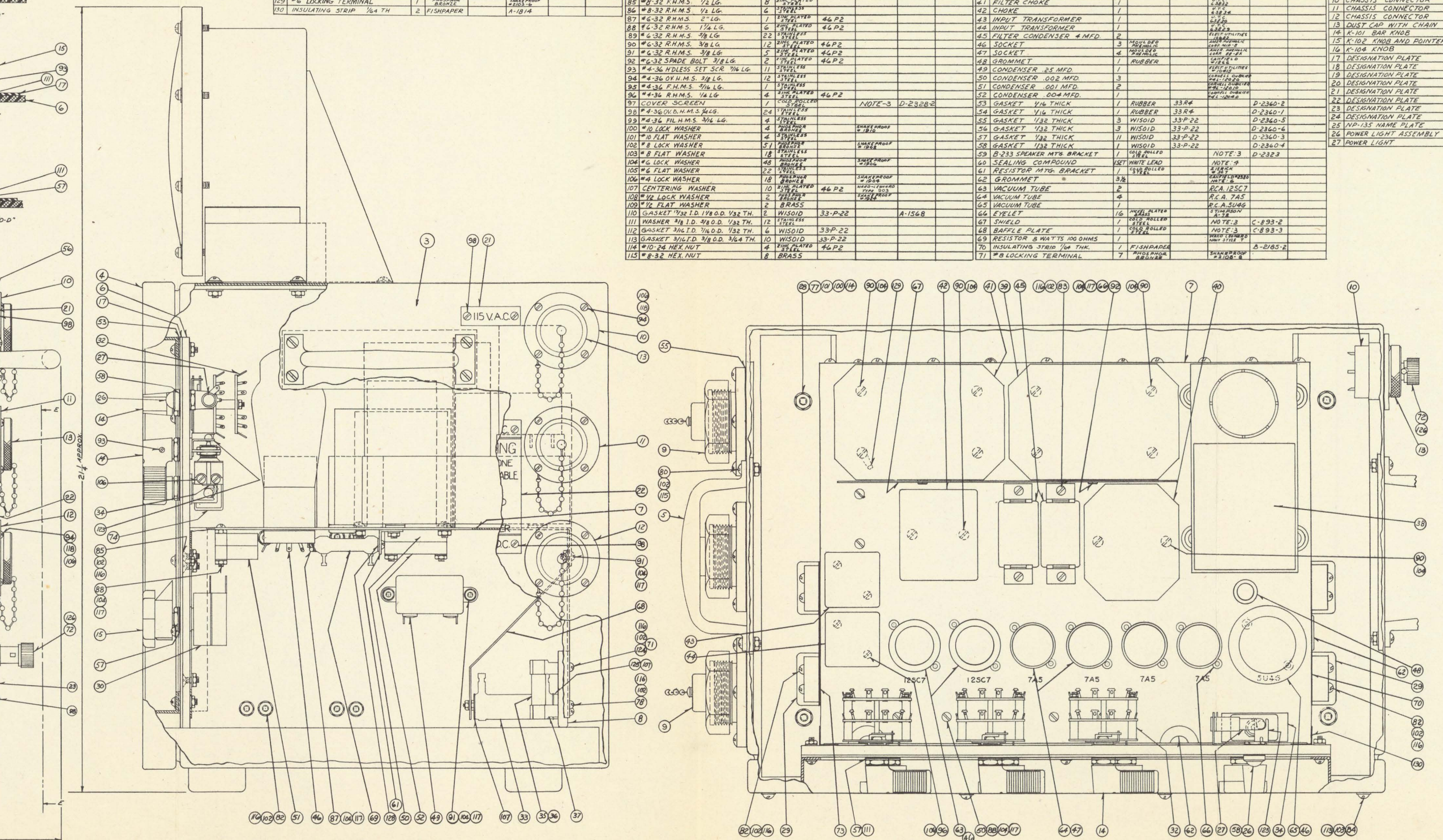
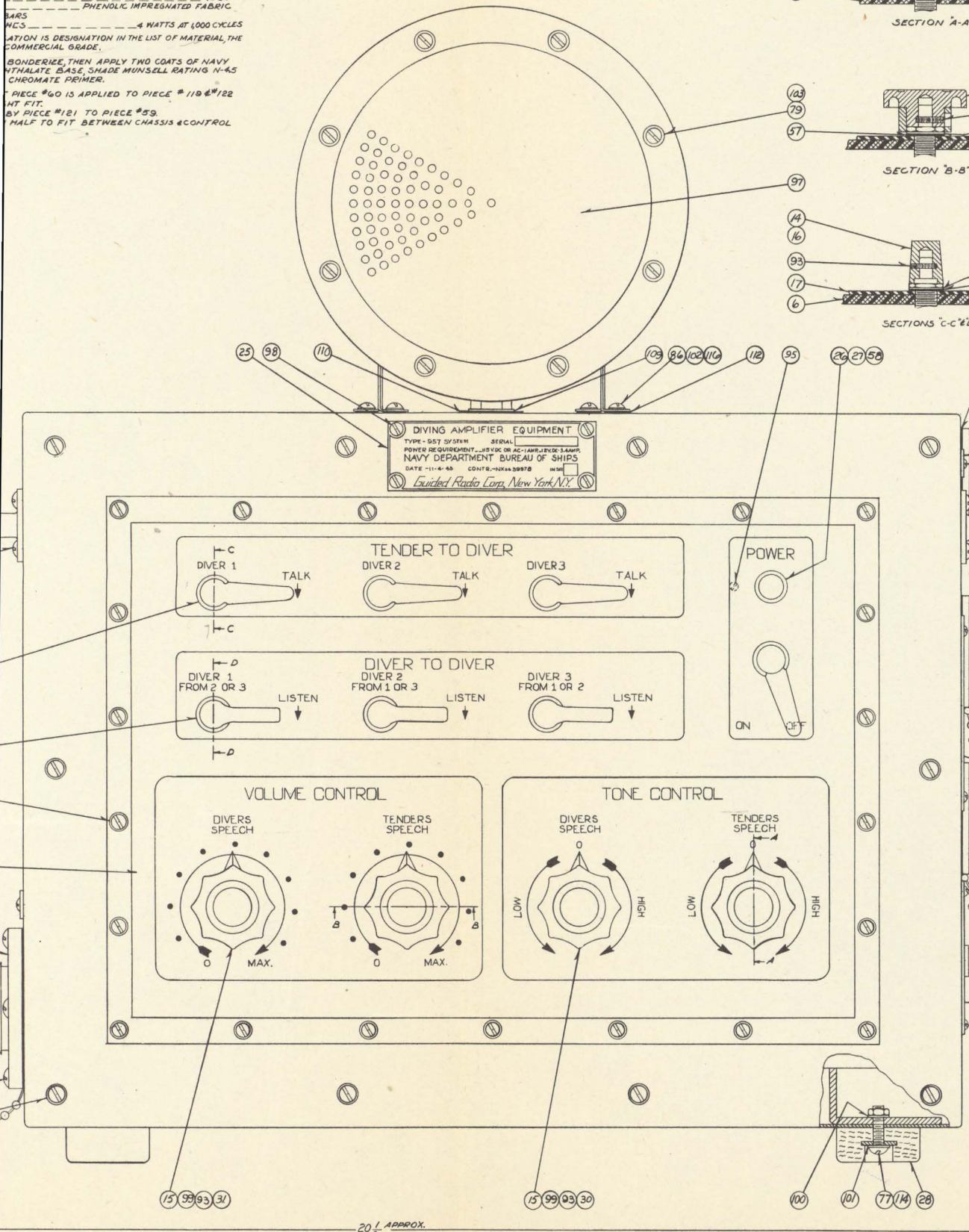
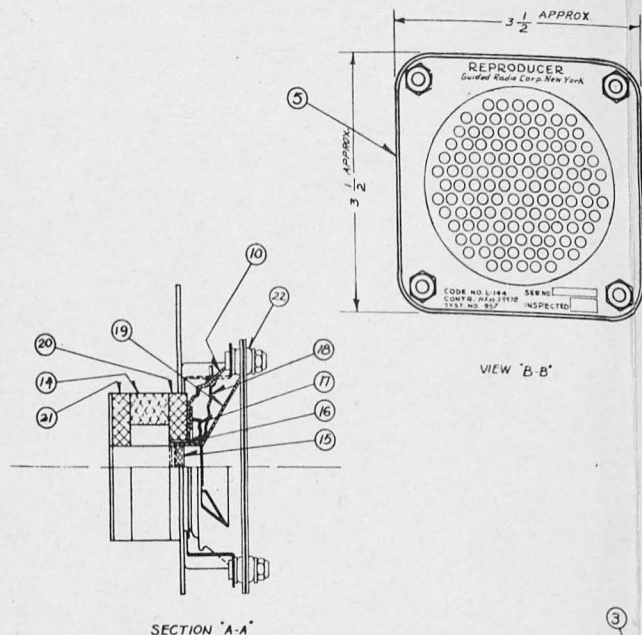


Fig. 2
 Amplifier Assembly and Tender's Reproducer - Dwg. No. H-2345

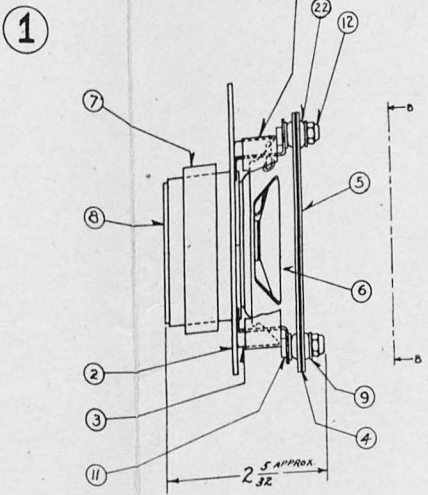
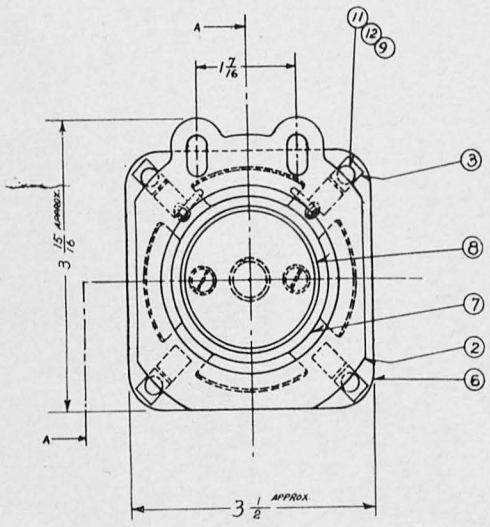
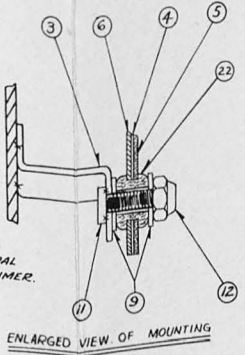


LIST OF MATERIAL
QUANTITIES ARE FOR ONE UNIT

PIECE NO.	NAME OF PIECE	QTY REQ.	MATERIAL	MATERIAL SPECIFICATION	REMARKS	DRAWING NOS.	
						CONTRACTOR	BUREAU
1	DIVERS REPRODUCER	X	COLD ROLLED STEEL		NOTE-2	D-887.3	
2	MOUNTING RING	4	COLD ROLLED STEEL		NOTE-2	D-887.4	
3	SUPPORTING FOOT	4	WISGOLD	33 P22		D-887.8	
4	GASKET 1/16 THICK	1	STAINLESS STEEL	47 S 20		C-2322	
5	N#134 PERFORATED NAME PLATE	1					
6	D-70 DRIVER UNIT ASSEMBLY	1	RUBBER			D-887.2	
7	MAGNET CUSHION	1	FELT			D-887.5	
8	DISC	1	BRASS				
9	#6 FLAT WASHER (SMALL PATTERN)	8	ZINC PLTD STEEL				
10	DIAPHRAGM SUPPORT FRAME	1	ZINC PLTD STEEL	46 P 2	NOTE-2		
11	#6-32 F.H. WELDING SCREW 1/2 LG.	4	ZINC PLTD STEEL	46 P 2	ELASTIC STOP BUTTER MODEL		
12	#6-32 ELASTIC STOPNUT	4	RUBBER			A-2132	
13	AIR BLAST PROTECTOR	1	ALNICO				
14	MAGNET	1	#30 COPPER (ENAMELED) WIRE		NOTE-1		
15	VOICE COIL	1	DURALUMIN				
16	VOICE COIL FORM	1	IMPERMEATED BAKELITE				
17	CENTERING SUSPENSION	2	STRANDED COPPER				
18	VOICE COIL LEAD	1	ELECTRIC STEEL				
19	SPEAKER CONE	1	ELECTRIC STEEL				
20	TOP MAGNET PLATE	1	RUBBER				
21	BOTTOM MAGNET PLATE	4				CANTFIELD #1182	
22	GROMMET	4					

WEIGHT	
COMPLETE ASSEMBLY	APPROX. 3 LBS

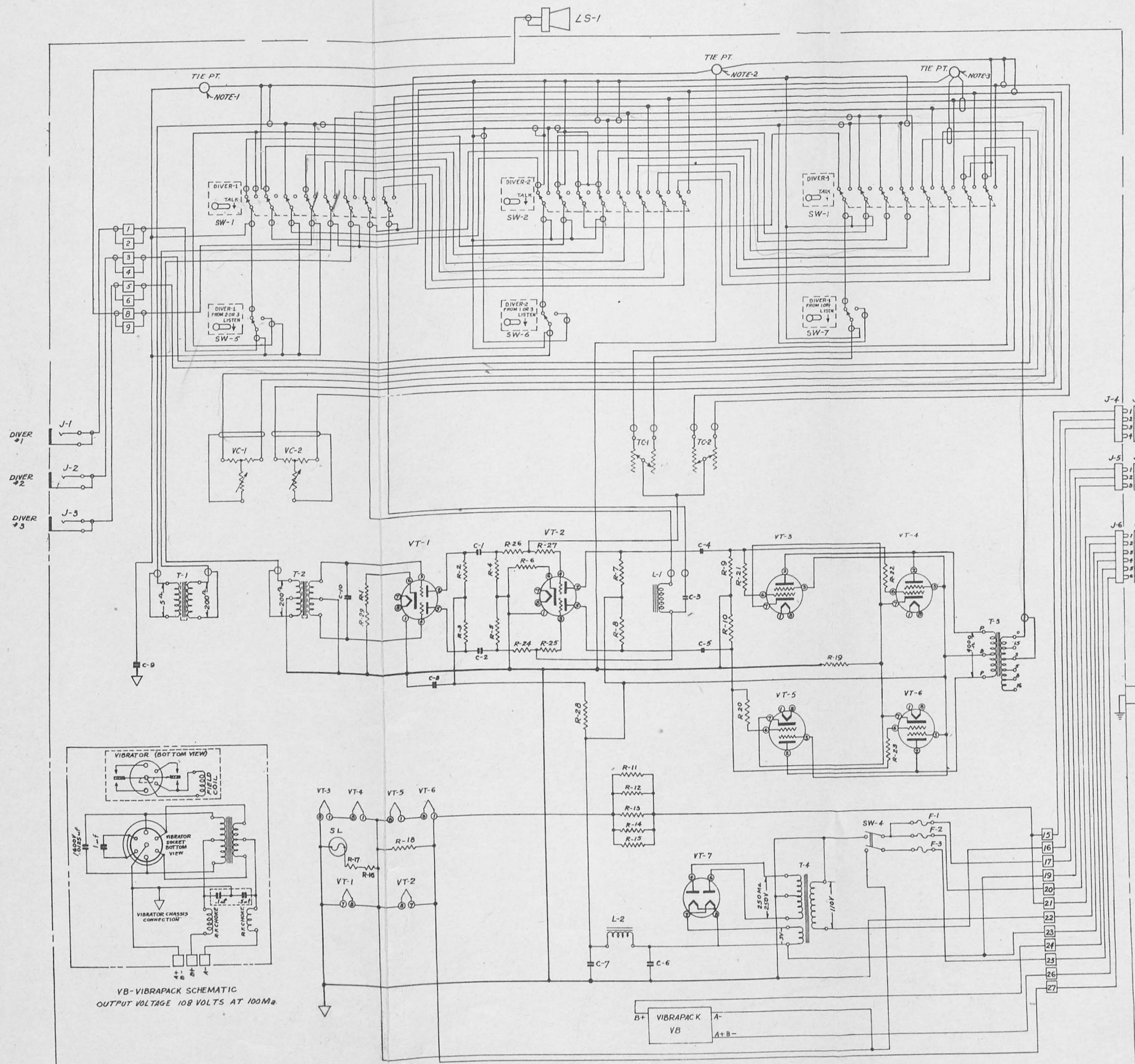
- NOTES:
- VOICE COIL DIAMETER .597 O.D.
VOICE COIL THICKNESS .012
AIR GAP THICKNESS .0285
VOICE COIL RESISTANCE 4-5 OHMS
VOICE COIL TURNS .68
WIRE SIZE #36
HEIGHT OF WINDING .200
HEIGHT OF POLE FACE .159
WATTS REQUIRED FOR 8 BARS OUTPUT AT 12 INCHES----.008
 - FINISH: AFTER MACHINING, BONDERIZE THEN APPLY TWO COATS OF NAVY GRAY PAINT, CRYCERAL PHTHALATE BASE, SHADE MUNSELL RATING N-4.5, OVER ONE COAT OF ZINC CHROMATE PRIMER.
 - "X" DENOTES SPOT WELD.
 - WHERE NO NAVY SPECIFICATION IS DESIGNATED IN THE LIST OF MATERIAL THE MATERIAL IS OF THE BEST COMMERCIAL GRADE.
 - PULL UP ON PIECE #12 UNTIL PIECE #11 IS LEVEL WITH TOP OF PIECE #12.



RESTRICTED

5	RE-DESIGNED		
23	CANCELLED WAS PROTECTIVE SCREEN		
6	METHOD OF MOUNTING CHANGED		
2	TITLE CONTRACT NOS. VOS-119817, NO. 3646, NOS. 112945A, NX-112945A & BLOCK WX-23779 REMOVED		
1	5 WAS PERFORATED, ETCHING CHANGED		
1	23 ADDED		
NO. PART	DESCRIPTION	APPROVED DATE	AUTHORITY
ALTERATIONS			

Fig. 3
Diver's Reproducer - Dwg. No. G-882



LIST OF MATERIAL			LIST OF MATERIAL		
PIECE NO.	DESCRIPTION	REFERENCE	PIECE NO.	DESCRIPTION	REFERENCE
J-1	JACK	F-2332	T-1	INPUT MATCHING TRANS	UTC 63829
J-2	SAME AS J-1		T-2	INPUT TRANSFORMER	UTC 63830
J-3	SAME AS J-2		T-3	OUTPUT TRANSFORMER	UTC 63831
J-4	CHASSIS CONNECTOR	CANNON AP-2-18	T-4	POWER TRANSFORMER	UTC 63833
J-5	CHASSIS CONNECTOR	CANNON AP-2-18	L-1	CHOKE	UTC 63834
J-6	CHASSIS CONNECTOR	CANNON AP-2-18	L-2	CHOKE	UTC 63832
J-7	CABLE CONNECTOR	CANNON AP-2-18	R-1	RESISTOR 3,000 OHMS 1/2WATT	ALLEN BRADLEY 6B-1028
J-8	CABLE CONNECTOR	CANNON AP-2-18	R-2	RESISTOR 510 OHMS 1/2WATT	ALLEN BRADLEY 6B-1028
J-9	CABLE CONNECTOR	CANNON AP-2-18	R-3	SAME AS R-2	
VT-1	VACUUM TUBE	RCA 6X4	R-4	RESISTOR 1 MEG 1/2WATT	ALLEN BRADLEY 6B-1028
VT-2	SAME AS VT-1		R-5	SAME AS R-4	
VT-3	VACUUM TUBE	RCA 6AV6	R-6	SAME AS R-1	
VT-4	SAME AS VT-3		R-7	RESISTOR 240 OHMS 1/2WATT	ALLEN BRADLEY 6B-1028
VT-5	SAME AS VT-3		R-8	SAME AS R-7	
VT-6	SAME AS VT-3		R-9	SAME AS R-2	
VT-7	VACUUM TUBE	RCA 6X4	R-10	SAME AS R-2	
LS-1	REPRODUCER L-143		R-11	RESISTOR 500 OHMS 25WATT	WAGO LEONARD 25F 500
			R-12	SAME AS R-11	
			R-13	SAME AS R-11	
			R-14	SAME AS R-11	
			R-15	SAME AS R-11	
			R-16	RESISTOR 75 OHMS 1/2WATT	ALLEN BRADLEY 6B-1028
			R-17	RESISTOR 100 OHMS 1/2WATT	ALLEN BRADLEY 6B-1028
			R-18	RESISTOR 200 OHMS 1/2WATT	ALLEN BRADLEY 6B-1028
			R-19	RESISTOR 100 OHMS 1/2WATT	ALLEN BRADLEY 6B-1028
			R-20	RESISTOR 10 OHMS 1/2WATT	ALLEN BRADLEY 6B-1028
			R-21	SAME AS R-20	
			R-22	SAME AS R-20	
			R-23	SAME AS R-20	
			R-24	SAME AS R-7	
			R-25	SAME AS R-7	
			R-26	SAME AS R-7	
			R-27	SAME AS R-7	
			R-28	RESISTOR 51M OHMS 1/2WATT	ALLEN BRADLEY 6B-1028
			R-29	SAME AS R-1	
			C-1	CONDENSER .002 MFD	CONDENSER TYPE 41-10220
			C-2	SAME AS C-1	
			C-3	CONDENSER .004 MFD	CONDENSER TYPE 41-10220
			C-4	CONDENSER .001 MFD	CONDENSER TYPE 41-10220
			C-5	SAME AS C-4	
			C-6	CONDENSER 4 MFD	ELECTRO-TECHNICAL 10888
			C-7	SAME AS C-6	
			C-8	CONDENSER .25 MFD	ELECTRO-TECHNICAL 10415
			C-9	SAME AS C-1	
			C-10	CONDENSER .0001 MFD	CONDENSER TYPE 41-10220
			TC-1	TONE CONTROL	CENTRALAB #010-061
			TC-2	SAME AS TC-1	
			VC-1	VOLUME CONTROL	CENTRALAB 4-D10-080
			VC-2	SAME AS VC-1	
			SW-1	SWITCH	DAK MFG. CO. #248E-10
			SW-2	SAME AS SW-1	
			SW-3	SAME AS SW-1	
			SW-4	SWITCH D.P.S.T.	ARROW MFG. #1000-AV
			SW-5	SWITCH D.P.D.T.	ARROW MFG. #1000-AV
			SW-6	SAME AS SW-5	
			SW-7	SAME AS SW-5	
			SL	PILOT LIGHT 6V	WAGO LEONARD 25F 500
			VB	VIBRAPACK	WAGO LEONARD 25F 500
			F-1	FUSE 3 AMP	WAGO LEONARD 25F 500
			F-2	SAME AS F-1	
			F-3	FUSE 6 AMP	WAGO LEONARD 25F 500

KEY
 ▽ DENOTES CHASSIS CONNECTION-INSULATED FROM CABINET AND GROUND.
 ⊥ DENOTES CABINET CONNECTION.
 ⊕ DENOTES SHIELDED SINGLE CONDUCTOR.
 ⊕⊕ DENOTES SHIELDED PAIR

POWER REQUIREMENTS.
 12 VOLTS - 3.4 AMPERES
 115 VOLTS D.C. - 9 AMPERES
 115 VOLTS 60 CYCLES - 14.4 VA AT 35% LAGGING.
AUDIO OUTPUT 4 WATTS
 HEAT DISSIPATION 115V D.C. 95 WATTS
 HEAT DISSIPATION 115V A.C. 140 WATTS
 HEAT DISSIPATION 12V D.C. 36.8 WATTS
OPERATION POWER SUPPLY OUTPUT (B+) VOLTAGE
 12 V. DC. ----- 108 VOLTS
 115 V. A.C. ----- 103 VOLTS
 115 V. A.C. ----- 108 VOLTS

NOTES:
 1. INPUT AND OUTPUT SHIELDS (ISOLATED FROM CHASSIS)
 2. TONE CONTROL SHIELDS (TIE TO CHASSIS)
 3. VOLUME CONTROL SHIELDS (ABOVE CHASSIS & GND.)
 4. WARNING ONLY ONE POWER CABLE TO BE PLUGGED INTO AMPLIFIER.
 5. WARNING TO PREVENT STATIC ELECTRIC SHOCK TO DIVER - GROUND AMPLIFIER CASE TO A PIECE OF METAL IN CONTACT WITH THE WATER.

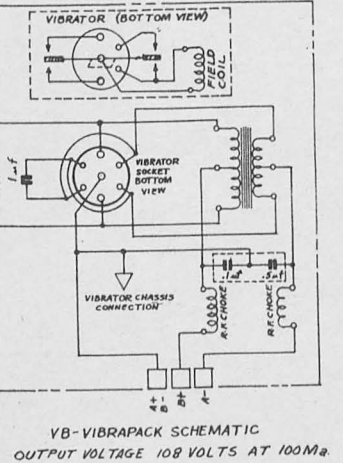


Fig. 4 System Schematic Diagram - Dwg. No. H-2344

LIST OF MATERIAL						
QUANTITIES ARE FOR ONE UNIT						
PIECE NO.	NAME OF PIECE	NO. REQ.	MATERIAL	MATERIAL SPECIFICATION	REMARKS	DRAWING NOS. CONTRACTOR BUREAU
1	CABLE CONNECTOR	1	ZINC ALLOY		CANNON ELEC AP 4 - C-6-11	
2	CABLE CONNECTOR	1	ZINC ALLOY		CANNON ELEC AP 3 - C-6-11	
3	CABLE CONNECTOR	1	ZINC ALLOY		CANNON ELEC AP 6 - C-6-11	
4	JACK PLUG	6	BRASS		NOTE-1	
5	CABLE 2 CONDUCTOR (17 IN)	3	RUBBER COVERED		C-92B-3	
6	CONNECTING CABLE	3	RUBBER COVERED		NOTE-1	
7	JACK	3	BRASS		NOTE-1	
8	CABLE 2 CONDUCTOR (30 FT)	2	RUBBER COVERED		C-92B-2	
9	CABLE 2 CONDUCTOR (31 FT)	1	RUBBER COVERED		C-92B-1	
10	POSITIVE BATTERY CLIP	1	LEAD COATED STEEL		MUELLER 24A	
11	NEGATIVE BATTERY CLIP	1	LEAD COATED STEEL		MUELLER 25A	
12	L-144 DIVERS REPRODUCER	3			Q-B82	
13	CA-21B AMPLIFIER CABINET	1			H-2345	

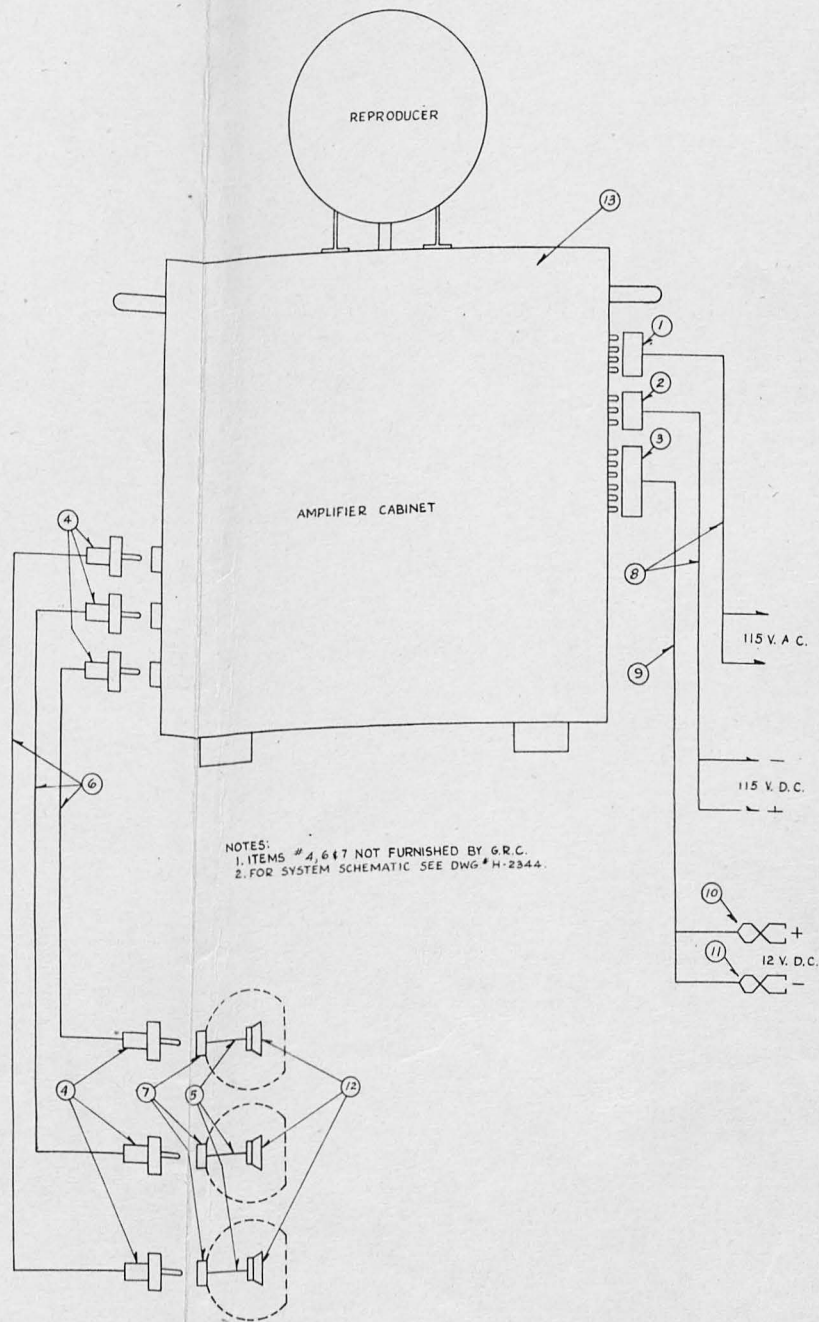
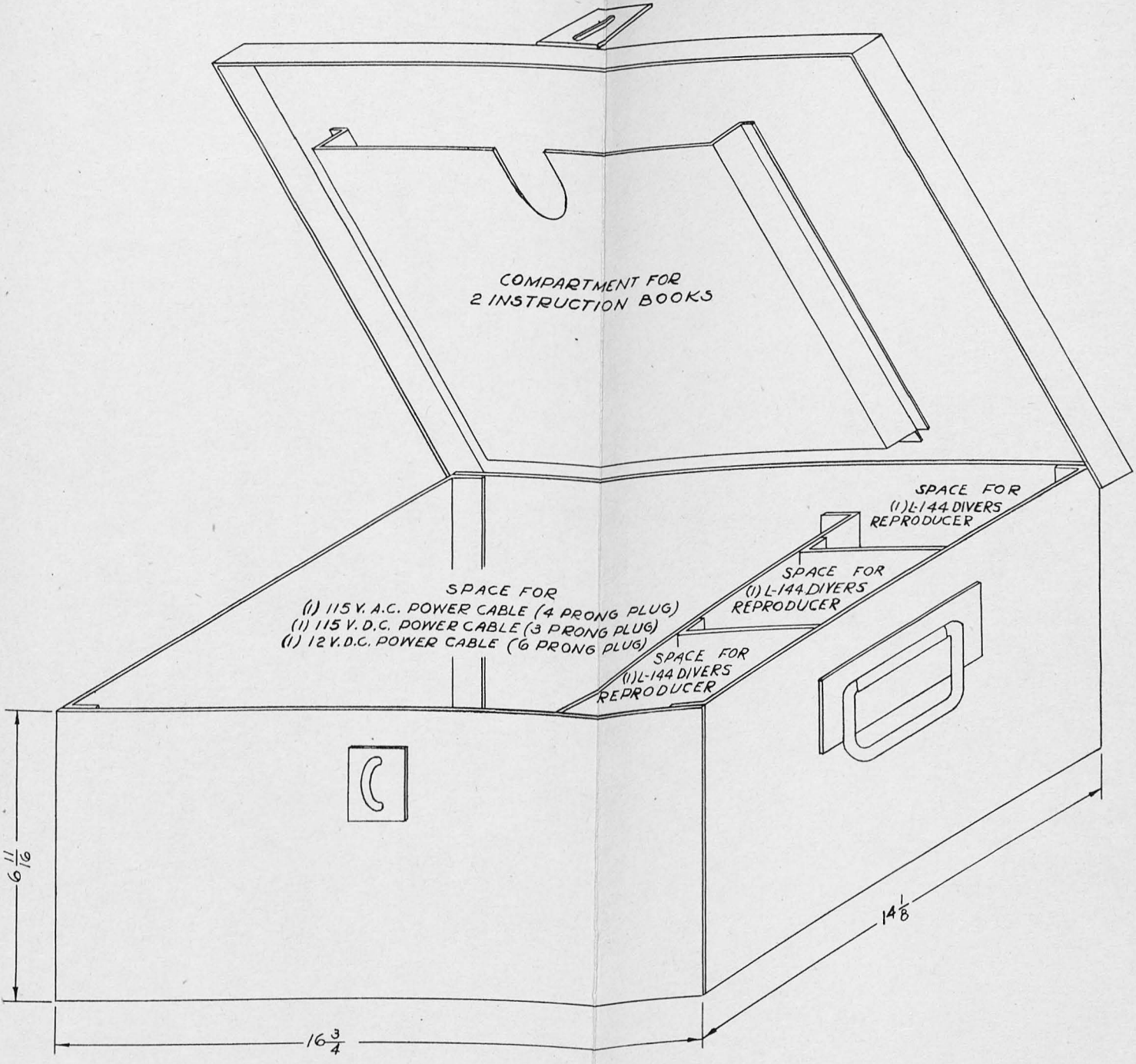


Fig. 5
 Block Cabling Diagram - Dwg. No. G-2357



NOTE:

1- BOX CONSTRUCTED IN ACCORDANCE WITH NAVY
SPECIFICATION 42B9.

Fig. 6
Stowage Box for Divers' Reproducers and Power Cables - Dwg. No. G-2567

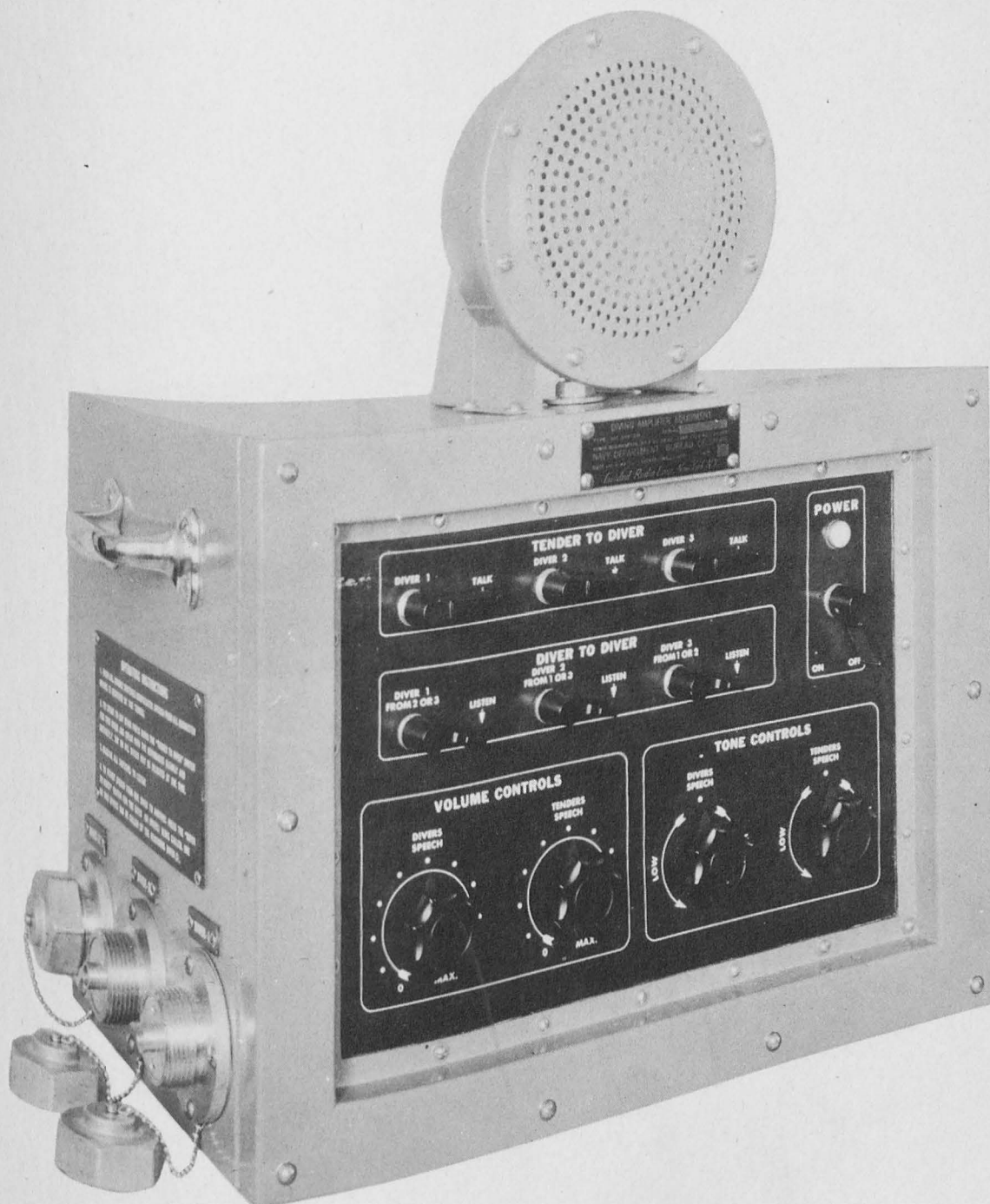


Fig. 7
 Amplifier and Tender's Reproducer - Front view



Fig. 8
Amplifier and Tender's Reproducer - Left side view - reproducer open

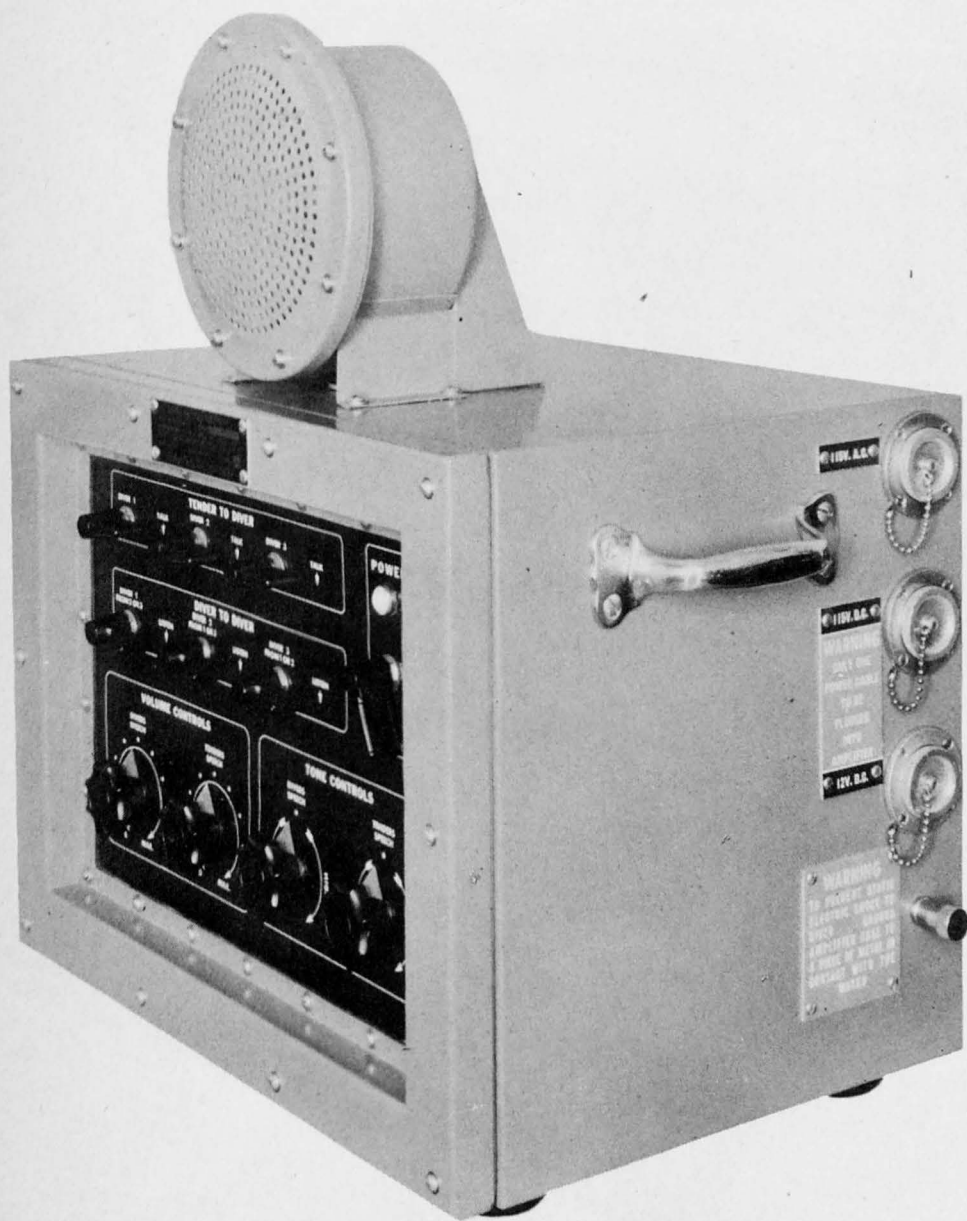


Fig. 9
Amplifier and Tender's Reproducer - Right side view

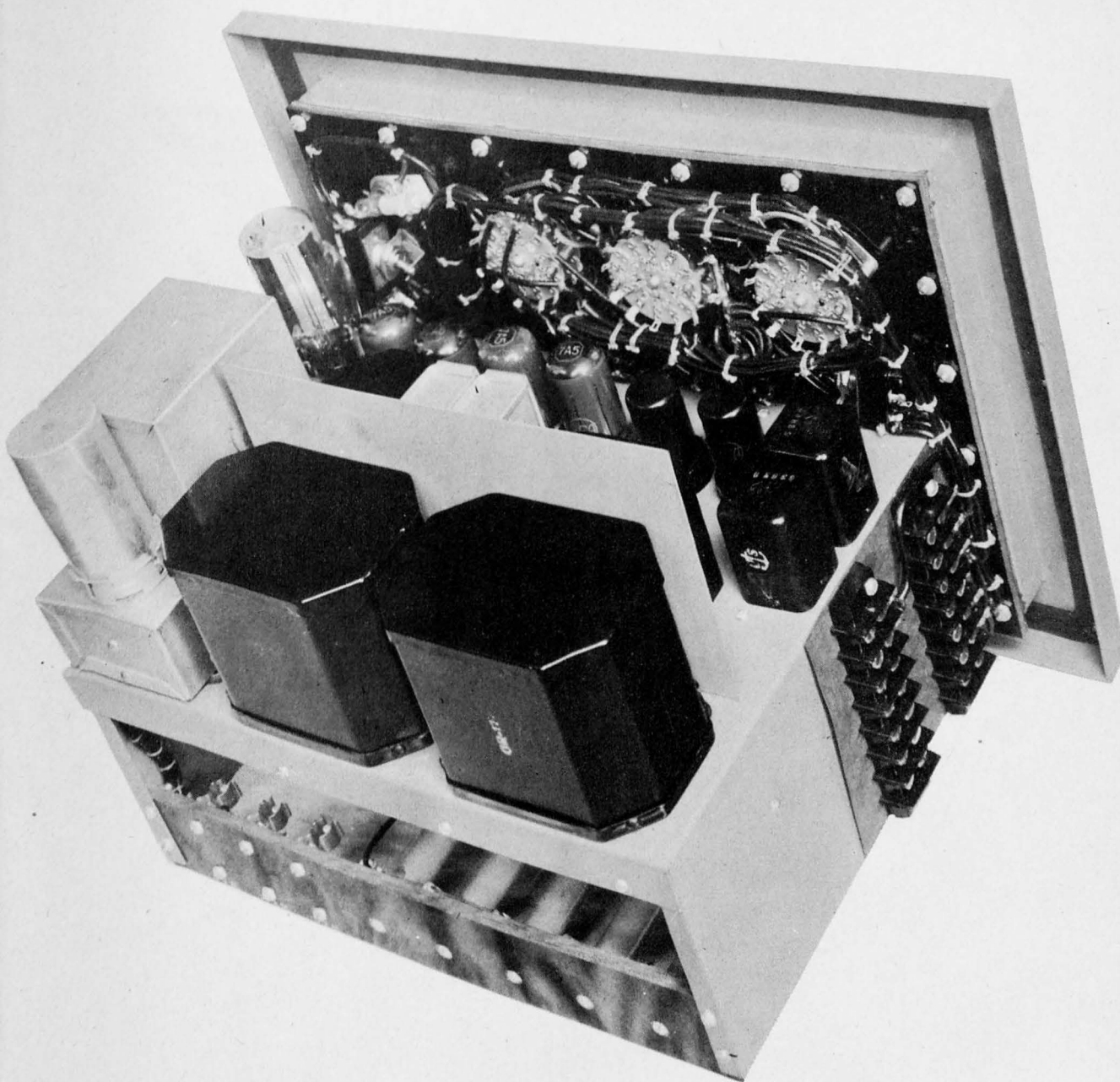


Fig. 10
Amplifier Chassis - Top view showing Divers' reproducers terminal strips

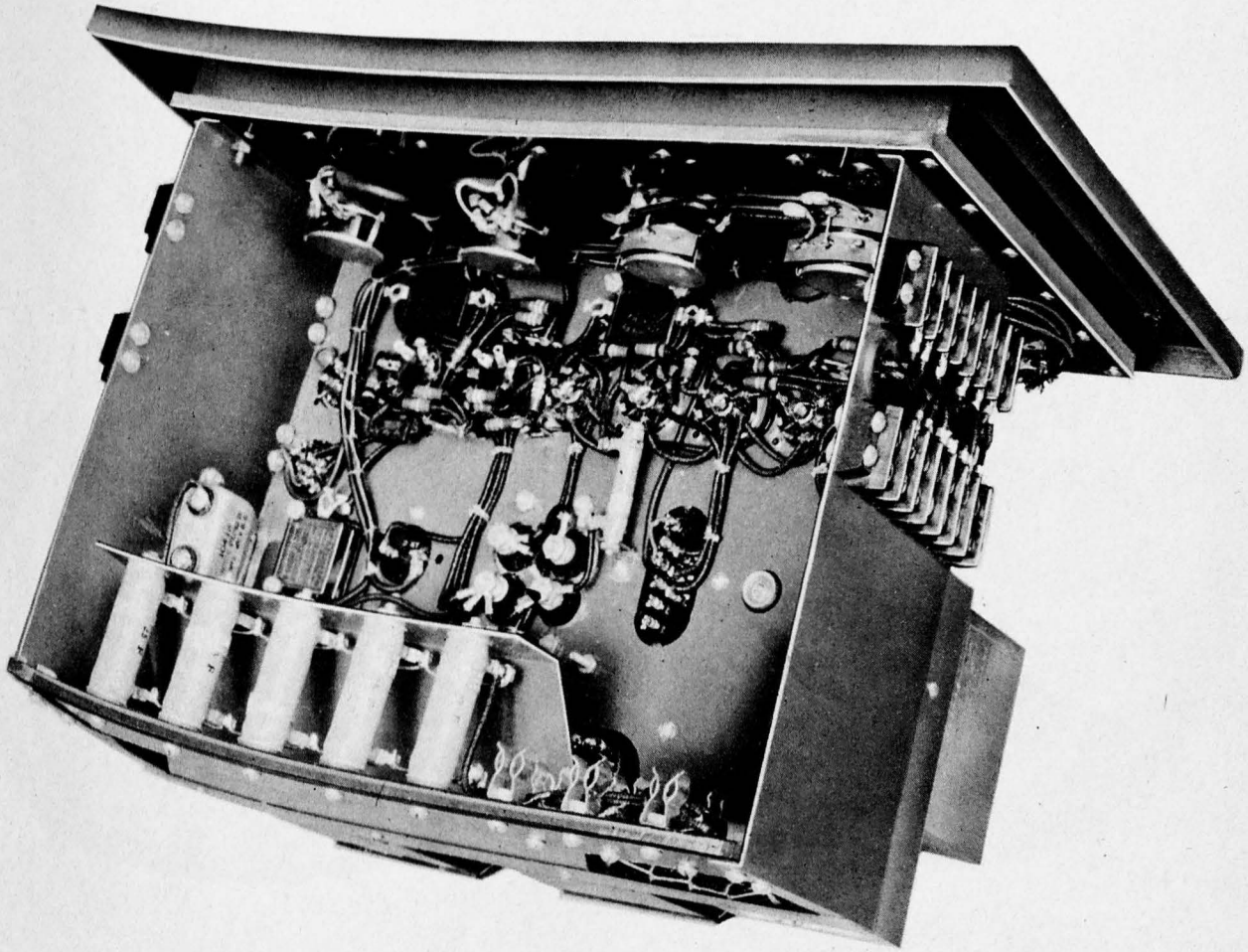


Fig. 11
Amplifier Chassis - Bottom view showing Power terminal strips

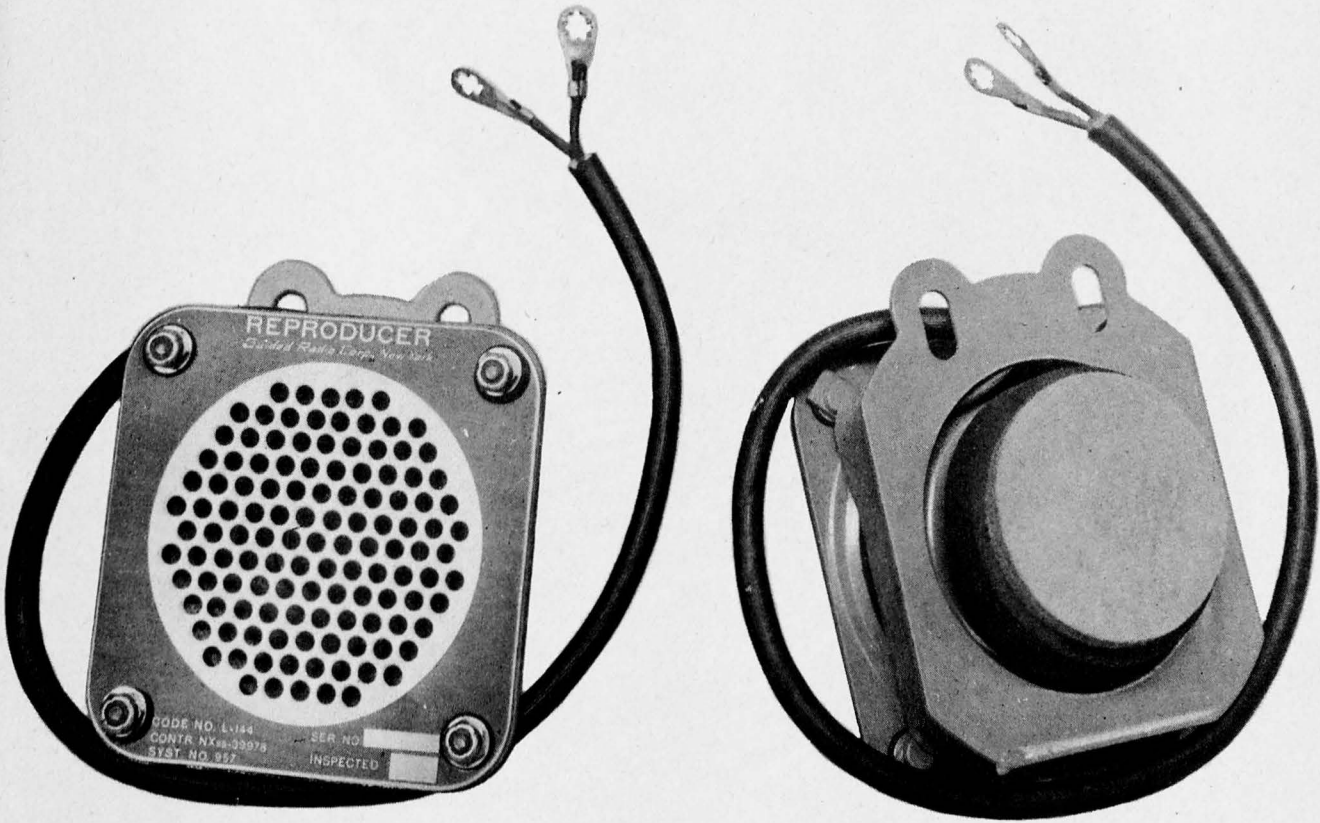


Fig. 12
Diver's Reproducer

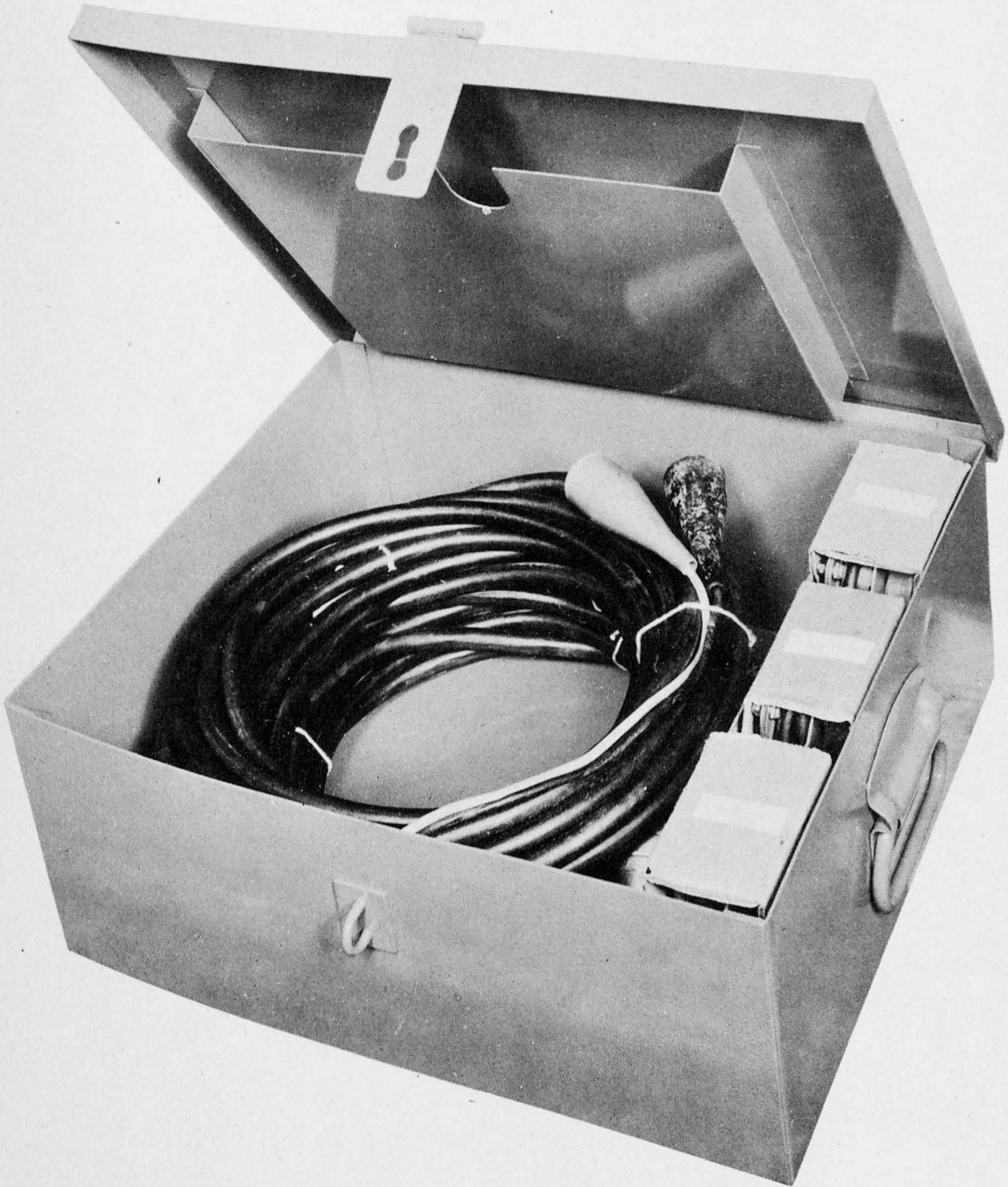


Fig. 13
Storage Box containing Divers' reproducers and Power Cables