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OPERATING AND INSTALLATION INSTRUCTIONS

**WIRELESS SET NO. 19,
SUPPLY UNIT NO. 2 (ZA-10572)**

Issued by:—

*Communication Development Division,
Signals Production Branch,
Department of Munitions and Supply,
Ottawa, Canada.*

(RCA 113920)

8, May, 1943.

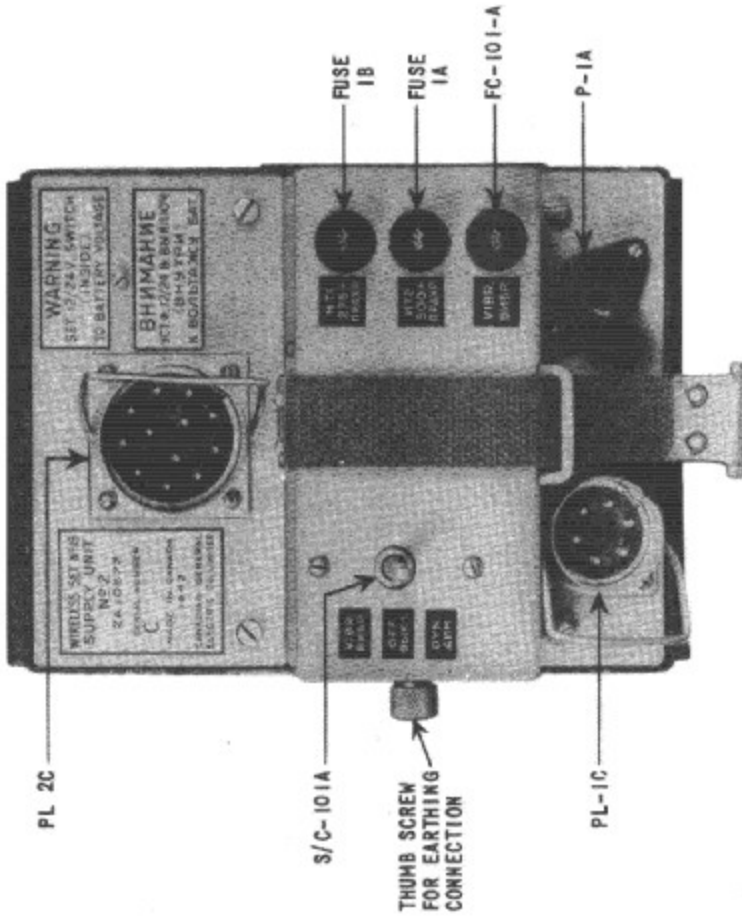


Fig. 1. Wireless Set No. 19, Supply Unit No. 2
Photograph, Front View in Case.

**OPERATING AND INSTALLATION INSTRUCTIONS
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C O N T E N T S

CHAPTER I.

USE AND INTERCHANGEABILITY	7
--------------------------------------	---

CHAPTER II.

INSTALLATION INSTRUCTIONS

2.1 General	8
2.2 Wiring change (Wireless Set No. 19, Mk. I and Mk. II.) (British, U.S., Canadian)	8
2.3 Installation Instructions. (Wireless Set No. 19, Mk. I, Mk. II, Mk. III) (British, U.S., Canadian)	10

CHAPTER III.

OPERATING INSTRUCTIONS	13
----------------------------------	----

CHAPTER IV.

REPLACEMENT OF FUSES, VALVE AND VIBRATOR

4.1 General	15
4.2 To replace a Fuse	15
4.3 To replace the Vibrator or the 0Z4A Valve	15

CHAPTER V.

DESCRIPTION

5.1 General	18
5.2 Weight and Dimensions	19
5.3 Voltages and Current Drains	20

CONTENTS—Cont'd

TABLES

Table I —Weight and Dimensions	20
Table II —Voltages and Current Drains	20
Table III—List of Components	21

PHOTOGRAPHS AND DIAGRAMS

Fig. I —Photograph, FRONT VIEW in CASE.....	2
Fig. II —Photograph, INSTALLED on CARRIER...	6
Fig. III —Photograph, TOP and SIDE VIEW (left) ..	23
Fig. IV —Photograph, TOP and SIDE VIEW (right) 24	24
Fig. V —Wiring Diagram of 12pt-6pt Connector....	25
Fig. VI —Diagram of Connections between BATTERY and Supply Unit	26
Fig. VII—Schematic Diagram	27

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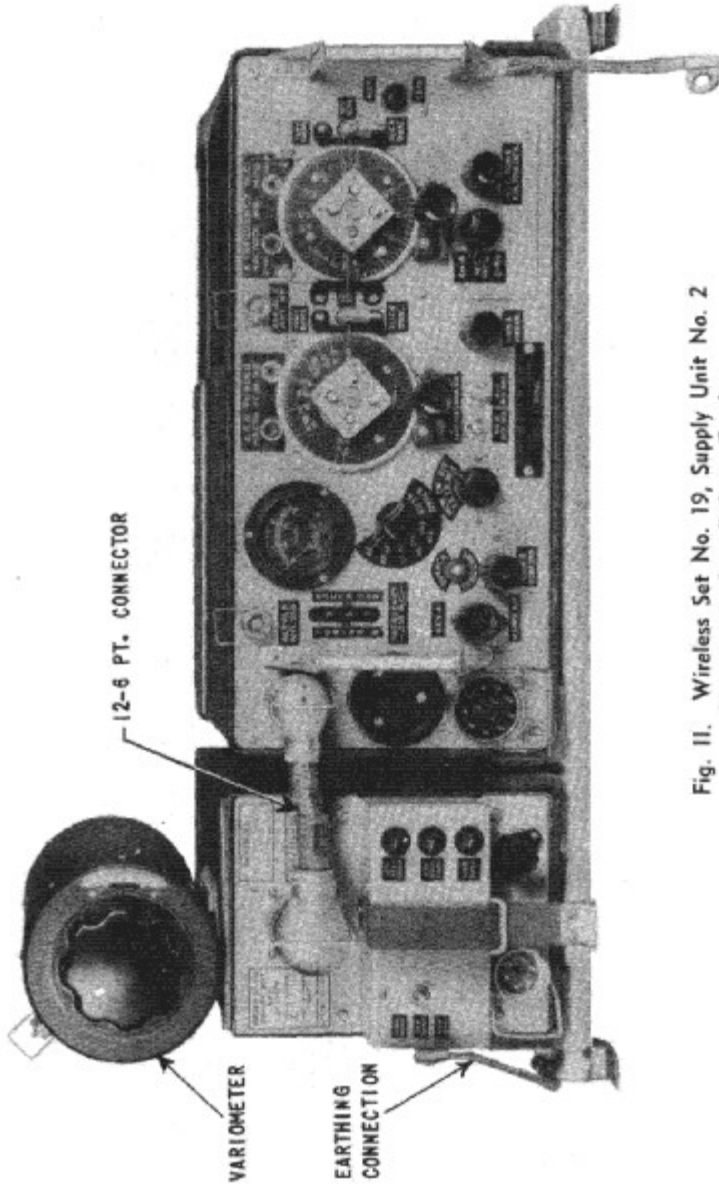


Fig. 11. Wireless Set No. 19, Supply Unit No. 2
Photograph, Installed on Carrier.

**OPERATING AND INSTALLATION INSTRUCTIONS
WIRELESS SET NO. 19, SUPPLY UNIT NO. 2**

CHAPTER I

USE AND INTERCHANGEABILITY

Supply Unit No. 2 is designed for use with Wireless Set No. 19, Mk. III, British or Canadian. It may also be used with Wireless Set No. 19, Mk. I or Mk. II, (British, U.S. or Canadian) after a minor wiring change has been made to the wireless set.

The Supply Unit may be operated from either a 12V or a 24V Supply. In the case of 24V operation the Supply Unit may be operated from either a three wire or a two wire system.

CHAPTER II.

INSTALLATION INSTRUCTIONS**2.1 GENERAL**

When a Supply Unit No. 2 is to be installed for use with a Wireless Set No. 19, Mk. I or Mk. II, the wiring change outlined in the following section (2.2) must be made to the wireless set.

FOR WIRELESS SET NO. 19, MK. I or MK. II, PROCEED ACCORDING TO SECT. 2.2 AND THEN ACCORDING TO SECT. 2.3.

When the Supply Unit is to be installed for use with a Wireless Set No. 19, MK. III, the wiring change described in Sec. 2.2 **MUST NOT BE MADE.**

FOR WIRELESS SET NO. 19, MK. III PROCEED DIRECTLY ACCORDING TO SECT. 2.3.

2.2 WIRING CHANGE. (Wireless Sets No. 19, MK. I & MK. II only.)

Proceed as follows:—

(a) Disconnect both the 6 pt. and the 12 pt. connectors, the aerial leads, and the key-plug from the wireless set. Loosen, but do not remove, the four screws at the corners of the front panel. Detach the ground pigtail from the set, and withdraw the wireless set from its case.

(b) Remove the four screws, lockwashers, and nuts which fasten the 6 pt.—plug mounting to the upper left hand corner of the front panel. Pull the plug mounting forward without straining the leads. (This is a good time to put those screws and nuts in a safer place.)

(c) The lead which is attached to pin No. 1 is a metal braid. Unsolder the braid from the pin.

(d) Obtain, if possible, a one inch length of cambric sleeve similar to that on the other leads. Obtain a piece of

insulated flexible wire, approximately 8 inches long. The No. 18 B & S ga. tinned flex. wire which is stocked in Ordnance Stores for Wireless Sets No. 19 is suitable. Solder one end of this wire to the pin (No. 1) to which the braid was originally connected. Slide the cambric sleeve along the wire into place over the joint. Thread the wire through the hole in the panel. Replace the plug mounting using all four screws and nuts.

(e) Turn the set over. Remove, and put in a safe place, all the screws and washers that hold the base plate to the set.

(f) The braid which was unsoldered passes through a hole in the chassis near the front panel. Thread the additional wire through this hole. Cut the metal braid (not the wire) near the chassis. Remove the braid from the set, being careful not to strain the connections at the 6 pt. plug, if the braid is tied to these leads.

(g) The free end of the lead which was soldered to the 6 pt. plug must now be connected to one of the switch contacts on the "KEY" jack. It DOES MATTER which contact is used. The correct contact on the jack is connected to pin No. 7 on the 12 pt. plug on the front panel. Find this contact by connecting an ohmeter to pin No. 7 on the 12 pt. plug and to each of the contacts in turn of the "KEY" jack.

(h) Solder the end of the new lead to the "KEY" jack contact. Do not remove the lead which is already soldered to the jack contact. Be careful to solder neatly, and not to drop solder onto other contacts in the set. If the contact is difficult to reach, the whole "KEY" jack may be unfastened from the front panel so that it can be held in a position which is more convenient for soldering.

(i) Replace the "KEY" jack and any spacers that may have been used between it and the panel. Replace the base-plate and slide the wireless set into its case. Tighten the four mounting screws. Replace the pigtail, the 12 pt. connector and the aerial leads.

WARNING: The wireless set has now been altered for use with a Supply Unit No. 2 or a Supply Unit No. 1, MK. III. It must not be used with a Supply Unit No. 1 until the wiring has been altered to the original connections.

2.3 INSTALLATION INSTRUCTIONS (Wireless Sets No. 19, MK. I, MK. II, MK. III)

(a) Detach the bag of fuses that is attached to the Supply Unit and put it into the Case, spare parts. Do not remove the fuses from the bag.

(b) Turn the Supply Unit switch to the "OFF" position.

(c) Loosen, but do not remove, the large screw on the lower part of the front panel. Remove the Supply Unit from its case by pulling on the web strap.

(d) On top of the Chassis, at the right hand side, is a two position toggle switch marked "12V-24V". A metal bracket confines the toggle handle and prevents unintentional operation of the switch. Two holes are provided in the Chassis for the screw which fastens the bracket to the Chassis. The bracket can be fastened at either hole, so that it holds the switch in either the 12V or the 24V position.

If the battery voltage for the wireless set is 24V the toggle switch must be in the position marked "24V".

If the battery voltage is 12V the toggle switch must be in the position marked "12V".

It is important that this switch be in the correct position. If it is in the wrong position, the Wireless Set may be burned out almost instantly.

(e) Replace the Supply Unit and tighten the large screw.

(f) Mount the Supply Unit No. 2 on the carrier in the same manner as a Supply Unit No. 1 was mounted. The Supply Unit is held in place by a broad strap. Be sure

that the knurled nut is tightened so that the strap holds the Supply Unit tightly and securely in place.

(g) One of the two metal grounding pigtails which are provided with the Supply Unit must be attached to the carrier. In those installations in which the Unit is mounted at the left of the wireless set, the shorter pigtail is used. If the Supply Unit is mounted on top of the wireless set, the longer pigtail is used.

Remove the screw that secures the front left hand rubber shock mount. A pigtail is held in place by this screw. Replace the screw, fastening under it the original washer, the round lug of the Supply Unit pigtail, and the round lug of the original pigtail.

(h) Attach the slotted end of the Supply Unit pigtail to the knurled terminal on the left hand side of the Supply Unit.

When the Supply Unit is next removed from its case, this terminal is loosened and only the slotted end of the pigtail is removed.

(i) Two connectors are supplied with each Supply Unit. Only one is used. For Wireless Set No. 19, MK. III, the 12 pt.—12 pt. connector is used. For Wireless Sets No. 19, MK. I or MK. II the 12 pt.—6 pt. connector is used.

The socket heads of the connectors are rotatable. They must be securely soldered at the rim.

If the Supply Unit is mounted at the left of the wireless set, the connector heads, when shipped, will fit the plug mountings on the Supply Unit and on the set. Plug the connector into place to be certain that it does fit the plug mountings. Solder the rim of each socket to the body of the connector in two places.

If the Supply Unit is mounted on top of the wireless set, the heads of the connectors must be rotated.

Remove the two circular clips from the connector and

then the back-plates of the sockets. Raise and straighten the wires at each socket. Hold the connector in place near the plug mountings, and slowly rotate each socket head to the position in which it will slide into the plug mounting.

Turn each socket in the direction which requires the smaller rotation.

Solder the rim of each socket to the connector body in two places. Straighten the wires at each socket and press them into the socket. Replace the two socket back plates and the two clips.

If you are unable to solder, crimp the rim in three places with a pair of wire cutters.

Plug the connector into the wireless set and Supply Unit plug mountings, and snap on the wire clips.

NOTE: One pigtail and one connector have not been used. Do not discard them. They must be returned to Q.M. Stores.

(j) Put the battery connector into the 6 pt. plug mounting on the Supply Unit, and snap on the wire clip.

Details of the cable connections between the battery and the Supply Unit are shown in Fig. V.

WARNING: Refer to page 10 para. 2.3 (d). Do not operate this equipment under any circumstances if you are not certain that the 12V-24V switch is in the correct position for the battery voltage which is being used. If you are not certain that it is in the correct position, remove the Supply Unit and check the position. If you do not know what the battery voltage is, either measure it or ask.

CHAPTER III.

OPERATING INSTRUCTIONS

The Supply Unit and the wireless set are switched "ON" and "OFF" by a three position switch on the front panel. The center position is "OFF". Neither of the two "ON" positions are marked "ON". They are marked "VIBR" and "DYN".

The operator chooses one of these positions as follows:—

VIBR. The "VIBR" position is normally used. This type of operation is more economical of battery life than operation in the "DYN" position.

The "VIBR" position may be used for the following operations:—

- (i) **Wireless Set, No. 19, MK. III.** When any one or two of the "A", "IC", "B" switches are "ON".
- (ii) **Wireless Set, No. 19, MK. I or MK. II.** When the "B" Set switch is "OFF", or when the "A ONLY—ALL" switch is at "A ONLY".

WHENEVER THERE WILL BE LONG PERIODS OF OPERATION ON "A" RECEIVE, USE THE "VIBR" POSITION.

DYN. The "DYN" position must be used in the following circumstances:

- (i) **Wireless Set, No. 19, MK. III:** When all three "A", "IC", "B" switches are "ON".
Wireless Set, No. 19, Mk. I or Mk. II: When the "A only-ALL" switch is at "ALL" and at the same time the "B" Set switch is "ON".
- (ii) When power for the wireless set is obtained from a 24V, two wire system.
- (iii) If the "VIBR" operation should fail, until a fuse or part may be replaced.

- (iv) When the greatest security from any failure is required as, for example, when in battle and a higher current drain is tolerable.

In some installations, the "IC" amplifier may be noisy when the vibrator is used. If the noise is objectionable, turn the Supply Unit switch to "DYN".

CHAPTER IV.

REPLACEMENT OF FUSES, VALVE, AND VIBRATOR.**4.1 GENERAL**

On the front panel of the Supply Unit are three fuse holders marked "H.T.1", "H.T.2", and "VIBR".

The first two of these are in the output circuits of the dynamotor in the 265V and 540V leads respectively. The "VIBR" fuse is in the input circuit to the vibrator.

The two H.T. fuses ($\frac{1}{4}$ amp.) are identical with those used in Supply Unit No. 1. Spares are carried in the Case, spare parts.

The "VIBR" fuse is NOT identical with the H.T. fuses. It is a 10 amp. fuse, identified by a blue mark. Spares are provided with the Supply Unit and are kept in a bag in the Case, spare parts.

BE CAREFUL TO USE ONLY $\frac{1}{4}$ AMP. FUSES (in wooden block in Case, spare parts) IN THE H.T.1 AND H.T.2 HOLDERS, AND 10 AMP. FUSES (blue mark, in bag in Case, spare parts) IN THE "VIBR" HOLDER.

4.2 TO REPLACE A FUSE

H.T.2—A blown "H.T.2" fuse will stop operation of the "A" sender only.

H.T.1—A blown "H.T.1" fuse will stop the operation of all facilities of the wireless set on "DYN". It will also stop operation of all facilities on "VIBR" if the "A" Set is at "Send" but will not affect any operation if the "A" Set is at "Receive".

VIBR.—A blown "VIBR" fuse will stop the operation of all facilities when the Supply Unit is on "VIBR" if the "A" Set is at "Receive". It will not affect any operation

when the "A" Set is at "Send" or when the switch is at "DYN".

To check, proceed as follows:

H.T.2—Turn the meter switch to H.T.2 and switch the Supply Unit to "DYN". If there is no meter reading, replace the H.T.2 fuse.

H.T.1—Turn the meter switch to H.T.1 and switch the Supply Unit to "DYN". If there is no reading, replace the H.T.1 fuse. Now switch the Supply Unit to "VIBR". The meter should read about 265V in each position.

If the meter indicates H.T.1 voltage when using the "DYN" but not when using the "VIBR", a further fault exists which is probably one of the following:

(a) The "VIBR" fuse has blown.

(b) The 0Z4A valve has failed.

Examine the "VIBR" fuse. If it has blown, replace it. If the second fuse blows, replace the vibrator and then the "VIBR" fuse.

If the fuse is alright, replace the 0Z4A valve.

4.3 TO REPLACE THE VIBRATOR OR THE 0Z4A VALVE

(a) Loosen the thumb screw at the side of the Supply Unit and remove the end of the pigtail.

(b) Remove the two connectors from the Supply Unit.

(c) Loosen, but do not remove, the large screw on the lower part of the front panel, and withdraw the Supply Unit from its case by pulling on the web strap.

(d) Remove the defective vibrator or valve. They are mounted vertically on the top layer of the Supply Unit

chassis at the back. The valve is smaller than the vibrator and is black. (See Figs. III and IV).

(e) A spare vibrator and a spare valve are mounted horizontally behind the Dynamotor. Remove the one that is required and plug it into the socket above.

(f) DO NOT put the defective vibrator or valve into the clip or socket that held the spare unit. The defective unit must be returned to Ordnance, and a new spare must be obtained and placed in its holder in the Supply Unit.

(g) Replace the Supply Unit. Tighten the large screw. Replace the pigtail and the two connectors.

CHAPTER V.

DESCRIPTION

5.1 GENERAL

Supply Unit No. 2 comprises two filtered power supplies. One consists of a non-synchronous vibrator and cold cathode valve rectifier. The other is a four-commutator dynamotor.

The vibrator and rectifier unit supplies power to the wireless set at high efficiency, enabling operation of the set with low current drain from the batteries. It is provided principally to operate the "A" receiver. It does supply sufficient power at 265V to operate any two of the following three; the "A" receiver, the "B" set, and the "IC" amplifier, but not all three. The vibrator unit cannot operate the "A" sender because it provides only one voltage—265V. Two components of the unit, the vibrator and the 0Z4A valve, are designed to plug into sockets and can therefore be replaced quickly. A 10 amp. fuse is provided in series with the primary of the vibrator transformer.

The dynamotor supplies power for all facilities of the wireless set. The current drain from the batteries is larger when the dynamotor is used than when the vibrator is used.

The two output windings supply power at 265V and 540V D.C. Two input windings are used which have similar shunt fields, series fields, commutators, and brush holders. The two windings are connected in parallel for 12 volt operation and in series for 24 volt operation. The necessary circuit change is performed by a 12V-24V toggle on the top of the Supply Unit chassis.

SWITCH AT "VIBR"

When the battery supply is 12V, the vibrator, the Supply Unit relay, and the wireless set heaters are connected in parallel.

When the battery supply is 24V. (three wires), the wireless set heaters are connected in parallel with the Supply Unit relay, and these are connected in series with the vibrator. The junction between the heaters and the vibrator is connected to the tap between the two 12V batteries. The currents that flow from the two 12V sections of the battery are nearly equal, and will never differ by more than one ampere.

When the "A" set is switched to "Send", a relay in the Supply Unit is operated which transfers the supply of power from the vibrator to the dynamotor. In the 12V case the two input windings of the dynamotor are connected in parallel with the heaters. In the 24V case the two input windings are in series, and the Supply Unit relay transfers the heaters to the junction of the dynamotor windings. Only the relay current is then drawn from the battery center tap.

SWITCH AT "DYN"

When the battery supply is 12V, the wireless set heaters are connected in parallel with the two dynamotor input windings.

When the battery supply is 24V the wireless set heaters are connected to the junction of the two dynamotor input windings. In this case (switch at "DYN") a 24V two or three wire supply may be used.

When the "A" set is switched to "Send", the Supply Unit relay is not operated and the functions of the Supply Unit are not altered.

5.2 WEIGHT AND DIMENSIONS

In Table I the weight and dimensions of Supply Unit No. 2 are shown.

TABLE I.

WEIGHT AND DIMENSIONS

	Weight	Outside Dimensions in Inches		
	Lbs.	Length	Depth	Height
Complete Unit in Case	30.5	6	12 $\frac{1}{4}$	8 $\frac{1}{4}$

5.3 VOLTAGES AND CURRENT DRAINS

In Table II the voltages and current drains for several conditions of operations are shown. These values represent a particular case. The voltages and currents which exist in any other Supply Unit and Wireless Set may differ from these values by 15%.

TABLE II.

VOLTAGES AND CURRENT DRAINS

FUNCTION	Supply Unit Switch at	Input	Input	H.T.1	H.T.1	H.T.2	H.T.2
		V	I	V	I	V	I
		Volts	Amps.	Volts	Milli-amps.	Volts	Milli-amps.
"A" receiver	"VIBR."	12	3.6	260	48
"A" receiver	"	24	1.8	259	46
"A" sender R/T	"	12	8.6	265	41.5	542	24.5
"A" sender R/T	"	24	4.3	269	42	550	25.
"IC", "B" & "A" rec.	"DYN."	12	9.8	257	95
"IC", "B" & "A" rec.	"	24	4.9	263	98
"IC", "B" send & "A" send R/T	"	12	12.	255	113	536	20
"IC", "B" send & "A" send R/T	"	24	5.8	260	116	543	21.5

TABLE III.
LIST OF COMPONENTS

Circuit Ref.	Part No.	Description	Value & Tol.	Rating
CONDENSERS				
			MFD.	Volts
C4AP	PC-68182-C	R.F. Filter (Dyn.)	$.1 \pm 20\%$	500
C4BP	PC-68182-C	R.F. Filter (Dyn.)	$.1 \pm 20\%$	500
C4CP	PC-68182-C	Dyn. 540V output filter	$.1 \pm 20\%$	500
C/C101A	RCA-114045	R.F. gnd. path (vib.)	$0.1 \pm 20\%$	500
C/C101B	PC-68182-C	Vibr. R.F. filter	$0.1 \pm 20\%$	500
C/C101C	PC-68182-C	R.F. Filter	$0.1 \pm 20\%$	500
C/C101D	PC-68182-C	Rectifier R.F. filter	$0.1 \pm 20\%$	500
C/C101E	PC-68182-C	265V Filter (Dyn.)	$0.1 \pm 20\%$	500
C/C102A	RCA-113850-1	Vibr. input filter (Part of Vibr. Transf.)	$0.5 \pm 20\%$	
C/C103A	RCA-113810-1	Vibr. buffer cond.	$1.0 \pm 10\%$	500
C/C104A	RCA-113809-1	Vibr. buffer cond.	$.004 \pm 10\%$	1000
C/C105A	RCA-113827-1	Rectifier filter elect.	$20 + 50\% -10\%$	450
C/C105B	RCA-113827-1	Rectifier filter elect.	$20 + 50\% -10\%$	450
C/C106A	PC-68121-C	Dyn. 540V output filter	$.1 + 20\% -10\%$	1500
C22C	PC-68183-C	Heater circuit filter	$.025 \pm 20\%$	500
C32A	PC-67192C-.191	Dyn. 265V output filter	$32 + 50\% -10\%$	520
RESISTORS				
			Ohms	Watts
R/C101A	RCA-113804-1	Res. rectifier protector	47 $\pm 20\%$	1
R/C102A	RCA-113804-2	Res. vibrator buffer	15,000 $\pm 10\%$	$\frac{1}{2}$
R40A	NE-90460C	Pilot lamp protection	20 $\pm 10\%$	$\frac{1}{2}$

TABLE III.

LIST OF COMPONENTS (Cont'd)

Circuit Ref.	Part No.	Description	Value & Tol.	Rating
		MISCELLANEOUS		Volts
S/C101A	RCA-110063-1	3-pos. 4 pole on-off-on sw.		
S/C102A	RCA-113808-1	DPDT toggle sw. (12V-24V)		
S/C103A	RCA-110053-1	Relay (3PDT sw)		12
	RCA-101985-1	Four commutator dynamotor		265 540
L17A	RCA-113865-501	RF filter choke heater circ.		
L18A	PC-78439-C	RF filter choke HT2 circuit		
L/C101A	RCA-113806-501	Rectifier filter choke 5H at 0.06 amp. D.C.		
L/C102A	RCA-113849-501	Vibrator input filter (Part of Vibr. Trans. RCA-113807-501)		
	RCA-110050-1	Non Synch. Vibr.		12
T/C101A	RCA-113807-501	Vibr. transformer		
V/C101A		Valve rectifier 0Z4A	(cold cathode)	
Fuse 1A	PC-90267C	Dyn. HT2 fuse 540V lead	¼ amp.	
Fuse 1B	PC-90267C	Dyn. HT1 fuse 265 lead	¼ amp.	
Fuse F/C101A	RCA-113838-1	Vibr. transformer input 10 amp. fuse (blue mark)		
P1A	PC-90615C	Pilot Lamp Bulb	12V 0.20 amp.	
PL1C	PC-75429C	6 pt. plug mtg. (PM6)		
PL2C	PC-75423C	12 pt. plug mtg. (PM12)		

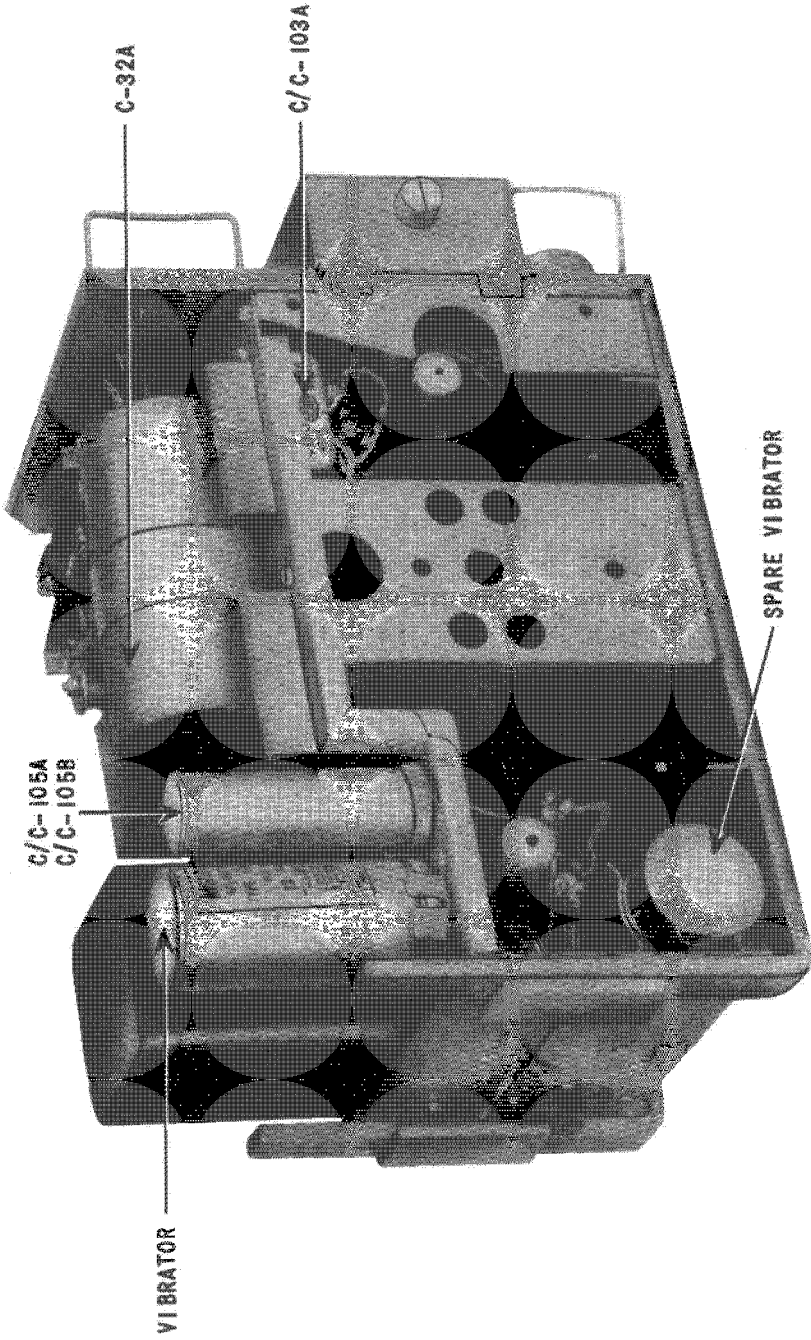


Fig. III. Wireless Set No. 19, Supply Unit No. 2
 Photograph, Top and Side View, Left.

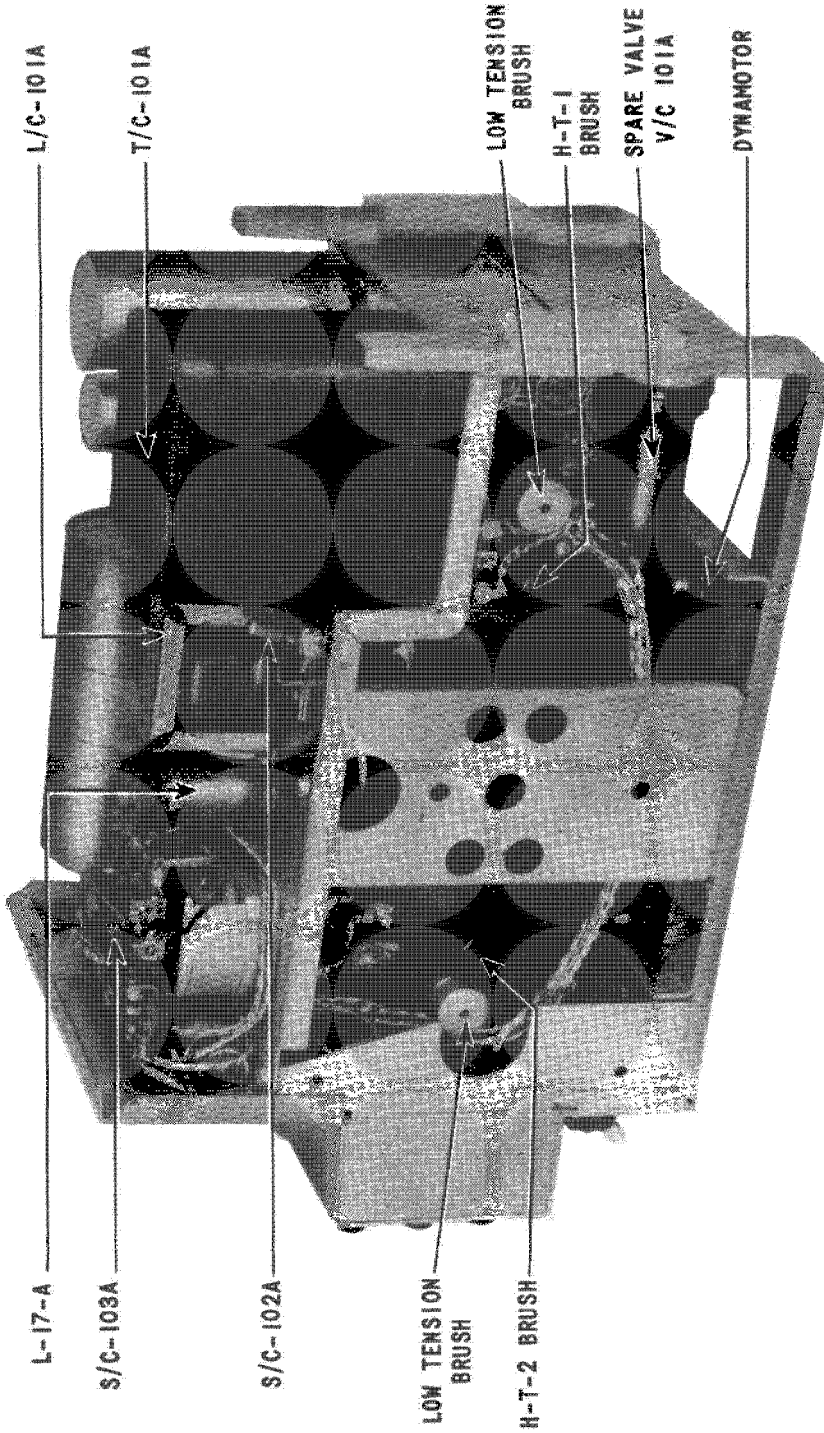


Fig. IV. Wireless Set No. 19, Supply Unit No. 2.
 Photograph, Top and Side View, Right.

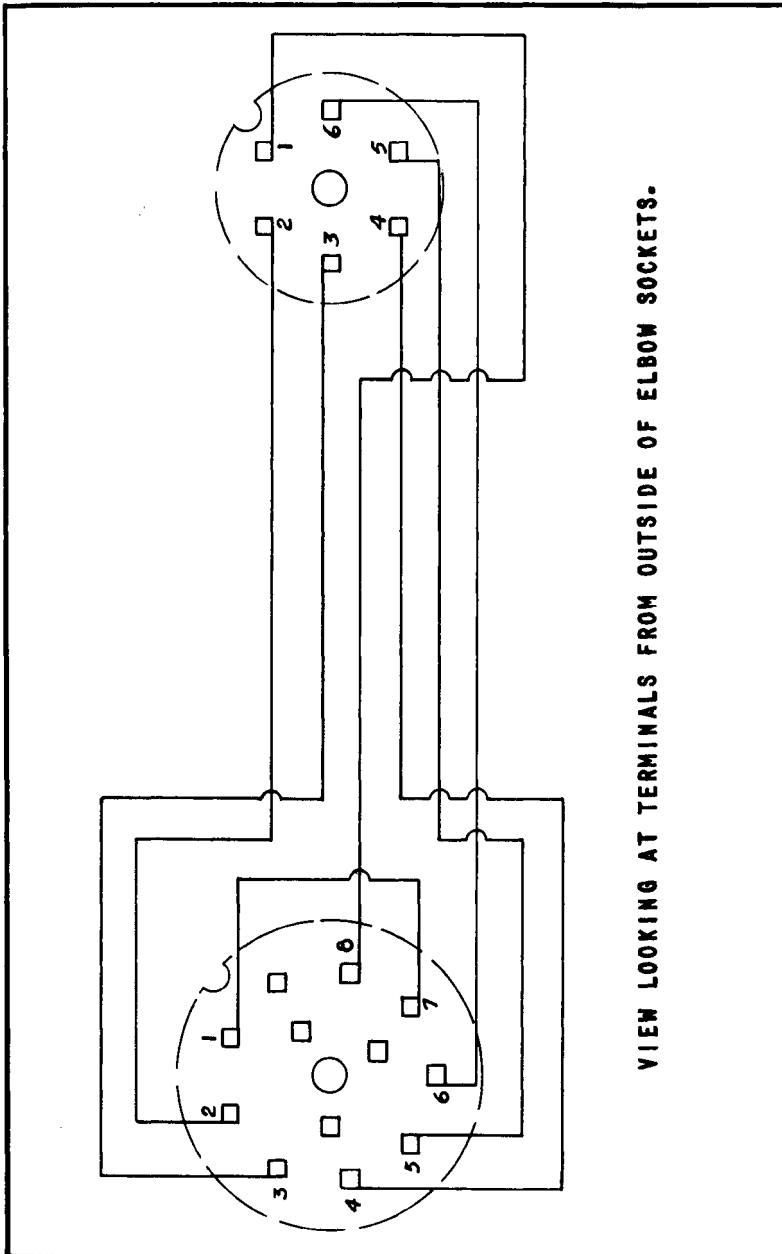


Fig. V. Wiring Diagram of 12 pt.—6 pt. Connector.

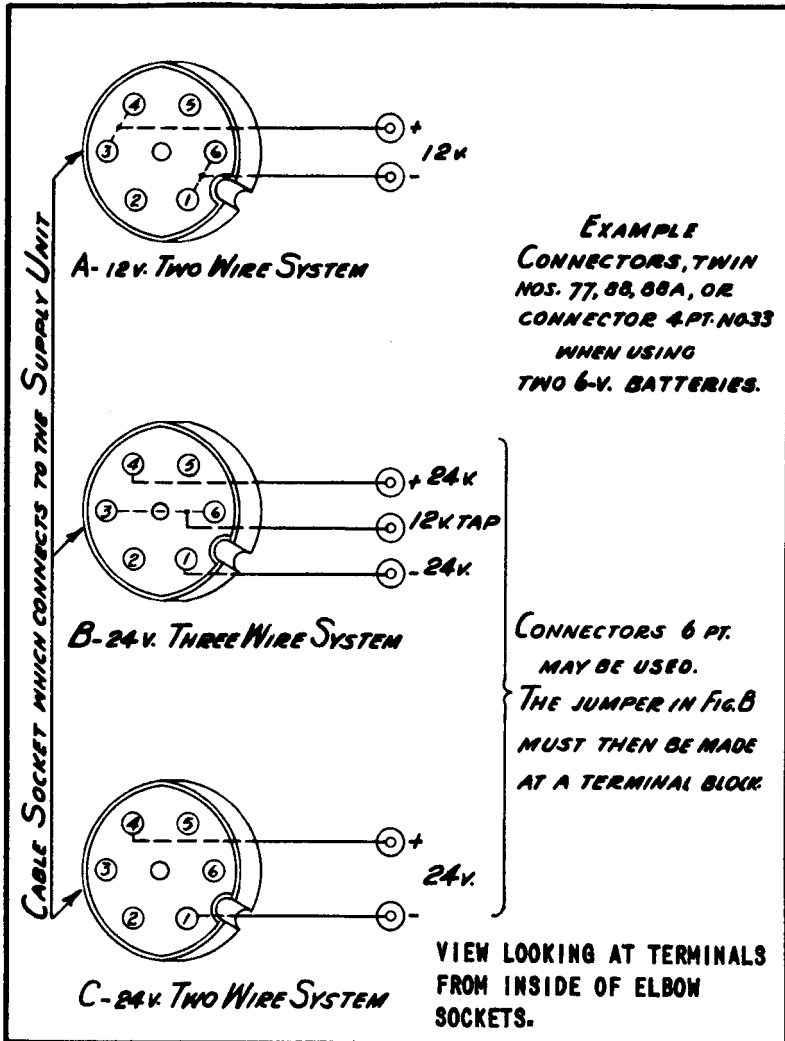
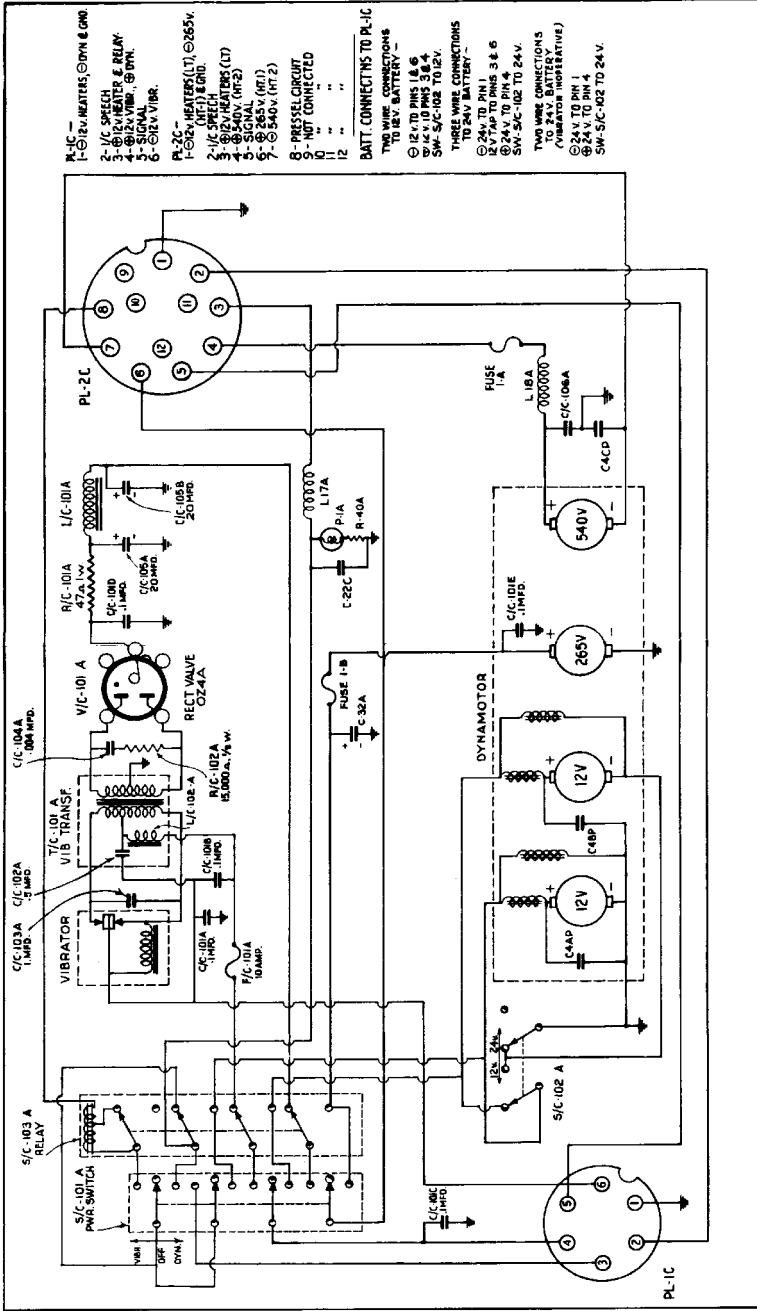


Fig. VI. Diagram of Connections between Battery and Supply Unit.



- PL-1C -
 1-12V HEATERS (DYN & GND)
 2-1C SPEECH
 3-12V HEATER & RELAY
 4-12V VIB. (DYN.)
 5-SIGNAL
 6-12V VIB.

- PL-2C -
 1-12V HEATERS (1) @ 265V.
 2-1C SPEECH
 3-12V HEATERS (1T)
 4-12V VIB. (HFZ)
 5-12V VIB. (HT)
 6-265V (HT)
 7-540V (HT 2)

- 8- PRESSURE CIRCUIT
 9- NOT CONNECTED
 10- "
 11- "
 12- "

BATT. CONNECTIONS TO PL-1C
 TWO WIRE CONNECTIONS
 TO 12V. BATTERY -
 12C TO PINS 3 & 6
 SW-5A-C-102 TO 12V.
 THREE WIRE CONNECTIONS
 TO 24V. BATTERY -
 24V TO PIN 1
 24V TO PINS 3 & 6
 SW-5A-C-102 TO 24V.
 TWO WIRE CONNECTIONS
 TO 24V. BATTERY
 (VIBRATOR MODERATE)
 24V TO PIN 1
 SW-5A-C-102 TO 24V.

Fig. VII. Wireless Set No. 19, Supply Unit No. 2 Schematic Diagram.

Notes