Big Bend

INSTRUCTION MANUAL

DU MONT®

MCA-101-B

MOBILE COMMUNICATION APPARATUS

25 to 54 Mc

UNIVERSAL 6/12-VOLT OPERATION

ALLEN B. DU MONT LABORATORIES, INC.

Communication Products Division

1500 MAIN AVENUE CLIFTON, NEW JERSEY

DE-8239

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CARL C
WILLIAMS

Martin
Theophiles

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SPECIFICATIONS

1. Equipment Complement

Quantity	Title
1	5820-(a)-# Communications Unit consisting of: 89A-40828 Receiver-Transmitter and 89A-40829 Power Supply
1	33E-40645-101 Cabinet Assembly
1	D-40750-101 Control Head Assembly (1 Frequency)
or	D-40750-102 Control Head Assembly (2 Frequency)
1	17C-40680 Microphone, Palm
1	18C-30585 Loudspeaker Assembly
1	50D-40000-101 Cable Assembly, Control Rear Mount
or	50D-40000-102 Cable Assembly, Control Front Mount
or	50D-40000-103 Cable Assembly, Control Rear Mount Special
1	50C-40001-101 Cable Assembly, Primary Rear Mount
or	50C-40001-102 Cable Assembly, Primary Front Mount
or	50C-40001-103 Cable Assembly, Primary Rear Mount Special
1	50A-30327 Cable Antenna
1	22D-30308 Universal Antenna Mount
1	30C-30721 Spring Antenna
1	22C-30586-101 Antenna Whip, 44-54 Mc
or	22C-30586-102 Antenna Whip, 37-44 Mc
or	22C-30586-103 Antenna Whip, 30-37 Mc
or	22C-30586-104 Antenna Whip, 25-30 Mc
1	89A-40748 Installation Kit

Accessories Available

17C-40730 Handset (replacing the Palm Microphone)
C-30355 Holder, Handset
18003650 Loudspeaker IB-8 (replaces 18C-30585 Loudspeaker)
89A-40755 Receiver Kit (Frequency 2)
89A-40754 Transmitter Kit (Frequency 2)
89A-40756 Transmitter-Receiver Kit (Frequency 2)

Change of suffix letter of the 5820-(a)-# indicates modification affecting FCC licensing. Change of suffix number indicates modification not affecting FCC licensing.

2. 5820-(a)-# Communications Unit

A. Transmitter Section

Frequency Range - 25 to 54 Mc. Range is covered by a change of padding capacitors and power amplifier tank coil taps.

RF Power Output - 40 watts nominal

Output Impedance - 50/70 ohms

Crystal - Frequency Range, 1562.5 to 3375 Kc
Frequency Stability, .002% (-30°C to +60°C) with standard crystal.
.0006% (-30°C to +60°C) with oven.
Frequency Adjustment, total range of .0125%, usable range of .01% of nominal.
Frequency Multiplication, 16 times

Modulation - FCC Designation of Emission: 36F3

Audio Input, .25 volts across 100 ohms for threshold of clipping obtained from a carbon microphone.

Distortion, 10% or less at .5 db below clipping at ±10 Kc deviation.

Modulation Adjustment, continuous from ±5 Kc to ±15 Kc deviation.

Spurious Emission - 60 db down.

B. Receiver Section

Frequency Range - 25 to 54 Mc. Range is covered in 2 steps by a change in receiver padding capacitors.

Audio - Output, 1.5 watts into a 3.2-ohm load at 10% distortion.
Maximum output, 2.25 watts.
Response, ±3 db from 300 to 3000 cps. De-emphasis provided, 6 db per octave, 1000 cps reference.

RF Sensitivity, .35 uv or less for 20 db quieting.

Input Impedance, 50/70 ohms

Selectivity, 6 db down at ±10 Kc
85 db down at ±40 Kc
Narrow band with suitable filter:
6 db down at ±6 Kc
100 db down at ±20 Kc

1st Oscillator Crystal - Frequency Range, 31 to 48 Mc
Frequency Stability, .002%
(-30°C to +60°C) with standard crystal.
.0006% (-30° to +60°C) with oven.
Frequency Formula, 25 to 40 Mc -
Signal frequency +6 Mc
Frequency Formula, 40 to 54 Mc -
Signal frequency -6 Mc

High Intermediate Frequency - 6 Mc

2nd Oscillator Crystal - Frequency, 5545 Kc
Frequency Stability, ±.01%
(-30°C to +60°C)

Low Intermediate Frequency - 455 Kc

Spurious Responses - 85 db down

Squelch Sensitivity - .1 uv at threshold
2 uv or less at tight

C. Power Supply Section

Total Input Power

Standby - 6.6 volts at 9.8 amperes or 13.2 volts at 4.9 amperes.
Transmit - 6.3 volts at 32.25 amperes or 12.6 volts at 17.75 amperes.

Output Power

Standby - 220 volts at 65 ma
Transmit - 1. 250 volts at 40 ma
2. 480 volts at 175 ma

1.0 INTRODUCTION AND DESCRIPTION

The MCA-101-B Mobile Communication Apparatus is designed to provide facilities for mobile communication in the frequency range of 25 to 54 Mc. Two-frequency operation is optional for the transmitter and/or receiver within a frequency band equal to 1% of the carrier frequency. Selection of the two channels is accomplished by a switch on the control head. The control head also permits an adjustment of the volume and squelch circuits of the 5820-(a)-# Communications Unit. The control head lamps indicate the instantaneous operating condition of the transmitter-receiver.

The MCA-101-B Mobile Communication Apparatus uses the 5820-(a)-# Communications Unit. The technical data for the transmitter portion of this Unit has been filed with the FCC by the manufacturer under the designation "5820-(a)-#". All communications between the applicant or licensee and the FCC should reference the "5820-(a)-# Communications Unit" and not the MCA-101-B Apparatus as the nomenclature designation.

The 5820-(a)-# Communications Unit consists of a crystal-controlled phase-modulated transmitter and a crystal-controlled double-superheterodyne receiver. One antenna is connected to the unit, relay-switched to the transmitter output by the action of depressing the remote microphone switch or the Transmitter Test switch.

The Unit is normally supplied with the crystals for single-frequency operation. Conversion kits are available for two-frequency operation located within a frequency band equal to 1% of the carrier frequency. Heater ovens may be supplied for the transmitter and the receiver first-oscillator crystals. Two crystals may be inserted into each oven.

A toggle switch is provided to change the filament and plate power connections to accommodate 6- or 12-volt operation.

The power supply voltages are obtained from the vehicle battery through a split reed vibrator and voltage-multiplying circuits using selenium rectifiers. The output B+ voltages are applied to the transmitter and receiver sections through the power-transfer relay contacts to permit standby operation. The relay is controlled by the microphone switch or the Transmitter Test switch located on this chassis.

The 5820-(a)-# Communications Unit is constructed on a horizontal metal chassis containing the complete circuitry of the transmitter and receiver. The power supply portion of the Unit is a subassembly mounted on the transmitter-receiver chassis. Tubes, coils and transformers as well as the crystals, and crystal ovens if required, are located on the top surface, while the smaller components are wired underneath. The receptacles for receiving power and control voltages, and input and output audio signals are mounted on the front edge of the chassis. The entire chassis is enclosed in a rectangular metal case.

Weight of Entire Installation - 50 pounds

Weight of 5820-(a)-# Communications Unit in case - 35 pounds

Dimensions

1. 5820-(a)-# Communications Unit in case

   Height - 6 inches
   Width - 8-1/4 inches
   Length - 16-1/4 inches

2. Control Head

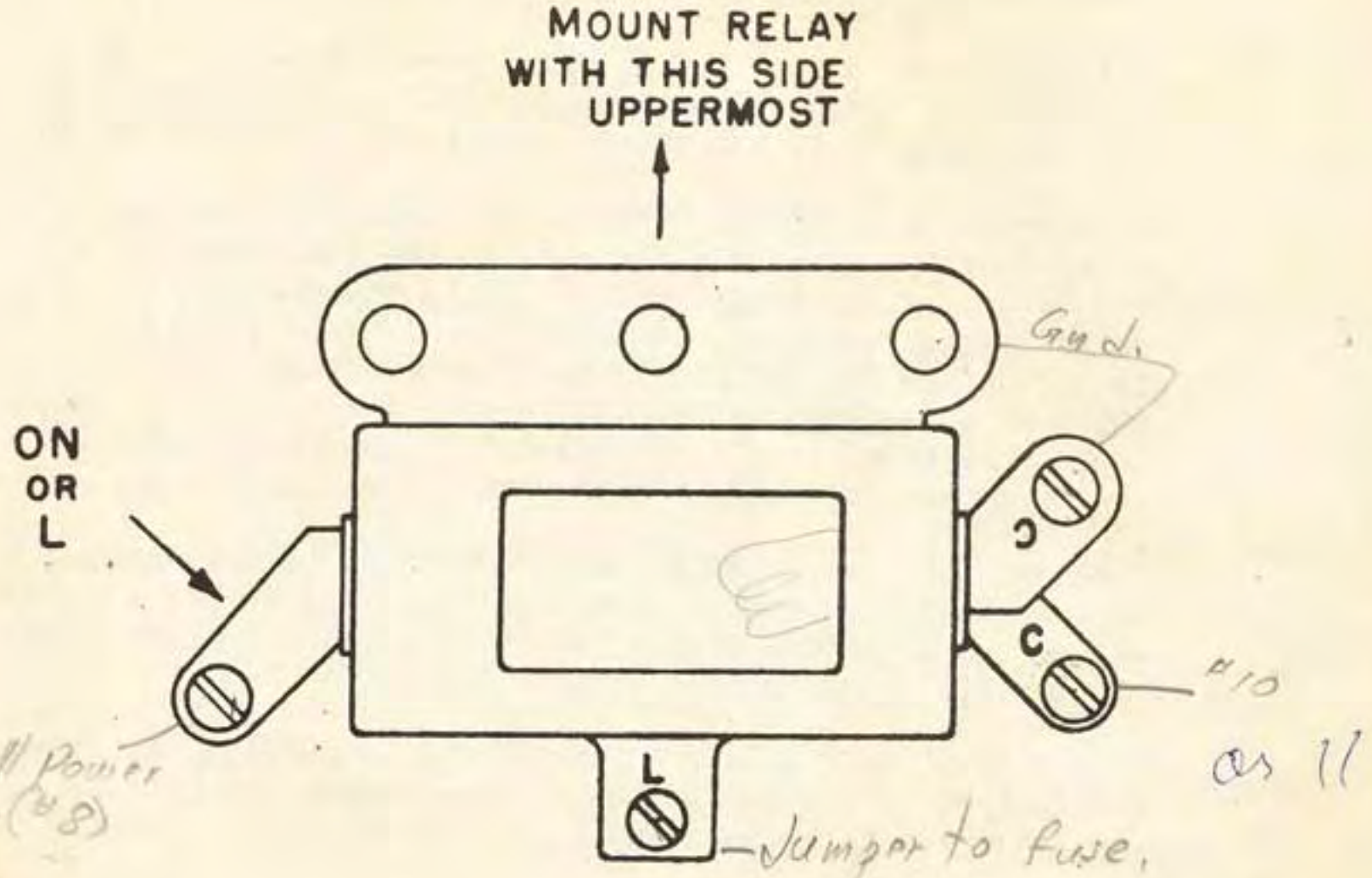
   Height - 2-1/4 inches
   Width - 6 inches
   Depth - 3-1/2 inches

3. Loudspeaker Assembly

   Diameter - 5-1/4 inches (6 inches at greatest dimension)
   Depth - 3 inches

For further information regarding this equipment or for available Du Mont accessories, address inquiries to

Allen B. Du Mont Laboratories, Inc.
Communication Products Division
Mobile Communication Sales Engineering Dept.
1500 Main Avenue, Clifton, New Jersey



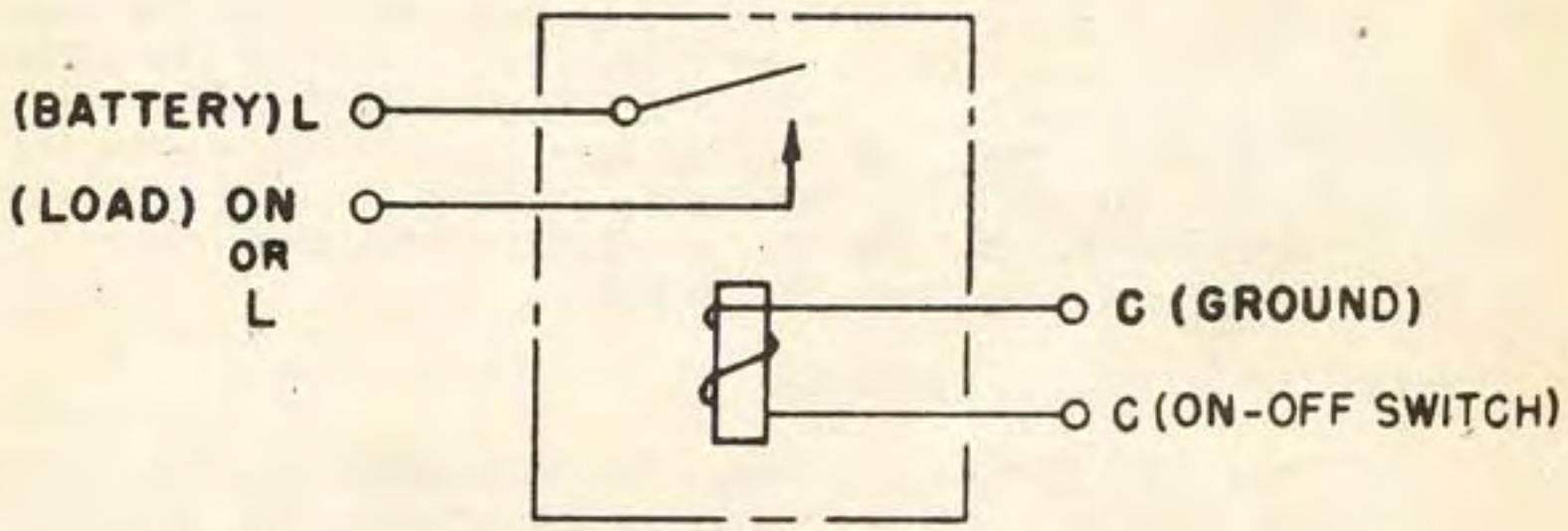


FIGURE 4. 05009800 PRIMARY POWER RELAY

2.0 INSTALLATION

2.01 General

The location of the various components in the vehicle should be carefully studied as a thorough, well-planned installation can contribute considerably to the performance of the equipment and to ease of maintenance.

The normal location for the antenna in a typical sedan is at the left rear corner of the body. In this position the radiation pattern is somewhat more pronounced in the direction of the front right corner due to the mass of the vehicle. In any case, and particularly where truck bodies are involved, the antenna should be mounted as high as possible, consistent with overhead obstructions normally encountered, and should not be closely parallel to vertical metal portions of the vehicle.

The 5820-(a)-# Communications Unit may be mounted in the rear luggage compartment or forward in the driver's compartment. The case may be mounted with its base on any firm surface from horizontal to vertical. Do not attempt to use other than the base mounting screws supplied.

The drawing of Figure 1 shows a typical installation. The following paragraphs refer to this diagram.

Locate the Control Head at any location convenient to the operator. Route the control cables either under the chassis or the floor mats to the rear mounted unit.

The Microphone Hanger is usually mounted convenient to the operator on the instrument panel. Avoid locations where the microphone cord is likely to catch on objects.

The Speaker may be mounted from the roof of the vehicle, above the instrument panel, or below on the dash or firewall. In each case endeavor to locate the speaker so that it may be aimed toward the operator.

The Primary Power Relay and system Fuses should be located on the forward surface of the dash and should be as close as possible to the storage battery, starting motor switch or starting motor solenoid.

The Installation Kit contains all the necessary parts for a complete installation, in addition to extra screws, clamps, etc., to insure a proper installation. A little extra time and effort spent in installation pays dividends in reduced maintenance.

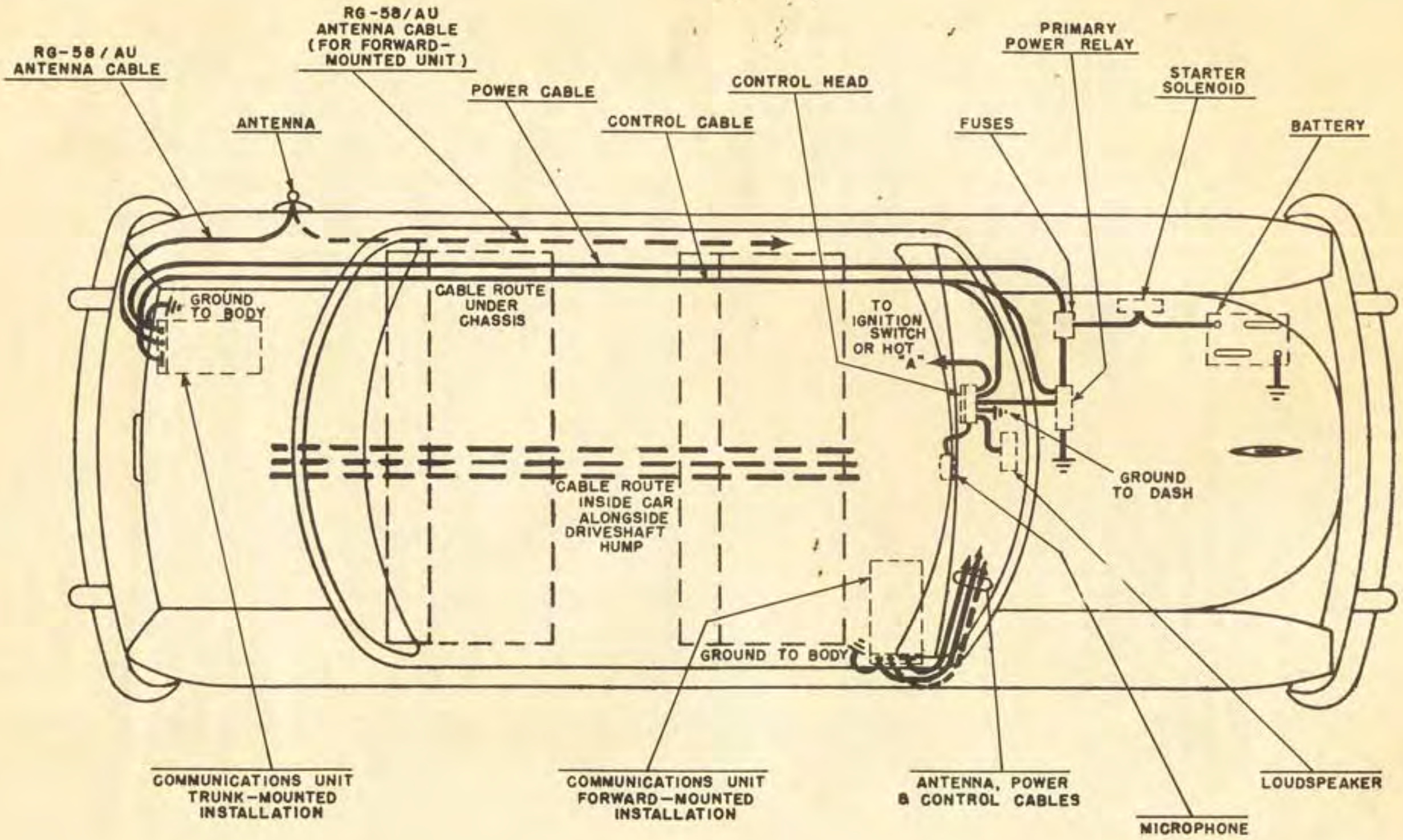


FIGURE 1A

MCA-101-B MOBILE COMMUNICATION APPARATUS INSTALLATION

RECEIVER

(NO SIGNAL AT THIS POINT)

(1) 500 ua meter - pin 5 of Test M plug J202 + grd
adjust L101 for maximum - reduce to 70%

(2) 100 ua meter - pin 2 of TM J203 + grd
Apply test signal adjust top screw of T106
for zero reading

(3) 500 ua - pin 4 J203 + grd - adjust L103
for Maximum reading

(4) 500 ua pin 3 J203 + ground - adjust L102
for maximum

(5) Meter same as (4) top + bottom adjust Z101, T105, T104, T103, T102, T101

(6) Connect VTVM between E of T106 + grd.
adjust bottom screw for maxim reading
Readjust top screw -

(7) Squelch - place control at full counter clockwise position - with signal gen. at, 5uv - Adjust R152 until recvr just awakens - [this control R152 only changes position on control head, not sensitivity.

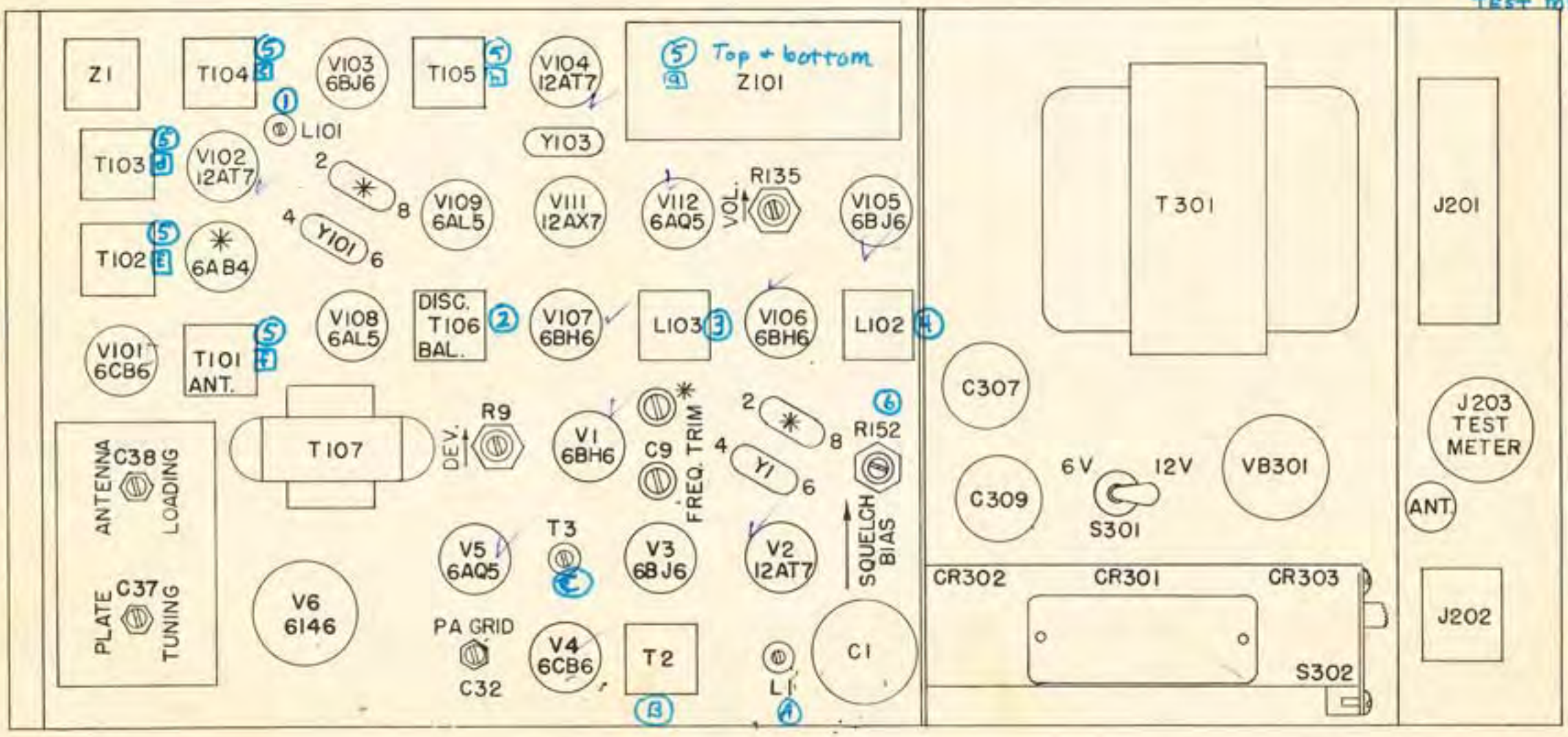


FIGURE 5
COMMUNICATIONS UNIT CHASSIS PARTS LOCATION - TOP