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TECHNICAL MANUAL

GENERAL SUPPORT MAINTENANCE MANUAL

POWER AMPLIFIER
AM-6545A/GRC-193A
(NSN 5820-01-186-3699)

HEADQUARTERS, DEPARTMENT OF THE ARMY

15 JANUARY 1986

Technical Manual

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REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-ME-MP, Fort Monmouth, NJ 07703-5007. A reply will be furnished to you.

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NOTE

Maintenance Kit OA-9163/GRC-193A

is available as a Test Bed

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NOTES

1. This document contains the data necessary to facilitate maintenance and servicing of Power Amplifier AM-6545/GRC-193, a component of Radio Set AN/GRC-193 and the vehicle mounted Radio Set AN/MRC-138.
Technical characteristics, assembly and component location and identification and servicing diagrams including operational sequence, flow, test point measurement data, and functional circuit blocks are contained herein.
2. There are two alignment procedures applicable to Power Amplifier AM-6545/GRC-193 at this level of maintenance: The high voltage over-voltage threshold adjustment on DC control PWB assembly 1A2 and the DC overvoltage adjustment on system control PWB assembly 1A3.
These alignment procedures are located on the figure associated with the assembly upon which the procedure is performed.
3. Only conventional tools and equipment are required to perform the alignment procedures specified in note 2, above.
4. Power Amplifier AM-6545/GRC-193 contains no fuse, but there are two circuit breakers for the +26.5 VDC. The 3 amp circuit breaker, shown on figure 5 and located on the front panel, is for the +26.5 VDC DIRECT to Antenna Coupler CU-2064/GRC-193 and is labeled ANT CPLR CB. The 50 amp circuit breaker, shown on figure 5 and located on the front panel, is for the +26.5 VDC DIRECT to the Power Amplifier and is labeled PA CB.
5. The following warnings and cautions apply in the event circumstances warrant them to protect personnel and the equipment:

WARNING
DANGER HIGH VOLTAGE
Dangerously high voltages (+1600 Vdc) are present on the plates of power amplifier tubes 1A1V1 and 1A1V2 (Y-621B), tank circuit module 1A8, plate assembly 1A9, and high voltage module 1A13. Do not touch any part of these components when the equipment is energized.

- WARNING**
Make sure the power is off before performing any cleaning inspection or maintenance.
- WARNING**
Power amplifier tubes 1A14V1 and 1A14V2 (Y-621B) contain BeO (Beryllium Oxide Ceramics). The dust or fumes from BeO are highly toxic and breathing them can result in serious personal injury or death. Normal use of electron tubes containing BeO is safe. However, never alter, disassemble, grind, lap, fire, chemically clean, or perform any other operation on any ceramic parts of the power tubes which could possibly generate dust of fumes.
6. Lubrication instructions applicable to the gear assemblies of tank circuit module assembly 1A8 are in figure 2.
7. The parts location information given in this manual is essentially for the quick-look ready use of maintenance personnel. The callouts and markings on these illustrations do not necessarily reflect the actual markings on the equipment. The actual equipment markings may be harder to read due to manufacturing processes such as soldering and coating.
8. The test point values and conditions given on sheet 5 of figure 3 are those encountered during Radio Sets AN/GRC-193 and AN/MRC-138 operation. If equivalent power amplifier inputs are used, allowances must be made, as necessary, for the indications observed.

TECHNICAL CHARACTERISTICS

DIMENSIONS: HEIGHT LENGTH WIDTH	8.0 inches (20.3 cm) 16.4 inches (41.7 cm) 11.4 inches (28.9 cm)
WEIGHT	54 lbs. (24.5 kg)
FREQUENCY RANGE	2.0 to 29.9999 MHz in 0.1 kHz increments
TYPE OF AMPLIFIER	High frequency power amplifier
RF POWER OUTPUT	400 watt PEP or average
RF INPUT	Less than 100 milliwatts for rated output. (2 watts PEP maximum)
TUNING	Automatic - less than 6 seconds
DUTY CYCLE	Continuous transmit at 400 watts average power output
INPUT AND OUTPUT IMPEDANCE	50 ohms with VSWR <1.3:1
PRIMARY POWER REQUIREMENTS	+22 to +30 Vdc, +26.5 Vdc (nominal, 45 amps maximum)
OPERATIONAL MODES	USB, LSB, CW, SSB secure voice, SSB FSK
SPURIOUS SUPPRESSION : INTERMODULATION PRODUCTS HARMONIC ATTENUATION SPURIOUS RADIATION HUM AND NOISE	Third order intermodulation products suppressed more than 30 dB below either of two equal tones producing 400 watts PEP ± 1 dB 35 dB below rated output 60 dB below rated output 40 dB below rated output

FREQUENCY CONTROL (TUNING)	Six digital inputs from receiver/transmitter
WARMUP TIME	60 seconds ±10 seconds
COOLING	Convection and forced air (fan on case exterior)
OPERATING TEMPERATURE	-40°C (-40°F) to +55°C (+13 1°F)
OPERATIONAL ALTITUDE	Up to 10,000 ft
IMMERSION OPERATION	3 feet in both fresh and salt water for 4 hours
SHOCK	20 g's, 11 msec
VIBRATION	2.5 g's or 1.5 inch double amplitude, 5-55 Hz

SECTION 0

GENERAL

0-1. SCOPE. This manual covers Power Amplifier AM-6545A/GRC-193A. This manual provides instructions for general support maintenance. Throughout this manual AM-6545/GRC-193 should be AM-6545/GRC-193A.

0-2. CONSOLIDATED INDEX OF ARMY PUBLICATIONS AND BLANK FORMS. Refer to the latest issue of DA Pam 310-1 to determine whether there are new editions, changes or additional publications pertaining to the equipment.

0-3. MAINTENANCE FORMS, RECORDS, AND REPORTS

a. Reports of Maintenance and Unsatisfactory Equipment. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750 as contained in Maintenance Management Update.

b. Report of Packaging and Handling Deficiencies. Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/NAVMATINST 4355.74A/AFR-400-54/MCO 4430.3F.

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33 C/AFR 75-18/MCO P4610.19/DLAR 4500.15.

0-4. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR). If your Power Amplifier AM-6545A/GRC-193A needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us why you don't like the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-ME-MP, Fort Monmouth, New Jersey 07703-5007. We'll send you a reply.

0-5. ADMINISTRATIVE STORAGE. Administrative Storage of equipment issued to and used by Army activities will have preventive maintenance performed in accordance with the PMCS charts before storing. When removing the equipment from administrative storage the PMCS should be performed to assure operational readiness. Disassembly and repacking of equipment for shipment or limited storage are covered in TM 740-90-1.

0-6. DESTRUCTION OF ARMY ELECTRONICS MATERIEL. Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2.