

TECHNICAL MANUAL

GENERAL SUPPORT MAINTENANCE MANUAL

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

HEADQUARTERS, DEPARTMENT OF THE ARMY

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

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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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-6545A/GRC-193A.

02. 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/MC0 4430.3F.

c. Discrepancy in Shipment Report (DISREP) (SF 362). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR55-38/NAVSUPINST 4610.33C/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.

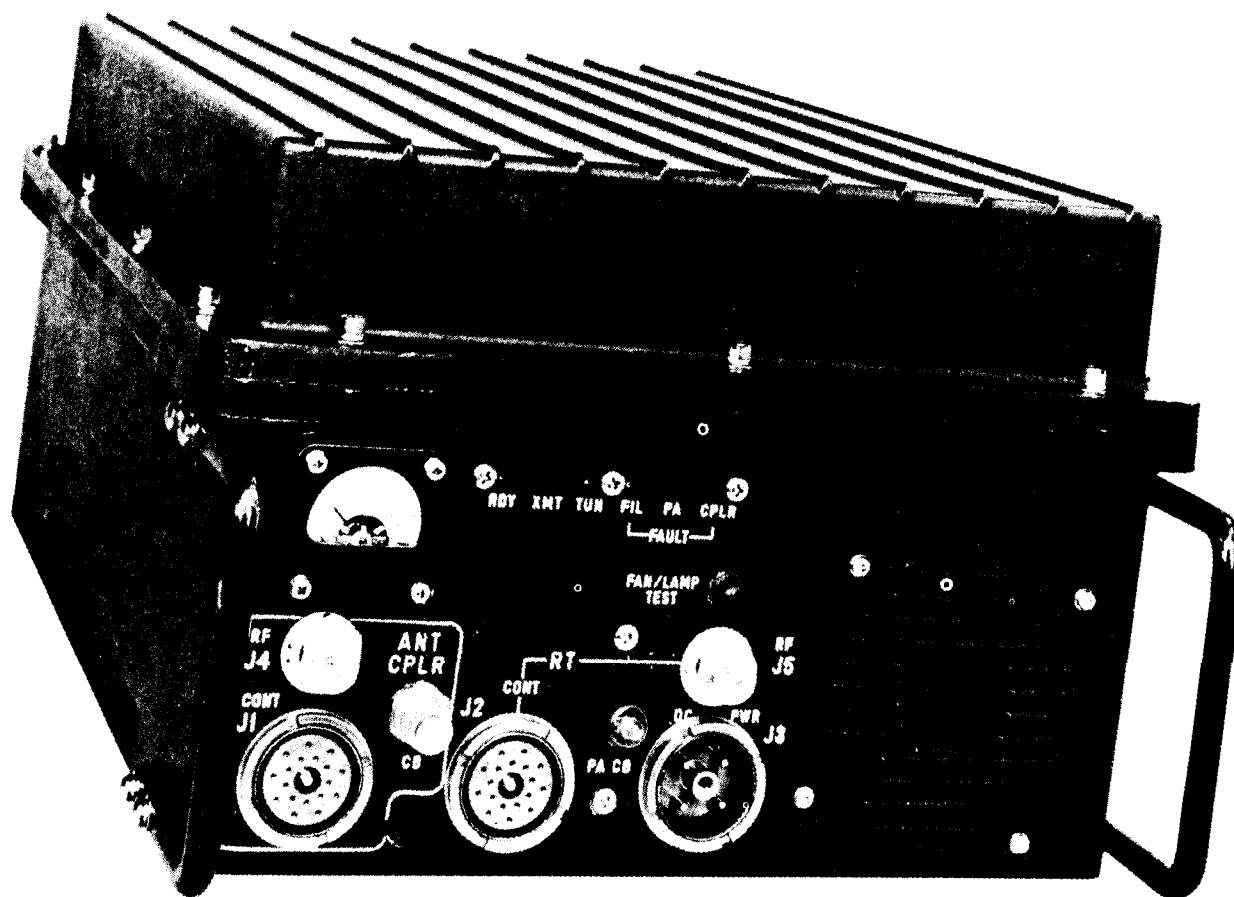


Figure 1-1. Power Amplifier AM-6545/GRC-193

CHAPTER 1

GENERAL INSTRUCTIONS

SECTION I

GENERAL DESCRIPTION AND SPECIFICATION DATA

1-1. INTRODUCTION

This manual provides intermediate maintenance instructions for Power Amplifier AM-6545/GRC- 193 hereinafter called the power amplifier), procured under Contract N00039-75-C-0022 (see figure 1-1). The power amplifier is part of Radio Set AN/GRC-193 and Radio Set AN/MRC-138. Its relationship to other components in the radio set is shown in figures 1-2 and 1-3. Organizational maintenance instructions for the power amplifier are provided in the system manual for the radio set, TM 11-5820-922-12.

1-3. FUNCTIONAL DESCRIPTION

14. The purpose of the power amplifier is to amplify a selected HF (high frequency) input signal, in the frequency range of 2.0000 to 29.9999 MHz. The input level to the amplifier from the receiver-transmitter is from 50 to 100 milliwatts. The output level is 400 watts average or PEP (peak envelope power). The power amplifier tunes automatically in response to bandswitching signals from the receiver-transmitter and to its own internally generated fine tuning (servo) signals. The power amplifier distributes +26.5 Vdc (nominal) primary power from the power source to the other radio set components, (the receiver-transmitter and the antenna coupler). The 400 watt output is coupled from the power amplifier to the antenna by the antenna coupler, which tunes automatically in response to bandswitching signals and RF excitation from the receiver-transmitter. The unit amplifies a 100 milliwatt RF input from the receiver transmitter to 400 watts ± 1 dB average or PEP (peak envelope power) output power. Primary power at 26.5 Vdc (nominal) is supplied to the amplifier from a vehicular battery-generator system, or from another appropriate source, for distribution to the amplifier-converter, receiver-transmitter, and antenna coupler units of the system.

1-5. The power amplifier consists basically of three major functional areas:

- a. RF amplifiers and PA control circuits
- b. Power and cooling circuits
- c. Monitoring and test circuits

1-6. The RF amplifiers and PA control circuits include part of Meter Board PWB Assembly 1A1, RF Driver Module Assembly 1 A1 1, Tune Detector Module Assembly 1A10, Tube Socket Assembly 1A14A2, Output Amplifiers 1A14V1 and 1A14V2, Plate Assembly 1A9, Tank Circuit Module Assembly 1A8, Harmonic Filter Assembly 1A15, ALC Module Assembly 1A7, System Control PWB Assembly 1A3, Tune Control PWB Assembly 1A4, Servo Amplifier PWB Assembly 1A5, and Band Control PWB Assembly 1A6. The 100 milliwatt input from the receiver-transmitter is first amplified by a two-stage transistorized wideband driver amplifier to an output level of about 15 watts. This output is used to drive the grounded-grid power amplifier stage. The power amplifier consists of two parallel-connected type Y621B triode vacuum tubes and a tunable π - network tank circuit that transforms the tube plate impedance from 1600 ohms to the 50-ohm output impedance. The 50-ohm output impedance matches the input impedances of the antenna coupler and provides selectivity to suppress harmonic signals. Tank Circuit tuning is automatic in less than five seconds, with the shunt elements selectable in eight bands by the motor operated 1A8A3B1 rotary switches 1A8S1-A through 1A8S1-C. The series coil is tuned to the proper inductance by the servo loop and the drive motor.