



**USER
MANUAL
AIR BAND SERIES
RADIO FREQUENCY
LINEAR POWER AMPLIFIERS**

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PRODUCT DESCRIPTION

The **HMS** series of TPL power amplifiers are intended for use in base station or repeater applications. They are all high power units and in various configurations will cover the frequency range extending from Low Band VHF to 960 MHz.

This manual covers a special version which uses two HMS amplifiers and a controller assembly for use in an aircraft ground to air control system. It is characterized by very high power capability and very high linearity for use with AM exciters. It is packaged in a 60" rack with additional space for customer supplied exciter and control assemblies. The amplifier portion of the transmitter consists of three 10.5 inch high assemblies. Two of these (when so specified) are power amplifiers producing 250 watts of carrier power each. They are coupled together to provide carrier power of 500 watts, which is equivalent to 2000 watts of peak power at 100% modulation. An alternative version may be specified, with a single amplifier assembly to provide a system with 1000 watts peak power capability. Other versions may be used in FM applications at various power levels.

The third assembly is called the Amplifier Controller. It provides for combining, metering, and monitoring of the RF power amplifier. Its major components are the transmit/receive relays, low voltage power supply, splitter and combiner modules, and metering and monitoring circuits. All three assemblies are designed to be installed in a nineteen inch rack with associated interconnect cables.

GENERAL SPECIFICATIONS

FREQUENCY RANGE: 118-136 MHz.

OPERATING MODE: AM, Linear

MODEL	POWER INPUT	NOMINAL POWER OUTPUT
PA3-2BG-AIR	10-20 W Carrier	250 W Carrier, 1000 W. PEP
PA3-2BH-AIR	10-20 W Carrier	500 W Carrier, 2000 W. PEP

Distortion: 5% max at 60% modulation, 10% max at 90% modulation

T/R Relay: Controlled by PTT

OPERATING TEMPERATURE RANGE: 0° + 40° Celsius.

OPERATING VOLTAGE: 220 VAC

DUTY CYCLE: 50%

RECEIVER INSERTION LOSS: .3 dB maximum

HARMONIC ATTENUATION: Meets FCC Type Acceptance requirements.

FUSING: 15 amperes Circuit Breaker. Separate fusing in each sub-assembly.

SWR: Full rated power output at 1.5:1; 50% output min. At 2:1 or more Proportional power reduction at VSWR above 3:1.

REMOTE MONITORING: PTT, Forward Power analog, Reverse power analog, System Fault, and several other signals are available in the Monitor Connector.

Options: TPL power amplifiers are available in several options and configurations, when specified at the time of order.

NOTE: This amplifier has been factory-tuned to the frequency specified at the time of order and will operate within ± 2 MHz of that frequency. For operation at any other frequency, see the Tune Up Instructions section.

BASE STATION CONFIGURATION: Supplied with a COR.

REMOTE MONITOR CONNECTOR OPTION: A monitor and control connector for access to the transmit control signal (PTT), test points and alarms is provided with the system.

CAUTION!

Check the amplifier upon receipt for visible damage. If any damage is noticed, please call TPL at (800) HI - POWER to request a RMA number (Return Material Authorization). If purchased through a dealer, ask them to follow this procedure for best results.

EXPENSIVE COMPONENTS MAY BE DESTROYED IF THE AMPLIFIER IS TURNED ON IN A DAMAGE CONDITION.

OPERATING PRECAUTIONS

CAUTION: This amplifier produces RF voltage that can cause painful and dangerous RF burns. Use caution! Connect and disconnect all RF connections with the DC power and drive power off.

DRIVE POWER: RF power transistors, although quite rugged in most respects, are easily damaged by overdrive. Be careful not to overdrive this amplifier, even for an instant. Higher than rated drive power may destroy the transistors and **VOID ANY WARRANTY.**

TERMINATIONS: The efficiency of this amplifier will degrade if it is operated into anything but a 50 Ohm load. Lowered efficiency may mean any, or all, of the following; lower power output, increased current drain, higher operating temperature, and reduced life.

INSTALLATION

This unit is mounted in a standard 19" rack cabinet. When picking a location for the rack, consideration must be given to RF power output cable lengths, as well as cooling considerations.

Mount the unit where dust and other debris are not likely to clog the cooling fins. Avoid mounting the amplifier in a hot area that could artificially raise the amplifier's temperature.

Connect the radio transmitter to the "EXCITER" terminal and the antenna to the "ANTENNA" terminal on the amplifier, with 50 Ohm coaxial cable and TYPE N plugs. Connect the receiver to the "RECEIVER" terminal. The installer must assure that the transmit coaxial cable used is adequate to handle 500 Watts average and 2000 Watts peak power.

Plug the AC line cord into the system AC power receptacle and extend the AC cable to a high capacity 220 VAC receptacle.

For safety, make sure the rack and all equipment connecting to the amplifier have proper AC grounds. Do not rely on coaxial cable shields for AC grounding.

Assure that the installation has proper lightning protection.

SYSTEM DESCRIPTION

Refer to wiring Diagram 102154 for an overall functional view of the system. The diagram shows the four blocks which make up the system. These are AC Distribution, Controller, and two amplifiers, Power Amp. A., and Power Amp. B.

The AC Distribution block provides three receptacles for the three main system assemblies, and one for cabinet fans. Two additional ones are available for user installed equipment.

The major block labeled Controller shows the major parts of this assembly and their interconnections. A detailed wiring diagram and schematic of this unit is shown on diagram 102150. The unit sends and receives RF and control signals to and from the two amplifier units.

The two amplifiers are PA "A" and PA "B". For system purposes, the top unit is identified as "A" and the lower one "B", although they are identical. An internal wiring diagram of the amplifiers is shown on diagram 102152.

A rear side diagram of the system is shown on Figure 1. This may be referenced for correct cable placement, and added RF cable locations.

MAINTENANCE

The amplifier requires no schedule maintenance. Maintenance should only be required in case of a major component failure. Block diagrams and schematics later in this manual will assist in identifying replaceable subassemblies.

Control Unit Maintenance: The Amplifier Controller has several replaceable modules which may be identified by reference to Block Diagrams 102154 and 102150 later in the manual. Should any fault occur, replacement parts may be obtained from the manufacturer.

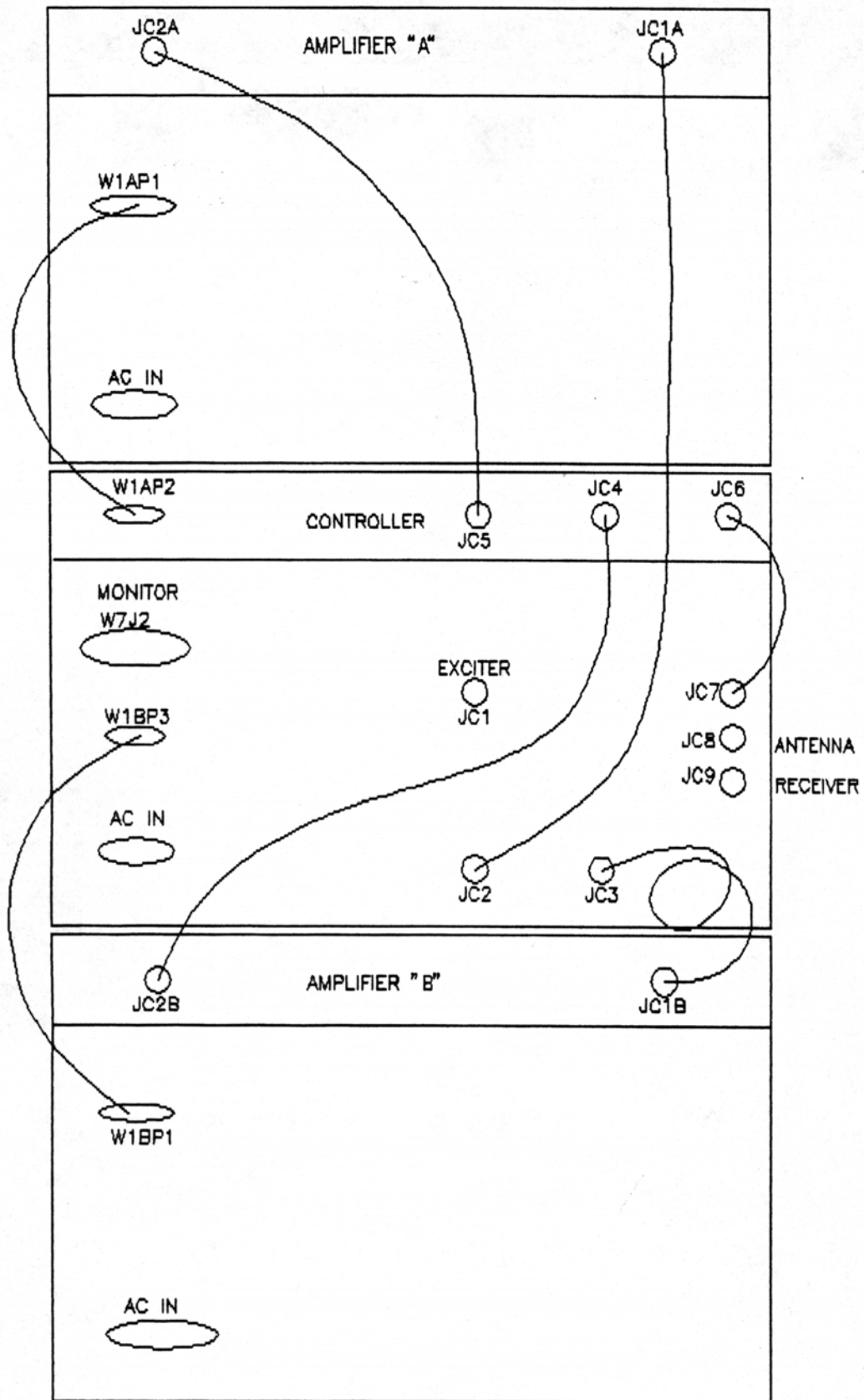


FIGURE 1
REAR SIDE WITH CABLES