MB Martin AVIACOM1-PA VHF Aviation Amplifier
User's Guide

IMPORTANT!

Changes or modifications not expressly approved by the manufacture could void the user's authority to operate the equipment. This amplifier is not certified for use with any transceiver other than the AVIACOM1 also manufactured by MB Martin & Company.

INTRODUCTION

The AVIACOM1-PA ('amplifier') is specifically designed to boost the transmit output signal of our AVIACOM1 aviation transceiver ('radio') by a factor of ten.

Basic operation requires:

- An AVIACOM1 VHF transceiver already installed in the manner detailed in the AVIACOM1 transceiver user's guide
- Sufficient 12VDC power (radio power plus additional 1.2A=1.6A total)

IMPORTANT!

In view of regulatory radio frequency energy exposure limits, minimum required separation between the antenna and any person is two meters. This distance represents a comfortable margin above the calculated 75 cm minimum distance as required when using the amplifier with an AVIACOM1 transceiver and SJ-1 antenna (antenna gain= 4.5 dBi).

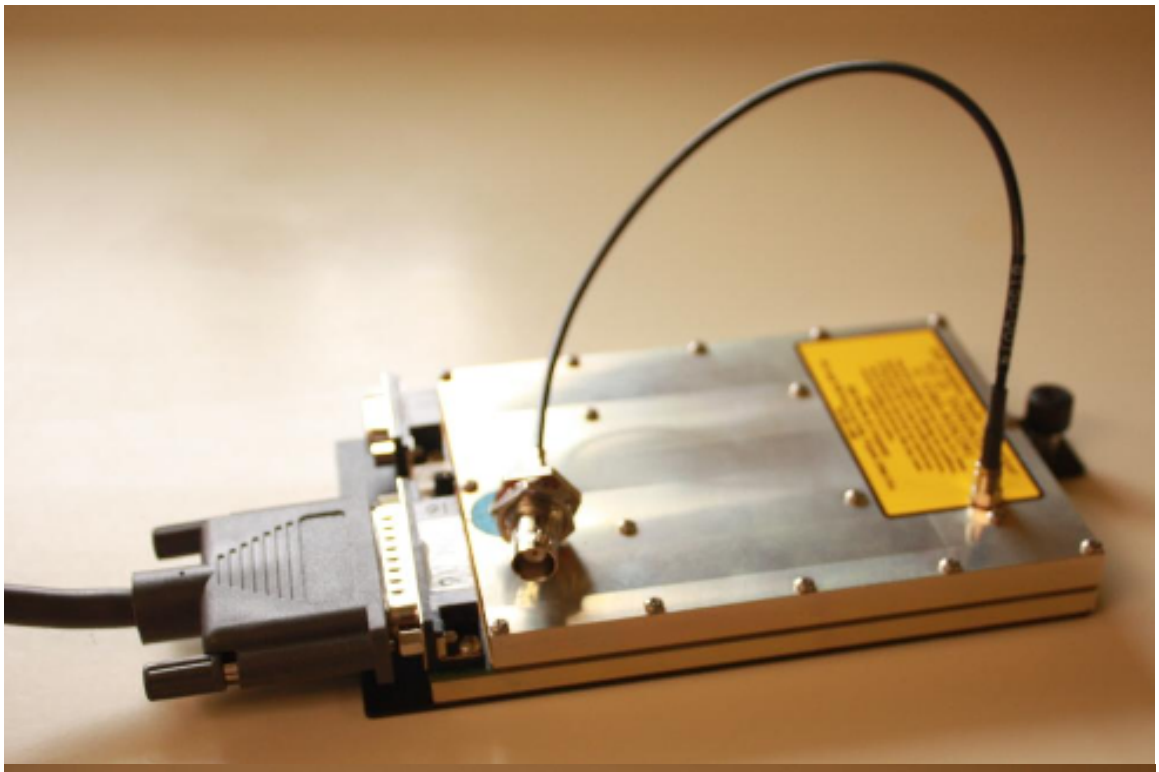
INSTALLATION

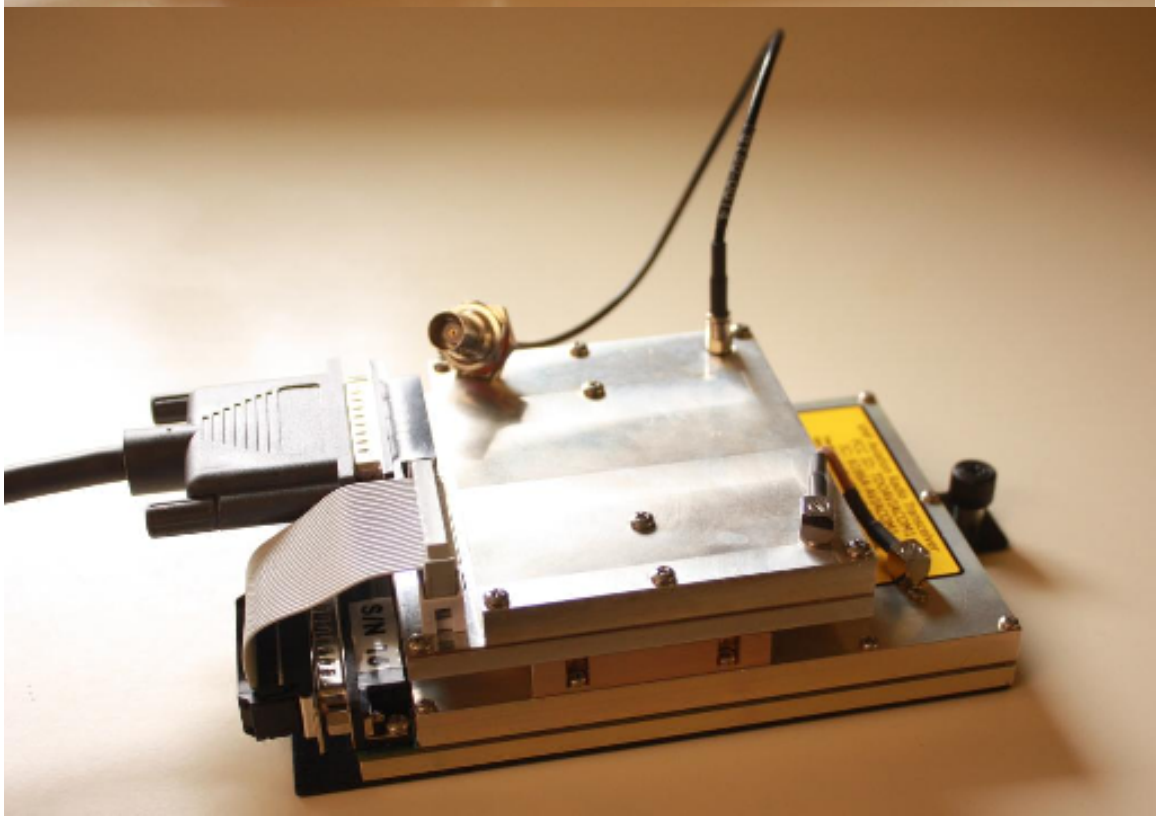
Refer to the photographs on the next page for this simple installation procedure. The amplifier installation kit includes a coaxial jumper cable, a ribbon cable, two long screws and a mounting plate.

The mounting plate is first attached to the radio using six of the radio's cover screws. These screws and the proper plate orientation may be easily identified by observation of the hole pattern in the mounting plate. The two long screws included in the install kit are then used to secure the amplifier to the mounting plate.

Remove the system interface and antenna cables from the radio. Connect the amplifier to the radio using the ribbon cable and coaxial jumper cable. Attach the system interface and antenna cables to the amplifier. This completes the installation.

RADIO PRIOR TO INSTALLATION OF AMPLIFIER





AMPLIFIER INSTALLED ON RADIO

INSTALLATION PRECAUTIONS

The radio/amplifier should be mechanically mounted to the system enclosure with consideration to the higher amount of heat which would be generated by the radio alone. An adequate installation is indicated by a maximum 15 degrees (Centigrade) difference between the system enclosure and the reported internal temperature of the amplifier while the system is operating with a 50% transmit duty cycle over a period of at least thirty minutes. The Aviacom1 PC software may be used to monitor the internal temperature of the radio and amplifier during temperature testing. We advise that these tests be conducted with the antenna replaced with a non-radiating load (i.e., "dummy load" resistor) in order not to interfere with local aviation communications.

The radio alone is specified to run with a power supply as high as 18 Volts; however, be sure to check that the power supply will never exceed 14 Volts before installing this amplifier (see power supply specifications below).

PERFORMANCE SPECIFICATIONS and FEATURES

- frequency coverage: 118.000 to 136.975 MHz
- insertion loss in receive and/or with TX amplifier internally bypassed: .4 dB
- transmit amplification may be disabled under user software control
- transmit amplification: 10 dB
- receiver amplification: none
- transmit harmonic suppression: 60dB minimum
- insignificant emissions at/near L1 and L2 GPS frequencies
- minimum transmit output power: 2.5 Watts average (10 Watts peak envelope)
- power supply requirements: 10.5 to 14 Volts DC; 1.2A
- antenna and transceiver connectors: type SMB, 50 Ohms
- RS232 serial port for HPA's internal microprocessor (for factory use)
- High-speed communications between transceiver and HPA microprocessors
- temperature measurement (as also included in transceiver)
- integral RF power, modulation percentage measurements (as also in transceiver)
- rugged LD-MOS field effect transistor used in transmit output stage
- superb shielding/filtering for use in extreme electrical noise environments
- bolts directly to transceiver
- FCC and IC certification
- Amplifier is transparent to transceiver's antenna VSWR measurement feature

INTERFACE CABLES/CONNECTORS

The amplifier is powered via the cable (primary system connection) which would otherwise be connected directly to a radio not equipped with an amplifier. The amplifier is shipped with a short ribbon cable which passes power and system control from the

amplifier to the radio (i.e., in a loop-through fashion). A coaxial jumper cable is also provided to connect the radio's antenna port to the amplifier. The amplifier has a second coaxial connector which now becomes the antenna connection point. The length of the jumper cable has been intentionally made too short to allow an accidental/improper connection.

Pin assignments, amplifier primary system interface connector (type DB25 male):

1 Receive Audio (output), 1V peak-to-peak, 600 Ohms impedance
2 ground
3 Transmit audio (input), 1V peak-to-peak for 90% modulation (600 Ohms)
4 Ground
5 Microphone Bias (output) – appears during transmit for use with carbon microphone
6 Push-to-Talk (input) – connect this pin to ground to transmit
7 RS232 input to HPA microprocessor
8 no connection
9 no connection
10 +12VDC power (input)
11 +12VDC power (input)
12 ground
13 ground
14 amplifier activation signal from transceiver
15 AUX2 output (open collector) from transceiver
16 ground
17 no connection
18 RS232 Data Out - reports and command acknowledgments from transceiver
19 RS232 Data In – command input from user to transceiver
20 RS232 Data Out from HPA microprocessor
21 connects to D3 of 16-position transceiver switch
22 connects to D2 of 16-position transceiver switch
23 connects to D1 of 16-position transceiver switch
24 connects to D0 of 16-position transceiver switch
25 ground

Note that most (but not all) of these amplifier pin assignments are the same as those of the radio's identical 25-pin connector. The pins that do have different functions (radio versus amplifier) are not normally connected at the far end of the interface cable. Refer to the AVIACOM1 Transceiver user's manual for the pin assignments of the radio's 25-pin connector.

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