AD RADIO FMA-3500 FM AMPLIFIER

1.1 DESCRIPTION

The new FM power amplifier FMA-3500 is a member of a new series designed to maximum energy saving.
FMA-3500 guarantees a maximum power of 3600W with two 3000W power supplies and an amplifier module with 7th generation NXP - LDMOS transistors.
Amplifier temperature is extremely low because of an air cooling system that, added to a very good heat sink and a very high efficiency of the whole machine, permits to reduce heat dissipation.
A microprocessor monitors and controls LDMOS currents and power supply voltages together with output power measurements and the temperature of the heat sink.
With a multifunction display it is possible to verify all these amplifier features and to set alarm and fold-back thresholds on demand. It's possible also to enable warning thresholds.

1.2 MAIN FEATURES

- Air cooling;
- very high efficiency;
- manual and automatic mode to reach desired power;
- restrained dimensions and weight;
- USB controllable;
- voltages and currents available from display.

1.3 TECHNICAL CHARACTERISTICS

RF SECTION

Frequency Range..... FM Band
Nominal Output Power ..... 3.5kW CW
Nominal Input Power 22W
Amplification Class..... AB
Gain at Nominal Power..... 22dB ±1
Technology..... Solid State LDMOS
RF Input Connector ..... N Female
Input Impedance 50Ω
RF Output Connector ..... 7/8" Flange
Output Impedance 50Ω

USB CONTROL SECTION (LIMITED ACCESS TO TECHNICAL STAFF)

Parallel Interface ..... ON / OFF, Alarm, Forward, Reflected
Serial Interface ..... USB (for firmware upgrade)

ALARM THRESHOLDS

Forward Input Power 24W
Forward Output Power 3600W
Reflected Power 150W
Temperature ..... 75°C
IDC ..... Min. 0A - Max 25.0A
VDC ..... Min 48VDC - Max 50VDC
IUNB 1.0A

FOLD-BACK THRESHOLDS

Reflected Power 150W
Temperature ..... 75°C

GENERAL

Power Supply Voltage ..... 230VAC ±15% (Other on request)
Power Supply Frequency ..... 50 - 60Hz ±4%
Power Factor .....> 0.98
Power Consumption ..... < 5,200VA
Housing..... Rack 19”-4U
Weight 80LBS
Airflow ..... 550 CFM
Room Temperature..... -5°C to +40°C

2.1 OPERATING ENVIRONMENT

You can install the equipment in a standard component rack or on a suitable surface such as a bench or desk.
In any case, the area should be as clean and well-ventilated as possible. Do not locate the transmitter directly above a hot piece of equipment.

2.2 FIRST INSTALLATION

Correct installation of the equipment is important for maximum performance and reliability. Antenna and grounding connections must be installed with the greatest care. The equipment adjustment isn’t required, because the unit is completely adjusted by our technical staff.

1. Connect power supply cables of the Amplifier and the Exciter to the electric network (230VAC Monophase).
2. Connect the RF OUT of the Exciter to RF IN of the Amplifier.
3. Connect the Antenna cable to RF OUT connector of the Amplifier.

2.3 FIRST START-UP

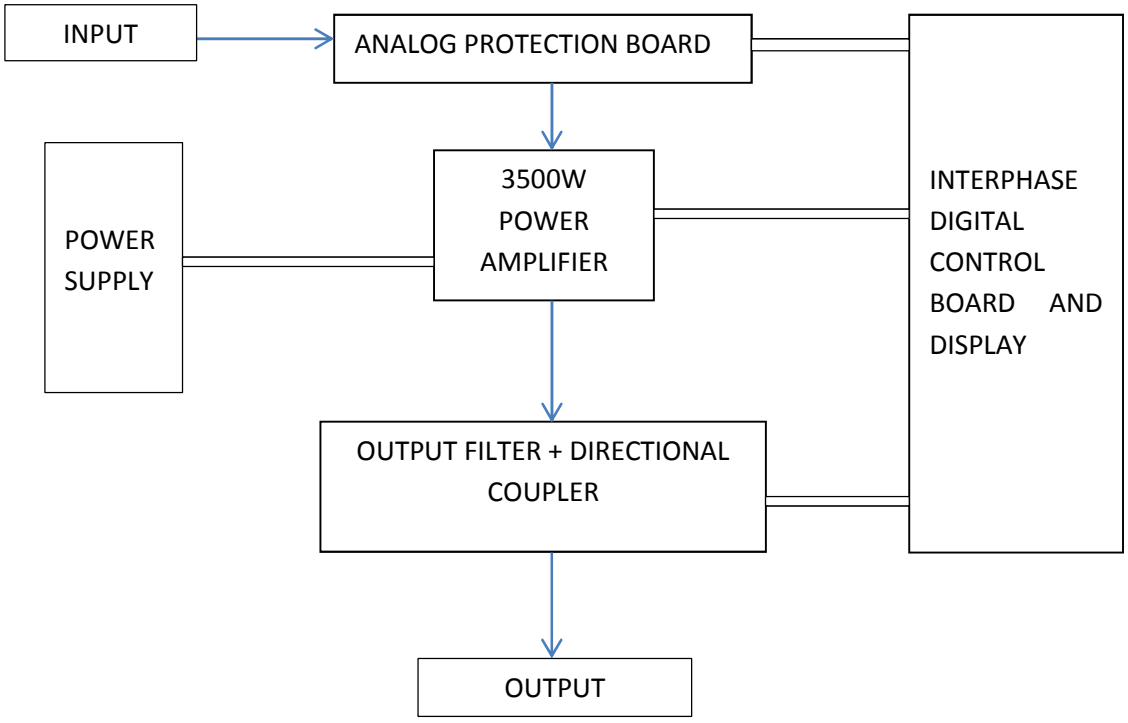
After double checking the connections *(carefully read the previous paragraph)*, you are ready to switch on the amplifier arming the breaker on the rear panel.
In order to safely put the overall transmitter (amplifier and exciter) in a normal working mode, follow the steps described below.

1. Switch on the Amplifier from the Mains Breaker on the back.
2. Set the working frequency on the Exciter.
3. Set the output power adjusting the output level of the Exciter .
4. Set in the exciter the proper operation mode.
5. Verify that the output power on the amplifier does not exceed the output limit.
6. Verify the absence of reflected power (it would mean that the RF output cable, the antenna and/or the combiner is not well made).
7. Set the nominal power and confirm on exciter output level.

2.4 READING PARAMETERS

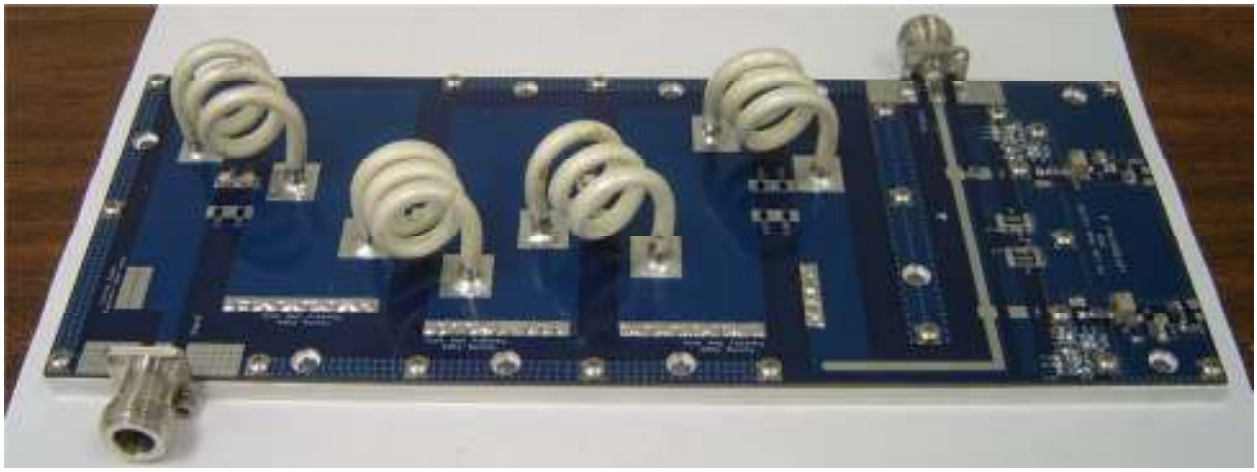
1.The amplifier will show the main parameters on the first screen. Using “ENTER” , “SCAPE”, “UP” and “DOWN” you can access to preset parameters, protection thresholds, etc.
2. The amplifier has protection redundancy, digital and analog. If one of the alarm thresholds is reached, amplifier will shot down and will show on the display the cause of alarm.

BLOCK DIAGRAM



3.1 OUTPUT FILTER AND COUPLER

This low pass filter directional coupler provides a DC voltage at the forward and reflected ports. The test ports feature a broadband equalizer network. The equalizer maintains a constant RF level at the diodes across the FM band which results in the same voltage at all frequencies. The filter also has RF sample output for applications requiring log detection/high precision.



3.2 PALLET AMPLIFIERS

The FMA-3500 amplifier section includes four pallets amplifiers model **P1000FM-188PLA .** These pallets are built with the latest planar technology that provides 85% or higher efficiency and stable performance on FM band. These pallets are powered by the NXP BLF188XR (extremely rugged technology form NXP or former Phillips) , picture bellow, attached PDF.

3.3 POWER SUPPLIES

The FMA-3500 uses three power supplies, two RSP-3000-48 to feed the output stage and one auxiliary power supply RS-50-12 to feed control system, display and protection board.

The RSP-3000-48 provides reliable and stable 50 VDC for pallets and fans. Wide range of input AC voltage, protects the unit from external voltage fluctuations.

FEATURES:

- AC input 180 / 264VAC
- AC input active surge current limiting
- High efficiency up to 91.5%
- Built-in active PFC function, PF>0.95
- Protections: Short circuit I Overload I Over voltage I Over temperature / Fan alarm
- Forced air cooling by built-in DC with fan speed control function
- Output voltage can be trimmed between 20/110% of the rated output voltage
- High power density 15.6WIinch^3
- Current sharing up to 3 units
- Alarm signal output (relay contact and TTL signal)
- Built-in 12VI0.1A auxiliary output for remote control
- Built-in remote ON-OFF control
- Built-in remote sense function.

Meanwell RS-50-12

FEATURES:

- Universal AC input I Full range
- Protections: Short circuit I Overload I Over voltage
- Cooling by free air convection
- LED indicator for power on
- 100% full load burn-in test
- All using 105℃ long life electrolytic capacitors
- Withstand 300VAC surge input for 5 second
- High operating temperature up to 70℃
- Withstand 5G vibration test
- No load power consumption<0.5W
- High efficiency, long life and high reliability

4.1 DISPLAY AND READINGS

Once you turn the amplifier “ON”, the display shows SYSTEM STATUS screen. You will be able to read main parameters as Forward Power , Reflected Power, Current 1 and 2, Temperature and Real time.

By pressing any UP or DOWN button you will go to MAIN MENU. On this screen the display shows the following sub menus: USER DEFAULT, RF VARIABLES, TEMP, TIME AND POWER, POWER VARIABLES and PROTECTIONS.

By pressing UP / DOWN / ENTER and ESCAPE you can navigate through the different sub menus and check the different limits, parameters real time adjustment and critical protection levels.