RF2000

OWNER'S MANUAL

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INTRODUCTION

The Rockford Fosgate RF2000 Power Amplifier is the first in a series of high performance home audio components. In the Rockford-Fosgate tradition, it is hand-made in America, with the highest quality components available, to exacting specifications. The RF2000 is designed to achieve, as closely as humanly possible, perfect reproduction of the live performance and total reliability.

FEATURES

OUTPUT SECTION

The RF2000 uses 32 MOSFET output devices — 16 per channel — to source the high current and power required. Each device is rated at 4.0 Amperes continuous drain current at 100 degrees Celsius.

HIGH CURRENT CAPABILITY

Each channel can safely produce peak transient output currents exceeding 50 Amperes. This ensures that momentary speaker impedance dips and surge current requirements are easily supplied.

WIDE LOAD RANGE

The RF2000 is fully rated for loads of 4 and 8 Ohms. It is stable to 2 Ohms. (This means it will operate safely, cleanly and stably into 2 Ohms, but very high power dissipation may lead to frequent thermal shutdown.)

The 16 output devices per channel assure operation well within the MOSFET Safe Operating Area with low impedances and/or reactive loads.

SOA PROTECTION (Safe Operating Area)

The output devices of the RF2000 are protected by a sophisticated analog computing system. The device instantaneous temperature is continuously calculated by the computer and compared to a maximum limit. If the limit is reached, the computer cuts back the power and lights the channel's distortion (red) front panel LED.

THERMAL PROTECTION

A pair of thermistors, one mounted on each heatsink, measure temperature of the output system. They control fan speed and provide thermal shutdown in case temperatures become too high for safe operation. (Thermal shutdown turns the power lamp red.)

FAN COOLING

The fan cooling system is a key to the RF2000's performance. The fan is of a very quiet design, with continuously variable speed control. When the amp is cool, the fan is off. As the amp is driven harder, the fan gradually turns on and speeds up only to the extent needed to sustain the power dissipation needed for the conditions.

TOROIDAL TRANSFORMER

The power supply for the RF2000 is based on a 1000 Volt-Ampere toroidal (donut-shaped) line transformer. We use the toroid core (which is more expensive than a conventional square transformer) for its higher efficiency, lower weight, smaller size, and freedom from stray magnetic fields. The 1000 Volt-Ampere rating indicates that the transformer can supply power to a load of 1000 Watts continuously.

ENERGY STORAGE

Energy storage for the power supply consists of two 42,000 Microfarad capacitors, for a total supply capacitance of over 80,000 Microfarads. This large energy storage capability provides a low-impedance source of extremely high current for surges, musical transients, variations in speaker impedance, and very low frequencies.

GREAT FLEXIBILITY

Individual channel gain controls match the RF2000 to a wide range of installations.

Four Output Modes are available to fit almost any requirement: Normal Stereo, Stereo plus Bridged Mono, Bridged Mono, and Dual Mono.

DISPLAY

Simple three-LED multicolor display shows amplifier status including power, signal level, distortion, and thermal condition.

TESTING AND BURN-IN

All Rockford-Fosgate amplifiers undergo a rigorous test and qualification process during normal production. After a series of tests throughout the production process, your amplifier was burned-in at full power for a minimum of four hours prior to final tests. Quality control of this extensive nature is time-consuming and expensive, but it makes us confident that your RF2000 will be of the highest quality possible.

INSTALLATION AND SETUP

AMPLIFIER PLACEMENT

The RF2000 is designed to be placed on a shelf or other substantial support. (A rack-mount front panel is available.) Take care to ensure unimpeded air flow behind the amplifier, as the intake and exhaust vents are located at the rear. If the amp is to be placed in an enclosed wall unit or cabinet, it would be a good idea to allow for fresh air intake and hot air exhaust venting in the back of the cabinet, especially for continuous high-output operation.

POWER CONNECTION

The RF2000 is designed to operate on 120 Volts AC, 60 Hertz (standard U.S. line output) only. Connection is via a standard 3-prong grounded AC plug. If a 3-prong (grounded) outlet is not available, the third (ground) wire MUST be grounded to a satisfactory electrical ground using adapters available at most hardware stores.

If an extension cord must be used, it will rob power from your amplifier. Use only the highest quality 3-wire (grounded) extension cords, with large wire (14-Gauge or larger) to reduce your losses.

SPEAKER CONNECTION

SPEAKER CONNECTORS

Speaker connectors are heavy-duty gold-plated "5-way" binding posts, spaced for standard banana jack connectors. They will accept bare stranded wire up to approximately 12-Gauge. Banana connectors may be more convenient.

NORMAL STEREO CONNECTIONS

For normal stereo operation leave ALL REAR PANEL SWITCHES IN. The amplifier's left channel red binding post connects to the left positive (+) speaker terminal and the left black post goes to the left negative (–) speaker terminal. Wire the right channel the same.

Left positive (+) terminal (red) to Left Speaker positive (+)
Left negative (–) terminal (black) to Left Speaker negative (–)
Right positive (+) terminal (red) to Right Speaker positive (+)
Right negative (–) terminal (black) to Right Speaker negative (–)

SPEAKER POLARITY NOTE

Be sure to observe speaker polarity (+ and – leads) throughout your system. Getting them wrong can result in missing bass, massive distortion, or blown speakers!

SPECIAL SYSTEM CONFIGURATIONS

DUAL MONAURAL (MONO)

What

Both channels are driven by the same signal. (In the RF-2000, the common signal input is the Left channel input.) In this mode, both amplifiers are controlled by the left input gain control and put out exactly the same kind of signal and power.

Why

*You may wish to drive biamplified pairs of speakers with identical signals if the speakers have internal crossovers.

*You may wish to drive multiple speakers which would be too low in impedance if driven together (under 4 Ohms).

How

Set the INPUT switch to MONO (out). This feeds the right channel power amplifier section from the left input signal jack. Connect the speakers the same as you would for standard stereo. Leave all other switches in the standard position (IN) unless you have other reasons for using them.

Left positive (+) terminal (red) to Left Speaker positive (+)
Left negative (-) terminal (black) to Left Speaker negative (-)
Right positive (+) terminal (red) to Right Speaker positive (+)
Right negative (-) terminal (black) to Right Speaker negative(-)

BRIDGED MONO/WHAT IS BRIDGING?

"Bridging" an amplifier means using two amplifier channels to drive a single speaker. Normally, one terminal of the speaker is driven by an amplifier section, and the other terminal is grounded (that is, current is returned to the driving amplifier). When a speaker load is driven by a bridged amplifier pair, each terminal of the speaker is driven by a separate amplifier section.

Bridging applies much more power to the speaker load than either amplifier channel would alone. For an 8-Ohm speaker, the RF2000 is rated for a minimum output of 200 Watts for a single channel. For both channels bridged into the same speaker, the minimum output would be 600 Watts.

When the application calls for higher power levels than you can get from the RF2000 in normal stereo, you can use the bridged-mono mode.

USE CAUTION! Most speakers cannot handle the power of the RF2000 in bridged mono mode.

Typical applications include: driving large (mono) subwoofers, large power hungry speaker systems, or bi-amp applications where large amounts of power are required.

In order to use both channels of input to sum the signal to drive a mono speaker, set the input switch to stereo (IN) and the output switch to mono (OUT). The amplifier's left channel red binding post connects to the positive (+) speaker terminal and the right channel red binding post connects to the negative (-) speaker terminal.

STEREO PLUS BRIDGED MONO

Stereo satellites can be driven at the same time as a bridged mono subwoofer or bridged center channel speaker (with one RF2000).

If you have satellites designed specifically for midrange and treble, with a single mono subwoofer designed for bass only.

Set output switch to MONO (OUT). All other switches IN. This inverts the right channel output, while leaving the input stereo. You will connect the left speaker normally, but the right speaker POS (+) and NEG (-) will be REVERSED from normal stereo. The center (bridged mono) channel will be connected between the two RED (MONO) amplifier terminals.

Left Positive (+) terminal (red) to Left Speaker Positive (+)
Left Negative (-) terminal (black) to Left Speaker Negative (-)
Right Negative (-) terminal (black) to Right Speaker Positive (+)
Right Positive (+) terminal (red) to Right Speaker Negative (-)
Left Positive (+) terminal (red) to Mono Speaker Positive (+)
Right Positive (+) terminal (red) to Mono Speaker Negative (-)

REAR PANEL SWITCHES

NOTE

Normal stereo position for all rear panel switches is IN. The only time any of the switches should be OUT is for one of the special functions in this section.

Be sure to turn the amplifier OFF before changing rear panel switch positions (to avoid possible pops and clicks).

BALANCED/UNBALANCED INPUT SWITCH

Home Version

The Balance/Unbalanced Input Switch is disabled in the Home RF2000. This function is used only with special professional connectors (XLR and ¼-inch phone plugs) available with the PRF2000 professional back panel.

Pro Version

The Balanced/Unbalanced switch converts the inputs to fully balanced. Use for balanced XLR and phone jack inputs.

INPUT SWITCH (RIGHT CHANNEL)

IN position: Stereo. Right input feeds Right channel.
OUT position: Mono. Left input feeds Right channel.

OUTPUT SWITCH (RIGHT CHANNEL)

IN position: Stereo (normal). Right channel is in phase with Left.
OUT position: Mono. Right channel is reversed in phase compared to Left.

GROUND SWITCH

IN position: Floating (normal). Chassis ground separate from output section ground.

OUT position: Chassis. Chassis ground connected to output section ground.

INPUT CONNECTIONS

Input is via standard "RCA" style pin jacks.
Pro Version: ¼ phone jax and XLR connectors are also provided.

LEVEL ADJUST

Input sensitivity is adjustable with the level controls adjacent to each input pin jack. The overall gain ranges from zero (fully counterclockwise) to 36 dB (fully clockwise).

SPEAKER FUSES

The RF2000 is equipped with AGC 5-Ampere speaker protection fuses. These fuses are for speaker protection only.

Most speakers will not handle more than a 5-Ampere fuse (or less). Refer to your speaker manufacturer's recommendations for your fuse selection.

OPERATION

Turning On The Amp

First Time: Before turning on power switch to the RF2000 for the first time, double-check all speaker and input connections and turn input level controls all the way down (fully counterclockwise). Turn on your source equipment (preamp, CD player, etc.). Turn power switch on and adjust input controls so that the left and right channel LEDs light up green at a low preamp volume control position.

Normal Operation: As with any high-powered amplifier, it is best to turn on the amplifier AFTER all other equipment is on, and turn it off BEFORE any other equipment. This prevents any turn-on or turn-off transients from other equipment from damaging your speakers.

LED DISPLAYS

From left to right the front panel LEDs indicate: Left Channel Status, Right Channel Status, and Power Status.

The Channel Status LEDs indicate the condition of the Left and Right channel outputs. They will turn on GREEN to indicate a signal output of over about 200 milliWatts. They will switch to RED to indicate distortion over about 0.5% THD.

The Power Status LEd will turn on GREEN to indicate power on. In case of overheating, it will switch to RED and the amplifier will turn off until it cools down.

CHANNEL STATUS LEDS

The channel status LEDs can show three indications:

OFF indicates no signal or a signal level under about 200 Milliwatts (a very quiet level with most speakers).

GREEN indicates a signal over about 200 Milliwatts and very low distortion (under 0.5% for most conditions); that is, normal operation.

RED indicates distortion in the output signal for any reason: blown speaker fuse, shorted speakers, excessive speaker load, or any other reason.

POWER STATUS LED

The Power Status LED can have three indications:

OFF: The power switch is off, the amplifier is not plugged in, or the main fuse is blown.

GREEN: Indicates normal power and operation.

RED: Indicates amplifier overheat. Leave the switch on and the fan will cool the amplifier down to operating temperature very quickly.

CARE

Do not allow speaker wires to touch each other, chassis ground, or any metal object.

Protect your amplifier from moisture and dust.

Clean anodized finishes with soft damp cloth.

Save the original carton and packing. It is the only safe way to ship the amplifier. If you need to replace the carton and/or packing, consult your authorized dealer or Rockford Customer Service Department.

No user serviceable parts inside. Do not disassemble amplifier for any reason. Refer to an authorized Rockford-Fosgate warranty station or to Rockford Corp. directly.

TROUBLESHOOTING

LED Displays for Troubleshooting

The LED displays show a lot of information about how the amplifier is acting. They can provide direction and trouble-shooting information for most system problems if they are interpreted properly.

POWER STATUS LED (Rightmost LED)

The Power LED can show three indications:

OFF: No power is reaching the main amplifier board low-voltage section.

GREEN: Normal low-voltage power is available.

RED: Amplifier has shut down due to overheating (fan will still run to cool the amplifier).

NO L.E.D.

This is an indication that no power is reaching the amplifier. Possible reasons include:

1) Amplifier not securely plugged in.

2) Power source (socket) failed (AC line fuse blown, wiring open, etc.)

3) Internal amplifier fuse blown. Fuse replacement should only be attempted by a qualified technician.

TURNS RED (OVERHEATS) RAPIDLY

1) Rear cooling channels blocked. Clear the area behind the amp.

2) No fresh air ventilation (rear air intake and output feeding each other). Provide a source of fresh air (not heated air) for the inlets at the sides.

3) Excessive loading. If the amplifier is run into less than a 4 Ohm speaker load per channel, or is bridged into less than 8 Ohms, the amplifier may not be able to produce continuous high output levels without overheating. Reduce the loading by increasing load impedance.

4) Fan is jammed or has failed. Clear the obstruction or replace the fan.

5) There may have been an internal malfunction. Send amp to the factory or a qualified technician for repair.

CHANNEL STATUS LEDs (Two Left LEDs)

The channel status LEDs can show three indications:

OFF indicates no signal or a signal level under about 200 Milliwatts (a very quiet level with most speakers).

GREEN indicates a signal over about 200 Milliwatts and very low distortion (under 0.5%) for most conditions); that is, normal operation.

RED indicates distortion in the output amplifier section for any reason: blown speaker fuse, shorted speakers, excessive speaker load, or any other reason.

SPECIFICATIONS

8-OHM PERFORMANCE

POWER: Over 200 Watts per channel from 20 Hertz to 20,000 Hertz, both channels driven, at rated distortion.

DISTORTION: Less than 0.05% Total Harmonic Distortion plus Noise, 20 Hz to 20,000 Hz, both channels driven at full power.

IM DISTORTION (IHF): Less than 0.01%

SLEW RATE: Exceeds 80 Volts per Microsecond.

4-OHM PERFORMANCE

POWER: Over 300 Watts per channel from 20 Hertz to 20,000 Hertz, both channels driven, at rated distortion.

DISTORTION: Less than 0.10% Total Harmonic Distortion plus Noise, 20 Hz to 20,000 Hz, both channels driven at full power.

IM DISTORTION (IHF): Less than 0.02%

2-OHM PERFORMANCE

Stable into two Ohms.

May overheat and shut down rapidly if driven hard at 2 Ohms.

S/N RATIO: Over 110 dB (unweighted) with respect to full power.

PEAK OUTPUT CURRENT: 50 Amperes

FREQUENCY RESPONSE:

20 Hz to 20,000 Hz: +0.1, –0.25 dB
5 Hz to 75,000 Hz: +0.1, –3.0 dB

POWER BANDWIDTH: 5 Hz to 75,000 Hz

PROTECTION:

Capable of safe operation indefinitely into any load condition.

Sustained (over 1 second) hard clipping at ultrasonic frequencies (over 20 KHz) will cause protection to activate, the limit peak power. Please test ultrasonic behavior either with signals that don't cause clipping or with tone bursts.

Dimensions
Width 17.5
Height 4.75
Depth 13 1/8
Weight 40.1