

Gamma 1, 2, 2.5, 3, & 3.5kW Operating Manual and User Guide

Version 2.4— Sept 2011



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Limited Warranty

PTEK LLC (SELLER) warrants that products are free from defects in material and workmanship and meet the performance specifications stated; however:

- A. SELLER liability under this Warranty is limited to repairing or replacing, at its option, any product delivered not conforming to this Warranty;
- B. This Warranty is limited to a period of three years;
- C. Minor deviations from specifications that do not affect performance are excluded from this Warranty; and
- D. SELLER shall be liable under this Warranty only if:
 - 1. SELLER is promptly notified in writing by the BUYER upon discovery of the failure of any product to conform to this Warranty,
 - 2. The product is returned to the SELLER, with transportation charges prepaid by the BUYER,
 - 3. The Product is received by SELLER not later than ten (10) days after the last day of the two-year period of this Warranty, and
 - 4. SELLER examination of the product discloses the SELLER's reasonable satisfaction that such defects or failures as may exist have not been caused by misuse, neglect, improper installation, repair, alteration, accident, or shipping.

The BUYER will repay freight to and from SELLER on products serviced here under at SELLER's plant; but SELLER may, at its option, elect to perform any repairs here under at the BUYER's place of business.

The foregoing constitutes SELLER's entire Warranty expressed, implied, and/or statutory, except as to title, and state the full extent of SELLER's liability to the BUYER or to any other party for any breach of such Warranty and for damages, whether direct, special, incidental, or consequential; and other than as expressly provided in this document. No Warranties, expressed or implied, including any Warranty or merchant ability or of fitness for a particular purpose, are made. No employee, representative, or agent of SELLER has any authority, expressed or implied, to alter or to supplement the terms of this Warranty.

Warranty Service

The Limited Warranty covers parts and labor to the original purchaser for three years. Damage caused by misuse or shipping is excluded from the Warranty.

PTEK
Customer Service Manager
1723 Little Orchard Street—Unit D
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Safety Instructions

To maximize user safety and ensure correct device operation, all instructions contained in this section should be read carefully.



Caution: It is important that the user observe all warnings and instructions that are on the device and contained in this manual.

Before Applying Power



Warning: DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE

Operation of the Gamma in the presence of flammable gasses or fumes can endanger persons proximate to the site of operation.

Verify that the line voltage is 220VAC.

Ground the Amplifier



Caution: NO NOT REMOVE THE AMPLIFIER COVER

Removal of the exciter cover will invalidate the Gamma Warranty. Component replacement and internal adjustments must be made only by PTEK qualified service personnel.

To minimize shock hazard, the exciter chassis must be connected to an electrical ground, the exciter must be connected to the AC power mains through a three-conductor power cable, with the third wire connected to an electrical ground (safety ground) at the power outlet. Any interruption of the protective (grounding) conductor or disconnection of the protective earth terminal will cause a potential shock hazard that could result in personal injury. If the exciter is to be energized by any other source be certain that the chassis is connected to a separate safety ground.

AC Line Fuses and trips

The Gamma series power amplifiers are provided with an 8 gauge 3 conductor “pig tail” AC Line cord. This should be wired into a breaker box and feed with a 2 pole 35A breaker

Output Connector



Warning: The Flange output connector carries dangerously high RF voltages that present shock and burn hazards. Never operate the Gamma power amp with -out properly terminating the output connector in either an adequately rated load or antenna.

Electrostatic Discharge (ESD)

A sudden discharge of electrostatic electricity can destroy static-sensitive devices or micro-circuitry. Proper packaging and grounding techniques are necessary precautions to prevent damage. Always take industry-standard precautions.

Grounding Methods

Guard against electrostatic damage at workstations by following these steps:

1. Cover workstations with approved anti-static material. Provide a wrist strap connected to a work surface and properly grounded tools and equipment.
2. Use anti-static mats, heel straps, or air ionizers to give added protection.
3. Handle electrostatic-sensitive components, boards, and assemblies by the case or the PCB edge.
4. Avoid contact with pins, leads, or circuitry.
5. Turn off power and input signals before inserting and removing connectors or test equipment.
6. Keep the work area free of non-conductive materials such as ordinary plastic assembly aids and Styrofoam.
7. Use field service tools, such as cutters, screwdrivers, and vacuums that are conductive.

General Safety Rules

- The device must be used in accordance with the instructions for use.
- Electrical installations in the room must correspond to the requirements of respective regulations.
- Take care that there are no cables, particularly mains cables, in areas where persons can trip over them.
- Do not use a mains connection in sockets shared by a number of other power consumers. Do not use an extension cable.
- Only use the mains cable supplied.
- The unit is completely disconnected from the power source only when the power cord is disconnected from the power source. Therefore the power cord and its connectors must always remain easily accessible.
- Do not set up the device in the proximity of heat sources or in a damp location. Make sure the device has adequate ventilation.
- All plugs on the connection cables must be screwed or locked to the chassis housing.
- The device is designed to be used in horizontal position only.
- The device is no longer safe to operate when the device has visible damage or the device no longer functions.
- In case of system malfunction or visible damage to the FM150ES, the device must be shut down and secured against unintentional operation.
- Repairs may only be carried out by a person authorized by PTEK LLC.
- If extensions are made to the FM150ES, the legal stipulations and the device specifications must be observed.
- The FM150ES must be switched off when removing the top cover.

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Preface

This document, entitled Gamma Operating Manual and User Guide , provides instructions on how to install, configure, power up, and perform diagnostics on the 2.0, 2.5 and 3kW Gamma FM Broadcast Transmitter. (see photo below). The information contained within is intended for an experienced system operator with a knowledge of high-performance broadcast transmission systems. The 4RU-high (7.0”) Gamma is designed to fit a standard 19” rack and is provided with rack-mount left and right brackets and handles. Rack-mount slides are also provided and must be used to mount the unit in a 19” rack cabinet



Gamma FM Broadcast transmitter

Key features of the Gamma FM Broadcast Transmitter include:

- Totally solid-state no-tune construction
- Wide input range from 210 to 264 VAC
- 3-year warranty on all parts and labor
- Remote-control interface
- Optional built-in stereo encoder
- Meets or exceeds all FCC and CCIR standards
- Designed and manufactured in the United States

The Gamma series are FCC-type verified for use on FM stations. Frequency stability for each unit is ensured by using PLL (phase-locked loop) frequency synthesis from a highly stable crystal oscillator. All units incorporate over-temperature protection and VSWR foldback to automatically reduce power output to safe operating levels

Switch-mode power supplies provide consistent performance even when there are frequent power outages and voltage fluctuations that make stressful demands on power dependence. An overview and specifications of the Gamma series Broadcast Transmitters is given in Chapter 1, "Overview and Specifications", of this manual.

Website Information

PTEK corporate and product information may be accessed on the World Wide Web by browsing the website <http://www.ptekpower.com>.

Your Comments are Welcome

We are interested in improving our documentation and welcome your comments and suggestions. You can email your comments to us at docfeedback@ptekpower.com . Please include the document part number in the subject line of your email.

Notes, Cautions, Warnings, and Sidebars

The following icons and formatted text are included in this document for the reasons described:



Note: A note provides additional information concerning the procedure or action being described.



Caution: A caution describes a procedure or action that may result in injury to the operator or equipment. This may involve—but is not restricted to—heavy equipment or sharp objects. To reduce the risk, follow the instructions accompanying this symbol.



Warning: A warning describes a procedure or action that may cause injury to the operator or equipment as a result of hazardous voltages. To reduce the risk of electrical shock and danger, follow the instructions accompanying this symbol.



Sidebar: A “sidebar” adds detail to the section within which it is placed, but is not absolutely vital to the description or procedure of the section.

General Section

Chapter 1

Overview and Specifications

1.1 Overview

The Gamma series are FCC-type verified for use on FM stations. Frequency stability for each unit is ensured by using PLL (phase-locked loop) frequency synthesis from a highly stable crystal oscillator. All units incorporate over-temperature protection and VSWR foldback to automatically reduce power output to safe operating levels

Switch-mode power supplies provide consistent performance even when there are frequent power outages and voltage fluctuations that make stressful demands on power dependence.

The 4RU-high (7.0”) Gamma is designed to fit a standard 19” rack and is provided with rack-mount left and right brackets and handles. Rack-mount slides are also provided and must be used to mount the unit in a 19” rack cabinet



Figure 1-1. Gamma Broadcast Transmitter

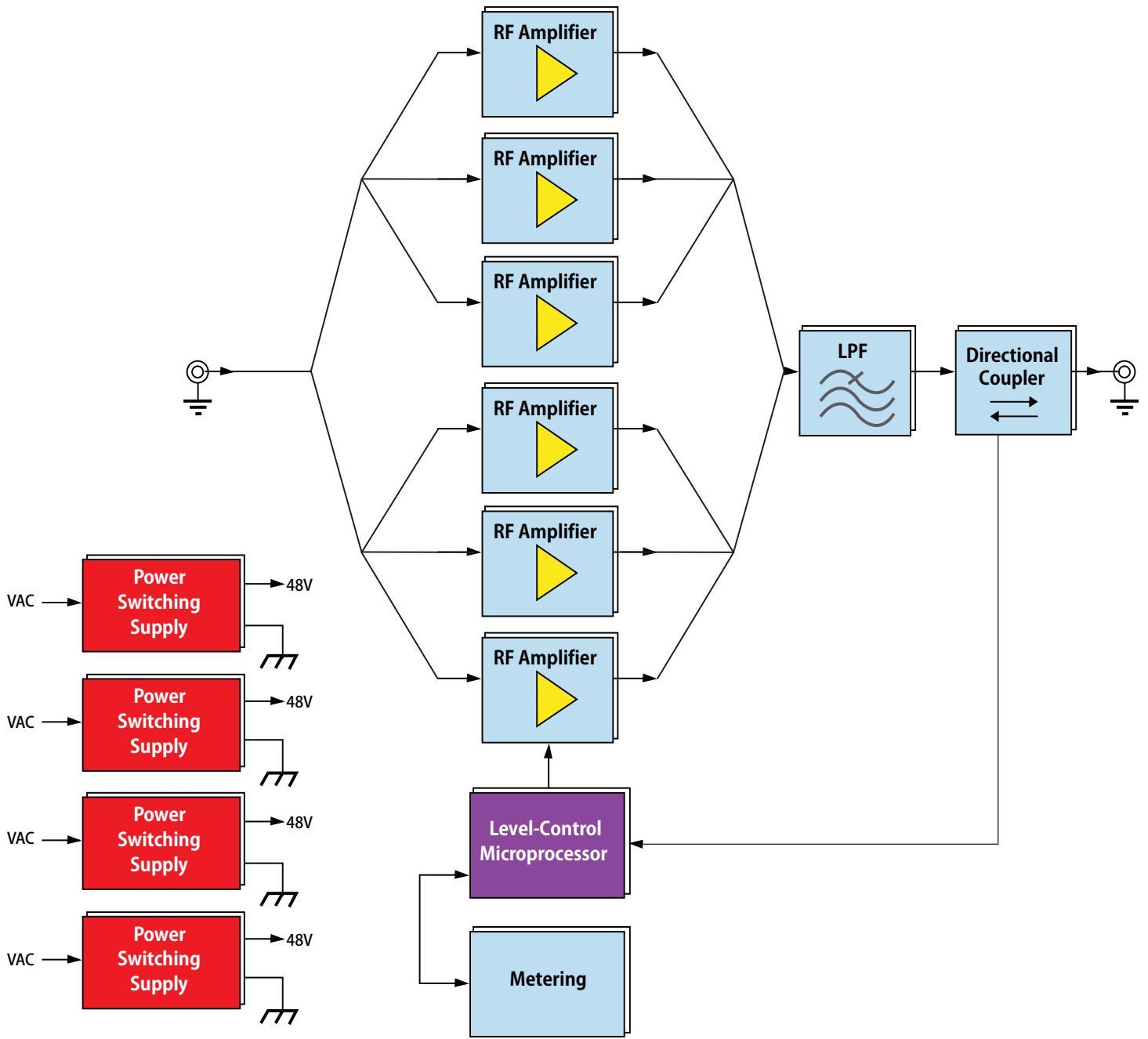


Figure 1-2. Gamma System Block Diagram

The Gamma series is designed within a 4RU-high (3.5”) form-factor that is 24” deep (including the front panel and rear protective flanges; the chassis body itself is 27” deep) and 17” (43.2 cm) wide (19” including the front panel to fit a standard sizerack).

Features on the Gamma front panel are shown in Figure 1-3.

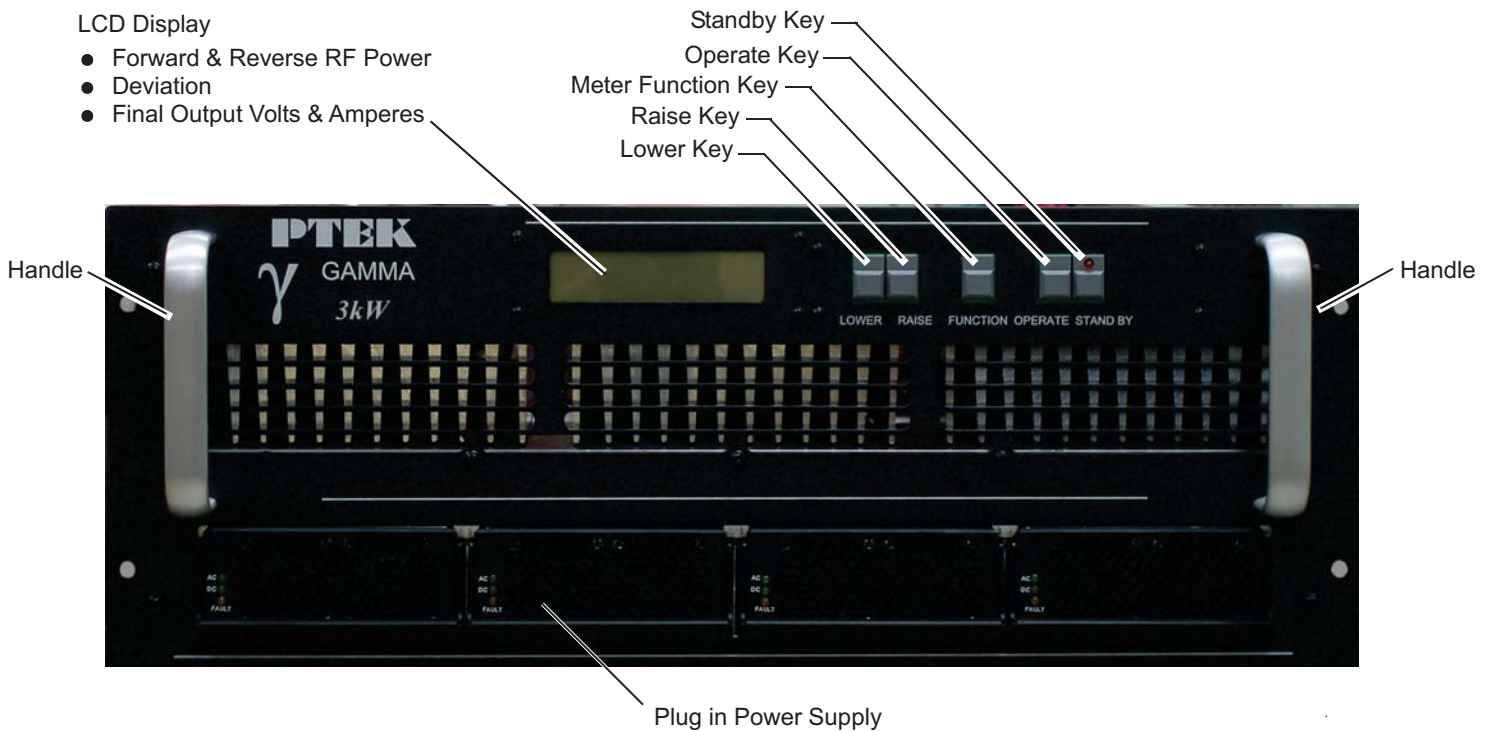


Figure 1-3. Gamma Front Panel

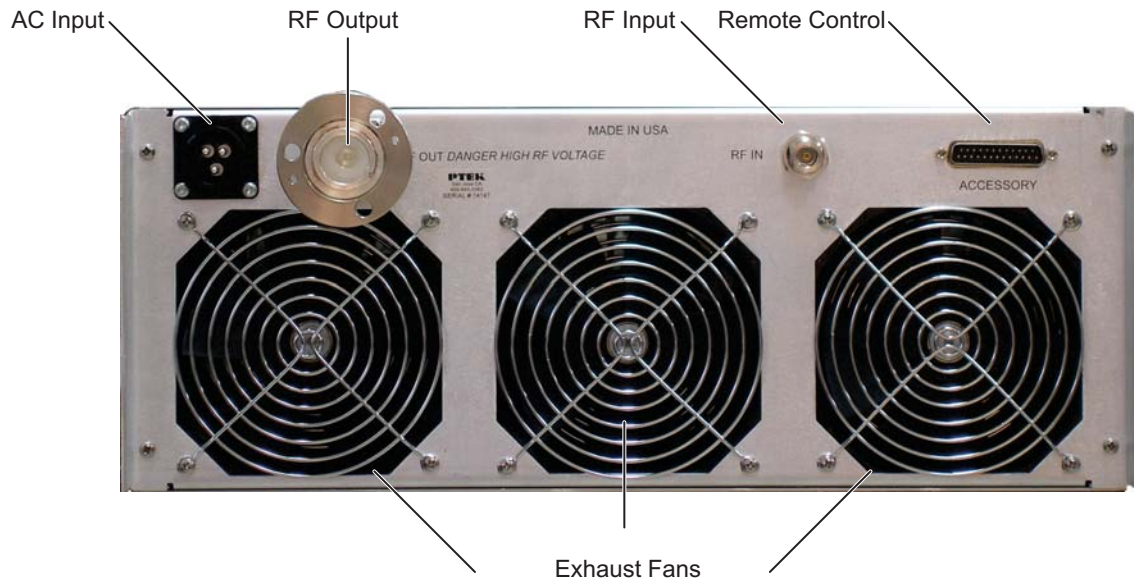


Figure 1-4. Gamma Rear Panel

1.2 Specifications

1.2.1 General

Table 1-1 lists general specifications for the Gamma Series.

Table 1-1. Gamma Series General Specifications

Parameter	Description
Dimensions	<ul style="list-style-type: none"> ⌘ 7.0" (4RU) high ⌘ 19" wide including the front panel ⌘ 24" deep (including the front panel and rear protective flanges; the chassis body itself is 17" deep)
Weight	<p>Total shipping weight is 90 pounds and includes the following:</p> <ul style="list-style-type: none"> ⌘ Chassis 70 pounds, including ⌘ Add 25 pounds for four AC power supplies packed separately.
19" Rack-Mountable with Slide capability	<ul style="list-style-type: none"> ⌘ Left and right rack-mount tabs and handles are attached directly to the chassis. Rack-mount slides are provided
Temperature Operating: Non-Operating:	<ul style="list-style-type: none"> ⌘ 0°C to +30°C ⌘ -40°C to +70°C
Relative Humidity Operating: Non-Operating:	<ul style="list-style-type: none"> ⌘ 8% to 90% non-condensing ⌘ 5% to 95% non-condensing
Maximum Wet Bulb Operating: Non-Operating:	<ul style="list-style-type: none"> ⌘ 27°C, non-condensing ⌘ 35°C, non-condensing
Altitude Operating: Non-Operating	<ul style="list-style-type: none"> ⌘ 0 to 10,000 feet above sea level ⌘ 0 to 40,000 feet above sea level

1.2.2 Electrical

Table 1-2 lists the electrical specifications for the Gamma with FM150ES Exciter.

Table 1-2. Electrical Specifications

Parameter	Description
Frequency Range	⌘ 87.7 MHz to 108 MHz
Audio Input Impedance	⌘ 600 ohms
Audio Input Level (Composite)	⌘ -10 dBm
Audio Input Level R & L Stereo Encoder (<i>optional</i>)	⌘ -10 dBm
Frequency Response (Composite)	⌘ 20 Hz to 15(90) KHz
Pre-Emphasis	⌘ 50 or 75 uS
Harmonic Distortion	⌘ < 0.15% max
Signal-to-Noise Ratio	⌘ > 80 dB rms
RF Output Impedance	⌘ 50 ohms
Output Connector	⌘ 7/8 EIA Flange
RF Power Output	⌘ 2100 for 2kW : 2600 for 2.5kW ⌘ 3150 for 3kW
Harmonic Attenuation	⌘ < -70 dB
Power Requirements	⌘ 220-264 VAC, externally fused 35A

1.2.2.1 System Power

The Gamma series is shipped with 4 (dependant on model) “plug in” AC power supplies packed separately to avoid damage. Each AC power supply has a 1500-watt output capacity that auto-ranges single-phase input from a 220 to 264 VAC (47 to 63 Hertz) source. AC is supplied from a rear-mounted power connector,

1.2.3 Environmental

1.2.3.1 Noise Level

Typical noise levels emitted by the Gamma series are outlined in Table 1-3. The chassis is installed with three 4.7" fans mounted side-by-side at the rear of the system. In addition, each AC power supply has its own cooling fan.

Table 1-3. Typical Noise Levels of the Gamma series

Measured at:	1 Meter	2 Meters
Front	81.24 dB	72.57 dB
Rear	86.53 dB	77.93 dB

1.3 Packaging and Shipping

The Gamma Series Broadcast Transmitter is packaged in a reusable shipping container. Approximate weight of an empty container and one (1) AC power cord is 9 pounds (4 kg). The approximate weight of a Gamma series transmitter with out power supplies is 60 pounds.

The power supplies are packed separately and weigh 25 pounds

1.3.1 Rack-Mount Slides

Rack-Mount slides are installed on each side of the Gamma for the purpose of sliding the unit easily in and out of a 19" rack using the convenient front handles. In order to support the weight of the uni, rack-mount slides should be used. To learn how to install rack-mount slides, refer to Appendix B, "Rack-Mount Slide Installation", on page B-1.

Installation Section

Chapter 2

Installation

2.1 Installation Procedures



Caution: Use industry-standard ESD grounding techniques when handling all components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface. Handle all IC cards by the front panel or edges only.

There are no operator serviceable parts inside the Gamma ; therefore, replacement, inspection, or adjustment of internal components within the Gamma requires service by a PTEK technician only. **DO NOT REMOVE THE TOP PROTECTIVE COVER OF THE Gamma CHASSIS** (see following Warning).

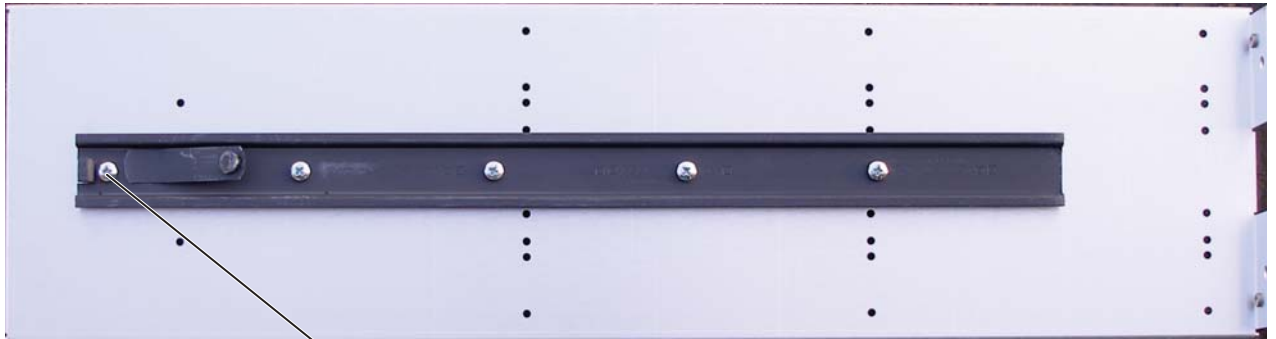


Warning: Removal of the top protective cover of the Gamma by anyone other than an authorized PTEK technician will void the product warranty.

2.2 Mounting in a rack



Warning: Make sure that the AC power cord is removed from the AC input connector on the rear of the Gamma before installing.



Mount side to side of the Gamma
use 10-32 Screws provided 5
places

Figure 2-1. Gamma Rack slides

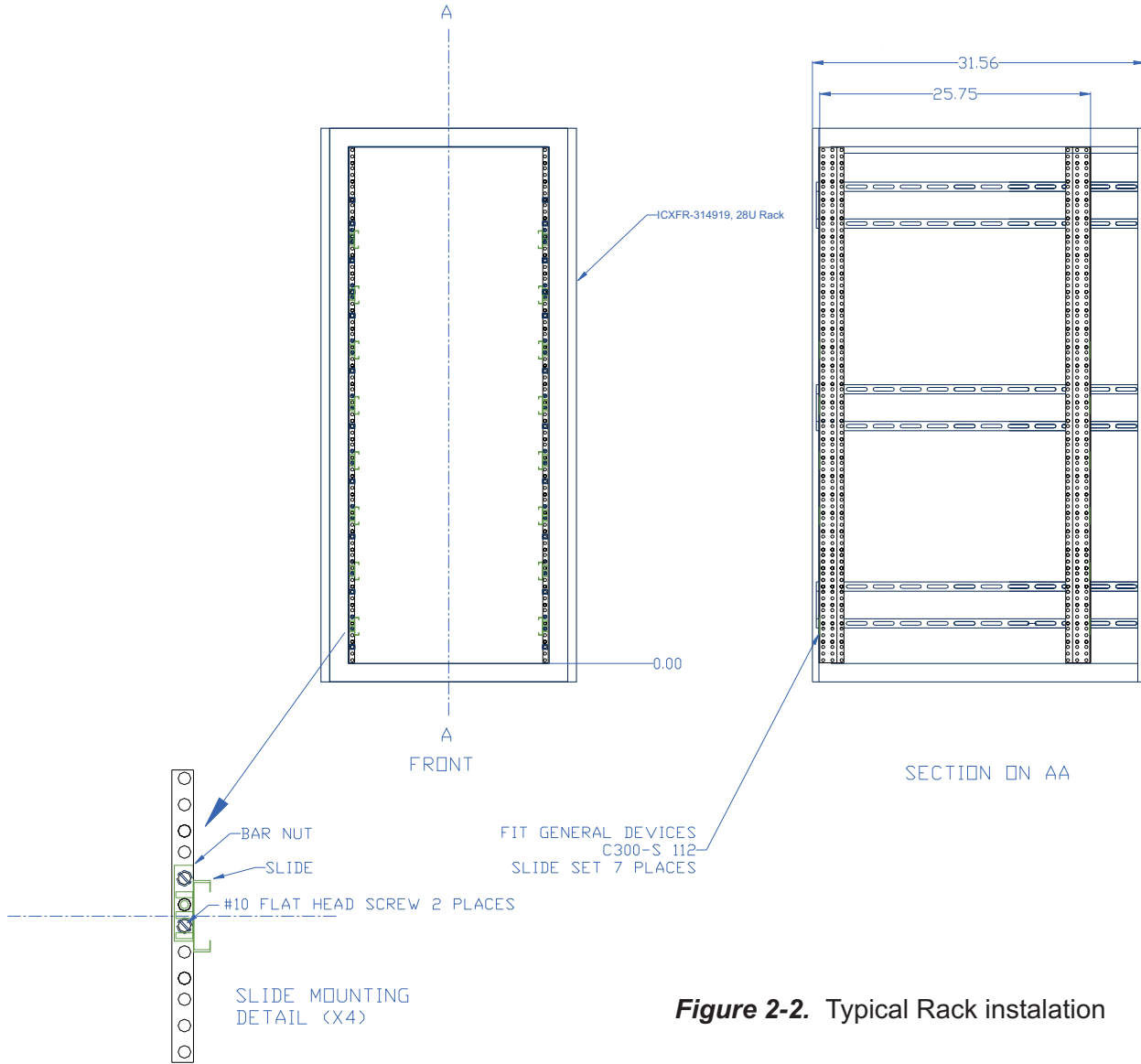


Figure 2-2. Typical Rack instalation



Figure 2-3. Fitting Gamma into Rack

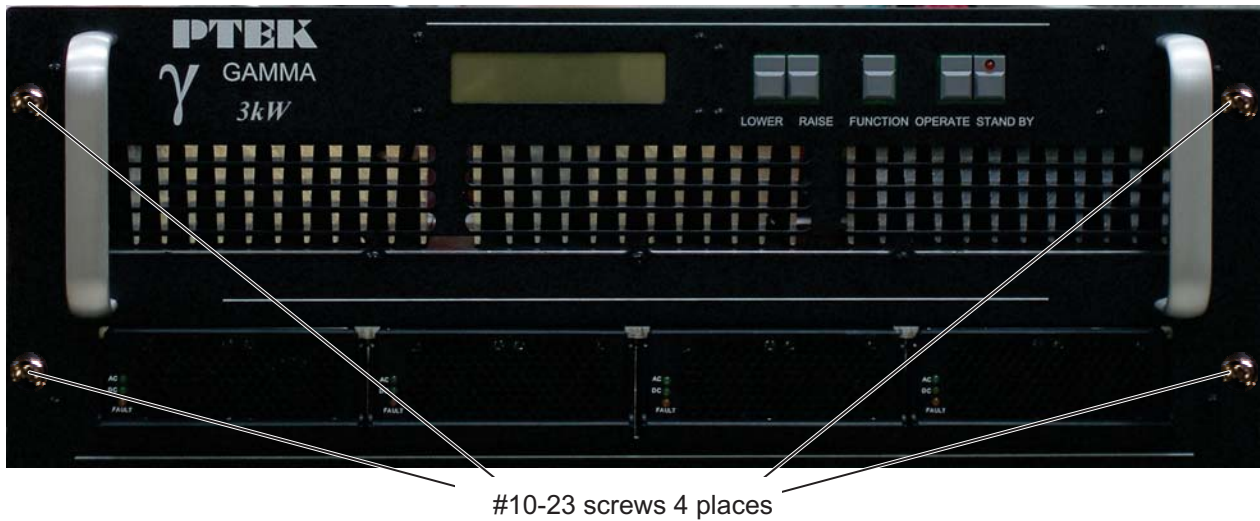


Figure 2-4. front panel screws

Using the supplied #10 screws with nylon washers screw the front panel securely to the rack.

2.3 Installing the Power Supplies

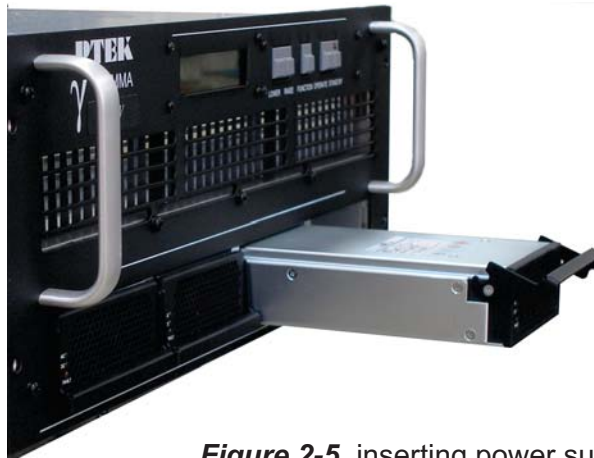


Figure 2-5. inserting power supplies

1. Place power supply in the power supply slot.



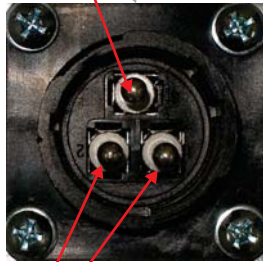
Figure 2-6. Locking power supplies

2. With the handle in the up position press the power supply fully into the slot.
3. Fully secure the power supply in place by pressing the handle down.

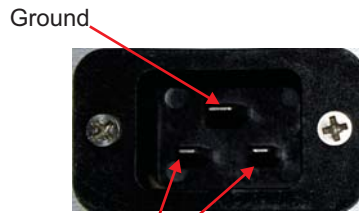
2.4 Electrical Connections



Figure 2-7. Gamma Rear panel



3 & 3.5kW



1, 1.5, 2 & 2.5kW

220 VAC

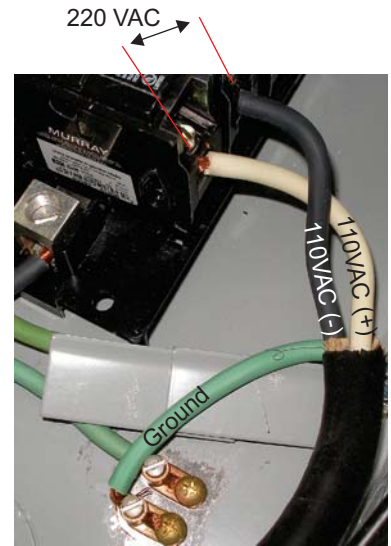
220 VAC

Connect the AC Line to a fused or tripped 220V single phase AC Supply. the Trip/fuse rating should be 35A.

Connect the Power output to the anetnna

Connect the Exciter output to the input connector

Optional Connect the 25 way D connector to the remote control



AC Cable connections to Breaker Box

Operation Section

Chapter 3

Operation

This chapter describes:

- How to set up the Gamma system to begin operation
- How to turn the Gamma on and off
- How to monitor and change the operational settings of the Gamma

3.1 Set Up the System

To successfully operate the Gamma Transmitter, it must be connected to a correctly matched antenna, an exciter and a 220V single phase supply.



Warning: PREVENT FIRES!

Ensure the 220V line is connected to a circuit breaker rated at 35A. Use the supplied 8 gauge 3 conductor cable.

Refer to the exciter manual for set up of the exciter. Set the power out put of the exciter to the following power levels dependant on the Gamma model.

Model	Exciter Drive Power
2000	100W
2500	125W
3000	150W

Table 3-1. Exciter drive powers

3.2 Power Up the System

1. Check that the exciter power is as above.
2. Switch the exciter to standby.
3. Operate the breaker to apply 220AC to the Gamma.
4. Check the following:.

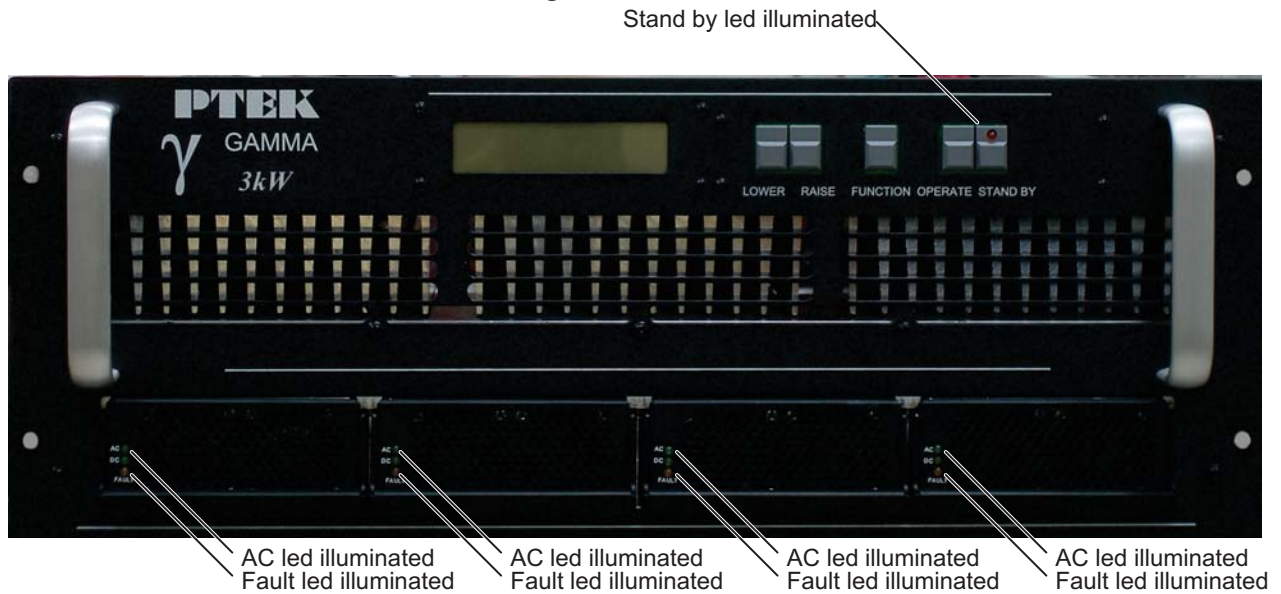


Figure 3-1. Gamma Front Panel

Press the OPERATE key on the front of the Gamma. Check that the fans are running and that the indications are as below:

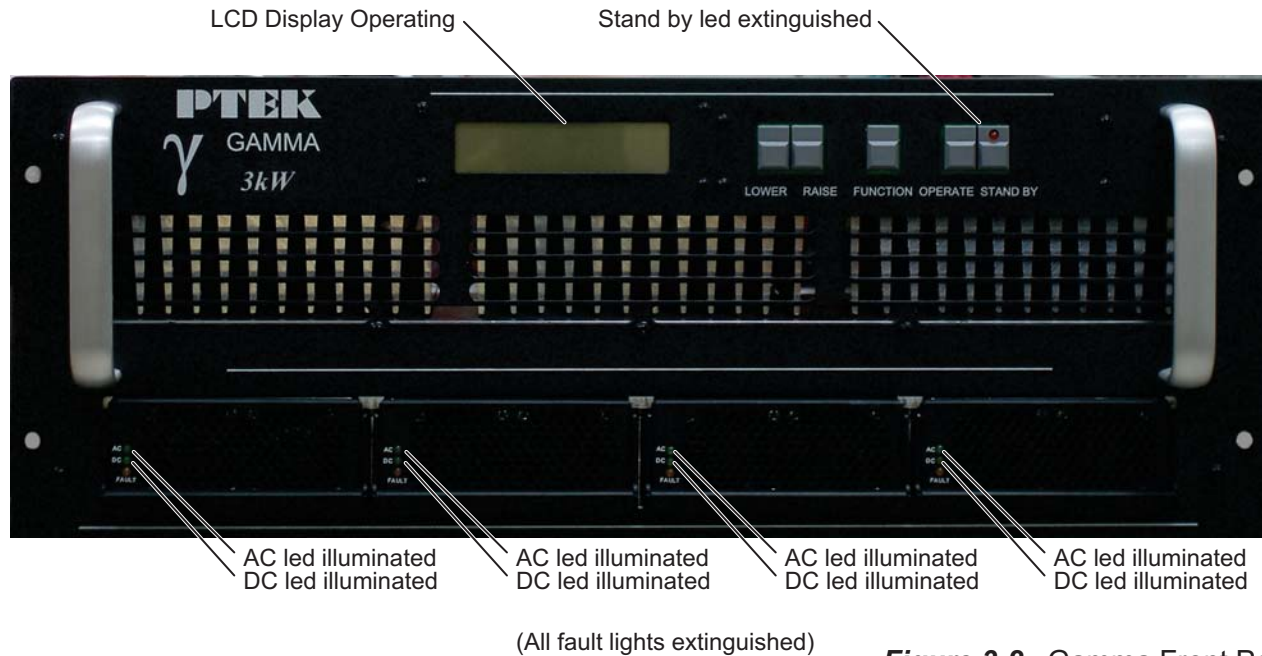


Figure 3-2. Gamma Front Panel

Switch the exciter to OPERATE

After the start up sequence has completed and the exciter is generating power the Gamma will also produce power.

Typically the power is set at the factory to a mid value i.e. 1500W for the 3000W Gamma. This should now be indicated on the LCD display similar to this:

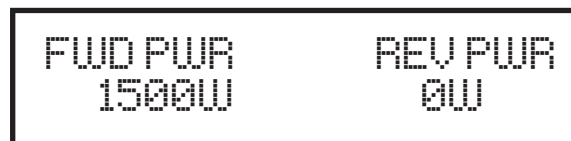


Figure 3-2. LCD Display Power

Pressing the function button will change the display to read Voltage and Current



Figure 3-3. LCD Display Current & Voltage

Pressing the function key will revert the display to read Forward and Reverse Power. At this point the power can be adjusted to the required output power by operating the raise or lower key as appropriate.

Note all the readings for future reference.

Below is a table of expected power outputs, current and efficiency.

3.3 Power Readings

Power Output	Gamma 1kW		Gamma 1.5kW		Gamma 2kW		Gamma 2.5kW		Gamma 3.0kW	
	Current	Efficiency	Current	Efficiency	Current	Efficiency	Current	Efficiency	Current	Efficiency
500	25	42%	28	37%	37	28%	41	26%	41	26%
600	27	46%	31	41%	41	31%	45	28%	45	28%
700	29	50%	33	44%	44	33%	48	30%	48	30%
800	31	53%	35	47%	47	35%	51	32%	51	32%
900	33	56%	38	50%	50	38%	55	34%	55	34%
1000	35	59%	40	53%	53	40%	57	36%	57	36%
1100			41	55%	55	41%	60	38%	60	38%
1200			43	58%	58	43%	63	40%	63	40%
1300			45	60%	60	45%	66	41%	66	41%
1400			47	62%	62	47%	68	43%	68	43%
1500			48	65%	65	48%	70	44%	70	44%
1600					67	50%	73	46%	73	46%
1700					69	52%	75	47%	75	47%
1800					71	53%	77	49%	77	49%
1900					73	54%	79	50%	79	50%
2000					75	56%	81	51%	81	51%
2100							83	53%	83	53%
2200							85	54%	85	54%
2300							87	55%	87	55%
2400							89	56%	89	56%
2500							91	57%	91	57%
2600									93	58%
2700									94	60%
2800									96	61%
2900									98	62%
3000									100	63%
3100									101	64%
3200									103	65%
3300									104	66%
3400									106	67%
3500									108	68%

Table 3-2. power Readings

3.3.4 Final Check

Pressing the FUNCTION key rotates the LCD display through the following screens:



Note: At each screen, pressing the LOWER or RAISE key changes the output power only. PA VOLTS and PA AMPS is another way of indicating the power output, accomplished by multiplying the voltage by the amperage (current), then multiplying the result by the efficiency.

Readings should be recorded weekly to keep track of changes, which may indicate developing problems such as antenna or coax deterioration.

1. After pressing the FUNCTION key on the front of the Gamma, the Forward and Reverse power readings appear on the LCD display (see Figure 3-9).

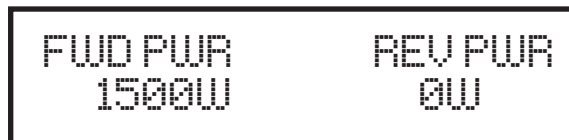


Figure 3-4. Press the FUNCTION Key to read Powers

2. Pressing the FUNCTION key again will display Voltage and Current on the LCD display (see Figure 3-10).



Figure 3-4. Press the FUNCTION Key to read Voltage and Current

3.4 Faults



Warning: Removal of the top protective cover of the Gamma by anyone other than an authorized PTEK technician will void the product warranty.

3.4.1 Over Temperature

Should the internal temperature exceed 40 degrees Centigrade the power will be reduced to a low value (typically around 300W). At this time the all the controls will be locked out and the stand by LED will flash. After a couple of minuetes the system will retry and power will be reset to the previous value. If the temperature is still in excess of 40 degrees Centigrade then again the power will be reduced as above.

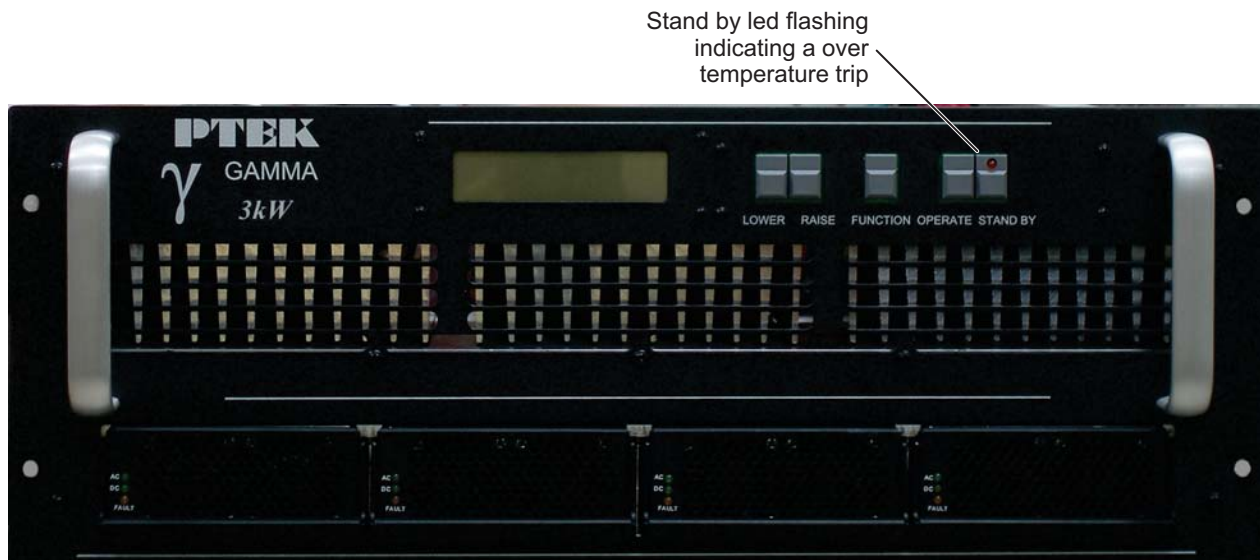


Figure 3-5. Over Temperature Indication

3.4.1 High VSWR

If the load VSWR is high indicated by a high reading on the reverse power meter (greater than 5% of the Forward Power reading). The power will be reduced progressively so as to limit the maximum reverse power. If the Load VSWR improves the power will be increased, ultimately to the previous set value.

3.4.2 Power Supplies

Each power supply has 3 LEDs AC good, DC good and Fault. In the stand-by mode the AC good and Fault will be illuminated. This is a normal condition. In operate mode both the AC good and DC good will be illuminated, the fault LED will be extinguished. Any other combination would indicate a fault with that power supply. Further confirmation of this would be that the other power supply are operating as expected.



Figure 3-6. Power Supply LEDs

3.5 Power Down the System

To power down (turn off) the Gamma, press the STANDBY key, then disconnect the AC power cord from the AC power socket on the rear panel of the chassis.

Built in exciter Option

Chapter 4

Operation

This chapter describes:

- How to set up the Exciter options to begin operation
- How to monitor and change the operational settings of the Exciter

4.1 Set Up the System

To successfully operate the Gamma FM Stereo Broadcast Transmitter, an antenna and an audio source must first be connected to the system, as outlined in the following steps:

1. Connect the antenna or power amplifier input to the RF output connector on the rear panel of the Gamma
2. Connect the audio input to one of the following connectors the rear panel:
 - Composite Input
 - Mono Input
 - Balanced Stereo Left and Right (if equipped with stereo encoder)

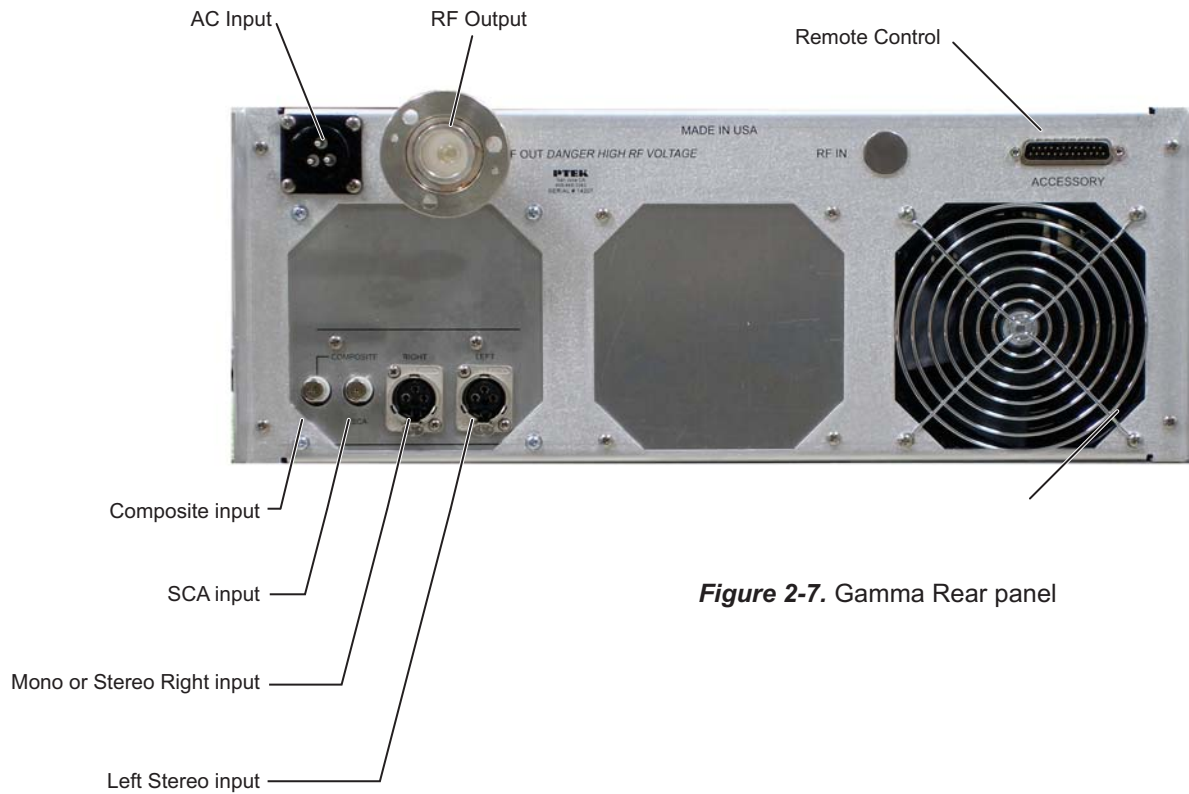


Figure 2-7. Gamma Rear panel

4.2 Power Up the System

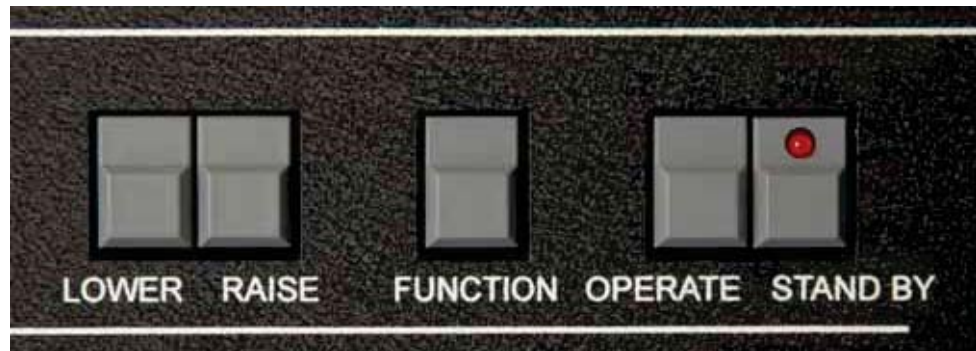
1. On the rear of the Gamma, plug an AC power cord (shipped with each unit) into the AC power socket (see *Figure 3-2* on page 3-3).
2. Plug the other end of the AC power cord into a “live” AC outlet.



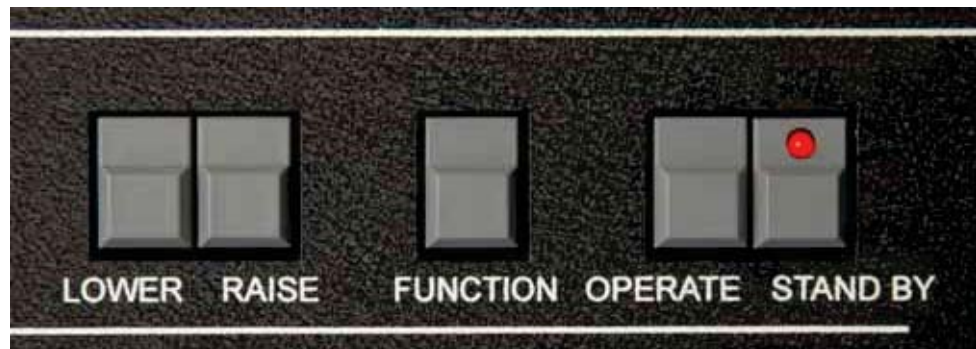
Note: There is no On/Off switch (key) on the Gamma FM Stereo Broadcast Transmitter. As soon as power is introduced to the system through an AC power cord attached to a “live AC outlet, if the system was powered off while in Standby mode, the system will again enter Standby mode and the light on the STANDBY key on the front of the Gamma will turn **red**.

If the system was powered off while not in Standby mode, it will begin the startup sequence described in the section “Startup Sequence” on page 3-4.

3. Make sure the STANDBY key on the front of the Gamma has turned red (or the system has begun the startup sequence), thus assuring that the system has powered on (see *Figure 3-3*, page 3-3).



A Before power is applied to the system, the STANDBY key LED is off



B After power is applied to the system, the STANDBY key LED turns red

Figure 3-3. After Power has been Applied to the FM500ES, it enters Standby mode

4.3 Getting Started

4.3.1 Startup Sequence

1. Press the OPERATE key on the front of the Gamma
2. After the OPERATE key is enabled, the LED display will show the initialization sequence and display the screens—in order—shown in *Figure 3-4*.

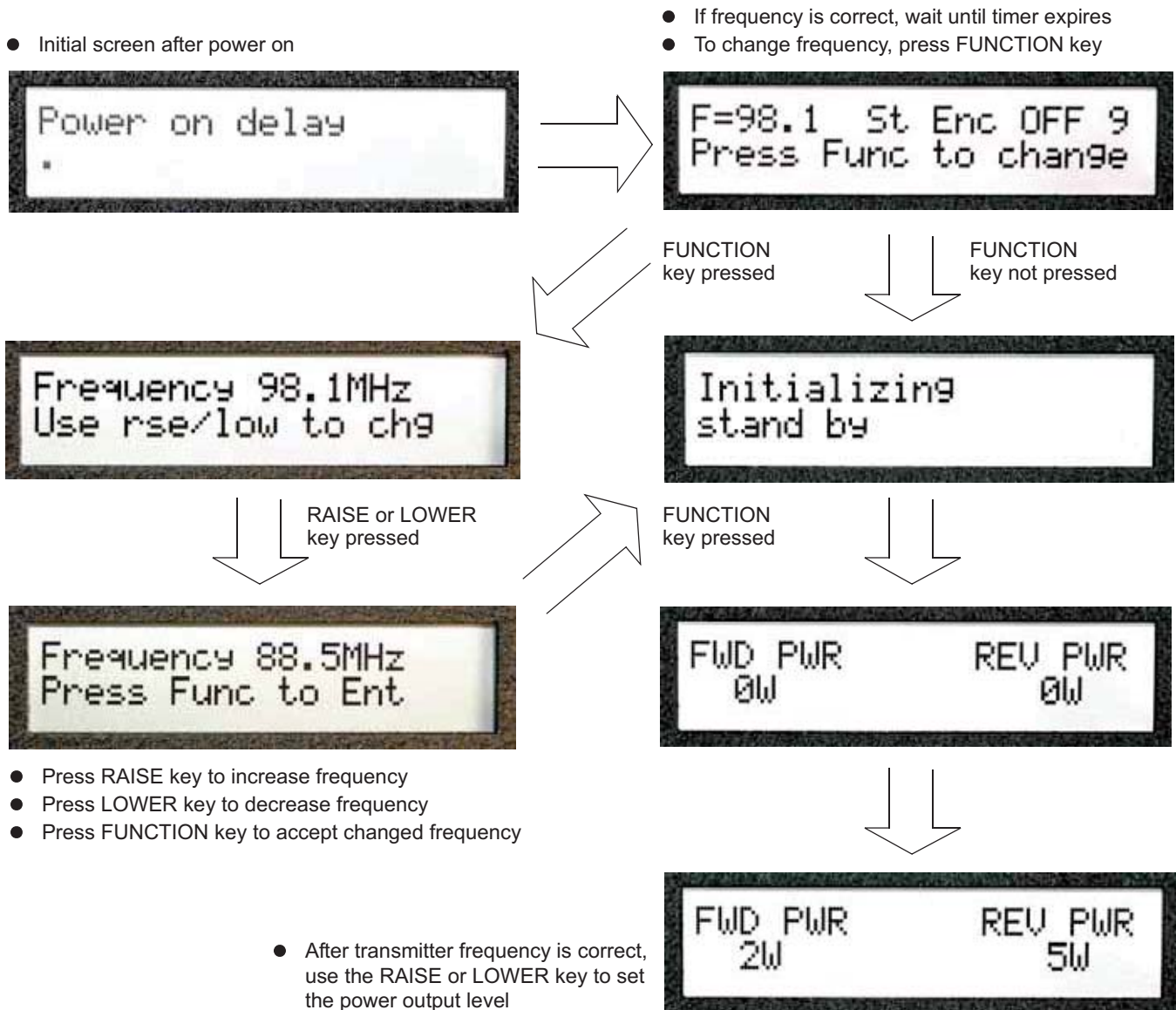


Figure 3-4. After the OPERATE Key is Pressed, the Startup Sequence Begins

4.3.2 Changing the Stereo Encoder

After changing the frequency in the startup sequence (see previous page), you have the option of changing the Stereo Encoder setting:

1. If the LCD screen displays the desired setting (Stereo Encoder OFF or ON), press the FUNCTION key to accept the setting (see *Figure 3-5*).



Figure 3-5. Stereo Encoder Can be Changed Through the LCD Display

2. To change the Stereo Encoder setting, press the RAISE or LOWER key, which will result in the alternate setting (see *Figure 3-6*).

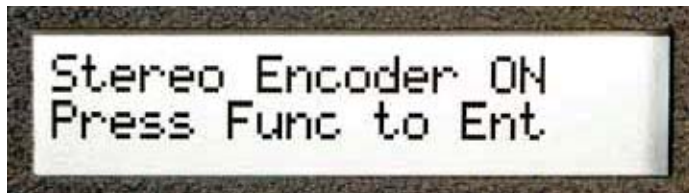


Figure 3-6. Press the RAISE or LOWER key to Change the LCD Display

4.3.3 Audio

Audio levels for the FM500ES have already been set and should not need to be changed. Deviation can be checked by pressing the FUNCTION key until the appropriate LCD screen is reached (see *Figure 3-7*).



Figure 3-7.

When the LCD display is in DEVIATION mode, the maximum deviation should occasionally reach 100% (indicated by the thick bar). If the 100% level is never reached or exceeds 100%, the level needs to be adjusted.

The output level from the audio source should be adjusted to give a peak deviation of 75 kHz (as described above).

If the correct deviation cannot be obtained, the audio gain can be raised or lowered by pressing the FUNCTION key until the appropriate LCD screen is reached (see *Figure 3-8*).

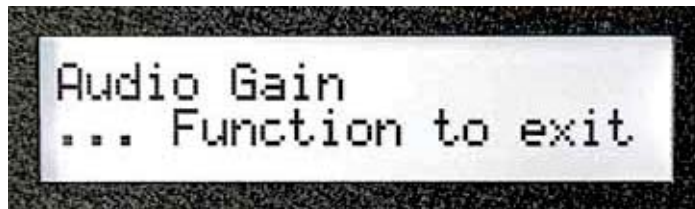


Figure 3-8. Audio Gain Can be Adjusted Through the LCD Display

When the AUDIO GAIN screen appears, the value may be raised by pressing the RAISE key or lowered by pressing the LOWER key until the desired deviation is reached. The Deviation Screen is Displayed through the FUNCTION Key

4.3.4 Final Check

Pressing the FUNCTION key rotates the LCD display through the following screens:



Note: At each screen, pressing the LOWER or RAISE key changes the output power only. PA VOLTS and PA AMPS is another way of indicating the power output, accomplished by multiplying the voltage by the amperage (current), then multiplying the result by the efficiency.

Readings should be recorded weekly to keep track of changes, which may indicate developing problems such as antenna or coax deterioration.

1. After pressing the FUNCTION key on the front of the Gamma the operating frequency will appear on the LCD display (see *Figure 3-9*).

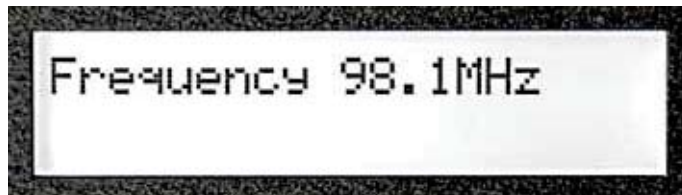


Figure 3-9. Press the FUNCTION Key to read Frequency

2. Pressing the FUNCTION key again will display the audio gain (see *Figure 3-10*).

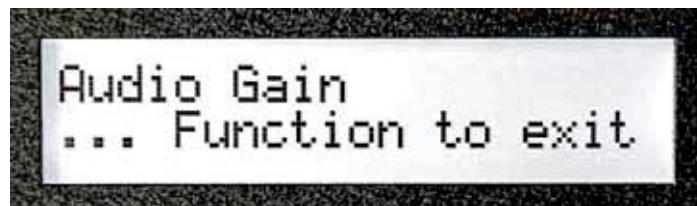


Figure 3-10. Press the FUNCTION Key to read Audio Gain

3. Pressing the FUNCTION key again will display the power output (volts multiplied by amps; see *Figure 3-11*).

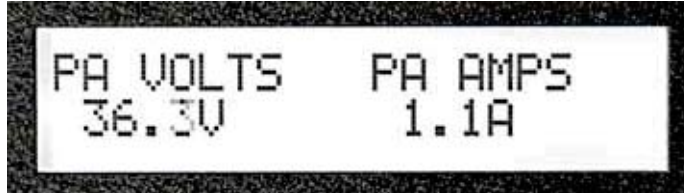


Figure 3-11. Press the FUNCTION Key to read VOLTS & AMPS

4. Pressing the FUNCTION key again results in a screen showing forward power and reverse power (see *Figure 3-12*).



Figure 3-12. Press the FUNCTION Key to read Forward & Reverse Power

5. A final pressing of the FUNCTION key will produce a screen showing deviation (see *Figure 3-13*).



Figure 3-13. Press the FUNCTION Key to read Deviation

As already noted, further pressing of the FUNCTION key will rotate the LCD display through a queue of the same screens.

4.4 Additional Adjustments

The Gamma offers additional capabilities by pressing the LOWER, RAISE, and FUNCTION keys simultaneously (see *Figure 3-14*).

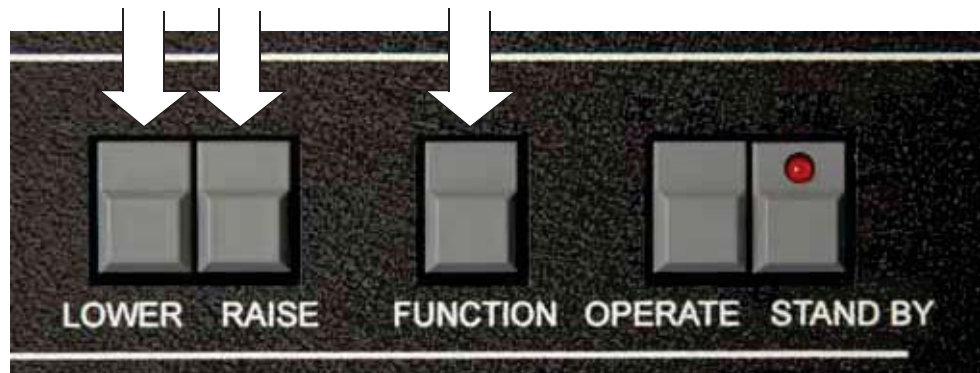


Figure 3-14. Press LOWER/RAISE/FUNCTION Keys Simultaneously



Note: When pressing LOWER, RAISE, and FUNCTION, the FM500ES cannot be in STANDBY mode.

The resulting LCD screens will appear as follows:

1. First,

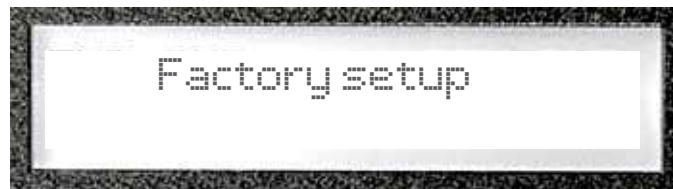


Figure 3-15.

After a few seconds, _____

Press the FUNCTION key to display the next LCD screen.

Caution do not change any of these setting unless you have the proper test equipment and are able to make the aproprate mea-
surements

2.

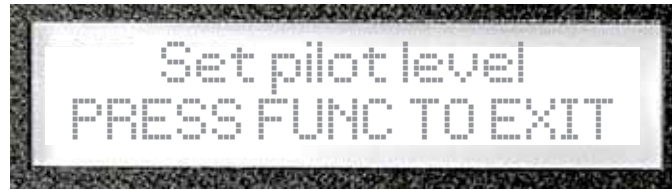


Figure 3-16.

Use the raise Lower Keys to adjust

3.



Figure 3-17.

4.

4.6 Power Down the System

To power down (turn off) the FM500ES FM Stereo Broadcast Transmitter, press the STANDBY key, then disconnect the AC power cord from the AC power socket on the rear panel of the chassis.

Appendix A

Connector Pinouts

This appendix provides connector pinouts and signal descriptions for the user I/O connectors that are installed on the Gamma Broadcast Transmitter rear I/O Panel (see Figure 1-4, page 1-3, in Chapter 1, "Overview and Specifications").

A.1 Accessory Port

The Gamma rear I/O Panel provides a 25-pin male DB25 connector as an accessory-port interface. A pinout is provided in Figure A-1; signal descriptions are defined in Table A-1 on page A-2.

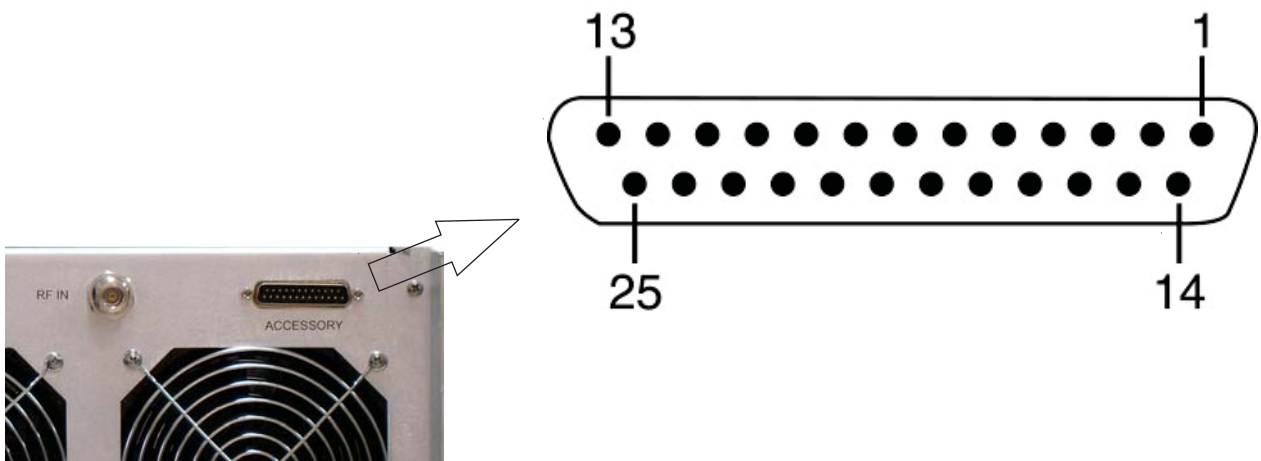


Figure A-1. Accessory Port Pinout

Table A-1. Accessory Port Pinout Signal Descriptions

Pin	Signal Function
1	Forward power DC indication; 2.4V = 3000W
2	Final voltage DC indication; V = V/10
3	<i>Not used</i>
4	<i>Not used</i>
5, 6, 18, 19	<i>Not used</i>
7	<i>Not used</i>
8	Raise; ground to raise the output power
9	<i>Not used</i>
10	<i>Not used</i>
11, 12, 23, 24	Ground
13	Remote on (ground to turn the unit on momentarily only)
14	Reverse power DC indication; 2.4V = 3000W
15	<i>Not used</i>
16	<i>Not used</i>
17	<i>Not used</i>
20	Lower; ground to lower the output power
21	Final current DC indication; Full scale = 2.5V
22	<i>Not used</i>
25	Remote off (ground to turn the unit off momentarily only)