



## OWNER'S MANUAL

# Model 5101F

RF POWER AMPLIFIER

0.8 – 2.5 GHz, 50 Watts

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## Certification

Ophir RF certifies that this product met its published specifications at the time of shipment from the factory.

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## Warranty

This Ophir RF product is warranted against defects in material and workmanship for a period of two (2) years from date of receipt. During the warranty period, Ophir RF, will, at its option, either repair or replace products that prove to be defective. For warranty service or repair, this product must be returned to a service facility designated by Ophir RF.

### **Limitation of Warranty**

The foregoing warranty shall not apply to defects resulting from improper or inadequate maintenance by Buyer, Buyer-supplied software or interfacing, unauthorized modification or misuse, operation outside of the environmental specifications for the product, or improper site preparation or maintenance.

NO OTHER WARRANTY IS EXPRESSED OR IMPLIED. OPHIR RF SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

### **Exclusive Remedies**

THE REMEDIES PROVIDED HEREIN ARE BUYER'S SOLE AND EXCLUSIVE REMEDIES. OPHIR RF SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER BASED ON CONTRACT, TORT, OR ANY OTHER LEGAL THEORY.

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## Assistance

*For any assistance, contact your Ophir RF Sales and Service Office.*

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## Safety Information

The following safety notes and symbol are used in this manual and on the equipment. Familiarize yourself with each and its meaning before operating this equipment.

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**Caution** Caution denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, would result in damage to, or destruction of, the equipment. Do not proceed beyond a caution note until the indicated conditions are fully understood and met.

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**Warning** Warning denotes a hazard. It calls attention to a procedure which, if not correctly performed or adhered to, could result in injury or loss of life. Do not proceed beyond a warning note until the indicated conditions are fully understood and met.

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The instruction documentation symbol. The product is marked with this symbol when it is necessary for the user to refer to the instructions in the documentation.

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## General Safety Considerations

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**Warning** This is a safety Class I product provided with a protective earthing ground incorporated in the AC power cord. The AC power cord shall only be inserted in a socket outlet provided with a protective earth contact. Any interruption of the protective conductor, inside or outside of the equipment, is likely to make the equipment dangerous. Intentional interruption is prohibited.

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**Warning** No operator serviceable parts inside. Refer servicing to qualified personnel. To prevent electrical shock, do not remove covers.

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**Warning** If this equipment is used in a manner not specified by Ophir RF, the protection provided by the equipment may be impaired.

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**Caution** Before switching on this equipment, make sure that the line voltage is correct and that an External Load has been applied. (Refer to 2.2.3)

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# Contents

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<b>Section</b>		<b>Page</b>
<b>I</b>	<b>General Information</b>	<b>5</b>
	Declaration of Conformity	5
	Scope	5
	Description	5
	Equipment Specifications	6
<b>II</b>	<b>Installation</b>	<b>7</b>
	Incoming Inspection	7
	Preparation for Use	7
	Power Requirements	7
	Earthing	7
	Load Requirements	7
	Cable Connections	7
<b>III</b>	<b>Operation</b>	<b>8</b>
	Introduction	8
	Statement Against Unspecified Use	8
	Controls, Indicators, and Connectors	8
	Basic Operating Procedures	8
	Before Turn On	8
	Turn On	9
	Operation	9
	Turn Off	9
<b>IV</b>	<b>Maintenance</b>	<b>10</b>
	Introduction	10
	Performance Test	10
	Adjustment Procedures	10
	Troubleshooting Procedures	10
	Improper Power Distribution	10
	Low or No RF Output Power	10
	Cleaning	10
<b>V</b>	<b>Customer Service</b>	<b>11</b>
	Servicing	11
	Return Material Authorization (RMA)	11
	Repackaging for Shipment	11
	RMA Request Form	12

## Figures

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Figure 1	Block diagram	13
Figure 2	System View	14

## Tables

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Table 1	Equipment Specifications	6
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# SECTION I

## General Information

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### 1.1 Declaration Of Conformity

#### DECLARATION OF CE CONFORMITY

Ophir RF Inc., 5300 Beethoven Street, Los Angeles, CA 90066, declares under sole responsibility that the RF Power Amplifier, Model 5101F, to which this declaration relates, meets essential health and safety requirements and is in conformity with ISO 3864. The CE marking has been applied according to the relevant Safety and CE Directives listed below using the relevant section of the following EC standards and other normative documents:

**EU EMC DIRECTIVE 89/366/EEC** - Essential health and safety requirements relating to electromagnetic compatibility

**ENEN55022** Class B

**EN50082-1** EC generic immunity requirements, Category A & B

**IEC801-2, IEC801-3, IEC801-4**

**EC Low Voltage Directive 72/23/EEC** Essential health and safety requirements relating to electrical equipment designed for use within certain voltage limits.

**EN61010-1** Safety requirements of Test Measurement and Laboratory Equipment.

### 1.2 Scope

This owner's manual contains operating instructions for a model 5101F amplifier.

### 1.3 Description

The power amplifier operates in the RF frequency. The input to the power amplifier is rated at 0 dBm nominal CW signal between the 0.8 – 2.5 GHz frequency range. The output of the power amplifier is specified at 50 Watts CW RF signal. Detailed specifications for the power amplifier are given in table 1-1.

# Equipment Specifications

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Table 1-1. Specifications @ 25° C

Class of Operation:	A/AB
Frequency Range:	0.8 – 2.5 GHz
Output Power @ Saturation:	50 Watts CW Typical
Output Power @ 1 dB Compression:	40 Watts CW minimum
Small Signal Gain:	+48 dB minimum
Small Signal Gain Flatness:	± 2.0 dB maximum
Input/Output Impedance:	50 ohms nominal
Input VSWR:	2:1 maximum
<b>Max. RF Input</b>	<b>+10 dBm</b>
Operating Temperature Range:	0° C to 50° C
Operating Humidity Range:	95%, Non-condensing
Temp. Protection:	Shut down @ 80° C minimum
Cooling system:	Internal Forced Air
AC Input:	100 - 240 VAC, 50/60 Hz, 1↓
AC Input Power:	600 Watts maximum
Dimensions:	19" W x 5.25" H x 20" D
Weight:	48 Pounds maximum

Option(s) included:

- Type-N Connectors on Front Panel.

**\*NOTE – Specifications subject to change without notice**

# SECTION II

## Installation

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### 2.1 Incoming Inspection

#### **WARNING!**

**Do not apply power until you have read Sections II and III and you have performed all specified procedures. If you fail to observe this warning, damage to the equipment and/or bodily injury may result.**

The power amplifier has been mechanically and electrically inspected prior to shipment. If the equipment has been damaged or if electrical performance is not within specification, notify the carrier and OPHIR RF immediately.

### 2.2 Preparation For Use

#### 2.2.1 Power Requirements

The power amplifier requires a power source of 100 – 240 VAC, 50/60 Hz capable of delivering 600 Watts. Turn off the front panel 'ON/OFF' switch **before** connecting the AC power source.

#### 2.2.2 Earthing

Earthing is achieved simultaneously with connection of the AC power cords to a properly grounded power source.

#### 2.2.3 Load Requirements

The power amplifier requires a load, antenna, or dummy load with a 50-Ohm nominal impedance.

#### **CAUTION!**

Make this external load connection before applying any power to the equipment.

#### 2.2.4 Cable Connections

The AC power cable connection is made at the rear of the power amplifier via the receptacle connector. RF connections for Input and Output are made at the front via Type-N connectors. (Refer to Figure 2)



# SECTION III

## Operation

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### 3.1 Introduction

This section describes the operating controls and procedures of the power amplifier.

### 3.2 Statement Against Unspecified Use

This amplifier must be used as specified by the manufacturer. Use of this equipment in any way not specified by the manufacturer may result in bodily injury and/or damage to the equipment.

### 3.3 Controls, Indicators, and Connectors

When set to ON, the ON/OFF switch will light indicating that AC power is present. The RF INPUT and OUTPUT connections are located on the front of the power amplifier. Refer to figure 2 and the following discussion for the location and functional description of all controls, indicators, and connectors.

### 3.4 Basic Operating Procedures

#### NOTE!

The operation of the power amplifier is passive; that is, after an External Load and Input power have been applied, no procedures other than turn off are required.

### 3.5 Before Turn On

#### CAUTION!

**Do not obstruct the airflow at the front and rear of the power amplifier. If you do not verify that this equipment has an unobstructed airflow, you may cause this equipment to overheat or otherwise impair its operation.**

Perform the following preliminary procedures before energizing the equipment:

- a. Check that the ON/OFF switch is set to the 'OFF' position.
- b. At the rear of the RF power amplifier, verify that the AC cord is properly inserted into the receptacle connector.
- c. Verify that 50 ohm loads are connected to the RF Input and Output ports.

### 3.6. Turn On

Perform the following procedures to energize the equipment:

- a. Set the ON/OFF switch to the 'ON' position. Verify that the green switch lamp is lit.
- b. Apply RF power.

#### CAUTION!

To maintain specified performance and retain certain operating characteristics, RF input power should not exceed +10 dBm.

### 3.7. Operation

#### 3.7.1 ON/OFF Switch

In the 'ON' position, AC power is supplied to the power amplifier.

#### 3.7.2 ON/OFF Switch Lamp

Lights to indicate the distribution of AC power throughout the power amplifier.

#### 3.7.3 TEMP. FAULT Indicator

Lights at an internal temperature exceeding 80° C with the amplifier turning off DC bias voltage to the main amplifiers' modules. DC bias voltage will automatically return at temperatures below 75° C.

### 3.8 Turn Off.

#### **WARNING!**

In the event of ANY power failure, whenever possible and practical, it is advisable to reset the ON/OFF switch on the front panel to the "OFF" position before you reconnect AC power to the power amplifier. This is to prevent any possible electrical damage to the amplifier, due to the initial power surge, once power is restored.

Turn off the RF power amplifier by first lowering or removing the RF Input drive level and then placing the ON/OFF switch in the 'OFF' position.

# SECTION IV

## Maintenance

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### 4.1 Introduction

This section describes the performance tests, adjustments and troubleshooting procedures for the power amplifier.

### 4.2 Performance Test

The performance test is identical to the operating procedure described in Section III.

### 4.3 Adjustment Procedure

There are no operator adjustments applicable for the power amplifier.

### 4.4 Troubleshooting Procedure

#### NOTE!

**Troubleshooting beyond the level described in this procedure must be performed at an authorized service facility or the warranty may be voided.**

The following troubleshooting procedure is to be used as a guide to help ascertain whether the equipment is malfunctioning.

#### 4.4.1 Improper Power Distribution

Whenever there appears to be improper power distributed throughout the amplifier, perform the following steps:

- a. Verify the 'ON/OFF' switch lamp is illuminated on the front panel.
- b. Verify that the internal fans are operating.
- c. If neither step A or B above appear to be working, verify the presence of AC power at the source and also at rear panel connection.

#### 4.4.2 Low or No RF Output Power

Whenever the RF output power of the amplifier and/or the current drawn from the power supply is low, or the operating temperature has exceeded 80°C, the system may have triggered the thermal protection function. Perform the following procedure:

- a. Verify that the drive level is correct.
- b. Check that the 'TEMP. FAULT' indicator is not illuminated.

If the above conditions are verified and there is still low or no RF output power, then contact your nearest authorized Ophir RF Service Center.

### 4.5. CLEANING

Use a rag with isopropyl alcohol to clean exterior surfaces. Use a vacuum to remove dust from the screens on the front and rear of the equipment.

# SECTION V

## Customer Service

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### 5.1 Servicing

All servicing and repair must be done by an authorized repair and servicing facility.

### 5.2 Return Material Authorization (RMA)

In the unlikely event you experience equipment difficulties that can not be resolved without opening up the equipment, you will need to obtain authorization and an RMA number prior to returning the equipment.

#### **NOTE!**

**It is Ophir RF's policy not to accept any returned equipment without an authorized RMA number!**

### 5.3 Repackaging for Shipment.

#### **WARNING!**

It is always recommended that two people carry this system due to its weight.

Use the original shipping container and packing materials if possible. If these have been discarded or are not in good condition for reuse, use a heavy-duty carton capable of providing adequate protection. Whenever the amplifier is being returned to the manufacturer, attach an identifying tag, indicating the RMA number, on the outside of the container.

Wrap the equipment in heavy paper or plastic, and use enough shock-absorbing material (3 to 4-inch layers) around all sides to provide a firm cushion and to prevent movement within the container. Protect the front and rear panels with cardboard or foam blocks. Seal the shipping container securely and mark the container "**FRAGILE**".

To receive your RMA number, contact our customer service department.

#### **Customer Service**

**Phone: 310-306-5556**

**Fax: 310-577-9887**

**Email: [CustomerService@ophirrf.com](mailto:CustomerService@ophirrf.com)**

You will be required to complete a simple questionnaire prior to receiving your RMA number. Once you have your RMA number, you are authorized to return your equipment.

To help you expedite this process, we have included a copy of the form you will be required to complete prior to receiving your RMA number.



5300 Beethoven Street, Los Angeles, CA 90066  
Tel: (310) 306-5556 • FAX (310) 577-9887 • e-mail: customerservice@ophirrf.com

**RMA REQUEST FORM**

**RMA NUMBER:** \_\_\_\_\_

**CUSTOMER NAME:** \_\_\_\_\_

**RECEIVED**

**FROM ADDRESS:** \_\_\_\_\_

(STREET ADDRESS – INCLUDING SUITE OR M/S NUMBER)

\_\_\_\_\_  
(CITY – STATE – ZIP OR COUNTRY CODE) (COUNTRY)

**RETURN TO ADDRESS:**

\_\_\_\_\_  
(STREET ADDRESS – INCLUDING SUITE OR M/S NUMBER)

\_\_\_\_\_  
(CITY – STATE – ZIP OR COUNTRY CODE) (COUNTRY)

**CONTACT PERSON:**

\_\_\_\_\_  
(FIRST AND LAST NAME) (TITLE/RANK)

\_\_\_\_\_  
(TELEPHONE) (FAX)

\_\_\_\_\_  
(E-MAIL)

**MODEL NUMBER** \_\_\_\_\_ **SERIAL NUMBER** \_\_\_\_\_

**REASON FOR RMA:**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**PLEASE FAX THIS FORM TO OPHIR RF, INC.  
AT (310) 577-9887 ATTN: CUSTOMER SERVICE**

**THERE IS A \$500 MINIMUM EVALUATION CHARGE FOR ALL NON-WARRANTY REPAIRS. PURCHASE ORDER TO BE PRESENTED PRIOR TO COMMENCEMENT OF REPAIRS. FOLLOWING EVALUATION, THE COST OF REPAIRS WILL BE SUBMITTED FOR YOUR APPROVAL AND PURCHASE ORDER AMENDMENT.**

**DO NOT SHIP AMPLIFIERS C.O.D. – OPHIR RF WILL NOT ACCEPT ANY C.O.D. SHIPMENTS. PLEASE CALL US WITH ANY SHIPPING QUESTIONS.**