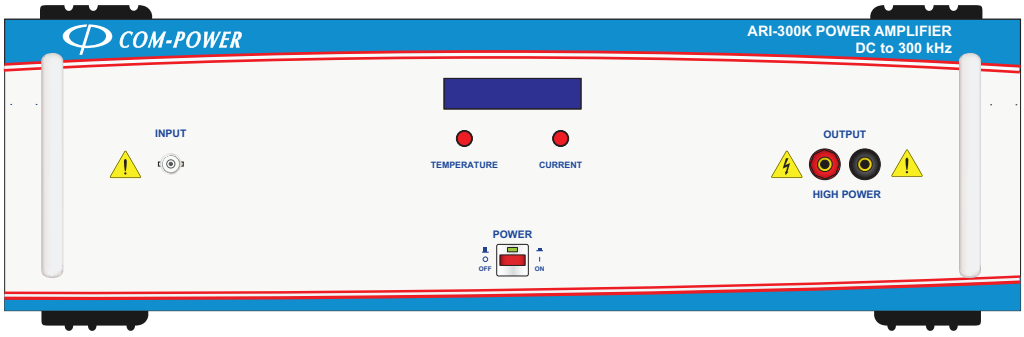
INSTRUCTION MANUAL
For

POWER AMPLIFIER

Model:
ARI-300K



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1.0 Introduction

This owner's manual contains operating instructions for the ARI-300K Power Amplifier.

2.0 Products Available from Com-Power


Antennas


Antenna Kits


Absorbing Clamps


Coupling/Decoupling Networks (CDN)


Comb Generators


Current Probes & Bulk Current Injection Probes


Emissions Test Systems


Conducted Immunity Test Systems


Impedance Stabilization Networks (ISN)

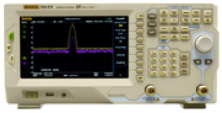

Line Impedance Stabilization Networks (LISN)


Antenna Masts


Near-Field Probe Sets


Preamplifiers


Power Amplifiers


Spectrum Analyzers


Surge Generators


Transient Limiters

Turntables


Antenna Tripods


Telecom Test Systems

www.com-power.com

3.0 Product Information

3.1 Product Description

The Com-Power ARI-300K Power Amplifier is specifically geared for conducted and radiated susceptibility testing such as that described in MIL-STD-461 (CS101 & RS101) and RTCA DO-160 (Section 18), in addition to other standards. The ARI-300K operates from DC to 300 kHz.

The amplifier is equipped with protection circuitry to avoid damage in the case of input overload, improper output connections (shorted or improper loads), over-temperature as well as over-current conditions.

There is a also a digital ammeter display on the front panel along with LEDs for indication of any over-temperature and over-current conditions.

3.2 Incoming Inspection

WARNING!

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 Com-Power immediately.

3.3 Safety Information

3.3.1 Definitions of Safety Notes and Symbols

The hazard symbols appearing on the product exterior are defined below.

The yellow triangle with an exclamation mark indicates the presence of important operating and/or maintenance (servicing) instructions in the literature accompanying the product.

The yellow triangle with a lightning bolt indicates an alert to the user that uninsulated ***dangerous voltages*** are present within the product enclosure and on output connectors. These voltages may be of sufficient magnitude to constitute a risk of electric shock to persons.

The Ground symbol inside a circle indicates terminal which is intended for connection to an external conductor for protection against electric shock in case of a fault, or the terminal of a protective earth (ground) electrode.

To indicate on the rating plate that the equipment is suitable for AC current.

3.3.2 General Safety Considerations

The following safety instructions have been included in compliance with safety standard regulations. Please read them carefully.

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.

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

Warning If this equipment is used in a manner not specified by Com-Power Corporation, the protection provided by the equipment may be impaired.

Caution Before switching on this equipment, make sure that the line voltage is correct and that an External Load has been applied.

3.3.3 General Safety Instructions/Precautions

- **READ AND RETAIN INSTRUCTIONS** - Read all safety and operating instructions before operating the instrument. Retain all instructions for future reference.
- **HEED WARNINGS** - Adhere to all warnings on the instrument and operating instructions.
- **FOLLOW INSTRUCTIONS** - Follow all operating and use instructions.
- **WATER AND MOISTURE** - Do not use the instrument near water.

- **VENTILATION** - The instrument should be used/installed only in locations where the flow of air through the ventilation openings is not impeded.
- **MOUNTING –** The instrument can be used in Horizontal or vertical orientation as long as the ventilation holes are not obstructed and the protective grounding is not defeated.
- **HEAT** - The instrument should be situated away from heat sources such as heat registers or other instruments which produce heat.
- **POWER SOURCES** - Connect the instrument only to the type of power source described in the operating instructions or as marked on the instrument.
- **POWER CORD PROTECTION** - Place power supply cords so that they are not likely to be walked on or pinched by items placed on them or against them.
- **CLEANING** – Clean the instrument outside surfaces of the device with a soft, lint-free cloth. If necessary, a mild detergent may be used.
- **NON-USE PERIODS** - Unplug the power cords of the instrument when it will be left unused for a long period of time.
- **OBJECT AND LIQUID ENTRY** - Take care that objects do not fall into the instruments and that liquids are not spilled into the enclosure through openings.
- **DEFECTS AND ABNORMAL STRESS** - Whenever it is likely that the normal operation has been impaired, make the equipment inoperable and secure it against further operation.
- **SITTING OR CLIMBING** - Do not sit or climb upon the instrument or use it as a step or ladder.
- **ENVIRONMENTAL CONDITIONS** - This equipment is designed for indoor use. Ambient temperature range during operation should be between 5° C to 40° C.
- **STORAGE AND PACKAGING** - The device should only be stored at a temperature between –25 and +70 °C. During extended periods of storage, protect the device from dust accumulation. The original packaging should be used if the device is transported or shipped again. If the original packaging is no longer available, the device should be packed carefully to prevent mechanical damage.

3.4 Product Features

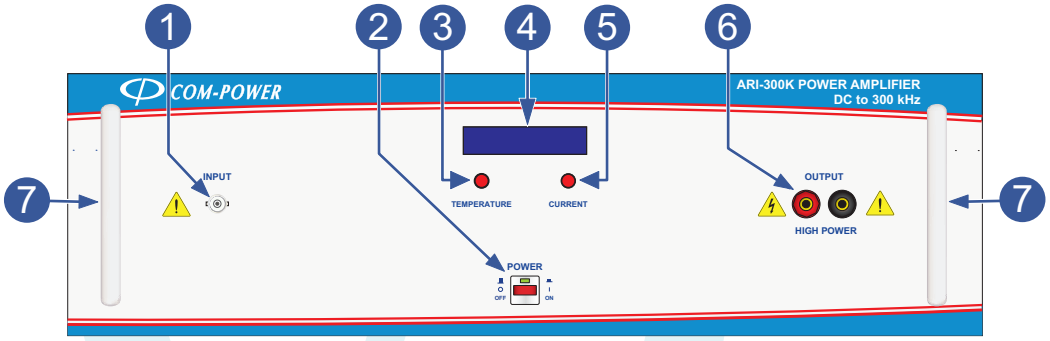


FIGURE 1 - *Product Features – Front Panel*

1. **Amplifier Input Port**
   The Amplifier Input Port is equipped with a coaxial BNC-Type (female) Connector.
2. **Front Panel Power Switch**
   Turns on/off amplifier power when Rear Panel Power Switch is in the 'ON' Position.
3. **Over-Temperature Indicator Lamp**
   Indicates that the internal temperature of the amplifier has exceeded 60° C, and that the amplifier output has been disabled. When the internal temperature falls below 60° C, the output can be re-enabled via the front panel power switch.
4. **Digital Ammeter Display**
   Displays the present bias current and internal temperature of the amplifier.
5. **Over-Current Indicator Lamp**
   Indicates that the bias current has exceeded 16 amperes, and that the amplifier output has been disabled. When the over-current condition has been corrected, (i.e.: input signal has been reduced), the output can be re-enabled via the front panel power switch.
6. **Amplifier Output Port**
   The Amplifier Output Port is equipped with two (2) 4 mm Banana Jack Binding Post Connectors.
7. **Handles**
   Handles attached to either side of the front panel.

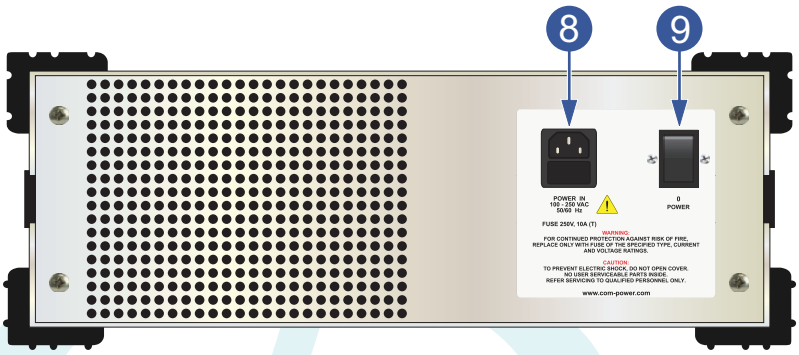


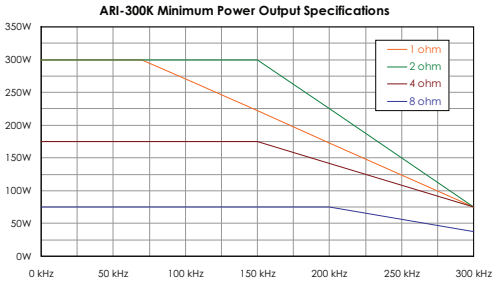
FIGURE 2 - *Product Features – Rear Panel*

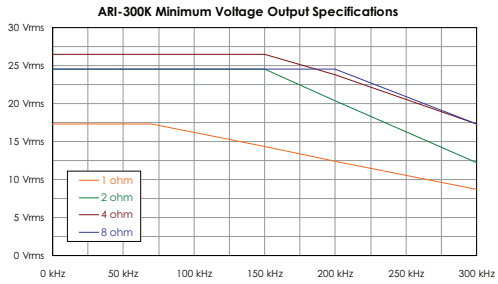
8 **AC Input Receptacle**
IEC C13 Receptacle for Amplifier Input Power.

9 **Rear Panel Power Switch**
Enables/disables front panel power switch.

3.5 Product Specifications

GENERAL	
Product Description	**Power Amplifier**
Application	**Audio Frequency Susceptibility Testing**
Standards	**MIL-STD-461, RTCA DO-160, etc.**
Frequency Range	**DC to 300 kHz**
Output Power	*[see '**ARI-300K** Min. Power Output Specifications' graph]*
Input Impedance	**10 kΩ** *(nominal)*
Output Impedance	**6.25 mΩ** *(nominal)*
Output Voltage	*[see '**ARI-300K** Min. Voltage Output Specifications' graph]*
Distortion	**≤0.3%**
DC Drift	**±1.5 mV** *(after 30 minutes of operation)*
Phase Response	**±5 degrees** *(up to 75 kHz)*
ELECTRICAL	
AC Input Power	**100-250 Volts AC, 50/60 Hz** **100 Volt-Amp (VA)** *(maximum)*
INPUT/OUTPUT CONNECTORS	
Input Connector	**BNC** *(female)*
Output Connectors	**(2)** *x* **4 mm Banana Jack Binding Posts**
AC Input Connector	**IEC C13 Receptacle**
ENVIRONMENTAL	
Operating Temperature	**40° F to 104° F** *(5° C to 40° C)*
Cooling	**Forced Air**
MECHANICAL	
Dimensions (H) x (W) x (D)	**6.24" x 19" x 23.25"** (***15.9*** *cm x* ***48.3*** *cm x* ***59*** *cm)*
Rack Mount Dimensions *(top/bottom feet removed, not including front handles)*	**(3U) 5.25" x 19" x 22.25"** (***13.34*** *cm x* ***48.3*** *cm x* ***56.5*** *cm)*





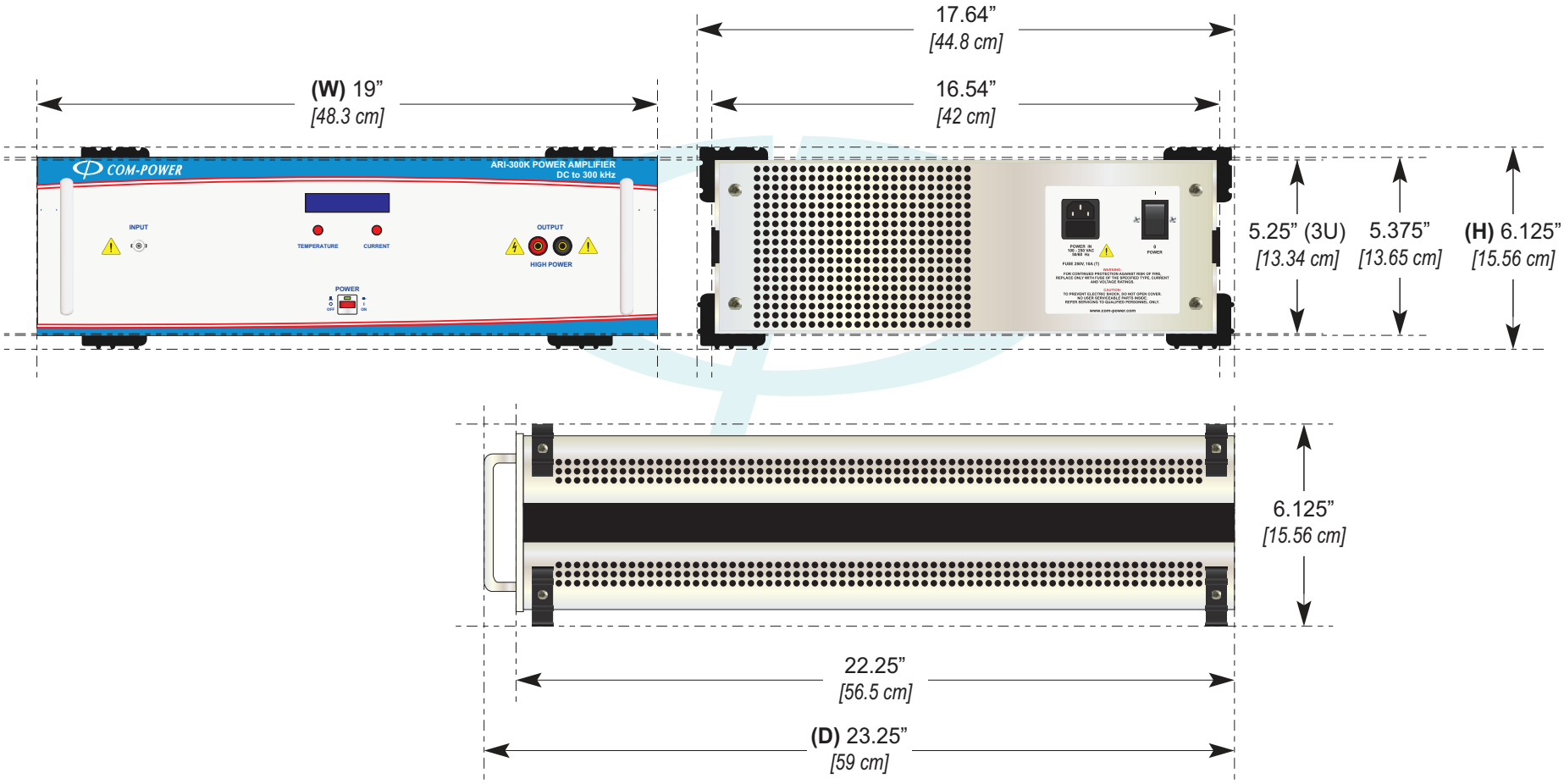


FIGURE 3 - *Product Dimensions*

4.0 Installation and Operation

4.1 Power Requirements

The power amplifier requires a power source of 100 to 240 VAC, 50/60 Hz capable of delivering 1000 Volt-Amps (VA). Turn off the front panel 'ON/OFF' switch ***before*** connecting the AC power source.

4.2 Earthing

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

4.3 Load Requirements

The power amplifier requires an appropriately rated output load (i.e.: antenna, transformer, dummy load, etc.) at all times during operation.

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

4.4 Cable Connections

The AC power cable connection is made at the rear of the power amplifier via the receptacle connector. Connections for Amplifier Input and Output are made via the Amplifier Input/Output ports located on the front panel.

4.5 Statement Against Unspecified Use

This amplifier must be used only 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.

4.6 Indicators and Connectors

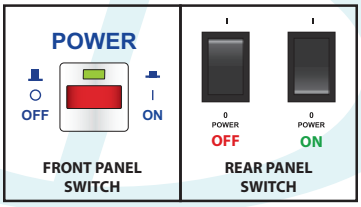
When both the rear and front panel power switches are set to 'ON', the green AC power indicator LED on the front panel switch assembly will light, indicating that AC power is present. The Amplifier Input and Output connections are located on the front of the power amplifier. Refer to Section 3.1 for the location and functional description of all indicators, and connectors.

4.7 Before Turn On

CAUTION! Do not obstruct the airflow at the rear, top and sides 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:

Check that both front and rear panel power switches are set to the 'OFF' position.



At the rear of the Audio Power amplifier, verify that the AC cord is properly inserted into the AC system power input receptacle.

Verify that the Amplifier Input Port is properly connected to the signal source (source equipment). ***ENSURE THAT THE OUTPUT OF THE SOURCE EQUIPMENT IS TURNED OFF OR OTHERWISE DISABLED.***

Verify that the Output Port is properly connected to the load, antenna, transformer or other device, having an appropriate power rating.

WARNING The Amplifier Input and Output ports must remain connected when the amplifier is in operation. Disconnection of the input or output connections while the amplifier is in operation may damage the amplifier.

4.8 Turn On

Perform the following procedure to energize the equipment:

a) Set the ON/OFF switch on the rear and front panels to the 'ON' position. Verify that the AC power indicator LED on the front panel switch assembly is lit;

b) With the output amplitude setting to a low level, enable the output of the source equipment.

4.9 Basic Operation

4.9.1 ON/OFF Switches

With both the front and rear panel power switches In the 'ON' position, AC power is supplied to the power amplifier.

4.9.2 AC Power Indicator Lamp

Illumination of the green AC power indicator LED on the front panel switch assembly indicates that the power amplifier is powered.

4.10 Turn Off

Turn off the Audio Power amplifier by first lowering or removing the RF Input drive level and then placing the front panel power switch in the 'OFF' position.

WARNING In the event of ANY power failure; whenever possible and practical, it is advisable to reset the front and rear panel power switches 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.

4.11 Operation

As there are no user controls or adjustments to be made, control of this amplifier is essentially limited to control of the frequency and amplitude of the amplifier input (drive) signal from the source equipment.

4.11.1 Amplifier Input Levels

The frequency of the input signal shall be between DC and 300 kHz. Operation of the amplifier with input signals greater than 300 kHz may damage the amplifier.

The amplitude of the input signal to the amplifier should not exceed:

a) any value that causes the bias current (displayed on the front panel display) to exceed 16 amperes; or,

b) any value that causes the internal amplifier temperature (also displayed on the front panel display) to exceed 60 degrees Celsius.

The amplitude value that causes either of the above two (2) conditions is herein defined as the maximum input signal.

The maximum input signal amplitude for the amplifier will change depending on the following variables:

- Frequency of the input signal from the source equipment.
- Resistance/impedance of the load connected to the amplifier output terminals.

If the maximum input signal is exceeded, the amplifier will automatically disable its output. In order to avoid the occurrence of this condition:

- ✓ Monitor the bias current displayed on the front panel display, especially when increasing the amplitude of the input signal. Shut-down will occur if the bias current reaches 16 amperes.
- ✓ Monitor the internal temperature of the amplifier, which is also displayed on the front panel display of the amplifier. Shut-down will occur if the temperature reaches 60 degrees Celsius.
- ✓ Reduce the amplitude of the input signal before changing the frequency of the input signal.
- ✓ When increasing the amplitude of the input signal, do so slowly, and in small increments.

Generally, the maximum input signal for the amplifier is greater than 0.1 Vrms (100 dBµV); and less than 0.8 Vrms (118 dBµV).

Keep in mind that the nominal input impedance of the amplifier is 10 k-ohms, and not 50 ohms. Refer to section 4.11.1.2.

If automatic shut-down does occur, normal amplifier operation can be restored by following the procedure below. If the shut-down condition was caused due to an over-temperature fault, allow the amplifier sufficient time to cool.

RESTORING AMPLIFIER OPERATION AFTER AUTOMATIC SHUT-DOWN

1) Disable the output of the source equipment without disconnection from the amplifier input.
2) By pressing the front panel power switch button twice, turn the amplifier off, and then on again.
3) Slowly increase the amplitude of the source equipment output, exercising caution to remain below the level which caused the amplifier to shut down.

4.11.1.1 Signal Source Amplitude Settings

The nominal output impedance of most signal sources is 50 ohms. Due to the fact that, typically, a 50 ohm source will be connected to a 50 ohm load, the voltage amplitude of an output signal from most 50 ohm sources is actually twice the indicated value, so that the measured value will agree with the indicated value after half of the voltage drops across 50 ohm impedance of measuring instrument's input port.

For example, if the amplitude of a 50 ohm source is set to 100 dBµV (0.1V), its output will actually be 106 dBµV (0.2V). But, when measured by an instrument with a 50 ohm input impedance, the measured value will be 100 dBµV (0.1V). However, if that same output were measured with, for instance, an oscilloscope with a high input impedance, the measured value would be 106 dBµV (0.2V).

The nominal input impedance of the ARI-300K is 10k-ohms; therefore, when being driven by a 50 ohm source, the actual input voltage will be twice the value indicated on the source equipment.

Some contemporary source instruments allow the user to select the output impedance (i.e.: HighZ, 50Ω, etc.). If such a selection is available, the 'HighZ' output setting should be chosen, so that its indicated output will correctly reflect the actual output voltage.

NOTE: Many signal sources use 'dBm' units to indicate their output level; which is a power term for dB over 1 mW. Here too, there is the assumption of a 50 ohm system, which does not hold true when the system is not 50 ohms. The relationship between dBµV and dBm in a 50 ohm system (dBm + 107 = dBµV), assumed by the source equipment will not hold true when the source is connected to the ARI-300K.

5.0 Maintenance

5.1 Cleaning

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

6.0 Warranty

Com-Power warrants to its Customers that the products it manufactures will be free from defects in materials and workmanship for a period of three (3) years. This warranty shall not apply to:

- Transport damages during shipment from your plant.
- Damages due to poor packaging.
- Products operated outside their specifications.
- Products Improperly maintained or modified.
- Consumable items such as fuses, power cords, cables, etc.
- Normal wear
- Calibration
- Products shipped outside the United States without the prior knowlege of Com-Power.

In addition, Com-Power shall not be obliged to provide service under this warranty to repair damage resulting from attempts to install, repair, service or modify the instrument by personnel other than Com-Power service representatives.

Under no circumstances does Com-Power recognize or assume liability for any loss, damage or expense arising, either directly or indirectly, from the use or handling of this product, or any inability to use this product separately or in combination with any other equipment.

When requesting warranty services, it is recommended that the original packaging material be used for shipping. Damage due to improper packaging will void warranty.

If you feel that the product is not working as intended, or is malfunctioning, please contact Com-Power for assistance. In the case of repair or complaint, Please visit our website at www.com-power.com and fill out a Service Request (http://com-power.com/repairservicereq.asp). The RMA number, which will be provided afterward, should be displayed in a prominent location on the packaging and on the product, along with a description of the problem and your contact information.