***INSTRUCTION MANUAL***
***For***
# Microwave Preamplifier

**Model PAM-840A**
***18 to 40 GHz, 37 dB Gain***

# Table of Contents

# 1.0 Introduction

This manual includes product specifications, safety precautions, product maintenance and warranty information.

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# 2. 0 Product Specifications

| **Model:** | **PAM-840A** |
|---|---|
| **Electrical** | |
| **Frequency Range:** | 18 to 40 GHz |
| **Typical Gain:** | 37 dB |
| **Flatness:** | ± 2.5 dB |
| **Max DC input:** | 0 Vdc |
| **Max RF Input:** | 0 dBm |
| **$P_{out}$ at 1 dB compression point:** | +10 dBm |
| **Noise Figure:** | < 5 dB |
| **Typical Reverse Isolation:** | 40 dB |
| **I/O connections:** | 50Ω, 2.9 mm (K type) female |
| **Operating Power:** | 15 VDC, 500 mA |
| **Battery Type:** | Rechargeable 6 V, 2 Ah, NimH |
| **Charging adapter (Output)** | 15 VDC, 500 mA |
| **Charging time:** | 8 to 10 hours |
| **Operating time with battery power**: | 10 Hours approximately |
| **Reference Temperature:** | 25° C / 77° F |
| **Mechanical** | |
| **Dimensions L x W x H:** | 7.6 x 5.95 x 2.17 inches / 19.2 x 15.1 x 5.5 cm |
| **Weight:** | 2.5 lbs / 1.13 kg |

***This equipment is designed for indoor use only.***

### 2.1 Other related equipment available from Com-Power.

- CGO-51000, 40 GHz Comb Generator
- AH-840 Horn antenna - 18 to 40 GHz
- AH-640 Horn antenna - 26.5 to 40 GHz
- AH-826 Horn antenna - 18 to 26.5 GHz
- Microwave cables and connectors

### 2.2 Other preamplifier models available from Com-Power

| Model | Specifications |
|---|---|
| PAL-010 | 100 Hz to 30 MHz, 28 dB |
| PAM-103A | 1 MHz to 1 GHz, 32 dB |
| PAM-6000 | 1 to 6 GHz, 30 dB |
| PAM-118A | 1 to 18 GHz, 40 dB |

# 3. 0 Important Precautions

Observe the following safety precautions to ensure user safety and maximizing the operating life of the preamplifier.

- Remove the batteries from the preamplifier when it is not used for an extended period.
- Use only the battery charger adapter supplied with preamplifier.
- Replace fuse with same type and current limit
- Replace only with batteries supplied by Com-Power.
- Exercise caution when handling the preamplifier because it is **sensitive electrostatic discharge.**
- Avoid using the preamplifier in environments with excessive heat or moisture.

The only user replaceable part in the preamplifier is the battery pack. It can be accessed from the bottom of the unit. There are no other user serviceable parts inside the unit. Do not remove the main instrument cover. If the preamplifier needs repair please contact authorized Com-Power service center.

## 3.1 Excessive RF input

Do not exceed RF input level indicated on front panel. Excessive RF input may damage the preamplifier's sensitive input and will not be covered under warranty.

## 3.2 Saturation

In addition possible damage to the preamplifier input, excessive RF signals may cause the preamplifier to saturate. When a preamplifier reaches saturation point the gain will reduce and cause a nonlinear increase in output power resulting inaccurate measurements. PAM-840A can handle up to +10 dBm (117 dBµV) input signal.

## 3.3 Calibration

The factory recommended calibration period for the Preamplifier is 12 months. However, its performance should be checked periodically to ensure the preamplifier is operating within the rated specification given in section 2.0 of this manual.

# 4.0 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 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 seperately or in combination with any other equipment.

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

In the case of repair or complaint, a label should be attached to the housing of the instrument which describes briefly the faults observed. Please include the name, telephone number and email address of the contact person. Please visit our website www.com-power.com and obtain an RMA number by selecting service and completing the online form.

## 4.1 Maintenance

This product contains no user replaceable parts other than the battery. If the unit does not operate or needs calibration, please contact Com-Power Corporation. Do not remove the instrument cover. The batteries can be accessed from the the bottom of the unit if needs replacement. Any modifications or repairs performed on the unit by anyone other than an authorized factory trained technician will void warranty.

The exterior surface may be cleaned with mild detergent and then be wiped with a dry, clean, lint-free cloth. Use care to avoid any liquids or foreign objects entering the chassis.

# 5.0 Application and product operation

## 5.1 Application

Com-Power PAM-840A Preamplifer are designed specifically for EMI radiated emissions testing from 18 to 40 GHz.

The PAM-840A high gain of the preamplifier

- Amplifies signals within its operational frequency band to improve the overall signal noise ratio of the measurement system.
- Compensates for signal losses associated with the use of cables and antennas operating within its frequency range.
- Increases sensitivity of overall test system.

## 5.2 Items included with preamplifier

The following accessories and documents are supplied with the Model PAM-840A Preamplifier:

- Battery Charger / Power Adapter
- Instruction Manual
- Calibration data with certificate traceable to NIST
- Pre-installed batteries

**Optional item**

- ISO-17025 calibration data and certificate

## 5.3 Front and Rear Panel

### 5.3.1 Front Panel

The simple panel shown in the photo below consists of N type connector for RF input and output, power switch with LED indicator, charging indicator and battery low indicator. *Please observe the maximum input rating printed on front panel.* When the battery low indicator turns on, the preamplifier needs charging. However, you can continue using it powered by battery charger adapter. The battery low indicator will turn off when the adapter is plugged and the charging indicator will turn on. For faster charging, turn off preamplifier.


### 5.3.2 Back Panel

The back panel shown below consists of fuse holder and charging adapter input socket. Make sure to use only the charger adapter supplied by Com-Power. Damage caused to the preamplifier by using an alternate adapter will void warranty.


### 5.3.3 Battery Replacement

The replaceable battery pack can be accessed from the bottom of the preamplifier. Four screws secure the cover to the battery compartment. If the batteries are no longer holding the charge, replacement battery pack can be purchased from Com-Power.

**Troubleshooting tips**

If the battery is not holding charge or the charging indicator does not turn on, open the battery compartment and make sure the battery is properly connected. If the batteries are securely connected, check the fuse on the back panel. If the fuse is blown, replace it. Please heed the warning label on the bottom of the fuse holder and rear panel.

If the battery charging indicator still does not turn on, check the charging adapter to make sure it is supplying the rated voltage on the adapter. If the charging adapter is producing the proper voltage, the batteries may have to be replaced.

# 6.0 Typical Preamplifier Gain