



**INSTRUCTION MANUAL**

**BATTERY PACK/CHARGER**

**MODEL BAT-30**

# INSTRUCTION MANUAL

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## **BATTERY PACK/CHARGER**

**ELECTRO-METRICS**

**MODEL BAT-30**

**SERIAL NO: N/A**

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# **WARRANTY**

**This Model BAT-30 Battery Pack/Charger is warranted for a period of 12 months (USA only) from date of shipment against defective materials and workmanship. This warranty is limited to the repair of or replacement of defective parts and is void if unauthorized repair or modification is attempted. Repairs for damage due to misuse or abnormal operating conditions will be performed at the factory and will be billed at our commercial hourly rates. Our estimate will be provided before the work is started.**

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## **APPENDIX A BAT-30 ACCESSORIES**

### **A-1.0 Standard Accessories**

The following accessories are included as standard with each BAT-30.

- a.** Power/Control Cable NO: 8721.
- b.** AC Power Cable NO: 8722.

## DESCRIPTION AND USE ELECTRO-METRICS MODEL BAT-30 BATTERY PACK/CHARGER

### 1.0 Introduction

The Electro-Metrics Model BAT-30 Battery Pack/Charger Module enables the EMC-30 Interference Analyzer to operate independently of an AC power source. This permits the EMC-30 to be used for on-site (in-field) testing or to eliminate possible ground loop problems during laboratory testing.

The BAT-30 Module is a separate free-standing unit and is normally placed beneath the EMC-30 when used. A power/control cable connects the two units together.

The battery pack is a 36 V (nominal) 8 ampere-hour battery made up of 18 sealed lead-acid cells. Since these cells are classified as "dry" by the U.S. DEPARTMENT OF TRANSPORTATION and the INTERNATIONAL AIR TRANSPORT ASSOCIATION, they are not subject to the Restricted Articles Regulations covering air shipments. The module can be stored in any position and the cells will not dry out, vent acid, or acid vapors. A self-sealing safety vent prevents cell rupture in the event of charger failure.

A fully charged battery will operate the EMC-30 for a nominal time period of five hours. The actual operating time will vary and is dependent on the type of EMI testing the instrument will be performing. It will fully recharge after such usage in approximately 16 hours. A fully charged battery can be stored up to three years with no appreciable decrease in battery capacity.

The charger circuit incorporates monitor and protection circuitry to prevent overcharging or excessive discharging of the battery cells.

### 2.0 Specifications

#### 2.1 Electrical

##### a. AC Power Sources

(Supplied either directly or via the EMC-30 )

- 1) 105-130 VAC, 50-60 Hz.
- 2) 210-260 VAC, 50-60 Hz.

##### b. Fuse Specifications

- 1) 115 VAC operation: 1.5 AMP 3AG SLO-BLO.
- 2) 230 VAC operation: 0.75 AMP 3AG SLO-BLO.

##### c. Operating Time

Nominal 5 hours, typically 5-8 hours.

## 2.2 Mechanical

Length:	491 mm (19.3").
Width:	426 mm (16.8").
Height:	65 mm (2.6").
Weight:	Approx. 15.5 kg (34 lbs).

## 3.0 Description Front/Rear Panel

### 3.1 Front Panel

#### a. Charge Indicator

**Type:** LED.

**Color:** Red.

**Function:** When activated, indicates that the BAT-30 Module is connected to an AC power source either directly or via the EMC-30.

#### b. Battery Test Switch

**Type:** Pushbutton.

**Function:** Use to activate the front panel Battery Status Meter.

#### c. Battery Status Meter

**Type:** 2-inch analog meter.

**Function:** To indicate the approximate status of the battery charge/ discharge cycle.

The meter has three status markings:

**1) CHG (CHARGE):** The battery is charging properly. Depending upon the depth of the previous discharge, the meter may indicate less than the actual charge value for the first few hours after the unit is connected to the AC power source.

**2) HIGH:** The battery is fully charged, unloaded condition. This indication is most accurate if the battery has not been charged or discharged for the past 24 hours.

**3) LOW:** The battery has insufficient capacity to run the EMC-30. The module should shut itself off before the indicator drops below the "LOW" status line.

### 3.2 Rear Panel

**a. Input Connector (J1)**

**Type:** 9-pin connector (MS-3102A-20-16P).

**Function:** Performs two functions:

- 1) EMC-30 supplies AC power to the BAT-30.
- 2) BAT-30 supplies DC voltages to the EMC-30.

**b. 115/230 Power Source Switch (S2)**

**Type:** Two position slide switch.

**Function:** Set BAT-30 for operation with either 115 VAC or 230 VAC power source.

**c. AC Power Line Fuse Holder (F1)**

**Type:** Panel mount, knurl knob.

**Function:** Self-explanatory.

**4.0 Operating Instructions****4.1 Power Source Switch**

The AC Power Source Switch is located on the rear panel between the Input Connector and the fuse holder. To change the switch setting, move the switch slider to the side with the appropriate markings for the AC power source being used.

**CAUTION**

- 1. Verify that the Power Source Switch setting corresponds to the AC power source being used. Operation on "220" VAC with the switch set for "110" VAC can cause extensive circuit damage.**
- 2. The switch setting "MUST" match the POWER SOURCE SELECTOR setting of the EMC-30.**

**4.2 Battery Operation**



EMC-30 operation is identical whether using the external BAT-30 Battery Pack/Charger or an AC power source except that the battery has a limited or finite time of operation.

#### 4.2.1 EMC-30/BAT-30 Connection

- a. Connect the Power/Control Cable (8721) from Connector J1 on the rear panel of the BAT-30 to Connector A14J3 on the rear panel of the EMC-30.
- b. The EMC-30 is now ready for operation using the BAT-30. When connected to the EMC-30, the BAT-30 is controlled by the receiver.

#### 4.2.2 EMC-30/BAT-30 Operation

Whenever the EMC-30 is connected to an AC power source, the receiver will operate from the AC line and an AC voltage will be supplied to the BAT-30 to operate the charging circuitry.

If the EMC-30 is disconnected from the AC power source, the BAT-30 will supply the "raw" DC voltages to operate the power supplies within the EMC-30. In either mode, the front panel POWER Switch of the EMC-30 controls the input power to the DC supplies of the receiver.

The battery charge status should be checked as soon as the EMC-30 POWER switch is activated using the front panel BAT-30 BATTERY TEST Switch. When this switch is pressed, the front panel analog meter will indicate the approximate state of the battery charge. For operation using the battery as a sole power source, the meter should read between the LOW and HIGH markings of the battery test scale.

If the meter reads at or below the LOW marking, the EMC-30 will turn on momentarily and then be automatically turned-off by the Excessive-Discharge Circuitry. In this case, battery recharging is required.

- NOTE:**
- 1. To operate the receiver for the nominal five hours using the battery pack as the sole power source, the meter should read at or near the HIGH meter scale marking.**
  - 2. During periods of extended or heavy usage, it is advisable to check the battery condition periodically.**

A fully charged battery will operate the EMC-30 for a nominal time period of five hours. The actual operating time will vary and is dependent on the type of EMI testing the instrument will be performing. Some examples of usage that will reduce the operating time cycle of the battery pack:

- a. Tests that require extensive use of the upper Frequency Ranges (25-1000 MHz), especially Frequency Range 15 (500-1000 MHz).
- b. Frequent switching between Frequency Ranges.
- c. Use of accessories that draw their power from the EMC-30.

It will fully recharge after such usage in approximately 16 hours.

#### 4.2.3 BAT-30 Recharging

Two methods are available to recharge the BAT-30:

##### a. Connected To An EMC-30

Connect the receiver to an external AC power source. Battery charging is automatically controlled by the BAT-30 and will take place with the EMC-30 POWER Switch either ON or OFF, but may take longer with the receiver turned ON.

##### b. BAT-30 Only

Connect the external AC power cable (8722) to the Input Connector J1 and connect the BAT-30 to an AC power source.

**NOTE: The Power Source Switch setting should correspond to the AC power source being used.**

#### CAUTION

**The BAT-30 should "NEVER" be stored with discharged battery cells. A fully charged battery pack can be stored up to three years with no appreciable decrease in battery capacity.**

#### 4.2.4 Precautions

If the BAT-30 will not recharge or operate the EMC-30 or five hours, contact **Electro-Metrics, Inc.** or your nearest **Electro-Metrics, Inc.** representative for any assistance required.

All rechargeable battery systems have a limited number of charge/discharge cycles. To obtain maximum battery life:

- a. Prevent deep discharges. Even though the BAT-30 has circuitry to prevent excessive discharge, battery cell life will be increased if the time spent near the lower charge limit is kept to a minimum.
- b. **"NEVER"** store a deeply discharged BAT-30, without recharging the module first.
- c. Avoid high temperatures. The higher the operating or storage temperature, the shorter the operating life-time of the battery.

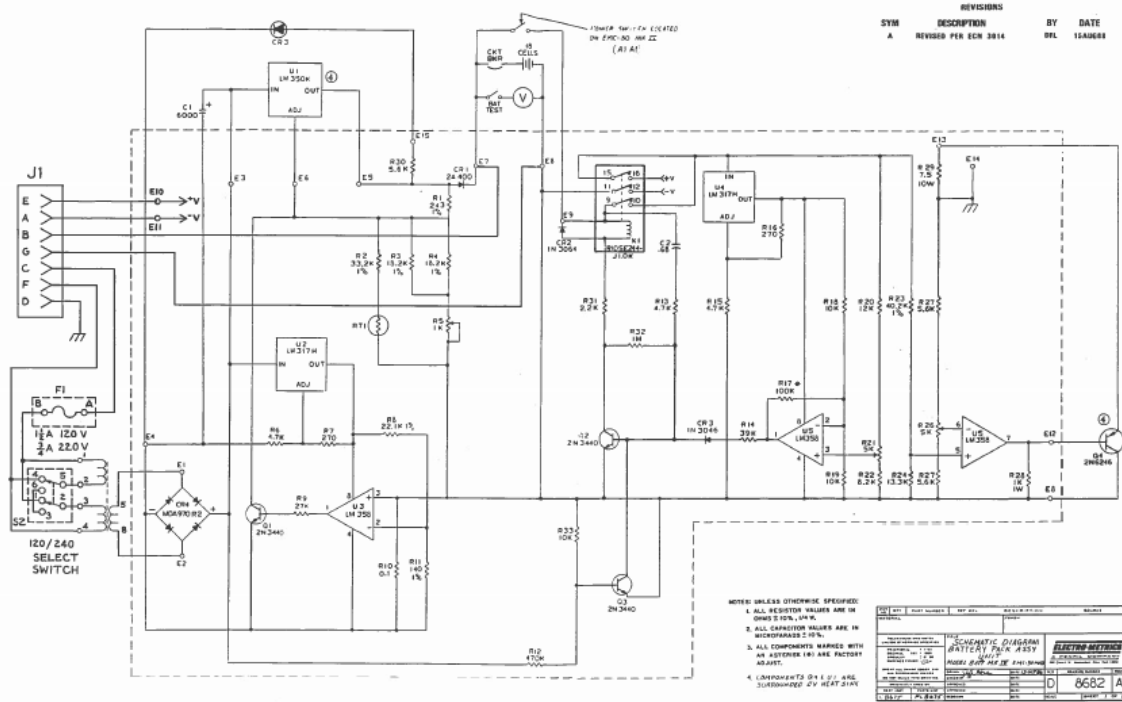
#### 4.2.5 Battery Protection Circuits

#### **4.2.5.1 Overcharging**

Whenever the charging current reaches a significant level, the charger circuit will automatically reduce the charging current to prevent overcharging the battery.

#### **4.2.5.2 Excessive Discharge**

Excessive discharge will not occur since the flow of battery current to all circuits is automatically interrupted as soon as battery voltage drops to a value indicating negligible remaining capacity.



**SCHEMATIC DIAGRAM  
BAT-30**