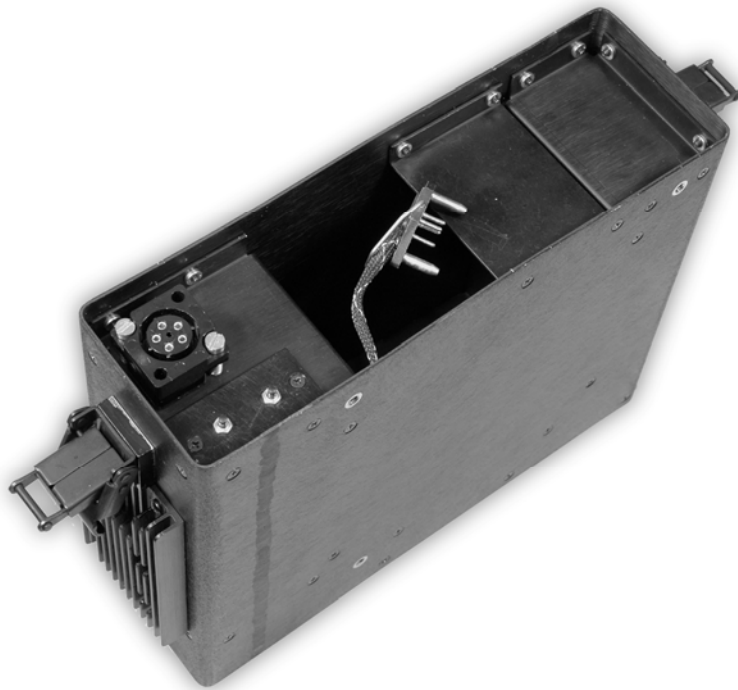




# **MRC-187**

## **Interoperable Adapter and Power Supply**



# **Operation Manual**

## Copyright

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## Revision History

Version	Description of Change	Effective Date
REV: A	Initial Release	MAY 17 2006
REV: B	Change 24 VDC to 26.5 VDC	DEC 00 2006
REV: C	This manual has been updated to reflect the new template design.	MAY 01 2008

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McDowell Research believes that information in this publication is accurate as of its publication date. McDowell Research reserves the right to change the contents without prior notice and is not responsible for any inadvertent errors.

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# 1 ABOUT THIS MANUAL

This manual has been prepared by McDowell Research, an Ultralife Company, for the purpose of providing the information necessary to operate and maintain the MRC-187 Transit Case System.

## Symbols Used

The symbols shown in this section appear throughout this manual, the first one shown being the *NOTE* symbol, below, which is self-explanatory.



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**NOTE:** *Note statements contain important information that may affect how you use this product.*

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The other symbols represent *important safety advice*, and they appear throughout this manual in the form of *WARNINGS* and *CAUTIONS* against possible hazards to people or equipment, respectively. These safety *WARNINGS* and *CAUTIONS* must be followed at all times. They are flagged by use of a triangular alert icon shown just to the left of the cautionary advice given, as shown below:



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**WARNING:** *Warning statements mean danger. They identify practices, procedures or conditions such as high voltage that could result in injury or loss of life and which, therefore, require extreme care before proceeding.*

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**CAUTION:** *Caution statements denote a hazard. They identify practices, procedures or conditions that could result in damage to or destruction of this product or other equipment or property.*

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McDowell Research assumes no liability for the customer's failure to comply with these *WARNINGS* and *CAUTIONS*.

## General Safety Instructions

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**WARNING:** This manual contains important safety and operating instructions for the MRC-187. Before using the MRC-187, read all instructions in this manual and cautionary markings, if any, on the device. Specifically:

- Do not operate the MRC-187 if it has received a sharp blow, been dropped, or otherwise damaged in any way; take it to a qualified repair technician for servicing.
- Do not operate the system with a damaged cable or connector - replace it immediately.
- Make sure cords are positioned so that they will not be stepped on, tripped over, or otherwise subjected to damage or stress.
- Do not disassemble the MRC-187; take it to a qualified repair technician when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire.
- Use of an attachment not recommended or sold by McDowell Research may result in risk of fire, electric shock, or personal injury.
- To reduce risk of electric shock, unplug the MRC-187 from its power source before attempting any maintenance or cleaning. Turning off controls will not eliminate this risk.
- If there are any questions regarding maintenance or safety-of-use issues pertaining to the MRC-187, please contact our service department at:

Service Department  
McDowell Research, an Ultralife Company  
(PHONE) (315) 332-7100 (FAX) (315) 331-7800  
(Email) [service@mcdowellresearch.com](mailto:service@mcdowellresearch.com)

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## 2 PRODUCT DESCRIPTION

The MRC-187 Interoperable Power Adapter and Charger (IPAC) provides 26.5 VDC (nominal) of uninterruptible power under varying input/output conditions. Operational from either an AC or DC input, the versatility of the MRC-187 IPAC makes it suitable for a variety of applications and systems, including the AN/PSC-5 (EMUT), AN/PRC-113, AN/PRC-138 and the AN/URC-200 transceivers.

### 2.1 Required/Supplied Equipment

Provided with the MRC-187, Interoperable Power Adapter and Charger, is an AC and DC power cable, an optional cable, and this technical manual, as shown in the table below:

Equipment	Quantity
MRC-187 Power Adapter and Charger	1
PCP-35 AC Input Power Cable	1
PCP-40 DC Input Power Cable	1
Operation Manual	1
Optional PCP-257 Y Cable	0

### 2.2 Features

The MRC-187 has the following features:

- ◆ Provides uninterruptible 26.5 VDC (nominal) output under varying external load conditions.
- ◆ The integrated, internal battery system can be recharged while the equipment is operating. Battery backup operations can be “Armed” or “Disarmed” with an external switch located on the side of the MRC-187, near the output connector.
- ◆ Allows operation of 26.5 VDC equipment from a DC Voltage source ranging from 9 VDC to 36 VDC, which encompasses most military and commercial vehicles.
- ◆ All input and output circuits are EMI filtered.
- ◆ Provides regulated DC output power and charges battery simultaneously from almost any input power source, including solar panels and wind generators.
- ◆ No shipping or handling restrictions.

## 2.3 Functional Description

In Input power (AC or DC) is provided through Input Power Connector J1 (26.5 Volt input eight pin male connector). Output power to the radio is provided through Radio Power Connector – J6 (26.5 Volt 5-pin connector on inside top panel).

Auxiliary power out of 26.5 VDC at 1 Amp is provided through Auxiliary Power Connector J3 (two-socket female connector). This power is intended for use by a TSEC/KY-57, TSEC/KY-99 or equivalent encryption unit and MRC-67A amplified speaker.

The MRC-187 is connected directly to the transceiver in the same manner as a typical battery box would be connected, and is secured with the two over-center latches. Circuits for power conversion, status monitoring and battery charging that are contained inside the MRC-187 include:

- ◆ **Control PCB** - Contains the output power circuit breakers and the LED indicator circuits.
- ◆ **DC Module** - Contains the circuitry for transforming the 9 to 36 VDC input to a regulated 26.5 VDC (nominal) output.
- ◆ **AC Module** - Contains the circuitry to transform the 95 to 265 VAC, 47 TO 440 Hz input power to a regulated 26.5 VDC (nominal) output.
- ◆ **Filter Board Assembly** - The filter board serves as the main interconnection for the AC module, DC module, input power and internal battery. It contains input power line circuit breakers, steering diode logic circuits for DC voltages into and out of the Power Modules, and differential and common mode filter circuits.
- ◆ **BB-390A/U Rechargeable Nickel Metal Hydride Battery** - Provides back-up power when AC or DC input power is lost or not available.
- ◆ **LED Indicators** - There are three light emitting diodes (LEDs) located on the Control Board inside the unit with three lenses on the side of the MRC-187, providing the operator with MRC-187 status information..

## 3 OPERATION

The subsequent sections will list in chronological order how to operate the MRC-187 safely and efficiently.



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**NOTE:** *It is highly recommended that a BB-390A/U nickel metal hydride rechargeable battery be installed in the unit prior to operating the MRC-187. The AC and DC modules are designed to operate the transceiver in any mode; however, if external power is lost, codes could be lost unless a battery is installed.*

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### 3.1 Controls and Indicators

There are three (3) light emitting diodes (LEDs) located on the Control Board inside the unit with three (3) lenses on the side of the MRC-187 providing the operator with status information. They function as follows:

- ◆ Top LED lens - Illuminates (green) when the battery is supplying power.
- ◆ Middle LED lens - Illuminates (amber) when the DC module is supplying power.
- ◆ Bottom LED lens - Illuminates (green) when the AC module is supplying power.

### 3.2 Start-up

The MRC-187 IPAC provides output of 26.5 VDC (nominal) to power the AN/PSC-5 (EMUT), AN/PRC-113, AN/PRC-138, AN/PRC-117F and AN/URC-200 series Transceivers and ancillary equipment from either 9 to 36 VDC or 95 to 265 VAC input.

The MRC-187 can be connected to external AC and DC power sources as well as allowing the Transceiver to operate from the internal battery without an external power source connected.

The MRC-187 can be connected to both AC and DC sources at the same time without damage to the unit. The MRC-187 automatically prioritizes the input power such that the unit will select the AC input power whenever it is available. If the AC external power is lost or interrupted, the MRC-187 will automatically revert to the DC power. If DC power is lost or interrupted, the MRC-187 will operate from the internal battery. If AC power is available, the DC power module shuts off to prevent the DC power module from drawing power.

## 4 MAINTENANCE

Maintenance for the MRC-187 is described in the following sections.

### Cleaning

Cleaning of the MRC-187 is described in the following sections.

#### 4.1.1 Dirt and Dust

All external components to the MRC-187 can be cleaned with a water dampened non-abrasive cloth and allowed to air dry or wipe dry with a clean dry non-abrasive cloth.

#### 4.1.2 Oils and Grease

All external components of the MRC-187 can be cleaned with a mild soap/water solution dampened non-abrasive cloth. Rinse with water dampened non-abrasive cloth and allowed to air dry or wipe dry with a clean dry non-abrasive cloth.

### Corrective Maintenance

The MRC-187 has NO user serviceable parts. Units requiring corrective maintenance should be sent to McDowell Research for repair. Contact information is provided in the next chapter.

## 5 CUSTOMER ASSISTANCE

### Warranty Information

#### Warranty Statement

**4 years for equipment shipped after May 1, 2004.**

**3 years for equipment shipped prior to May 1, 2004.**

McDowell Research warrants to its customers that the products it manufactures and sells will be free from defects in materials and workmanship for a period of four (4) years for equipment shipped after May 1, 2004.

This warranty shall not apply to any defect, failure or damage caused by improper use or inadequate maintenance and care. McDowell shall not be obligated to provide service under this warranty to repair, service, or modify these products.

In order to obtain service under this warranty, customers must return a failed unit to McDowell with a description of the failure, contact information (in case questions arise and to speed up processing of guarantee claims) and finally a return shipping address. McDowell will return any failed unit at McDowell's cost.



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**NOTE:** *This warranty does not apply to batteries supplied by McDowell Research. All batteries supplied by McDowell Research are warranted for 90 days from date of shipment.*

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### Contact/Return Information

Please call (315) 332-7100 to obtain an RMA number prior to returning any failed unit(s) to:

McDowell Research, an Ultralife Company  
2000 Technology Parkway  
Dock "X"  
Newark, New York 14513  
Phone: (315) 332-7100  
Fax: (315) 331-7800

Online RMA requests can be located and submitted at:  
[http://www.mcdowellresearch.com/rma\\_form.php](http://www.mcdowellresearch.com/rma_form.php) or  
[service@mcdowellresearch.com](mailto:service@mcdowellresearch.com)

## 6 SPECIFICATIONS

**Table 1: Physical Characteristics**

Dimension	Measurement
Width	10.6 inches
Height	3.27 inches
Depth	6.25 inches
Weight with Battery	7.60 lbs.
Weight without Battery	4.60 lbs.

**Table 2: Environmental Characteristics**

Dimension	Measurement
Storage Temperature	-50° C to +65° C
Operating Temperature	-30° C to +55° C
Relative Humidity	95%
Storage Altitude	55,000 ft.
Operating Altitude	27,000 ft.

**Table 3: Electrical Characteristics**

Dimension	Measurement
DC Input Range	9-36 VDC MIL-STD-1275
AC Input Range	95-265 VAC, 47-440 HZ
DC Output	26.5 VDC @ 5.5 Amps 26.5 VDC @ 7 Amps Peak