

## MFJ-4114 PORTABLE RECHARGEABLE POWER PACK

GENERAL DESCRIPTION: The MFJ-4114 powers MFJ QRP-series transceivers from either AC mains or self-contained rechargeable NiCd batteries. Front-panel switching selects AC or BATTERY operation and controls operation of the built-in constant-current charger. Attractively styled to match MFJ transceivers, the MFJ4114 is also compatible with any other device requiring 13.8 Volts at up to 1.2 Amps. Output voltage is supplied to a coaxial power jack or color-coded binding posts on the back panel.

### SPECIFICATIONS:

AC Supply Output: 13.8 VDC @ 1.2 A, Voltage Regulated.  
Charger Output: 100 mA all loads, Current Regulated. NiCd  
Battery Pack Output: 13-15 VDC @ 1.2 A NiCd Storage  
Capacity: 1.6 AH - 4.0 AH Charge Time: 14-hours typical  
for 1.6 AH NiCds. Batteries: NiCd "D" Cells (12  
required). Size: 6"x 6"x 3.5"  
Weight: Approx. 3 Lbs.

THEORY OF OPERATION (see schematic diagram): An external wall transformer (MFJ-407-1106) provides AC to bridge rectifier. Bridge output (approx. 20 VDC) is Filtered by a 4400-uF capacitor bank and routed to power pack regulators. Three 1N4001 diodes bootstrap the LM7812 supply regulator to 13.8 V output. The charger regulator (LM317T) is configured as a constant-current source set at 100 mA by a 10-Ohm series resistor. LED's indicate when the MFJ-4114 is powered and when the charger circuit is online. DPDT switching selects AC or BATTERY as the power source, and turns the CHARGE circuit on or off when AC is in use.

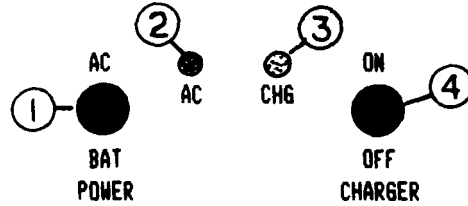
BATTERY INSTALLATION: The MFJ-4114 lets you choose the best NiCds for your application. For normal operation, 1.6-AH cells like Radio Shack 23-123, Duracell NC13, Eveready CH50, or GE GC3 are good choices. Heavy-duty 4.0 AH cells like the Radio Shack 23-140 provide a significantly longer discharge cycle.

To install NiCds, remove 8 screws ringing the bottom of the MFJ4114 case (see Figure 1). The bottom plate drops out and provides holders for 8 cells; the remaining 4 install next to the pc board in the top. Charge new batteries fully before using to power equipment (14-hour charge cycle typical for 1.6 AH NiCds).

NOTE: The MFJ-4114 is specifically designed for NiCds. If you must use conventional batteries, install no more than 10 cells and jumper the remaining 2 positions in the battery holder with a cliplead. NEVER ATTEMPT TO RECHARGE ALKALINE OR CARBON-ZINC CELLS!

INSTALLING YOUR POWER PACK: The MFJ-4114 power pack may be stacked with a companion MFJ transceiver and tuner. Two brackets and 8 screws are included in this package to connect the power pack to the MFJ transceiver and tuner.

CONTROLS:



1. POWER

AC/BAT Switch: Select AC or NiCds as power source.

2. AC: Red LED indicates when AC is supplied to MFJ-4114.

3. CHG: Green LED indicates when Charger is on-line.

4. CHARGER Switch: Turns charger ON or OFF when is AC connected.

OPERATION:

1. TO CHARGE NiCds: Insert the molded plug from the MFJ-407-1106 AC adapter into the header connector on rear of the MFJ-4114 power pack. Plug the AC adapter into AC mains. The red AC LED on panel will light. Press POWER switch to AC, and press CHARGE switch to ON. The green CHG LED on the panel will light.

NOTE: For best battery life, always press CHARGE switch OFF at the end of the charge period (prevents overcharging NiCd cells).

2. TO OPERATE TRANSCEIVER FROM AC POWER: Connect AC adapter to the MFJ-4114. Connect your transceiver to the MFJ-4114 power jack using a patch cord (5.5mm OD, 2.1mm ID). You may also connect auxiliary equipment to the red and black binding-post power terminals (Red = +, Blk = Gnd). Press POWER switch to ON.

3. TO OPERATE TRANSCEIVER FROM NiCd PACK: Connect transceiver as above. Remove AC wall adapter. Press POWER switch to BAT.

IMPORTANT NOTE: If you operate from BAT with the AC adapter plugged in, the CHG light still functions -- but the charger circuit is totally disconnected from the pack. When operating on BAT, unplug the AC adapter to disable the CHG light and prevent confusion.

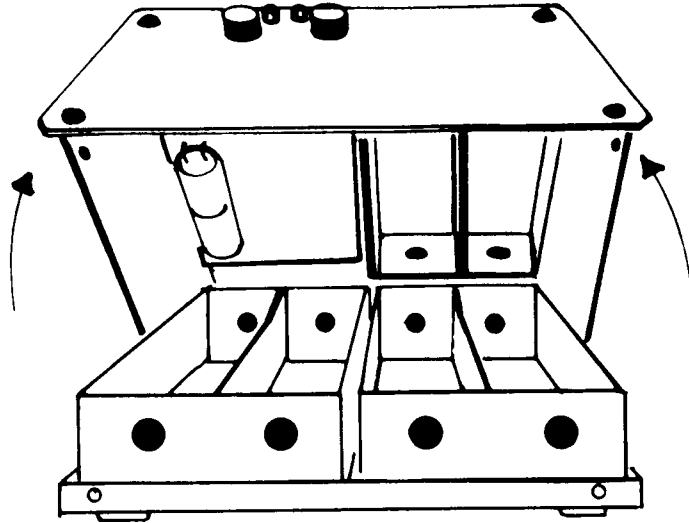
CARE AND FEEDING OF NiCds (for deepest cycle and longest life):

1. Charge NiCds fully prior to first use.
2. Always discharge to 11 VDC (or erratic radio operation).
3. Always recharge for full 100 mA period specified on cell.
4. Never discharge totally (below 10 V).
5. Avoid recharging mid-cycle.



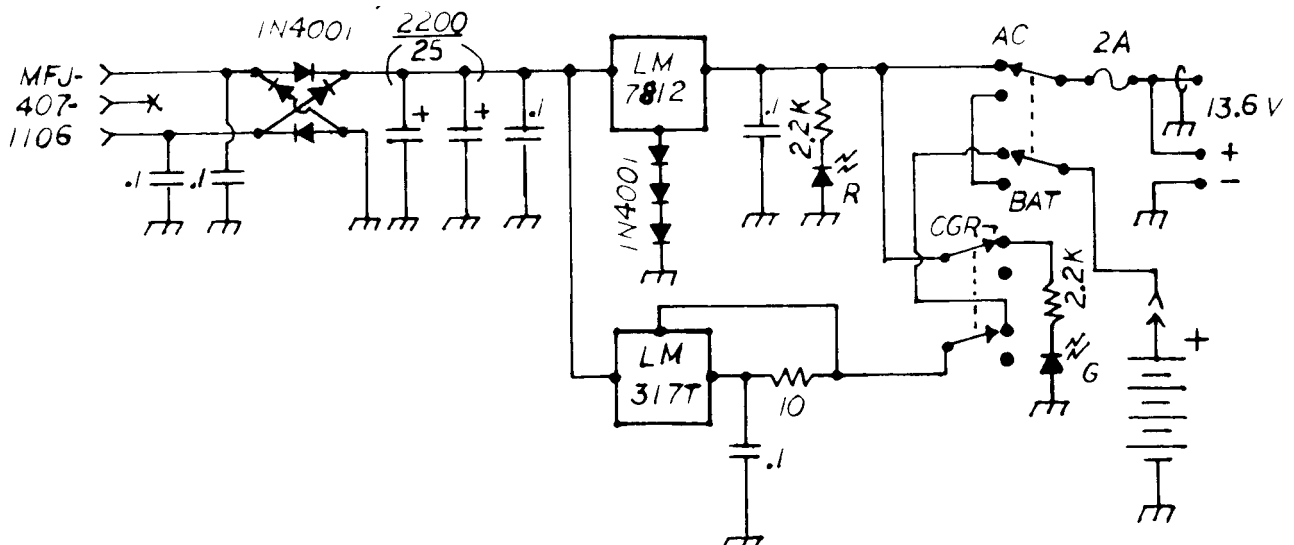
If you are preparing for an event and want maximum battery power available, you can "run down" your pack and fully recharge it in advance. Connect a 5-Watt 50-Ohm resistor (or dummy load) and a voltmeter to the MFJ-4114 terminals. Draw pack down to 11 Volts (50 Ohms = 300 mA/Hr discharge rate). Then fully recharge.

FIGURE 1, INSTALLING BATTERIES IN YOUR MFJ-4114:



INSTRUCTIONS: Remove 8 screws around bottom sides of cover. Lift cover as shown above. Install 12 NiCd batteries according to polarity markings inside the battery holders. If a battery holder becomes unplugged from the pc board header while loading, you may reinstall the plug either way without damage: Center pins are (-), outside pins are (+).

SCHEMATIC DIAGRAM, MFJ-4114 RECHARGING POWER PACK:



WARNING: DO NOT TRY TO RECHARGE CARBON-ZINC OR ALKALINE CELLS IN YOUR MFJ-4114. NEVER SHORT-CIRCUIT, PUNCTURE, OR INCINERATE BATTERIES -- JACKETS MAY EXPLODE OR LEAK TOXIC MATERIALS. PLEASE DISCARD USED BATTERIES IN ACCORDANCE WITH SUPPLIED INSTRUCTIONS.