

# PLUG-IN ACCESSORY UPGRADES POCKET SCANNERS

*A simple circuit provides power-supply protection, backup power, trickle charging, and other features without modifying your portable*

BY PAT JOHNSTONE

THE pocket scanner is a popular item among reporters, radio enthusiasts, volunteer workers, and others who want to monitor public-service broadcasts. However, its small size usually means a sacrifice in features. For example, most pocket scanners have a poorly protected power supply, short battery life, and little flexibility. The circuit described provides pocket scanners with features found on bulkier base units.

Before we discuss the circuit, let's examine the pocket scanner in more detail. Pocket scanners usually have a jack for external power. When the scanner is powered from this jack, an internal switch disconnects the scanner's batteries from the circuit, isolating them from the external power. In this mode the batteries are not charged by the external source. To recharge the nickel-cadmium batteries, a second jack is provided to isolate the scanner circuit from the battery eliminator/charger. This provides recharging power to the NiCad batteries but makes the scanner inoperative. Thus, the user must choose between operating the radio or charging its batteries. The only way to get around this is to purchase separate charger/eliminators for each function. However, if you did use a separate charger and eliminator, you would still have the problem of an

unprotected power source. The scanner is committed to the ac power as long as the battery eliminator is in use; and if it should fail, the scanner goes dead. An unnoticed blown fuse can mean lost communication.

An inexpensive solution to these problems and more can be found in the simple circuit shown in Figure 1. The entire assembly can be point-to-point wired to work on any scanner that has separate "charge" and "power" jacks.

**Circuit Operation.** The parts specified in the list are for Bearcat Thin-Scan® models. The same circuit can be used for Realistic or similar scanners by substituting coaxial power plugs for the ones specified here.

A 1/8" mini plug, P1, for external power and a 3/32" submini plug, P2, for charge are soldered to a stiff piece of copper wire to hold them at the proper spacing so they will fit their respective jacks without bending. Join only the ground (negative) bases of these. External power from a car battery or eliminator/charger is applied to the circuit via J1 (a submini jack here, but it can be coaxial if needed). Reverse-polarity protection, another feature not found on many small units, is provided by diode D1. At this point a bridge rectifier could be substituted for D1 if you are unsure of the

polarity of the external supply. In either case, a negative-ground supply should be present after rectification.

Electrolytic capacitor C1 acts to remove the ripple (buzz) from the ac-powered battery eliminator. Both eliminators and scanners provide some filtering, but their small size only allows for small filter capacitors so hum or buzz is often a problem. Furthermore, a polarized capacitor across power supply leads is good practice even if the ac adaptor is not used.

After filtering, power enters the scanner via P1, acting as a battery eliminator. Simultaneously, power is applied across the poles of the NiCad batteries via P2, acting as a charger. The charge rate is limited by resistor R1, which can be altered to suit the users needs and the charge-current demand of the NiCads. In the event of a power failure or removal of the external supply, power from the batteries is allowed to pass back through diode D2 and operate the scanner (and any accessory plugged into P3, mentioned later) without interruption of service. Diode D1 also prevents back drainage through the external supply.

As an option, subminiature plug P3 can be added across the leads of C1 (observing polarity) to power other outboard accessories, such as tone-activated relays or the plug-in descrambler module made by Paralin, 2511 E. 25th St., Tulsa, OK 74114. (This module is made especially for pocket scanners.) Since accessories connected through P3 use the scanner's batteries, descramblers or other devices may be used with the same portability as the pocket scanner. For neatness and physical protection, the completed and tested assembly can be cast in a mold of epoxy or polyester resin, available at most hobby shops. The resin can be molded and dyed black to match the color and contour of the scanner. ◇

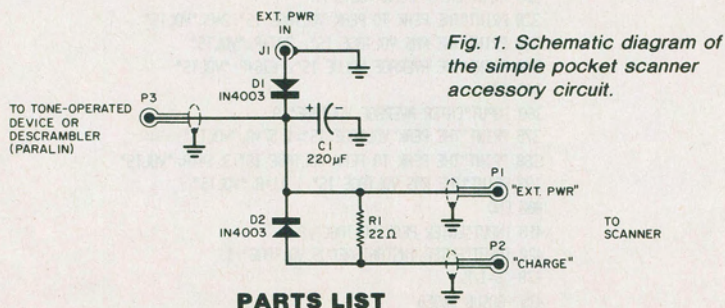


Fig. 1. Schematic diagram of the simple pocket scanner accessory circuit.

## PARTS LIST

C1—220- $\mu$ F electrolytic  
D1, D2—Diode (1N4003)  
J1—Submini jack (see text)

P1—Mini plug (see text)  
P2, P3—Submini plug (see text)  
R1—22- $\Omega$ , 1/2-W resistor