

## Kirtland Warbler Transmitter Development/Tracking Studies

### PHASE I. Radio Transmitter Development - FY 1982-FY 1983

Considerable progress was made in FY 1982 under funding provided by the Endangered Species Program for the development and improvement of electronic components necessary to reduce the size and weight of wildlife transmitters. A 1.1-gram transmitter has now been fabricated, and field tests are being planned to test this hardware in FY 1983.

#### 1. Electronic Component Selection

The newest miniature transmitter design uses a quartz crystal which measures 3 mm in diameter and 8 mm in length. This new component is approximately one-half the size of our previous crystals. We are now trying to procure an even smaller crystal, but to date, the manufacturer has been unable to deliver the units. At this time, we do not know what the electrical characteristics will be for these small crystals.

The battery division of Gould Inc. has manufactured a special 500 mg, 50 ma-hr battery for our use. This cell meets the power requirements for the bird transmitter, but may not perform satisfactorily under humid field conditions. Battery experts from Duracell International Inc. have expressed pessimism with this cell application even though they could not suggest a better alternative.

New specifications have been developed for a selected transistor for the Kirtland's transmitters. These new transistors have better amplification at VHF frequencies than those previously used. This increased performance should help to compensate for certain electrical degradations anticipated with the smaller quartz crystals.

Smaller passive electrical components will be used with the Kirtland transmitters, and this will require an increase in assembly time. Also, extra caution must be taken to accurately position and solder the components and not degrade the circuit reliability.

