

TELEPHONE (416) 968-0520

740 SPADINA AVENUE • TORONTO, ONTARIO, CANADA M5S 2J2

Sydney 02-9091788 J. Macdonald

THE UTEM 3 SYSTEM

The UTEM 3 system is an upgrade of the UTEM1/UTEM2 system developed at the University of Toronto from 1973 to 1978. The Wideband Time Domain Project reports contains descriptions of the system and its use in test surveys (U. Of Toronto, Geophysical Lab.). The new UTEM 3 system makes essentially the same measurements as the former systems, but it has significant improvements in terms of reliability, field worthiness and flexibility. Some improvements in accuracy have also been achieved, particularly with regard to gain stability. A slight improvement in precision is expected to result from increased transmitter power (30% to 15% more depending on the load). More flexibility in stacking will improve the precision appreciably where power line noise is the main limiting factor. The main significant changes are the reduction in weight of the receiver and coil and<sup>a</sup> reduction in receiver power consumption. This has been done by the use of a low power microprocessor system to control most of the receiver functions.

UTEM Method

The main characteristics of the UTEM method are:

- 1- The transmission of a precisely regulated triangular current waveform into a large loop to produce a large dipole moment.
- 2- Sensing of the magnetic field by a wideband induction coil and optionally by grounded electrodes.
- 3- Sampling of the waveform by channel windows which have widths and delay times logarithmically spaced by factors of two.
- 4- Square wave response in the absence of any conductor, such that all channels have equal amplitudes.
- 5- Absolute gain calibration to detect anomalies of extremely long time constants, including magnetic susceptibility responses.

The objective of the system is to combine large bandwidth, deep penetration, and rapid survey rates in a mineral exploration