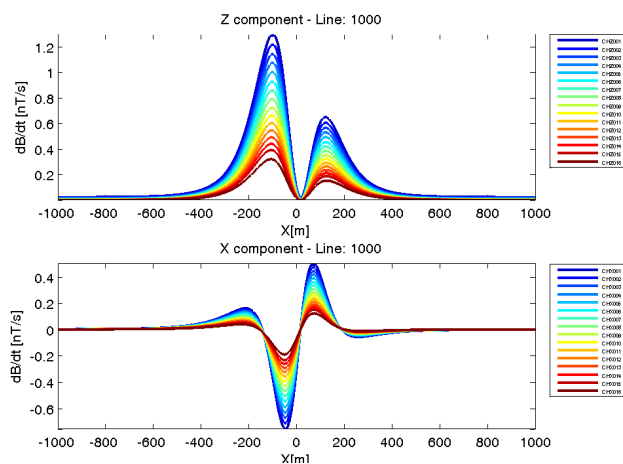


## NovaTEM TDEM surveys

**NovaTEM** is a Canadian heliborne Time-Domain Electro-Magnetic system, with a central loop configuration developed in collaboration with CNRC. The **NovaTEM**'s transmitter loop is light and very rigid. Its frame is built in composite and designed to minimize the drag in flight. Both on-time and off-time measurements are recorded as well as the B field to improve the response of ultrahigh conductance bodies. This unique configuration provides both a high resolution system for TDEM sounding, and a great penetration for TDEM prospecting:

- TDEM sounding to delineate conductivity contrasts associated with the lithology or hydrothermal alterations as well as oil or groundwater investigations;
- TDEM prospecting to locate massive sulfide ore deposits at great depths. The necessity for greater penetration depths requires both a higher transmitting moment and a low noise level: increasing the transmitting moment increases the signal to noise ratio; increasing the loop size increases the signal to bias ratio. **NovaTEM** has been designed in order to optimize these ratios.

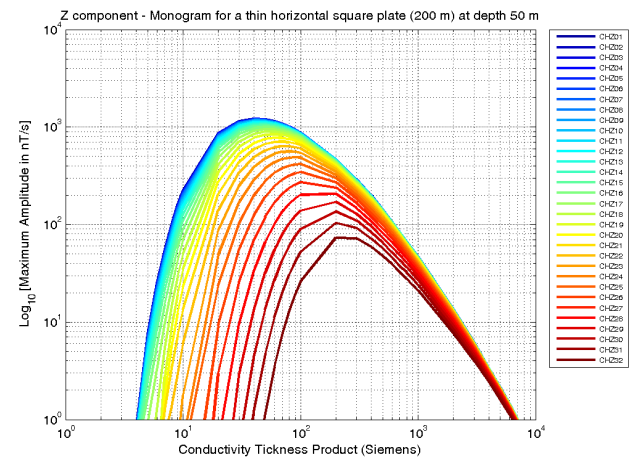
The instrumentation involves inclinometers, laser altimeters, DGPS and one high sensitivity magnetometer. The magnetometer is synchronized with the TDEM system to measure only during the 'off-time', up to 10 samples per second.



## NovaTEM design

NovaTEM is a self-operating system with all the sensitive instrumentation inside the helicopter. Having no operator on board, the range of each flight is increased. Having all the instrumentation inside the helicopter, **NovaTEM** is designed for hard conditions including very low temperatures. **NovaTEM** is easily transportable by air. Quality controls parameters are provided to the pilot in real-time as well as the height above the ground and the attitude of the frame.

The transmitter coil is coincident with the receiver coil to form a rigid and lightweight frame. The current ramp is measured for every turn-on and recorded together with the data sets. The receiver uses digital controlled analog gates with delay times from 5  $\mu$ s to 10 ms in order to obtain the maximum signal to noise ratio.



## Specifications:

### Transmitter

- Coil: Vertical axis
- High Moment: 160 000 Am<sup>2</sup>
- Loop size: 100 m<sup>2</sup>
- Pulse wave form: square
- Moment turn off: 5  $\mu$ s
- Base frequency is variable (30-90 Hz in North America and 25 - 75 Hz in Europe)

### Receiver

- Coils: Z, X and Y axis
- Measurements during 'on-time' and 'off-time' from 5  $\mu$ s to 10 ms

### Mechanical

- Flight speed: 100 km/h
- Height of the transmitter and receiver coils above the ground: 10-25 m
- Total weight: less than 300 kg