



ACF-4M

AUDIOMAGNETOTELLURIC DATA ACQUISITION SYSTEM



ACF-4M receiver

PURPOSE: The ACF-4M equipment is intended for carrying out audiomagnetotelluric and frequency soundings using natural and controlled sources electromagnetic fields.

TECHNICAL CHARACTERISTICS:

Number of channels	4
ADC, bit	24
Frequency range, Hz	0.1-800
Internal memory, Mb	1024
Connection to PC	Ethernet
Display	LCD, monochrome
Display resolution, pix.	320x240
Keypad	18 keys
Built-in accumulator	5 A*hours
Operation with built-in accumulator, hours	8
External power, V	12
Dimensions and weight	340x295x155 mm 5.0 kg

AREAS OF APPLICATION: regional geophysical investigations, searching of oil and gas structures and deep ore deposits, mapping of fracture zones and detection of kimberlite pipes, control of state of nuclear and chemical waste depositories, hydrogeological and geothermal investigations, monitoring of geodynamic processes and earthquake prediction.

FEATURES OF THE RECEIVER:

- control of measurement can be realized using both keypad of the recorder and external PC;
- the equipment allows carrying out either four-component (tensor) or two-component (scalar) measurements;
- measurement results are stored into the internal memory during field works;
- the equipment has the possibility of fulfillment of program-controlled monitoring;
- both time series and spectrograms can be collected, apparent resistivity and impedance phase are calculated directly in the recorder;
- program control of the equipment is provided, the recorder have the possibility of visualization of spectral parameters at the display and estimation of data quality takes place directly at a point of measurements;
- the measurements can be carried out using either grounded or ungrounded electric antennae that allows fulfilling measurements in all seasons and in case of bad grounding conditions (frequency band of the ACF-4M equipment with ungrounded line is 7 – 800 Hz);
- the GPS receiver can be connected to the recorder during field works (coordinate detection and time synchronization);
- depth of investigation is from 30-50 m to 2-3 km.



FEATURES OF MEASUREMENTS WITH THE ACF-4M SYSTEM

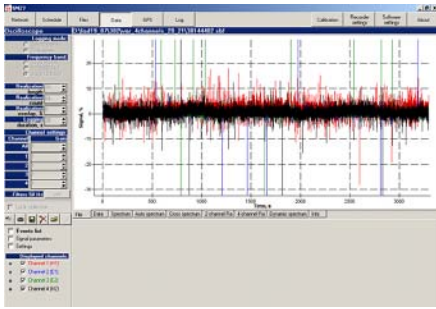


Fig. 1. Time Series

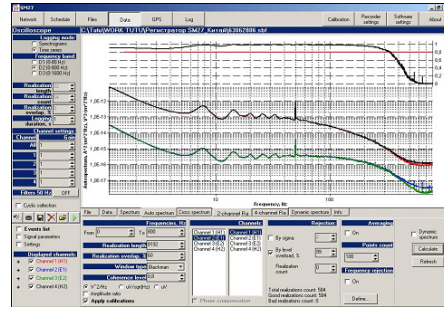


Fig. 2. Autospectra and coherency

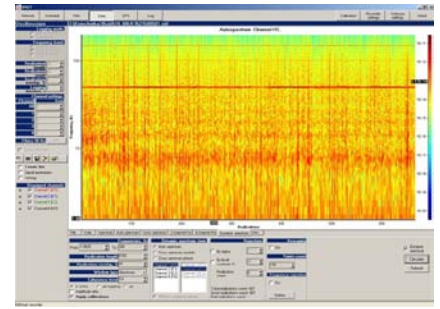


Fig. 3. Dynamic Spectrum

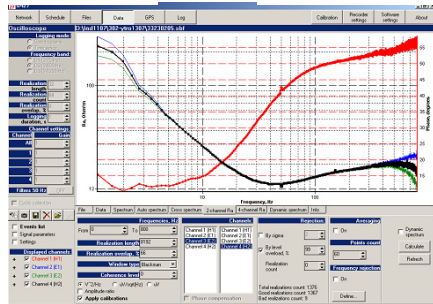


Fig. 4. Curves of apparent resistivity and impedance phase (two-channels measurements)

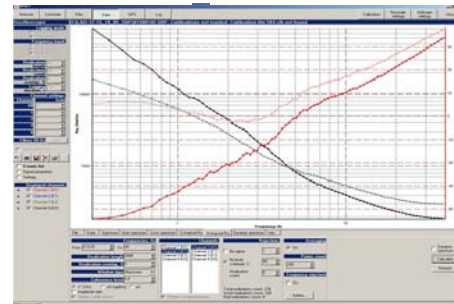


Fig. 5. Curves of apparent resistivity and impedance phase (four-channels measurements)

REALIZATION OF MEASUREMENTS WITH UNGROUNDED (CAPACITIVE) ELECTRICAL LINES USING ACF-4M SYSTEM

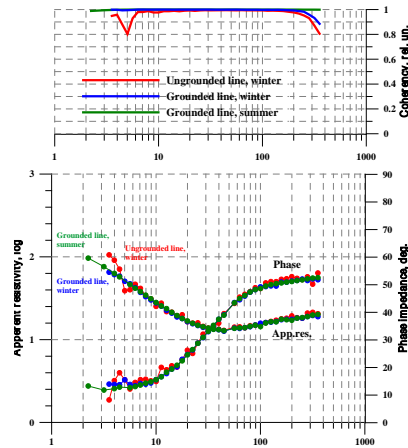


Fig. 6. Comparison of measurements with grounded and ungrounded electrical lines in winter and grounded electrical line in summer time

Ungrounded electrical lines can be obtained for investigations by AMT method under adverse conditions of ground (dry sand, frozen earth, snow and ice) in frequency range from 7 Hz and higher.

At measurements with ungrounded electrical lines are used:

- preamplifier with high input resistance;
- long receiving lines (100 m);
- robust data processing.