PHOENIX GEOPHYSICS LTD. XLPF EXTERNAL TELLURIC LOW-PASS FILTER

Description and Application

The XLPF low-pass filter is designed to operate with Phoenix MTU, MTU-A, and V8 receivers when recording MT data. The filter's purpose is to reduce the effect of high-frequency noise commonly encountered in high-altitude mountainous regions.

The effect of the filter can be adjusted by selecting capacitance of either 0.33 µF or 2.2 µF. The filter is equipped with five banana plugs, colour-coded to indicate their connection points. See Figure 1.1.
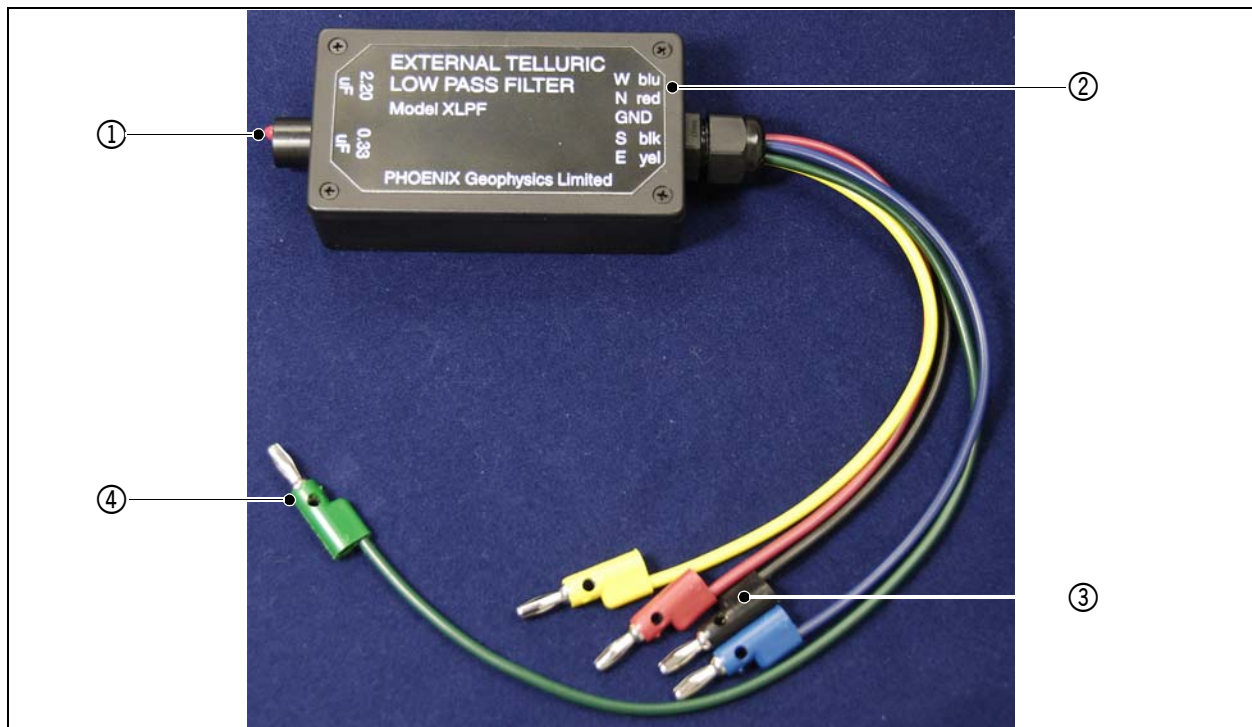

Figure 1.1— ① Capacitance selector; ② colour legend; ③ banana plugs for telluric terminals E, N, S, W; ④ banana plug for ground terminal.

Instructions for Use

To acquire the full MT frequency spectrum, record one to two hours of data without using the XLPF filter. Then connect the filter, note the time, and record several more hours of data. When processed, the unfiltered recording should provide reasonable high-frequency results, and the filtered recording should provide improved low-frequency results. The complete spectrum can therefore be obtained during editing.

## Determine the capacitance required

Begin by determining the appropriate capacitance for the circumstances. The higher the contact resistance, the lower the corner frequency of the filter. The corner frequency (F_c) can be calculated as:

$$F_c = \frac{1}{2\pi RC}$$

where R is the contact resistance in ohms and C is the capacitance in microfarads.

To determine the capacitance required:

1   Use an analog ohmmeter to measure the contact resistance of the E-channel electrodes, and determine the average value.

2   If the average contact resistance is less than 200 Ω, select the 2.2 µF setting. If the average contact resistance is 200 Ω or more, select the 0.33 µF setting.
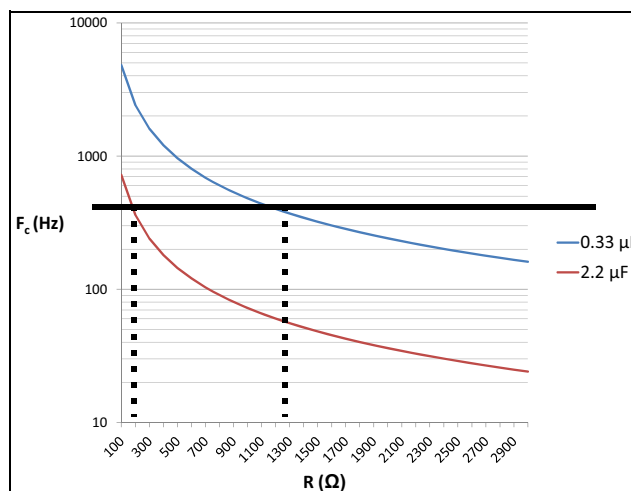
Record without the filter, then connect the filter

Record one to two hours of data without the filter. While recording continues, connect the filter as described here.

Note	There is no need to stop or pause recording when adding the XLPF filter.

To connect the XLPF filter:

1   Insert the green banana plug into the receiver's GND terminal.

2   Insert the four other banana plugs as follows:

   Blue plug to West electrode terminal
   Red plug to North electrode terminal
   Black plug to South electrode terminal
   Yellow plug to East electrode terminal

3   Note the time of day so that the processed data can be correctly edited.

4   Continue recording data for several more hours.