Appendix B

Summary Sheet for PASSCAL Sensor

Vertical Geophone Strings

**Physical Characteristics:**
- **Size:** 20x20x20 cm for a whole string
- **Weight:** 3 kg
- **Shipping Weight:** Size
- **Power consumption:** None, passive sensor

**Frequency Response:**
- **Natural Freq.:** 8 Hz.
- **Damping:** 0.707
- **Zeros:** two at zero
- **Poles:** -35.5 + 35.5i, -35.5 - 35.5i

**Installation Tips:**
These sensors are normally used with Cable reels, they will not connect directly to the DAS. The vertical string is not really long enough to reduce ground roll. The six phones produce a composite signal tending to reduce the effect of an element's poor plant or poor coupling. There are six phones per string with phones at 1 meter intervals.
1) Lay out the cable reel and drop a string of phones at each takeout.
2) Determine if the whole cable or any takeout position must be shifted slightly. The cable should not be taut to the sensor.
3) For best results, make a shallow trench a 3-4 inches deep and plant the phone in the trench. Cover the phone and cable with soil.
4) Clip the string onto the cable reel cable. Do not allow the clips to contact the ground, severe 60 Hz noise pickup may result.
5) Test the connections at the DAS by measuring the resistance on the signal pairs of the U77/U connector which connects to the DAS sensor input. The pairs are; ch1=A and B, ch2=C and D, ch3=E and F.
6) Connect the cable reel to the DAS

**Cabling Notes:**
The end connectors are Mueller 27 clips which are color coded and polarized by having different widths for the clips. Red clips for (+) are wider. The coil resistance is 680 Ohms and there are two parallel strings of three phones in series (See figure at right). Normally 3 strings are shipped on a steel hanger.