LDT-10B

LAB TRANSMITTER

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1. LAB TRANSMITTER PANEL DESCRIPTION

1.1. ON-OFF switch. This two-position switch controls the source of power to the LAB TRANSMITTER. In the **ON** position the power source for the LAB TRANSMITTER is the battery attached to the **EXT.POWER** connector, using the GDP-PW cable. This is the only method to supply power when using a GDP-16 or GDP-32. In the **OFF** position no power is supplied to the LAB TRANSMITTER.

1.2. BATT-ON Lamp. This lamp, in conjunction with the battery, shows when power is supplied to the LDT-10B.

1.3. INPUT connector. This connector is used to connect a GDP to the LAB TRANSMITTER for frequency and duty cycle control. The GDP-16 or -32 is connected using an LDT-IN/16 cable. Signals controlling the LAB TRANSMITTER are optically isolated from the GDP to avoid ground loops between the two units.

1.4. EXT-POWER connector. This connector is used to attach a 12V battery to power the LAB TRANSMITTER using the GDP-PW cable.

1.5. OFFSET control. This control is used to shift the output waveform so that it is symmetric, about zero volts. The output can shift due to SP effects in the electrodes, the ground, or the rock sample.

1.6. RANGE select. This switch has four positions controlling the output current range.

1.7. FINE adjustment. This control is used to set the current within the range selected by the **RANGE** select switch. To determine the current setting multiply the lower of the two numbers indicated by the **RANGE** switch by the number indicated by the **FINE** adjust knob. For example, if the **RANGE** switch is set to the **.01-.1** mA range and the **FINE** adjust is set to **0.1**, the output is .01mA x 0.1 = 1 microamp. As another example, if the **RANGE** switch is set to **1-10mA** and the **FINE** adjust is set to **9.5**, the output is 1mA x 9.5 = 9.5 mA.

1.8. SATURATION indicator. This is a two-color light indicating amplifier saturation. The light will flash if the operator has selected a current setting that requires a higher voltage than the LAB TRANSMITTER is capable of delivering. If the light is flashing **RED**, the output is attempting to be greater than +10 volts. If the light is flashing **GREEN**, the output is attempting to be less than -10 volts. If **RED & GREEN** colors are flashing, the output is trying to exceed +10 volts and -10 volts. This usually indicates an open circuit.

1.9. CURRENT MONITOR binding posts. The output of the **CURRENT MONITOR** is proportional to the setting of the **FINE** adjust knob and varies between 0.1 volt and 1 volt. It is an accurate scaled version of the output current with a different current sense resistor for each current range. This current monitor is usually used for making resistivity measurements or downhole resistivity/IP measurements. Current output and thus the current monitor is inverted in relation to other Zonge transmitters. Reversing polarity at the OUTPUT and CURRENT MONITOR binding posts is advised. See *Figure 2*, Alternate Laboratory Rock Measurement Setup.

1.10. OUTPUT binding posts. The output waveform is constant-current regulated in either time or frequency domain. The **RANGE** and **FINE** adjust knobs control the current. The GDP attached to the **INPUT** connector controls the frequency. Current output is inverted in relation to other Zonge transmitters.

2. LAB TRANSMITTER LABORATORY CONFIGURATION

2.1. Connect the GDP, LAB TRANSMITTER, and ELECTORDES as shown in *Figure 1* or *Figure 2*. The ELECTRODES are specifically designed for laboratory measurements to provide a non-polarizing contact with the rock.

3. LAB TRANSMITTER DOWNHOLE CONFIGURATION

3.1. Downhole measurements can be made using the configuration shown in *Figure 3***.** The current output should be used with the negative terminal attached to the downhole electrode. Select the current desired, up to 10 milliamps, being careful not to saturate. Current is monitored using the **CURRENT MONITOR** output as shown.

3.2. By using two ISOLATION AMPLIFIERS, ground loops may be reduced between the transmitter and the receiver. This connection is illustrated in *Figure 4*.

3.3. In making downhole complex resistivity measurements, it is advisable to use an active probe, with a preamplifier built into the probe (see *Figure 5*). This reduces coupling between the transmitted and received signals. In shallow measurements, it is possible to use a passive probe with a time-domain signal. Zonge Engineering manufactures the active DOWNHOLE PROBE pictured in *Figure 5*.

4. CABLES SUPPLIED WITH THE LDT-10

4 ea.	B24-0	24" Black Pomona cable.
4 ea.	B24-2	24" Red Pomona cable.
1 ea.	GDP-PW	Power cable to attach to PB1260 battery. (Battery not included)
1 ea.	XMT/16-CN/6	Control cable from GDP or XMT.
10 ea		Alligator clips

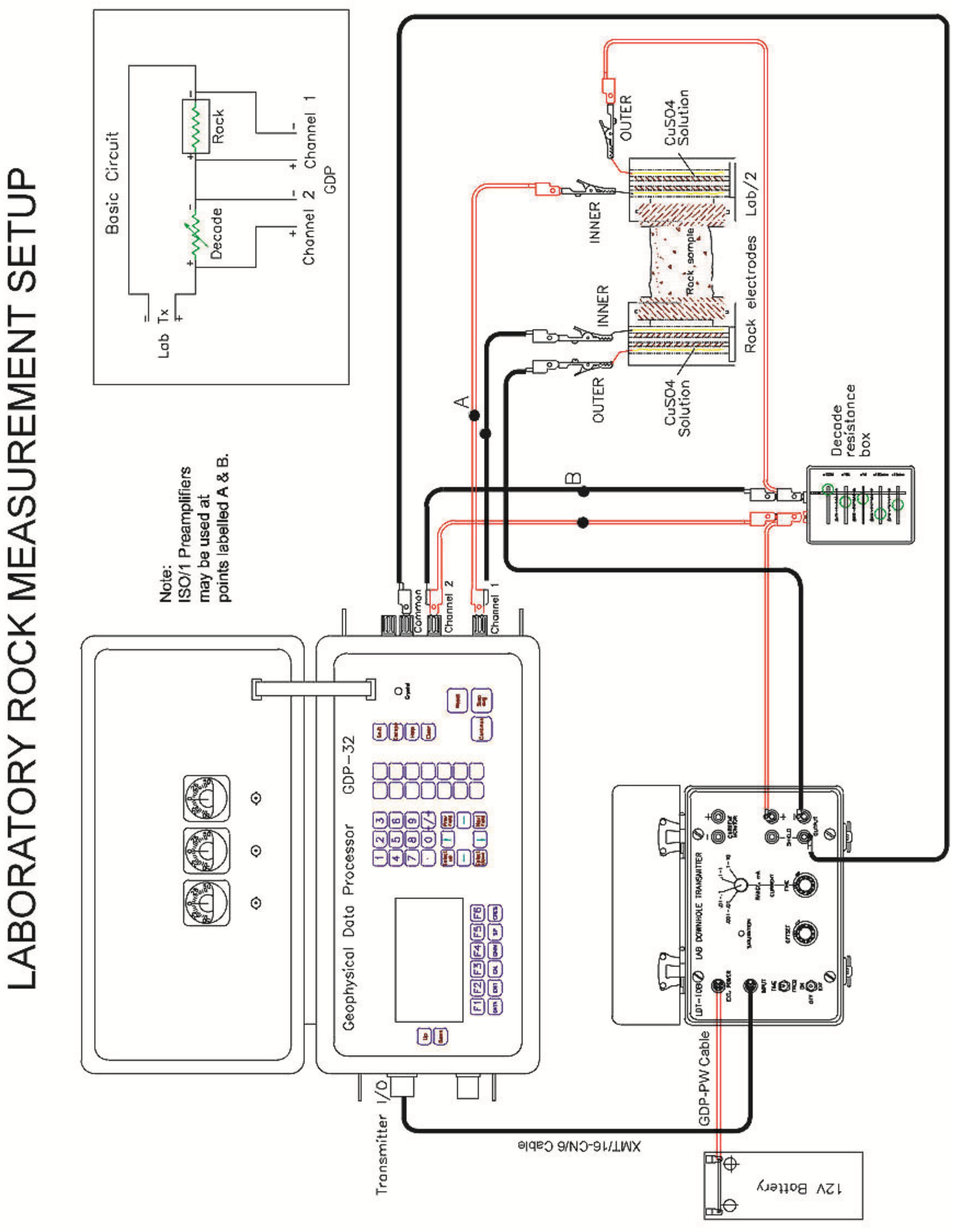

Figure 1 Laboratory Rock Measurement Setup.
Note that with this setup the recorded Vp and Magnitude will be inverted. Reversing the inputs at the GDP will result in the proper signal input.

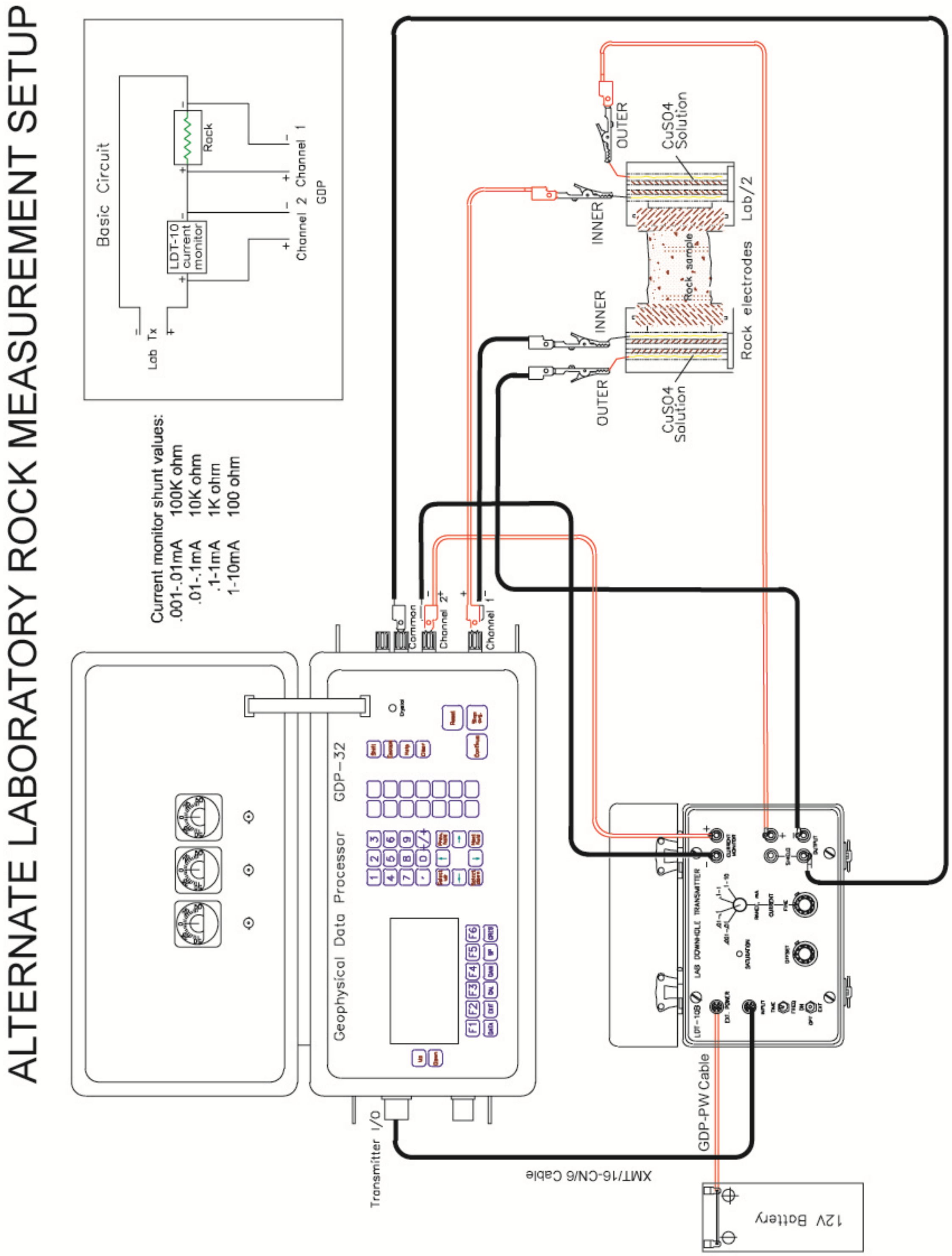

Figure 2 Alternate Laboratory Rock Measurement Setup.
Note that with this setup the recorded Vp and Magnitude will be inverted. Reversing the inputs at the GDP will result in the proper signal input.

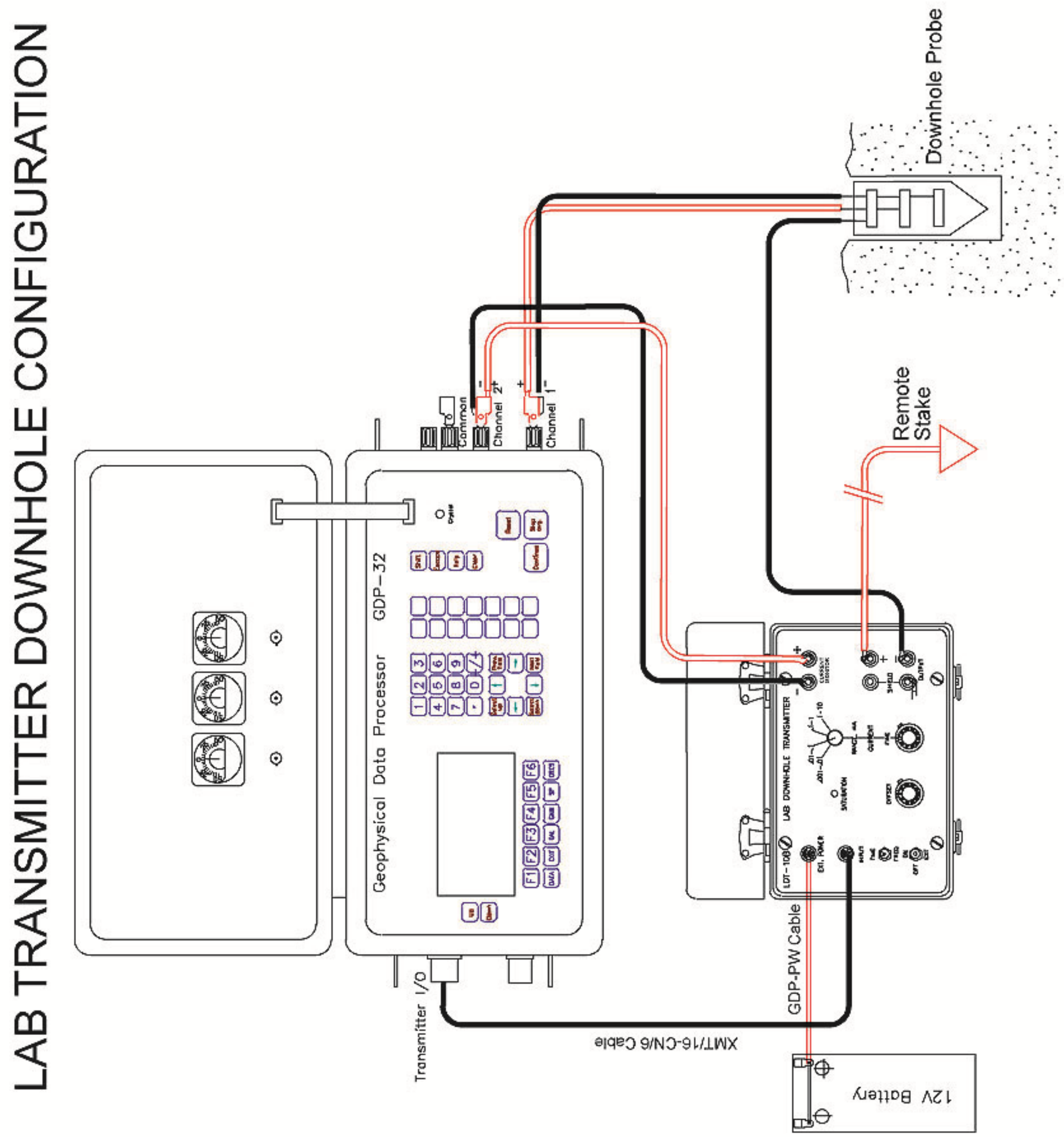

Figure 3 Lab Transmitter Downhole Configuration.
Note that with this setup the recorded Vp and Magnitude will be inverted. Reversing the inputs at the GDP will result in the proper signal input.

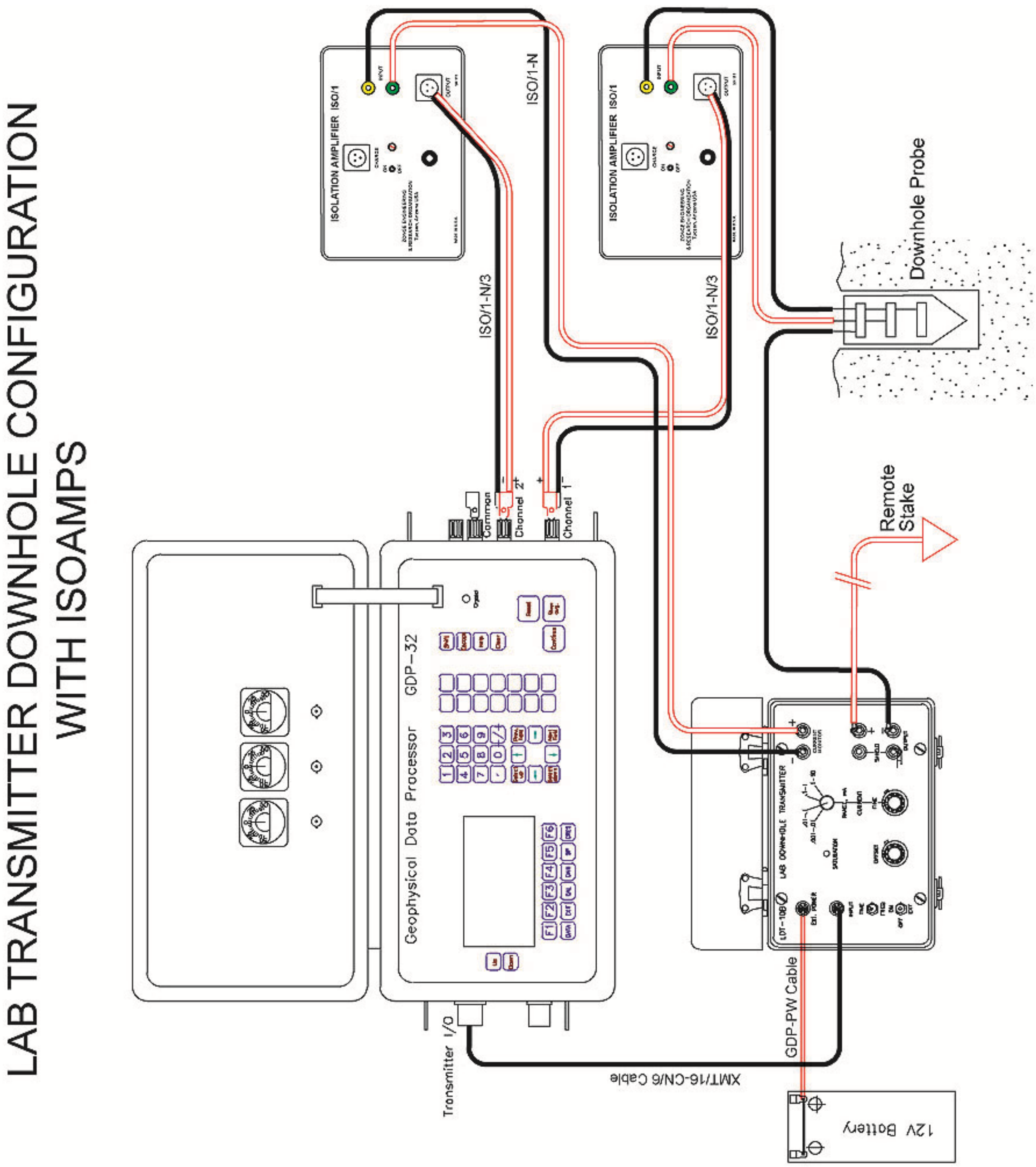

Figure 4   Lab Transmitter Downhole Configuration with Isoamps.
Note the reversal of input signal at the ISO/1.

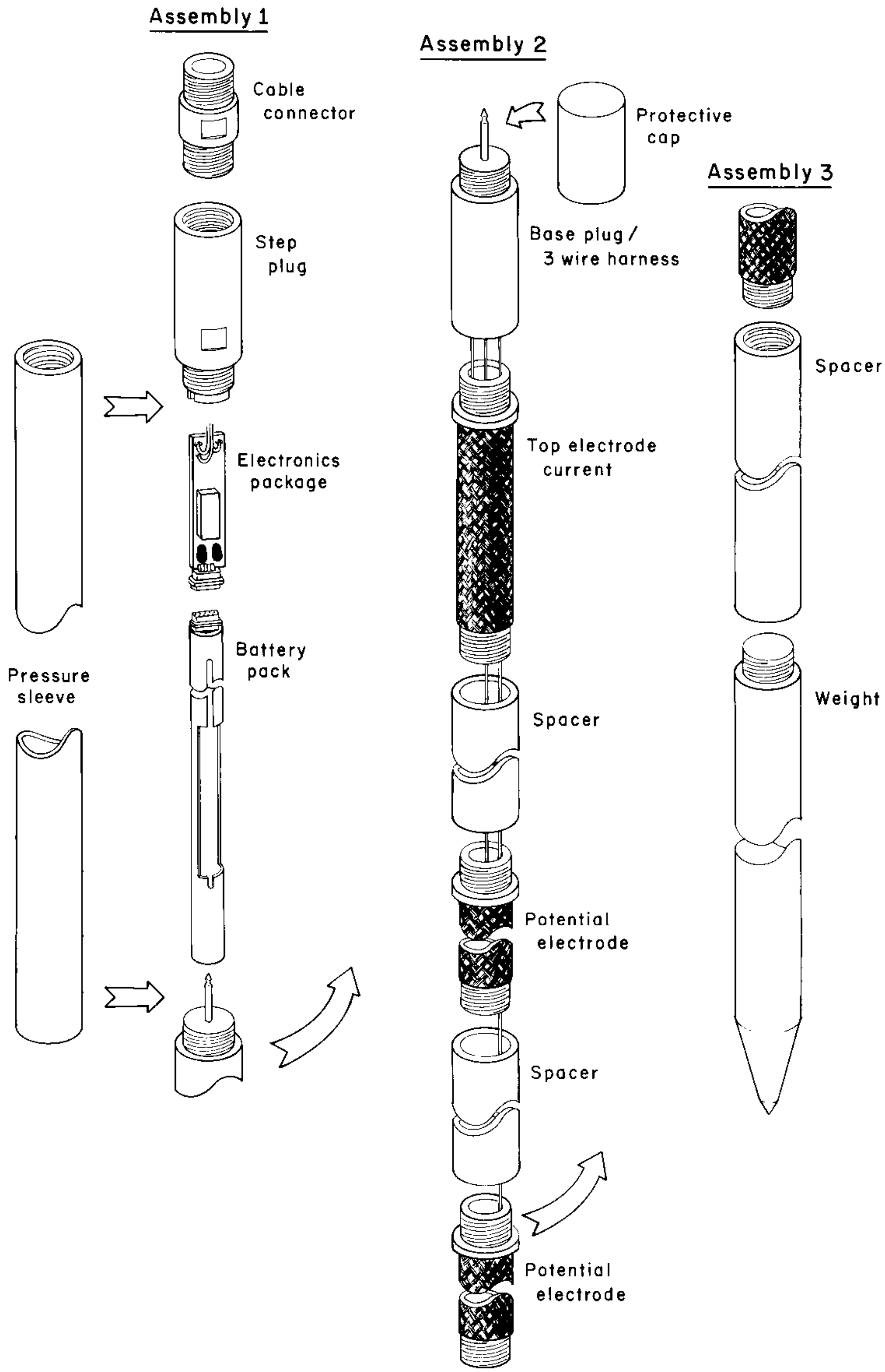

Figure 5 Complex Resistivity Downhole Probe

5. LDT-10 Board Alignment *(see Figure 6)*

5.1. Adjust Offsets (No input signals)

5.1.1. Disconnect one end of **R12**

5.1.2. Turn power **ON**

5.1.3. Set **Fine Current ADJ. Pot** (Front Panel) to zero (0).

5.1.4. Adjust **Amp 1** to zero on 1 mV scale of scope (**TP1**)

5.1.5. Adjust **Amp 2** to zero at 1 mV scale of scope (**Amp 2, pin 6**)

5.1.6. Adjust **Amp 3** to zero at 1 mV scale on scope (**Amp 3, pin 6**)

5.1.7. Short current output (Red and Black Output) before adjusting **Amp 4**

5.1.8. Adjust **Amp 4** to zero at 1 mV scale on scope (**Amp 4, pin 6**)

5.1.9. Adjust **Amp 5** to zero at 1 mV scale on scope (**Amp 5, pin 6**)

5.1.10. Continue with adjusting **Amp 6 (pin 2)**, **Amp 7 (pin 2)**, and then **Amp 8 (pin 6)** or at **CURRENT MONITOR** output (**RED Post**) to zero output. Remove short on current output.

5.2. Set Gain on **Amp 2** and **Amp 10A**

5.2.1. Resolder **R12**

5.2.2. Adjust **FINE CURRENT** (front panel) pot for 0.100 volts output at **TP1** using DVM meter.

5.2.3. Apply a 0.125 Hz signal to the external control (**INPUT**) of the LDT-10B. Monitor **TP2** with a DVM and adjust pot **R7** for ±0.100 Vdc signal.

5.2.4. Check the output of **LH0070** for 10.00 Vdc. Adjust pot **R24** for an output of -10.00 Vdc at **Amp 10A, pin 1** (LF444CN). This sets the saturation level and the negative reference of the offset adjust pot.

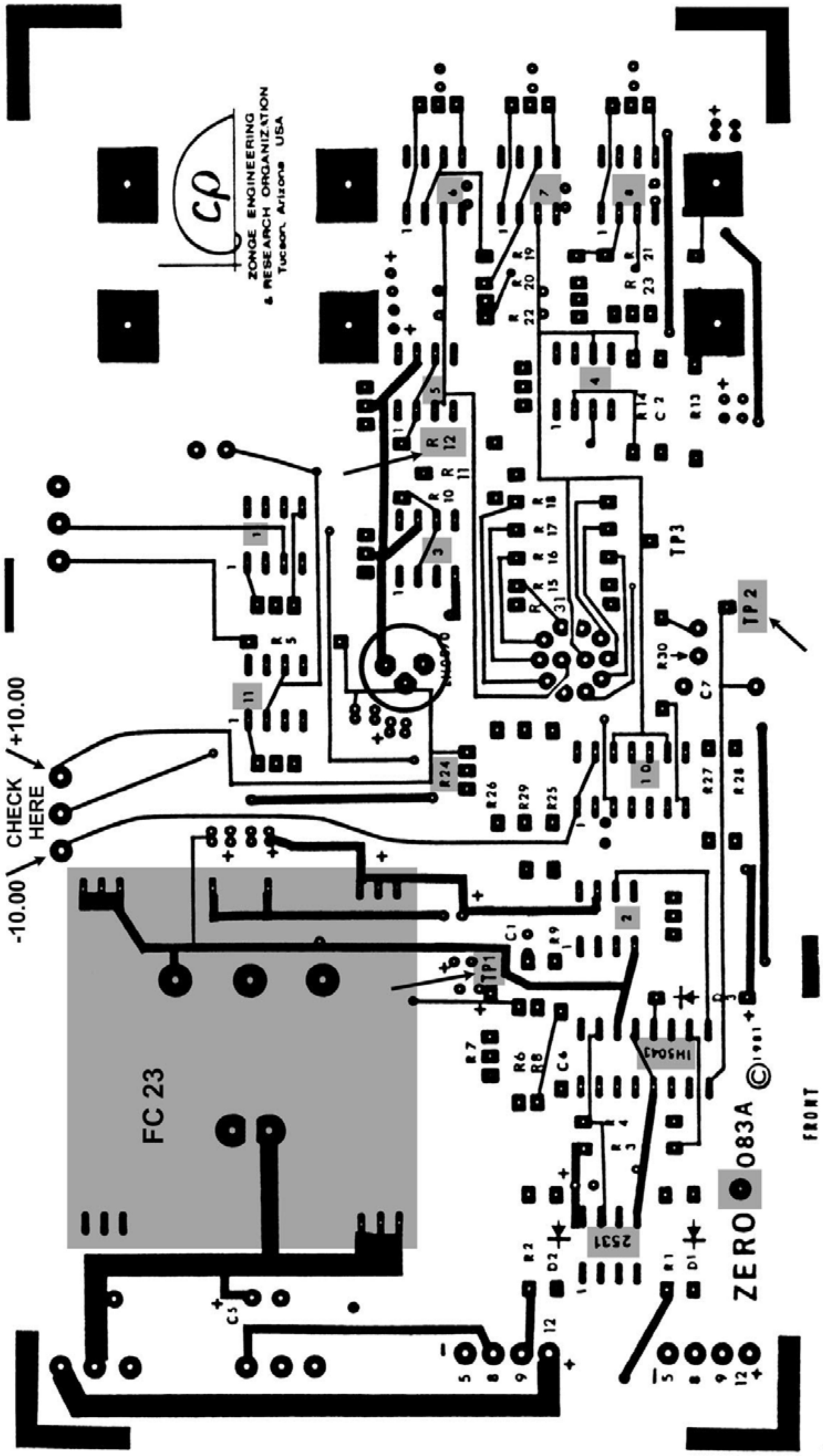

Figure 6 LDT-10B Board 83A