For Length Determination of Unknown Foundation Depths Even When Tops Are Not Accessible

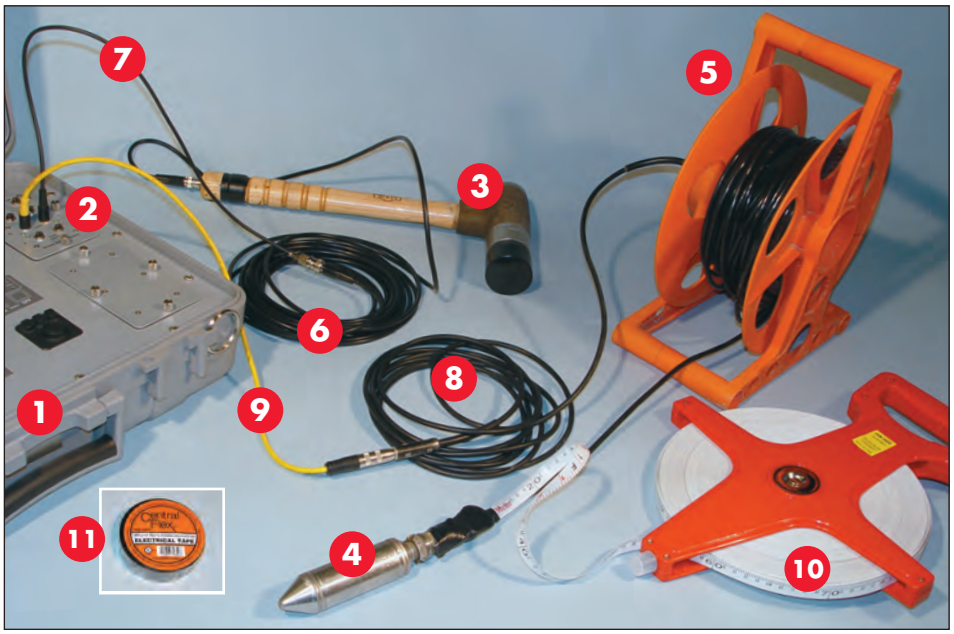
PARALLEL SEISMIC *Testing*

2.0 HARDWARE

PARALLEL SEISMIC (PS) EQUIPMENT LIST
Using an Impulse Hammer

(1) - 1 Olson Freedom Data PC
(2) - 1 Input Module Containing:
- 1 Channel Wideband Hammer (Green Light Required)
- 1 Channel Wideband Input (Hydrophone)

(3) - 1 Impulse Hammer
(4) - 1 Hydrophone/Geophone Receiver or Receiver String
(5) - 1 Orange Reel of CSL Cable (3 Pin MS to Phone Plug)
(6) - 1 BNC Cable
(7) - 1 4 Pin Adapter Cable (black)
(8) - 1 Phone Plug Cable
(9) - 1 4 Pin Adapter Cable (yellow)
(10) - 1 Flexible Tape Measure
(11) - Electrical Tape

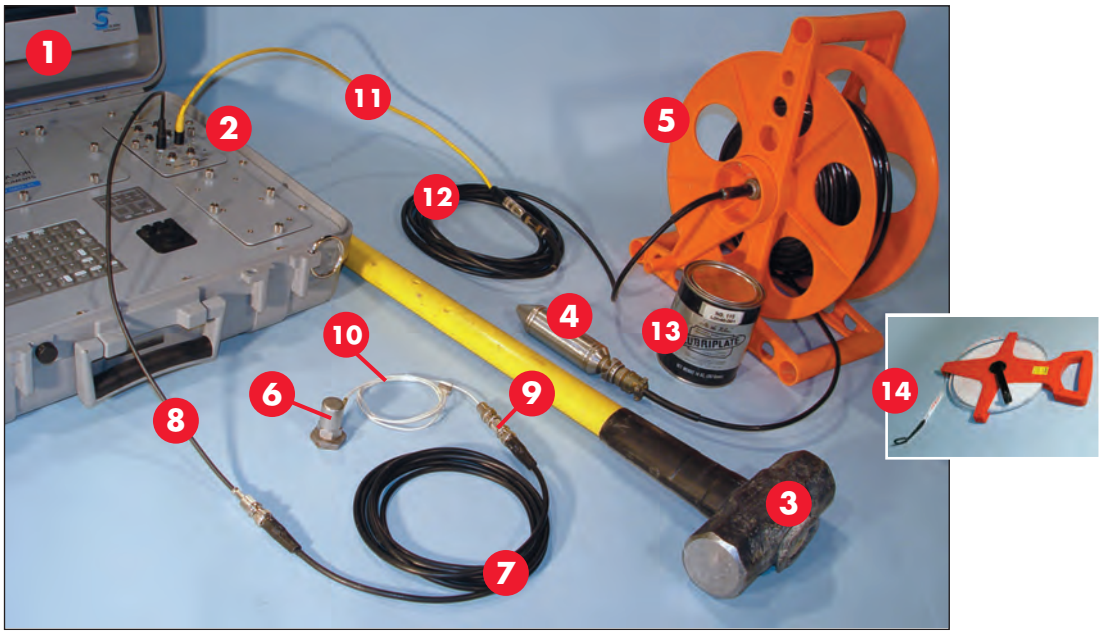


* Equipment/Software Required for Testing Not Shown in Photo:
- Latest SHM Software
- Latest IX Foundation Software
- Field Notebook & Pen

PARALLEL SEISMIC (PS) EQUIPMENT LIST
Using a Sledge Hammer & Accelerometer

(1) - 1 Olson Freedom Data PC
(2) - 1 Input Module Containing:
- 1 Channel Wideband Accelerometer (Green Light Required)
- 1 Channel Wideband Input (Hydrophone)

(3) - 1 Sledge Hammer
(4) - 1 Hydrophone Receiver/Geophone Receiver or Receiver String
(5) - 1 Orange Reel of CSL Cable (3 Pin MS to Phone Plug)
(6) - 1 Accelerometer
(7) - 1 BNC Cable
(8) - 1 BNC to 4 Pin Adapter
(9) - 1 Female-Female BNC Adapter
(10) - 1 Microdot to BNC Cable
(11) - 1 Reel to 4 Pin Adapter to Phone Plug
(12) - 1 Phone Plug Cable
(13) - Coupling Grease
(14) - 1 Flexible Tape Measure

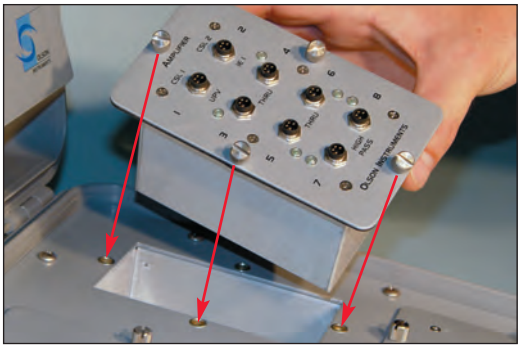


* Equipment/Software Required for Testing Not Shown in Photo:
- Latest SHM Software
- Latest IX Foundation Software
- Field Notebook & Pen

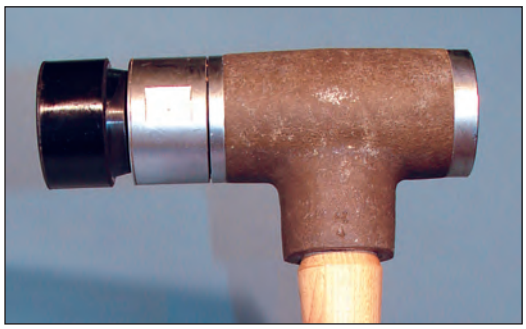
2.0 HARDWARE SETUP - Impulse Hammer

PS with Impulse Hammer Hardware Setup Step-by-Step Guide

1. After opening the Freedom Data PC, insert the input module into the top module pocket if not already present. This pocket is reserved for the input modules. Make sure to align the four (4) thumbscrews on the module with the holes in the Freedom Data PC, and hand-tighten securely into place.



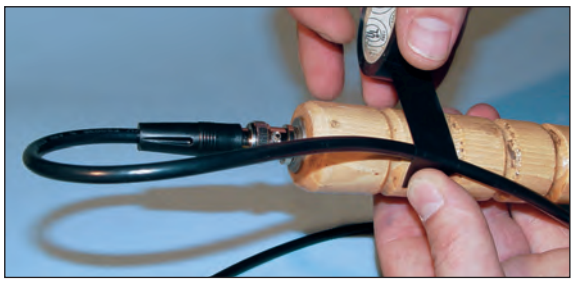
2. Next, the appropriate tip must be connected to the end of the impulse hammer. The tips differ by their hardness. Each color represents a different hardness; refer to the manual to for specific harness represented by each color. The tip is connected to the impulse hammer by aligning the screw on the tip with the hole in the load cell portion of the hammer. Please note that overtightening or excessive force used during the removal of the tip will damage the load cell permanently.

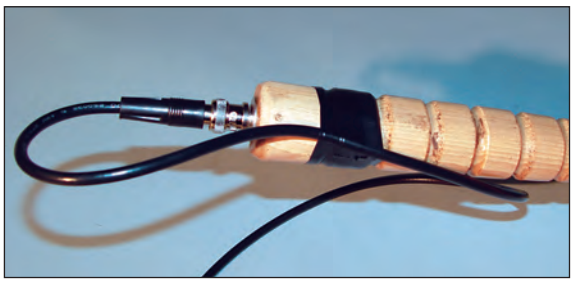


2.0 HARDWARE SETUP - Impulse Hammer

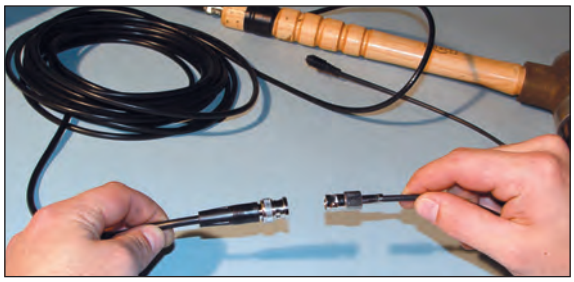
3. The next step involves connecting a BNC cable to the BNC connection on the bottom of the impulse hammer's handle. Align the BNC cable with the BNC connector and hand-tighten the connection. Note that there is a locking mechanism involved when connecting BNC cables. This will prevent you from overtightening the cable.

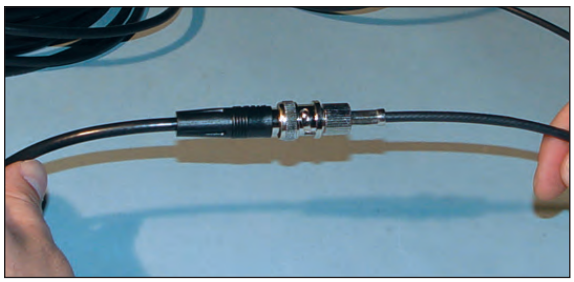
4. The BNC cable must then be taped to the handle of the impulse hammer. This is done to protect the cable and the connection from being damaged during the testing. Note that the cable should not be bent at a ninety degree angle at the base; leave some slack in the cable when taping.





5. Next the BNC cable that is connected to the impulse hammer must be connected to a 4 Pin Adapter Cable. This is done by connecting the other end of the BNC cable to the BNC end of the 4 Pin Adapter Cable. Align the connectors and hand-tighten them. Once again, the BNC connection has a locking mechanism which will prevent you from over tightening the connection.

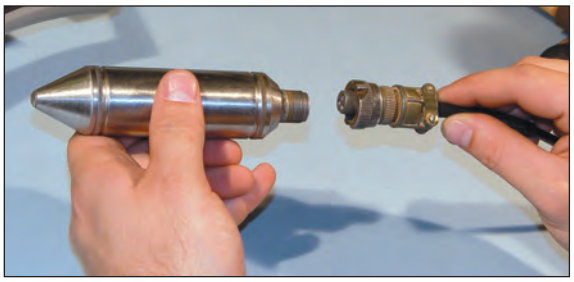


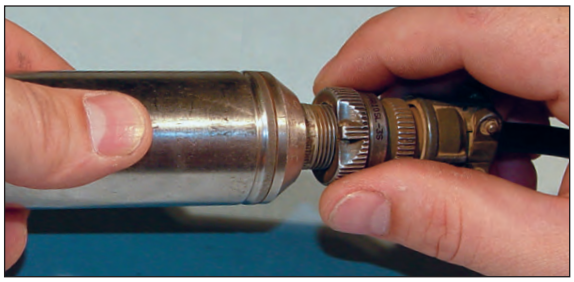


2.0 HARDWARE SETUP - Impulse Hammer

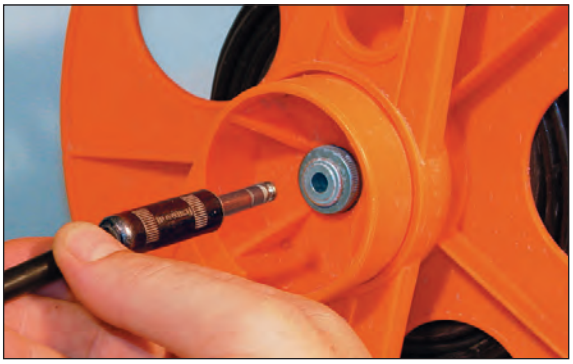
6. The 4 Pin Adapter Cable, which is connected to the BNC cable and impulse hammer, must be inserted into the appropriate slot in the input module. For PS testing it is important to use a channel that is wide-band (has no filtering applied). It is also important that this channel has power supplied to it; this is indicated by a green light next to the channel. The connection can be made by pulling back on the small black sleeve at the end of the cable and carefully lining up the four holes on the cable with the four pins on the input module. The green light will illuminate when the impulse hammer is properly connected.

7. The next step involves the cable (3 Pin MS to Phone Plug) on an orange reel and a hydrophone. Remove these two items from the padded case. Once these items are removed, connect the cable to the hydrophone by aligning the pins with their corresponding holes and hand tightening the cable onto the hydrophone. It is important to note during this step that the cable connection should not be loose.



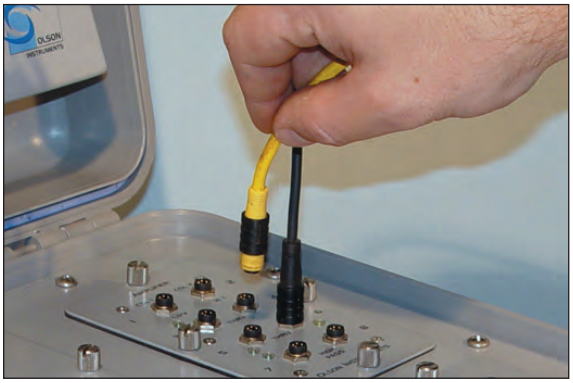


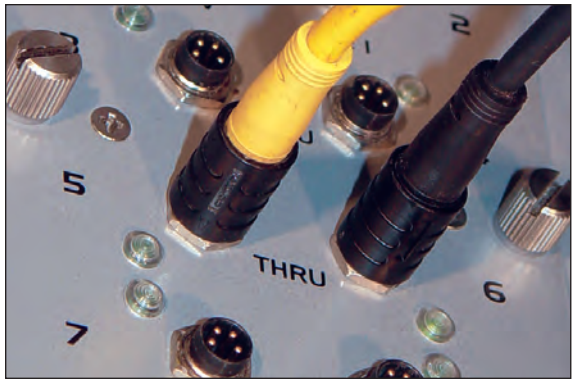
8. Next attach the phone plug extension cable to the orange reel's phone jack by inserting the male end of the cable into the female receptor on the orange reel.



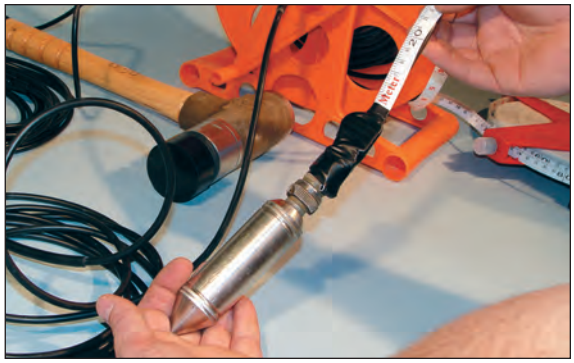
9. Attach the 4 pin adapter to the extension cable by inserting the phone plug into the phone plug receptor end of the 4 pin adapter.

10. Now, insert the 4-pin adapter into a wideband channel of the input module. See step 6 for further details.



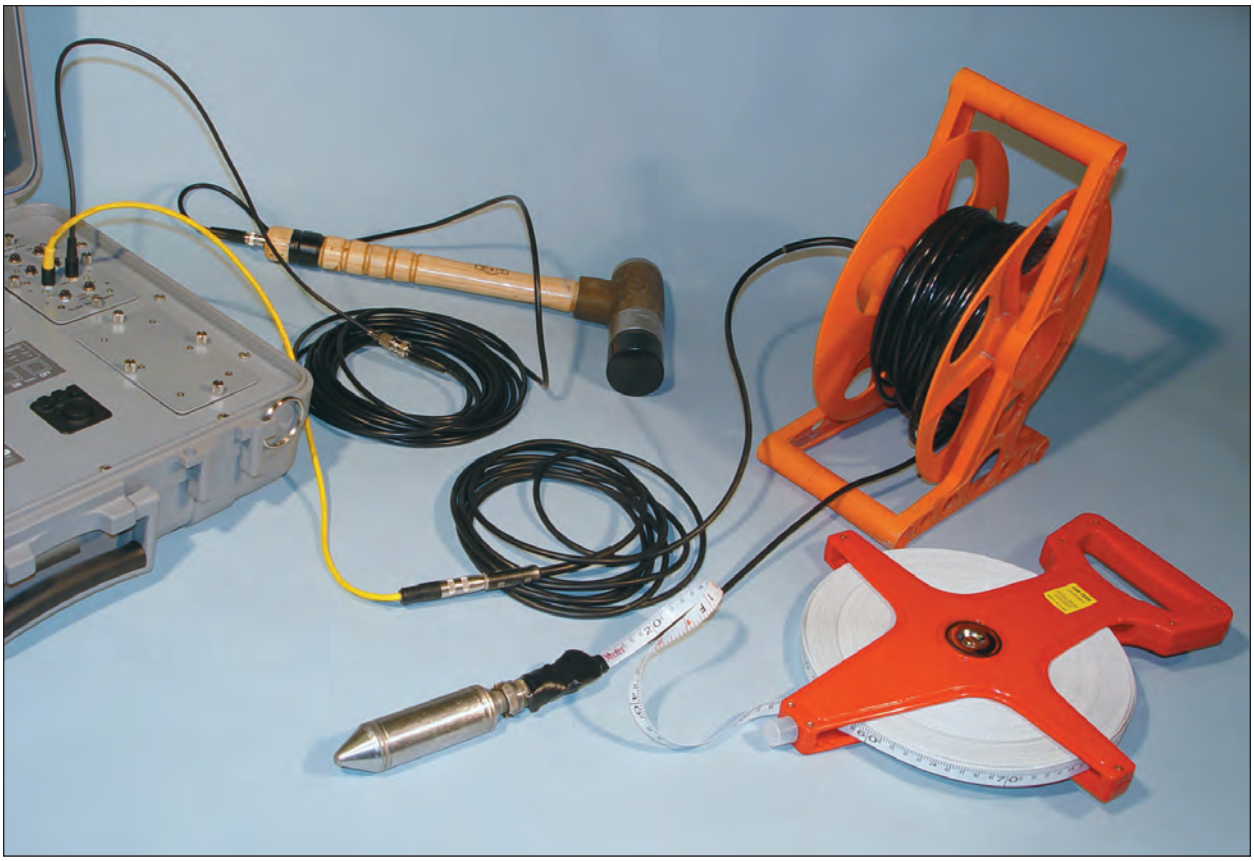


11. Lastly, attach the tape measure to the transducer as shown in the figure using electrical tape.



2.0 HARDWARE SETUP - Impulse Hammer

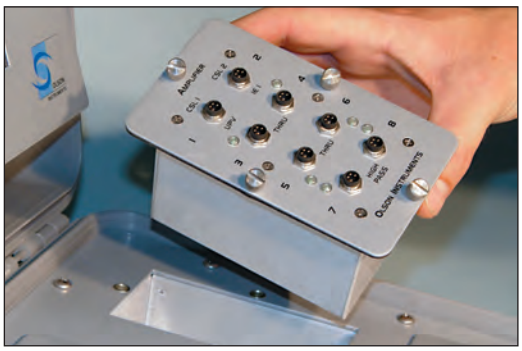
12. The hardware is now properly setup for the acquisition system.

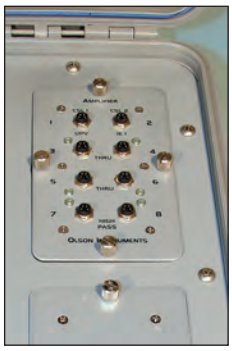


Complete PS System with Impulse Hammer showing all components properly attached

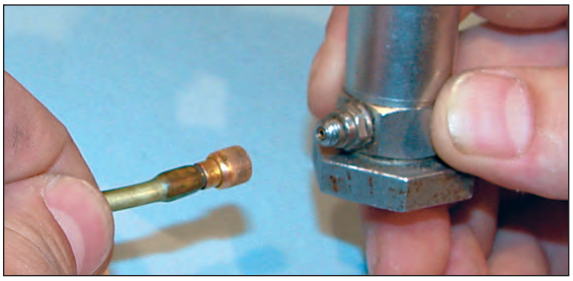
PS with Accelerometer Hardware Setup Step-by-Step Guide

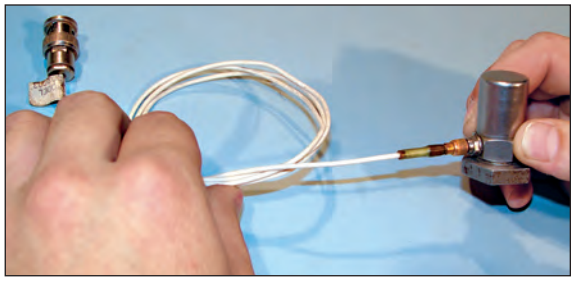
1. After opening the Freedom Data PC, insert the input module into the top module pocket if not already present. This pocket is reserved for the INPUT modules. Make sure to align the four (4) thumbscrews on the module with the holes in the Freedom Data PC, and hand-tighten securely into place.



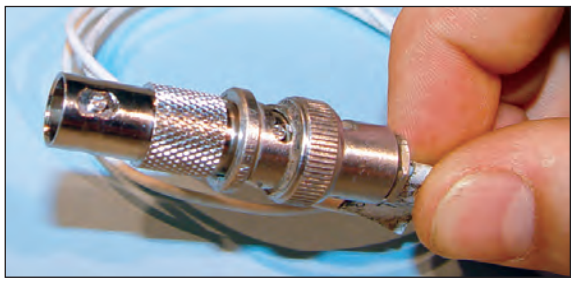


2. Next connect the microdot cable to the accelerometer by aligning the pin on the microdot cable with the corresponding hole in the accelerometer and then hand-tightening the connection.



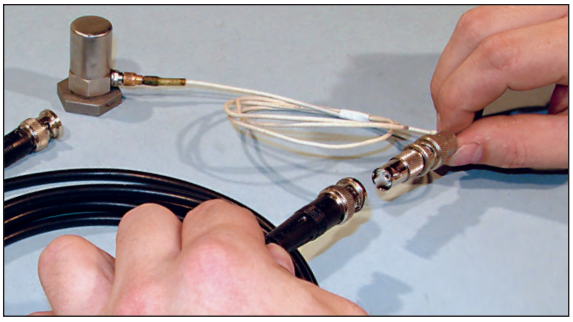


3. If needed, attach the female BNC adapter to the BNC end of the microdot cable by aligning the pin with the hole and gently connecting the two pieces. This connection will have a locking mechanism that will prevent you from over tightening the connection.

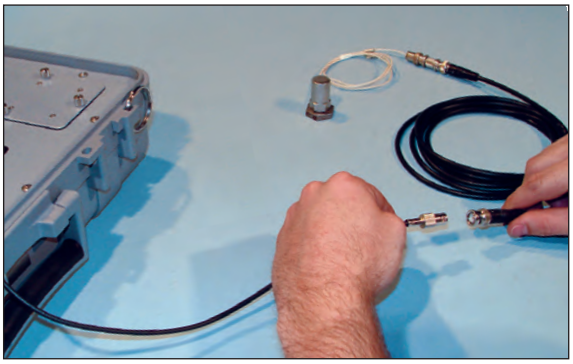


2.0 HARDWARE SETUP - Accelerometer

4. Next, attach the other end of the female BNC adapter to a BNC cable. Follow the same procedure as before when connecting these two cables.



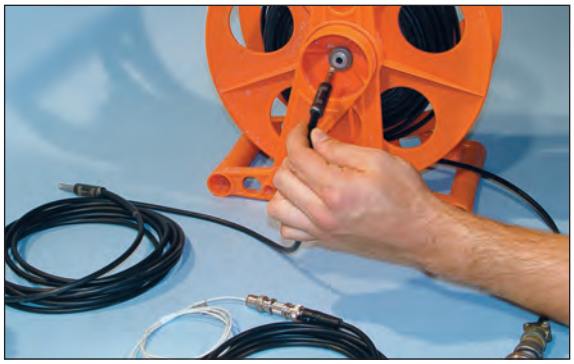
5. Now attach the BNC cable to the 4 pin adapter cable using the same procedure as before.



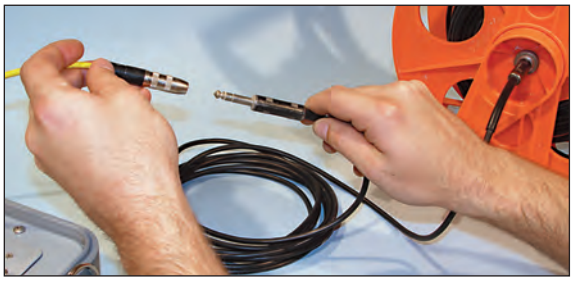
6. Insert the 4 pin adapter cable into a wideband channel in the input module. It is also important to note that this channel has power supplied to it; this is indicated by a green light next to the channel. The connection is made by pulling back on the small black sleeve at the end of the cable and carefully lining up the four holes on the cable with the four pins on the input module. Note that the green light will illuminate when the accelerometer is properly connected.

7. The next step involves the cable (3 Pin MS to Phone Plug) on an orange reel and a hydrophone. Remove these two items from the padded case. Once these items are removed, connect the cable to the hydrophone by aligning the pins with their corresponding holes and hand tightening the cable onto the hydrophone. It is important to note during this step that the cable connection should not be loose.

8. Next attach the phone plug extension cable to the orange reel's phone jack by inserting the male end of the cable into the female receptor on the orange reel.

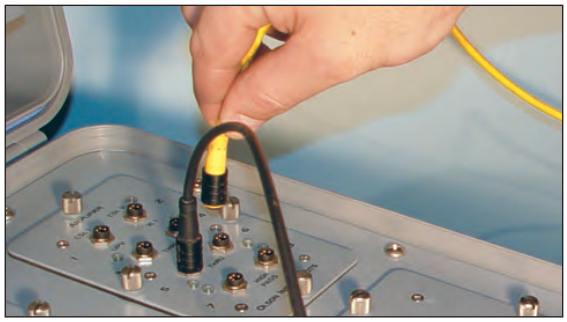


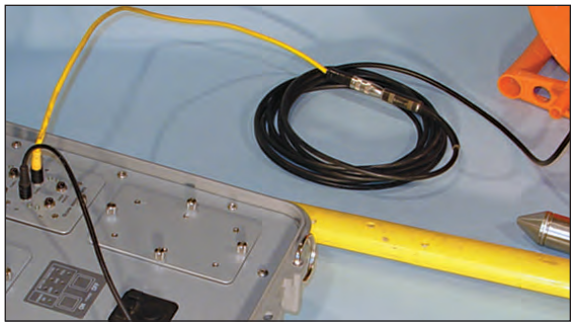
9. Attach the 4 pin adapter to the extension cable by inserting the phone plug into the phone plug receptor end of the 4 pin adapter.



2.0 HARDWARE SETUP - Accelerometer

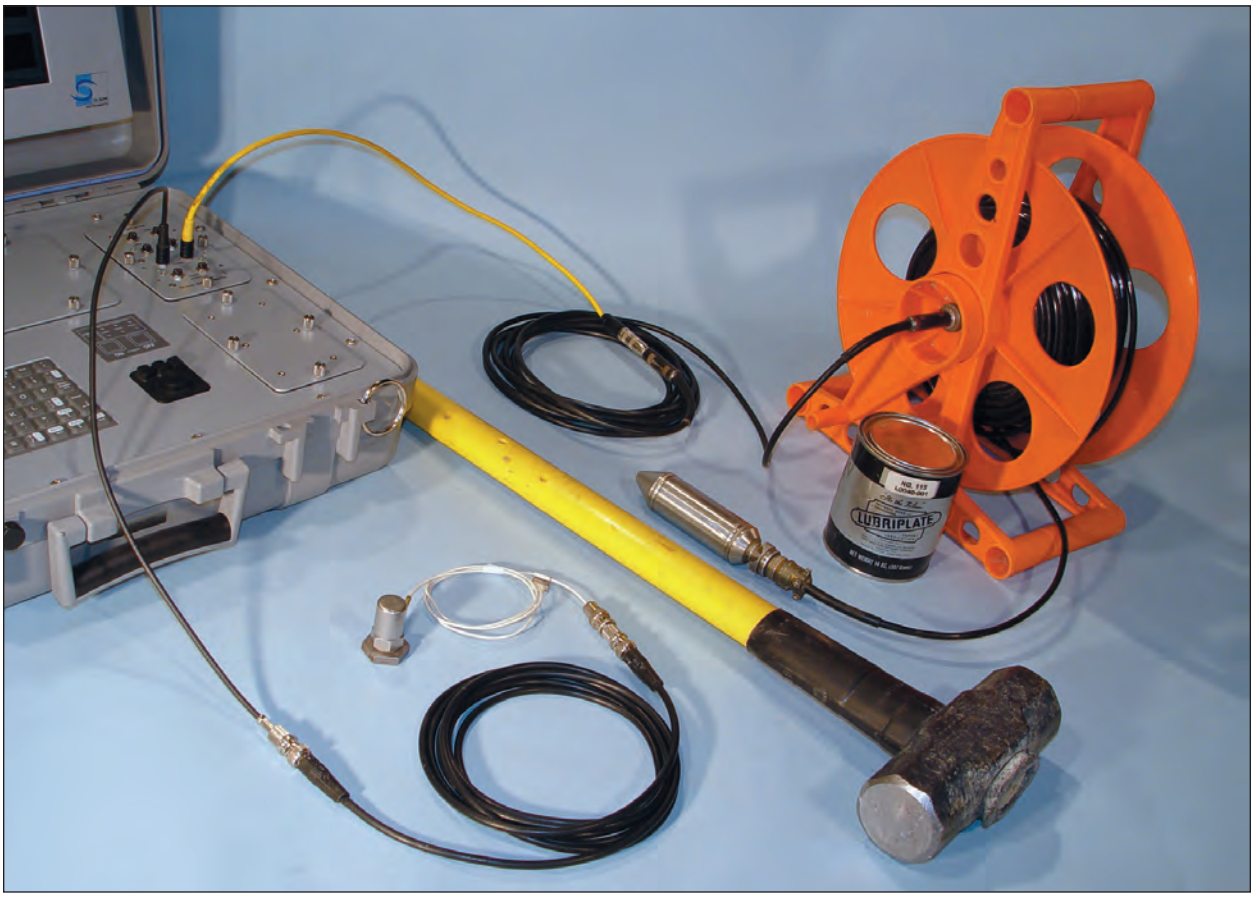
10. Now, insert the 4-pin adapter into a wideband channel of the input module by aligning the pins with their appropriate holes. See step 6 for further details.





11. Lastly, attach the tape measure to the transducer as shown in the 3 photos using electrical tape.

12. The hardware is now properly setup for the acquisition system.



Complete PS System with Accelerometer showing all components properly attached