Use of the Guralp Handheld Control Unit (HCU aka GCU).

"4.2 The handheld control unit" below is an extract from the most recent Guralp CMG-3T Operator's guide. Please read it and the additional tips:

> When using the functions Lock, Unlock, or Center the Enable toggle switch must be held simultaneously, a full 7 seconds for newer 3T's , and you will see the red LED light up. (If the LED lights immediately, it is an older 3T and either way, the switches can be released once the LED is lit.)

> Newer 3T's (w/ 7-second Enabling) Lock, Unlock, or Center functions are in order timewise: Z, then N/S, then E/W.
Older 3T's (instant Enabling) Lock, Unlock, or Center functions are in order timewise: Z, then E/W, then N/S.

> Any of the functions require several minutes to complete and the LED will remain lit during that time. For example an unlocking sequence lasts approx 3 min and can take up to 5 min.

> Once you initiate an Enable/Lock, wait several minutes for the masses of all three components to approach 8 to 9 Volts; the Vertical component will take longer than the horizontals to reach maximum value; allow several minutes. We recommend repeating the Enable/Lock function as a further check. If the 3T was completely locked after the first Enable/Lock, any subsequent Enable/Lock of the locked sensor will cause the LED to flicker very briefly (less than a second). If the locking process was incomplete, you will see several seconds of LED lights. Reheck the mass positions and try Enable/Lock again, looking for the very brief flicker.

> Bear in mind: all the LED lighting will be very difficult to see in direct sunlight.

4.2 The handheld control unit

This portable control unit provides easy access to the seismometer's control commands, as well as displaying the output velocity and mass position (*i.e.* acceleration) on an analogue meter. It takes input from the 26-pin connector at the bottom, and repeats it at the connector on the side for connection to further equipment.

The handheld control unit can be sited up to 50 m from the breakout box.

The meter

The meter at the top of the unit allows you to monitor the voltage outputs of the instrument. Using the knob below, you can select either the mass position output or the velocity output, for each of the three components. There is also a *RANGE* switch allowing you to alter the sensitivity of the meter.

Control commands

You can use the handheld control unit to centre, lock and unlock the sensor masses.

- To unlock the sensor masses, press the *ENABLE* switch down, and the *LOCK/UNLOCK* switch up simultaneously. The *BUSY* LED will light. All three masses are unlocked, each in turn. The sensor then automatically moves on to centre the masses, during which time the *BUSY* LED will flash. When the *BUSY* LED goes out, the instrument is ready for use.

You should not attempt to move the instrument without re-locking the masses.

- To lock the sensor masses, press the *ENABLE* and *LOCK/UNLOCK* switches down simultaneously.. When the *BUSY* LED goes out, the instrument is ready for transportation.

- To re-centre the sensor masses, press the *ENABLE* and *CENTRE* switches down simultaneously. When the *BUSY* LED stops flashing, the centring process has finished. You may need to initiate several rounds of centring before the instrument is ready; when no more centring is required, pressing the *ENABLE* and *CENTRE* buttons has no effect.

The *ENABLE*, *LOCK*, *CENTRE* and *UNLOCK* switches require only a single quick press to initiate the processes. Do not hold them down.

For more details on the control system, see Section 5.2, page 36.

Outputs

The remaining banana sockets provide easy access to the output voltages of the instrument. For each component (vertical, N/S and E/W):

- the left-hand two sockets expose the balanced differential outputs representing ground velocity, and

- the right-hand socket exposes the mass position (acceleration) output.

Ground references for each of these voltages are provided at the bottom of the unit. Ensure that you do not connect either side of a differential output to ground.