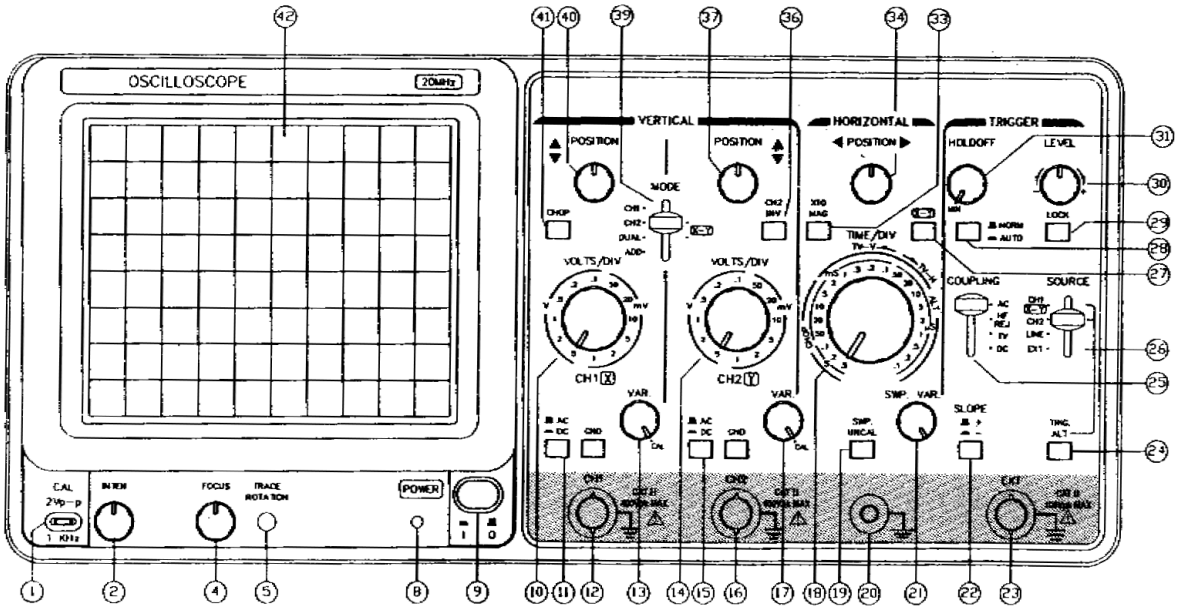
Oscilloscope Fundamentals

This sheet discusses the basics of using the Leader Model LS 8022 oscilloscopes you will be working with in the lab. A front-panel drawing of the scope is given below:



All oscilloscopes include 3 major subsystems:

- VERTICAL Controls how voltages are translated to vertical positions on screen.
- HORIZONTAL Controls how fast beam is swept from left to right.
- TRIGGER Creates a stable waveform on the screen.

VERTICAL SUBSYSTEM

The main elements in the vertical subsystem (from bottom to top) are:

- CH1 and CH2 probe inputs (12, 16) at the bottom. These are "BNC" connectors. This scope provides dual-trace capability so that two waveforms can be displayed at once and compared.
- AC/DC coupling button (11, 15). Determines whether or not DC offsets in signals are displayed.
- Ground reference button GND (to right of 11, 15). Internally disconnects probe when pressed in. Used to determine where "zero volts" is on the display (when DC coupled).
- VOLTS/DIV knob (10, 14). Used to set the "vertical sensitivity". Determines how many volts at the input corresponds to one grid-square (division) on screen.
- Sensitivity vernier control (13, 17). Used to obtain volts/div scalings between the increments on the main Volts/Div dial. (Set to CAL position normally)

- MODE control (39). Determines which channel is displayed and if both, how the single beam is used to create two traces. (Normally set to CH1 position)
- POSITION knob (40, 37). Used to manually move trace up or down. Use this in conjunction with the GND button to know where zero-volts is on the screen.

HORIZONTAL SUBSYSTEM

The most important elements of this subsystem are (from top to bottom)

- POSITION knob. Use to move trace to left or right. Normally set so that trace begins at exactly the left side of the screen.
- TIME/DIV knob (18). Use to determine how fast beam sweeps from left to right across screen.
- X10 MAG button (33). Increases sweep speed by factor of 10. Normally not used. Leave button "out".
- SWP UNCAL button (19) and SWP VAR knob (21). Used to obtain time/div settings between the increments on the main knob. Normally leave the SWP UNCAL button "out".

TRIGGER SUBSYSTEM

This section is critical to getting your waveform displayed well. The most important controls are:

- SOURCE switch (26). Make sure this is set to CH1 if you are using channel 1.
- COUPLING switch (26). Set to AC normally.
- NORM/AUTO button (28). Leave pressed in normally (set to AUTO).
- LEVEL knob (30). Use this to get the waveform to trigger properly.