

CR-160 Gaussian shaping amplifier evaluation board: application guide

rev. 5, November 2007

General Description

The CR-160 is an 'evaluation board' for the CR-200-X family of Gaussian shaping amplifier modules. The CR-160 makes it easy for the casual experimenter to use the CR-200-X, providing BNC connectors for input and output, a power supply terminal block, and a socket for the insertion of the CR-200-X shaping amplifier modules. To provide flexibility in the implementation of the CR-160 within the users' instrumentation, the connectors have been provided un-assembled to the CR-160 board.

Additionally, the CR-160 includes an adjustable low-noise wide-band amplifier having gains adjustable from 0 to 100. Combined with the CR-200-X gain of 10, this allows an overall gain of 0 to 1000. Furthermore, an inverted-polarity signal is available, as well as adjustments for pole-zero correction and DC offset.

The CR-160 board has dimensions: 3.7 inches x 2.3 inches x 0.062 inches

Gain Adjustment

The 'fine gain' of the on-board amplifier can be continuously adjusted using a small potentiometer (R19) placed between the input and output connectors (see diagram to the right). The coarse gain may be adjusted by implementing one or both of the two separate amplification stages, each of which has a gain of 10 when 'on'. When 'off', the gain of each stage is 1. Keep in mind that, in addition to the gain of the amplifiers on the CR-160 evaluation board, the CR-200-X shaping amplifier modules themselves have a gain of 10.

Pole-Zero

Pole-zero correction is made using the 'pole-zero' adjustment potentiometer (R18), the location of which is shown in the diagram to the right. This is used to adjust the baseline of the output in the time domain immediately following the completion of a pulse.

Offset Adjustment

The DC offset of the output can be adjusted using the potentiometer (R24) which can be located using the diagram on the right.

Signal Polarity

Signal polarity can be changed using the small slide switch on the CR-160 board.

Application of Power

The CR-160 requires positive and negative DC power in order to operate. The supply voltage must be in the range from +/- 7 volts to +/- 13 volts. At +/- 9 volts the current draw is 21 mA on both the positive and negative power supplies (these figures includes the current drawn by the installed CR-200-X module).

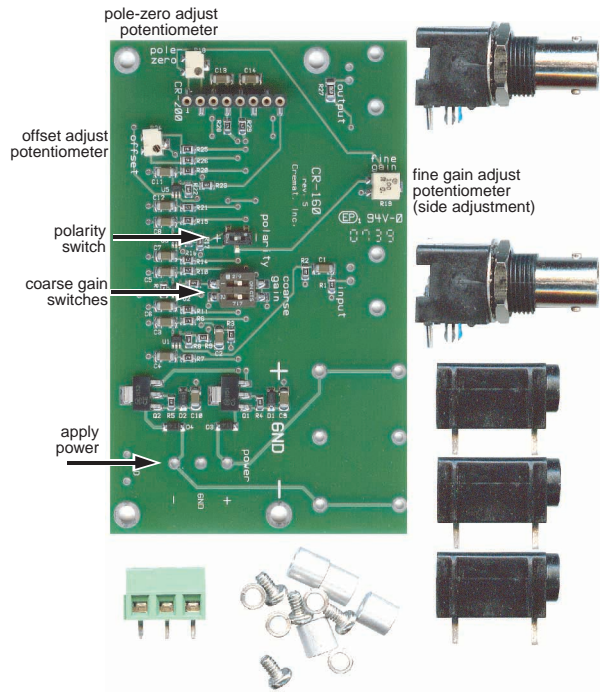
The supply voltage can be applied to the CR-160 to the points shown in the figure to the above-right. A terminal block is supplied to assist in connecting wires to the board if necessary. Power can also be applied via three PC-mount 4 mm (banana) connectors that are provided.

Output Swing

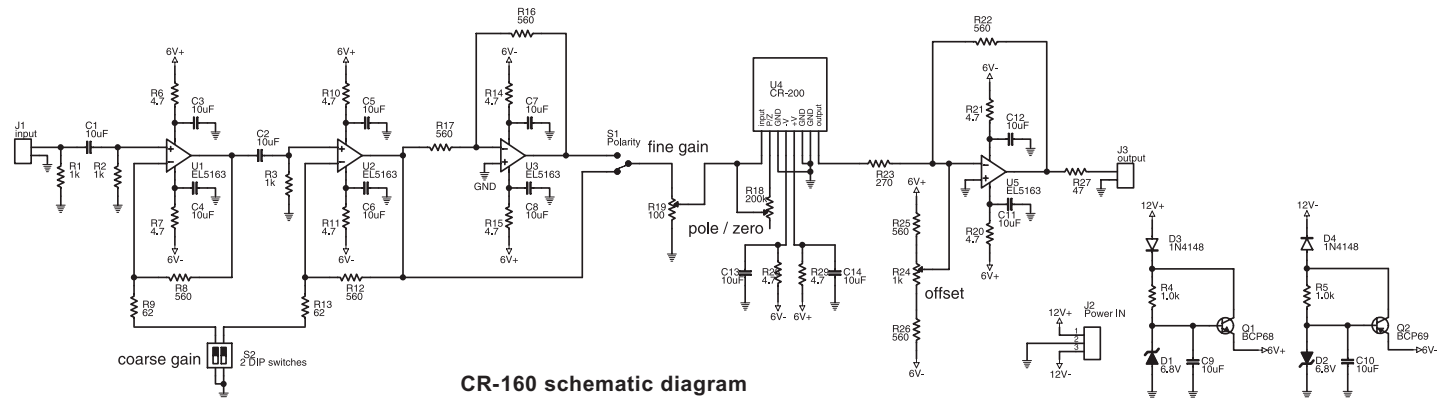
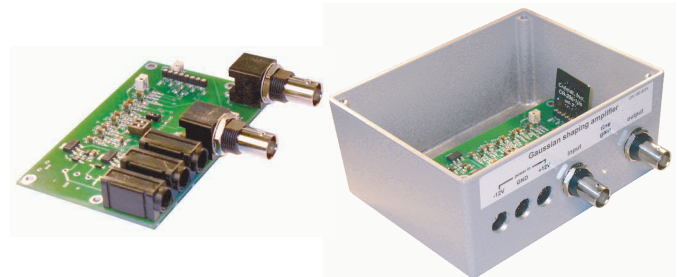
The output of the CR-160 can swing to +/- 5 volts in the unloaded state. This output swing is reduced to +/- 2 volts if the output is loaded by a 50 ohm load.

Caution

Set-up of the CR-160 board requires the user to be able to (and preferably be comfortable with) soldering and connecting wires, cables, and connectors to PC boards.



The CR-160 comes with the parts shown above. The connectors are supplied un-assembled to the board in order to allow the user greater flexibility in their implementation. If the user in fact assembles the connectors to the CR-160 board (as is shown in the figure below and to the left), the user may consider installing the assembled CR-160 board into the CR-160-BOX (sold separately). This is shown in the figure below and to the right (the lid is not shown). More information on the CR-160-BOX can be found at our web site.



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