



# AVTECH ELECTROSYSTEMS LTD.

NANOSECOND WAVEFORM ELECTRONICS  
SINCE 1975

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## INSTRUCTIONS

MODEL AV-151B-C-SUNY2 FUNCTION GENERATOR

S.N.:  
MODIFICATION #1

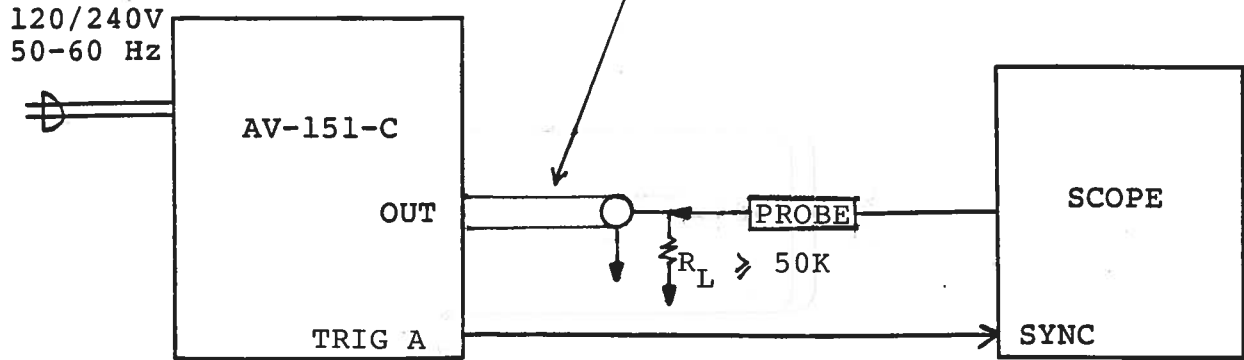
### WARRANTY

Avtech Electrosystems Ltd. warrants products of its manufacture to be free from defects in material and workmanship under conditions of normal use. If, within one year after delivery to the original owner, and after prepaid return by the original owner, this Avtech product is found to be defective, Avtech shall at its option repair or replace said defective item. This warranty does not apply to units which have been disassembled, modified or subjected to conditions exceeding the applicable specifications or ratings. This warranty is the extent of the obligation or liability assumed by Avtech with respect to this product and no other warranty or guarantee is either expressed or implied.

Fig. 1

BASIC TEST SET-UP

If 50 Ohm coaxial cable is used  
in this position then length  
should not exceed 1 meter  
(to avoid waveform distortion)



## GENERAL OPERATING PROCEDURE

- 1) Connect the instrument as shown above. Do not apply prime power. Note that the sync input to the scope is connected to TRIG A (and not to TRIG B).
- 2) Terminate OUT in a load impedance of 50K (or higher) and do not use 50 Ohm coaxial cables having a length greater than one meter (to avoid waveform distortion).
- 3) Set the amplitude controls to maximum counter clockwise.
- 4) Set the offset controls at 5.0 and the offset ON-OFF switch in the OFF position.
- 5) Set the INT-EXT switch in the INT position and the WAVEFORM selector switch in the SINE position.
- 6) Set the PRF range switch in the 100 Hz position (mid range).
- 7) Set the scope time base on about 5 ms/div and the vertical on about 50 Volts/div and set the scope time base to trigger on EXT (+).
- 8) Turn on the prime power and adjust scope trigger controls to obtain a trace.
- 9) Rotate the amplitude control clockwise to obtain the desired output amplitude (as high as 400 Volts peak to peak).
- 10) Set the OFFSET ON-OFF switch in the ON position and rotate the OFFSET amplitude control to obtain the desired offset (0 to  $\pm 50$  Volts).
- 11) CAUTION: Take great care not to operate into a low impedance (i.e.  $< 50K$ ) or into a short circuit as this may result in damage to the output stage.

12) Units with a serial number higher than 5600 are protected by an automatic overload protective circuit which controls the front panel overload light. If the unit is overloaded (by operating at an exceedingly high duty cycle or by operating into a short circuit), the protective circuit will turn the output of the instrument OFF and turn the indicator light ON. The light will stay ON (i.e. output OFF) for about 5 seconds after which the instrument will attempt to turn ON (i.e. light OFF) for about 1 second. If the overload condition persists, the instrument will turn OFF again (i.e. light ON) for another 5 seconds. If the overload condition has been removed, the instrument will turn on and resume normal operation. Overload conditions may be removed by:

- 1) Removing output load short circuit (if any)
- 2) Reducing the output amplitude

Note the overload light may activate when the prime power is turned on. The light will extinguish after a few seconds.

- 13) The output waveform may be changed to square wave or triangle by simply changing the position of the waveform selector switch.
- 14) To trigger the unit externally, set the INT-EXT switch in the EXT position and apply the signal to be amplified to the TRIG A and TRIG B ports ( $V_{pp} \leq 4$  Volts, DC to 100 kHz). The AV-151-C unit then operates as two independent variable gain amplifiers with maximum gains of x100 and maximum outputs of  $\pm 200$  Volts.
- 15) The unit can be converted from 110 to 220V 50-60 Hz operation by adjusting the voltage selector card in the rear panel fused voltage selector-cable connector assembly.
- 16) For additional assistance:

Tel: (613) 226-5772  
Fax: (613) 226-2802

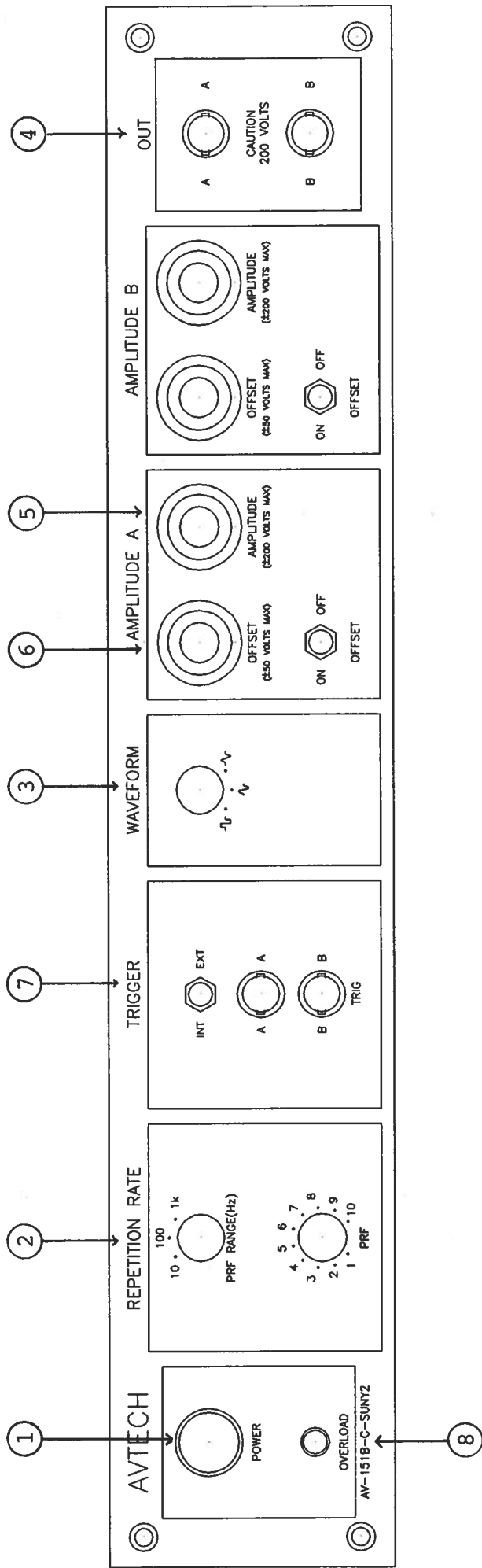


Fig. 2 FRONT PANEL CONTROLS

- (1) ON-OFF Switch. Applies prime power to all stages.
- (2) PRF Control. Varies output PRF as follows:
 

Range 1	1	Hz	10 Hz
Range 2	10	Hz	100 Hz
Range 3	100	Hz	1 kHz
- (3) WAVEFORM. 3-position switch selects between square, sine or triangular output at (4).
- (4) OUT. BNC connectors provide output to high impedance load ( $\geq 50K$ ). Output may include 1 Hz to 1 kHz component and DC offset component.
- (5) AMPLITUDE. Ten turn control determines amplitude of 1 Hz to 1 kHz component at (4).
- (6) OFFSET. Ten turn control allows DC offset at (4) to be varied from 0 to  $\pm 50$  Volts. ON-OFF switch turns DC offset on or off.
- (7) INT-EXT, TRIG A, TRIG B. With the two position switch in the INT position, the frequency and shape of the 1 Hz to 1 kHz component at (4) is determined by controls (2) and (3). Also, in this position a 5 Volt square wave is provided at the TRIG A BNC connector for the purpose of triggering a scope. When the two position switch is in the EXT position, the AV-151B-C may be used as two independent DC-100 kHz variable gain (x100 max) amplifiers. The required input signals are applied at TRIG A and TRIG B for this mode of operation.
- (8) OVERLOAD. Units with a serial number higher than 5600 are protected by an automatic overload protective circuit which controls the front panel overload light. If the unit is overloaded (by operating at an exceedingly high duty cycle or by operating into a short circuit), the protective circuit will turn the output of the instrument OFF and turn the indicator light ON. The light will stay ON (i.e. output OFF) for about 5 seconds after which the instrument will attempt to turn ON (i.e. light OFF) for about 1 second. If the overload condition persists, the instrument will turn OFF again (i.e. light ON) for another 5 seconds. If the overload condition has been removed, the instrument will turn on and resume normal operation. Overload conditions may be removed by:

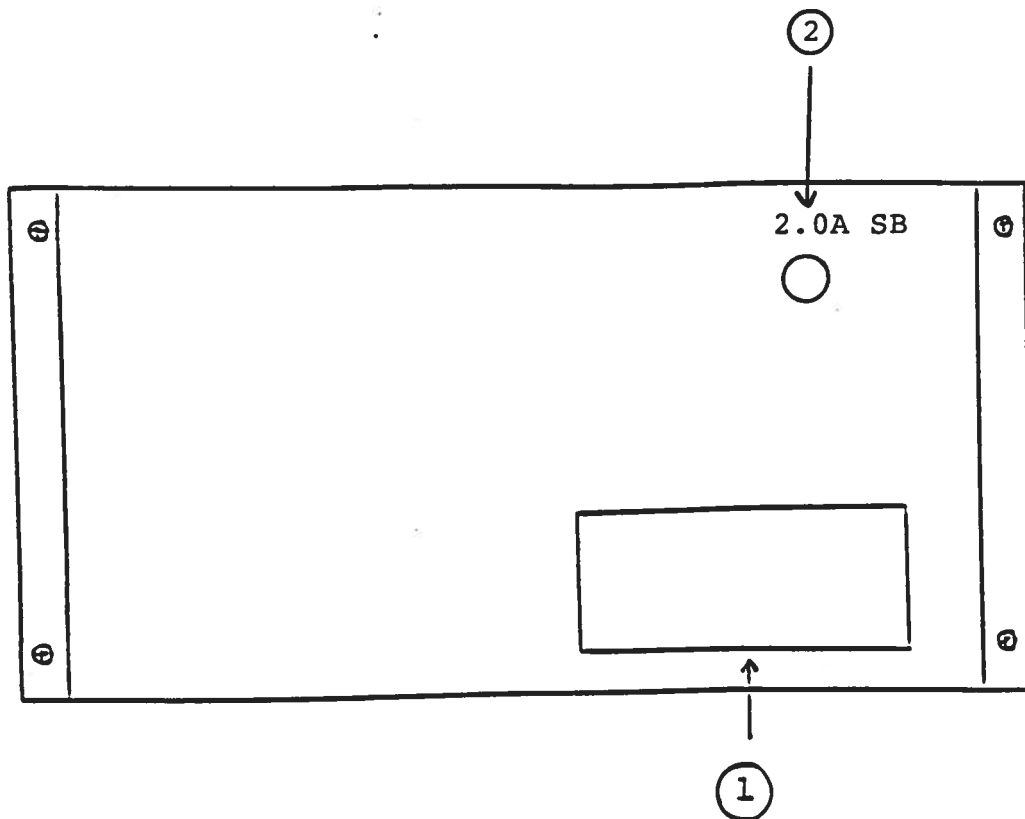
- 1) Removing output load short circuit (if any)
- 2) Reducing the output amplitude

Note that the overload light may come on when the prime power is applied. The light will extinguish after a few seconds.

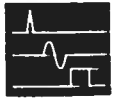


Fig. 3

BACK PANEL CONTROLS



- (1) FUSED CONNECTOR, VOLTAGE SELECTOR. The detachable power cord is connected at this point. In addition, the removable cord is adjusted to select the desired input operating voltage. The unit also contains the main power fuse (1.0A SB).
- (2) 2.0A SB. Fuse which protects the output stage if the output duty cycle rating is exceeded.

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August 30, 1995.

Dr. William Chuang  
SUNY Health Science Center  
Neurosurgery Research Laboratory  
766 Irving Avenue  
Room 3118, Weiskotten Hall  
Syracuse, NY 13210

Dear William:

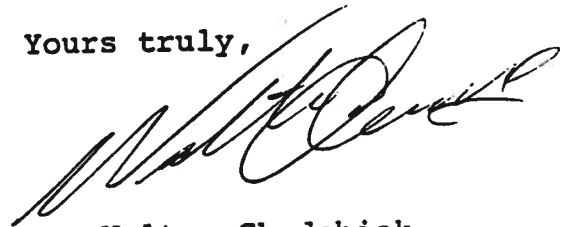
Following our phone conversation of August 29th, I am pleased to offer the following revised price and delivery quotation:

Model designation:	AV-151B-C-SUNY2
Number of outputs:	Two (two amplitude controls, but all other controls are shared)
Basic output waveforms:	See enclosed sketch and page 102, Catalog No. 9. Generates square, triangle and sine waveforms.
Output amplitude:	0 to $\pm 200$ Volts. (Two ten turn controls. Also provides 0 to $\pm 50$ Volts DC offset.)
PRF:	1 Hz to 1000 Hz
Duty cycle:	50% fixed.
Pulse width:	0.5 ms to 500 ms (controlled by PRF control).
Load impedance:	$\geq 50$ K (we assume that the bimorph draws less than 4 mA)
Rise, fall time: (for max output, square wave)	$\leq 1$ us

Chassis size: 3.9" x 17" x 14.8"  
Other: See standard AV-151B-C, page 102,  
Catalog No. 9.  
Price: \$4,998.00 US each, FOB destination.  
Please note that this price  
includes our standard 5% academic  
discount.  
Delivery: 60 days ARO

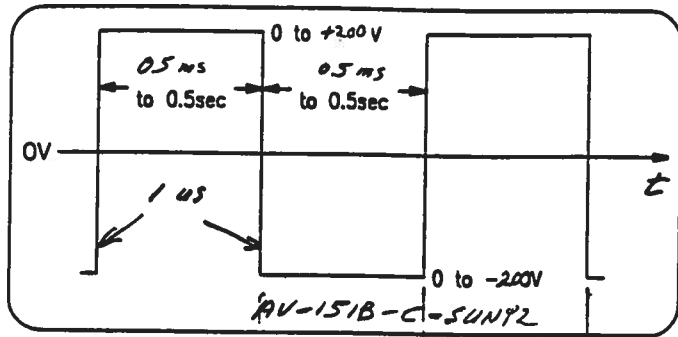
Thank you for your continuing interest in our products.  
Please call me again (1-800-265-6681) if you require any  
additional information or modifications to the above quotation.

Yours truly,

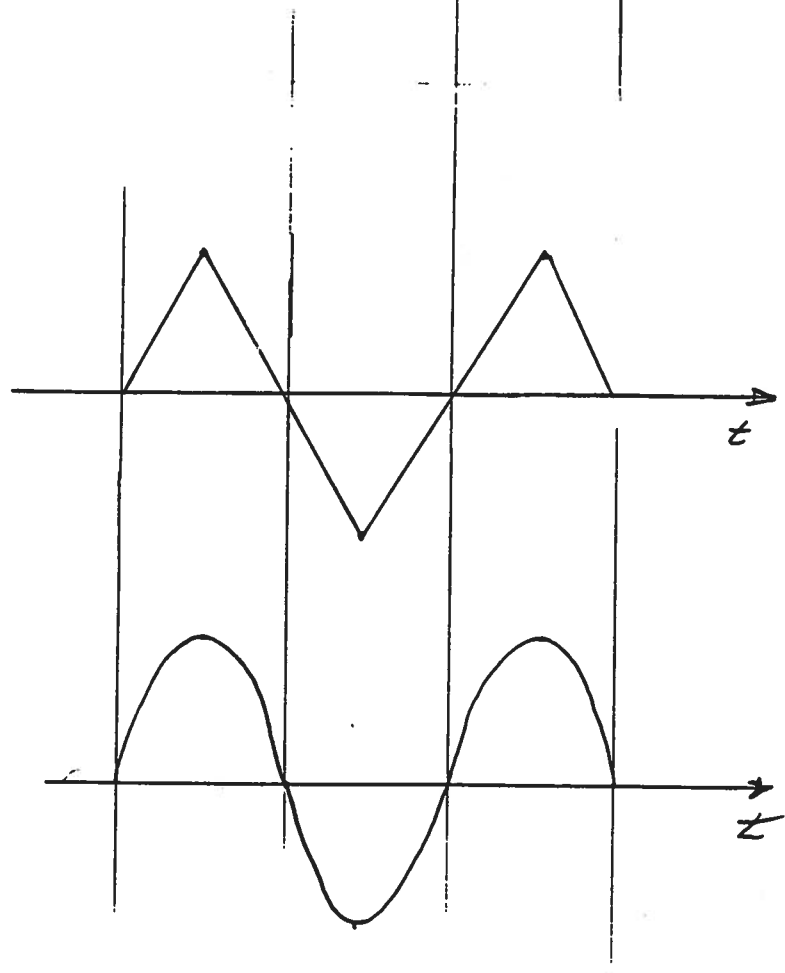


Dr. Walter Chudobiak  
Chief Engineer

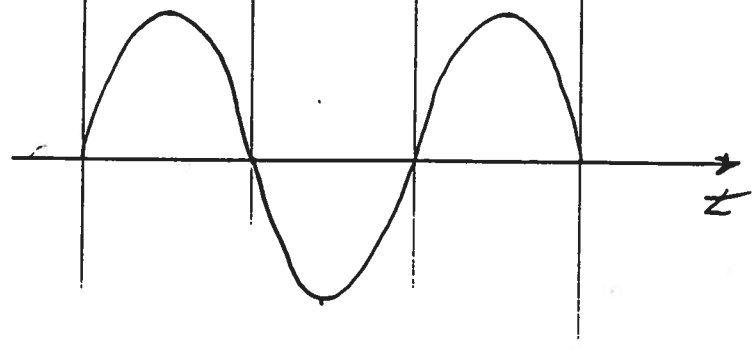
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SQUARE  
WAVE  
AU-151B-C-50



TRIANGLE  
AU-151B-SUNPZ



SINE  
WAVE  
AU-151B-SUNPZ

Jan 18/96

Dir: AV-150

Name: SIBCSUNY. MOD