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SINCE 1975

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INSTRUCTIONS

MODEL AV-151A-C FUNCTION GENERATOR

S.N.:

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 assumed by Avtech with respect to this product and no other warranty or guarantee is either expressed or implied.

TECHNICAL SUPPORT

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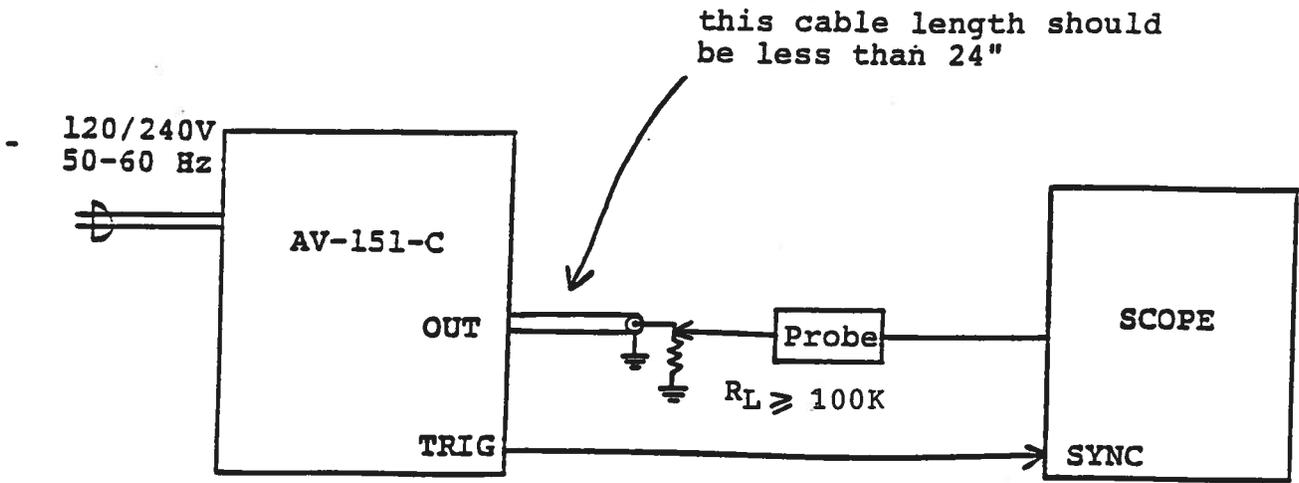
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FIG.1: BASIC TEST SET-UP



GENERAL OPERATING PROCEDURE

CAUTION: This unit outputs a signal as high as 1000 Volts peak to peak so exceptional attention must be given to safety and the unit should be operated only by personnel experienced with high voltage technologies.

- 1) Connect the instrument as shown above. Do not apply prime power.
- 2) Terminate OUT in a load impedance of 100K (or higher). Note that the length of 50 Ohm cable between the output connector and the load should be less than 24" in order to avoid distortion of the waveform.
- 3) Set the amplitude control to maximum counter clockwise.
- 4) Set the offset control 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 300 Hz position (mid range).
- 7) Set the scope time base on about 2 ms/div and the vertical on about 50 Volts/div (or higher) 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 1000 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 ± 50 Volts).
- 11) **CAUTION:** Take great care not to operate into a low impedance (i.e. $< 100K$) 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 port ($V_{pp} \leq 4$ Volts, DC to 3 kHz). The AV-151-C unit then operates as a variable gain amplifier with a maximum gain of x 250 and a maximum output of ± 500 Volts.
- 15) The unit can be converted from 120 to 240V 50-60 Hz operation by adjusting the voltage selector card in the rear panel fused voltage selector-cable connector assembly.
- 16) For additional assistance:

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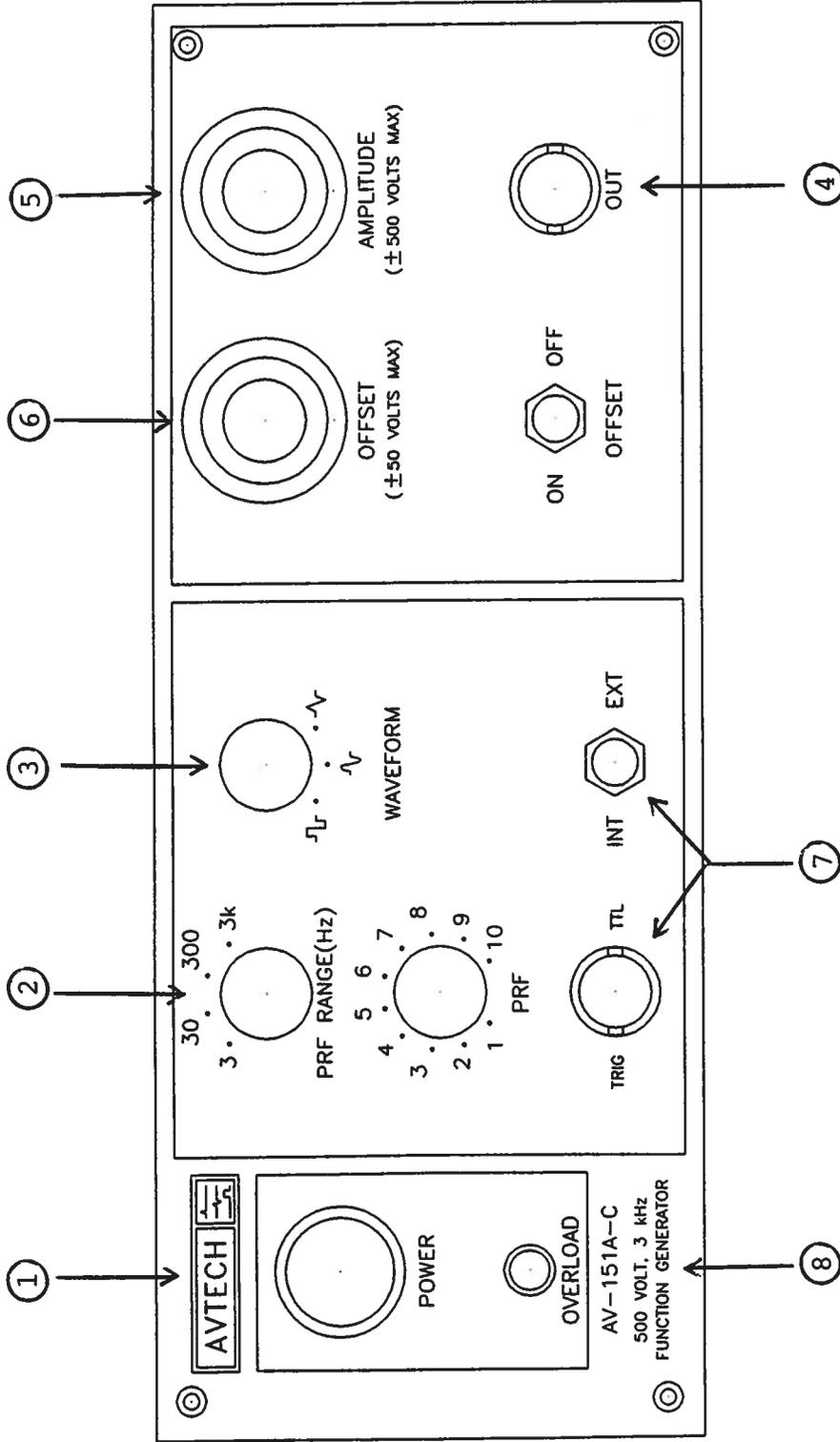


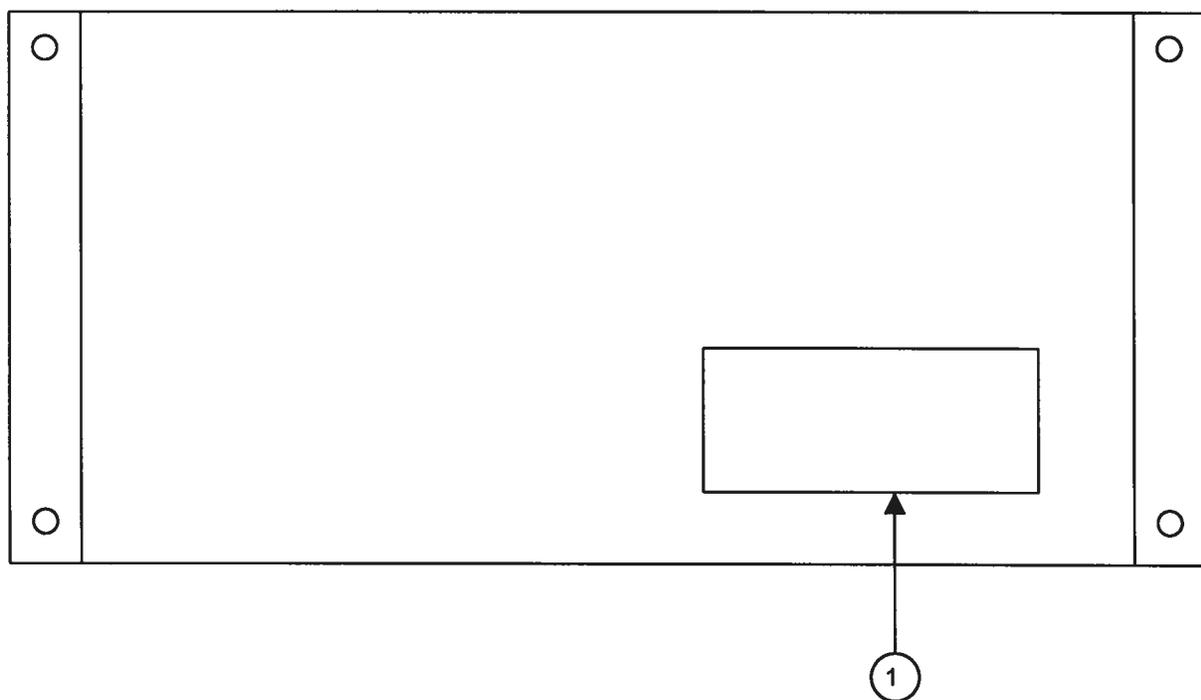
Fig. 2

FRONT PANEL CONTROLS

- (1) ON-OFF Switch. Applies prime power to all stages.
- (2) PRF Control. Varies output PRF as follows:
- | | | |
|---------|--------|--------|
| Range 1 | 0.3 Hz | 3 Hz |
| Range 2 | 3 Hz | 30 Hz |
| Range 3 | 30 Hz | 300 Hz |
| Range 4 | 300 Hz | 3 kHz |
- (3) WAVEFORM. 3-position switch selects between square, sine or triangular output at (4).
- (4) OUT. BNC connector provides output to high impedance load ($\geq 100K$). Output may include 0.3 Hz to 3 kHz component and DC offset component. CAUTION: The peak to peak output can be as high as 1000 Volts.
- (5) AMPLITUDE. Ten turn control determines amplitude of 0.3 Hz to 3 kHz component at (4).
- (6) OFFSET. Ten turn control allows DC offset at (4) to be varied from 0 to ± 50 Volts. ON-OFF switch turns DC offset on or off.
- (7) INT-EXT, TRIG. With the two position switch in the INT position, the frequency and shape of the 0.3 Hz to 3 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 BNC connector for the purpose of triggering a scope. When the two position switch is in the EXT position, the AV-151A-C may be used as a DC-3kHz variable gain (x250 max) amplifier. The required input signal is applied at TRIG 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



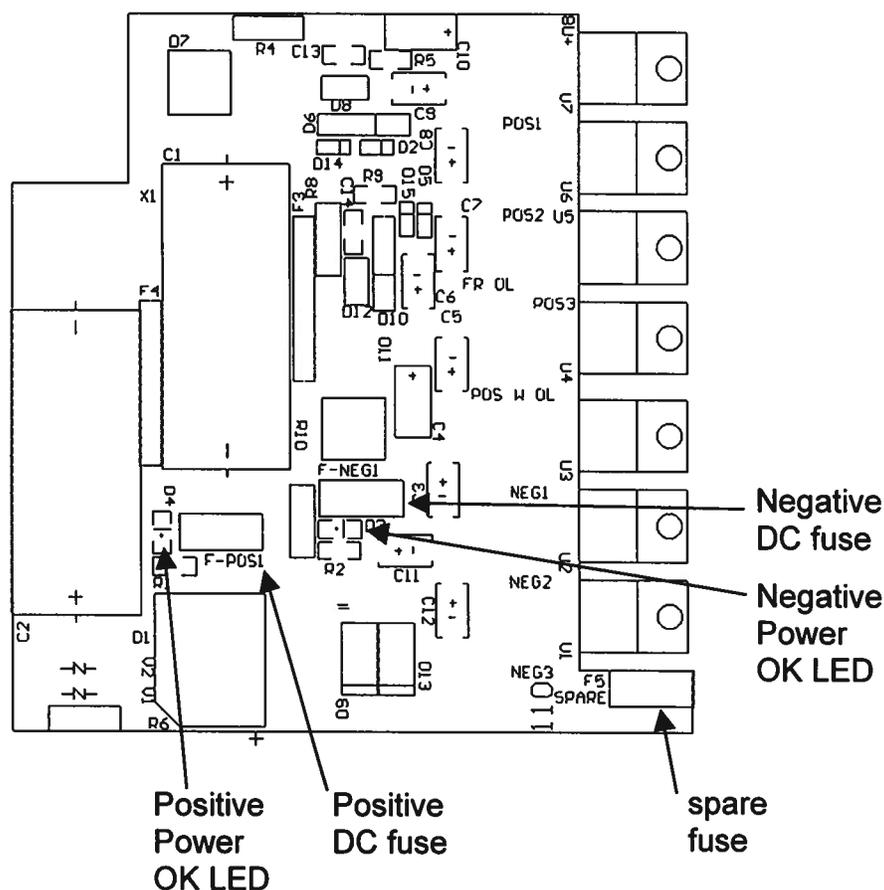
BACK PANEL CONTROLS

- (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 (0.5A SB).

POWER SUPPLY AND FUSE REPLACEMENT

This instrument has three fuses (plus one spare). One, which protects the AC input, is located in the rear-panel power entry module, as described in the “Rear Panel Controls” section of this manual. If the power appears to have failed, check the AC fuse first.

The other two fuses (plus one spare) are located on the internal DC power supply, as shown below:



The spare fuse may be used to replace one of the other fuses, if required.

The three fuses on this circuit board are 0.5A slow-blow fuses, Littlefuse part number R452.500. (This fuse can be ordered from Digikey, www.digikey.com. The Digikey part number is F1341CT-ND).

If you suspect that the DC fuses are blown, follow this procedure:

1. Remove the top cover, by removing the four Phillips screws on the top cover and then sliding the cover back and off.
2. Locate the two "Power OK" LEDs on the power supply circuit board, as illustrated above.
3. Turn on the instrument.
4. Observe the "Power OK" LEDs. If the fuses are not blown, the two LEDs will be lit (bright red). If one of the LEDs is not lit, the fuse next to it has blown.
5. Turn off the instrument.
6. If a fuse is blown, use needle-nose pliers to remove the blown fuse from its surface-mount holder.
7. Replace the fuse.