

AVTECH ELECTROSYSTEMS LTD.

**NANOSECOND WAVEFORM ELECTRONICS
ENGINEERING . MANUFACTURING**

□ P.O. BOX 265
OGDENSBURG
NEW YORK
13669
(315) 472-5270

✕ BOX 5120 STN. "F"
OTTAWA, ONTARIO
CANADA K2C 3H4
(613) 226-5772
TELEX 053-4591

INSTRUCTIONS

MODEL AVI-V-HV3-C-FC1-EA PULSE GENERATOR

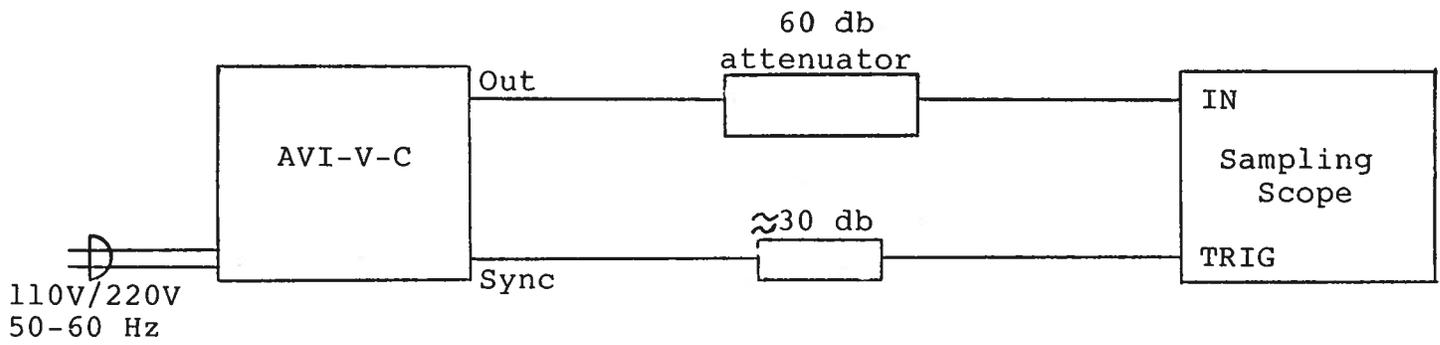
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WARRANTY

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

PULSE GENERATOR TEST ARRANGEMENT



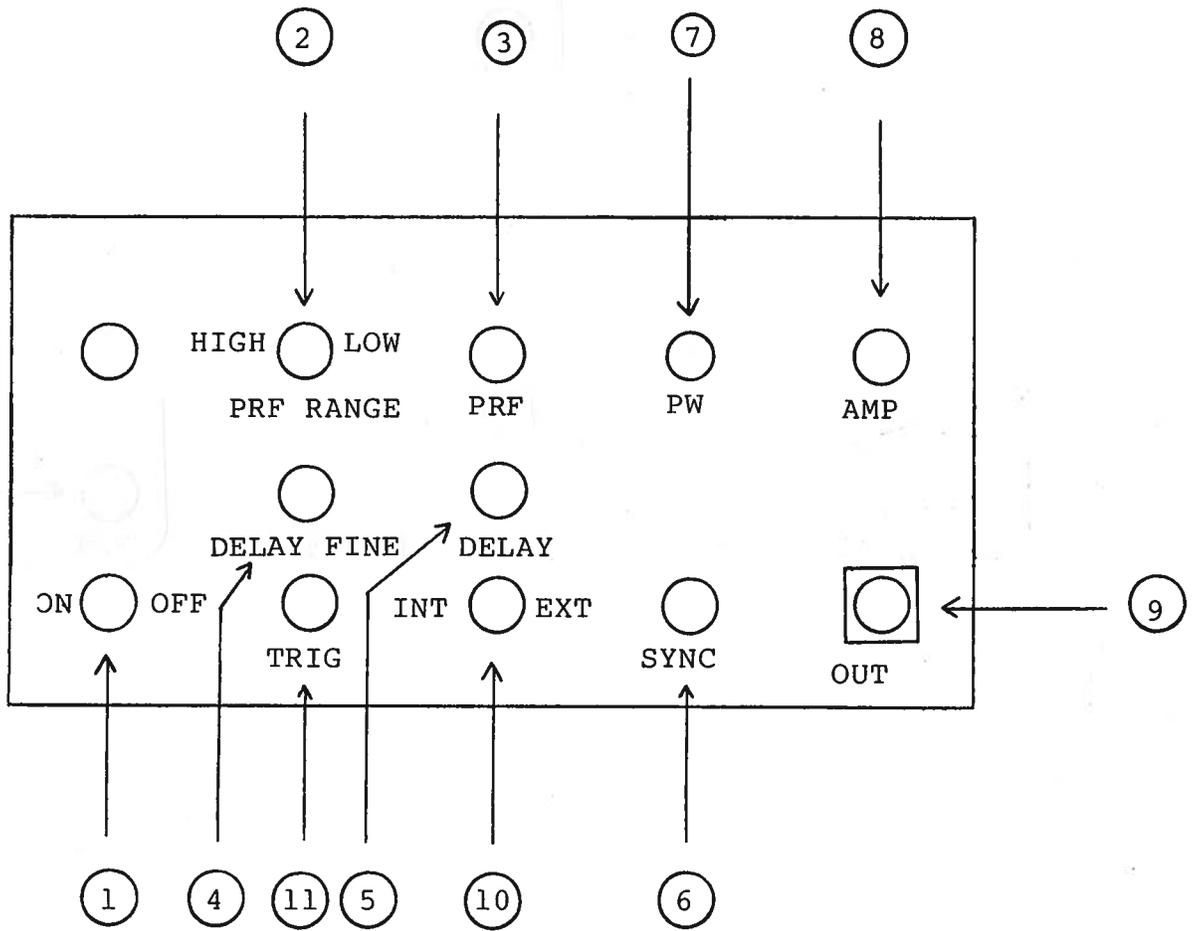
Notes:

- 1) The bandwidth capability of components and instruments used to display the pulse generator output signal (attenuators, cables, connectors, etc.) should exceed five gigahertz.
- 2) The use of 60 db attenuator at the sampling scope vertical input channel will insure a peak input signal to the sampling scope of less than one volt.
- 3) The sync output channel provides TTL level signals. To avoid overdriving the TRIG input channel of some sampling scopes, a 30 db attenuator should be placed at the input to the sampling scope trigger channel.
- 4) To obtain a stable output display the PRF and PRF FINE controls on the front panel should be set mid-range while the PRF switch may be in either range. The front panel TRIG toggle switch should be in the INT position. The front panel DELAY control and the scope triggering controls are then adjusted to obtain a stable output. The scope may then be used to set the desired PRF by rotating the PRF control.
- 5) The output pulse width is controlled by means of the front panel one turn PW control. The control should initially be set maximum clockwise and the pulse width adjusted using an oscilloscope.
- 6) The output pulse amplitude is controlled by means of the front panel one turn AMP control.
- 7) To voltage control the output amplitude, remove the jumper wire between banana plugs A and B on the back panel and apply 0 to +10V to connector B ($R_{IN} \geq 10K$). (EA option).
- 8) Some properties of the output pulse may change as a function of the amplitude pot setting. For some demanding applications, it may be desirable to use a combination of external attenuators and the amplitude pot to achieve the desired output amplitude.
- 9) An external clock may be used to control the output PRF of the AVI unit by setting the front panel TRIG toggle switch in the EXT position and applying a 0.2 usec (approx.) TTL level pulse to the TRIG BNC connector input. For operation in this mode, the scope time base must also be triggered by the external clock rather than from the SYNC output. The propagation delay time in the externally triggered mode is about 300 nsec.

- 10) The unit will operate at PRF as high as 20 KHz. However, at high PRF rates and high pulse widths and amplitude, the output rise time may increase. It is therefore suggested that if the full amplitude and PW capabilities are required, the max PRF should be limited to about 10 KHz.

Fig. 2

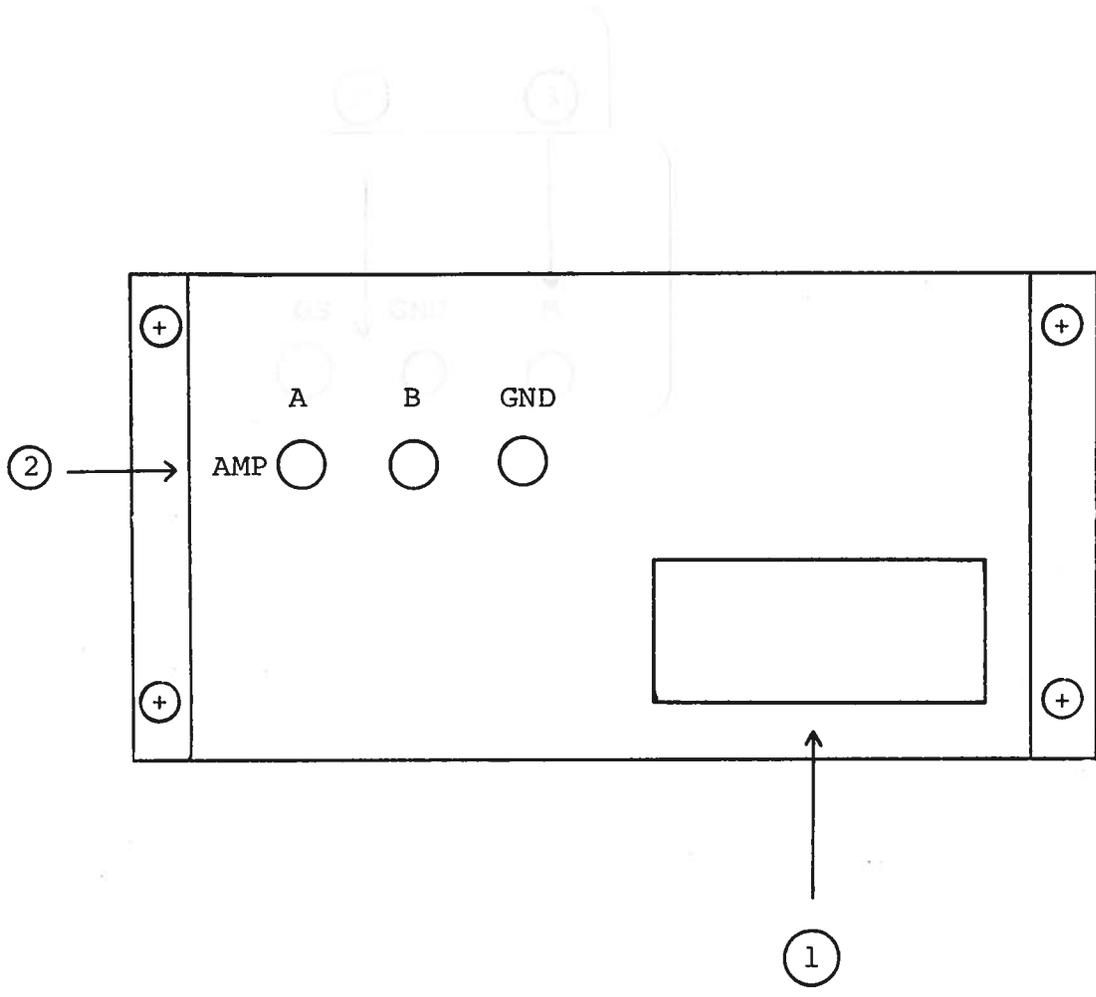
FRONT PANEL CONTROLS



- (1) ON-OFF Switch. Applies basic prime power to all stages.
- (2) PRF Control. With PRF range switch in the low position,
- (3) PRF control will vary PRF from 0.05 KHz to about 2.0 KHz. With PRF RANGE switch in the high position, varies PRF from about 0.2 KHz to 20 KHz.
- (4) DELAY Control. Controls the relative delay between the
- (5) reference output pulse provided at the SYNC output (6) the main output (9). This delay is variable over the range of 0 to at least 100 nsec.
- (6) SYNC Output. This output precedes the main output (9) and is used to trigger the sampling scope time base. The output is a TTL level 100 nsec (approx.) pulse capable of driving a fifty ohm load.
- (7) PW Control. A one turn control which varies the output pulse width from 2 to 100 nsec.
- (8) AMP Control. A one turn control which varies the output pulse amplitude from 0 to rated maximum to a fifty ohm load.
- (9) OUT Connector. SMA connector provides output to a fifty ohm load.
- (10) EXT-INT Control. With this toggle switch in the INT position, the PRF of the AVI unit is controlled via an internal clock which in turn is controlled by the PRF and PRF FINE controls. With the toggle switch in the EXT position, the AVI unit requires a 0.2 usec TTL level pulse applied at the TRIG input in order to trigger the output stages. In addition, in this mode, the scope time base must be triggered by the external trigger source.
- (11) TRIG Input. The external trigger signal is applied at this input when the EXT-INT toggle switch is in the EXT position.

Fig. 3

BACK PANEL CONTROLS

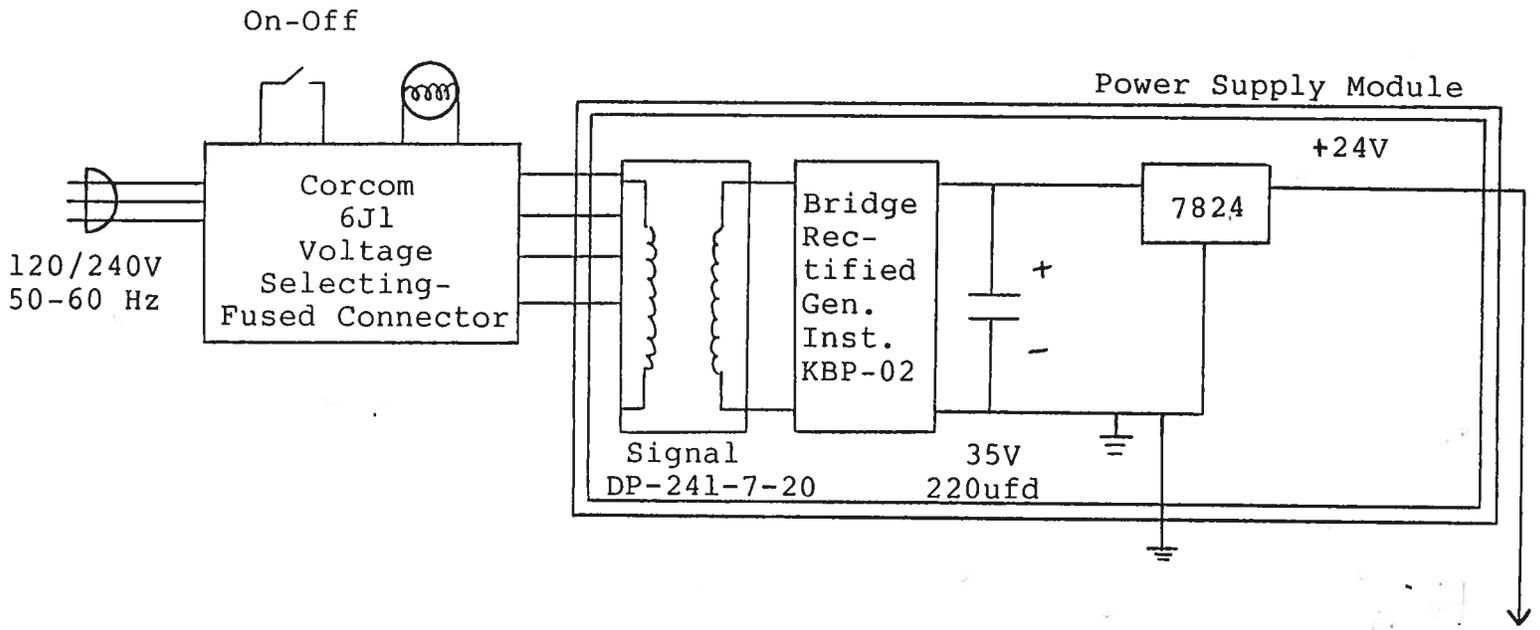


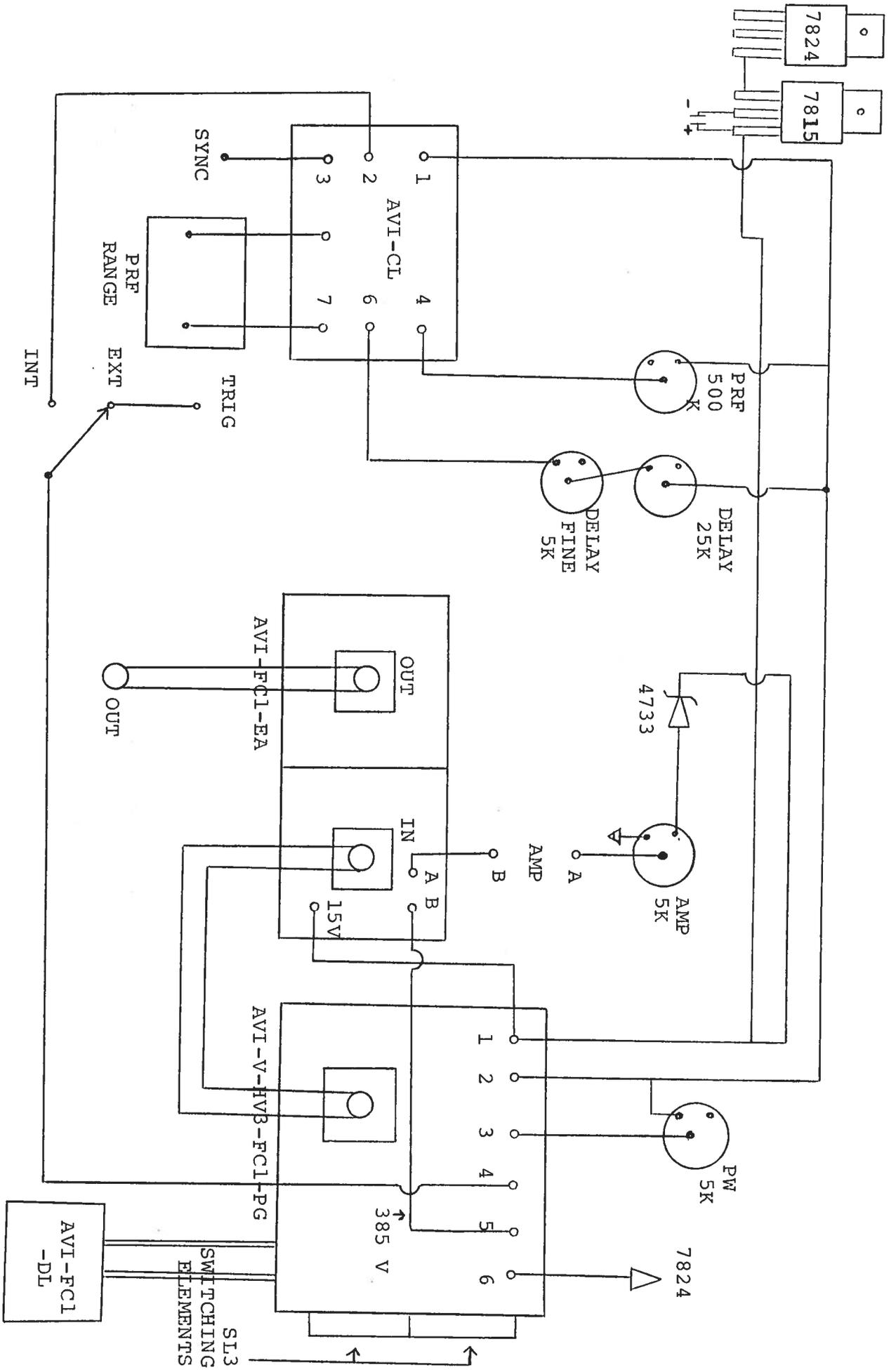
- (1) FUSED CONNECTOR, VOLTAGE SELECTOR. The detachable power cord is connected at this point. In addition, the removable cord is adjusted to select the desired input operating voltage. The unit also contains the main power fuse.

- (2) To voltage control the output amplitude, remove the jumper wire between banana plugs A and B and apply 0 to +10V to connector B ($R_{IN} \geq 10K$). (EA option).

Fig. 4

SYSTEM BLOCK DIAGRAM





BLOCK DIAGRAM, MODEL AVI-V-HV3-C-FCL-EA-R-N

SYSTEM DESCRIPTION AND REPAIR PROCEDURE

The AVI-V-HV3-C-FC1-EA consists of the following basic modules:

- 1) AVI-V-HV3-FC1-PG pulse generator module
- 2) AVI-CL clock module
- 3) AVI-FC1-EA amplitude control module
- 4) 24 volt power supply board

In the event that the unit malfunctions, remove the instrument cover by removing the 4 Phillips screws on the back panel of the unit. The top cover may then be slid off. Measure the voltage at Pin 5 of the PG module. If this voltage is substantially less than +380 volts, it is likely that one or both of the output switching elements (SL3) have failed. **WARNING:** The cases of the transistors are at potentials as high as 380 volts. With the prime power supply off remove one of the transistors by removing the two 2-56 screws which secure the transistor in its socket. Pull the transistor out of the socket. With the unit un-triggered turn on the prime power supply and measure the voltage from the case of the remaining transistor to ground. If the voltage is about 360 to 380 volts then the transistor which was removed is defective and should be replaced. If the voltage which is measured is less than 360 volts then the transistor still in position is defective and should be replaced. Note that the two transistors are completely interchangeable (Order Avtech Part No. SL3). Note that with both transistors removed, the voltage at pin 5 on the PG module should be in the range of 360 to 380 volts. If the voltage is less then the PG module must be replaced.

The AVI-CL module is functioning properly if:

- a) The TTL level output at pin 2 varies from 50 Hz to 20 KHz as the PRF control is varied.
- b) The relative delay between the output at pins 2 and 3 varies by about 100 to 200 nsec as the DELAY control is varied.

The voltages on the EA module should be as follows:

- a) 0 to +10 volts
- b) +380 volts
- c) +15 volts

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