AVTECH ELECTROSYSTEMS LTD.

NANOSECOND WAVEFORM ELECTRONICS
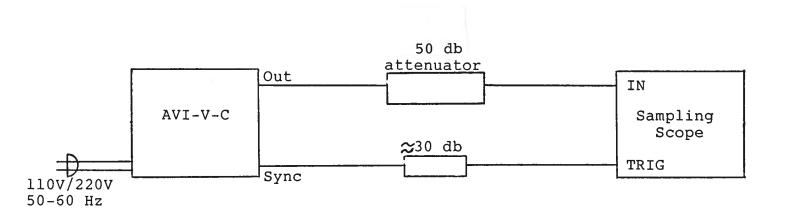### ENGINEERING · MANUFACTURING

INSTRUCTIONS

MODEL AVI-V-HV3-C PULSE GENERATOR

S.N.: 1509 MOD APRIL 1988

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 dissembled, 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
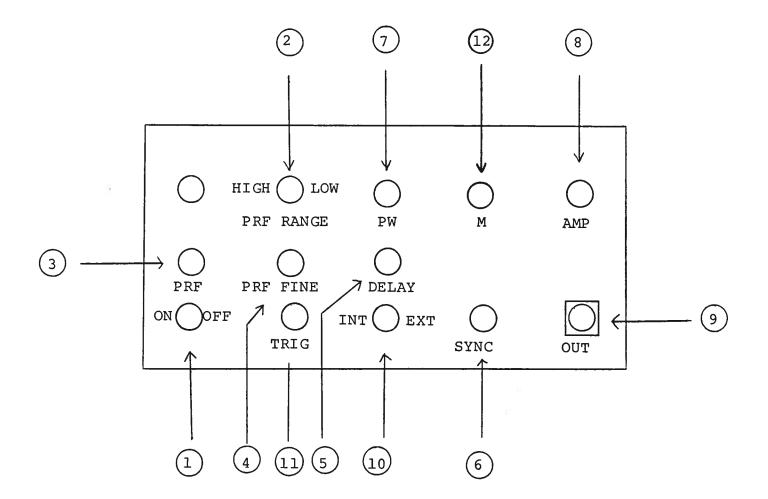no other warranty or guarantee is either expressed or implied.

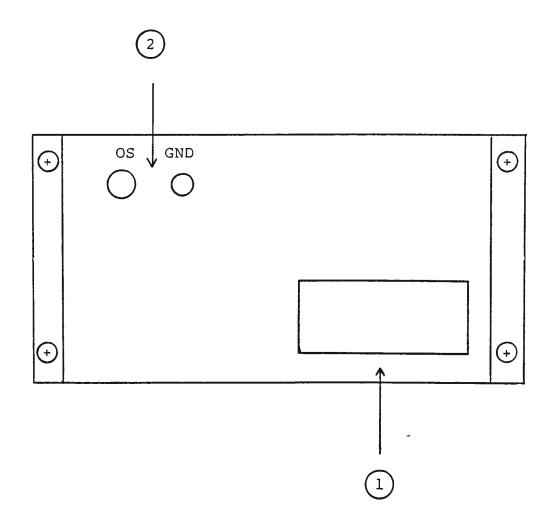Fig. 1   PULSE GENERATOR TEST ARRANGEMENT

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 50 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 and PRF FINE controls and by means of
       the back panel toggle switch.

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)   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.

8)   To DC offset the output pulse connect a DC power supply
       set to required DC offset value to the back panel
       terminals marked O.S. The maximum attainable DC offset
       voltage is ±50 volts. (option)

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
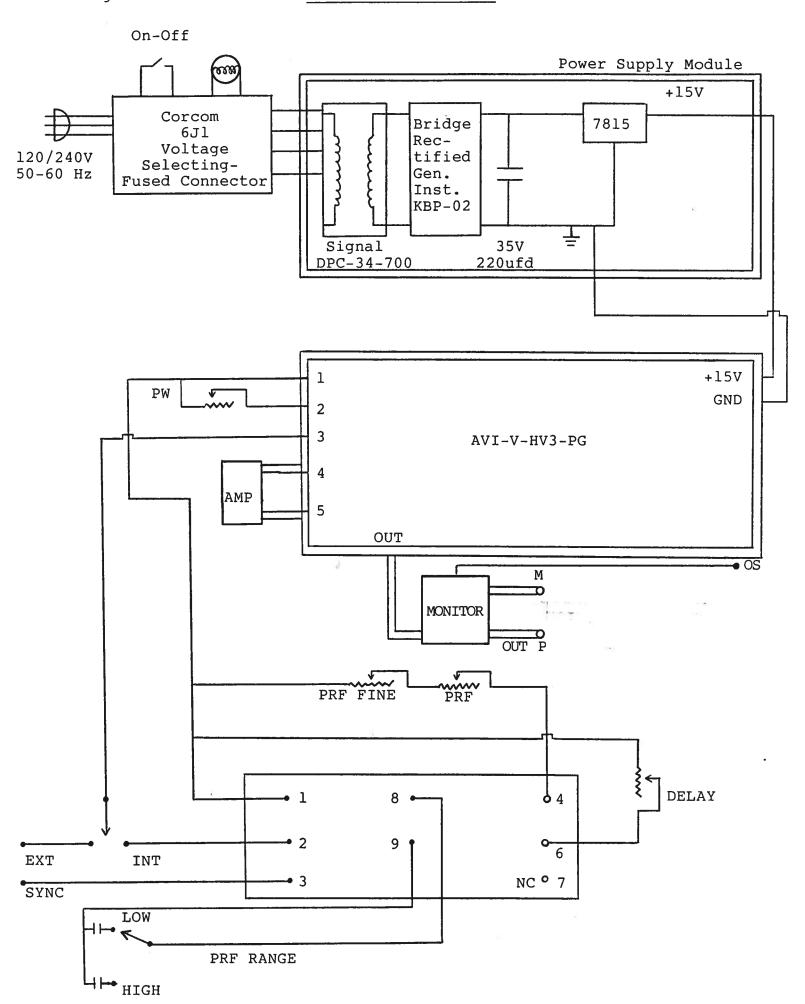   externally triggered mode is about 300 nsec.

10) To invert the output of units with the dual output polarity option (-PN), connect the AVX-3-AVI module to the output port of the AVI unit. An inverted pulse is then obtained at the out port of the AVX-3-AVI module.

11) To invert the output of units with the dual output polarity option (-PN) and the offset option (OS), connect the AVX-3-T module to the OUT port of the AVI unit. A positive pulse with a rise time <200 psec is then obtained at the OUT port of the AVX-3-T unit. To offset the positive pulse, apply the required DC level to the DC terminal of the AVX-3-T unit.

12) MONITOR OUT M. Provides an attenuated (x10) coincident replica of the main positive output pulse to fifty ohms. (option).

Fig. 2   FRONT PANEL CONTROLS

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
(4)   KHz. With PRF RANGE switch in the high position, varies
       PRF from about 0.2 KHz to about 5 KHz.

(4)   PRF FINE Control. This control varies PRF but is about
       10 times less sensitive than the main PRF control.

(5)   DELAY Control.   Controls the relative delay between the
       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.

(12)   MONITOR OUT M. Provides an attenuated (x10) coincident
       replica of the main positive output pulse to fifty ohms.
       (option).

Fig. 3   <u>BACK PANEL CONTROLS</u>

(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)   DC OFFSET Input. To DC offset the output pulse, connect
       a DC power supply set to the desired offset value to
       these terminals.   The maximum allowable DC offset
       voltage is $\pm$50 volts (option).

Fig. 4 SYSTEM BLOCK DIAGRAM

On-Off

120/240V
50-60 Hz

Corcom
6J1
Voltage
Selecting-
Fused Connector

Power Supply Module

+15V

7815

Bridge
Rec-
tified
Gen.
Inst.
KBP-02

Signal
DPC-34-700

35V
220ufd

+15V
GND

PW

1
2
3
4
5

AMP

AVI-V-HV3-PG

OUT

OS

MONITOR

M

OUT P

PRF FINE   PRF

DELAY

1   8   4

2   9   6

3   NC 7

EXT   INT

SYNC

LOW

PRF RANGE

HIGH

SYSTEM DESCRIPTION AND REPAIR PROCEDURE

The AVI-V-C consists of a pulse generator module (AVI-V-PG), a clock module AVI-V-CL and a power supply board which supplies +15 volts (600 mA max) to the pulse generator module. In the event that the unit malfuctions, 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 the +15 V pin of the PG module. If this voltage is substantially less than +15 volts, unsolder the line connecting the power supply and PG modules and connect 50 ohm 10 W load to the PS output. The voltage across this load should be about +15 V DC. If this voltage is substantially less than 15 volts the PS module is defective and should be repaired or replaced. If the voltage across the resistor is near 15 volts, then the PG module should be replaced or repaired. The sealed PG module must be returned to Avtech for repair (or replacement). The clock module provides a 0.1 usec TTL level trigger pulse at pin 2 to trigger the PG module and a 0.1 usec TTL level sync pulse at pin 3 to trigger the sampling scope display device. The output at pin 3 precedes the output at pin 2 by almost 0 to 100 nsec depending on the DELAY control setting. The clock module is powered by +5.8 V supplied by the PG module (from pin 5 to pin 1). With the INT-EXT switch in the EXT position, the clock module is disconnected from the PG module. The clock module is functioning properly if:

    a)   0.1 usec TTL level outputs are observed at pins 2 and 3.

    b)   The PRF of the outputs can be varied over the range of 0.05 KHz to 5 KHz using the PRF, PRF FINE and PRF RANGE controls.

    c)   The relative delay between the pin 2 and 3 outputs can be varied by at least 100 nsec by the DELAY control.

The sealed clock module must be returned to Avtech for repair or replacement if the above conditions are not observed.

Schroff   05.02.88

-OS

-PN

-M