# INSTRUCTIONS

MODEL AVMH-4-C PULSE 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 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

110V/220V
50-60 Hz
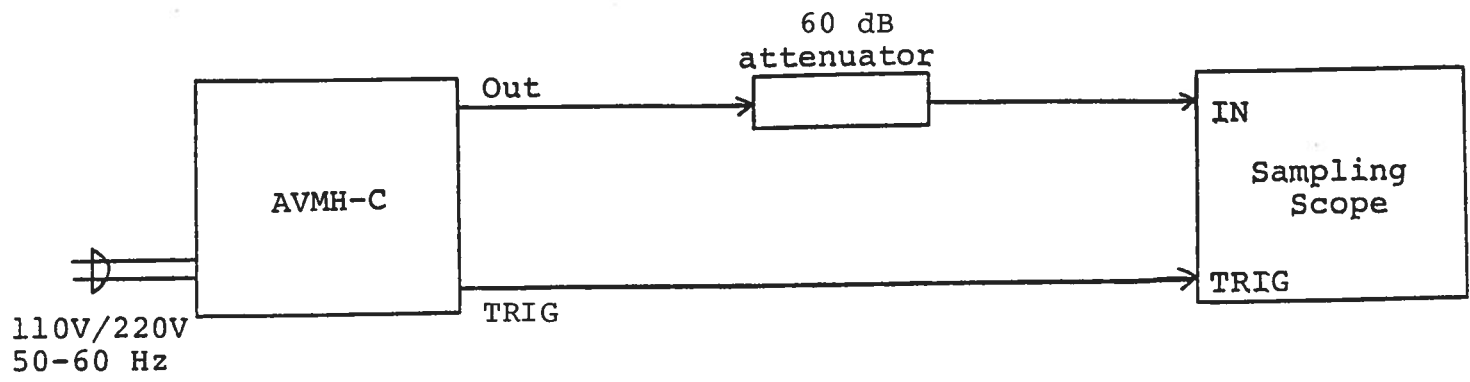
Notes:

1)   The bandwidth capability of components and instruments
     used to display the pulse generator output signal
     (attenuators, cables, connectors, etc.) should exceed
     ten 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 TRIG output channel provides a 0.2 Volt 10 ns
     pulse.

4)   To obtain a stable output display the PRF control on
     the front panel should be set mid-range while the PRF
     range 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.
     It is recommended that the DELAY control first be set
     max counter clockwise and then turned clockwise until a
     stable display is obtained. The scope may then be used
     to set the desired PRF by rotating the PRF control and
     by means of the PRF range switch. The stability of the
     display on some sampling scopes is very sensitive to
     the trigger delay setting, particularly at high PRF
     (eg. 5 to 10 MHz). If necessary, consult your sample
     scope instructions manual for the proper triggering
     method.

5)   The output pulse width is controlled by means of the
     one turn T_R and T_F controls. The T_R control controls
     the position of the leading edge while the T_F control
     determines the position of the falling edge. Clockwise
     rotation of these controls causes the pulse edge to
     move to the right. It is necessary to sequently adjust
     the T_R, T_F and AMP controls to obtain the desired output
     pulse width and amplitude.

6)   The output pulse amplitude is controlled by means of
     the front panel one turn AMP control. The pulse width
     may change by several nanoseconds as the output
     amplitude is reduced from maximum to minimum.
     Therefore it is convenient to first set the desired
     amplitude and then set the desired pulse width as
     described above.

7) An external clock may be used to control the output PRF of the AVMH unit by setting the front panel TRIG toggle switch in the EXT position and applying a 15 ns (or wider) TTL level pulse to the TRIG BNC connector input. The AVMH unit triggers on the rising edge of the input trigger pulse. For operation in this mode, the scope time base must also be triggered by the external clock rather than from the SYNC output.

8) <u>WARNING</u>: Model AVMH-C may fail if triggered at a PRF greater than 10 MHz.

9) The Model AVMH-C pulse generator can withstand an infinite VSWR on the output port.

10) To invert the output of the AVMH unit, connect the AVX-2-T unit to the OUT port. An inverted pulse is then obtained at the OUT port of the AVX-2-T unit. To offset the inverted pulse, apply the required DC level to the DC terminal of the AVX-2-T unit. (PN option).

11) 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) Reducing PRF (i.e. switch to a lower range)
   2) Reducing the amplitude
   3) Reducing pulse width (i.e. switch to a lower range)

12) The AVMH-C 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.

13) For additional assistance:

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

AVTECH

POWER

OVER LOAD

AVMH-4-C
1 ns, 100 VOLT
10 MHz
IMPULSE GENERATOR

100k
10k · 1M
1k · · 10M
PRF RANGE(Hz)

PRF

TRIG
TTL

DELAY

INT ⬡ EXT

5 6
4 · · 7
3 · · 8
2 · · 9
1 · 10
TR

PULSE
WIDTH
(1 ns)

5 6
4 · · 7
3 · · 8
2 · · 9
1 · 10
TF

5 6
4 · · 7
3 · · 8
2 · · 9
1 · 10
AMPLITUDE
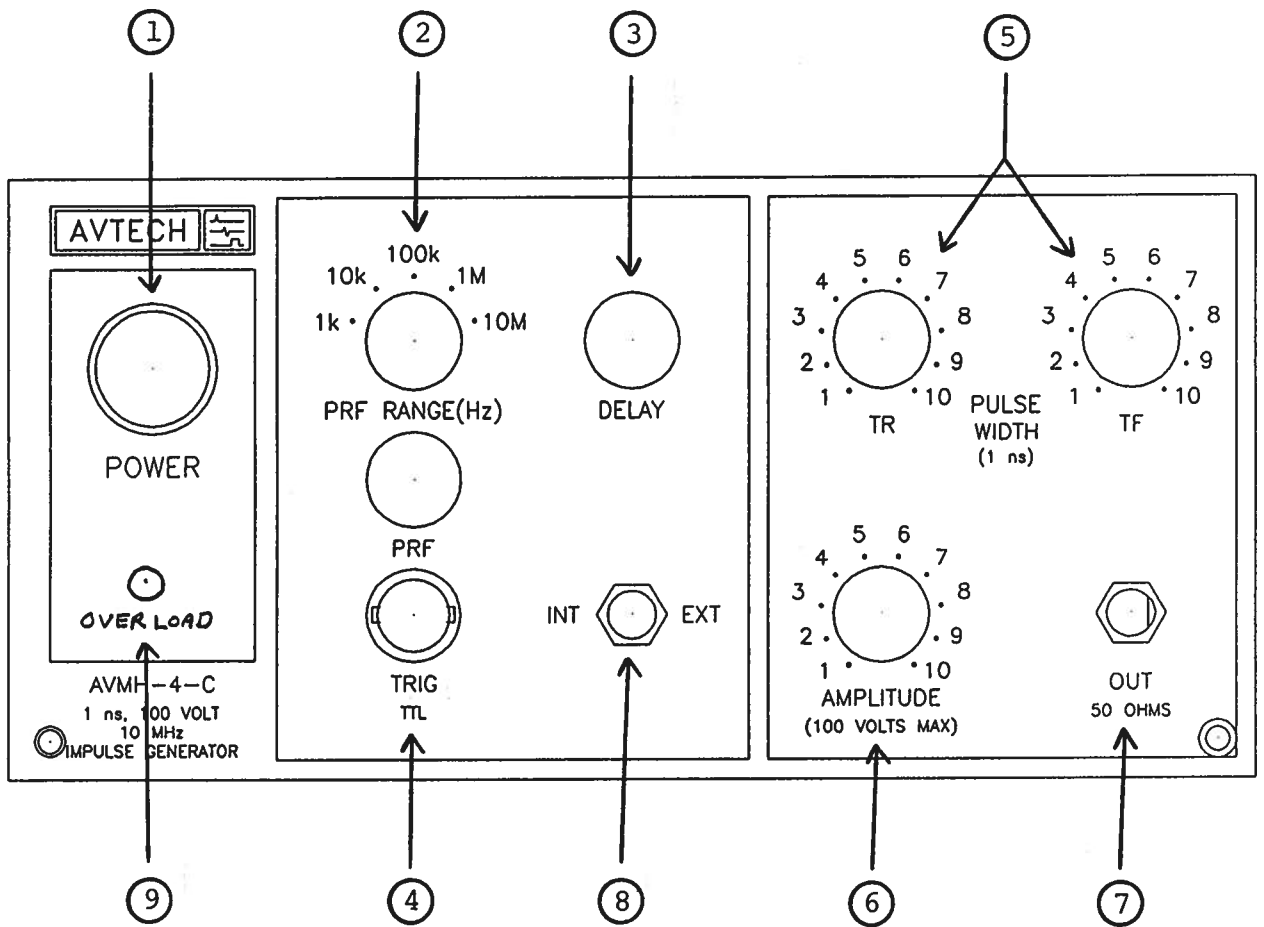(100 VOLTS MAX)

OUT
50 OHMS

Fig. 2   FRONT PANEL CONTROLS

FRONT PANEL CONTROLS

(1) **ON-OFF Switch**. Applies basic prime power to all stages.

(2) **PRF Control**. PRF RANGE and PRF controls determine output PRF as follows:

|	PRF MIN	PRF MAX
Range 1	0.1 kHz	1 kHz
Range 2	1 kHz	10 kHz
Range 3	10 kHz	100 kHz
Range 4	100 kHz	1 MHz
Range 5	1 MHz	10 MHz

(3) **DELAY Control**. Controls the relative delay between the reference output pulse provided at the TRIG output (4) and the main output (7). This delay is variable over the range of 0 to at least 100 ns.

(4) **TRIG Output**. This output precedes the main output (7) and is used to trigger the sampling scope time base. The output is a 200 mV 10 ns (approx) pulse capable of driving a fifty Ohm load.

(5) **PW Control**. Two one turn controls which varies the output pulse width. T_R determines the position of the rising edge while T_F determines the position of the falling edge.

(6) **AMP Control**. A one turn control which varies the output pulse amplitude from 0 to max output to a fifty Ohm load.

(7) **OUT Connector**. SMA connector provides output to a fifty Ohm load.

(8) **EXT-INT Control**. With this toggle switch in the INT position, the PRF of the AVMH unit is controlled via an internal clock which in turn is controlled by the PRF controls. With the toggle switch in the EXT position, the AVMH unit requires a 15 ns (or wider) 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.

(9) OVERLOAD INDICATOR. 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) Reducing PRF (i.e. switch to a lower range)
     2) Reducing the amplitude
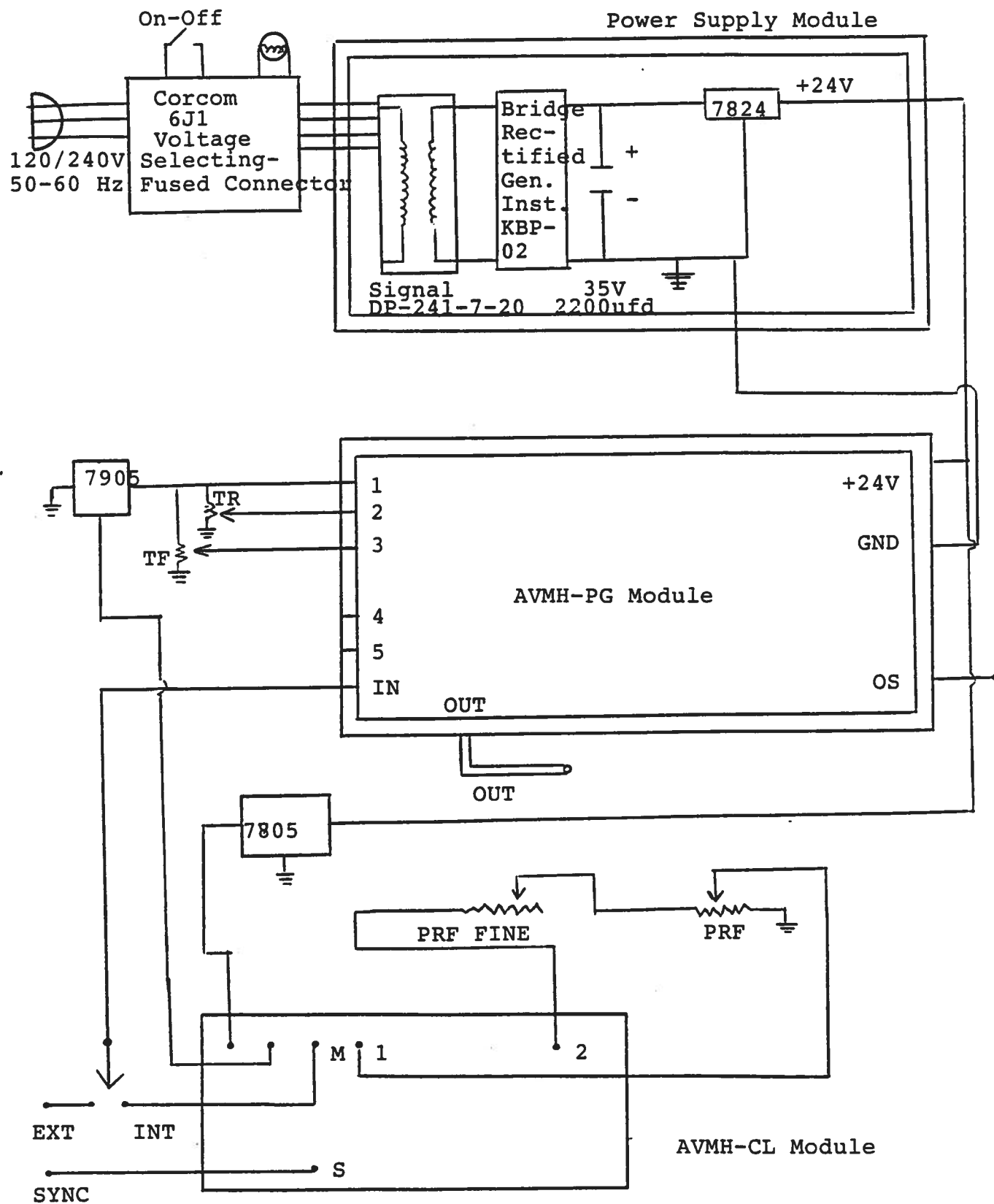   3) Reducing pulse width (i.e. switch to a lower range)

Fig. 3   BACK PANEL CONTROLS
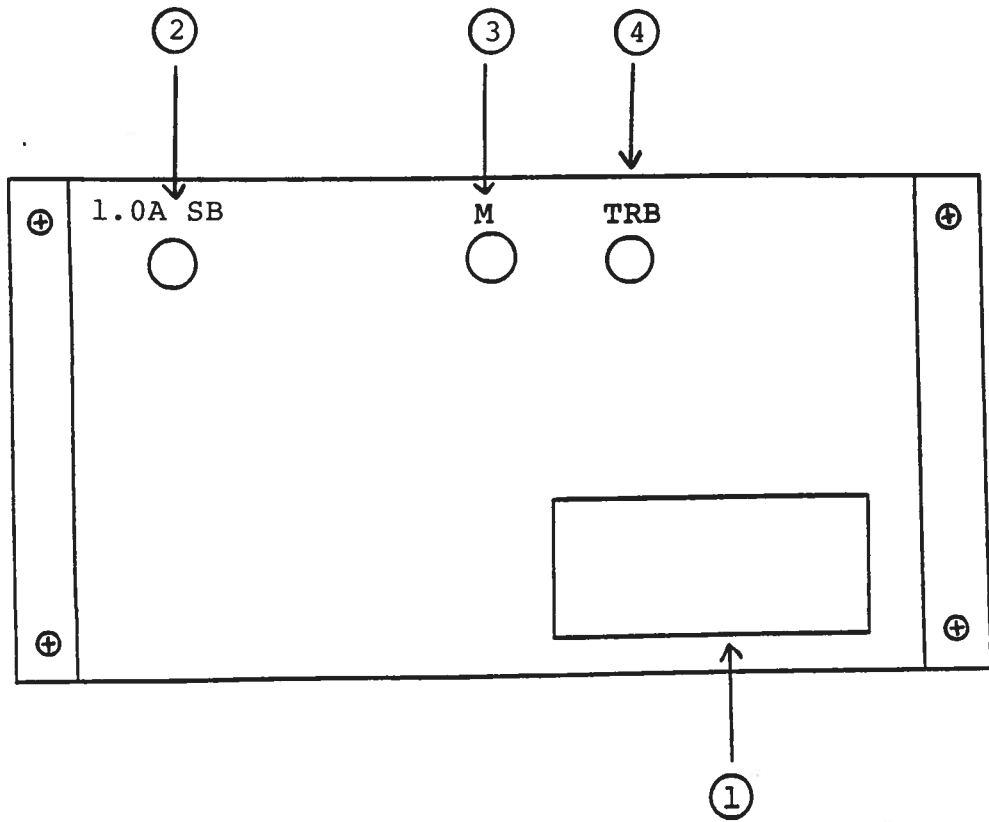
(1) <u>FUSED CONNECTOR, VOLTAGE SELECTOR</u>. The detachable power cord is connected at this point. In addition, the removable cord is adjusted to select the desired input operating voltage. The unit also contains the main power fuse (0.5A SB).

(2) <u>1.0A SB</u>. Fuse which protects the output stage if the output duty cycle rating is exceeded.

(3) <u>MONITOR Output</u>. Provides an attenuated (x10) coincident replica (to 50 Ohm) of the main output. (option).

(4) <u>TRB</u>. Units with a serial number above 4600 may also have a rear panel one turn TRB adjustment pot. This pot also controls the rising edge waveform. For PRF below about 10 MHz, the pot should normally be in mid-range but for PRF above 10 MHz the pot should normally be fully counter clockwise.

Fig. 4   SYSTEM BLOCK DIAGRAM

On-Off   Power Supply Module

Corcom
6J1
Voltage
Selecting-
120/240V Fused Connector
50-60 Hz

Bridge
Rec-
tified
Gen.
Inst.
KBP-
02

7824   +24V

+

-

Signal   35V
DP-241-7-20 2200ufd

7905

1
TR
2

3
TF

AVMH-PG Module

+24V

GND

4

5

IN

OS

OUT

OUT

7805

PRF FINE   PRF

M 1   2

EXT   INT   AVMH-CL Module

S

SYNC

SYSTEM DESCRIPTION AND REPAIR PROCEDURE

The AVMH-C consists of a pulse generator module (AVMH-PG), a clock module (AVMH-CL) and a power supply board which supplies +24 Volts (600 mA max) to the pulse generator module. In the event that the unit malfunctions, remove the instrument cover by removing the four Phillips screws on the back panel of the unit. The top cover may then be slid off. Measure the voltage at the +24 V pin of the PG module. If this voltage is substantially less than +24 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 +24 V DC. If this voltage is substantially less than 24 Volts the PS module is defective and should be repaired or replaced. If the voltage across the resistor is near 24 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 20 ns TTL level trigger pulse at pin M to trigger the PG module and a 20 ns 0.5 V sync pulse at pin S to trigger the sampling scope display device. The output at pin S precedes the output at pin M by 0 to 100 ns depending on the DELAY control setting. 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)   10 ns, or wider, outputs are observed at pins M and S.

b)   The PRF of the outputs can be varied over the range of 10 kHz to 25 MHz using the PRF and PRF RANGE controls.

c)   The relative delay between the pin M and S outputs can be varied by at least 100 ns by the DELAY control.

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

Sept. 24/96

Disk: AVMR-H

Name: AVMH4C.INS

- PN

- M