INSTRUCTIONS

MODEL AVR-S2-C-P-QTA 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 assumed by Avtech with respect to this product and no other warranty or guarantee is either expressed or implied.

TECHNICAL SUPPORT

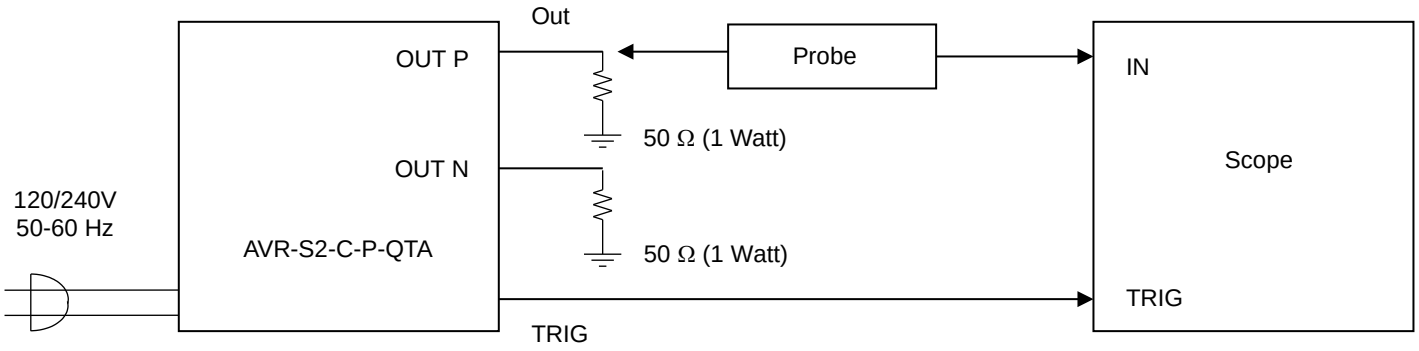
Phone: 613-226-5772 or 1-800-265-6681
Fax: 613-226-2802 or 1-800-561-1970

E-mail: info@avtechpulse.com
World Wide Web: http://www.avtechpulse.com

TABLE OF CONTENTS

Manual Reference: /fileserver1/officefiles/instructword/avr-s/AVR-S2-C-P-QTA,edition1.doc, created March 18, 2002

FIG. 1: PULSE GENERATOR TEST ARRANGEMENT



GENERAL OPERATING INSTRUCTIONS

1) CAUTION: BOTH THE POSITIVE AND NEGATIVE OUTPUTS REQUIRE A 50 OHM LOAD IMPEDANCE.

2) The bandwidth capability of components and instruments used to display the pulse generator output signal (attenuators, cables, connectors, etc.) should exceed 300 MHz.

3) The TRIG output channel provides TTL level signals. The TRIG output precedes the main output when the front panel ADVANCE-DELAY switch is in the DELAY position. The TRIG output lags the main output when the switch is in the ADVANCE position.

   The DELAY control controls the relative delay between the reference output pulse provided at the TRIG output and the main output. This delay is variable over the range of 0.01 us to 1.0 us.

	MIN	MAX
Range 1	0.01 us	0.1 us
Range 2	0.1 us	1.0 us

4) To obtain a stable output display the PRF control on the front panel should be set mid range. The front panel INT-EXT switch should be in the INT position. The DELAY controls 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 controls. An output PRF of 3.09 MHz is obtained by setting the PRF range switch in the 3 MHz range and setting the fine control max clockwise.

5) The output pulse width is controlled (10 ns +10%) by means of the front panel one-turn PW control.

6) The output pulse amplitude is controlled by means of the front panel ten-turn AMP control.

7) An external clock may be used to control the output PRF of the AVR unit by setting the front panel INT-EXT switch in the EXT position and applying a 50 ns (or wider) TTL level pulse to the TRIG BNC connector input. CAUTION: The input TRIG PRF must not exceed 3.09 MHz as this may cause failure of the unit (such failures are not covered by the Warranty).

8) For single pulse manual operation, set the front panel INT-EXT switch in the EXT position and push the SINGLE PULSE button.

9) OVERLOAD. An automatic overload protective circuit controls the front panel overload light. If the unit is overloaded (by operating at an exceedingly high duty cycle or by operating into a very low impedance), 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) Removing output load short circuit (if any)
    3) Reducing the output amplitude (i.e. switch to a lower range).

    The overload light may illuminate when the prime power is first applied. The light will extinguish after a few seconds and the unit will then operate normally.

    Note that the output stage will safely withstand a short-circuited load condition.

10) CAUTION: DC potentials as high as 90 Volts exist in the interior of the instrument. For this reason it is recommended that the top cover of the unit should not be removed and that the unit should be returned to the factory for servicing (when necessary).

11) 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.

12) For further assistance:

13) Tel: 613-226-5772
Fax: 613-226-2802
Email: info@avtechpulse.com

FIG. 2: FRONT PANEL CONTROLS

FRONT PANEL CONTROLS

(1) POWER Switch. The POWER push button switch applies AC prime power to the primaries of the transformer, turning the instrument ON. The push button lamp (#382 type) is connected to the +15V DC supply.

(2) INT/EXT Switch. In the “INT” position the instrument is internally triggered and the “SYNC OUT” connector provides a SYNC output which allows one to trigger other instruments, such as oscilloscopes. In the “EXT” position the instrument is triggered by a +5V 50 ns (or wider) input pulse on the “TRIG IN” connector, or by pressing the “SINGLE PULSE” push button.

(3) SINGLE PULSE Push Button. The “SINGLE PULSE” push button will trigger the instrument manually for one cycle of output, when the “INT/EXT” switch is in the “EXT” position. Otherwise, the push button has no effect.

(4) SYNC OUT. When the “INT/EXT” switch is in the “INT” position, this connector supplies a SYNC output that can be used to trigger other equipment, particularly oscilloscopes. This signal leads, or lags, the main output by a duration set by the “DELAY” controls and has an approximate amplitude of +3 Volts to R_L > 1K with a pulse width of about 50 ns.

(5) TRIG IN. When the “INT/EXT” switch is in the “EXT” position, the external trigger (+5 Volts, PW 50 ns) is applied to this connector. This input presents a high impedance (1M Ohm).

(6) GATE Input. The GATE input will suppress the triggering of the instrument if taken to a TTL HIGH level (i.e. 0.5 to 5.0V). If it is left open or taken to a TTL LOW, normal triggering will occur (R_{IN} = 1K).

(7) REPETITION RATE Controls. The rotary switch marked “RANGE” selects the pulse repetition rate for the internally triggered mode. The vernier (labelled “FINE”) provides continuously variable control of each range. There are six ranges and the instrument is set to the rate indicated on the front panel when the vernier is in the “MAXIMUM CW” position.

3 Hz	-	30 Hz
30 Hz	-	300 Hz
300 Hz	-	3 KHz
3 KHz	-	30 KHz
30 KHz	-	300 KHz
300 KHz	-	3.09 MHz

(8) DELAY Controls. The rotary switch selects one of six ranges and the vernier provides continuously variable control of each range. The instrument is set to the delay indicated on the front panel when the vernier is in the “MAX CW” position.

20 ns - 100 ns
100 ns - 1 μs

(9) ADVANCE, DELAY. With this two-position switch in the ADVANCE position, the leading edge of the output pulse precedes the leading edge of the SYNC output. When in the DELAY position, the leading edge of the SYNC output precedes the leading edge of the main output.

(10) PULSE WIDTH Control. One-turn control fine-tunes the output pulse width (10 ns ± 10%).

(11) AMPLITUDE. The ten-turn amplitude vernier provides continuously variable control of the peak amplitude of the main output from 0 Volts to ± 75 Volts to 50 Ohms.

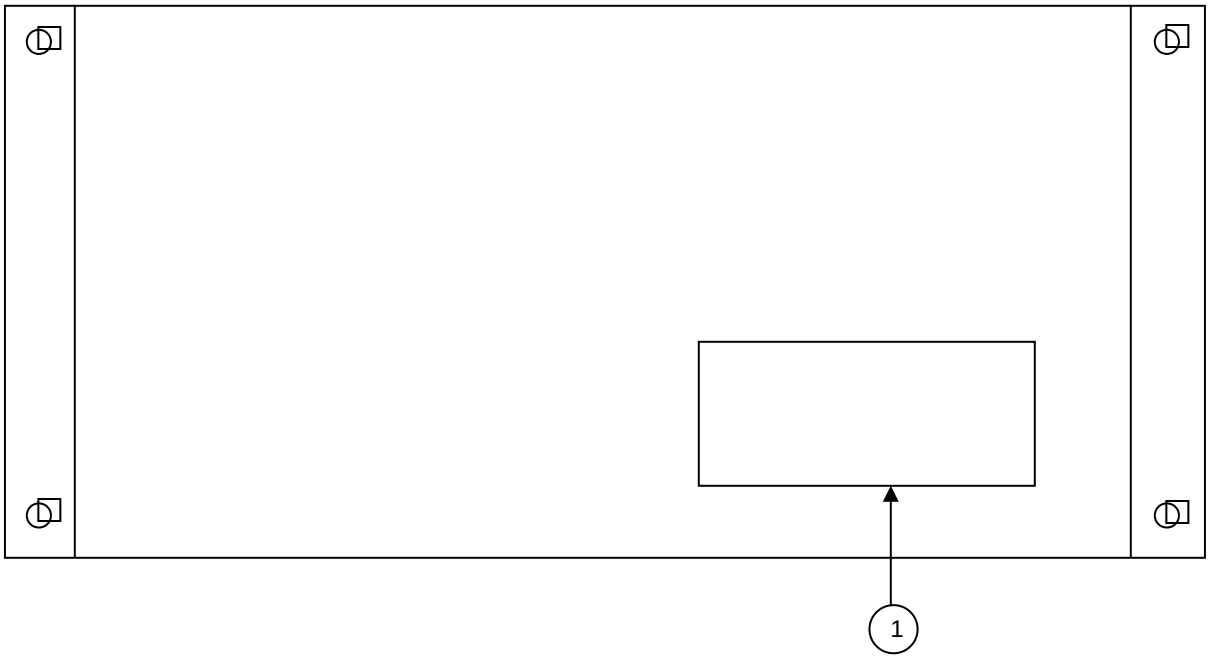
(12) OUT. SMA connectors provide output to load impedance of 50 Ohms. CAUTION: BOTH THE POSITIVE AND NEGATIVE OUTPUTS REQUIRE A 50 OHM LOAD IMPEDANCE.

(13) OVERLOAD. An automatic overload protective circuit controls the front panel overload light. If the unit is overloaded (by operating at an exceedingly high duty cycle or by operating into a very low impedance), 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) Removing output load short circuit (if any)
3) Reducing the output amplitude (i.e. switch to a lower range)

The overload light may illuminate when the prime power is first applied. The light will extinguish after a few seconds and the unit will then operate normally.

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.

For AC line voltages of 110-120V, the power selector card should be installed so that the “120” marking is visible from the rear of the instrument.

For AC line voltages of 220-240V, the power selector card should be installed so that the “240” marking is visible from the rear of the instrument.

If it is not set for the proper voltage, remove the fuse and then grasp the card with a pair of pliers and remove it. Rotate horizontally through 180 degrees. Reinstall the card and the correct fuse.

In the 120V setting, a 1.0A slow blow fuse is required. In the 240V setting, a 0.5A slow blow fuse is required.

TOP COVER REMOVAL AND RACK MOUNTING

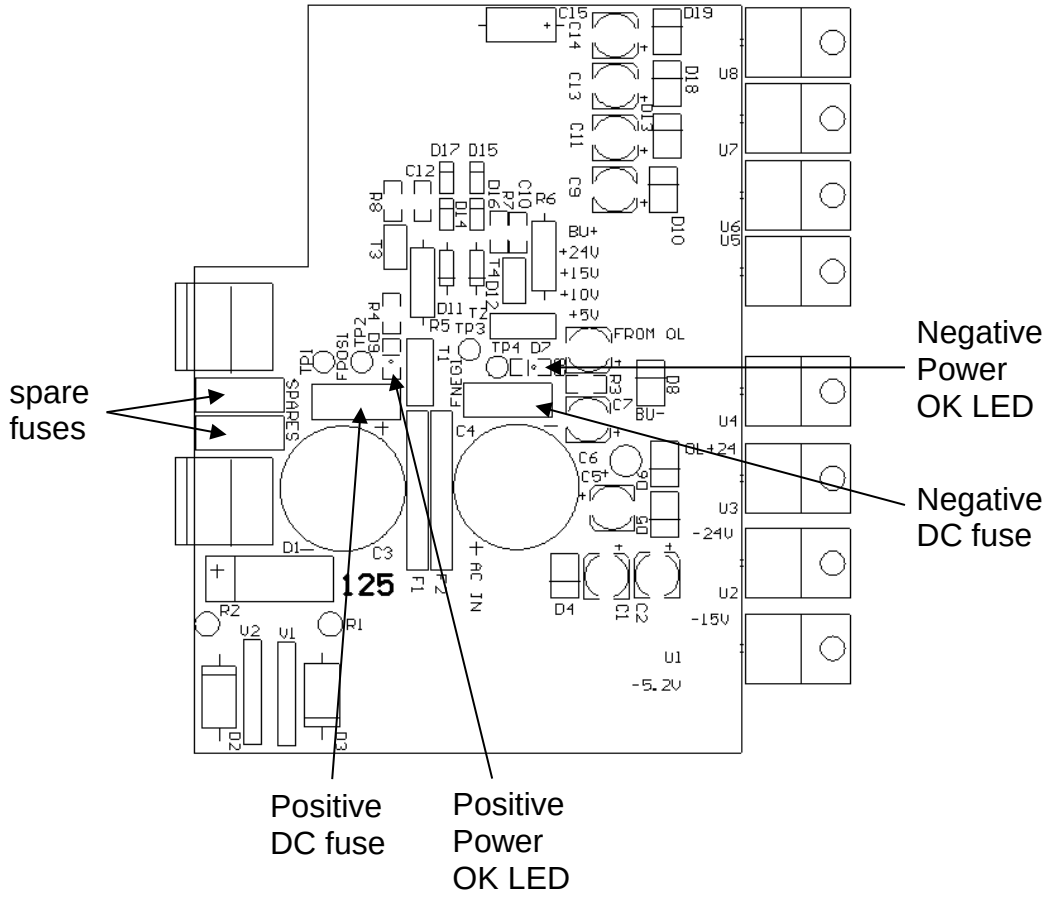
1) The interior of the instrument may be accessed by removing the four Phillips screws on the top panel. With the four screws removed, the top cover may be slid back (and off).

2) The -R5 rack mount kit may be installed after first removing the one Phillips screw on the side panel adjacent to the front handle.

POWER SUPPLY AND FUSE REPLACEMENT

This instrument has three main fuses, plus two spares. 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 two spares) are located on the internal DC power supply, as shown below:



The positive fuse and one of the spare fuses on this circuit board are 1A slow-blow fuses, Littlefuse part number R452001. (This fuse can be ordered from Digikey, www.digikey.com. The Digikey part number is F1343CT-ND). The negative fuse and the second spare fuse are 0.5A slow-blow fuses (Littlefuse R452.500, Digikey part number 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. (Spare 1 Amp and 0.5 Amp fuses are provided on the circuit board. They may be transferred to the active fuse locations using needle-nose pliers.)

ORIGINAL QUOTATION

PERFORMANCE CHECK SHEET