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SINCE 1975

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INSTRUCTIONS

MODEL AV-155C-C-MIA PULSED CONSTANT CURRENT 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 or liability assumed by Avtech with respect to this product and no other warranty or guarantee is either expressed or implied.

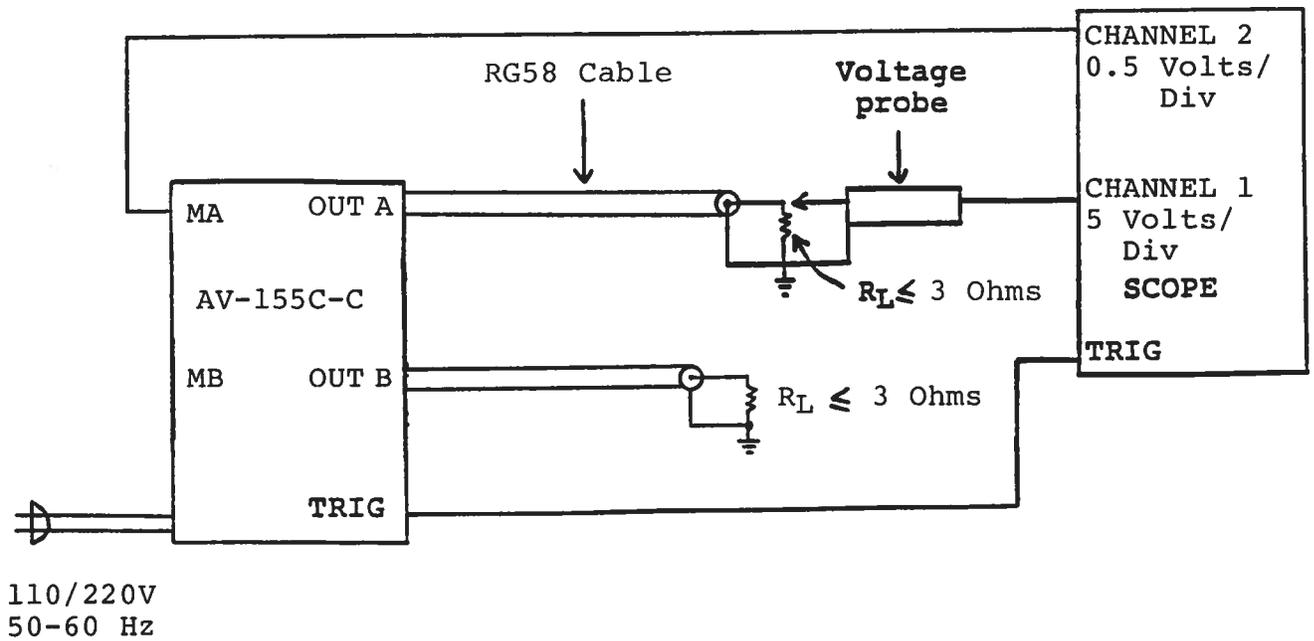
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Fig. 1

MODEL AV-155C-C PULSE GENERATOR TEST ARRANGEMENT

(RESISTIVE LOAD)



GENERAL OPERATING INSTRUCTIONS

- 1) The bandwidth capability of components and instruments used to display the pulse generator output signal (probes, cables, connectors, etc.) should exceed 10 MHz.
- 2) A low-inductance resistor should be used as the load. Note that an inductance of 1 uh will yield an inductance spike of about 1.5 Volts. Also note that the load resistance must not exceed 3 Ohms (for a maximum output current of 5 Amps) because the compliance voltage rating of the unit is 15 Volts. Note that to obtain an output, the STANDBY-OPERATE switches must be in the OPERATE position.
- 3) Model AV-155C-C-MIA provides the output waveforms shown in Fig. 2.
- 4) To control the unit via the internal clock, set the INT-EXT switch in the INT position. The PRF is then variable from 0.1 to 1.0 Hz.
- 5) The unit may be triggered externally by setting the INT-EXT switch in the EXT position and applying a TTL trigger pulse to the TRIG BNC (PW \geq 50 ns). The unit may be operated in the SINGLE PULSE MANUAL mode by setting the INT-EXT switch in the MAN position and pushing the SINGLE PULSE button.
- 6) The output pulse width is controlled by means of the front panel ten turn PW controls and the two-position range switches. The control should initially be set mid range and the pulse width adjusted using an oscilloscope.
- 7) The output pulse amplitude is controlled by means of the front panel ten turn AMP control. Note that the load voltage range (i.e. compliance voltage) of the unit is 15 Volts so the load resistance must be sufficiently low (\leq 3 Ohms) so that the load voltage does not exceed 15 Volts.
- 8) The DELAY control controls the relative delay between the reference output pulse provided at the TRIG output and the OUTPUT A. This delay is variable over the range of 0.1 us to 10 us.

	MIN	MAX
Range 1	0.1 us	1.0 us
Range 2	1.0 us	10 us

9) The DELAY AB control determines the delay between the leading edge of the output "B" and the output "A" as follows:

Range 1	0	to 1	ms
Range 2	1	ms to 10	ms
Range 3	10	ms to 100	ms

10) To obtain an output, the STANDBY-OPERATE switch must be in the OPERATE position. In the STANDBY position, a short circuit is placed across the output terminals and the output amplitude control signal is set to zero. This control may be used as a safety feature or as a means of deactivating one or both of the outputs.

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

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.

12) 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.

13) For additional assistance:

Tel: (613) 226-5772
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TRIG
OUT

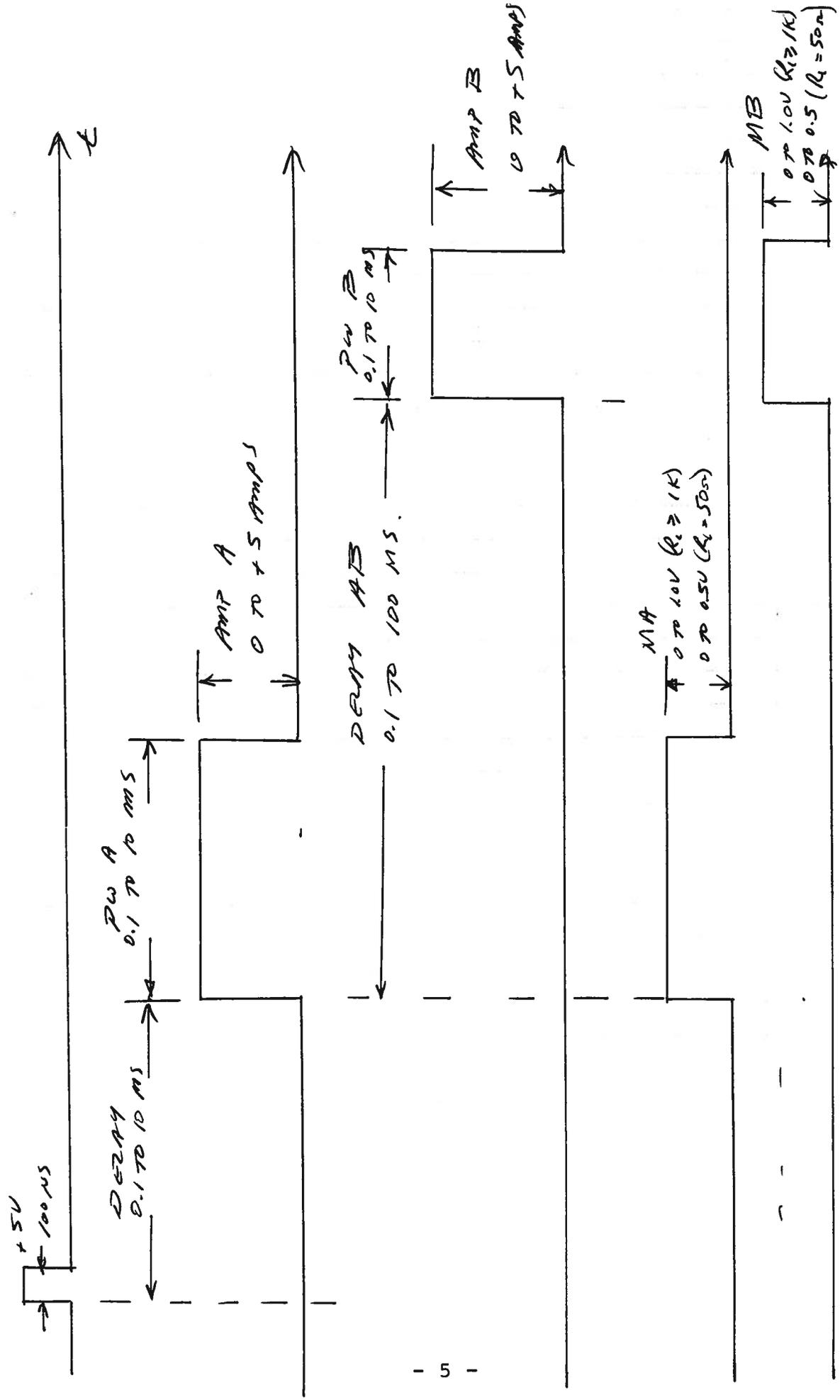
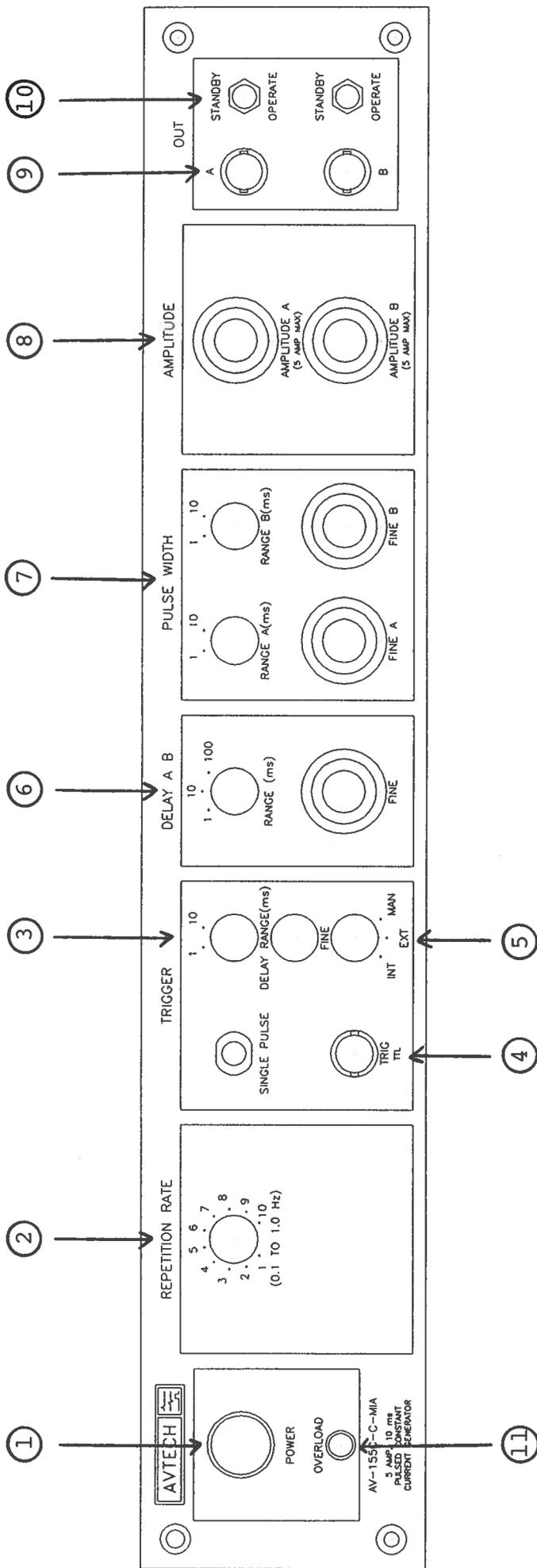


Fig 2. Model BK-1556-C-AMIB OUTPUT WAVEFORMS



FRONT PANEL CONTROLS

Fig. 3

- (1) ON-OFF Switch. Applies basic prime power to all stages.
- (2) PRF Control. Varies PRF from 0.1 Hz to 1 Hz.
- (3) DELAY Control. Controls the relative delay between the reference output pulse provided at the TRIG output (4) and the output "A" (6). This delay is variable over the range of 0.1 to about 10 us.

	MIN	MAX
Range 1	0.1 us	1.0 us
Range 2	1.0 us	10 us

- (4) TRIG. When the INT-EXT switch (5) is in the INT position this output is used to trigger the scope time base. The output is a TTL level 100 ns (approx.) pulse capable of driving a fifty Ohm load. The external trigger signal (TTL, PW \geq 50 ns) is applied at this input when the INT-EXT switch (5) is in the EXT position.
- (5) INT-EXT. To control the unit via the internal clock, set the INT-EXT switch in the INT position. The PRF is then variable from 0.1 to 1.0 Hz. The unit may be triggered externally by setting the INT-EXT switch in the EXT position and applying a TTL trigger pulse to the TRIG BNC (PW \geq 50 ns). The unit may be operated in the SINGLE PULSE manual mode by setting the INT-EXT switch in the MAN position and pushing the SINGLE PULSE button.
- (6) DELAY AB. The DELAY AB control determines the delay between the leading edge of the output "B" and the output "A" as follows:

Range 1	0	to 1	ms
Range 2	1	ms to 10	ms
Range 3	10	ms to 100	ms

- (7) PULSE WIDTH. The output pulse width is controlled by means of the front panel ten turn PW controls and the two-position range switches. The control should initially be set mid range and the pulse width adjusted using an oscilloscope.

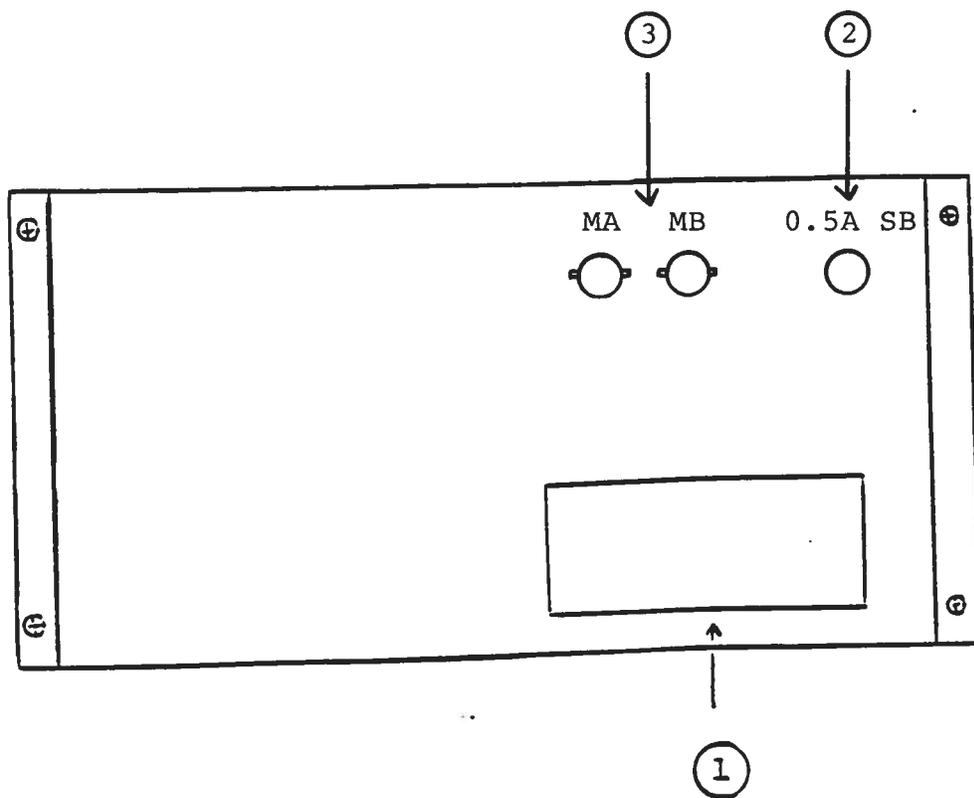
- (8) AMPLITUDE. The output pulse amplitude is controlled by means of the front panel ten turn AMP control. Note that the load voltage range (i.e. compliance voltage) of the unit is 15 Volts so the load resistance must be sufficiently low (≤ 3 Ohms) so that the load voltage does not exceed 15 Volts.
- (9) OUT. The load ($R_L \leq 3$ Ohms) is connected to the BNC connectors. RG58 cable may be used if necessary.
- (10) OPERATE-STANDBY. To obtain an output, the STANDBY-OPERATE switch must be in the OPERATE position. In the STANDBY position, a short circuit is placed across the output terminals and the output amplitude control signal is set to zero. This control may be used as a safety feature or as a means of deactivating one or both of the outputs.
- (11) 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) 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 pulse width (i.e. switch to a lower range)
 - 3) Reducing the output amplitude

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.

Fig. 4

BACK PANEL CONTROLS



BACK PANEL CONTROLS

- 1) Power Entry Module. Detachable line cord connects to this point. Also contains voltage selector card and line fuse (0.50 A SB).
- 2) 0.5 A SB Fuses. Limits current supplied to the output stages (A and B).
- 3) MA, MB CURRENT MONITORS. BNC connectors provide coincident replicas of the output pulses. For $R_L \geq 1K$.

$$I_{LOAD} = 5 V_M \text{ (Volts, Amp)}$$

$$\text{For } R_L = 50 \text{ Ohm}$$

$$I_{LOAD} = 10 V_M \text{ (Volts, Amp)}$$

V_M is the monitor output Volt, amplitude is determined using a scope.

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.

SYSTEM DESCRIPTION AND REPAIR PROCEDURE

The AV-155C-C unit consists of the following basic modules:

- 1) AV-155C-PG pulse generator modules (two)
- 2) +24V power supply board
- 3) -DB single pulse module
- 4) -DL delay control modules (two)
- 5) -CL clock module
- 6) -OL overload module

The modules are interconnected as shown in Fig. 5.

In the event of an instrument malfunction, it is most likely that the 0.5 A slow blow fuse or the main power fuse on the rear panel has blown. Replace if necessary. If the unit still does not function, it is most likely that some of the output switching elements have failed and these elements cannot be changed in the field. Therefore, the unit should be returned to AVTECH for servicing.

START-UP CHECK LIST

- 1) The instruction manual has been studied thoroughly.
- 2) Connect resistive loads ($R_L \leq 3$ Ohms) to the OUT terminals and set the STANDBY-OPERATE switch in the OPERATE position. Connect scope probes across the resistive loads.
- 3) Set the pulse width delay and PRF controls at the approximate desired values. Set the amplitude controls fully counterclockwise.
- 4) Set the INT-EXT switch on INT.
- 5) Connect the rear panel M output to the scope (1 VOLT/DIV) and connect the TRIG out to the scope time base.
- 6) Turn on the prime power. The scope time base should be triggering.
- 7) Gradually increase the output amplitude by rotating the amp controls clockwise and observe the waveforms on the scope. A rectangular pulse should appear on the scope (for both the load voltage and monitor channels) and the amplitudes should increase as the amplitude controls are rotated clockwise.
- 8) Adjust pulse width, pulse period (i.e. PRF) and amplitude to obtain the desired settings.
- 9) Briefly set the OPERATE-STANDBY controls to the STANDBY position and note that the output voltage (and the monitor outputs) are reduced to zero.
- 10) If additional assistance is required:

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September 30, 1996.

Tyler Malmrose
Morton International
3350 Airport Road
Ogden, UT 84405

Tel: 801-625-9218
Fax: 801-625-8258

Dear Tyler:

Following our telephone conversation of September 30th, I am pleased to provide a revised price and delivery quotation for a special purpose, two channel pulsed constant current generator meeting the following specifications:

Model designation: AV-155C-C-P-MIA.

Number of channels: Two (A and B) each with separate amplitude and pulse width controls.

Delay: Channel B may be delayed with respect to Channel A via a three-position range switch and a ten turn locking dial control as follows:
0 to 1 ms
1 to 10 ms
10 to 100 ms

Output amplitude: 0 to 5 Amp. Controlled by a front panel 10 turn locking dial control.

Output pulse width: 0.1 to 10 ms. Controlled by a ten turn locking dial control and a two-position range switch as follows:
0.1 to 1.0 ms
1.0 to 10 ms

.../2

Load voltage range: 0 to +15 Volts.

Output current regulation: $\leq 1\%$ for load voltage change from +15 to 0 Volts.

Rise, fall time: ≤ 3 us (10 to 90%).

Pulse repetition frequency:

- Internal trigger: 0.1 to 1.0 Hz. One turn control.
- External trigger: 0 to 1.0 Hz.
- (TTL)
- External trigger: 0 to 1.0 Hz. Manual push button for single pulse operation.
- (manual)

Maximum duty cycle: 10%; eg. for:
 PRF = 1 Hz, $PW_{MAX} = 100$ ms

Automatic overload function protects instrument if maximum duty cycle is exceeded.

External trigger: TTL, $PW \geq 50$ ns.

Standby mode: Each channel has a two-position switch which may be used to disable the output (places a short circuit across the output).

Dimensions: 100 mm x 430 mm x 375 mm
 (H x W x D) (3.9" x 17" x 14.8").

Chassis material: Aluminum. Anodized aluminum front panel with cast aluminum side panels (with gray plastic trim) and aluminum top and bottom panels with gray plastic trim (chassis is as per our Model AV-1010-C).

Connectors: BNC. Note that this special purpose unit does not include the AV-LZ output line as per the standard AV-155C-C.

Rack mounting: Includes -R5 rack mount kit for 19" rack mounting.

Prime power: 120/240V, 50-60 Hz.

Price: Channel A: \$2,249.00 US.

Channel B: \$2,249.00 US.

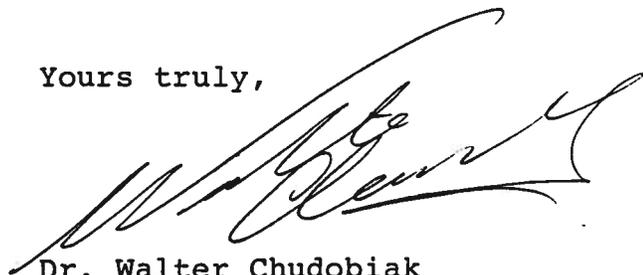
Note that Channels A and B are to be combined in a single chassis and shipped as the Model AV-155C-C-P-MIA.

FOB: Destination.

Delivery: 60 days ARO.

Thank you for your interest in our products. Please call me again (1-800-265-6681) if you require any additional information or modifications to the above quotation.

Yours truly,



Dr. Walter Chudobiak
Chief Engineer

WC:pr

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Fax Ref No: 835 From: Avtech Electrosystems Ltd.

To: Morton International Our Fax No: (613) 226-2802

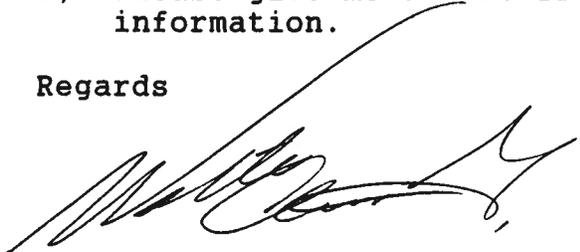
Date: Sept. 17, 1996

Attn: Keith Barnes Receivers Fax No: 801-625-8258
Tel: 801-625-4876

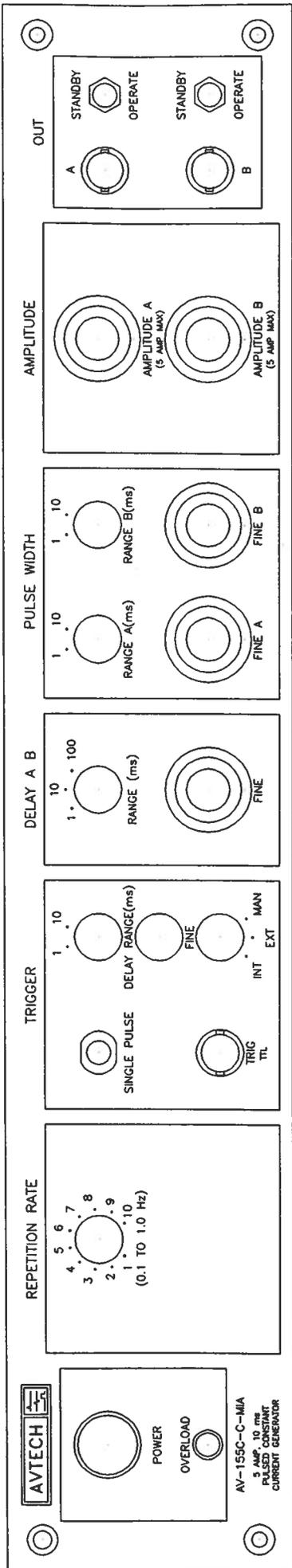
Subject: Our Quote of Sept. 13/96 No. of pages: 2

- 1) For your information, I enclose a sketch of the face plate for Model AV-155C-C-MIA.
- 2) Please give me a call if you require any additional information.

Regards


Dr. Walter Chudobiak
Chief Engineer

WC:pr



Nov. 5/96

Disk: AV-150

-R5

Name: 155CCMIA.INS