AVTECH ELECTROSYSTEMS LTD.
NANOSECOND WAVEFORM ELECTRONICS
SINCE 1975

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INSTRUCTIONS

MODEL AVR-G1-C-N-R5-RAYTHA-GTA-EA-EW 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

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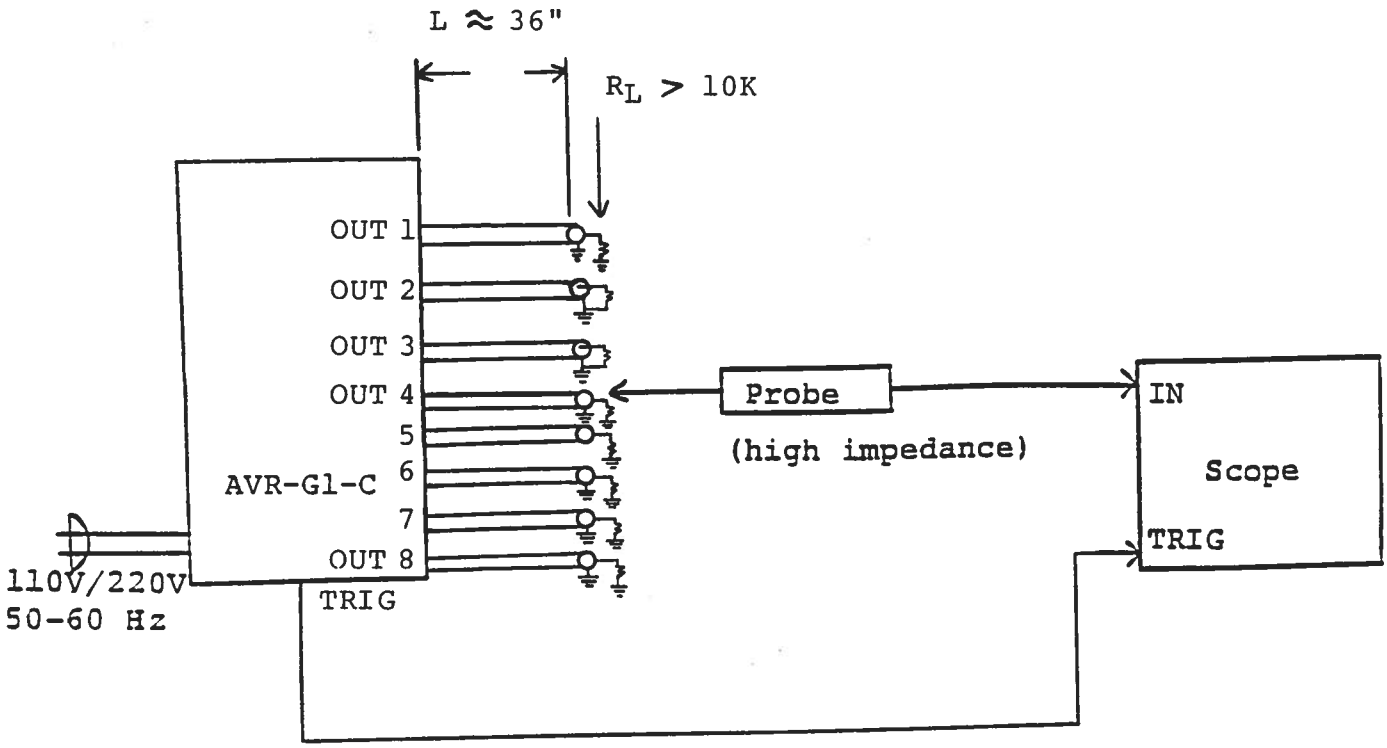
Fig. 1 PULSE GENERATOR TEST ARRANGEMENT



OPERATING INSTRUCTIONS

1) The bandwidth capability of components and instruments used to display the pulse generator output signal (attenuators, cables, connectors, etc.) should exceed 100 MHz.

2) The TRIG output channel provides TTL level signals (to a high impedance) at a PRF of 100 Hz. The output from channel one is synchronous with the TRIG output while output two is delayed 1.25 ms with respect to output one. Similarly, output three is delayed 1.25 ms with respect to output two (see Fig. 2).

3) The outputs are designed to drive a load impedance of greater than 10 K and the loads are to be connected to the output BNC using a 36" 50 Ohm cable. Note that this cable length is critical (see 4 below).

4) The overload LED on each output will illuminate when the load current exceeds 15 mA (150 Volts to 10 K), provided the load cable length is 36". If the cable length is more than 36", then the LED will illuminate at a lower load current while if the cable length is shorter, the LED will illuminate only at higher load currents. The DC level at the SMA overload output rises to +4V (to R_L > 10 K) when the led is illuminated.

5) The output pulse width is controlled by the ten turn pulse width control and the three-position range switch as follows:

Range 1	0.1 us	1.0 us
Range 2	1.0 us	10 us
Range 3	10 us	100 us

Within each range, the pulse width may be controlled electronically by setting the rear panel INT-EXT switch in the EXT position and applying 0 to +10 VDC to the A BNC connector (R_{IN} > 1 K).

6) The output pulse amplitude is controlled by means of the front panel ten turn AMP control. The output amplitude may be controlled electronically by setting the rear panel INT-EXT switch in the EXT position and applying 0 to +10 VDC to the A BNC connector (R_{IN} > 10 K). Note that when attempting to reduce the output pulse amplitude, the pulse amplitude decay time constant is of the order of tens of seconds.

This is normal and is due to the large energy storage capacitor used to insure low pulse top droop.

7) The period of the output pulses may be adjusted using the 10 turn trim pot on the top surface of the -CL module (see the top cover removal instructions). At the time of shipping, the separation between the leading edges of the output pulses was set at 1.25 ms and the PRF set at 100 Hz.

8) The output pulse width (for each channel) may be adjusted using the ten turn trim pot on the top surface of each -PG module (see the top cover removal instructions).

9) OVERLOAD INDICATOR. AVR-G-C 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 pulse width (i.e. switch to a lower range)
   3) Removing output load short circuit (if any)

10) A fan is used to cool the chassis. The air input to the fan is on the bottom of the chassis and includes a filter (Rotron Part No. 554140) which should be cleaned or replaced periodically.

11) The 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.

12) For further assistance:

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

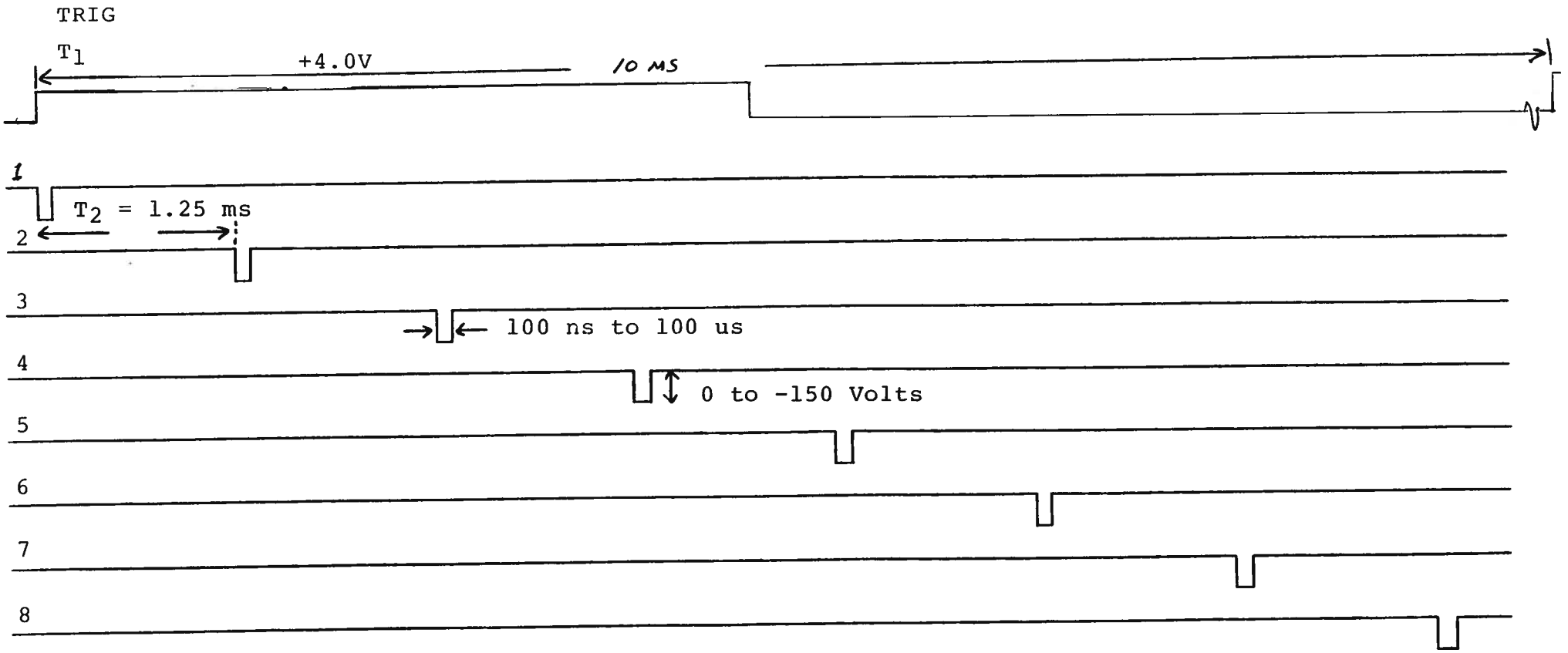


Fig. 2 OUTPUT WAVEFORMS

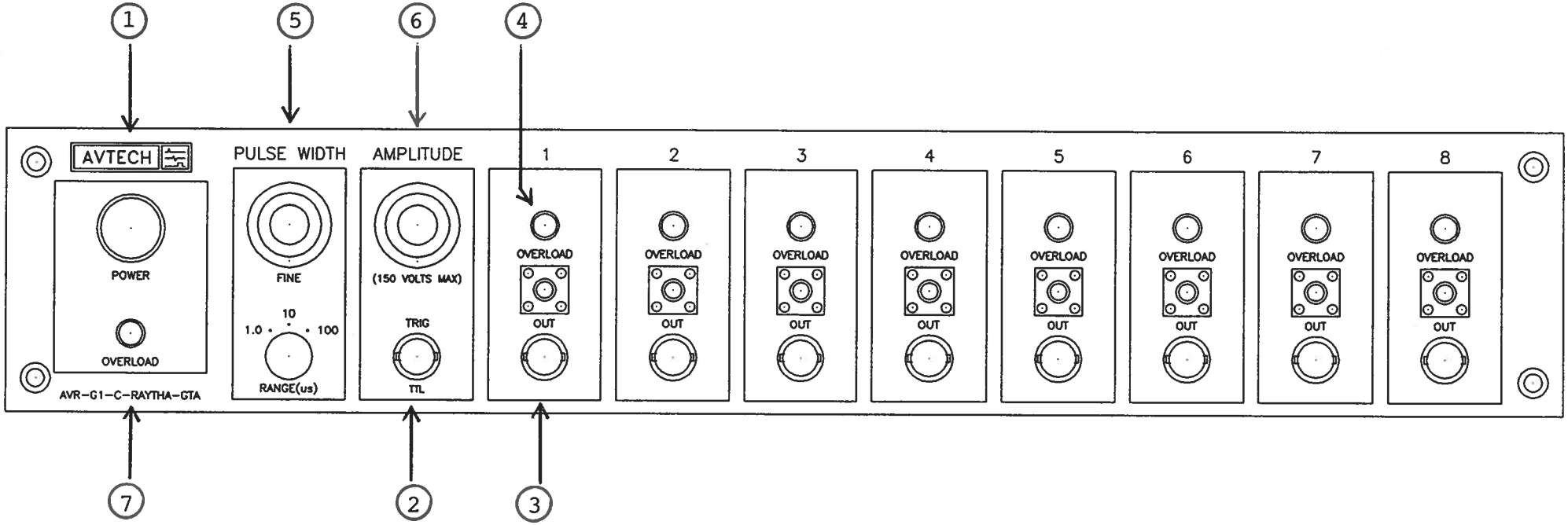


Fig. 3

FRONT PANEL CONTROLS

FRONT PANEL CONTROLS

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

(2) TRIG Output. This output is used to trigger the scope time base. The output is a TTL level 100 Hz pulse.

(3) OUT Connector. Eight BNC connectors provide output to a high impedance load connected to the connector via a 36" 50 Ohm cable.

(4) OVERLOAD. The overload LED on each output will illuminate when the load current exceeds 15 mA (150 Volts to 10 K), provided the load cable length is 36". If the cable length is more than 36", then the LED will illuminate at a lower load current while if the cable length is shorter, the LED will illuminate only at higher load currents. The SMA overload DC level rises to +4 Volts (to $R_L \geq 10$ K) when the led illuminates.

(5) PW Control. A ten turn control and 3-position range switch which varies the positive output pulse width from 0.1 us to 100 us as follows:

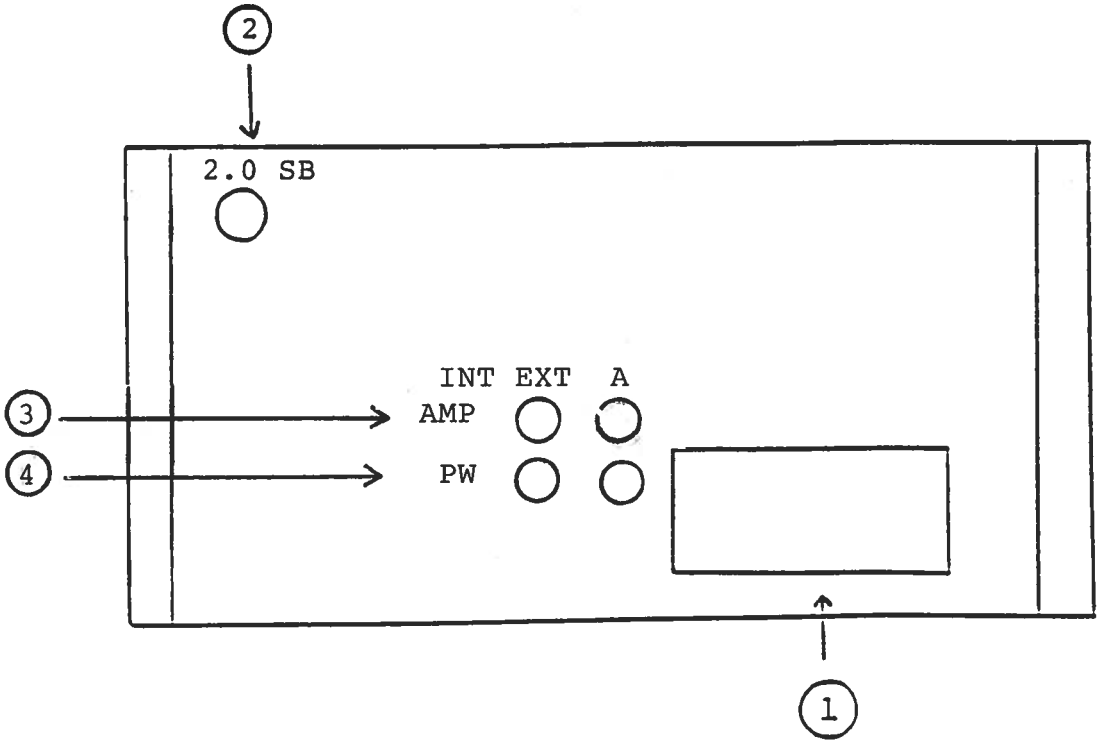
	PW min	PW max
Range 1	0.1 us	1.0 us
Range 2	1.0 us	10 us
Range 3	10 us	100 us

(6) AMP Control. A ten turn control which varies the output pulse amplitude.

(7) OVERLOAD INDICATOR. AVR 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 pulse width (i.e. switch to a lower range)
3) Removing output load short circuit (if any)

Fig. 4 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 (1.5 A SB).

(2) 2.0A SB. Fuse which protects the output stage if the output duty cycle rating is exceeded.

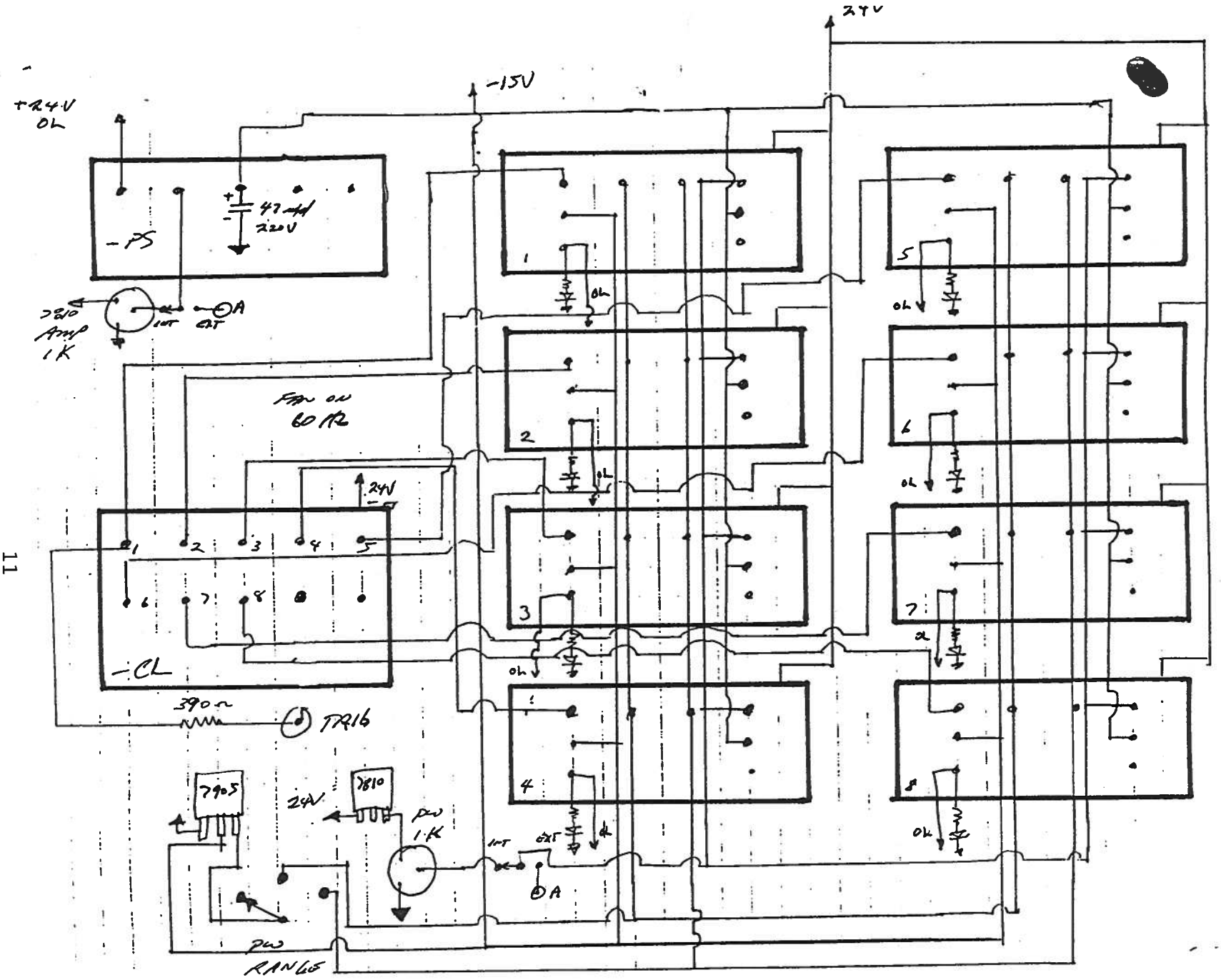
(3) AMP. The output amplitude may be controlled electronically by setting the INT-EXT switch in the EXT position and applying 0 to +10 VDC to the A BNC connector (R_{IN} > 10 K).

(4) PW. Within each PW range, the pulse width may be controlled electronically by setting the INT-EXT switch in the EXT position and applying 0 to +10 VDC to the A BNC connector (R_{IN} > 1 K).

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



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AVR-G1-C-N-R5-RAYMA-EA-EN-GTA

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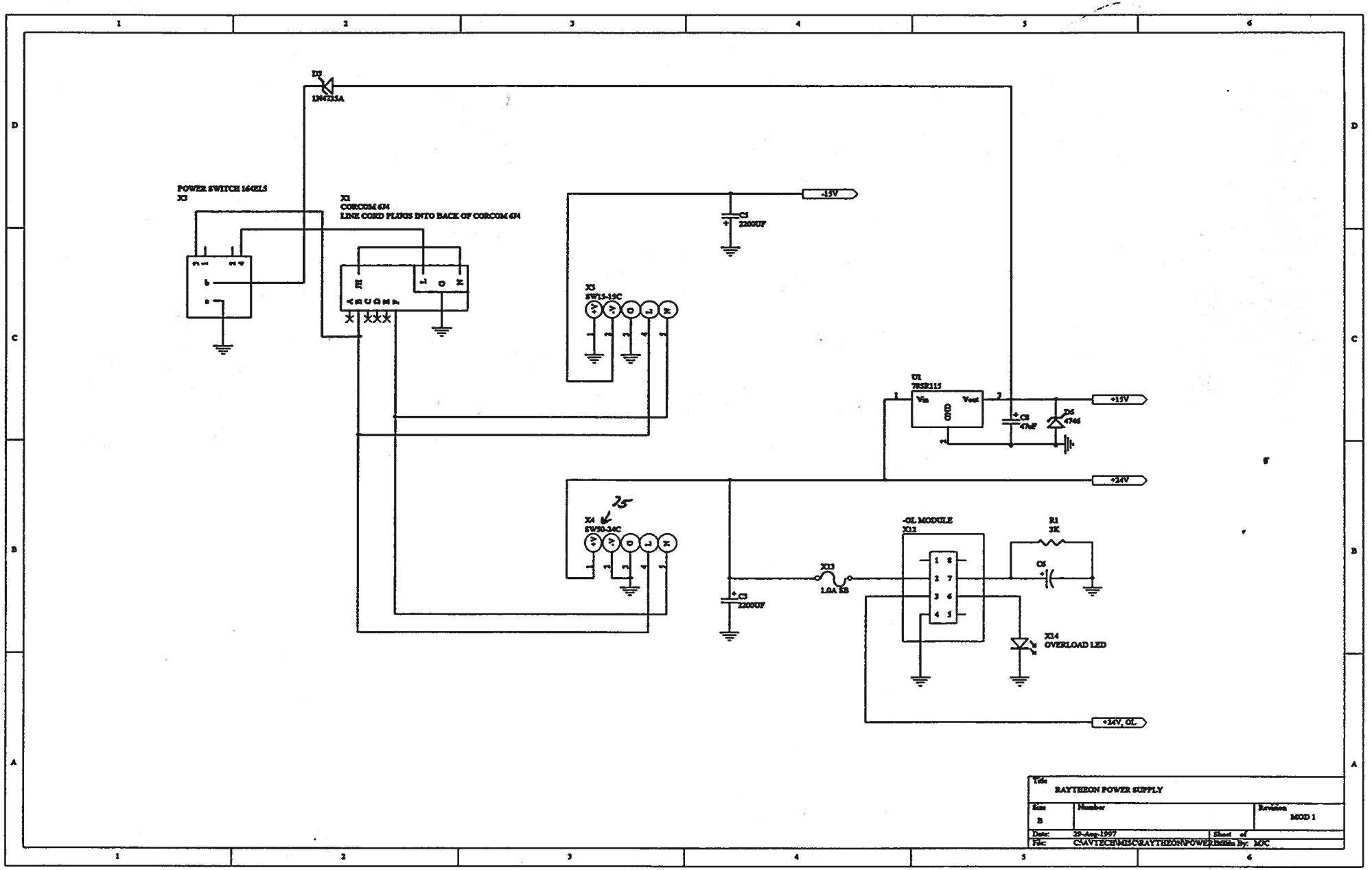
D2
1N4735A
POWER SWITCH 16GE15
X2
X1
CORCOM 634
LINE CORD PLUGS INTO BACK OF CORCOM 634
-15V
C3
2200UF
X3
SW15-15C
U1
78SR115
Vin
Vout
GND
+15V
C5
47uF
D5
4746
+24V
X4
SW30-24C
-OL MODULE
X12
R1
3K
X13
1.0A SB
C4
2200UF
C6
X14
OVERLOAD LED
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Revision
MOD 1
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Fax Ref No: 1437

From: Avtech Electrosystems Ltd.

To: Georgia Tech.

Our Fax No: (613) 226-2802

Atlanta, GA

Date: April 11/97

Attn: John Penczek
Tel 404-894-1861

Receivers Fax No: 404-894-1258

Subject: Quotation

No. of pages: 3

Following our quotation of April 8th, I am pleased to offer the following quotation, which includes additional technical specifications:

Model designation:	AVR-G1-C-N-R5-RAYTHA-EA-EW-GTA. This is identical to the unit supplied to Alan Palevsky at Raytheon (but with the EA, EW and GTA options).
Basic description:	8 negative outputs.
PRF:	Fixed at 100 Hz.
Outputs:	Trigger plus 8 channels with 1.25 ms spacing (see enclosed waveform sketch).
Pulse amplitude:	0 to -150 Volts, controlled by one common ten turn amplitude control or by 0 to +10 VDC applied to a rear panel BNC connector ($R_{IN} \geq 10K$). (-EA option).
Output amplitude ripple, perturbation:	$\leq$ 2.0 Volts for $\pm$ > 1.0 us after leading edge.

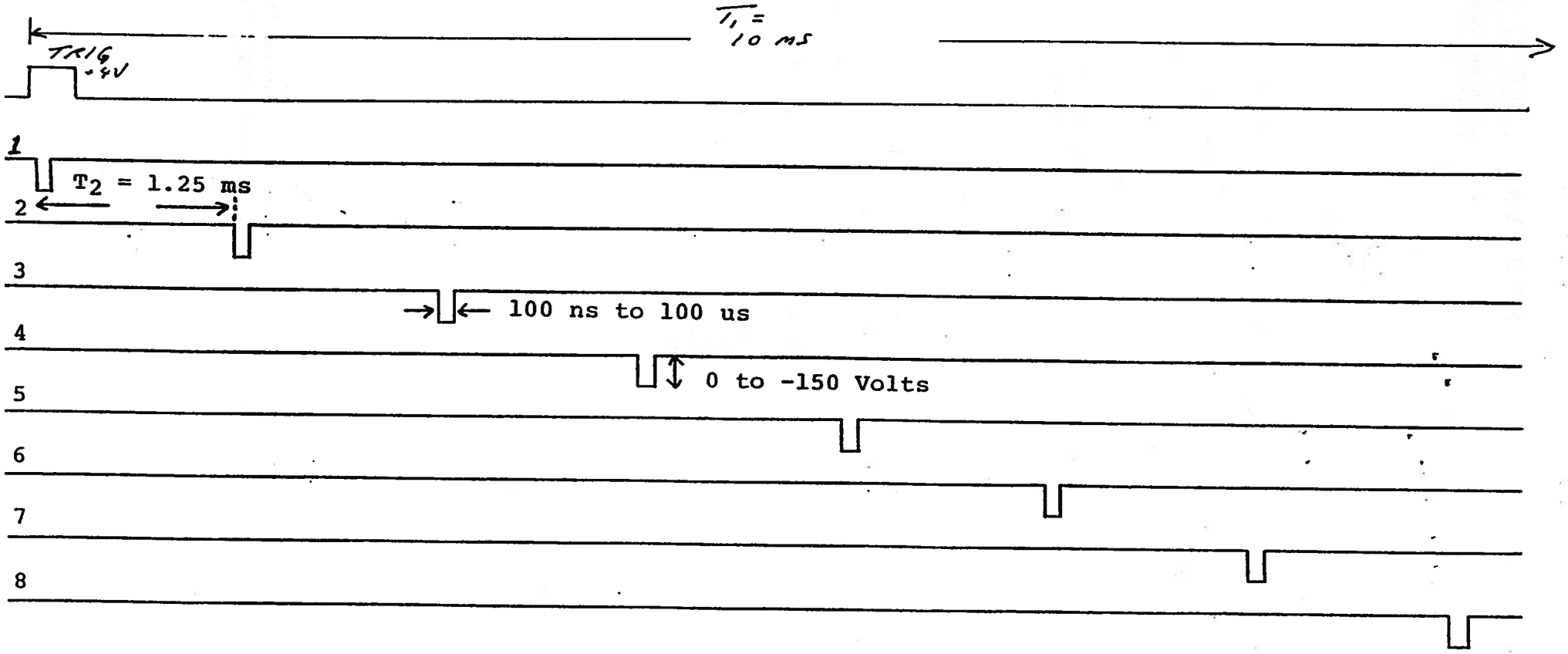
Pulse width:	100 ns to 100 us, controlled by one common three position range switch and a ten turn fine control. Within each range the pulse width may be controlled by an externally applied 0 to +10 VDC control voltage ($R_{IN} \geq 10K$), to a rear panel BNC connector. (-EW option).
Pulse width jitter:	≤ 0.01 %
Timing jitter:	≤ ± 0.5 ns
Overload indicators:	Each of the 8 outputs provided with its own overload LED which indicates when the peak output current exceeds 15 mA. SMA connector adjacent to each LED provides +4 VDC (to $R_L > 10K$) when overload LED indicates. (-GTA option).
Output impedance:	50 Ohms.
Connectors:	OUT, TRIG, EA, EW: BNC. Overload: SMA.
Chassis size:	5.25 x 17 x 17 inches. Includes a 19 inch rack mount kit.
Prime power:	120/240 Volts, 50-60 Hz.
Price:	$11,102.00 US each, FOB destination. This price includes our standard 5% academic discount.
Delivery:	60-90 days ARO.

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

Regards,

Dr. Walter Chudobiak
Chief Engineer

WC:mhd



OUTPUT WAVEFORMS

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