AVTECH ELECTROSYSTEMS LTD.
NANOSECOND WAVEFORM ELECTRONICS
SINCE 1975

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INSTRUCTIONS

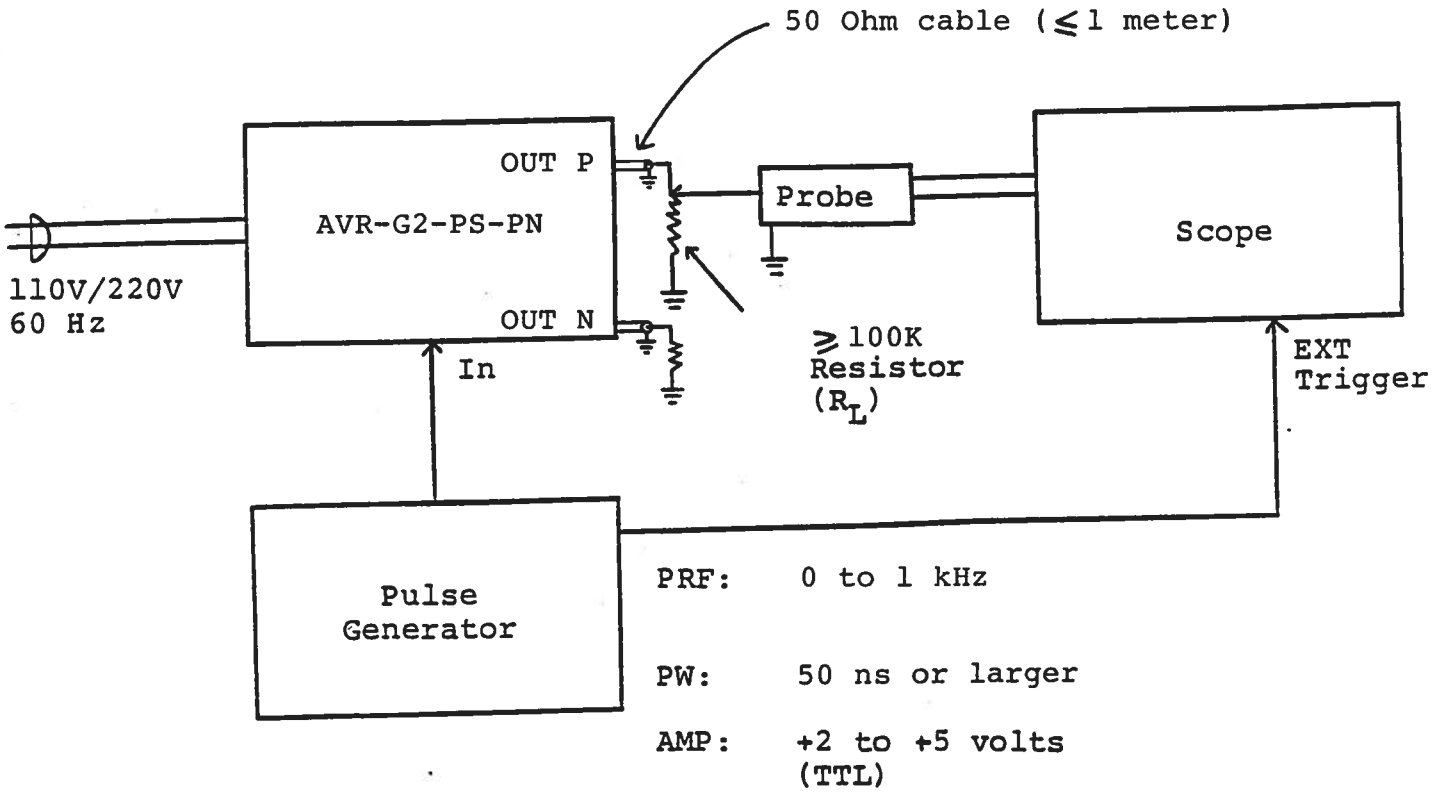
MODEL AVR-G2-PS-PN-HKU1 PULSE GENERATOR

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.

A. TEST ARRANGEMENT



GENERAL OPERATING INSTRUCTIONS

1) The equipment should be connected in the general fashion shown above. Since the AVR unit provides an output pulse rise time as low as 50 ns a fast oscilloscope (at least 50 MHz and preferably 200 MHz) should be used to display the waveform.

2) CAUTION:

   a) The AVR-G-PS unit is designed to operate into a high load impedance (≥ 100K). The output switching elements may be damaged if the unit is operated into 50 Ohms (or a short circuited load).

   b) The unit will fail if triggered at a PRF exceeding 1.0 kHz.

   c) Also, the cable to the load should not exceed 1 meter. If the cable is longer, the rise and fall time will increase.

3) The output PRF is equal to the input trigger pulse PRF.

4) When the MODE switch is in the A position, the output pulse width is controlled by the one turn PW control and the 3 position range switch as follows:

	PW
RANGE 1	50 ns to 1.0 us
RANGE 2	1.0 us to 10 us
RANGE 3	10 us to 100 us

   When the MODE switch is in the B position, the output pulse width equals the input pulse width.

5) The output amplitude is controlled by the two ten turn AMP controls.

6) The "OFF" voltage (see Fig. 2) may be adjusted from 0 to ±10 Volts using the one turn ground zero controls.

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)

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

8) The AVR 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.

9) For additional assistance:

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

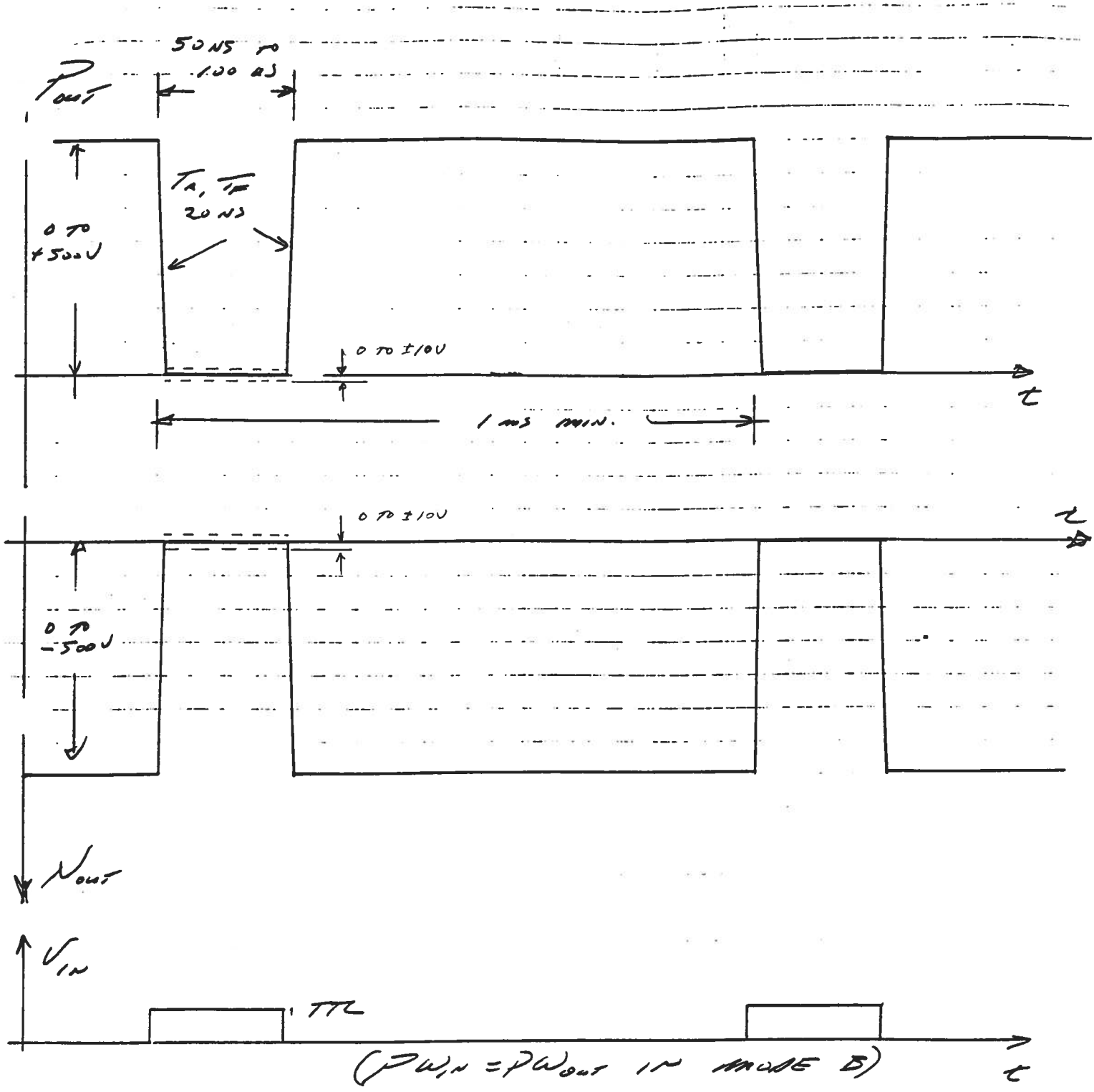


Fig 2: MODEL AVR-62-P5-PN-1KHZ

WAVEFORMS

SYSTEM DESCRIPTION AND REPAIR PROCEDURE

The AVR-G2-PS consists of the following basic modules:

1) AVR-G2-PG pulse generator modules (P and N)
2) AVR-G2-PW pulse width module
3) AVR-G2-PS power supply modules (P and N)
4) OL-471 overload module
5) +24V power supply board

The modules are interconnected as shown in Fig. 4.

In the event of an instrument malfunction, it is most likely that the 1.0 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 (SL27T) may have failed due to an output short circuit condition or to a high duty cycle condition. The switching elements may be accessed by removing the cover plates on the bottom side of the instrument. The cover plate is removed by removing the two 2-56 Phillips screws. NOTE: First turn off the prime power. CAUTION: Briefly ground the SL27T tabs to discharge the 550 Volts power supply potential. The elements may be removed from their sockets by means of a needle nosed pliers. The SL27T is a selected VMOS power transistor in a TO 220 package and may be checked on a curve tracer. If defective, replacement units should be ordered directly from Avtech. When replacing the SL27T switching elements, take care to insure that the short lead (of the three leads) is adjacent to the black dot on the chassis.

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Fax Ref No: 11103

From: Avtech Electrosystems Ltd.

To: Hong Kong University of Science & Technology, Dept. of Chemistry

Our Fax No: (613) 226-2802

Date: August 15, 1995

Attn: Dr. Shihe Yang

Receivers Fax No: 011 852 2358-1594

Subject: Quotation

No. of pages: 3

Following your fax of August 5th, I am pleased to offer the following price and delivery quotation:

Model designation:	AVR-G2-PS-PN-HKU1.
Output amplitude:	0 to 500 Volts. Provides simultaneous positive and negative outputs (to high impedance loads) with separate amplitude controls but with one common pulse width control. Note that this PN feature is not the same as that described in the catalog.
Pulse width:	50 ns to 100 us. The pulse width can be controlled by the front panel PW controls (Mode A) or by using Mode B where the output pulse width equals the input trigger pulse width. The pulse width cannot be less than 50 ns.
Connectors:	BNC.
Prime power:	As per standard unit. This is OK for your power system.

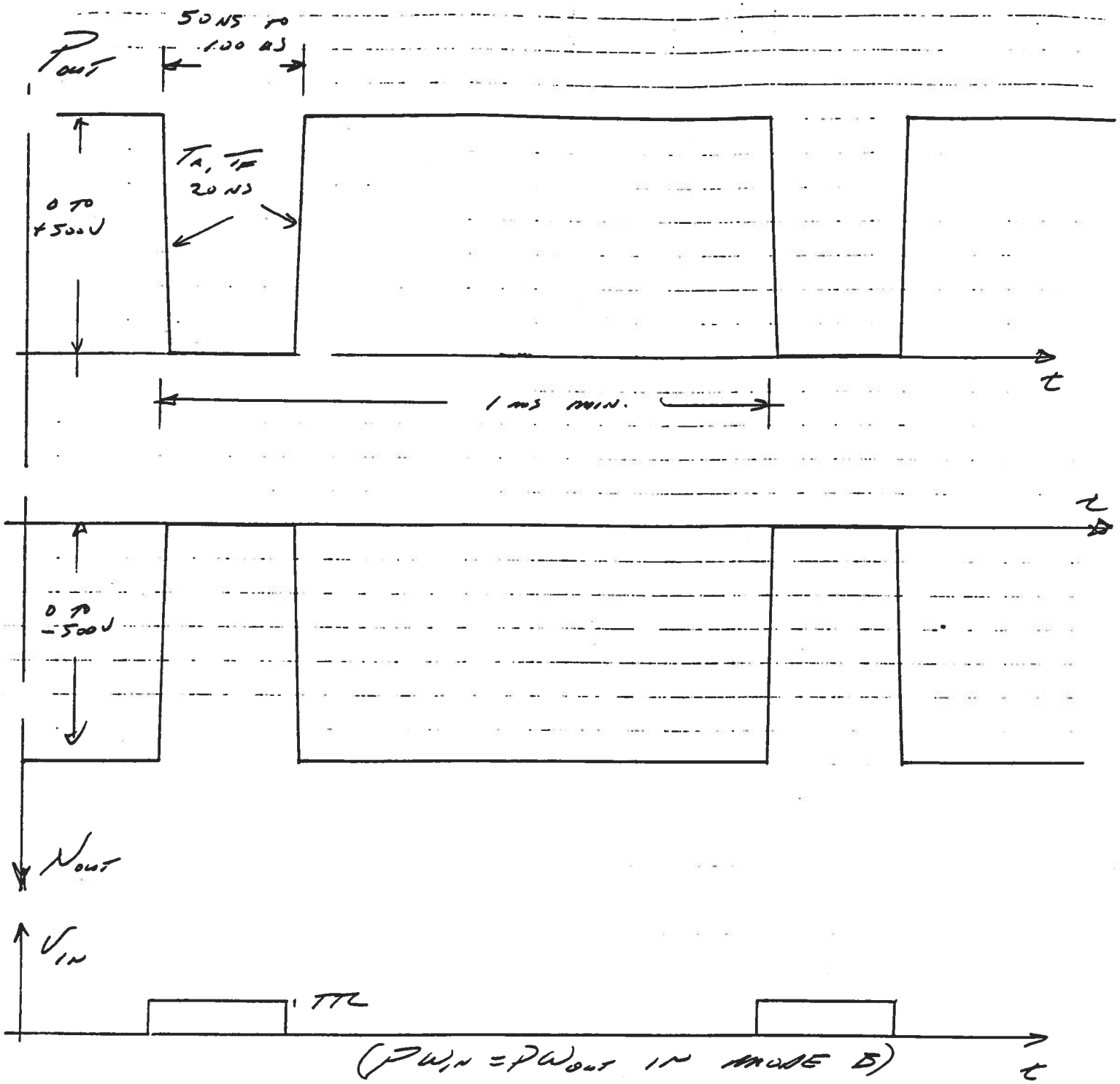
Rise, fall time:	< 20 ns.
Propagation delay:	< 100 ns.
Other:	See standard AVR-G2-PS, Cat. No. 9.
Price:	$5,696.00 US each, FOB Ottawa, Canada.
Delivery:	60 to 90 days ARO.
Terms:	Net 30 days. Payment via international draft or electronic transfer of funds to our bank account.

Thank you for your continuing interest in our products. If you require any additional information, please do not hesitate to contact me again.

Rgds

Dr. Walter Chudobiak
Chief Engineer

WC:pr



MODEL AVR-62-P5-DN-ITKU1

WAVEFORMS

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October 6, 1995.

SPECIFICATIONS

Model designation:	AVR-G2-PS-PN-HKU1.
Output amplitude:	0 to 500 Volts. Provides simultaneous positive and negative outputs (to high impedance loads) with separate amplitude controls but with one common pulse width control.
Pulse width:	50 ns to 100 us. The pulse width can be controlled by the front panel PW controls (Mode A) or by using Mode B where the output pulse width equals the input trigger pulse width. The pulse width cannot be less than 50 ns.
Connectors:	BNC.
Prime power:	115 ± 10%/230 ± 10% Volts, 50-60 Hz. This is compatible with the Hong Kong power system. The detachable line cord is the North American style and can be replaced by the end-user (if necessary).
Rise, fall time:	< 20 ns.
Propagation delay:	< 100 ns.
Other:	See standard AVR-G2-PS, Cat. No. 9.

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October 19, 1995.

Dr. Shihe Yang
The Hong Kong University
of Science & Technology
Dept. of Chemistry
Clear Water Bay
Kowloon
Hong Kong

Dear Dr. Yang:

In reply to your letter of October 10th, I am pleased to enclose several waveforms provided by a prototype unit.

Fig. 1 illustrates the output waveform at the end of a one meter length of 50 Ohm cable. The line is terminated in a very high impedance. You will note that the rise, fall time is $\lesssim$ 20 ns as we have specified. In addition, you will note that the waveform is quite free of the distortion and reflections predicted (incorrectly) by a third party.

Fig. 2 provides a waveform with a longer time base to portray the voltage flatness when pulsed to ground. Our unit includes a one turn control for zeroing the ground voltage (between ±10 Volts). The flatness during this interval we specify at ±1 Volt. Please note that copies of the waveforms are being mailed to you.

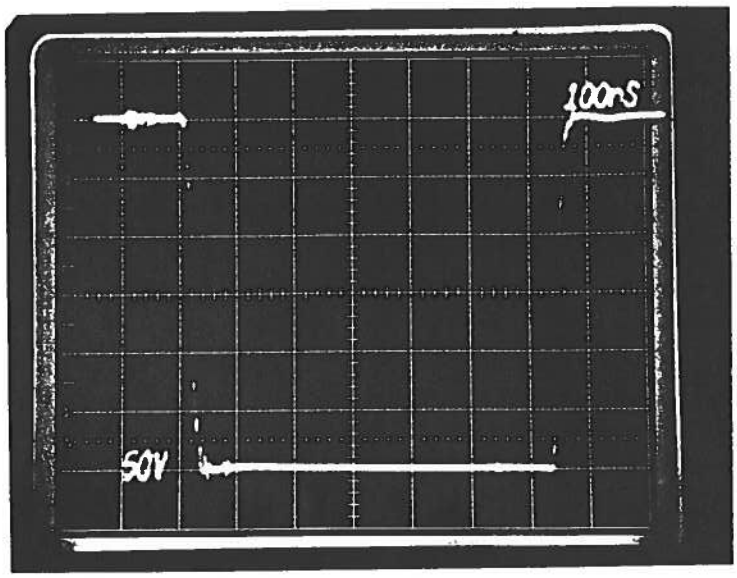
I hope that the above information is helpful to you and that you will contact me again if you require any additional explanation.

Yours truly,

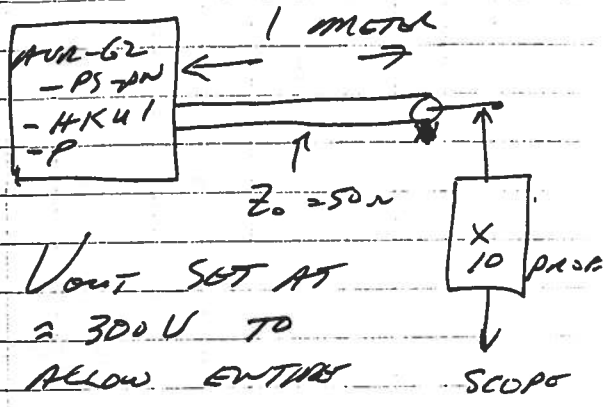
Dr. Walter Chudobiak
Chief Engineer

WC:pr
Encl. Waveforms

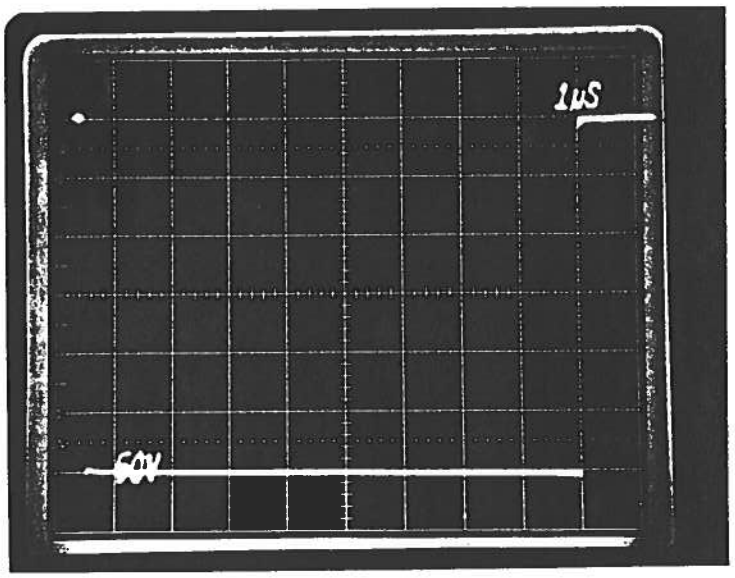
AVR-G2-PS-PN-HKU1 PROTOTYPE RESULTS



(A)



V_{OUT} SET AT ≈ 300V TO ALLOW ENTIRE WAVEFORM ON SCREEN.



(B) AS (A) BUT 1 μS/DIV

Feb. 26/96

Disk: AVR-G

Name: G2PSHKU1.INS