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NANOSECOND WAVEFORM ELECTRONICS
SINCE 1975

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INSTRUCTIONS

MODEL AVPP-1-C-P-HUTA 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 disassembled, 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

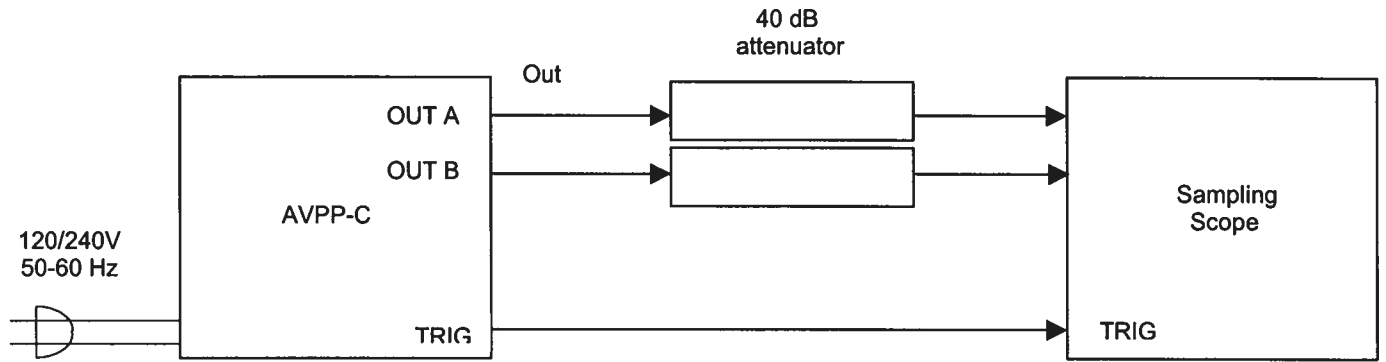
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FIG. 1 : PULSE GENERATOR TEST ARRANGEMENT



GENERAL OPERATING INSTRUCTIONS

- 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 40-dB attenuator at the sampling scope vertical input channel will insure a peak input signal to the sampling scope of less than one Volt. Note that the two output channels require 50-Ohm loads.
- 3) The AVPP-C contains two independent output channels (A and B). Channel B may be delayed up to 25 ns with respect to Channel A using the ten-turn delay B control.
- 4) The TRIG output channel provides +2V 200 ns pulses capable of driving 50 Ohms.
- 5) To obtain a stable output display the PRF controls on the front panel should be set mid-range. The front panel 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 control and by means of the PRF range switch.

Range 1:	0.2 ns	to	5 ns
Range 2:	5 ns	to	100 ns
- 6) The pulse width for each channel is controlled by a one-turn control and two-position range switch, which varies the output pulse width as follows:

The control should initially be set maximum clockwise and the pulse width adjusted using an oscilloscope.
- 7) The output pulse amplitude for each channel 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. Rotation of the PW pot causes the position of the falling edge of the pulse to change.
- 8) Some properties of the output pulse may change as a function of the amplitude pot setting. For some demanding applications, it may be desirable to use a combination of external attenuators and the amplitude pot to achieve the desired output amplitude.

- 9) To DC offset the output pulse connect a DC power supply set to required DC offset value to the back panel terminals marked O.S. The maximum attainable DC offset voltage is ± 50 Volts, (200 mA max).
- 10) An external clock may be used to control the output PRF of the AVPP unit by setting the front panel PRF range switch in the EXT position and applying a 30 ns or wider TTL level pulse to the TRIG BNC connector input.
- 11) The AVPP-C 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 additional assistance:

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

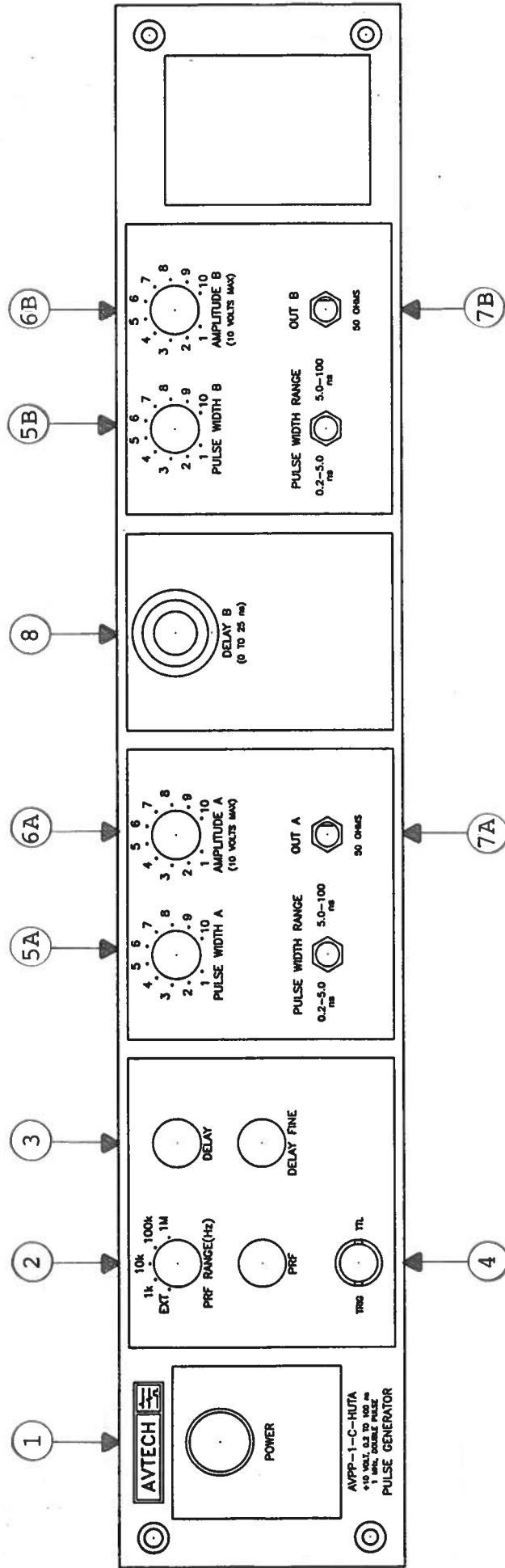


FIG. 2.: FRONT PANEL CONTROLS

FRONT PANEL CONTROLS

- 1) ON-OFF Switch. This is the main power switch. It applies basic prime power to all stages.
- 2) PRF Controls. With this range switch in the 1K, 10K, 100K or 1M positions, the pulse repetition frequency (PRF) of the instrument is controlled by the internal clock oscillator, which in turn is controlled by the PRF range switch and fine control.

With the range switch in the EXT position, the instrument requires a 50 ns (or wider) TTL level pulse applied at the TRIG input in order to trigger the output stages.

- 3) DELAY Control. These controls vary the relative delay between the reference output pulse provided at the TRIG output (4) and the main output (6). This delay is variable over the range of 0 to about 500 ns. Coarse and fine controls are provided.

The delay is not adjustable when triggering externally.

- 4) TRIG Connector. This connector has two functions. When triggered internally, this output provides a reference signal that can be used to trigger an oscilloscope scope time base. The output is a 2V, 200 ns (approx.) pulse capable of driving a 50-Ohm load. Set the scope to trigger on the positive edge.

When triggered externally (i.e., the PRF range switch is in the EXT position), the external TTL-level trigger signal is applied at this point.

- 5a) A one-turn control and two-position range switch, which varies the output pulse width as follows:
- 5b)

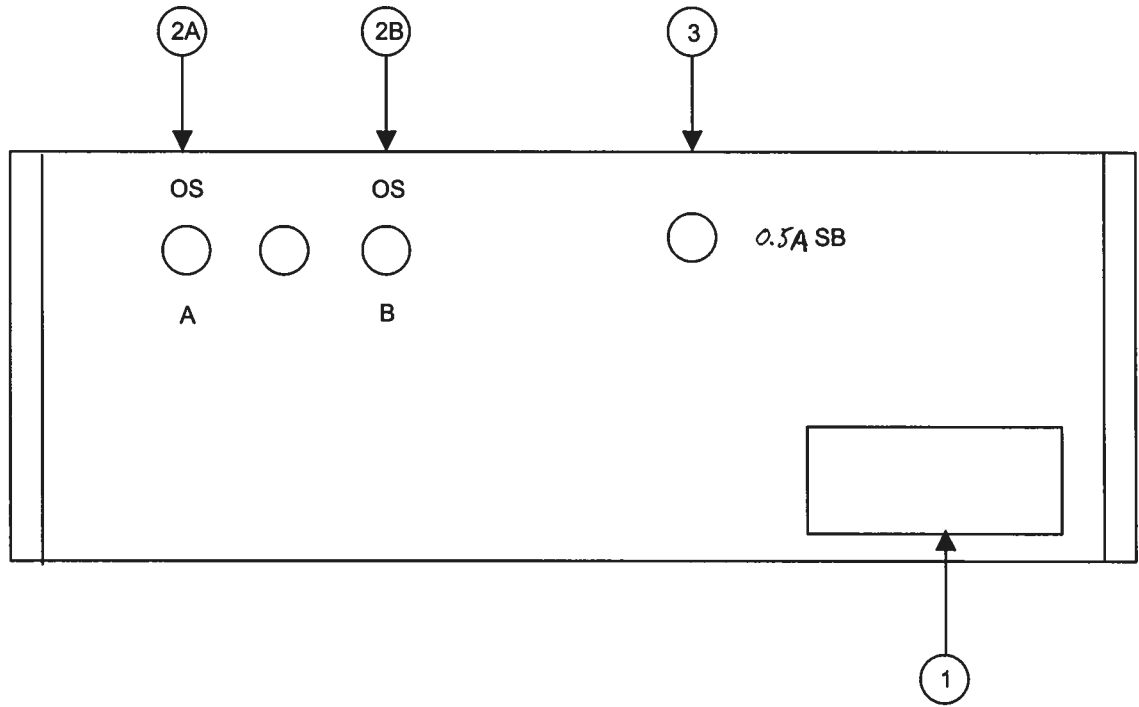
Range 1: 0.2 ns to 5 ns
Range 2: 5 ns to 100 ns

- 6a) AMP Control. A one-turn control which varies the output pulse amplitude (to 50 Ohms).
- 6b)

- 7a) OUT. SMA connector provides output to 50-Ohm load.
- 7b)

- 8) DELAY B. Ten-turn control delays the leading edge of Channel B 0 to 25 ns with respect to the leading edge of Channel A.

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 0.5A slow blow fuse is required. In the 240V setting, a 0.25A slow blow fuse is required.

- (2A) DC OFFSET. To DC offset the output pulse, connect a DC power supply set to the desired offset value to these terminals. The maximum allowable DC offset voltage is ± 50 Volts (200 mA max).
- (2B)
- (3) 0.5A SB. DC slow blow fuse limits power supplied to the output stages.

ORIGINAL QUOTATION

Walter Chudobiak

From: Avtech Sales
Sent: November 15, 2001 9:30 AM
To: 'Mika Sillanpää'
Subject: RE: Two-channel pulse generator?



end use
Statement.doc (61 k)

November 15, 2001

Dear Mika,

1) I am pleased to re-quote as follows:

Quote No: 10764

Model Number: AVPP-1-C-P-HUTA

No. of Channels: Two

Output Amplitude (to 50 Ohms): 0 to +10 Volts, two one-turn controls

Output Pulse Width: 200 ps to 100 ns, two one-turn controls and two two-position range switches (200 ps to 5 ns and 5 ns to 100 ^{ps} ~~us~~).

Rise Time: </- 100 ps

Fall Time: </- 135 ps

Channel Delay Control: 0 to 25 ns ten-turn control. This is an ultra stable low jitter control function derived from our low jitter delay generator Model AVX-D. Unfortunately, we have not "quantified" more extensively than that given for Model AVX-D.

Chassis Size: 3.9" x 17" x 14.8"

Other: See the standard Model AVPP-1-C

Price: \$8,998.00 US, EXWORKS: Ottawa, Canada

Delivery: 60-75 days, after receipt of order

2) This unit is a very high performance pulse generator, which is considered to be "Nuclear-Related Dual-Use Goods" under government regulations. As such, an "End Use Statement" must be completed. The necessary form is attached (in Microsoft Word format). We will use the information in the completed form to apply for an export license from the Canadian government, which will take 1 to 6 weeks to obtain. We cannot ship your order without the license. Please return the completed and signed form to us, by fax.

3) Thank you for your interest in our products. Please contact me again if you require any additional information or modifications to the above specifications. Three and four channel units might be possible provided the pulse widths ranges are restricted to 0.2 to 4.0 ns or 5.0 to 100 ns. However, we are not prepared to provide a quotation for such futuristic items until we have successfully produced a two-channel version.

Regards,

Dr. Walter Chudobiak
Chief Engineer

--- Avtech Electrosystems Ltd. ----- since 1975 ---

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Nanosecond Waveform Generators
for general purpose, R&D and OEM applications

Pulse Generators - Laser Diode Drivers - Pulse Amplifiers
Impulse Generators - Delay Generators - Comb Generators - Splitters Function Generators
- Monocycle Generators - Frequency Dividers + more!

-----Original Message-----

From: Mika Sillanpää [mailto:masillan@cc.hut.fi]
Sent: Tuesday, November 13, 2001 4:06 PM
To: Avtech Sales
Subject: RE: Two-channel pulse generator?

Dear Dr. Chudobiak,

thanks for the interesting quotation. I still have a few questions regarding it.

First, I'm asking if the parameters you specified below are negotiable? I looked again at your catalogue and I think now that the parameters of AVPP-1-C could be better for us, namely pulse width is adjustable over a longer range of values (0.2ns to 100ns), although rise times are not as short. So, it is possible to get a two-channel version of AVPP-1-C?

Could it be possible to have the channel delay adjustable over a bigger range than from 0 to 5ns? Say up to some 20-50ns? And what was the accuracy of this delay control (this is quite crucial parameter)?

Second, one can imagine applications for three-channel or four-channel generators. What do you think, could you produce such devices? Or could one synchronize several one-channel or two-channel devices together?

Best Regards,

Mika Sillanpää

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Otakaari 3 A, Espoo P.O.Box 2200
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tel. +358-9-4512956
fax. +358-9-4512969

On Fri, 9 Nov 2001, Avtech Sales wrote:

> November 9, 2001
>
> Dear Mika,
>
> 1) I am pleased to quote as follows:
>
> Quote No: 10748
>
> Model Number: AVP-AV-1S-C-P-HUTA

March 5/2002
(edition 1)