



AVTECH ELECTROSYSTEMS LTD.

NANOSECOND WAVEFORM ELECTRONICS  
SINCE 1975

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OTTAWA, ONTARIO  
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## INSTRUCTIONS

MODEL AVB1-3-USB

> 50V<sub>P-P</sub>, 900 MHz f<sub>CENT</sub>, 1 MHz PRF

MONOCYCLE GENERATOR MODULE

SERIAL NUMBER: \_\_\_\_\_

### 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

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Manual Reference: /filesserver1/officefiles/instructword/avb/AVB1-3-USB, edition3.odt.  
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## INTRODUCTION

The AVB1-3-USB is a monocyte generator, with an output center frequency of 900 MHz, and a non-adjustable peak-to-peak amplitude of  $\geq 50$  Volts.

The AVB1-3-USB must be triggered by an external TTL pulse ( $> 50$  ns) applied to the "IN" connector.

The output is designed to drive  $50\Omega$  loads. (A  $50\Omega$  load is required for proper operation.) The output is AC-coupled.

This instrument is intended for use in research and development laboratories.

## SPECIFICATIONS

Model:	AVB1-3-USB
Frequency: (MHz)	900 MHz, fixed
Amplitude: ( $V_{p-p}$ , to 50 Ohms)	$\geq 50V$ peak-to-peak, fixed
PRFmax (MHz):	1 MHz
Spurious signals: (WRT peak)	26 dB
Propagation delay:	$\leq 50$ ns (Ext trig in to pulse out)
Jitter:	$\pm 15$ ps (Ext trig in to pulse out)
Trigger required:	+5 Volts, 50 to 500 ns (TTL)
Connectors:	Out: SMA, In: SMA, Power: Solder terminals
Power requirements:	+15 Volts, 400 mA
Dimensions (H x W x D):	43 x 76 x 152 mm (1.7" x 3" x 6")
Chassis material:	Cast aluminum, blue enamel
Temperature range:	+5°C to +40°C

ORIGINAL QUOTATION

Date: Thu Aug 15 14:13:28 2002  
 From: Avtech Sales  
 To: XXXXX  
 Subject: RE: Avtech monocyple generator quote

XXXXX,

I quoted on a 800 MHz unit because it was the lowest (and thus easiest to make) frequency that you indicated you could work with. However, I have quoted on a 900 MHz version below.

The ringing does die out after 10 ns. The ringing will of course be sensitive to the termination. The generator expects a 50 Ohm load, and is only characterized for a 50 Ohm load. The root cause of the ringing lies in the basic architecture used to generate the monocyple and is not easily removed.

I am pleased to re-quote as follows (with a different model number):

Quote number: 11161

Model number: AVB1-3-USB

Description: Monocyple Generator

Amplitude: > 50V peak-to-peak, fixed

Center frequency: 900 MHz, fixed

Pulse repetition frequency: 1 MHz maximum

Dimensions, main module: 2.6 x 4.3 x 1.7"

Dimensions, output combiner module: 1.5 x 1.3 x 3.3"

Note: This instrument consists of a main module and an output combiner module. The two modules are connected by two short lengths of coaxial cable.

Other: as per the standard AVB1-3 (see <http://www.avtechpulse.com/monocyple/avb1-3>)

Price: \$3498 US each, quantity of 4, FOB destination.

Delivery: 60-90 days after receipt of order.

Regards,  
 Dr. Michael J. Chudobiak  
 VP, New Product Development

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

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Pulse Generators - Laser Diode Drivers - Pulse Amplifiers  
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 Function Generators - Monocyple Generators - Frequency Dividers + more!

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

Sent: Wednesday, August 14, 2002 1:50 PM  
 To: Dr. Michael J. Chudobiak  
 Subject: Re: Avtech monocyple generator quote

Michael,

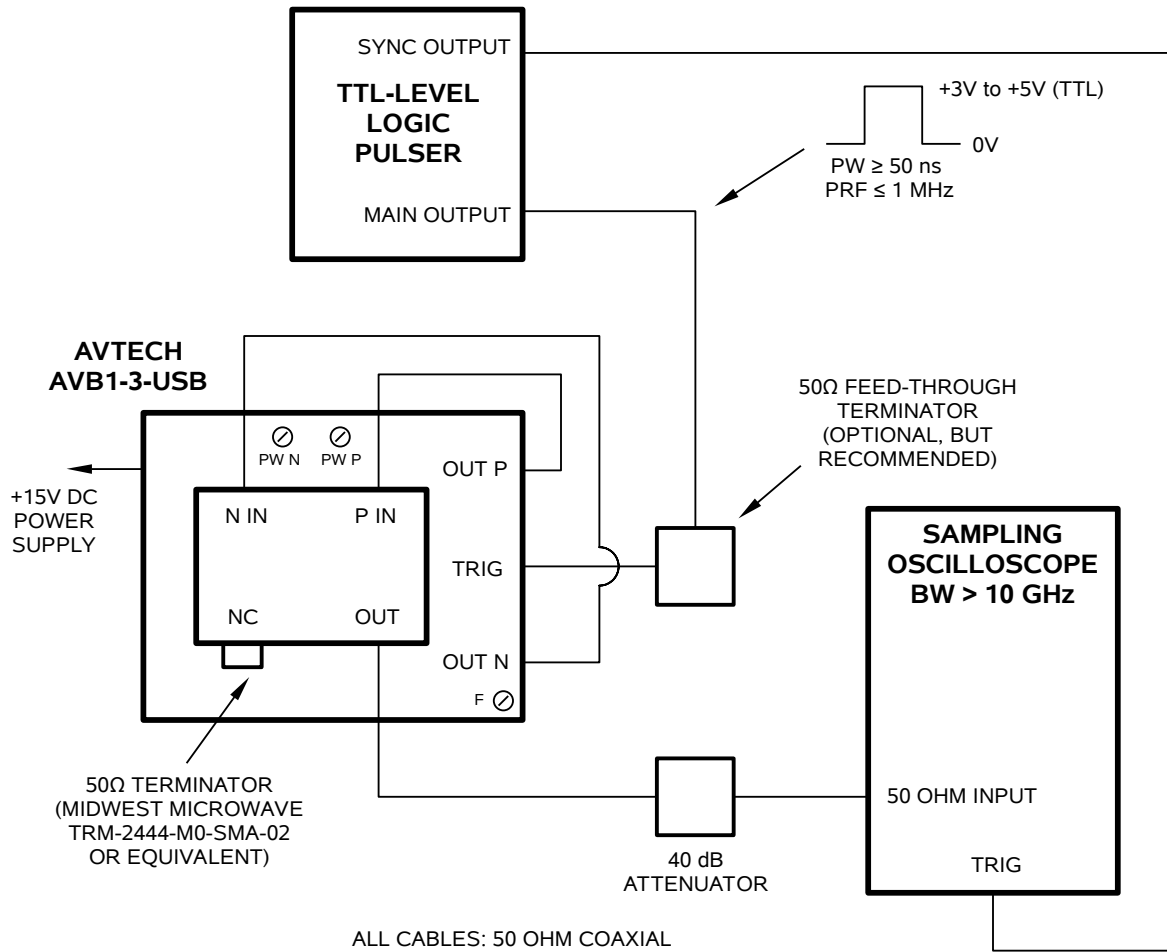
Thanks for the reply - a few quick questions.

I notice that the standard AVB1-3 can make it to 900 MHz - is there an issue/tradeoff with PRF that is limiting our version to 800 MHz?

Has anyone ever looked beyond 10 nS to see if the ringing on the tail end of the signal dies out? I assume this picture was taken into a 50 ohm load. Do you know if the ringing is sensitive to termination? Does anyone know the root cause of the ringing? (power supply feed-through leakage? impedance change in switching element?)

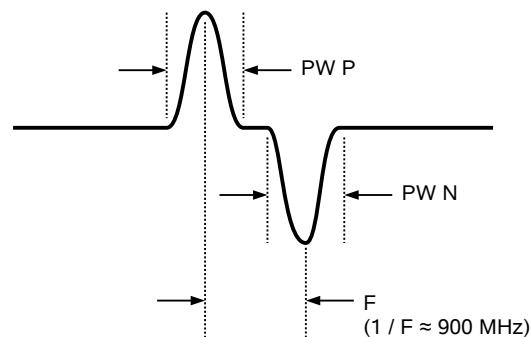
Thanks,  
XXXXX

## BASIC TEST ARRANGEMENT



## WAVEFORM CONTROLS

Three trimpots (PW N, PW P, and F) are located on the AVB1-3-USB in the general positions shown above. The PW P and PW N trimpots are accessed from the top cover, and the F trimpot is accessed from the front end of the chassis. The parameters controlled by these trimpots are shown below:





## GENERAL OPERATING NOTES

- 1) The bandwidth capability of components and instruments used to display the monocycle generator output signal (attenuators, cables, connectors, etc.) should exceed 10 GHz.
- 2) The use of a 40 dB attenuator will ensure a peak input signal to the sampling scope of less than one volt.
- 3) In general, the pulse generator delay control should be set in the 100 ns range. Other settings should be as shown in the above diagram. The monocycle generator output is delayed with respect to the trigger input signal by about 50 ns (typically).
- 4) The module shown should be bolted to a heat sink capable of dissipating at least 5 Watts.
- 5) PW P, PW N and F are sensitive to variations in the +15 VDC voltage supply and therefore a well-regulated DC supply is required.
- 6) The front panel one turn locking pot "F" controls the relative time separation between the positive excursion and the negative excursion. This setting is independent of PRF for PRF in the range of 0 to 100 kHz but is a function of PRF for PRF in the range of 100 kHz to 1.0 MHz, At the time of shipping, the F control was set to provide 900 MHz at a PRF of 100 kHz. The F setting requires a warm-up period of about 5 minutes to stabilize.
- 7) The ten turn trim pots PW P and PW N respectively control the widths of the positive and negative excursions. At the time of shipping, these controls were set to provide a 900 MHz output and should not require any further adjustment.
- 8) To reduce the spurious transients after the main output waveform, a 50 Ohm terminator should be installed on the "NC" SMA connector. A suitable terminator is the Midwest Microwave model TRM-2444-M0-SMA-02. See their website at [www.midwest-microwave.com](http://www.midwest-microwave.com) for details.

PERFORMANCE CHECK SHEET