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AVR-EB3-C

General Instructions For Performing T_{RR} Measurement, Method 4031.1, Test Condition B (For 1N4150, 1N4148 and 1N5809)

1N4150

1) Turn both AMP controls on AVR-EB3-C to minimum (see Fig. 1).

2) Set PW 1 control to about 0.1 (i.e. $\approx$ 100 ns) and PW 2 control to about 2.0 ($\approx$1.0 us).

3) Set DELAY 1-2 on about 1.0.

4) Set PRF in Range 3 and PRF one turn control in mid-range (∴PRF $\approx$ 3 KHz).

5) Set DELAY in LOW, LAG.

6) Connect to diode test jig as shown in Fig. 1A. Note the use of 6 db attenuator pads. CAUTION: Channel 1 of the pulse generator provides a rise time of $\leq$ 1.0 ns. Consequently, the user supplied diode test jig must be extremely broad band or the pulse rise time will be degraded and severe ringing will be observed. It is recommended that the test jig be constructed on microstrip employing high quality connectors (eg. SMA), microwave capacitors and resistors and that the diode lead lengths be less than 0.2 cm.

7) Set scope time base on 50 ns/cm range and vertical to 100 mV/cm.

8) Increase AMP 2 to near maximum to obtain display shown in Fig. 2 (adjust DELAY and scope set-up to center waveform display on CRT). With 40 db attenuation on the test jig, the scope reads 10 volts per div (or 200 mA per div). Therefore, set to 2 div to obtain I_F = 400 mA. Note that the coupling of OUT 2 to OUT 1 results in the increase of the rise time of OUT 2 to more than 5 ns. This is due entirely to C_B in the test jig. For

this reason, C_B should be limited to 1000 pfd. Note that with OUT 1 disconnected, the fast rise time waveform shown in Fig. 2A is obtained.

9) Increase AMP 1 to near maximum to obtain display shown in Fig. 3 (200 mA/div).

10) Set scope time base on 5 or 1 ns/div to obtain display shown in Fig. 3A and/or Fig. 3B (adjust DELAY to center on CRT). Note that the leading spike (and ripple) on the I_R waveform are primarily due to the extremely short rise time of OUT 1 and the parasitic reaction of the test jig. These effects can only be reduced by using a longer rise time.

11) Adjust AMP 1 and AMP 2 as desired to obtain final values for I_F and I_R. Note that if I_F is increased then I_R will decrease (since pulse generators are cross-connected). It is therefore necessary to increase the AMP 1 setting to return I_R to the original value.

12) The DELAY 1-2 control may be adjusted to re-position the leading edge of the I_R waveform with respect to the leading edge of the I_F waveform but note that provided DELAY 1-2 is more than about 100 ns, the T_{RR} reading is quite independent of the DELAY 1-2. Consequently, PW 2 should be limited to less than 1 us and DELAY 1-2 should be in the range of 0.2 to about 0.8 us.

13) For additional assistance, call (613) 226-5772.

1N4148

1) Specifications for the 1N4148 call for I_R, I_F of 10 mA. It is recommended that 16 db attenuation be placed on OUT 1 and OUT 2 and that 20 db replace 40 db in the test jig. For additional instructions see 1N4150 procedure.

2) If further assistance or information is required, call (613) 226-5772.

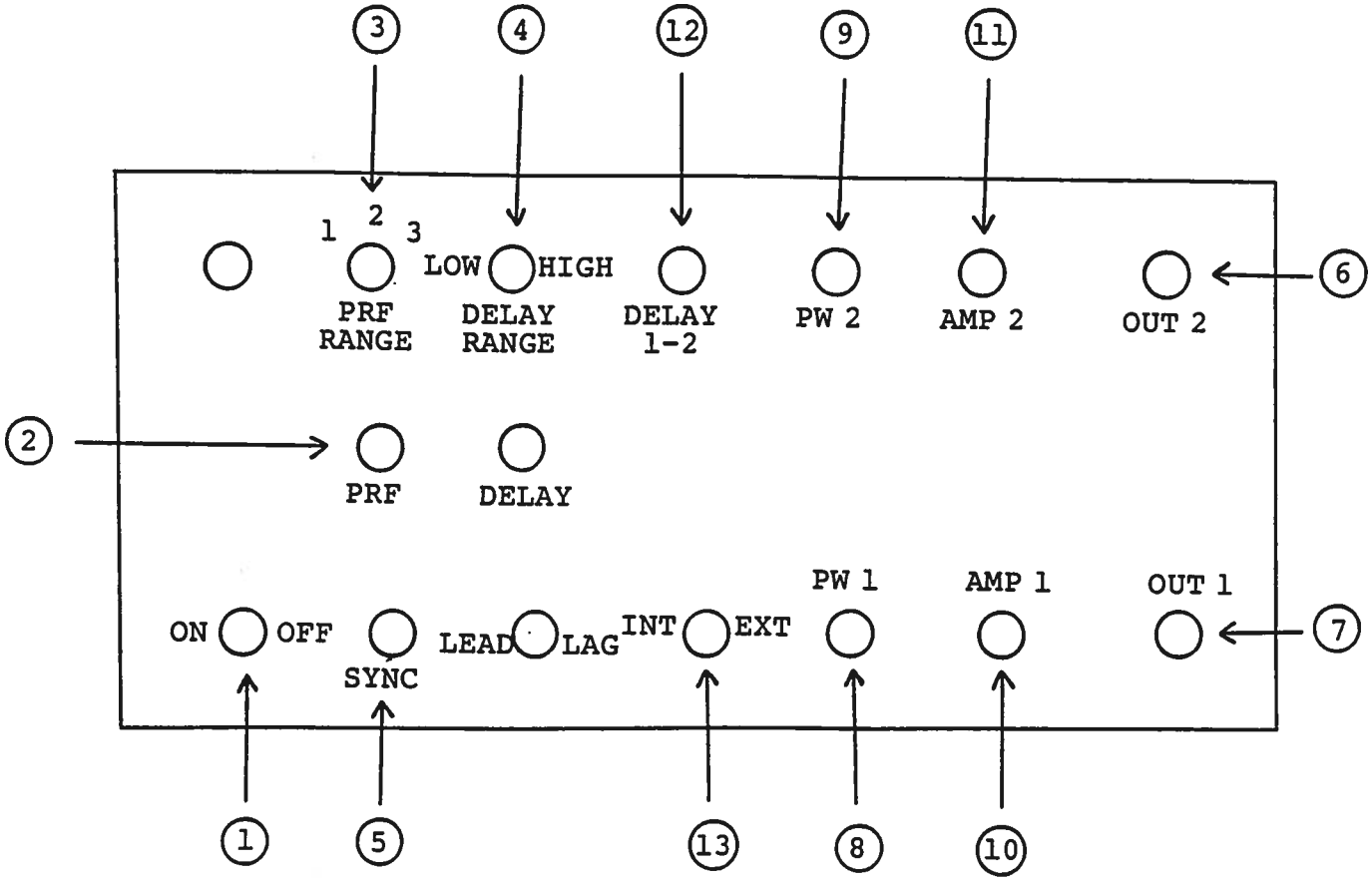
1N5809

1) Procedure as for 1N4150 but the input attenuation should be reduced to zero and the output attenuation increased to 50 db.

2) For additional assistance, call (613) 226-5772.

Fig. 1

FRONT PANEL CONTROLS



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

(2) PRF Control. Controls PRF as follows:
(3)

Range 1	5	Hz	to 50	Hz
Range 2	50	Hz	to 0.5	KHz
Range 3	0.5	KHz	to 5	KHz

(4) DELAY Control. Controls the relative delay between the reference output pulse provided at the SYNC output (5) and the Channel 2 output (6). This delay is variable over the range of 0 to about 1.0 usec (LOW) and 1.0 to 5.0 usec (HIGH). The TRIG output precedes the main output when the LEAD-LAG switch is in the LEAD position and lags when the switch is in the LAG position.

(5) SYNC Output. This output is used to trigger the scope time base. The output is a TTL level 100 nsec (approx.) pulse capable of driving a fifty ohm load. The relative delay between the SYNC output and Channel 2 output is variable from 0 to $\pm$5.0 usec using the DELAY controls.

(6) OUT 2 Connector. BNC connector provides output to a fifty ohm load (0 to +100 volts, 0.1 to 5.0 usec, 1.0 ns rise time).

(7) OUT 1 Connector. BNC connector provides output to a fifty ohm load (0 to 700 volts, 0.1 to 5.0 us, 5 ns rise time).

(8) PW Control. Ten turn controls which varies the output
(9) pulse width.

(10) AMP Control. Ten turn controls which varies the output
(11) pulse amplitude.

(12) DELAY 1-2 Control. The delay from the leading edge of the output from Channel 1 to leading edge of the output of Channel 2 is variable from 0 to 5.0 usec using the ten turn DELAY 1-2 control. Channel 1 output (leading edge) always lags the Channel 2 leading edge output.

(13) EXT-INT Control. With this toggle switch in the INT position, the PRF of the AVR unit is controlled via an internal clock which in turn is controlled by the PRF controls. With the toggle switch in the EXT position, the AVR unit requires a 0.2 usec TTL level pulse applied at the SYNC input in order to trigger the output stages. In addition, in this mode, the scope time base must be triggered by the external trigger source.

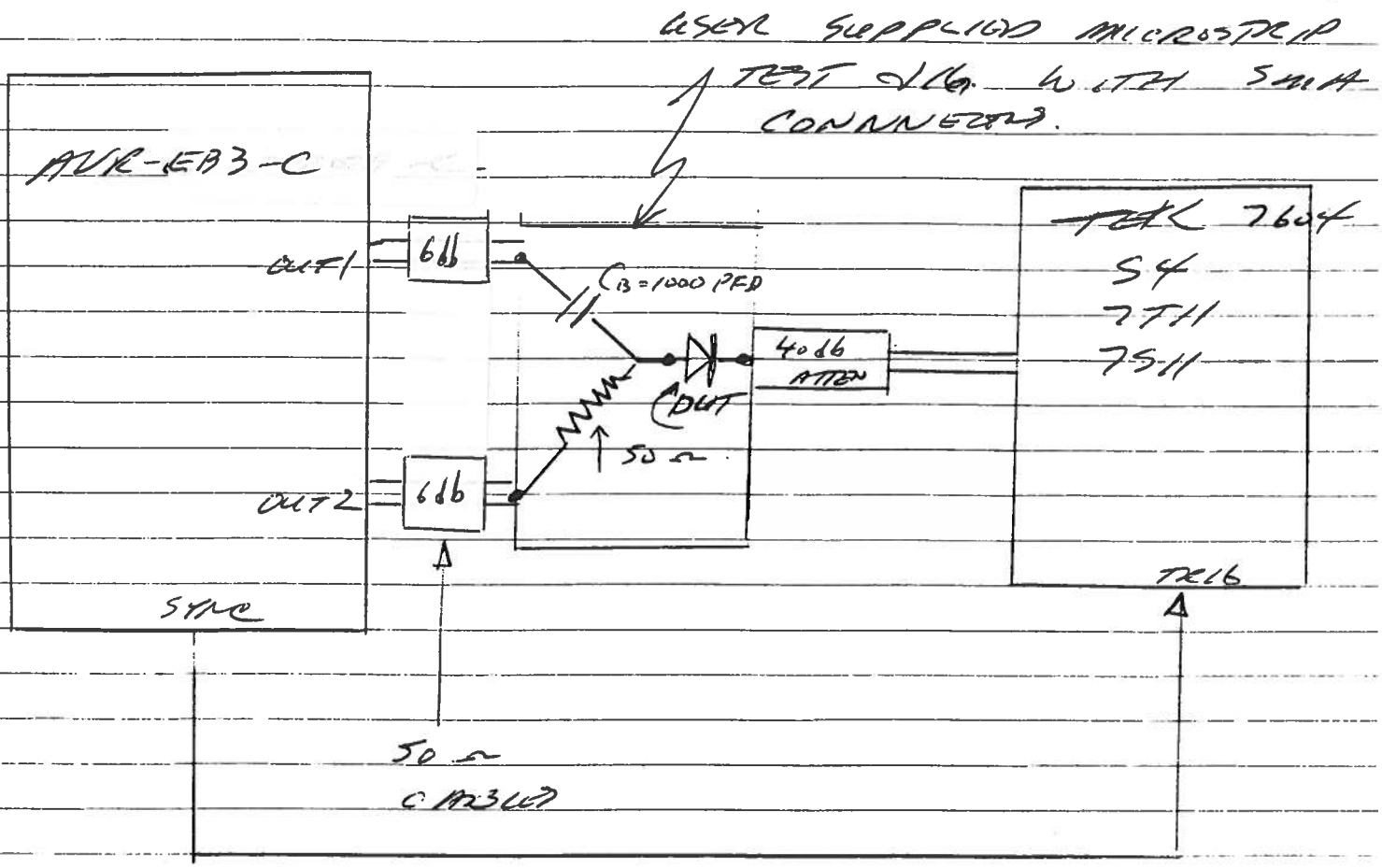


FIG 1A: BASIC TEST SET UP FOR TAR MEASUREMENT (1N4150).

FOR 1N4148: INPUT ATTENUATOR: 16 db
OUTPUT ATTENUATOR: 20 db

FOR 1N5809: INPUT ATTENUATOR: 0 db
OUTPUT ATTENUATOR: 50 db

(1N4150)

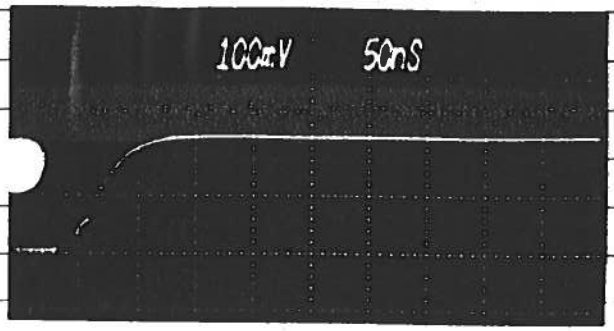


Fig 2 AMP 2 NEAR MAX TO OBTAIN I_F = known

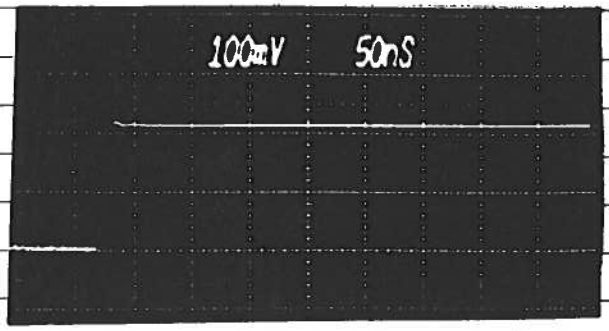


Fig 2A AS (2) BUT OUT 1 DISCONNECTED. NOTE RISE TIME IS INCREASED BY C_B IN TEST 116.

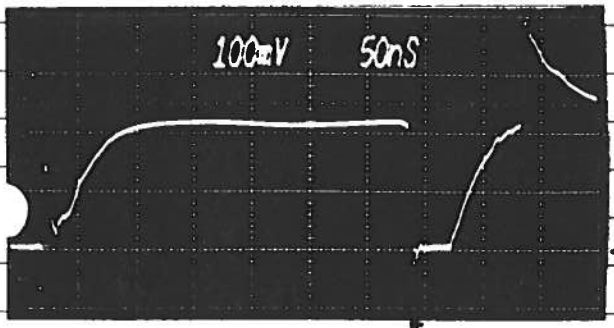


Fig 3 AS (2) BUT AMP INCREASED NEAR MAX.

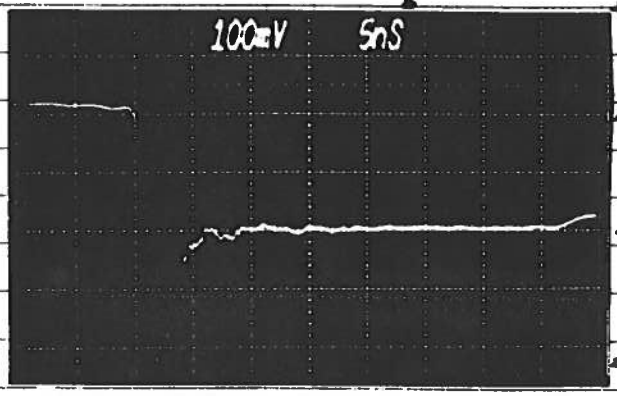


Fig 3A AS (3) BUT 5 NS/DIV

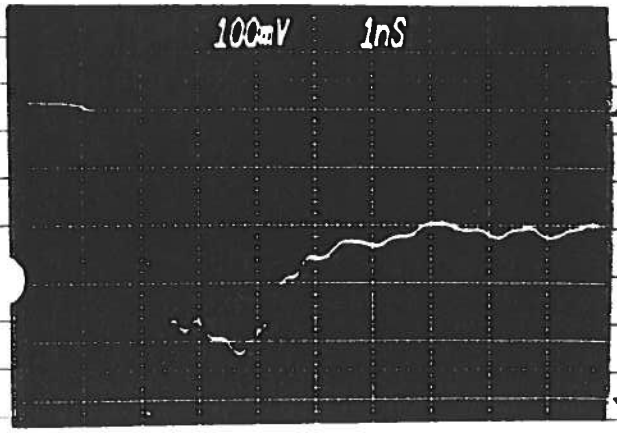
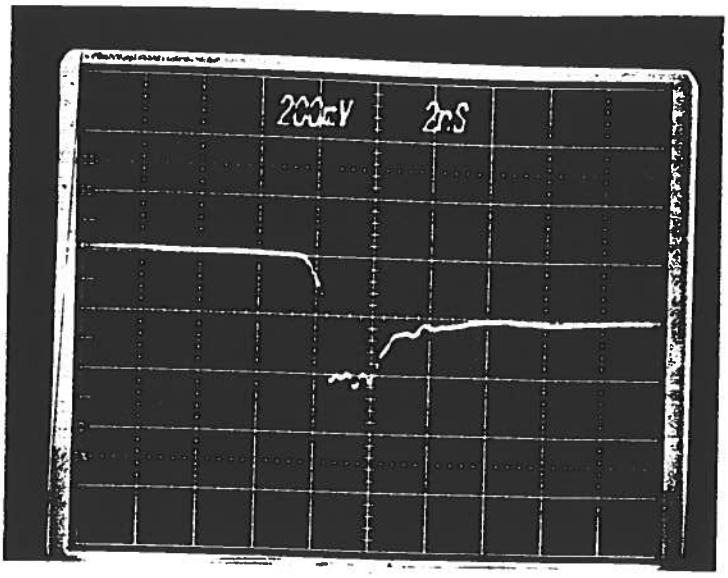


Fig 3B AS (3A) BUT 1 NS/DIV.

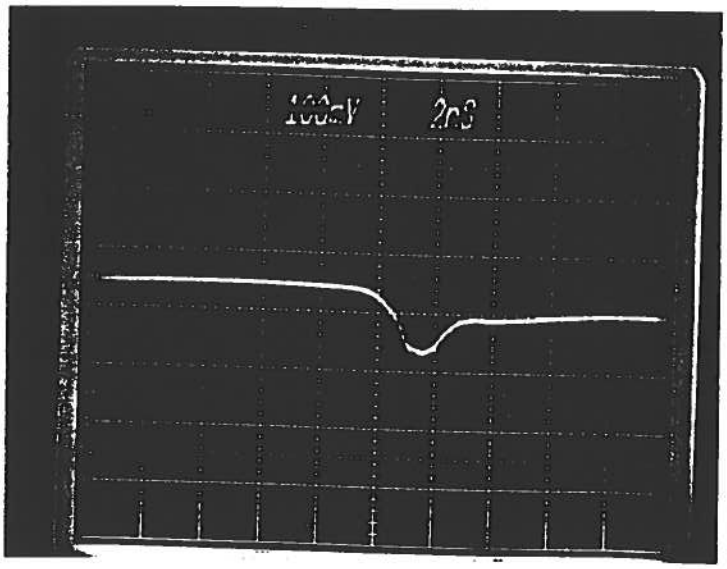
AUR-GB3-C RESULTS



(A) 1N4150

400 mA/DIV
2 nSEC/DIV

$I_R = I_F = 400$ mA

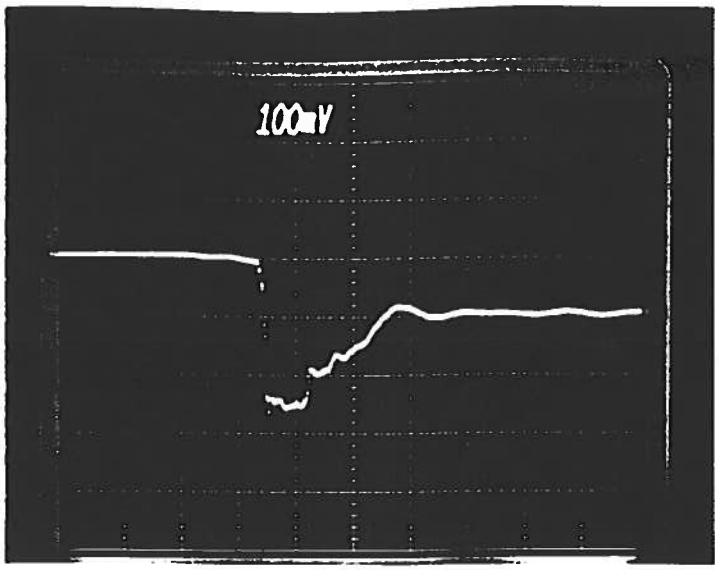


(B) 1N4148

20 mA/DIV
2 nSEC/DIV

$I_R = I_F = 10$ mA

(16 db ATTENUATION ADDED ON OUTPUTS 1 & 2).



© 1N5809

50 dB ATTEN

32V/

10 NSEC/DI

I_R = 1.0 mA

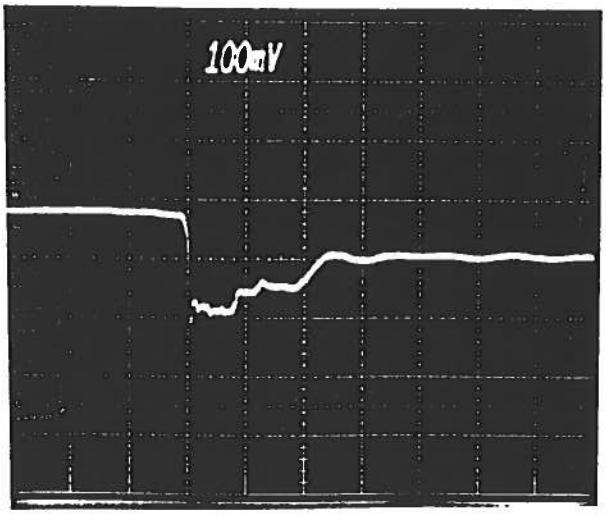
I_F ≈ 0.6 A

(D) AS (C)

BUT

$I_R = I_F$ =

0.5 AMP



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		Our Ref:	
Attn:	Chuck Cegelski Tel: 415-969-5500	Date:	April 18, 1991
From:	Avtech Electrosystems Ltd.	Receivers Fax No:	415-964-8673
Subject:	AVR-EB3-C Test Jig	No. pages faxed:	2

Following our telephone conversation of April 17, I enclose a rough sketch of a microstrip test for 4031.1 Test Condition B. The 0.1" lines on 1/16" glass epoxy circuit board serve as 50 ohm transmission lines. The lines may be etched or milled (or even "cut and peeled"). At this point I do not have a model number for an acceptable lead socket to hold the diodes (and provide the necessary short lead length).

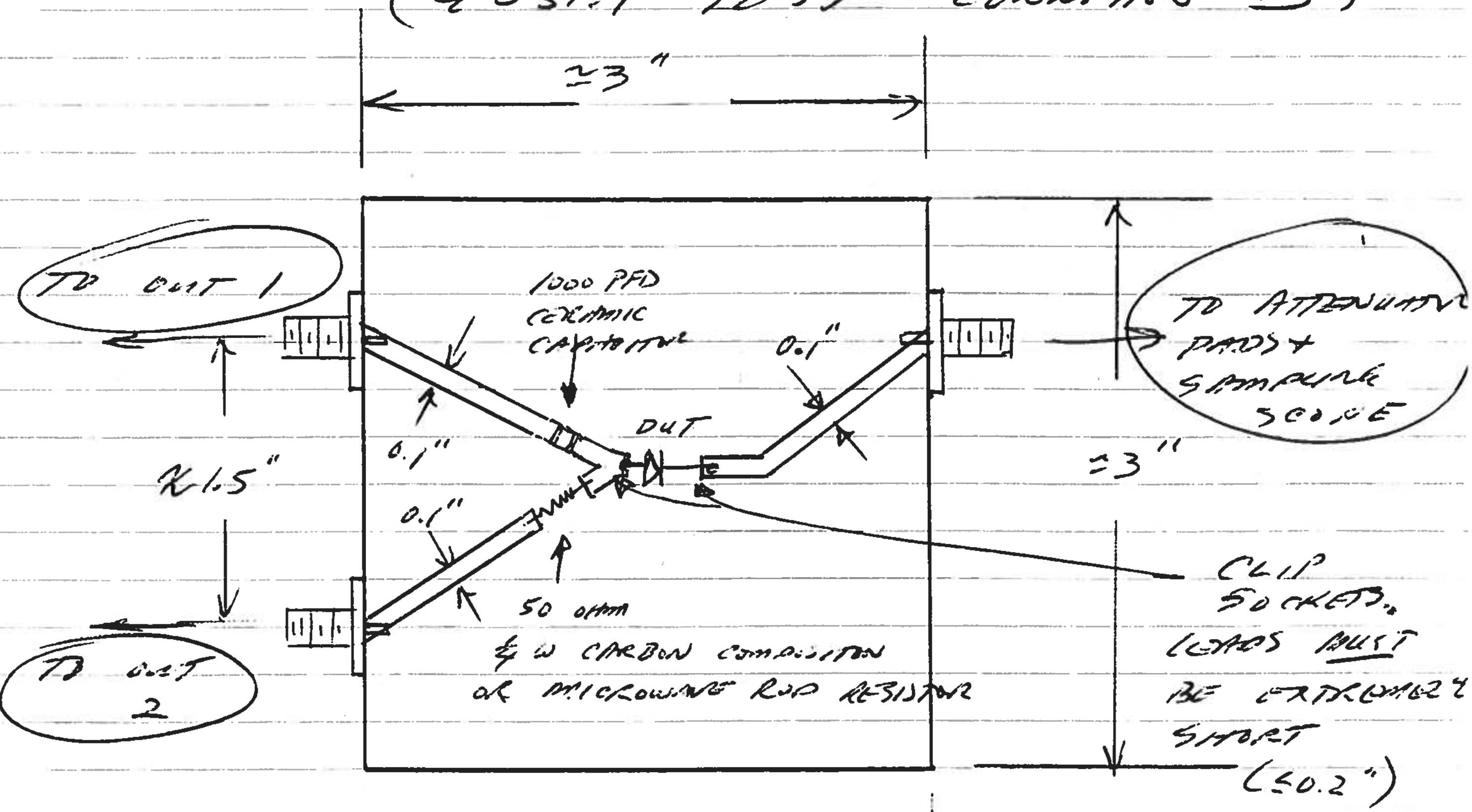
Rgds

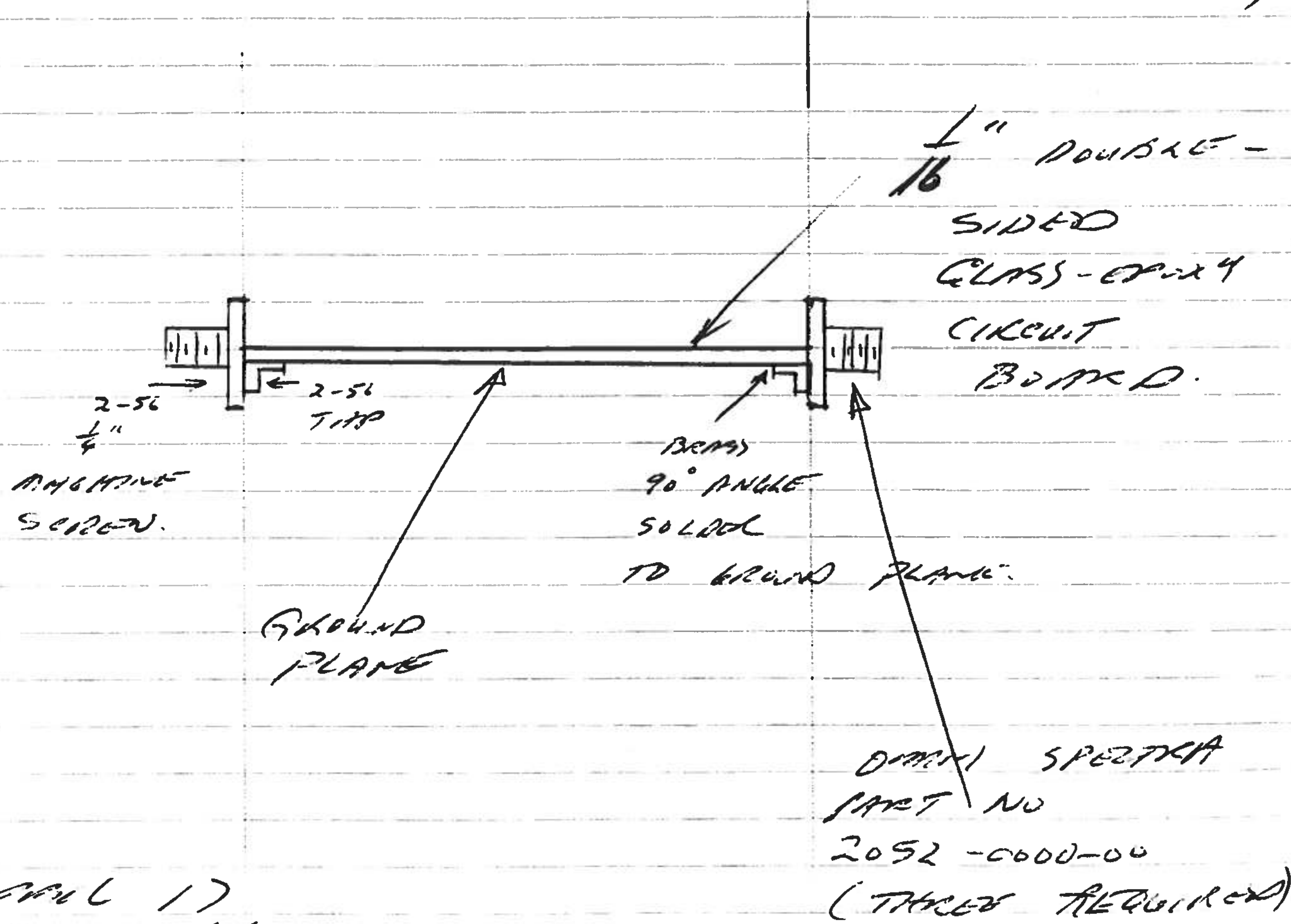
Walter J. Chudobiak
Chief Engineer

WJC:pr

ACR-6033-C MICROSTRIP TEST #16

(4031.1 DBT CONDITION B.)





APRIL 17 1971

04.25.91

for Metrum/Viking Labs, SN 5861