OB-05 OBC Transceiver Temperature Tolerance

ENGINEER: _____Sonnichsen_____

DATE 11-01-05

COMMENTS:

Test was passed with no BER errors at distances comparable to MARS cable

MARS
Org: WHOI
Engr: Fritz Sonnichsen
Date: 11/81/05

OB-05 OBC Transceiver Temperature Tolerance

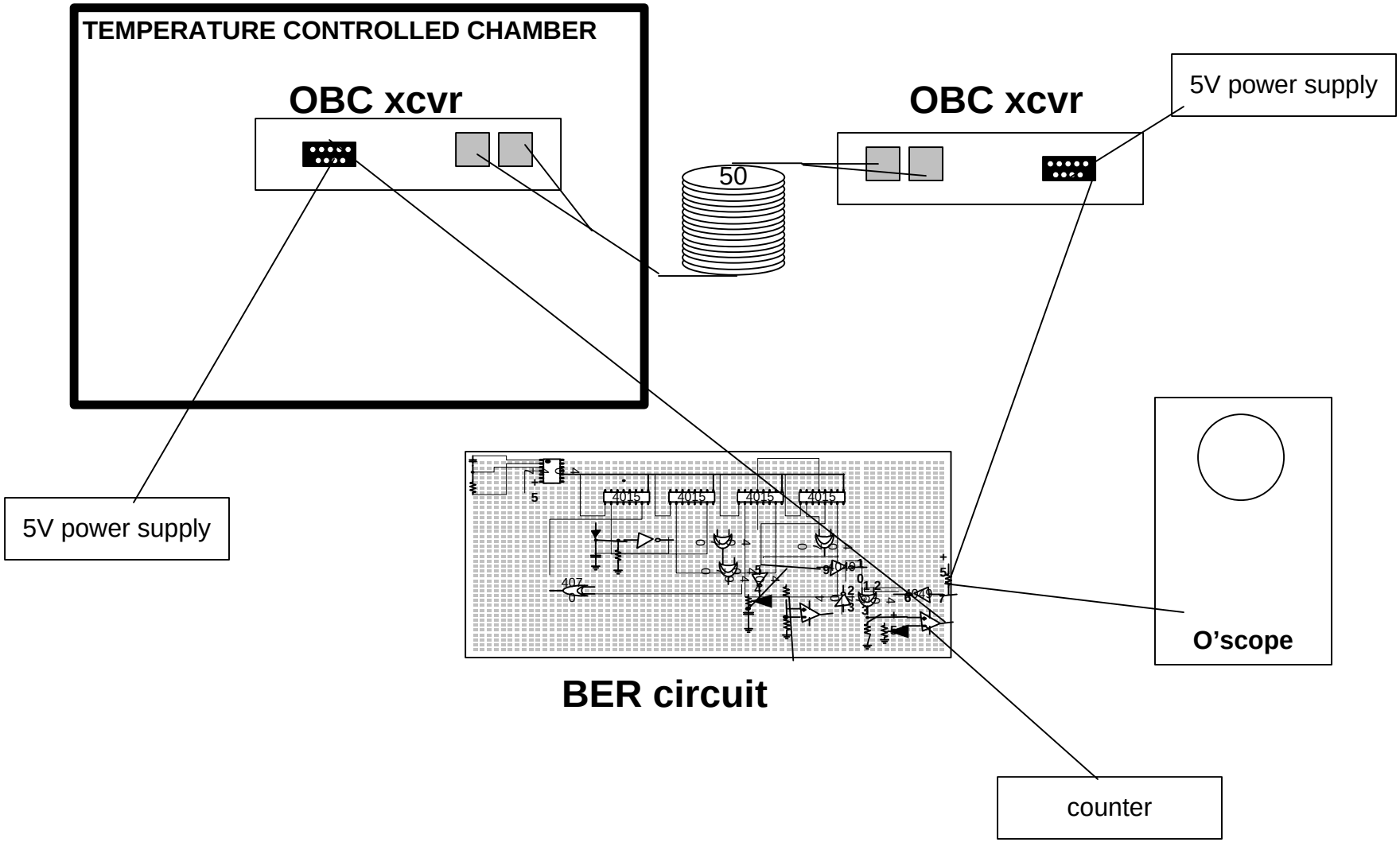
Purpose of Test:
The OBC Optical transceivers use standard 1550nm P-I-N diodes and laser diodes from Pennington-Hopewell. The laser diode transmitters are finely tuned to overcome capacitance issues in the modulation circuits and to insure constant power operation. The PIN diode receivers rely on a carefully tuned dynamic range circuit which permits operation over a range of 0 to -40dBm. It is important to insure that the tranceivers can operate over a design range of 0 - 35 degrees C.

Required Equipment:
Temperature controlled chamber
BERT circuit
50 km fibre spool or VOA optical attenuator
optical power meter
oscope

Description:
The OBC tranceiver will be tested as follows over temperatures of 0,10,20,30,35 degrees C over 50km of fiber with attenuation added to induce received powers of -20 dBm. Which is typical of MARS The 50km spool is introduce to check dispersion.
1) BERT test for 15 minutes

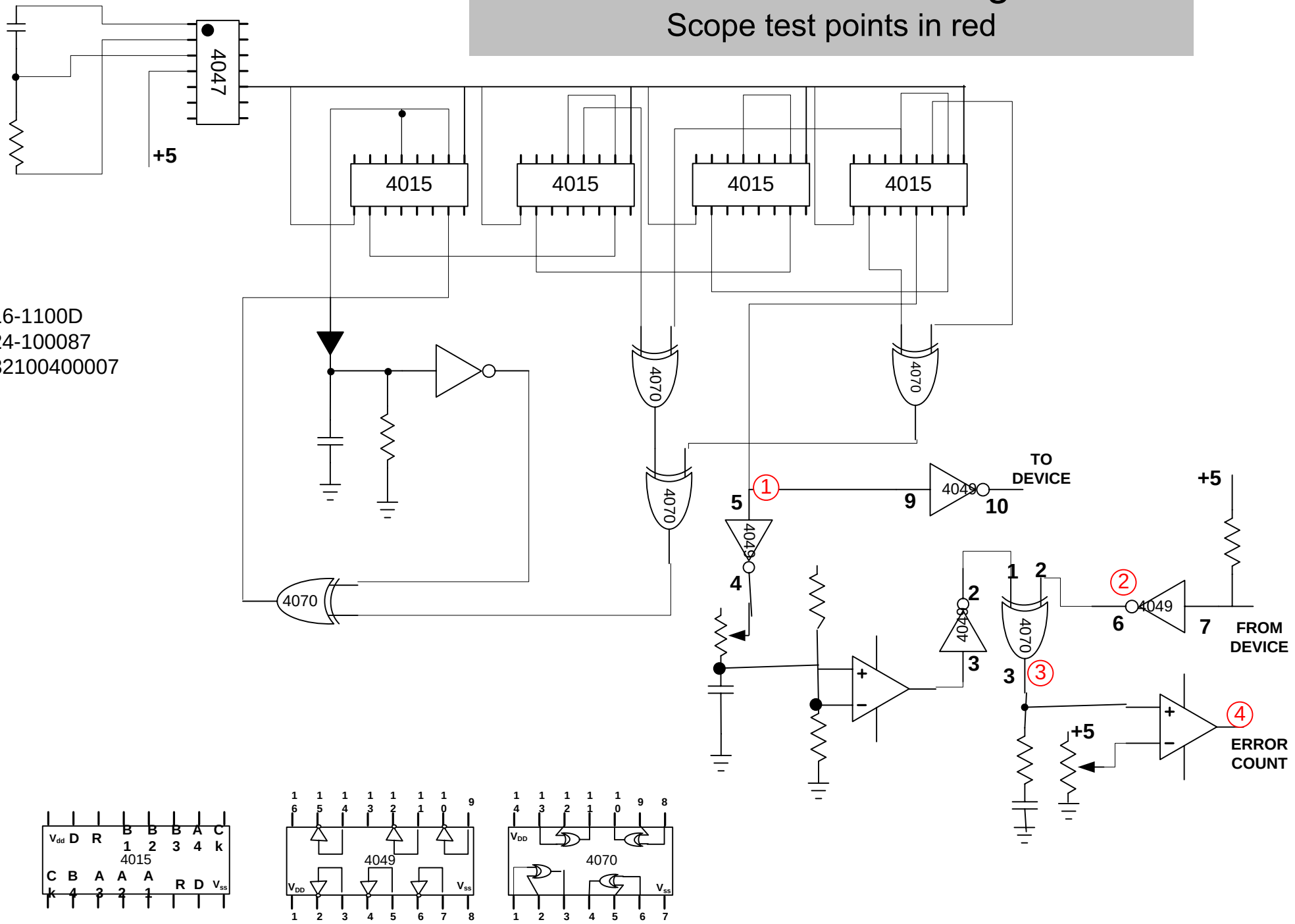
OB-05 OBC Transceiver Temperature Tolerance

BERT TEST



BER Tester circuit diagram

Scope test points in red



OB-05 OBC Transceiver Temperature Tolerance

PROCEDURE: BERT Test

1) Connect the output of the BER test circuit to the in-oven transciever transmit pin

2) Connect the input of the BER test circuit to the outside transciever receive pin

3) Start at BERT test on the tranceivers using the setup shown.

4) Run each test for 15 mnutes

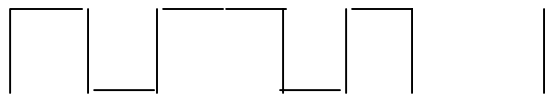
5) If fiber spools are not available use a VOA set at -40dB.

6) If 50km fiber spools are available add a VOA set at -30dB.

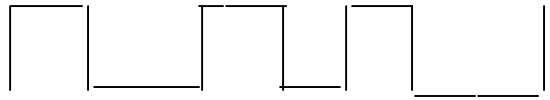
7) Perform for all temperatures (see data chart) and enter in the chart

8) Repeat the test swapping the transmit and receive wires and record the results

NOTE: The counter attached at the second Op Amp is not an actual error count. We are using the definition for a Bit Error as an overlap of the sent and received bit of at least 1/3 duty cycle. When the error counter triggers the scope observed the scope patterm for and actual bit error.



IN – test point 1



OUT – test point 2

Error Overlap – test point 3

OB-05 OBC Transceiver Temperature Tolerance

Temp	Transmit From Chamber					
	start	stop	time	err cnt*	atten dB	errors*
0 C	14:08	14:37	29	16	22	22
5 C	14:44	15;02	18	1	23	23
10 C	15:06	15:19	13	9	23	23
15 C	15:24	15:40	16	1	23	23
20 C	15:42	15:58	16	1	24	24
25 C	16:02	16:17	15	1	23	23
30 C	1622	16:45	23	12	24	24
35 C	16;49	17:10	21	1	23	23

Temp	Transmit To Chamber					
	start	stop	time	err cnt*	atten Db	errors*
0 C	10:55	10:11	16	2	23	23
5 C	11:17	11:27	10	3	23	23
10 C	1:38	1:58	20	66	42	42
15 C	13:56	14:11	15	36	41	41
20 C	15:30	16:10	20	33	41	41
25 C	16:12	16:25	13	48	41	41
30 C	16:21	16:42	21	4	41	41
35 C	16:42	16:55	13	18	41	41

* errors are determined by a bit overlap of greater that 1/3 at the oscilloscope. The error count (err cnt) enumerated byt the counter at the is only used to trigger the scope