

O-06 Submarine Cable & Data Reach Test - OBC

ENGINEER: _____sonnichsen_____

DATE: _____

COMMENTS:

supplanted by OB05_temperature

O-06 Submarine Cable & Data Reach Test - OBC

Prior to laying the MARS shielded cable the ability to port OBC data at the proper Bit Error Rate is to be tested. This will represent the first complete end-to-end test of the MARS OBC communications system. This test will insure that the optical and electrical media are capable of conducting serial data frames with an error rate of less than 1 error in 10^7 .

The timing jitter of the OBC timing system will also be tested. We will insure that the jitter is less than 1 microsecond.

- 1) An additional test will be performed to determine the maximum optical reach of the equipment over the MARS type cable
- 2) Tests are done separately for the East then the West paths of the node
- 3) These tests may be running while the DCS tests are commenced
- 5) This complete test will be run prior to attending the ship, using a 75km length of SMF28E test fiber in the lab. This will insure that the test procedure that follows is accurate

The required equipment for this test is:

- 1) 2 laptops with Serial test software for BER test
- 2) MARS subsea node OBC assembly completely fibered including OBC transponders, CMOS converters, optical couplers and SAIL modules
- 3) MARS cable possibly properly cut to length
- 4) MARS shore node OBC assembly completely fibered including OBC transponders, CMOS converters, optical couplers and SAIL modules
- 5) Optical Power Meter
- 6) Optical attenuators per following text

Possible Additional Tools:

- 1) Fusion splicer
- 2) Spare FC and SC connectors
- 3) FC and SC couplers

Issues to confirm with Alcatel

- 1) What connector types will be available at the 2 ends of each fiber in the bundle
- 2) Will the cable be pre-cut to the actual length that it will occupy in the ocean

MARS
Org: WHOI
Engr: Fritz Sonnichsen
Date: 12/01/04

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Each of the 2 sea to shore channels will be tested separately via loopback techniques.

> The MARS OBC will be tested in two stages-the east side and the west side. The test procedures are identical.

FIBER SELECTION-

Each of the 8 fibers in the MARS cable should be permanently labeled. Pairs should be selected and labeled as follows:

PAIR1: Data East Transmit - Data East Receive

PAIR2: Data West Transmit - Data West Receive

PAIR3: OBC East A - OBC East B

PAIR4: OBC West A - OBC West B

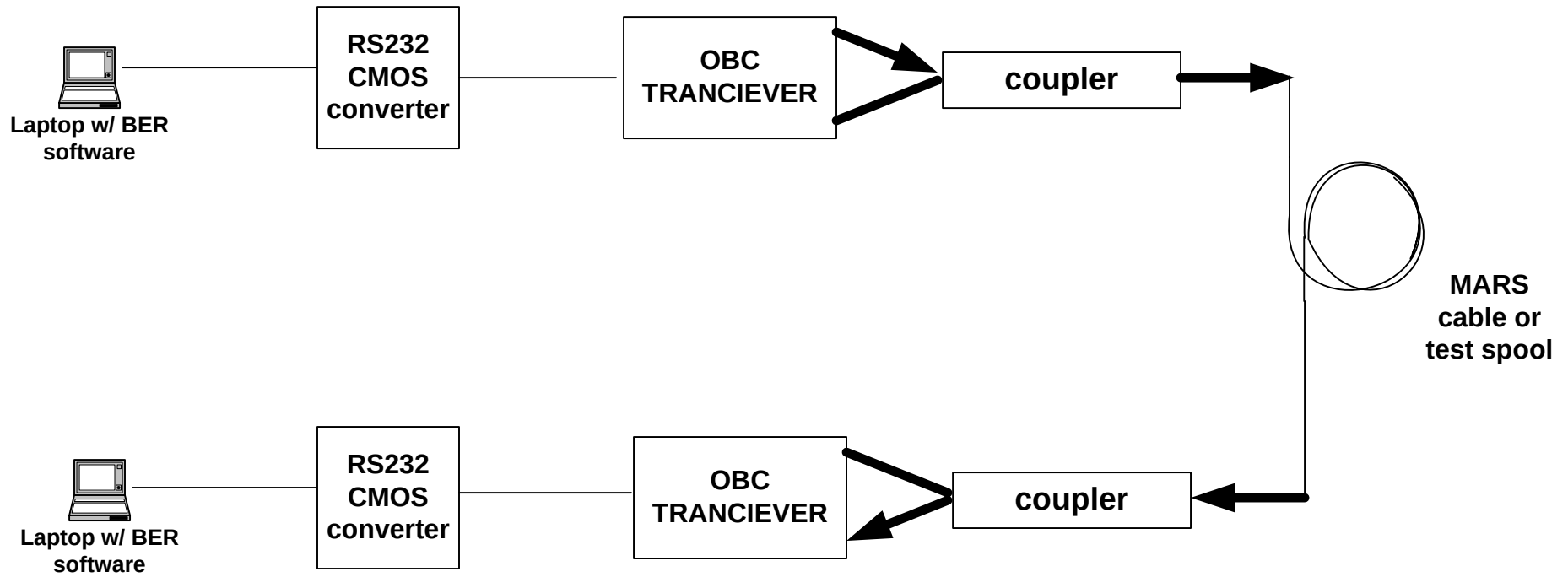
FIRST TEST - DIRECT OPTICAL BER TEST

- 1) Start with fiber pair 3A
- 2) Using figure 1 directly connect the optical transceivers via a CMOS/RS232 converter to the serial port of the laptop
- 3) Initiate a BER test with the pair of laptops
- 4) Run the BER test 17 minutes. This should pass 10^7 bits.
- 5) No more than 1 error in 10^7 should be detected. Record the error number in the East results table
- 6) Repeat this test for each fiber recording the results in the table

SECOND TEST - OPTICAL BER TEST OVER SAIL

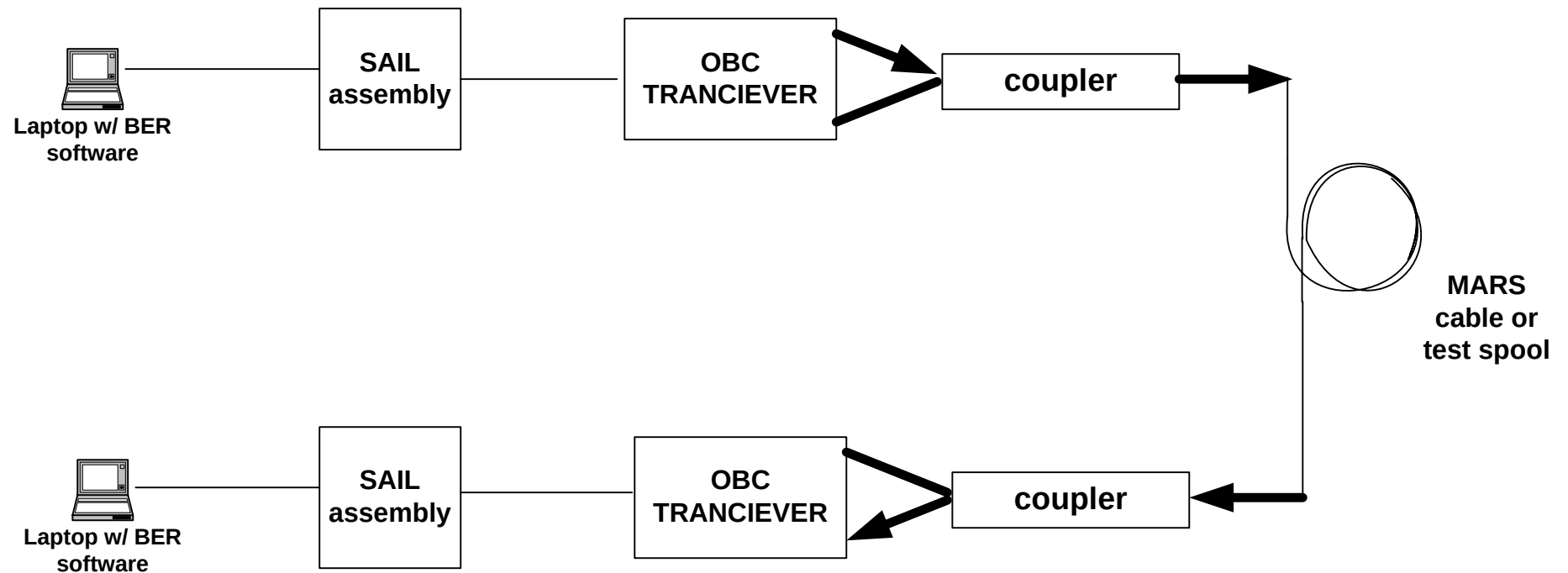
- 1) Start with fiber pair 3A
- 2) Using figure 3 connect the SAIL assemblies to the transceivers
- 3) Initiate a BER test with the pair of laptops. The shore laptop will need to initiate the SAIL addressing commands to connect to the proper sea device port
- 4) Run the BER test 17 minutes. This should pass 10^7 bits.
- 5) No more than 1 error in 10^7 should be detected. Record the error number in the East results table
- 6) Repeat this test for each fiber recording the results in the table

O-06 Submarine Cable & Data Reach Test - OBC (figure1) BER Test



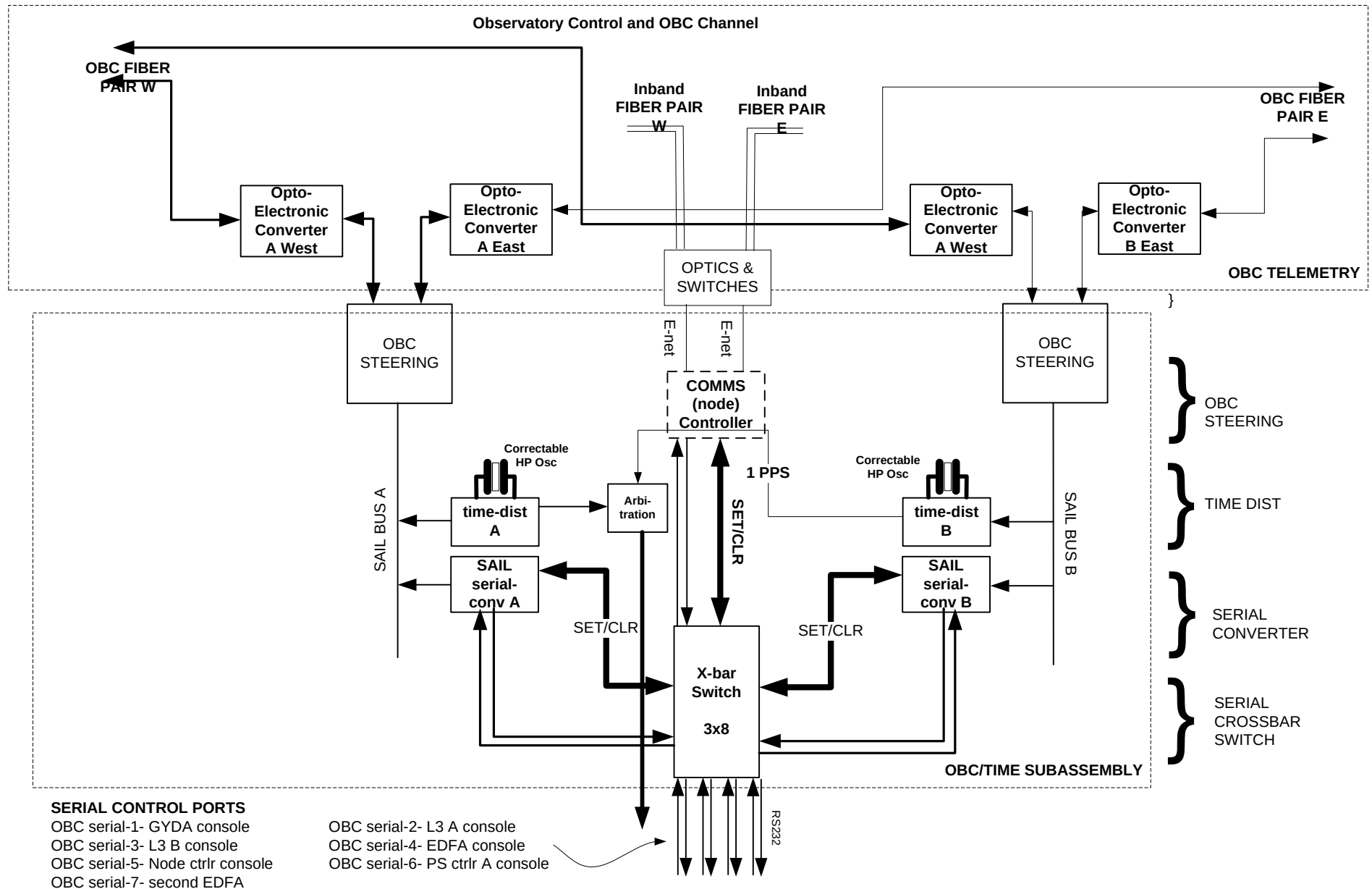
Repeat tests with:
Tranciever East A
Tranciever East B
Tranciever West A
Tranciever West B

**O-06 Submarine Cable & Data Reach Test - OBC (figure3)
BER Test over SAIL**



Repeat tests with:
Tranciever East A
Tranciever East B
Tranciever West A
Tranciever West B

OBC Architecture - Block Diagram for One Node



O-06 Submarine Cable & Data Reach Test - OBC (results)

GENERAL

Cable Length		
Ambient Temp.		

FIRST TEST - OPTICAL BER TEST

fibre	East A	East B	West A	West B
Duration of Run				
Number of Errors				

SECOND TEST - OPTICAL BER TEST OVER SAIL

fibre	East A	East B	West A	West B
Duration of Run				
Number of Errors				