

V05 OBCopen_node

ENGINEER: _____

DATE:

COMMENTS:

Repeated at MBARI.

REQUIREMENTS COVERED:

10,24 – Reliable OBC

all BER tests passed better than 1ppm

11,24,29 - Status & control

all ports on OBC were found to be accessible

MARS

Org: WHOI

Engr: Sonnichsen/Lerner

Date: 03/08/05

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Purpose of Test:

This test is performed after V04 OBC Optical is completed. This test will introduce bit patterns into the OBC electrical devices while checking power and accuracy.

Required Equipment:

2 laptops with the following software:

sail.exe

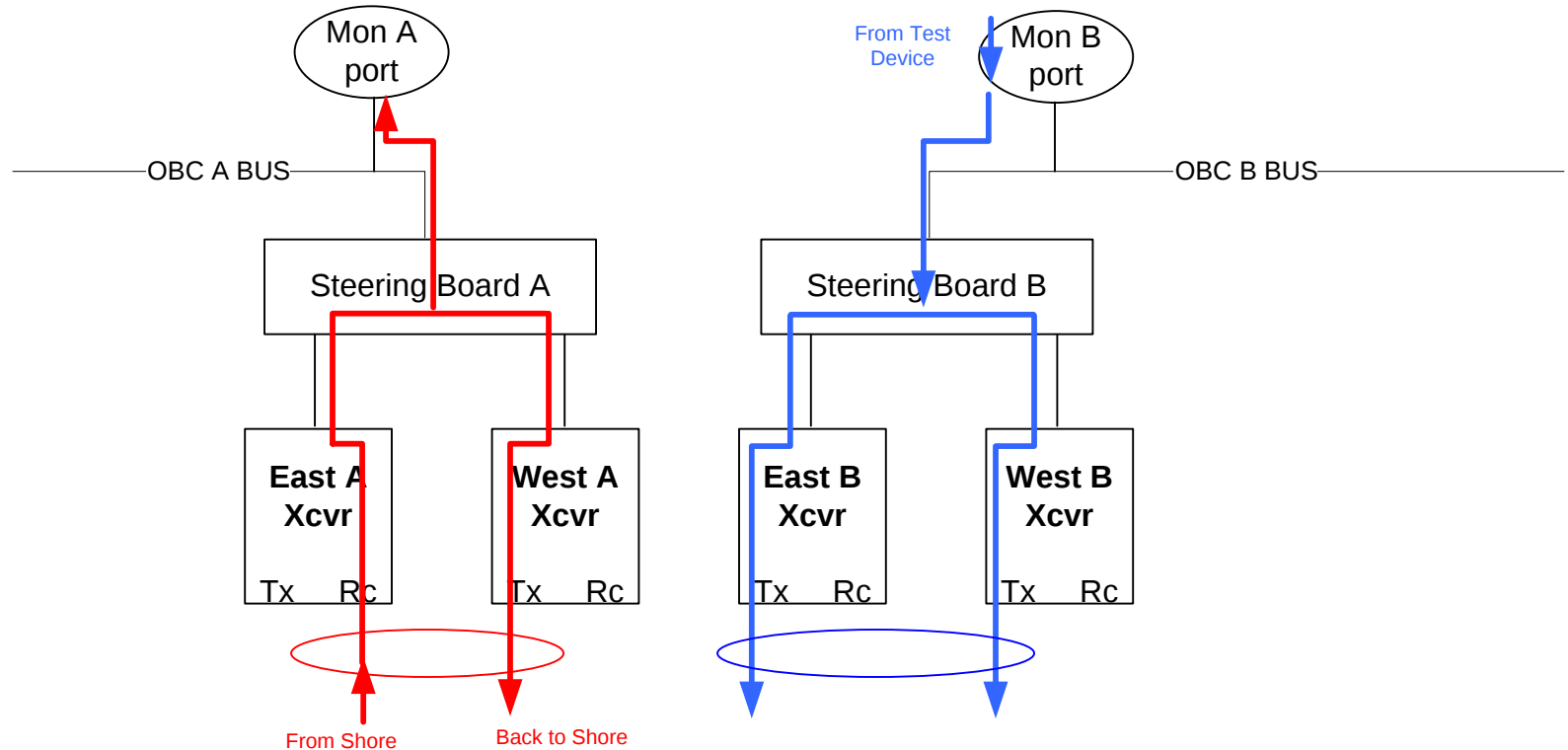
9600 BER software

cyclades client

Optical Power meter with FC adapter and SC adapter

Ethernet Cross over Cable

Shown Below is a sketch of 2 independent traffic flows showing how data propagates through the OBC transceiver system. The A and B sides are isolated. Infusing data into any port (East Rc, West Rc, or Mon) will cause data to flow out of the other ports. View the steering board as a BUS. When data enters a transceiver from the shore, it may be monitored from either the alternate transceivers of the Mon port. The former fact lends to on shore testing of the system after deployment.



Purpose of Test:

We will first check the output power of the Shore Station and Sub Sea Node transceivers. This test extends the power test performed for test V04.

Procedure – Shore Unit:

- 1) Procure a laptop with the serial_write.exe software (see WHOI)
 - 2) Attach the laptop to the serial port on the OBC shore unit.
 - 3) Attach an optical power meter (1550nm) to the optical output of the shore unit
 - 4) We will send the ASCII “@” symbol which is a long pulse (X'40')
- Start the serial_write.exe program to start sending a constant bit stream:
- ```
serial_write.exe -p/dev/ttyS0 -B23 -r-1 -x -c@
```
- 5) Record the optical power for each shore unit in the table at the end of this document.
  - 6) We will send the ASCII “U” symbol which is a square wave (X'55')
- Start the serial\_write.exe program to start sending a constant bit stream:
- ```
serial_write.exe -p/dev/ttyS0 -B23 -r-1 -x -cU
```
- 7) Record the optical power for each shore unit in the table at the end of this document.

Procedure – Sub Sea Unit:

It is assumed here that all 4 sea/shore fibers are connected from the node to the shore station.

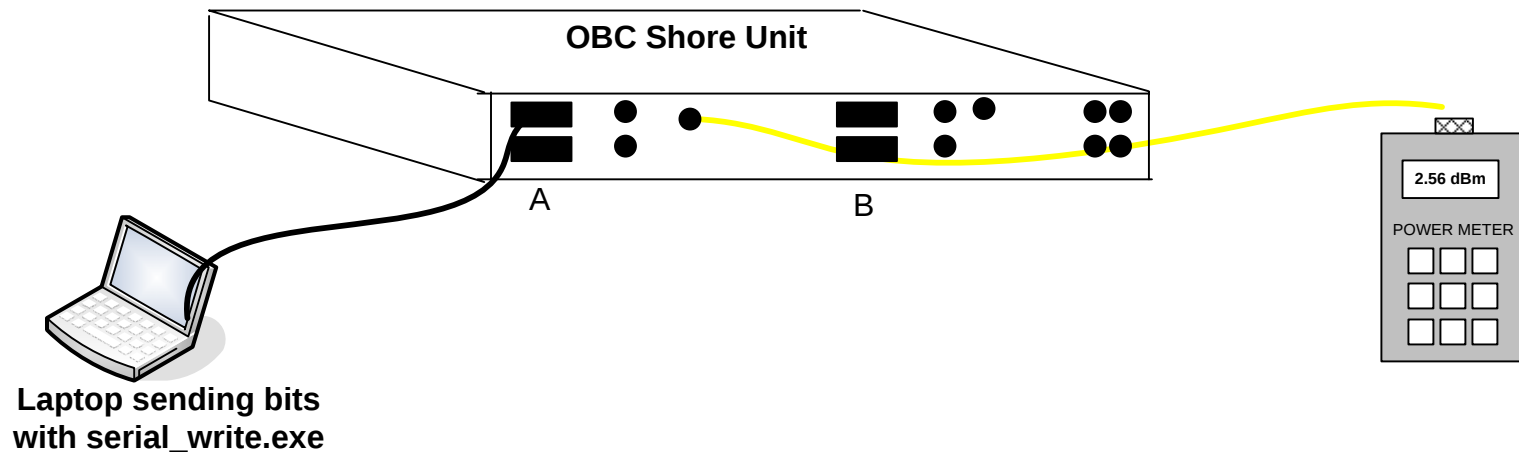
- 1) Procure a laptop with the serial_write.exe software (see WHOI)
 - 2) Attach the laptop to the serial port on the **East A** OBC shore unit.
 - 3) Attach an optical power meter (1550nm) to the optical output of the **West A** Subsea OBC Fiber
 - 4) We will send the ASCII “@” symbol which is a long pulse (X'40')
- Start the serial_write.exe program to start sending a constant bit stream:
- ```
serial_write.exe -p/dev/ttyS0 -B23 -r-1 -x -c@
```
- 5) Record the optical power in the table at the end of this document.
  - 6) We will send the ASCII “U” symbol which is a square wave (X'55')
- Start the serial\_write.exe program to start sending a constant bit stream:
- ```
serial_write.exe -p/dev/ttyS0 -B23 -r-1 -x -cU
```
- 7) Record the optical power in the table at the end of this document.
 - 8) Repeat the test for the following:

Shore Unit = East B	Subssea OBC Fiber = West B
Shore Unit = West A	Subssea OBC Fiber = East A
Shore Unit = West B	Subssea OBC Fiber = East B

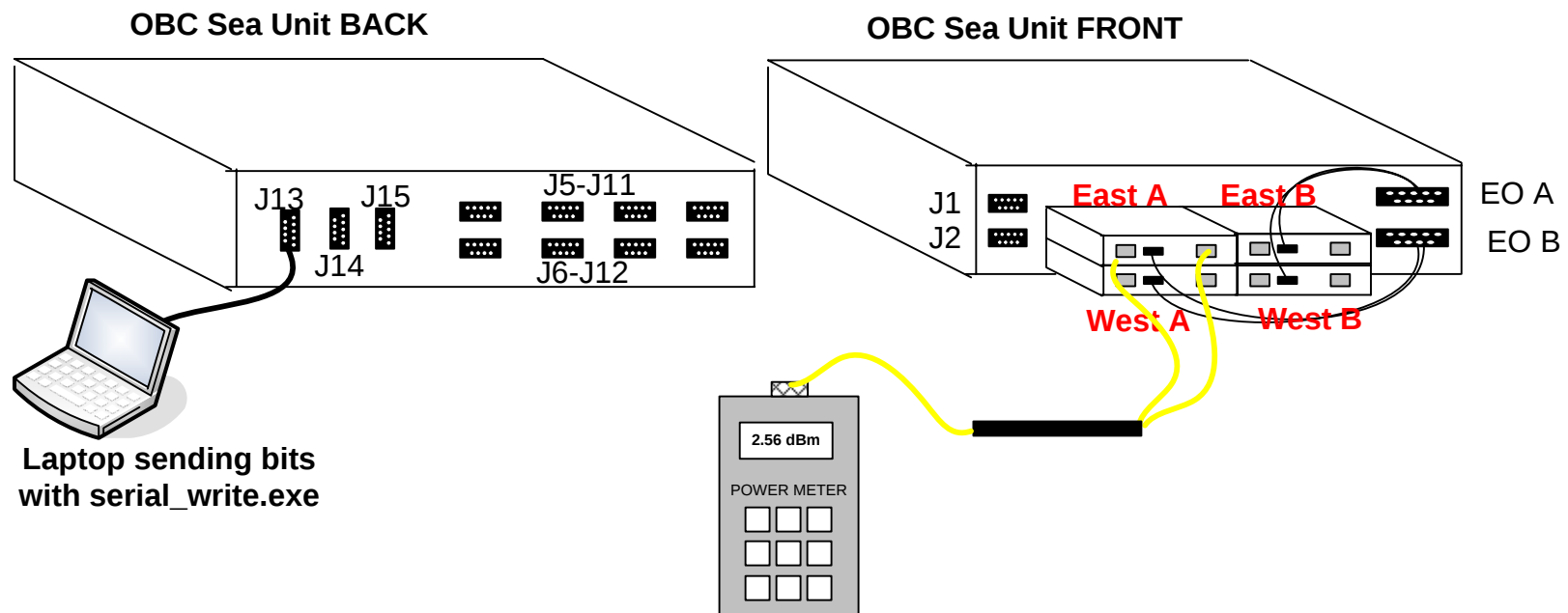
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Bit Power Test - Setup

Shore Station OBC Serial Power Test



SUB SEA OBC Serial Power Test



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Inband Backdoor Test

Purpose of Test:

This test will exercise the back door function via the inband system using the comms controller. The node DCS infrastructure devices will be accessed from a PC connected to the comms controller

Procedure:

- 1) Procure a laptop with a browser and connect it to the cyclades ethernet port as shown (red) on the next page using an ethernet **crossover** cable
- 2) Power on the OBC equipment
- 3) Connect to the comms controller from a browser: HTTP://10.128.1.20/cgi-bin/obc_xbar
- 4) Select the OBC backdoor port number. An audible click from the OBC enclosure can be heard as the relay selects the port
- 5) Select the "connect to serial port" option
- 6) You should be connected into the device for the port you selected.
- 7) Perform this test for the following devices and check them off in the checklist at the end of this document

CISCO A	port=3	J7
CISCO B	port=4	J8
EDFA East	port=5	J9
EDFA West	port=6	J10
Power Ctrlr	port=7	J11
Loopback	port=8	J12

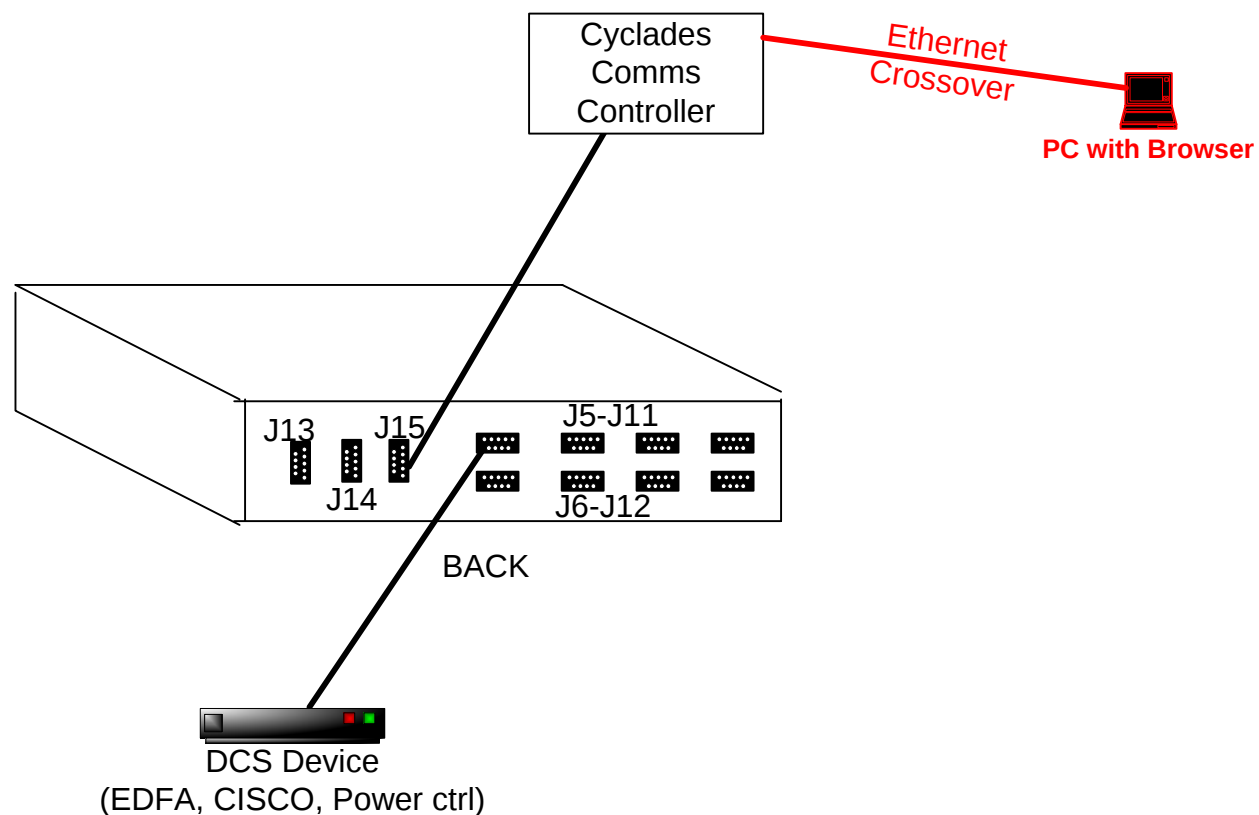
NOTE:

For the EDFA login by typing: AD FFFF 1234 <cr>. You should see a prompt: 0001>
occasionally the EDFA takes more than one try to connect
For the CISCO switch it should present you with it's name prompt e.g.: >mra01
For the Power Controller contact UW staff

NOTE: THIS TEST SHOULD BE OMITTED IF THE MARSDCS WEB INTERFACE IS UP AND RUNNING SINCE IT USES THIS FUNCTIONALITY TO PERFORM ITS NORMAL MONITORING. SEE TEST V13_WEBINTERFACE FOR TESTING THE MARSDCS WEB INTERFACE

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Inband Backdoor Test - Setup



TEST Using IN-BAND BACKDOOR

A PC is connected to the comms controller via an ethernet cable and a browser is brought up to connect to the controller

Note: Cyclades is at address 10.128.1.20

(Cyclades default address from vendor is: 192.168.160.10)

Root/neptune1 obc/neptune1

MAC 00:60:2E:01:2A:43

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Out of Band Backdoor Test

Procedure

1) For initial checkup, after connecting the East A&B and the West A&B shore fibers to their corresponding transponders in the sub-sea unit issue help commands to each device to check it's operation. Needless to say you wil need an RS232 connection to each port (East A,B and West A,B) on the shore stations.

Check Shore East or West A side

###CKAH

Check Shore East or West B side

###CKBH

Sub-sea East or West A side

###S01AH

Sub-sea Esat or West B side

###S01BH

In the event or problems a simple optical test can be performed:

- 1) Insert an optical power meter (1550nm) at the fiber end which connects to a sub-sea transponder
- 2) From an ASCII terminal connected to the shore station send continuous character strings
- 3) Expect about -35 to -45 dBm

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Out of Band Backdoor Test

Purpose of Test:

This test will exercise the back door function via the out-of-band (OBC) system using the SAIL bus system and the associated low speed transceivers. The node DCS infrastructure devices will be accessed from the SAIL bus.

It is assumed here that all 4 sea/shore fibers are connected from the node to the shore station.

Procedure:

- 1) Procure a laptop with a sail test program (sail.exe) and connect it as shown on the next page using a serial cable to the shore OBC station. Be sure the latter is powered on.
- 3) Power on the OBC sub sea units.
- 3) Start the SAIL program and via the SAIL A bus connect to a port on the sea OBC unit:
sail.exe -s#S01A -x3
An audible click can be heard from the OBC sub sea enclosure as the relay selects the port, (3 in this case)
- 4) You should be connected to the serial device for the port selected. Make sure that you are able to communicate with the device (see NOTE below)
- 5) Repeat the procedure for all serial backdoor ports to the CISCO switches, EDFAs and power controllers

CISCO A	port=3	CISCO B	port=4
EDFA East	port=5	EDFA West	port=6
Power Ctrlr	port=7	Loopback	port=8
- 6) As you test check off the devices in the checklist at the end of this document
- 7) On the shore side, move your laptop to the remaining shore OBC ports, repeat the test, and record the results:
West A
East B
West B
(For the B bus you will need to connect with the command: sail.exe -p#S01B -x3)

NOTE:

For the EDFA login by typing: AD FFFF 1234 <cr>. You should see a prompt: 0001>

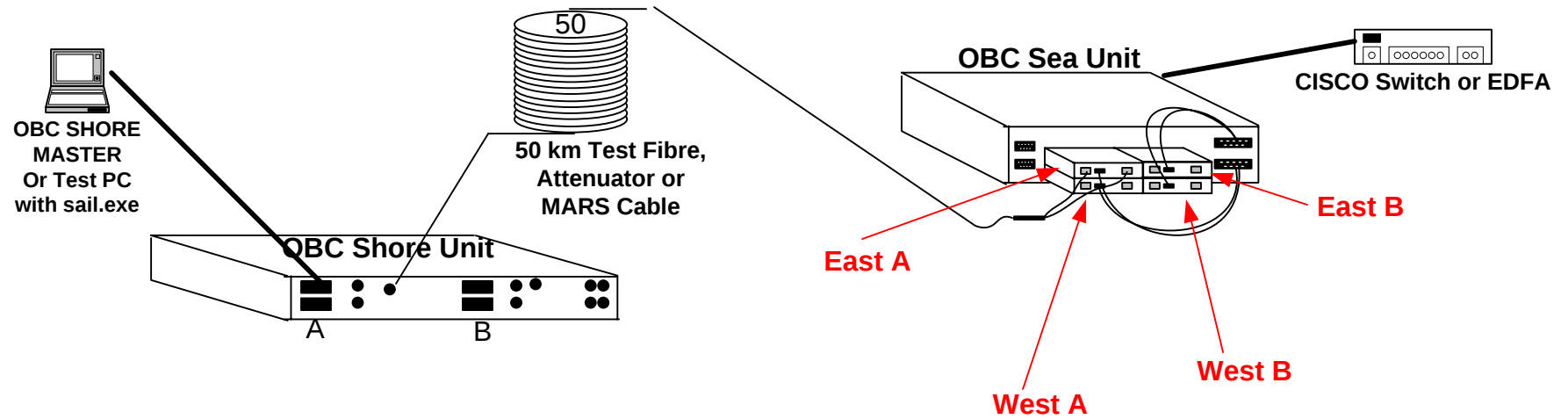
occasionally the EDFA takes more than one try to connect

For the CISCO switch it should present you with its name prompt e.g.: >mra01

For the Power Controller contact UW staff

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Out of Band Backdoor Test - setup



On the marsdcs server:

- 1) logon as root
- 2) cd /webdata/MarsDCS/bin
- 3) ./mars_xbar.pl
- 4) You should see the menu:

Mars OBC/Xbar Backdoor – v1.1

x) eXit

1) N/C

2) N/C

3) CiscoA

4) CiscoB

5) EDFA-E

6) EDFA-W

7) PwrCtl

8) Loopback

Enter Xbar Port Number:

The MARS operations system will be shut down by this option so it should only be used for testing and diagnostics. Remember to restart the operations systems after this test.

SAMPLE OBC SESSION:

- 5) Select (3) CiscoA
- 6) Hit return until you get a prompt mra01-01>
- 7) Type sh clock
- 8) You should see the cisco output
- 9) <ctl>C when you are finished
- 10) Restart the MARS operations processes

Purpose of Test:

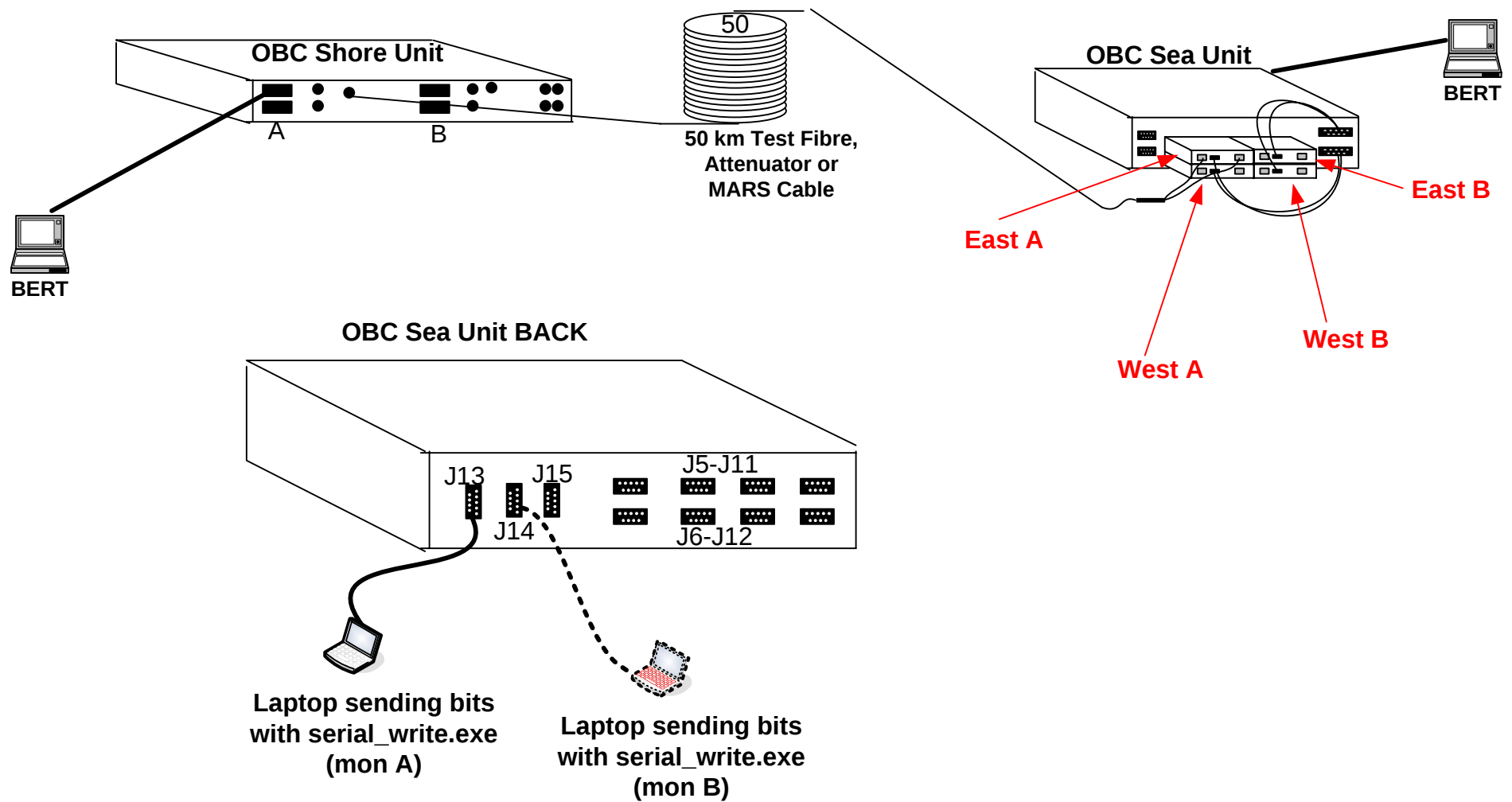
This test will confirm that the 4 MARS OBC optical channels can safely port data without bit errors

Procedure:

- 1) Connect a laptop with the BER transmitter software serial_write.exe (see WHOI) to the **East A** shore station.
- 2) Connect a laptop with the BER receiver software serial_read.exe (see WHOI) to the sub sea **Mon A port (J13)**
- 3) Start the BER test on the shore PC:
serial_write.exe -p/dev/ttyS0 -B700 -r2 -R -s
- 4) Start the BER test on the sea PC:
serial_read.exe -p/dev/ttyS0 -S
- 5) Perform a BERT test for at least 1 hour
- 6) Reverse the BER roles starting the read at the shore and the write at the sub sea.
- 7) Repeat the BERT test using:
West A shore station – sub sea Mon A port (J13)
East B shore station – sub sea Mon B port (J14)
West B shore station – sub sea Mon B port (J14)
- 8) Record the results at the end of this document

V05 OBOpen_node

Out of Band BERT Test



V05 OBCopen_node

OBC Wave Form Test - Procedure

Purpose of Test:

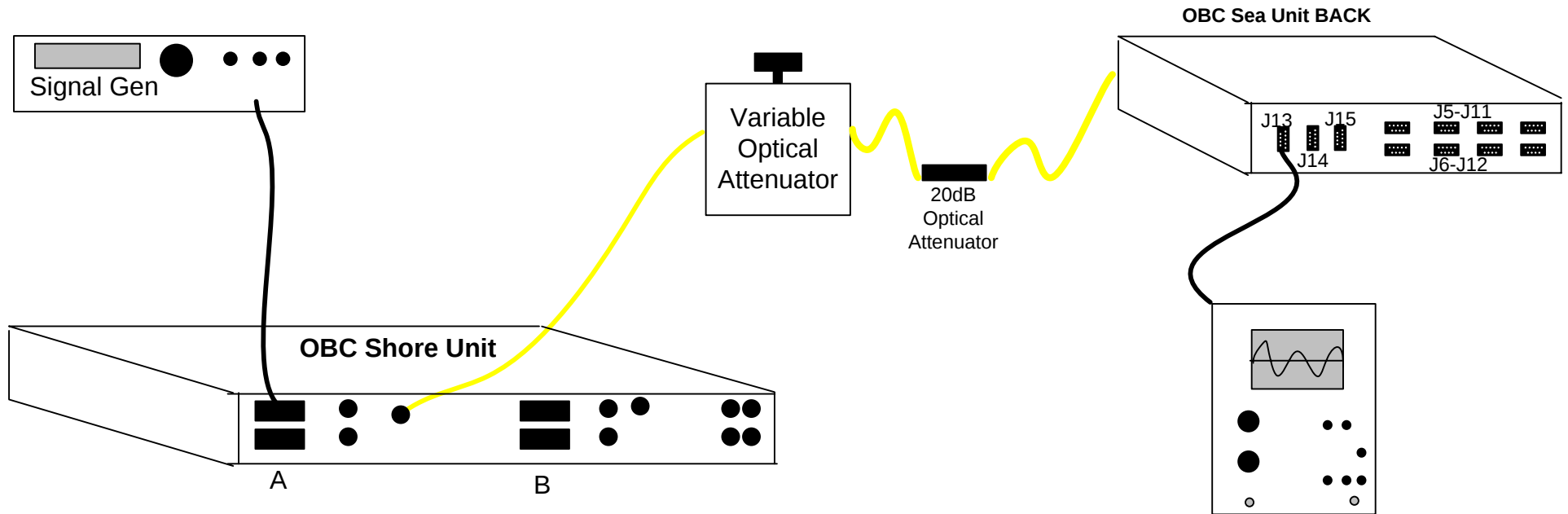
As optical power decreases the OBC transceivers encounter distortion in their wave form - the square wave develops rounded edges. A dynamic decision level adjusting circuit controls the shape of the electrically interpreted waveform that is passed to the OBC logic circuits. Drifting of this circuit could result in an unbalanced duty cycle between zeroes and ones. This test will display upon an oscilloscope the shape of the waveform emanating from the transceivers.

Procedure:

- 1) Using a function generator, introduce into the shore station **EAST A** OBC serial port for the path being tested, a 9600Hz square wave. You will need to apply this into pin 2 of the DB9 connector. Set the generator for RS232 levels e.g. 10V
- 2) Receive that square wave with an oscilloscope on the **Mon A** DB9 connector pin 3.
- 3) You should see a square wave form from 0 through about -40 dBm
- 4) Photograph or otherwise capture the wave form and add the data to the results page at the end of this document
- 5) Repeat this test for:
 - Shore WEST A serial port / Mon A Sub Sea OBC port
 - Shore EAST B serial port / Mon B Sub Sea OBC port
 - Shore WEST B serial port / Mon B Sub Sea OBC port

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OBC Wave Form Test - Setup



V05 OBCopen_node

Date:	3/8/2005	Location:	WHOI	Engineer:	Lerner/Sonnichsen
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Optical Power Shore	@	U
East A	-5.19	-7.25
East B		
West A		
West B		

Optical Power Sea	@	U
East A	-1.8	-4.0
East B	-3.0	-5.7
West A	-0.95	-3.0
West B	-1.7	-3.8

Checklist for in-band backdoor test	port	passed
EDFA East	5	yes
EDFA West	6	yes
CISCO A	3	yes
CISCO B	4	yes
Power Controller	7	yes

Checklist for out-of-band backdoor test	port	East A passed	East B passed	West A passed	West B passed
EDFA East	5	yes	yes	yes	yes
EDFA West	6	yes	yes	yes	yes
CISCO A	3	yes	yes	yes	yes
CISCO B	4	yes	yes	yes	yes
Power Controller	7	yes	yes	yes	yes

BER Test	Shore Sends / Time of run	Sea Sends / Time of run
East A	1err / 1drop 15h 41m	0err / 0drop 1h 0m
East B	0err / 0drop 1h 56m	0err / 0drop 1h 15m
West A		
West B		