

Equipment Needed:

- Bi-potentiostat test kit. Includes 2 sets of “dummy” electrode resistors (10 ohm and 1 ohm)
- Stopwatch
- 4 ½ digit digital voltmeter

Visual Inspection:

- Front panel solder joints ok.
- Front panel switches work properly (not sticking).
- Tighten screws on power transistors/ heat sink on rear panel.
- Tighten screws on terminal block.
- Tighten all screws on the enclosure, holding boards, and other case mounted components.

Test Procedure:

1. Program EPROM
2. Measure the resistance on all 4 power supplies on micro board. All should be > 1k ohms.
 +5VDC across C30 on micro board
 +/- 25VDC, +/- 15VDC, +/- 10VDC from analog common to J7 on the micro board.
3. Attach the power cord and measure resistance across power cord with the power switch on.
 Input module at 120VAC 5 ohms (older transformers on repairs 10 ohms)
 “ “ at 240VAC 20 ohms (older transformers on repairs 36 ohms)
4. Disconnect all 3 connectors going from the other 2 boards to the micro board. Apply 115VAC slowly while monitoring 5VDC power supply. Check other 3 power supplies. Turn power off. Repeat while applying 240VAC (change input module accordingly). Return to 120VAC setting.
5. Verify the pin to pin wiring is correct on the cable going from J7 on the power supply board to J11 on the analog board, then reconnect the 3 connectors to other boards and re-check all 4 power supplies.
6. With the meter at R1 of the power supply board, adjust P1 for 10.010VDC
 With the meter at R2 of the power supply board, adjust P2 for 10.010VDC
7. Check all front panel pots for accuracy. (Gnd to wiper)
 2 limit pots and 2 offset pots, +/- 50mv max
 Sweep pot +/- 5mv max (adjust P3 for 1 volt on pin 3 of the pot)
8. Check all front panel switches and LEDs for proper operation.
9. Measure voltage from earth gnd to DC gnd. Must be less than 0.1VDC.

ISSUED BY: Jerry Smith		APPROVED BY: Bruce Denniston
Page 1 of 3	DATE: 12/16/02 4:12 PM	REV: 2

SWEEP GENERATOR

10. With ZERO switch “on”, SWEEP switch on “hold”, adjust P5 for 0.000VDC at the SWEEP OUTPUT jack.
11. With ZERO “on”, SWEEP RATE at 9999 mv/sec and RANGE switch at 1000mv/sec, adjust P3 to obtain +/- 0.9766VDC at U19, pin 6. Change sweep direction back and forth and balance readings at U19, pin 6.
12. Set UPPER LIMIT pot to +2.5V and LOWER LIMIT pot to -2.5V. Set ZERO to “off” and SWEEP to “run”. Adjust P10 for a 5 sec. sweep (use stopwatch). CW will shorten time.
13. Set SWEEP RATE to 9999mv/sec, RANGE to 100mv/sec, ZERO to “on”. Adjust P4 to obtain +/- 0.09766VDC at U19 pin 6. Change sweep direction back and forth and balance readings.
14. Set UPPER LIMIT pot to +100mv and LOWER LIMIT pot to -100mv, RANGE to 1000mv/sec, SWEEP RATE to 500mv/sec, ZERO to “off”, SWEEP to “run”. Using the STOP AT LIMIT switches, sweep to one limit and note the voltage at the SWEEP output jack, then sweep to the other limit and note that voltage. Adjust P6 for equal voltages. (CCW lowers upper limit)

K1 ELECTRODE (Make sure K2 is off and sweep voltage is off)

15. Set K1 OFFSET VOLTAGE pot to 1.000V. CURRENT CONVERTER to 100ua/V. With meter at I1, adjust P8 for equal voltages when switching from + and - offset.
16. With K1 OFFSET VOLTAGE pot to 0V, +/- switch “off”, adjust P7 to obtain 0.000V at I1.
17. Check all current converter settings for + and - balance at I1. Set offset at 1mv at the lowest setting then increase to 10mv, 100mv, etc.. as you go up.

K2 ELECTRODE (Make sure K1 is off and sweep voltage is off)

18. Set K2 OFFSET VOLTAGE pot to 0V and +/- switch to “off”. Set CURRENT CONVERTER to 10ua/V. With meter at I2, adjust P9 for 0.000VDC.
19. Repeat step 17 for K2.

OPERATION CHECK LIST

20. High current check. Install 10 ohm resistors and switch to “Normal” on electrode switch. Set OFFSET VOLTAGES to 1.000V and CURRENT CONVERTERS to 10ma/V. Measure voltages at E1, I1, E2, I2. E1, E2 = 1VDC I1, I2 = 10VDC. Check + and - for balance.
21. Install 1 ohm resistors. Set CURRENT CONVERTERS to 100ma/V. E1, E2 = 1VDC I1, I2 = 10VDC. Check + and - balance.

CBP1 Bi-Potentiostat Test Procedure		AFCBP1-T
Page 2 of 3	DATE: 12/16/02 4:12 PM	REV: 2

22. With 1 ohm resistors installed, measure voltages across the resistors in the K1 and K2 jacks. Should be about 1VDC. (check +/- balance)
23. OVERLOAD check. Return to “dummy” electrodes. Set K1 CURRENT CONVERTER to 10ua/V and OFFSET VOLTAGE pot to 100mv. Monitor I1 voltage and OVERLOAD LED while you increment OFFSET VOLTAGE by 1mv steps. LED should light when I1 voltage is between 10.2VDC and 11.2VDC. Check + and – offset. Repeat for K2.
24. Check sweep to K1 and K2. Set SWEEP RATE to 9999 and RANGE to 1000mv/sec. Set UPPER LIMIT pot to 500mv. Set UPPER STOP LIMIT switch to “on”, SWEEP to “run”, and ZERO to “off” (sweep output should be 0.5VDC). With meter at E1, turn K1 SWEEP VOLTAGE switch “on”. E1 should read 0.5VDC. Jumper SWEEP OUTPUT jack to K1 IN jack. E1 should read 1.0VDC. Repeat for K2.
25. GALVANOSTAT mode check. Change mode switch to GALVANOSTAT. Set K1 offset voltage to 100mv. Voltage at I1 should be 0.1VDC at current converter settings of 10ma, 1ma, and 100ua. Voltage at E1 should increase by 10X (.01, 0.1, 1.0) as you go up the 3 current converter settings. Check at + and – offset voltage.
26. Check OPEN switch. With voltages at E1, I1, and E2 jacks, push OPEN switch. Voltages should go to 0VDC.
27. Calibrate panel DVM to match bench meter. Choose a medium voltage (3 to 5V) to calibrate. Adjustment pot on back of panel DVM. Check + and -.
28. Null DAC outputs.
 Adjust P11 for 0.000VDC at U37, pin 1.
 P12 for 0.000VDC at U38, pin 1.
29. Setup unit as follows and burn-in overnight on bench.

ELECTRODE to “Dummy”	MODE to “pot”	SWEEP RATE to 9999
RANGE to 1000mv/sec	ZERO at “off”	SWEEP to “run”
UPPER SWEEP LIMIT pot to +3VDC	LOWER SWEEP LIMIT pot to -3VDC	
K1 OFFSET pot to +100mv	K2 OFFSET pot to -100mv	
K1, K2 CURRENT CONVERTERS to 1ma/V	K1, K2 SWEEP VOLTAGE to “on”	

30. Repeat steps 6-28 after burn-in.
31. Test communication to computer and calibrate DAC sweep rate.

FINAL INSPECTION

- Make sure all connectors are in place and latched.
- Check wires to back compensation jacks. Pins 1 and 2 (grn and blk) to Rotator Output. Pins 3 and 4 (blue) to K2. Pins 6 and 7 (yel) to K1. Pins 9 and 10 (org) to GAL.
- Serialize and fill out Potentiostat checklist.

Rev. 0 was 1/24/96 C:\filer\procedur\cbp-1.cal
 12/16/02 JS Added Step 1. – Program EPROM, chg'd “pot” to “switch”, Step 8

CBP1 Bi-Potentiostat Test Procedure		AFCBP1-T
Page 3 of 3	DATE: 12/16/02 4:12 PM	REV: 2