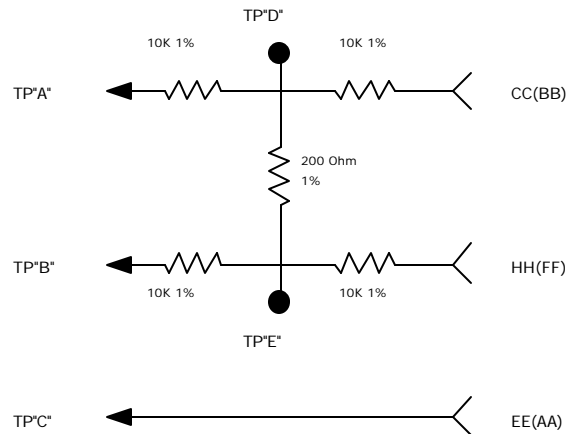


## Isolation Amplifier Module Checkout Procedure W. Jaskierny 8 May 97 rev.29 May 97



**Figure 1**

Bracketed NIM pin assignments are for channel B, all others are for channel A or common to both channels. Use front panel test points for all measurements.

### **Megger Test**

Connect TP"A", TP"B" and TP"C" together.

Connect one lead of megger to TP"A", the other to NIM module frame.

Megger at 1 KV, resistance should be 1000 Meg or greater.

Move megger lead from NIM module frame to circuit common.

Megger at 1 KV, resistance should be 1000 Meg or greater.

Remove megger, disconnect connection of TP"A", TP"B" and TP"C".

### **Initial Conditions**

Remove IC6 from socket.

Connect pins 1,7, and 14 of IC6 socket to circuit common.

Connect circuit shown in Figure 1 to signal input pins.

Jumper J1-2 to J1-3.

Jumper J2-2 to J2-3.

Jumper J3 closed

R3 set to minimum.

Connect a normally open switch contact between pins B(F) and pin L.

+ - 15 Volt power on module for a minimum of 1 hour uninterrupted prior to test.

### **Common Mode Adjustment**

Connect TP"A" to TP"B".

Connect scope between TP5 and circuit common.

Apply 5 Volts RMS 60 Hz. between TP"B" and TP"C".

Adjust R1 for minimum 60 Hz. at TP5, record the peak to peak value, this value should be less than 5 mV rms.

Remove the AC source from TP"B" and TP"C".

### **Zero Offset Null Adjustment**

Connect TP"A", TP"B" and TP"C together.

Connect DC Voltmeter at TP5 and circuit common.

Adjust R6 for 0.0 Volts +- 1 mV at TP5.

Connect DC Voltmeter between TP10 and TP11.

Adjust 20K offset pot of IC10 for 0.0 Volts +- 1 mV at TP10, TP11.

Connect DC Voltmeter between TP12 and TP13.

Adjust 20K offset pot of IC11 for 0.0 Volts +- 1 mV at TP12, TP13.

Connect DC Voltmeter between TP14 and TP15.

Adjust 20K offset pot of IC12 for 0.0 Volts +- 1 mV at TP14, TP15.

Open connection between TP"A", TP"B" and TP"C.

### **Fail Safe Offset Adjustment**

Remove jumper between J1-2 and J1-3.

Install jumper J1-1 to J1-2 permanently.

Adjust R2 for 5.0 Volts +- 5 mV at TP5.

Measure voltage at TP10, TP11 it should be the same as TP5 +-10 mV.

Measure voltage at pins C(K),positive, and H(P),negative, it should be the same as measured at TP5 +-10 mV.

### **Conditions**

Remove +-15 Volt power from module.

Remove jumpers connecting IC6 socket pins 1, 7, and 14 to circuit common.

Install IC6.

Apply +-15 Volt power to module.

### **Trip Level and Fail Safe Offset Null Adjustments**

Connect DC Voltmeter between TP7 and circuit common.

Adjust R3 for +4.5 Volts +-5 mV at TP7.

Measure voltage at TP14, TP15 it should be the same as TP7

+/-10 mV.

Measure voltage at pins W(c),positive, and a(h),negative, it should be the same as measured at TP7 +/-10 mV.

Measure voltage at TP8 to circuit common, it should be

-4.5 Volts +/-50 mV.

Measure voltage at TP12, TP13 it should be the same as TP8

+/-10 mV.

Measure voltage at pins M(U),positive, and S(Y),negative, it should be the same as measured at TP8 +/-10 mV.

Connect DC Voltmeter between J3 and circuit common.

Adjust R4 for -5.0 Volts +/-5 mV at J3, this voltage should have the same absolute magnitude, +/-10 mV, as the voltage measured at TP5.

Check that K1 is in an energized state.

Close the contact of the switch connected between NIM pins B(F) and L, K1 should be de-energized now, check that **all** of the **output contacts** of **K1** on the NIM module connector have **changed state**.

Open the switch connected between NIM pins B(F) and L.

K1 should be energized now and its contacts in an energized state.

### **Fail Safe Input Trips Check.**

Remove input resistor network from pins CC(BB) and HH(FF), K1 should be de-energized now, check that **all** of the **output contacts** of **K1** on the NIM module connector have **changed state**.

Connect resistor network back to pins CC(BB) and HH(FF), K1 should be energized now and its contacts in an energized state.

Connect jumper between pins CC(BB) and HH(FF), K1 should be de-energized now, check that **all** of the **output contacts** of **K1** on the NIM module connector have **changed state**.

Remove jumper between pins CC(BB) and HH(FF), K1 should be energized now and its contacts in an energized state.

### **External Compensation**

Adjust R3 for +2.0 Volts  $\pm$ 5 mV at TP7.

Remove jumper between J2-2 and J2-3.

Install jumper between J2-1 and J2-2.

Apply a DC voltage of 4.0 V, negative to pin N(V), positive to pin T(X).

Adjust R5 for maximum voltage at J2-2 with respect to circuit common, it should be 2.0 V  $\pm$ 200 mV.

Adjust R5 for 1.0 V  $\pm$ 10 mV at J2-2 with respect to circuit common.

Measure voltage between TP7 and circuit common, it should be +3.09 V  $\pm$ 90 mV.

Measure voltage between TP8 and circuit common, it should be -3.09 V  $\pm$ 60 mV.

Remove voltage from pins N(V) and T(X), connect pins N(V) and T(X) to circuit common.

Measure voltage at J2-2 with respect to circuit common, it should be 0.0 V  $\pm$ 20 mV.

Adjust R3 for +2.5 Volts  $\pm$ 5 mV at TP7.

### **Iso-Op Amp Front End Gain Tests**

Apply 4.0 V DC from a stable source to TP"A" and TP"B", TP"A" negative, TP"B" positive.

Measure voltage at TP"D" and TP"E", adjust DC input voltage for a reading of 40 mV  $\pm$  100 $\mu$ V at these points.

Measure voltage at TP5 with respect to circuit common, this voltage should be +7.0 V  $\pm$ 50 mV.

Slowly raise DC input voltage till K1 de-energizes, note and record the voltage at TP"D" and TP"E", the voltage reading at should be 50 mV  $\pm$ 1 mV.

Reverse polarity of input voltage.

Recheck magnitude of voltage at TP"D" and TP"E", adjust DC input voltage for a reading of 40 mV  $\pm$  100 $\mu$ V at these points.

K1 should be energized.

Measure voltage at TP5 with respect to circuit common, this voltage should be +3.0 V  $\pm$ 50 mV.

Slowly raise DC input voltage till K1 de-energizes, note and record the voltage at TP"D" and TP"E", the voltage reading at should be 50 mV +-1 mV.

**Note:**

Modules are to indicate, on the back of the module, the settings of the jumpers J1, J2, and J3, the trip level voltage, the percentage of the external compensation voltage, and the value of C used for the frequency rolloff of the comparators. If any changes are made in these setting it must be noted on the back of the module or in a manner permanently affixed to the module.