

Engineering Division
W/OS0321: FJZ

NOAA WIND PROFILER MODIFICATION NOTE 5
(for Electronics Technicians)

SUBJECT : Status Monitor Digital Interface Board (Type 2)
Replacement Procedure

PURPOSE : To prevent the 40-amp solid-state relays from melting.

PARTS REQUIRED : Quantity Description

1	Status monitor digital interface board
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MODIFICATION PROCUREMENT : Each station will receive the required kits. No technician action required.

SPECIAL TOOLS AND TEST EQUIPMENT REQUIRED : #2 Phillips screwdriver
#3 Phillips screwdriver
Large flat blade screwdriver
Regular flat blade screwdriver
Very small flat blade screwdriver
Heat gun
Digital (or analog) multimeter
Flashlight

TIME REQUIRED : 2 working hours, plus travel.

EFFECT ON OTHER INSTRUCTIONS : None. File this note in EHB-9.

CERTIFICATION The PPO tested this modification.

GENERAL

The Status Monitor Digital Interface Board has been redesigned to solve two problems:

1. The voltage levels supplied by the present Digital Interface Board are not high enough to drive the 40-amp solid state relays.
2. When the 40-amp solid state relay overheats, the excess current damages the Digital Interface Board. This problem is solved by fusing the output of the new Digital Interface Board.

This modification note provides the procedure to replace and verify operation of the Status Monitor Interface Board.

PROCEDURE

A. Removal and Installation

1. Power down the radar by turning off breakers 17/19, 22, and 24 in that order.
2. Remove the four mounting screws from the front panel of the system status monitor located in the equipment cabinet.

NOTE

To prevent cable binding in the next step, it may be necessary to pull out the power supply drawers beneath.

3. Carefully pull the status monitor **out to its full stop position.**
4. Remove the top cover from the **status monitor and locate the digital interface circuit board** in the chassis. Refer to Figure 1 for the internal component layout of the status monitor.

5. Note the interface cable connections to the digital and analog interface circuit boards. Remove the interface cables from the digital interface circuit board.
6. Remove the analog and digital interface boards from the chassis.
7. Mount the new digital interface circuit board in the chassis and connect the interface cables. For-the time being do not re-mount the analog interface circuit board.
8. **Without shorting the analog interface circuit board against the chassis or other metal components**, situate the analog circuit board so that the digital board's test points will be accessible.
9. Power up the radar by turning on breakers 24, 22, and 17/19 in that order.
10. Perform the tests described in the Verification of Operation.
11. If all tests pass, power down the radar and secure the analog board in the status monitor. Reconnect the interface cables to the analog board and replace the status monitor's top cover. Slide the unit back into the rack.
12. Replace the mounting screws on the status monitor face plate and power up the radar as described in step 9.
13. Discard the old digital interface board.
14. If any of the tests fail, contact the Profiler Control Center for assistance at (303) 497-6033. Schematic diagrams of the digital interface board are supplied to aid in troubleshooting any problems.

Verification of Operation

The following tests are performed to verify proper operation of the new digital interface board. It is essential that the environmental controls of the board are confirmed to prevent the possibility of a fire hazard. If any of the tests outlined below fail, contact the PCC for assistance.

Environmental Controls

Verify proper operation of ECU#1, ECU#2, Exhaust fan, and main breaker trip relay by performing the following procedures.

NOTE

The outside temperature must be above 60°F (15°C) for the Environmental Control Units (ECU) to turn on. If the outside temperature is below 60°F, high outside temperatures can be simulated. To do this, disconnect the outside temperature probe connector from port J10 on the rear panel of the status monitor assembly.

1. Verify that the inside and outside temperature readings on the PMT are within $\pm 2^{\circ}\text{C}$ of the temperature meter displays on the front panel of the Status Monitor Assembly. The readings are obtained from the following PMT menu:

Display Current Output Menu ->
Landline Output Menu ->
Status Data Menu.

2. Wave a heat gun across the top 1/3 of the inside temperature probe to simulate raising the inside temperature.

CAUTION

DO NOT hold the heat gun continuously on the probe as this may destroy the sensing element in the temperature probe.

3. The "inside temperature" digital readout on the status monitor assembly will show the inside shelter temperature slowly increase.

4. Gradually increase the inside temperature to approximately 33°C **but not higher.**

CAUTION

DO NOT let the temperature reach 37°C at any point during this test or the main breaker may trip.

5. Hold this temperature for approximately 15 minutes. If the system is functioning correctly, the listed events should occur in following order:
 - Both ECUs will come on, first one, then the other
 - The exhaust fan will turn on.
6. If either the ECUs or fan have not turned on, contact the PCC for assistance.
7. After both the ECUs and fan have turned on, disconnect the inside temperature probe from the connector at the top of the BSU cabinet. This will simulate an over-temperature condition inside the shelter.
8. If the system is working properly, the status monitor will trip the main breaker in approximately 45 seconds. If several minutes have passed and the main breaker has not tripped, contact the PCC for assistance.
9. If the main breaker trips, turn off breakers 17/19, 22, and 24 in the Power Distribution, Panel on the shelter wall opposite the Transmitter or PA cabinet. Open the-shelter door or use a flashlight to view the fuse panel.
10. Reset the main breaker in the Circuit Breaker Panel.
11. Reconnect the inside temperature probe.
12. If necessary; reconnect the outside temperature probe to port J10 on the rear panel of the status monitor.

13. Turn on breakers 24, 22, and 17/19 in that order.
14. If any of the tests do not react as expected, contact the PCC for assistance.

Power Amplifier Quad Control

The operation of the Power Amplifier Quad control can be accomplished using the PMT and the AMP local monitor.

1. Put the radar in maintenance mode.
2. Select Auxiliary Operations from the PMT Main menu.
3. Select Quad Control from the PMT Auxiliary Operations menu.
4. Set the Quads Enable bits 1-4 to "0000".
5. Return radar to operational mode.
6. Put the AMP local monitor in LOCAL mode.
7. Verify that all 16 power amplifier modules are not putting out any power. Confirm this by stepping through the modules and observing the OUTPUT POWER METER reading for each.
8. Press the SYSTEM POWER OUT button and observe the lower left hand meter. Eventhough the RF input LED may be green, no meter deflection should be observed. If functioning correctly, all four Quads will be disabled and the PA modules will not emit any power.
9. Put the radar in maintenance mode and set the Quad enable bits-to "1111".
10. Put the radar in operational mode.

Site Access Alarms

1. Opening the front door of the shelter should generate a "Shelter Access Alarm" in the PMT Failure Data Log.

2. After the test, reset the "Shelter Access Alarm" immediately from the Status Monitor Reset menu of the PMF.
3. Opening the shelter rear door or the antenna fence gate should generate a "Fence Access Alarm" in the PMF Failure Data Log and shut off the transmitter output.
4. Transmitter shut down can be verified using the AMP local monitor. Under this condition, the transmitter is shut down by turning off the bias-gate for the individual PA Quads rather than by disabling the RF input. Even though the transmitter may be turned off, the RF INPUT LED is still green.
5. Press the button next to the SYSTEM POWER OUT LED. Observe the analog meter on the lower left side of the AMP local monitor. If there is no meter deflection the transmitter has -been disabled.
6. After the test, reset the access alarm immediately from the Status Monitor Reset menu of the PMF.

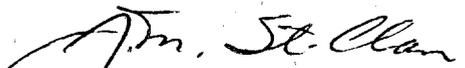
BSU Fault Detection

The BSU fault detection feature of the digital interface circuit board is tested prior to shipment. It is not necessary to field test this function.

This completes. the modification note.

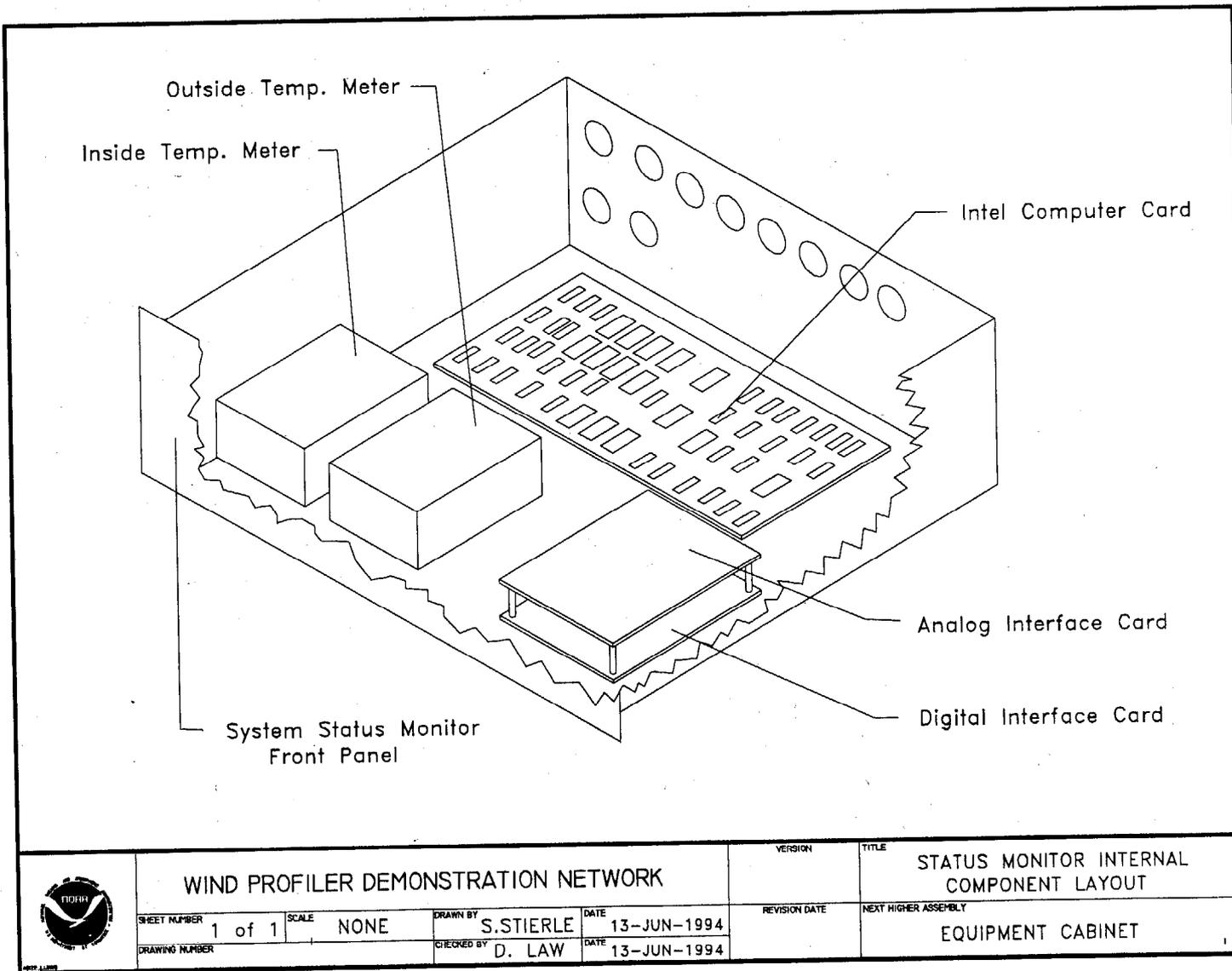
Reporting Modification

Target date for completion of the modification is 30 days after receipt of the kits. Report completed modifications on WS Form A-26, Maintenance Record, according to instructions in EHB-4, part 2, using reporting code PROF.



J. Michael St. Clair
Chief, Engineering Division

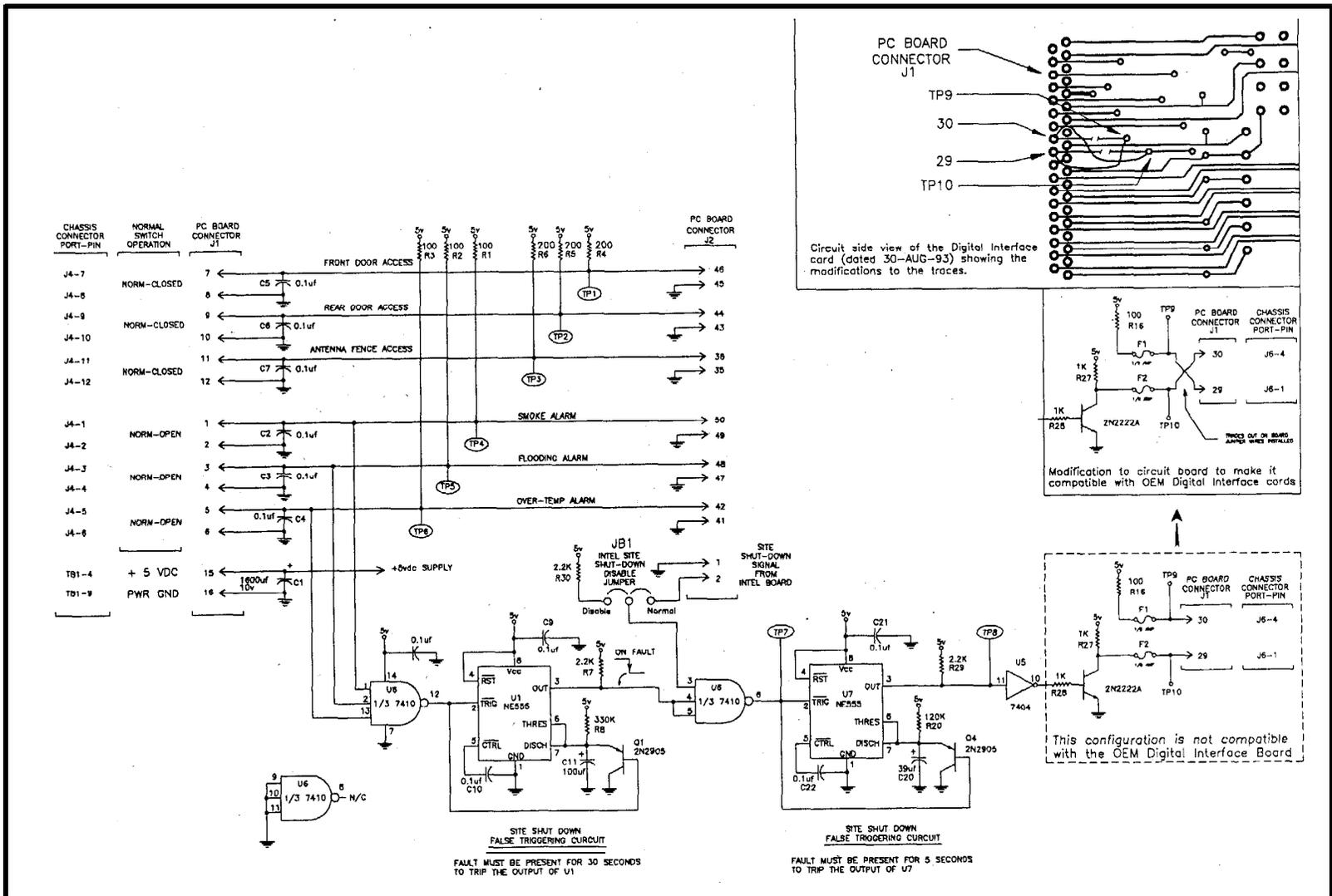
Attachments



EHB-9
 Issuance
 9-14-94

	WIND PROFILER DEMONSTRATION NETWORK				VERSION	TITLE				
	SHEET NUMBER	1 of 1	SCALE	NONE	DRAWN BY	S. STIERLE	DATE	13-JUN-1994	REVISION DATE	NEXT HIGHER ASSEMBLY
DRAWING NUMBER		CHECKED BY	D. LAW	DATE	13-JUN-1994	EQUIPMENT CABINET				

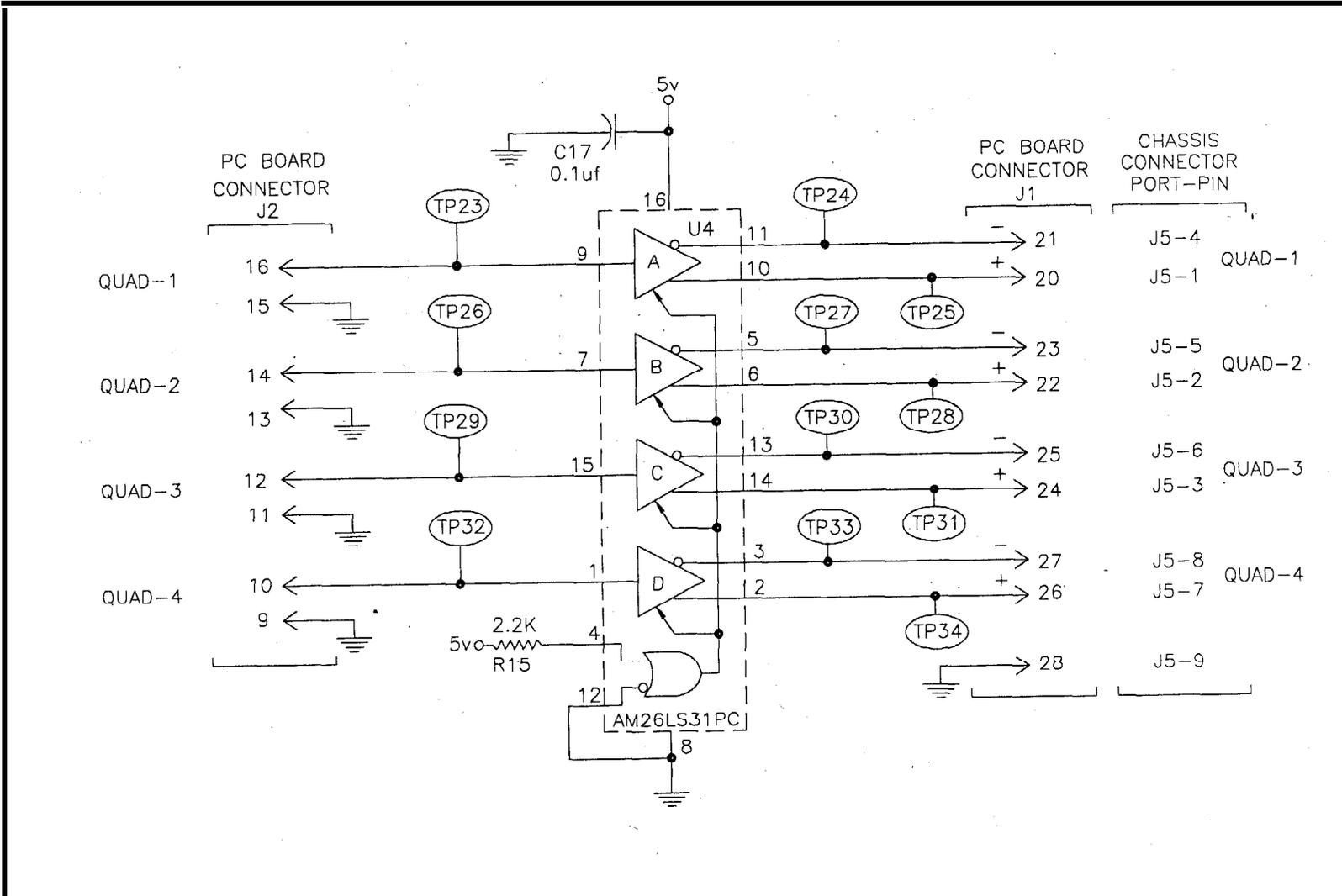
Figure 1 Status Mnitor Internal Component Layout



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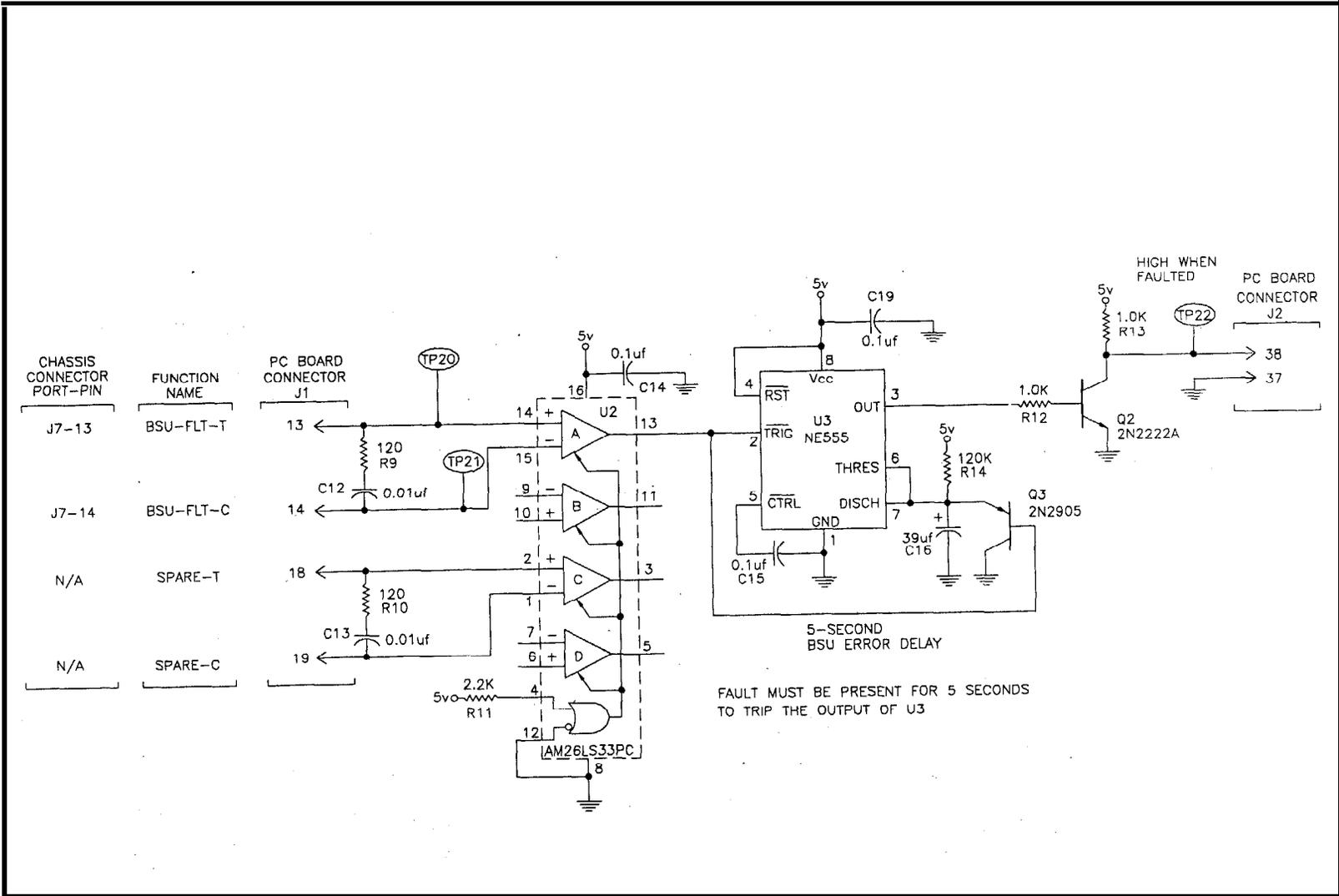
	WIND PROFILER DEMONSTRATION NETWORK			TYPE 2	SITE ACCESS AND SITE SHUT-DOWN CIRCUITRY	
	SHEET NUMBER	1 of 4	NONE	S. STIERLE	8-OCT-93	NEXT HIGHER ASSEMBLY
DRAWING NUMBER			CHECKED BY	D. LAW	9-OCT-93	SYSTEM STATUS MONITOR



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 Issuance 94-7
 9-14-94

	WIND PROFILER DEMONSTRATION NETWORK				VERSION TYPE 2	TITLE DIGITAL INTERFACE SCHEMATIC POWER AMPLIFIER MODULE QUAD CONTROL DRIVER CIRCUITRY
	SHEET NUMBER 2 of 4	SCALE NONE	DRAWN BY S. STIERLE	DATE 8-OCT-93	REVISION DATE 8-OCT-93	NEXT HIGHER ASSEMBLY SYSTEM STATUS MONITOR
DRAWING NUMBER		CHECKED BY D. LAW	DATE 9-OCT-93			



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 Issuance 94-7
 9-14-94

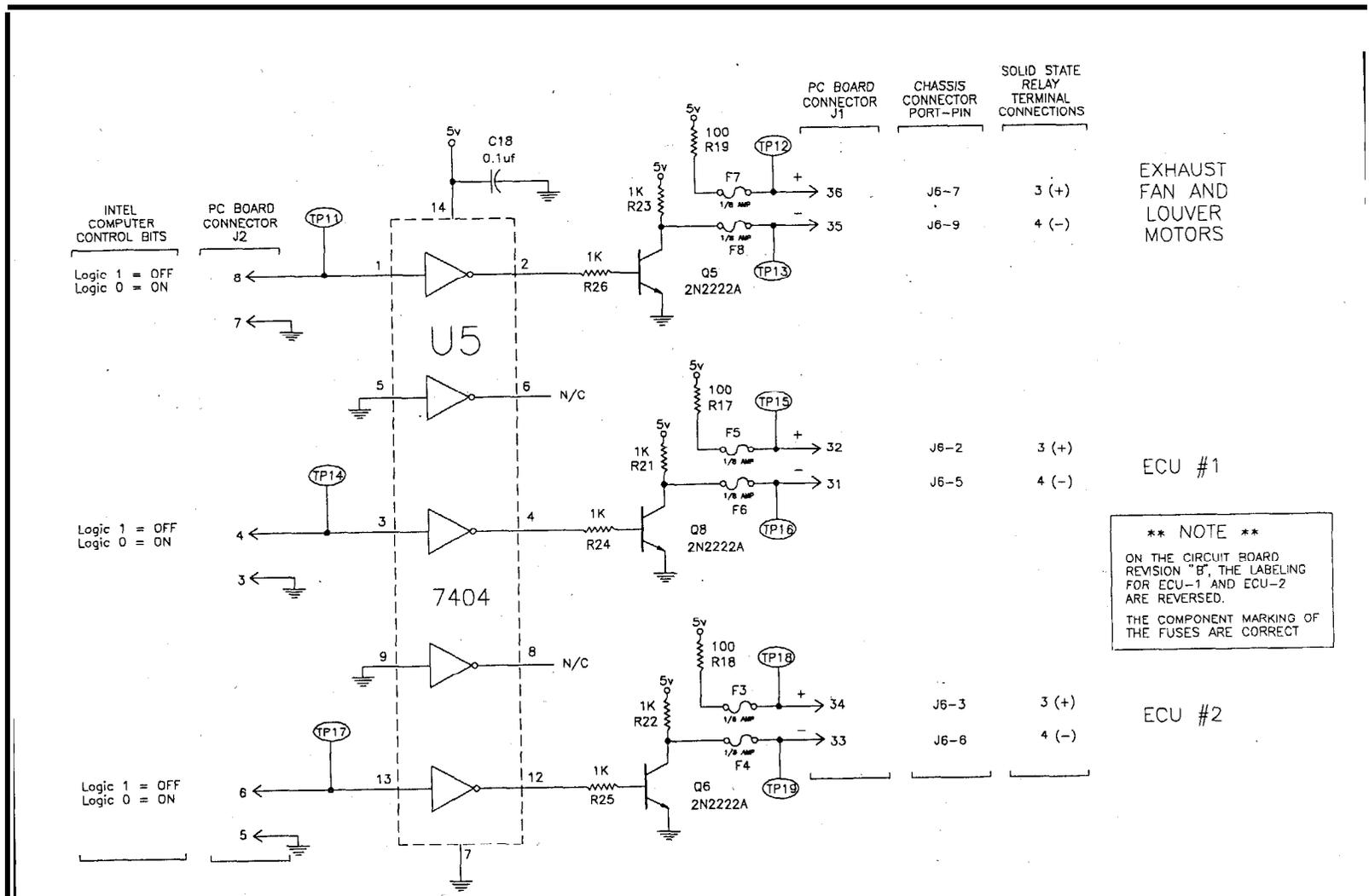


WIND PROFILER DEMONSTRATION NETWORK

SHEET NUMBER	3 of 4	SCALE	NONE	DRAWN BY	S. STIERLE	DATE	8-OCT-93
DRAWING NUMBER		CHECKED BY	D. LAW	DATE	9-OCT-93		

VERSION	TYPE 2
REVISION DATE	8-OCT-93

TITLE	DIGITAL INTERFACE SCHEMATIC BEAM STEERING UNIT FAULT DETECTION CIRCUITRY
NEXT HIGHER ASSEMBLY	SYSTEM STATUS MONITOR



**** NOTE ****
ON THE CIRCUIT BOARD REVISION "B", THE LABELING FOR ECU-1 AND ECU-2 ARE REVERSED.
THE COMPONENT MARKING OF THE FUSES ARE CORRECT

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Issuance 94-7
9-14-94



WIND PROFILER DEMONSTRATION NETWORK

VERSION TITLE
TYPE 2

DIGITAL INTERFACE SCHEMATIC
ENVIRONMENTAL CONTROL
DRIVER CIRCUITRY

SHEET NUMBER 4 of 4
DRAWING NUMBER

SCALE NONE

DRAWN BY S. STIERLE
CHECKED BY D. LAW

DATE 8-OCT-93
DATE 9-OCT-93

REVISION DATE 8-OCT-93

NEXT HIGHER ASSEMBLY

SYSTEM STATUS MONITOR