



V-F PCBs FOR THE MODELS 200A AND 100A

We have noticed that some V-F assemblies are not configured properly for the A series analyzers. One of the failure symptoms is no analog output for the NO₂ channel, or reading only 80% of the displayed NO₂ ppb.

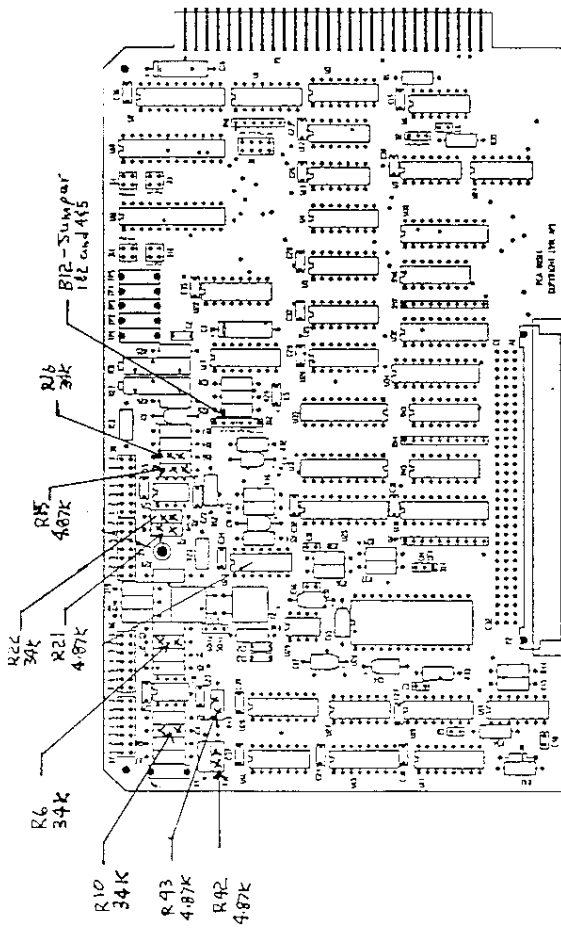
To determine if your V-F assembly is the correct assembly, please follow the instructions below:

1. To test for the resistors and jumpers on B12 being correct, go to " SETUP-MORE-DIAG-ANALOUT-ENTER". Allow voltage to step to 100% and press button under 100%. With your DVM, verify the NO_x, NO and NO₂ recorder outputs all agree with the voltages on the display of the analyzer. If you get 80% of the voltages on the recorder output (20% lower than the display), follow the proceeding steps to resolve the problem. If at 100% you read correct output voltages, the correct resistors are installed in the V-F assembly.

To test for the cut on the V-F pcb, place your DVM return lead in TP5 of the V-F assembly and the plus lead in TP3 of the V-F assembly. If you read < 20 millivolts, the cut has not been made. If you read greater than 50 mv, the cut is present and the V-F is okay.

2. Turn power off to the analyzer. Remove the cover to the analyzer and remove the V-F assembly/CPU assembly. If you have any problems performing the following steps, please contact APT for an RMA number and a replacement V-F assembly. For customers that want to repair their own V-F assemblies, follow the steps below.
3. . Remove the screw attaching the CPU assembly to the V-F assembly.
4. Verify the value of the following resistors (see attached for locations):

R15, R21, R42 and R43 are 4.87 K resistors and R6, R10, R16 and R22 are 34 K resistors.
5. Verify Jumper B12 has a jumper from pins 1 and 2 and 4 and 5 (see attached).
6. Verify the circuit board modification on the circuit side. You must remove the circuit trace (see attached).
7. Follow the DAC calibration procedure after any modifications have been performed (attached).



1 COMPONENT SIDE

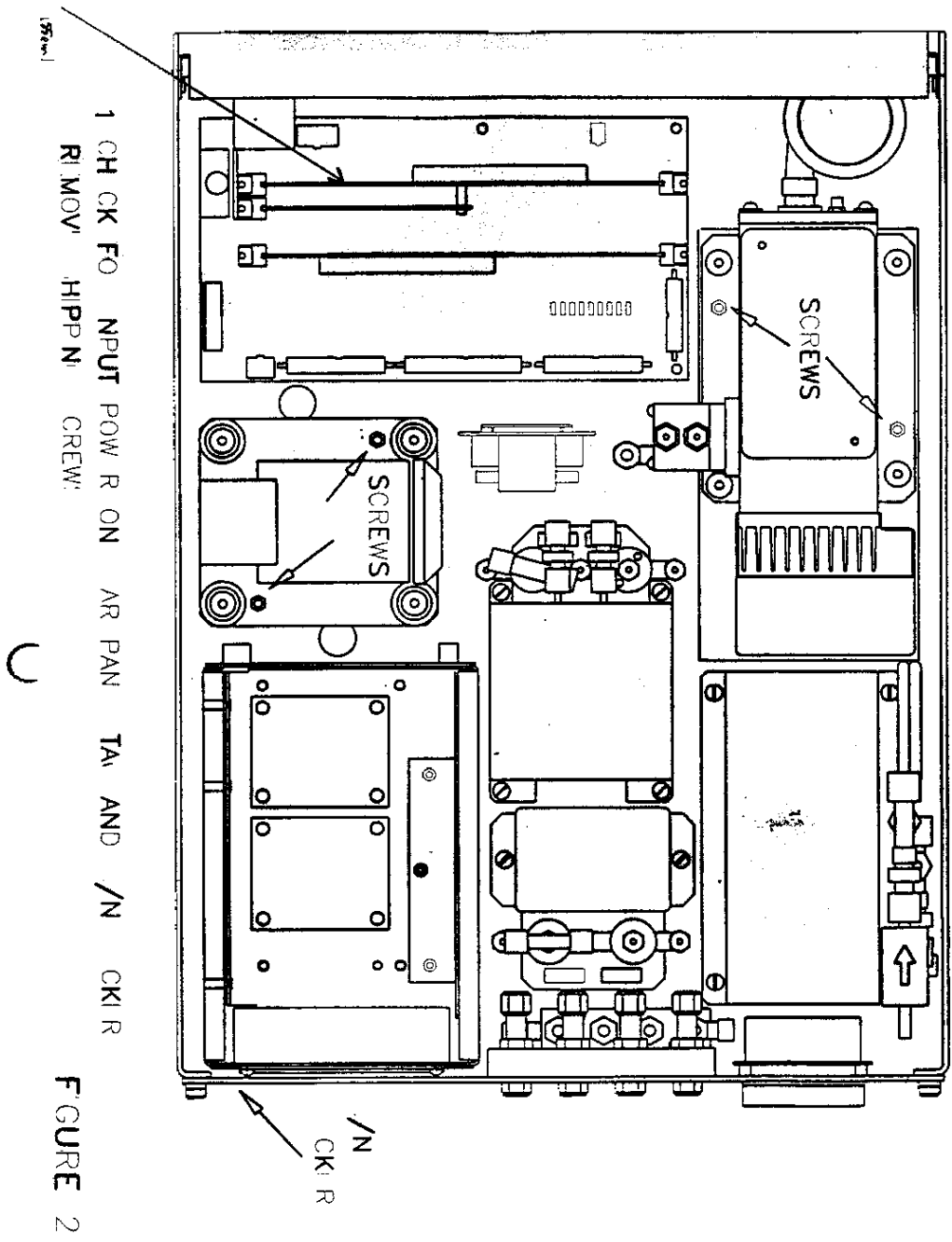
2 CIRCUIT SIDE

3 JUMPER U23-13 TO U23-14 ON CIRCUIT SIDE

8/05/92 ECR #1254 ADDED NOTES LAYER

QTY	CORE	PART OR	MANUFACTURE
REQD	UNIT	IDENTIFYING NUMBER	OR DESCRIPTION
PARTS LIST			
UNLESS OTHERWISE SPECIFIED		CONTRACT NO.	
DIMENSIONS ARE IN INCHES		DATE	
FRACTIONS ARE IN 16ths		APPROVALS	
DECIMALS ARE IN 10ths		DESIGNER	
ANGLES ARE IN DEGREES		DATE	
TOLERANCES ARE AS SHOWN		DRAWN	
MATERIAL		SITE (ORC LAYOUT NO)	
FINISH		SCALE	
60 NOT SCALE DRAWING		SCALE 21	
NEXT ASST APPLICATION		USER OR	
3		2	

NOTES: UNLESS OTHERWISE SPECIFIED



To calibrate the DAC's on the V/F board, do the following

a) Press SETUP-MORE-DIAG. then scroll down to the DAC CALIBRATION diagnostic mode, then press ENTR to start the procedure.

b) The M100A display will read "DAC #0: 60 mV", where 60 mV is the target voltage which should be coming out the DAC (it should be 60 mV). Put the probe of a voltmeter on recorder output terminals 1 and 2 on the M100A rear panel, then press the up/down buttons on the front panel until the voltmeter displays the target voltage (60 mV on the 5 V range). Note that the value on the display will not change. When the voltmeter shows the same value($\pm 3\text{mV}$) as the display, press ENTR.

The reading will be close to 60 mV if the analyzer is setup for the 5V range, 120 mV for the 10V range, etc. DAC #0 is terminals 1 and 2 of the recorder output.

c) The M100A display will now show a new voltage in the same format as above. This voltage will be 90% of the full scale DAC output range (4500 mV on the 5V range). As before, press the up/down buttons on the M100A front panel until the voltmeter displays the same ($\pm 3\text{ mV}$) reading as the M100A display, then press ENTR. The DAC #0 is now calibrated and will be used as a voltage reference for calibrating the ADC.

d) The display will now read ZR: $60 = 60 \pm 3\text{ mV}$, where 60 mV is the voltage being output from the DAC as input to the ADC, and $60 \pm 3\text{ mV}$ is the voltage as read from the ADC. The two values should be the same ($60 = 60$). If they are not, adjust the zero pot (R27) on the V/F board (as indicated by ZR on the display) until the two values are the same, then press ENTR.

e) The M100A display will now read GN:4500=4500 \pm where 4500 is the voltage being output from the DAC as input to the ADC, and 4500 ± 3 is the voltage as read from the ADC. The two values should be the same. If they are not, adjust the gain pot (R3 1) on the V/F board (as indicated by GN on the display) until the two values are the same ($4500 = 4500 \pm 3\text{ mV}$), then press ENTR. The ADC is now calibrated.

f) Next, the analyzer goes through a procedure which calibrates the other 3 DAC's, indicating the % completion as it proceeds. When completed press EXIT to return to upper level menus.

9.3.3.2 Changing Output Voltage Ranges

Several different output voltage ranges can be selected by jumper on the V/F board. See Figure 9.3 for the jumper settings.

Figure 9.4 - V/F Board Jumper Settings