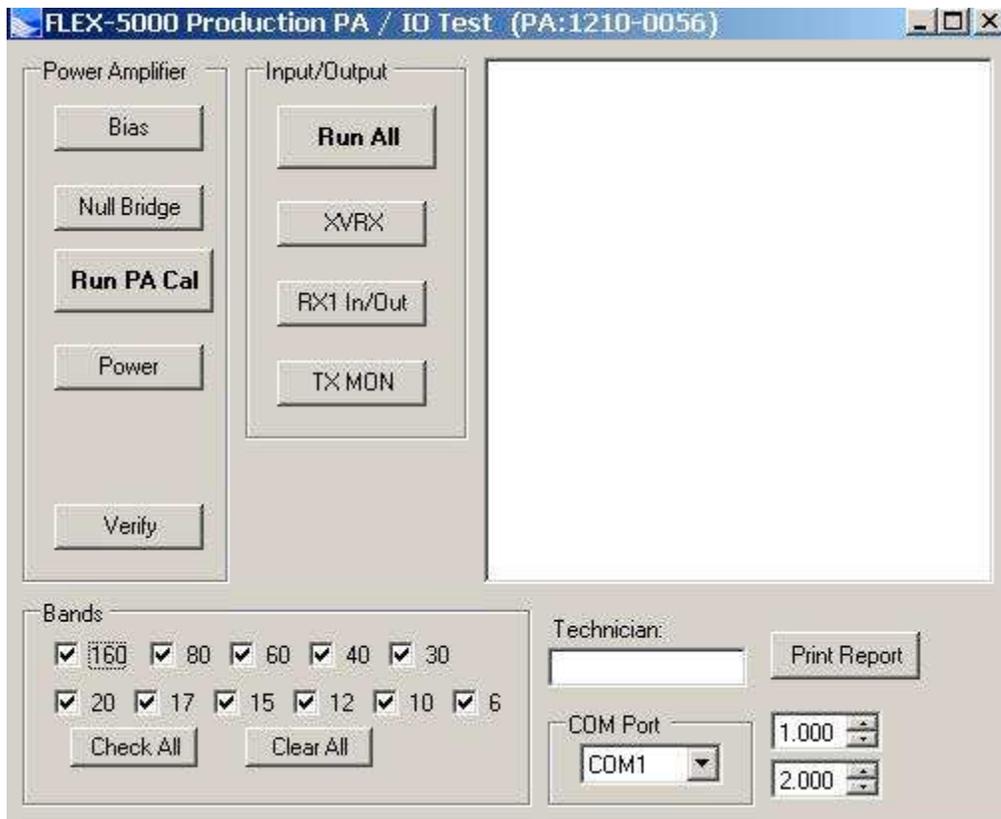


Changing the Bias of the Flex 5000 for Class A power amplifier:

Load up Power SDR with the radio on and connected to a dummy load.

1. Press the "**SHIFT + CTRL + F**" keys. This will bring up a screen that says to check the function of the power on/off switch. Just press "**OK**" to proceed.
2. After that a new screen will appear. At this time press the "**CTRL + ALT + B**" keys. This will enable a menu box in the bottom right corner. When the PA is operating in AB the values are **1 and 2**. (Top and Bottom) To alter the bias settings for the PA to run in Class A set these to values of **2 and 4**.



3. Run the bias check by pressing the "**BIAS**" tab. When the bias routine finishes, your Flex should be running in Class A. It would be advisable to monitor the temperature of the PA while operating in Class A. To enable this function, press the "**CTRL + SHIFT + I**" keys.

4. To revert back to the standard Class AB power amplifier settings, follow the procedural steps again using the numerical values of **1 and 2** in the second step. Note that the software will automatically have those numbers entered into the fields.

Note: The option to run the Flex 5000 series in Class A is not currently supported by Flex. After extensive bench testing, they determined that it might reduce the reliability of the hardware if users exceeded the dissipation ratings of the FETs used in the final amplifier. An easy way to avoid this worry, is to run at somewhat reduced power and watch the temperature of the PA while operating in Class A. **Note that to keep the drivers and PA linear it is recommended**

that the peak power output be limited to around 30 watts output. The chart below clarifies the permissible temperature ranges for the Flex 5000:

Content provided by: FlexRadio Systems Engineering

The FLEX-5000 and FLEX-3000 have a temperature sensor on the RF power amplifier (PA) to monitor the operating temperature of the FETs (power transistors). You can access the **Information Form** from PowerSDR 1.x that will monitor the D/C input voltage along with the PA temperature by using the keyboard sequence <CTRL> <SHIFT> I. See the Figure 1 below for an example.

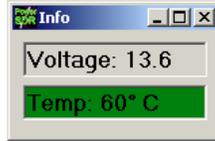


Figure 1

The Temperature Monitor utilizes a four (4) color range scale to visually indicate where in the acceptable temperature range the PA is operating. Below is the FLEX-5000/3000 Power Amplifier Temperature Range Chart.

FLEX-5000/3000 Power Amplifier (PA) Temperature Range Chart		
Status	Temperature Range (degrees C/F)	Comments
Green	less than 69C/156F degrees	Normal operating temperature range.
Yellow	70C/158F to 79C/174F	Upper-end of normal operating temperature range. This is an informational notice. No corrective action is necessary.
Orange	80C/176F to 89C/192F	PA temperature is approaching the maximum recommended operating temperature. Cut back on the RF output or take longer RX breaks to allow the PA temperature to drop below 80C/176F degrees. Taking corrective action is highly recommended.
Red	greater than 90C/194F	PA temperature has exceeded the recommended operating temperature. Do not operate the PA in excess of 90C/194F degrees. Failure to do so may stress the finals and shorten their lifespan. TAKE CORRECTIVE ACTION IMMEDIATELY .

The final devices are actually quite rugged, and rated for continuous duty output at the 100 watt level. Note also that **Class A** operation has never been supported for anything other than the Flex 5000 A and C models.

BIAS adjustment procedure.

Under no circumstances should you stray from the following procedure. Do not click on any other buttons as the test proceeds.

1. in Power SDR press CTRL-SHIFT-F
2. a window will pop up
3. now click on the button labelled BIAS. DO NOT click on anything else.
4. In the window to the right MOS FET currents will be displayed.

5. Wait till the procedure finishes.
6. When the routine finishes the BIAS button will become green indicating all is well.
7. In any other case, i.e. one or more of the 4 MOS FETs are defective, a failure message will appear.