

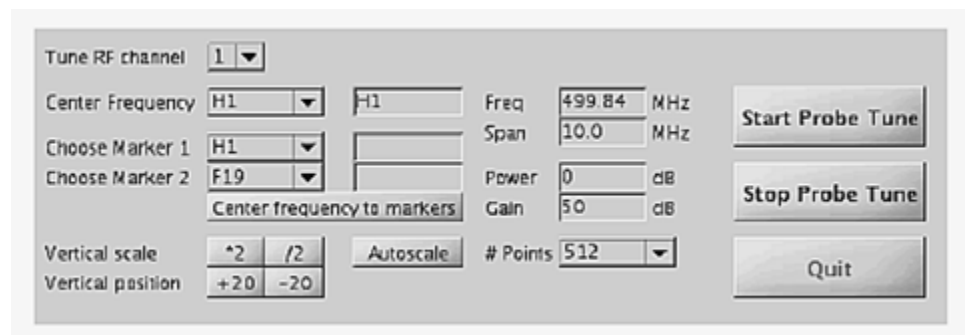
Manually Tuning The Dual Broadband Probe on v400

You should only tune the system if you are running Phosphorous, Platinum or Fluorine NMR experiments or for Carbon and Proton when the signal to noise ratio drops significantly.

Tuning Using Mtune

The Mtune routine runs in the graphics canvas and uses VnmrJ panels.

A: Tuning from 1H to 19F



1. Click on **Tools** on the main menu and select **Manual Tune Probe...** or enter **mtune** on the command line.
2. Select **RF Channel 1**
3. Select **F19** for Center Frequency
4. Click **Start Probe Tune**
5. Choose an appropriate tuning **Power** (may be channel dependent)—typical values are between 0 and 10 dB. Most of the times just use a power of 2-5.
6. Set the tuning **Gain** to 50 dB (a typical gain).
7. Set a frequency **Span** to 60
8. Click **Autoscale**
9. To tune the proton or fluorine, adjust first the **¹H tune knob** and then the **¹H match knob** using the red tuning stick so that the dip on the computer monitor aligns with the dark blue cursor for the frequency you are trying to tune to. **The aim is to align the dip at its lowest point on the blue frequency marker using the tune and match knobs.** Please do not force the tuning knobs, as you can break the capacitor in the probes.
10. Once the probe is tuned, click the **Stop Probe Tune** button and then **Quit** to return to your experimental set up page.

After you run your Experiment, you MUST tune the probe back to 1H Frequency. Follow the procedure above except the Center Frequency is set to H1

ess Tools Help

No data in data file

Exp:1 Seq: mtune Index: 1

vp 0 cr 494.83 vs 0.01 delta

Start Acquire Process Show Time Stop

Probe tune

Tune RF channel 1

Center Frequency H1 H1 Freq 499.82 MHz

Span 40.0 MHz

Choose Marker 1 H1

Choose Marker 2 H1

Center frequency to markers

Power 0 dB

Gain 50 dB

Vertical scale *2 /2 Autoscale # Points 512

Vertical position +20 -20

Start Probe Tune

Stop Probe Tune

Quit

FID: 1 CT: 7 286:44:08

No data in data file

annels, Pa... [Untitled1 - OpenOffi... [vn_menu.pdf - Adob... [Vnmr] Installation an... [NMR Spectroscopy ... Starting Take Screens...

B: Tuning from 13C to 31P

1. Click on **Tools** on the main menu and select **Manual Tune Probe...** or enter **mtune** on the command line.
2. Select **RF Channel 2**
3. Select **P31** for Center Frequency and note the frequency change from 100(for C13) to 161 MHz. Click **Start Probe Tune** button.

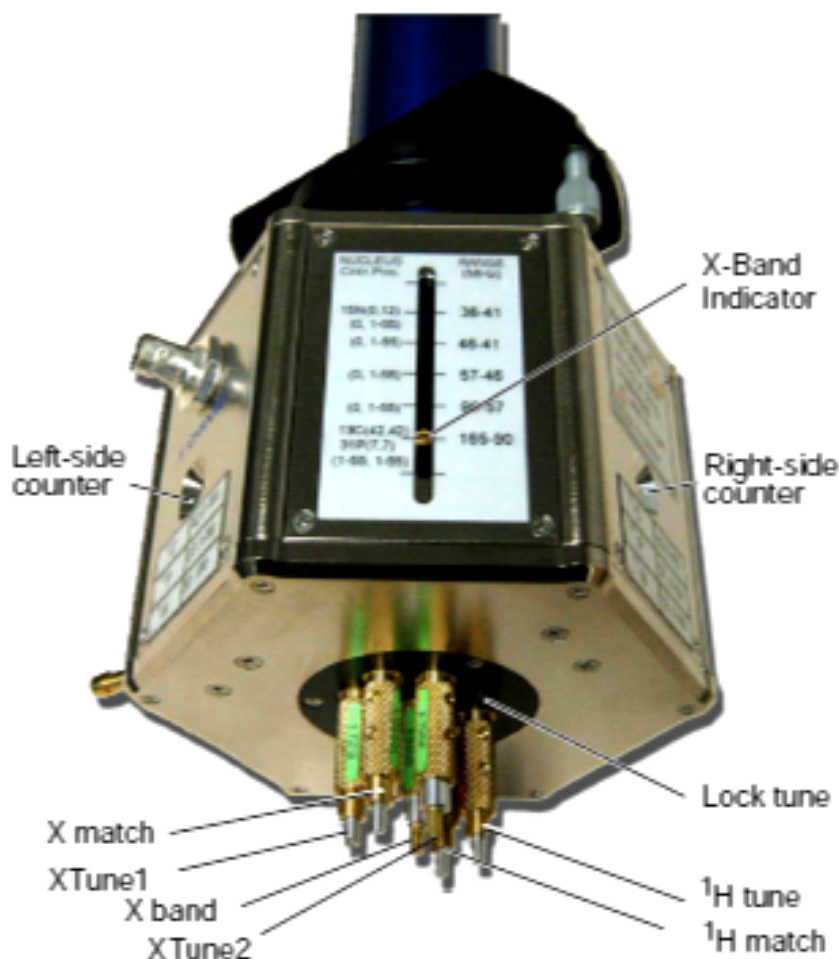


Figure 1. AutoX Dual Broadband Probe Tuning Knobs and Connectors

4. Choose an appropriate tuning **Power** (may be channel dependent)—typical values are between 0 and 10 dB. Most of the times just use a power of 2-5.
5. Set the tuning **Gain** to 50 dB (a typical gain).
6. Set a frequency **Span to 120** MHz. You will see a dip at 100MHz (the C13 frequency) and the center of the tuning window will be on P31 with a blue line at 161 MHz
7. Click **Autoscale**
8. Use the red tuning rod, turn the **xtune1** in the direction that moves the dip from 100 MHz to the center of the tuning window. Continue to tune until you get to the end and you can not turn **xtune 1** anymore.
9. Now tune **xtune 2** in the same direction until the dip is almost on the P31 frequency.

10. Change the **Span** in #6 above to **20MHz** to zoom into the center frequency and hit the enter button and then click **Autoscale** again.
11. Use **xtune 2** to bring the dip onto the P31 frequency.
12. Adjust **X-match** to minimize the dip and then bring the dip back to the P31 frequency using **xtune 1** or **x tune 2**. **Again, the aim is to align the dip at its lowest point on the blue frequency marker using the x-tune and x-match knobs**
13. Once you have finished tuning, click the **Stop Probe Tune** button and then **Quit** to return to your experimental set up page and run your experiment.

When you finish your P31 Experiment, you MUST tune the probe back to C13 using the above procedure (B) except you will use C13 as your Center Frequency.

Troubleshooting tips:

- ❖ **Cannot find the tuning dip?** It is easy to lose dip amongst all the waves etc.
 - Set the **span** to about 200 and click the **Autoscale** again.
 - If you are tuning to 13C note the 13C numbers next to the right-side (xtune2) or left-side (xtune1) counter on the probe base.
 - Use the tuning rod and tune one of the xtune rods until the corresponding counter reads that counter number for 13C. Watch the computer screen as you tune and you will eventually see the dip moving.
 - Once you see the dip, then carefully use the other xtune rod and xmatch to finish the tuning.