

Probe tuning for on the INOVA 500, 501 and 600

Use these instructions to optimize the tuning for the observe and decoupler channels. Tuning is recommended on the 500 and 501 and **required** on the 600.

All experiments:

1. Make sure your sample is positioned correctly and in the probe
2. Set up a proton experiment
3. If you are planning to observe ^{13}C or do $^1\text{H}/^{13}\text{C}$ correlation experiments make sure the decoupler nucleus is set to C13 [Acquisition tab → Channels group; or type: **dn?**]
4. Click the Standard tab → Setup Hardware button or type **su** on command line
5. Connect the ^1H channel of the probe to the tune interface (see diagrams on following pages):
 - a. Find the **H** port on the probe
 - b. Follow the cable from the H port: it will either go to a tubular filter on the floor or to the **PROBE** port on the **high-band preamp** (the one on the right)
 - c. Disconnect the cable from the filter or preamp and connect it to the **PROBE** port on the **tune interface**
 - d. ON THE 600 ONLY: Move the cable from the **OUTPUT** port of the **high-band preamp** to the **TUNE OUTPUT** in the center of the preamp stand
6. Confirm (or set) **ATTEN** is 9 on the **tune interface**
7. Change **CHAN(nel)** to **1** on the **tune interface** [Note: Channel 1 is *always* the *observed* nucleus, channel 2 is the first *decoupled* nucleus, channel 3 is the second decoupled nucleus etc. You ran 'setup hardware' in a ^1H experiment (possibly with the decoupler set to ^{13}C), which makes channel 1 ^1H (and channel 2 ^{13}C). If you run setup hardware from a carbon experiment, channel 1 would be ^{13}C and channel 2 ^1H .]
8. Minimize the value displayed on the tune interface by iteratively adjusting:
 - a. LNC (500): the **upper** then **lower** portions of the **blue thumbscrew** (in that order) at the base of the probe
 - b. DBG (501): the **red** and **blue thumbscrews** (in that order) at the base of the probe [Note: The red thumbscrew is *extremely* sensitive so make very small adjustments!]
 - c. HCN (600): the **upper** than **lower** portion of the **brass thumbscrew** labeled **PROTON** (in that order)
9. *You should be able to get it down below 010. If that's not the case, make a note in the logbook and email and/or talk to Ivan or Tony!* [Note: the 500 may be difficult to get below 10. Do the best you can but try for at most 25.]
10. Set the **CHANNEL** to **0** on the tune interface
11. Disconnect the proton cable from the **tune interface** and reconnect it to the filter or high band preamp
12. ON THE 600 ONLY: Move the cable from the **TUNE OUTPUT** port to the **OUTPUT** port on the **high-band preamp**
13. If you are doing ^1H and homonuclear 2D only (COSYs, TOCSY, NOESY, ROESY etc.) you are DONE.

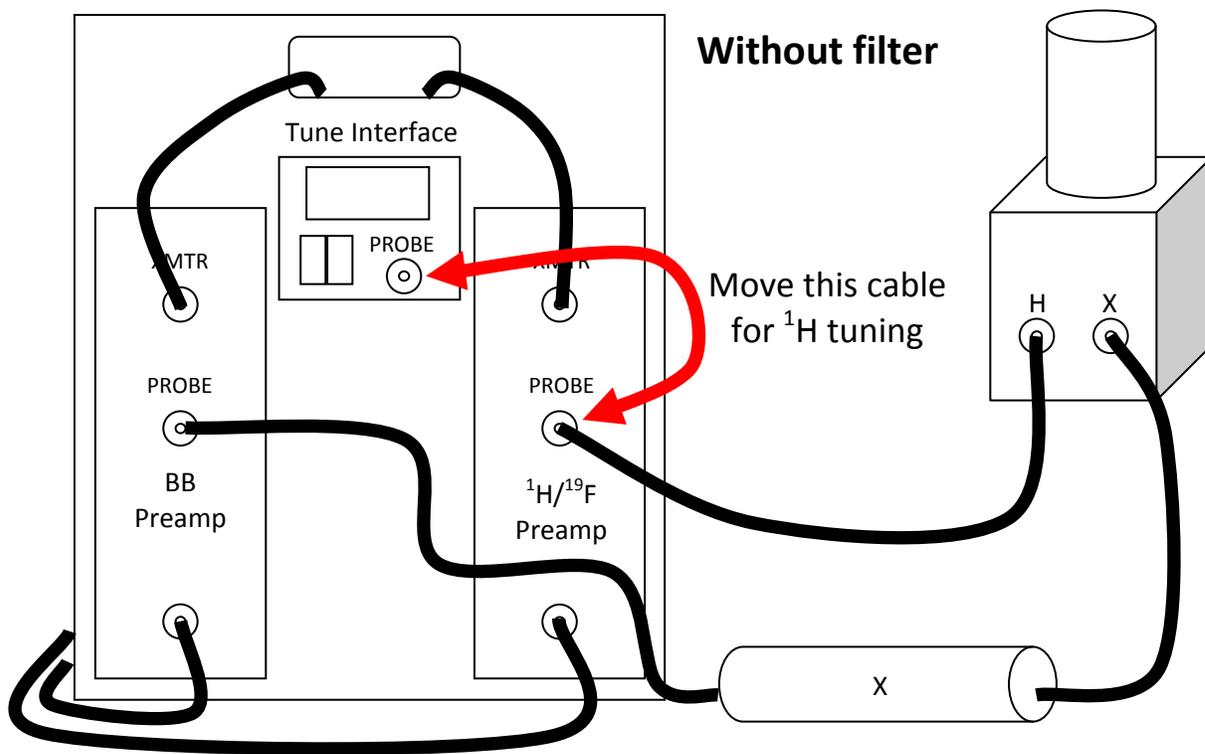
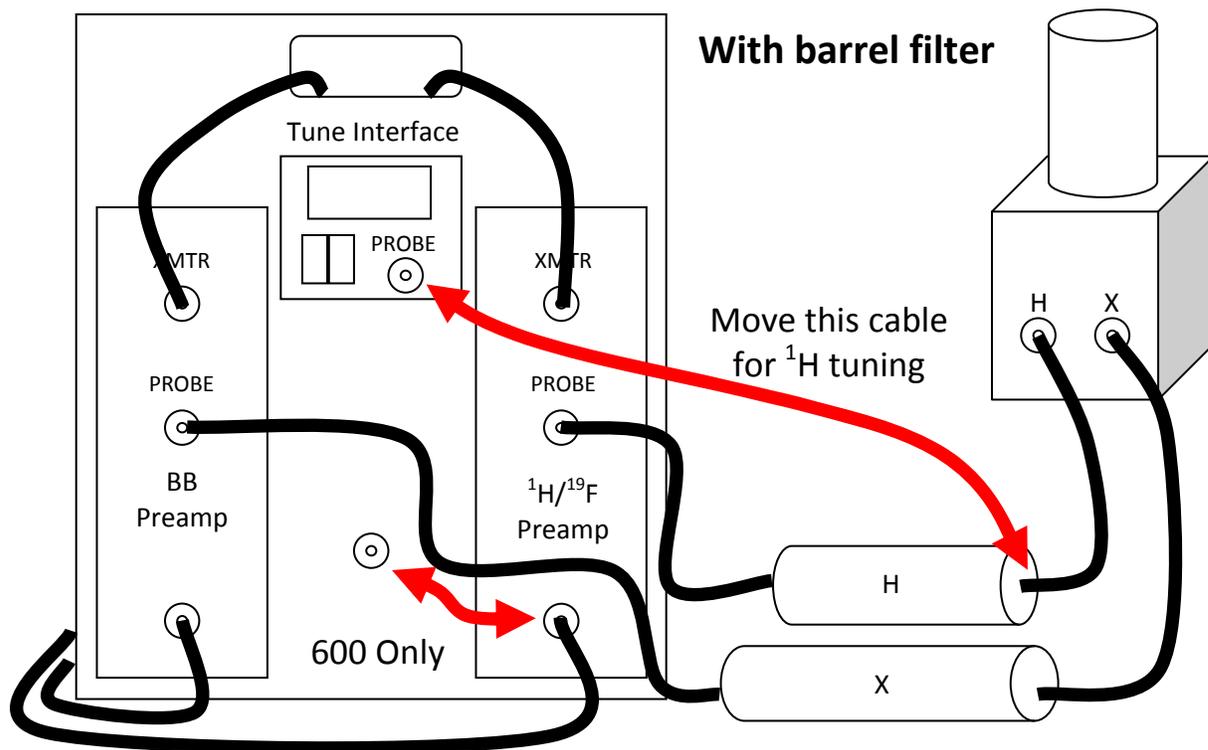
Heteronuclear experiments:

14. Connect the broadband or ^{13}C channel of the probe to the tune interface (see diagrams on following pages):
 - a. Connect the Find the **X** or **C** port on the probe

- b. Follow the cable from the probe to the tubular or rectangular filter
 - c. Move the cable from the filter to the **PROBE** port on the **tune interface**
 - d. **ON THE 600 ONLY:** Move the cable from the **OUTPUT** port of the **low-band preamp** (the one on the left) to the **TUNE OUTPUT** in the center of the preamp stand
15. Turn the tune interface to channel **2** using the **CHAN+** button
 16. Minimize the value displayed on the tune interface by iteratively adjusting:
 - a. LNC (500): the **upper** then **lower** portions of the **red thumbscrew** (in that order) at the base of the probe
 - b. DBG (501): the **gold** and **black thumbscrews** (in that order) at the base of the probe
 - c. HCN (600): the **brass thumbscrew** labeled **CARBON** [Note: there is only one adjustment for X on the 600 HCN]
 17. *On the 500 and 501 you should be able to get it down to 010. On the 600 the value is usually between 30 and 100. If that's not the case, make a note in the logbook and email and/or talk to Ivan or Tony.*
 18. Turn the tune interface to **0** using the **CHAN –** button. The display should go dark
 19. Disconnect the cable from the tune interface and reconnect it to the filter
 20. **ON THE 600 ONLY:** Move the cable from the **TUNE OUTPUT** port to the **OUTPUT** port on the **low-band preamp**

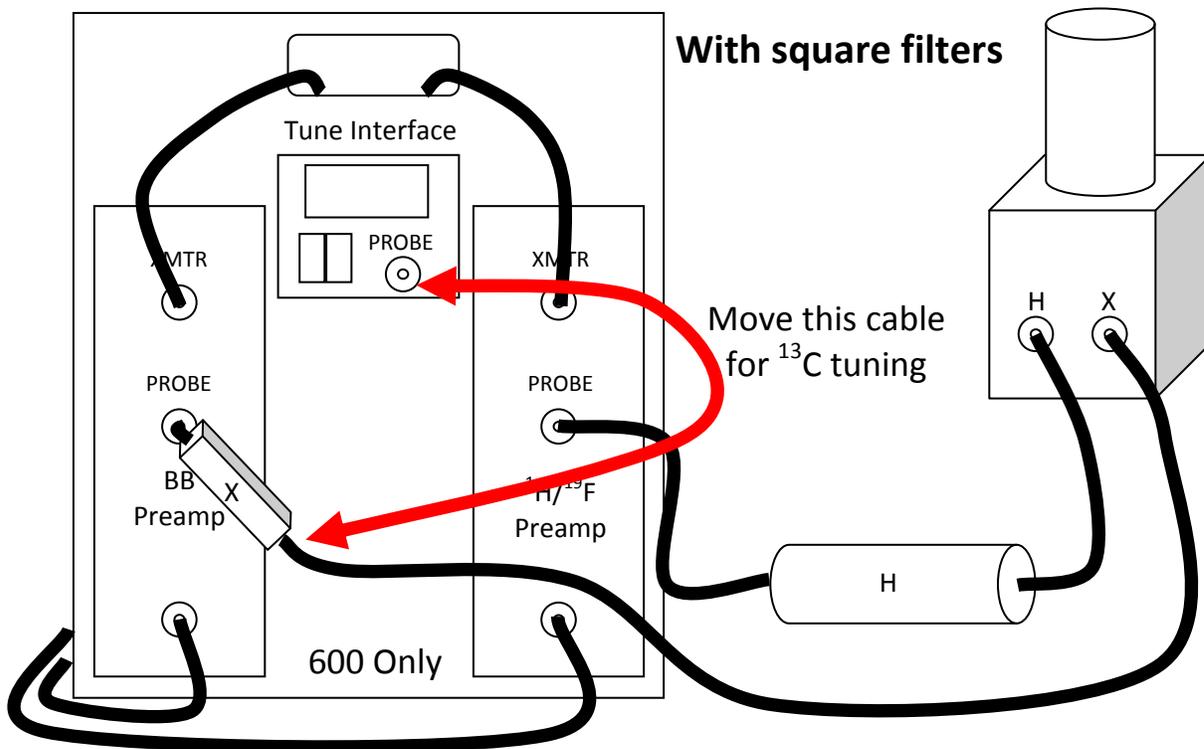
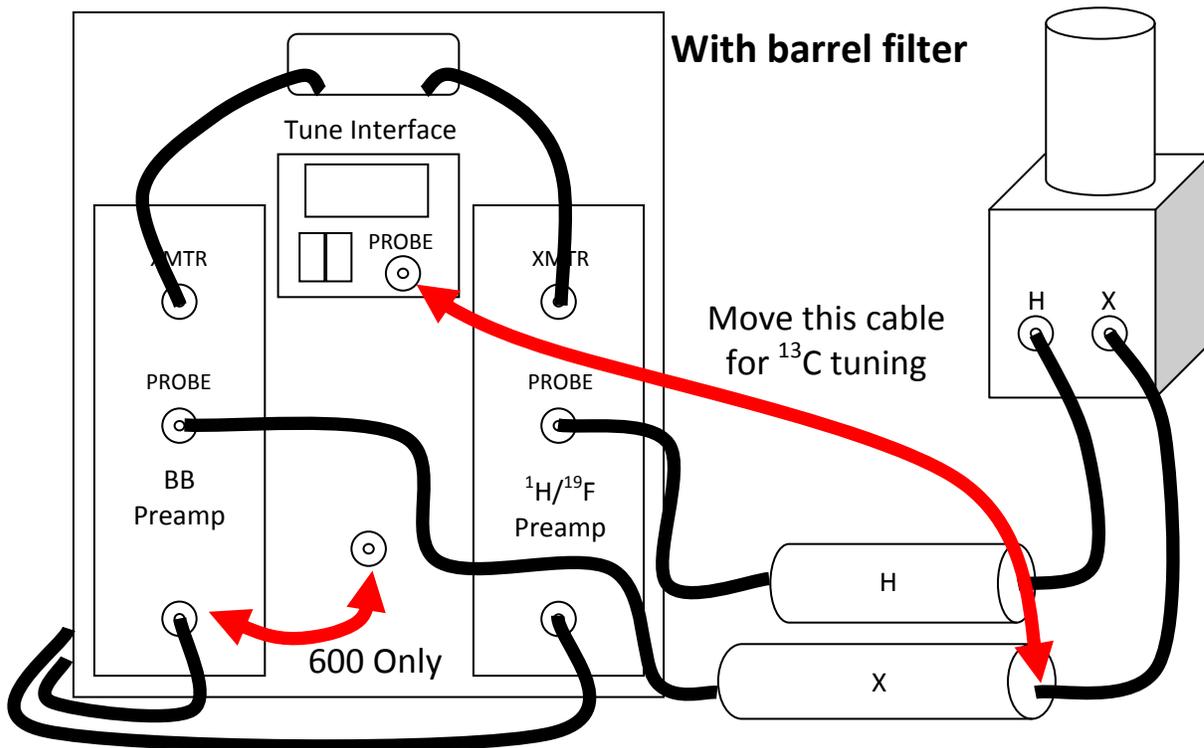
NOTE: if the ^{13}C tuning required a lot of adjustment, recheck ^1H tuning by repeating the procedure above!

Cable connections for ^1H tuning



Remember to put the cables back when you are done!

Cable connections for ^{13}C tuning



Remember to put the cables back when you are done!