

## How to install a USALS Motor

A Condensed Guide By

Michael Graves, KE4EST

1. First and very important. Make absolutely sure your pole or mast is plumb. You can get away with a mast that is off a little when only aiming at one satellite for a fixed dish, but **NOT** with a motor used for tuning several satellites. If ground mounted make sure you have a good stout pole. If not, when the weight of your motor and dish move to the East and West most satellites from your location, the pole will twist or pull and move it out of plumb. If using a mast such as a J-Pole it is very important to use 2-3 supporting arms to keep it very stable.
2. Mount your motor on the pole, making sure to **evenly** tighten the 4 nuts that hold the motor to the pole. If these are not done evenly you can pull the motor out of level, or bend the thin metal motor bracket. At this point do not full tighten the 4 bolts holding the motor to the pole. Just tighten them snug enough to keep the motor from sliding down the pole but loose enough so the whole motor assembly can be rotated on the pole by hand, with a little force.
3. Set the latitude setting on your motor to the latitude of your location. This should not have to be touched again. Sometimes this has to be tweaked just a hair, but for now set it and **do not** touch it again, throughout the rest of this tutorial.
4. Now mount your dish on the motor, making sure to put the through hole bolt through the motor arm and dish assembly. Yes, I am aware that some motors do not have one. It is a good idea to drill a hole and add one. This keeps the dish from sliding on the motor arm. Over time even if the dish is tightened very good, it can still move just a bit, with use and temperature extremes. This can give you headaches down the road.
5. Now look in the manual that came with your motor and set your dish elevation per the formula in the manual. The elevation will be different than what it would be if mounting the dish by itself for fixed satellite operation.
6. Set the skew for your LNBF to zero (0). As the motor turns it will be moving the whole dish including LNBF of course where it needs to go. For this reason, no need to set a skew on your LNBF.
7. Now for the reason for not fully tightening the motor bracket. Using a compass or smart phone app of your choice, move the whole motor/dish assembly on the pole so the dish is pointing to what looks to be pretty close to your true south. Leave the motor bracket nuts still loose enough to turn at this point.
8. Now using good quality RG-6 coax, run a jumper from your LNBF to the motor where it says LNB IN or LNBF. Now run another jumper from the other port on the motor to your receiver. It is imperative that you can see a signal and quality meter while you are tuning the dish. If you do not have a good quality meter, then run an extension cord and set up a small TV and receiver at

the dish site. **IMPORTANT**, even if you have a meter, at this point you still need to hook up to your receiver.

9. Go into the menu on your receiver and choose the closest satellite to your latitude. So let's say your longitude is 86.1. Now let's look and see what satellite is active and close. If you go to [lynosat.com](http://lynosat.com) or [sathint.com](http://sathint.com) and look you will see that is 87W. So now go in your receiver and select 87W Ku. Then for the settings for that satellite make sure you select or manually input a known current active transponder on your chosen satellite. Also enter Horizontal or Vertical and the known symbol rate. You can look at the above websites for active transponders. You can also get on the forum at [SatelliteGuys.us](http://SatelliteGuys.us) and go to the FTA section and ask. "Hey guys can someone tell me an active transponder for satellite xx.x°W?.....". Now, go on down and make sure your LO or "Local Oscillator" is set for your LNBF you are using. If you have a standard LNBF for North America that will be 10750. If you have a universal LNBF you need to set your LO to 10600 and turn 22kHz tone on. Also for universal you can set the LO to 9750/10600 and in most receivers this will automatically turn on 22kHz and grey it out so you cannot turn it off.

10. **CRITICAL STEP (That most miss their first time)**. Next, this is why you need your receiver hooked up at this time: Go down in your settings for your chosen satellite to the motor setting. Select USALS and then hit OK/select button normally while USALS is highlighted. This will bring up a menu to enter your longitude and latitude. This needs to be entered in decimal format and not degrees, minutes and seconds. You can go to [dishpointer.com](http://dishpointer.com), use your smart phone, use your GPS, etc to find your exact longitude and latitude. Once entered and you exit this menu most receivers will issue a command and you will see your motor move. It may not move much. It will depend on how far off of zero the satellite you chose is located. Note there is a little scale behind the rotating shaft on your motor this should be on zero to start with. If it is not, in the USALS menu issue the goto zero command and then start over with step 10. Also make note that this is the only time you will have to enter your longitude and latitude. Once you are set-up and running you have to go into the different satellites you want to view and set them for USALS so the receiver and motor know that is what you want to happen to use that satellite. You will not however have to enter your coordinates again.

11. Using our example above unless your longitude is exactly 87°W, your motor will move some. If not your receiver may have a move command or similar. This though is the **critical step** that most miss. If this is not done once you continue your motor will not be set right to track the arc. Continuing on, at this point if you have a good meter you want to use, you can connect a jumper from the LNBF directly to your meter. Just make sure your meter is set-up for proper LO and has an active transponder entered and selected. **Now** rotate the whole motor/dish assembly on the pole ever so slightly back and forth. No Signal? Change the elevation on your dish a small amount either up or down, and rotate the whole motor/dish assembly again. Repeat this until you find a signal and then peak out the signal by rotating the motor on the pole and changing the dish elevation in small increments.

**DO NOT CHANGE THE LATITUDE SETTING ON THE MOTOR** (sometimes you may have to move it a hair, but for now leave it be), just peak by rotating on pole and elevation on dish.

When you have a good quality reading, you can tighten everything down. Using a level make sure to tighten the nuts on the motor bracket evenly and in an alternating sequence until tight. This will keep it level and hopefully not warp the thin metal on the motor bracket.

12. Now if you were using a meter, go ahead and hook back up to your receiver and check things there. You should have a good reading on the quality meter. Note: 90% of receivers will not go all the way to 100. If you have a level in the high-60's to mid-70's that is a good reading. Now select a different satellite. Say choose something 10 degrees away like in this example that would be 97°W. Make sure to go into 97 and set the proper LO etc. and set motor for USALS. Remember you do not have to enter your coordinates again. At this point if all is well you do not even have to enter an active transponder just do a blind scan on 97. You should start seeing dozens of channels scanning in.

13. Continue moving to different satellites and checking out the signals. Now, if you notice that it does not seem to work well on satellites that are more than say 30 degrees away from your true south. You may need to make some other adjustments.

First send your motor to a satellite quite a way off from your true south. In our example of using 87°W for closest to true south; go to 125°W. If it seems off, first go out and check for level on different spots on your pole, motor, motor bracket, etc. Sometimes even though you think you have something stout enough you find out there is more weight pulling than you realize. If, however everything is still level and plumb, now you can tweak that latitude adjustment on your motor. Just remember though, you will only want to move it about a mm at a time.

Ok I have read this whole guide three times and did everything, and well everything is plumb and level. I very carefully touched the latitude adjustment on the motor. BUT I STILL CAN NOT GET 125 TO COME IN RIGHT!!!! ARGH!!!!

Over the years I have found that some motors do not work the best at their extremes. Also some motors have more “slop” in them than others. By “slop” I mean if you grab the shaft you notice you can turn the shaft a bit back and forth with little effort. In this case sometimes you will have to use DiSEqC 1.2 for these satellites. If you go in the motor menu and select DiSEqC instead of USALS and choose a number, you wish to use you can do that also. If needed just ask me in the forum for more help. As this guide is mainly for setting up USALS.

**FINAL STEP 14. ENJOY!!**

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