

Ku-band Upgrade Manual

Welcome to the wonderful world of Ku-band—where all the “live” TV and radio action is, including:

- News
- Local and regional sporting events of every variety
- Cultural events
- Educational feeds from schools and colleges
- Canadian programming
- Corporate seminars, etc., etc., etc.

News

You’ve probably seen TV station vans with a satellite dish on the roof wherever news is happening. These news crews cover a story from start to finish, beam it up to a satellite and the home station tapes it. With Ku-band, you can watch the news story in its entirety before it’s edited down to a short segment on the evening news.

Local Sports, Regional Sports, Educational Feeds, and Seminars

Major networks carry professional sports and cover only a few local and regional events. Ku-band gives you a chance to watch local, regional, state, and even some professional sports during prime time and non-prime time periods. You can watch harder-to-find sports like bowling, surfing, ice skating, auto racing, etc., from around the country and even the world on Ku-band.

With Ku-band, you may be able to watch a local college class being broadcast to another classroom or advanced courses broadcast by major universities. You can catch corporate tele-conferences done in your area or U.S. governmental networking, which is largely unscrambled, on Ku-band. You can also pick up a variety of Canadian broadcasts on Ku-band—anything from the arts to politics, Parliament to weather, and more.

Tuning Your System

Tuning your system for Ku-band will also “fine tune” your C-band system. You will get the sharpest reception possible due to the critical tuning required for Ku-band. And Skyvision is ready to assist with our handy SkyPeaker Trio II™ Tune-up Kit. See back page for order information.

Technical Support

Upgrading your system with Ku-band is a “do-it-yourself” project with the simple step-by-step instructions in this manual. But remember, Skyvision’s Technical Department is ready to help you with installation or technical problem.

Tech Support Line
218-739-5232 International
800-500-9279 Toll Free

Tech Support Hours (Central time)
For fastest service: Monday through
Friday, 9:30 a.m. - 6:00 p.m.

Ku-band Upgrade Installation Instructions

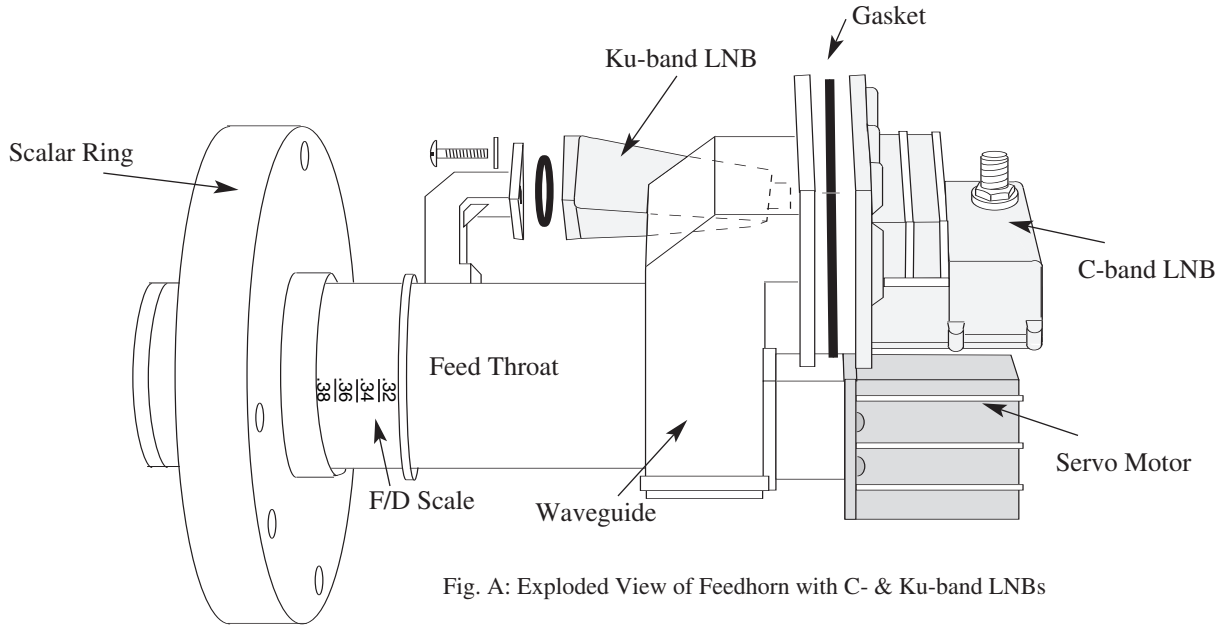


Fig. A: Exploded View of Feedhorn with C- & Ku-band LNBS

CAUTION: Before doing any work on your LNBS or your satellite system, unplug your satellite receiver from the AC wall outlet in your home.

Step 1: Assemble LNBS to the Feedhorn

A. Installation of the C-band LNB

To install the C-band LNB, you must first determine whether or not you need to remove the waveguide. (See waveguide in Fig. A.) Older models of feedhorns have removable waveguides. Newer feedhorns, like the one pictured above, have non-removable waveguides. To determine whether or not to remove the waveguide on your older feed, compare your LNB with Fig. B at right. LNB #1 is a standard C-band LNB. LNB #2 is a newer version called “elbowless” which many dealers sell. If your LNB is “elbowless,” remove or leave the waveguide off the feedhorn.

If you have a standard C-band LNB (#1), the waveguide must be attached to the feedhorn. (Nuts and bolts are furnished in the packet.) Use the gaskets provided as indicated in the drawing. To make the process easier, attach the LNB to the waveguide first, then attach to feedhorn. There are only two ways the LNB will bolt on the feedhorn, and either way is correct.

B. Installation of Ku-band LNB

Now attach your Ku-band LNB as shown in Fig. A. There are only two ways the Ku-band LNB will fit on the feedhorn. As long as the rectangular hole on the feedhorn and LNB are matched, either way is correct.

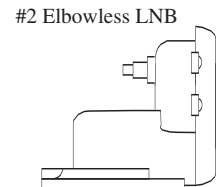
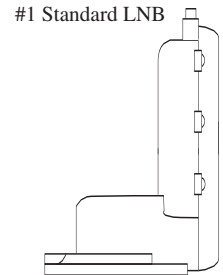


Fig. B: Types of C-band LNBS

Step 2: Calculate Focal Length and F/D Ratio

What is **Focal Length**? Your satellite dish captures the signal from a satellite. Because of the shape of the dish, it reflects the signal to a single point somewhere in front of your dish called the “focal point.” The distance from the focal point to the center of your dish is called the “focal length.” The focal point is where you feedhorn should be mounted for your LNBS to receive the maximum signal. See Fig. C.

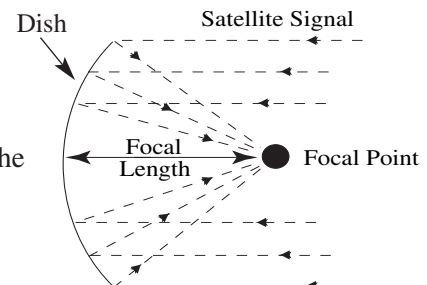


Fig. C: Focal point of your dish.



How to Find the Focal Length of Your Dish

The focal length and F/D ratio of your dish were supplied with your dish. Check your records for this information. If it is not available, you can use a simple equation to determine focal length. First you need to take a couple of measurements. You will need:

- Masking or Scotch tape
- Tape measure
- Paper (or this manual)
- Pencil
- String, such as kite string or fishing line

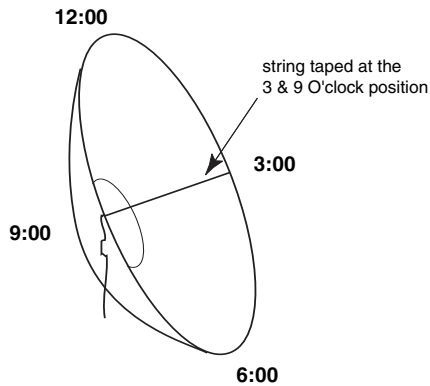


Fig. D: Stringing the Dish

A. Measure Depth

Stand in front of your dish, imagine that it's a clock with 12:00 at the top, 6:00 at the bottom, 9:00 and 3:00 in their respective positions. (See Fig. D.) Using string and tape, stretch it from the 9:00 to the 3:00 position, taping it in place. Make sure the string is tight. With a tape measure, get the depth of the dish from the center out to the string. (See Fig. E.) This is the depth of the dish. Write the depth in the space below.

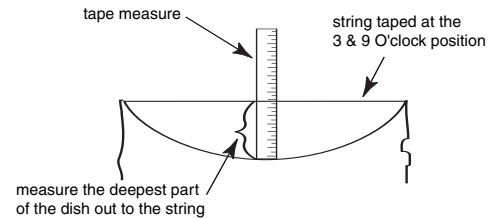


Fig. E: How deep is your dish?

Depth = _____ inches.

B. Measure Diameter

Now measure in inches the diameter of your dish from the 9:00 to the 3:00 positions. Write this distance down in the space below (in line C). With these two numbers, you will be able to determine the focal length of your dish using the formula in Fig. F.

Diameter = _____ inches.

C. Calculate Focal Length

The formula to calculate focal length may look complex, but it's not. Follow the steps below.

- Square the diameter. (D^2) That means multiply the diameter of your dish (in inches) times itself. Write the number in the space in Fig. F marked D

Example: Your dish diameter is 10 feet. This is 120 inches. Multiply 120" x 120" = 14,400."

- Multiply the depth of your dish times 16. (The letter d is the depth of the dish.) Write the number in the space in Fig. F marked 16d. Example: Your dish has a depth of 21". Multiply 21"(d) x 16 = 336."
- Divide the diameter squared (D^2) by the depth x 16 (16d). Write the number in the space in Fig. F marked FL: this is your Focal Length. Example: 14,400 (D^2) ÷ 336 (16d) = 42.86; the Focal Length of our dish.

$$\text{Focal Length (FL)} = \frac{\text{Diameter Squared (D}^2\text{)}}{16 \times \text{depth (16d)}} \quad \text{or} \quad \text{FL} = \frac{D^2}{16d}$$

$$\text{FL} = \frac{\text{_____ (D}^2\text{)}}{\text{_____ (16d)}} \quad \text{or} \quad \text{D}^2 \div 16d = \text{FL} \quad \text{FL} = \text{_____}$$

Fig. F: Focal Length equation.

D. Calculate the F/D Ratio

F/D Ratio is a ratio of the diameter of your dish to the focal length. You need to know the F/D ratio to determine component compatibility and to make future installation adjustments. To determine the F/D Ratio:

Divide the diameter of your dish (in inches) into the focal length (in inches) you just calculated.
Example: 42.86" (FL) ÷ 120" (D^2) = .36 F/D ratio.

If your number comes out to .32 or lower, you have a deep dish. Any numbers higher than .32 would be considered a shallow dish.



Step 3: Assemble Feedhorn to the Dish

A. Slide or Screw the Scalar Ring onto the Feed Throat

If you have a feedhorn with a sliding scalar ring, match the F/D ratio you just calculated to the numbers listed on the feedthroat (See Fig. A) and tighten the bolt on the backside. If you have a feedhorn with a screwing scalar ring, you need to find the F/D gauge that came with your feedhorn. Turn the scalar ring on the throat until the F/D gauge indicates the F/D ratio you calculated and tighten the bolt on the backside of the ring.

B. Install New C/Ku-band Feedhorn

Disconnect the coax, snip the polarity wires* from the old C-band feedhorn, and remove the feedhorn from your dish. Install your new C/Ku-band feedhorn. You're ready to connect the coax cables and the polarity wires.

***The 3 wires coming from the servo motor are red, black, and white. If the 3 wires in your cable bundle going to your receiver are different colors (i.e., the red servo motor wire is connected to a green wire in your cable bundle), leave about 1/2" on the cable side of the connections. By doing this, you will know which color wire in your cable bundle connects to the red, black, or white wire of the servo motor.**

CAUTION: Before doing any work on your satellite system, unplug your satellite receiver from the AC wall outlet in your home.

C. Connect the 3 Servo Motor Wires

You don't have to strip your wires, just push a servo motor wire (red, black or white) into one hole of the Scotch Loks[®] provided and the corresponding wire in the cable bundle in the other hole. Make sure you push them in as far as you can.

D. Squeeze the Red Dot

Using a pliers, squeeze the red dot on the top until it's flush with the main body of the Scotch Lok[®]. If you look at the Scotch Lok[®], you'll see the silicone seal around the wires. This is a weather sealant that keeps the connection moisture proof.

E. Connect your C-band LNB Coax to Your C-band LNB

Put a new "F" connector on your second coax and connect it to your new Ku-band LNB. Move the ladder away from the dish. Now go inside, plug in your receiver and move the dish to the lowest satellite on the eastern or western horizon.

Step 4: Set the Polar Axis on Feedhorn

The servo motor must be positioned a certain way on your dish so it can move the probe inside the feed throat to receive both horizontal and vertical polarized transponders. Without setting the polar axis, the servo motor would give you either horizontal or vertical polarity—not both. It would run to its limit and "chatter", potentially causing servo motor failure.

Lining up the polar axis with the feedhorn is simple. On the back of the servo motor is an arrow. (See Fig. H.) With your dish pointing due south this arrow will point straight up. Loosen the bolt on the scalar ring and rotate the feed throat until the arrow is straight up. Don't worry, you're not going to change the F/D ratio enough to make a difference.

For a Chaparral Feed: With the dish pointing straight south, the Ku LNB is at 10 o'clock and the C-band LNB is at 4 o'clock. (See Fig. G.)

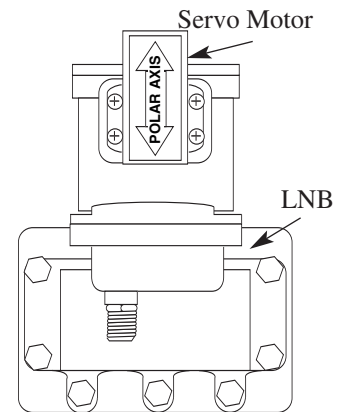


Fig. H: Point the arrow straight up

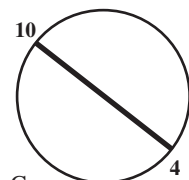


Fig. G



Step 5: Check Focal Length

Measure from the center of your dish to the feed throat cover and add 1/4" to the total. If this measurement is different from the focal length you calculated in Step 2, adjust your feedhorn assembly to match the focal length by moving the assembly in or out on the feed support, ie., buttonhook, tripod, or quad support legs. Do not change the F/D gauge setting from step 3A. Move the whole assembly by adjusting the buttonhook, or tri/quad legs toward or away from the dish. In some applications, you may need to use spacers to obtain this measurement. Your focal distance should be from the center of the face of the antenna to 1/4" inside the new feedhorn's throat.

Step 6: Check Focal Point To Ensure that the Feedhorn is Centered

Measure from the edge of the dish to the feedhorn at 3 points around the dish. If the measurements are equal, the feedhorn is centered. If not, figure the average measurement by adding the 3 measurements and dividing the total by 3. This number, at all 3 points, will center your feedhorn and is the distance each measurement should be. Adjust your feed support (quad legs, tripod, or buttonhook) to arrive at this measurement. Doublecheck your focal length. Now you are centered.

Easier Dish Alignment with a Skyvision SkyPeaker Trio II™ Tune Up Kit

There are many benefits to a tune up kit from Skyvision. The cost of hiring a service man to tune your dish is equal to, or more than, the cost of the SkyPeaker Trio II™ Tune Up Kit. It pays for itself right away. Also, you can use it anytime your dish has been bumped out of alignment by high winds. Skyvision recommends you tune your dish twice a year; once in the spring after the hard weather of winter and also in the fall after the summer storms. See page 8 for order information.

Step 7: Peaking the C-band

Note: Do not peak your dish if the wind is over 5 mph!

Movements you make with your dish will affect picture quality on your TV. You will want to know immediately how each movement affects picture quality. Choose one of the following options:

1. Bring your satellite receiver and a portable TV out to the dish and connect the LNB, control wires (dish mover and servo motor), and AC power to the satellite receiver;
2. If you have a UHF remote control and the distance to your dish is not more than 100', you can run a piece of coax from the satellite receiver in your home to the dish and bring a portable TV outside;
3. Use a set of "walkie talkies" and have someone in the house relay information about the picture quality while you are making movements with the dish;
4. Have someone in the house relay the information in a loud voice (holler out the window).
5. Simplify it. Purchase the Skyvision SkyPeaker Trio II™ Tune Up Kit. It makes life easier! See order information on back cover.

A. Peak the Dish on the Highest Satellite Straight South

Note: Elevation adjustments are only done on the highest satellite straight south using the elevation bolt on the polar mount.

Move your dish to the highest satellite south of your location. Find a transponder and tune it to the best possible picture, using east and west movements with your dish mover. Lift the face of the dish no more than a couple of inches and observe the picture quality. If the picture gets better while lifting, turn the elevation bolt on the back of the dish a half turn so the face of the dish moves up. Recheck your picture. Continue turning the elevation bolt until the picture gets bad when you lift up and push down on the face of the dish.

If the opposite happened and your picture got worse, it means the dish is pointing above the satellite arc and needs to be tilted down so it's pointing right on the arc. Again, this is done by turning the elevation bolt.



B. Find the Farthest East or West Satellite

Note: *East/West adjustments are only done on the far east or far west satellite by rotating the polar mount on the mounting pole.*

Answer this question: which satellite is farthest from the highest satellites south of your location? Is it W2 or W7? Whichever it is, move your dish to that satellite. If you're right in the center of the satellite arc and W2 and W7 are the same distance, take your pick. Once you're on the satellite, find an active channel. If you cannot "see" W2 or W7 because your dish is obstructed or out of alignment, go to the farthest east or west satellite that you can see. Let's assume you're looking at W7 to the west. Peak up a channel on W7 to the sharpest picture possible using your dish mover and polarity skew.

C. Mark a Reference Point on the Polar Mount and Ground Pipe

Place a strip of masking tape on the polar mount canister where the ground pipe and canister meet. Place a second strip on the ground pipe right under the tape on the canister. Mark a line from the canister to the ground pipe with a pencil or pen. The pencil or pen marks will serve as a reference point to tell you how much you turned the dish on the ground pipe. If you turn the dish and lose the picture, all you have to do is line up those two pencil or pen lines and you're back in business.

D. Peak Your Dish on the Far East or West Satellite

Lift the face of the dish. If your picture gets better—your dish is pointing below the satellite arc and you need to rotate the whole dish assembly to the west. You do this by loosening the mount-to-pole bolts on the mount canister just enough so you can move the assembly. Move the entire dish and mount assembly no more than 1/8" to the west. Snug up the mount-to-pole bolts on the canister. You will see that your video is either horrible or totally gone. Don't worry. Just use your dish mover to move your dish to the east and get the channel back. You may see the picture is a bit sharper.

Again, lift on the face of the dish. If the picture got worse, push down on the dish. If the picture got worse doing this, you're on target.

Rules of thumb

To peak a western satellite: *Rotate the dish to the west if your picture improves by lifting the dish. Rotate your dish to the east if your picture worsens by lifting and improves by pushing it down.*

To peak an eastern satellite: *Rotate the dish to the east if your picture improves by lifting the dish. Rotate the dish to the west if your picture worsens by lifting and improves by pushing it down.*

Step 8: Peaking the Ku-band

Peaking the Ku-band is going to be simple because you have already peaked the C-band satellites. Therefore, the Ku-band satellites should be right on or just slightly off. If you don't have a Ku-band satellite directly south of your location, you have to move your entire dish assembly on the pipe like you did to peak your east or west satellite. However, there are many satellites that are "hybrids"—they transmit both C- and Ku-band signals. If you have a hybrid straight south of you, start there and make adjustments with the elevation bolt. From there, peak the farthest east or west Ku-band satellite from your location.

One final note. If you have any questions regarding installing or peaking your new Ku-band upgrade, don't hesitate to call the Skyvision Technical Department. A few minutes on the phone with them will be time well spent. Call them toll free at 800-500-9279. Outside the U.S. call 218-739-5232.

You have made the right choice by upgrading your system to Ku-band. You're going to see things you've never seen before. Best of all, the installation was easy. By the way, what time does the game start?



Notes:

Skyvision SkyPeaker Trio II Tune-up Kit

Tune your satellite system like a professional while saving money on service calls. Skyvision's SkyPeaker Trio II™ Tune-up Kit lets you obtain perfect alignment. You can send the strongest signal to your receiver for the sharpest picture and clearest audio.

Kit includes:

- SkyPeaker Trio II meter
- Coax jump cables
- Skyvision's exclusive *Aiming Data Sheet*
- *Five Easy Steps to Alignment*
- Protractor aiming tool
- Free compass

SkyPeaker Trio II Tune-up Kit

#9000080

Call for sale prices

SkyPeaker Trio II

Give your satellite system the professional edge it deserves with the user-friendly handheld SkyPeaker Trio II™. The most useful and economical tool you'll ever own. The SkyPeaker Trio II tunes C-band, Ku-band, and digital systems—even ones with multiple dishes. Enjoy the low-cost, hassle free convenience of peaking your own satellite system. Includes coax jump cables.

SkyPeaker Trio II

#9000045

Call for sale prices



WE'RE WAITING FOR YOUR CALL!

Business hours

Monday-Friday: 8 a.m. to 8 p.m. **Saturday:** 9 a.m. to 6 p.m.
all times Central

General Information

Product information, catalog requests, or order status.

800-500-9275

Fax Ordering

24 hours a day.

218-739-4879

Ordering

Have your credit card ready.

800-644-5705

International Orders

Ordering outside the U.S.

218-739-5231

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www.skyvision.com

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