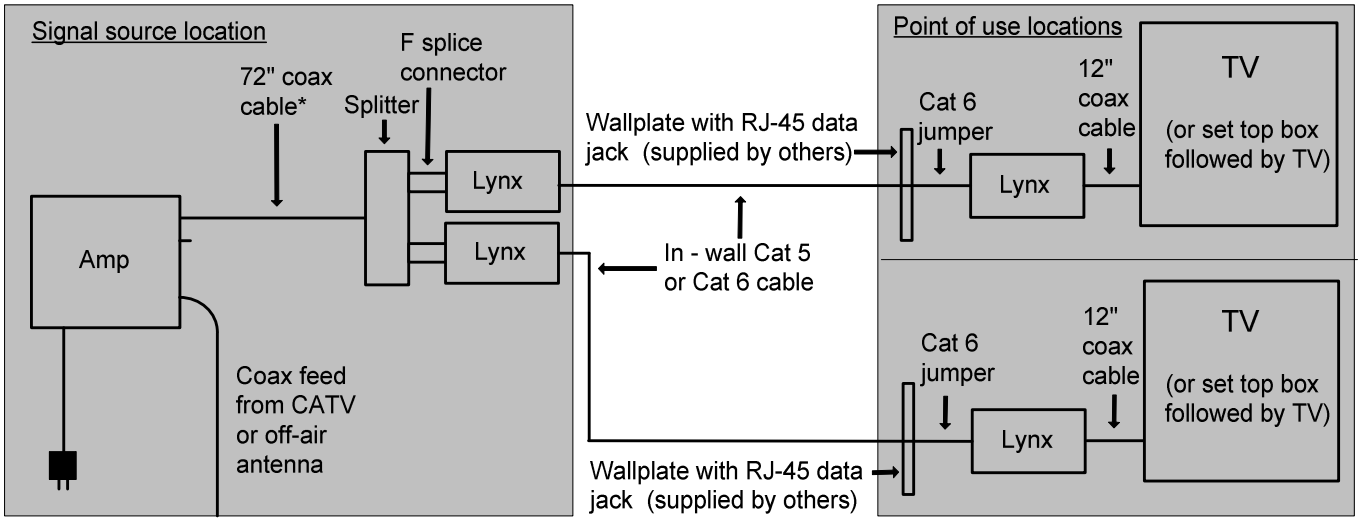
Lynx® Broadband – Installation Manual for Residential Packages with a 35 dB Amp

Quick Start Guide (first 3 pages)

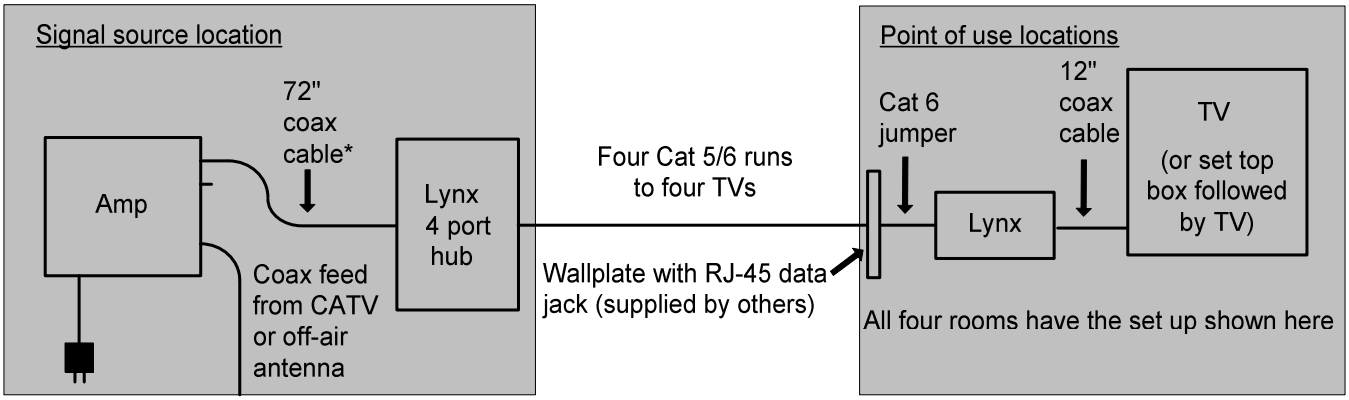
1. Be sure that your kit includes all the parts shown in the "Check the Equipment" section in the center of page 4.

2. If you are using this product to deliver cable TV and you also have internet service from your cable provider, install the tap so that the "through signal" goes to the equipment in this package and the "tap off" or "perpendicular" signal goes to the cable modem. See photo on the bottom of page 4.

3. For kits serving one, two, or three TVs, install the remaining equipment with reference to the drawing below. For a two TV application, install the equipment as shown. For a one TV installation there is no splitter and just one Lynx converter in the signal source location. For a three TV installation there is a three way splitter followed by three Lynx converters in the signal source location.



4. For a kit serving 4 TVs install the remaining equipment as shown below.



(Instructions for mounting the 4 port hub are shown in Exhibit A on page 10.)

5. When installed as shown there will be some elbows left over, and possibly up to three attenuators left over. The extra elbows can be used to save space when connecting the 12 inch coax cable to the TV (but they do not have to be used). The attenuators will be explained in step 8.

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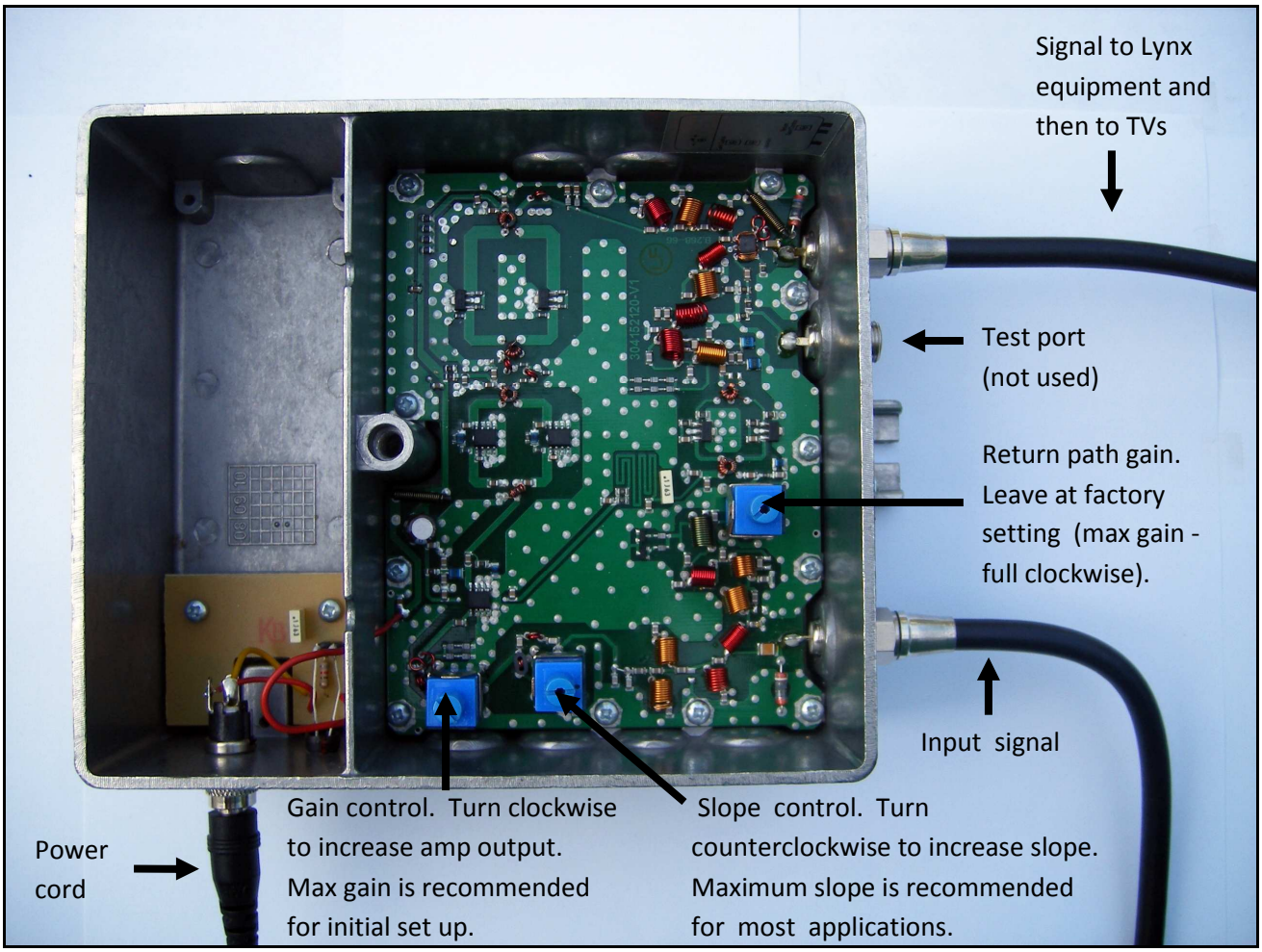
* A 72" coax cable is supplied for applications where all the equipment except for the amplifier will be installed in a low voltage enclosure. It delivers signals from an amplifier installed outside the enclosure to other equipment located inside the enclosure. If your configuration does not require such a long cable, you can shorten it by coiling it up and securing it with tape or a tie wrap. Or you can install a 12 inch coax cable after the amplifier and install the coiled 72" cable behind one of the TVs.

6. Install the power cord supplied with the amplifier and plug it in. Then remove the cover of the amp by using the Allen wrench supplied with the amp to remove the set screw in the center of the amp. Then set the slope and gain adjustments to their maximum settings, as shown below:

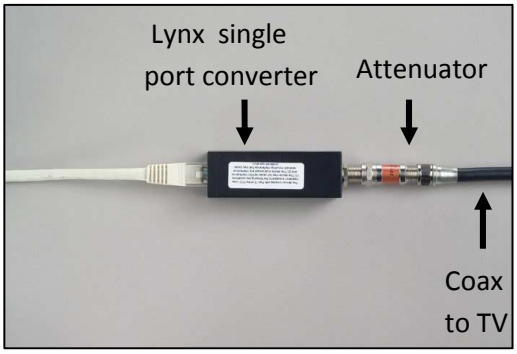


7. If your application has analog programming, see Exhibit B on page 11. If you application has digital programming (as most do) turn on the TVs and observe the picture quality on the **longest run.** If some channels are frozen or pixelated use the following procedure:

   a. If your application includes a set top box, disconnect the power to the set top box, wait 20 seconds, and then connect the power again. Wait for the set top box to initialize as indicated by the message on the set top box and the picture on the TV screen. Initializing may take a few minutes.

   b. Confirm that the amp is set to max gain (full clockwise position less ¼ turn) and max slope (full counterclockwise position less ¼ turn) as shown in the photo above. This is typically the optimal setting for the longest run. If this setting still has some problem channels on the longest runs, tune to a problem channel and gradually reduce the slope (by turning the slope control clockwise) until the frozen or pixelated channel clears up. If this process does not work, return the slope control to its full counter clockwise position less ¼ turn, identify another channel that is frozen or pixelated, and repeat this process (step 7b). If the process works, see if any other channels that were frozen or pixelated have cleared up. If they have not, tune to the channel and gradually reduce the slope further until the picture clears up.

8. When step 7 is completed successfully, observe the picture quality on the **second longest run**. If some channels freeze or pixelate on this run, but not on the longest run, install one attenuator between the Lynx single port converter and the 12” coax cable going to the TV, as shown in the photo on page 3. (The problem may be caused by a signal that is too strong at the TV, and the attenuator addresses this by reducing the signal strength).



9. Continue the process described in step 8 for the next shortest run (if there is one).

10. Continue the process described in step 8 for the next shortest run (if there is one).

11. <u>Attenuators should almost always be installed on very short runs. Specific recommendations follow:</u>

a. For installations with one TV, attenuators are not supplied and should not be necessary. If you have a short run you can make adjustments by reducing the gain provided by the amplifier.

b. **<u>For installation with two TVs, install the 10 dB attenuator on any run less than 65 feet.</u>** (If both runs are less than 65 feet, do not use attenuators and simply reduce the gain provided by the amplifier. Set gain control at max gain (full clockwise) and then turn control counterclockwise 2½ full rotations.)

c. **<u>For installations with three TVs, install the 6 dB attenuator on any run less than 55 feet.</u>** (If all runs are less than 55 feet, do not use attenuators and simply reduce the gain provided by the amplifier. Set gain control at max gain (full clockwise) and then turn control counterclockwise 1½ full rotations.)

d. <u>For installation with four TVs, install the 6 dB attenuator on any run less than 50 feet.</u> (If all runs are less than 50 feet, do not use attenuators and simply reduce the gain provided by the amplifier. Set gain control at max gain (full clockwise) and then turn control counterclockwise 1½ full rotations.)

A more detailed version of these instructions is available on pages 4 to 9.

A troubleshooting guide is available on page 8.

Detailed Installation Manual and Troubleshooting Guide

Overview

This product is designed to deliver digital or analog programming from a cable TV feed or an off air antenna feed. The receiving device can be an analog or digital TV or a set top box. To receive digital programming your TV must be equipped with a digital tuner, a free-standing ATSC tuner box, or a set top box from your cable TV provider. Broadcast television is all digital, but cable TV offerings can be analog or digital or a combination of both. If you have cable TV and use a set top box you probably have digital TV.

Distance capabilities for various configurations are show below:

# of TVs	Part number	Distance with analog cable TV (< 550 MHz)	Distance with digital cable TV or off–air TV (< 860 MHz)
1	040-0222	≤ 210 ft.	≤ 155 ft.
2	040-0223	≤ 185 ft.	≤ 135 ft.
3	040-0224	≤ 170 ft.	≤ 125 ft.
4	040-0225	≤ 165 ft.	≤ 120 ft.

Check your equipment

Verify that your package includes:

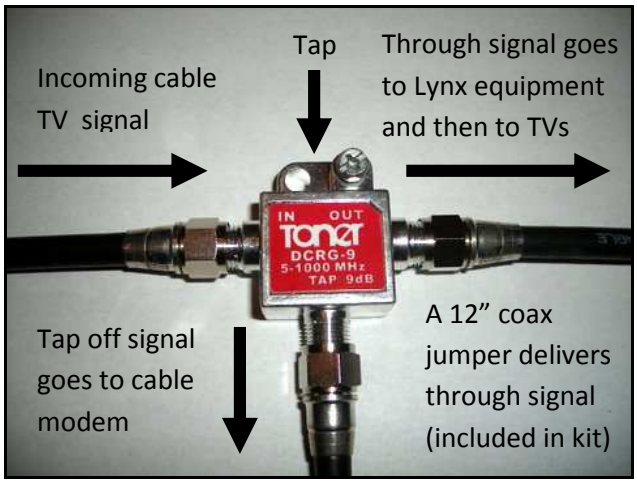
1 35 dB amplifier
1 72” coax cable
1 9 dB tap

Then confirm that your package includes the following parts for your configuration:

# of TVs	12 “ coax cable	Splitter	F Splice	Four port Lynx hub & 4 screws	Lynx single port converters	7 ft Cat 6 jumper	“F” Elbows	Attenuators
1	2	-	-	-	2	1	2	-
2	3	2 port	2	-	4	2	3	1 10 dB
3	4	3 port	3	-	6	3	4	2 6 dB
4	5	-	-	1	4	4	5	3 6 dB

Connect the cable internet modem (when applicable)

If you are using this kit to deliver cable TV and if you are also getting internet service from your cable TV provider, you need to install the 9 dB tap included in this kit to send one cable feed to the cable modem and another cable feed to the televisions. The tap must be installed with the tap off signal going to the cable modem, as shown below. The through signal can be delivered on the one foot cable supplied with the kit, or a longer coax cable supplied by others.

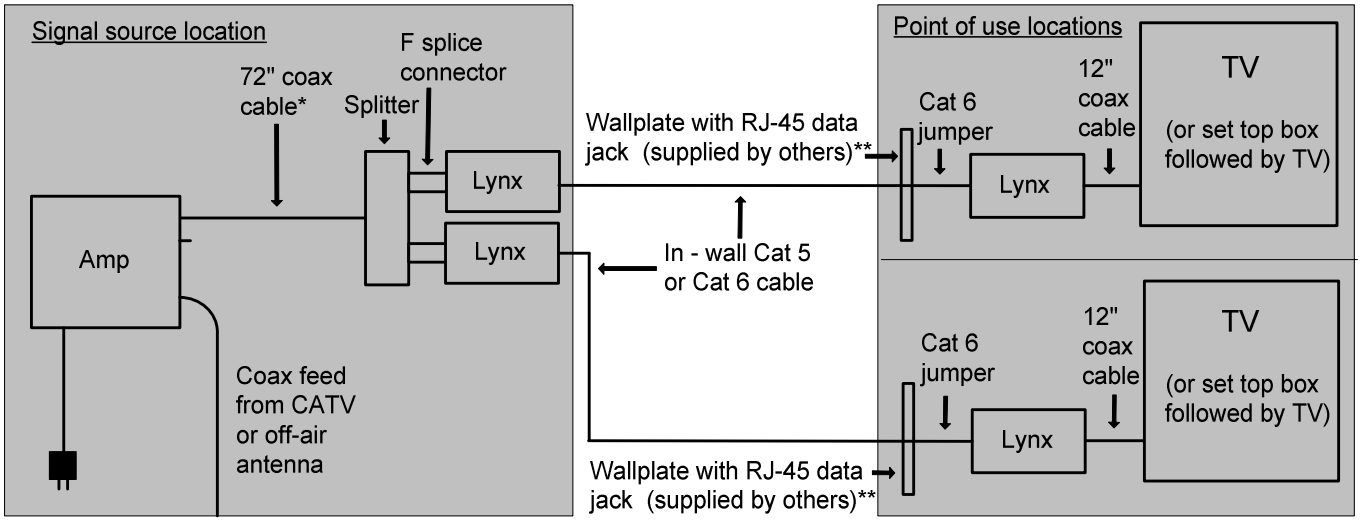


It is imperative that this tap be installed exactly as shown. If any of the cables are connected to the wrong terminals of the tap, internet performance and TV picture quality will be compromised.

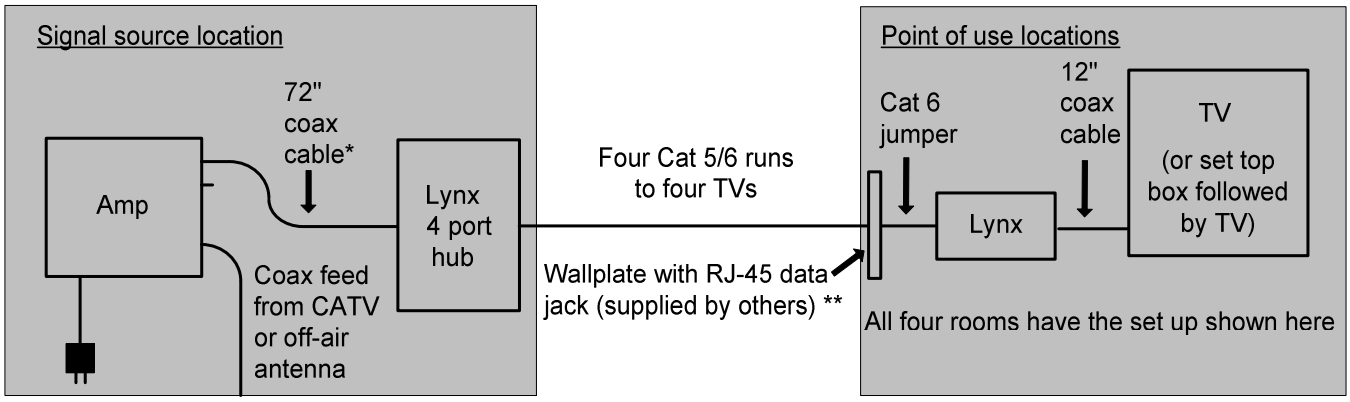
Also note that the signal to the cable modem should always be delivered on coax cable. We do not recommend a Lynx / Cat 5 connection to the cable modem.

Install the remaining equipment

1. For kits serving one, two, or three 3 TVs, install the remaining equipment with reference to the drawing below. For a two TV application, install the equipment as shown. For a one TV installation there is no splitter and just one Lynx single port converter in the signal source location. For a three TV installation there is a three way splitter and three Lynx single port converters in the signal source location.



2. If you have a four TV kit, install it as shown below:



If desired the four port Lynx hub can be mounted to plywood or other surfaces using the four mounting holes on the bottom of the hub and the four mounting screws included in this kit. See the mounting instructions and template in Exhibit A.

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* A 72 inch coax cable is supplied for applications where all the equipment except the amplifier is installed in a low voltage enclosure. It delivers signals from an amplifier installed outside the enclosure to other equipment located inside the enclosure. If your configuration does not require such a long cable, you can shorten it by coiling it up and securing it with tape or a tie wrap. Or you can install a 12 inch coax cable after the amplifier and install the coiled 72 inch cable behind one of the TVs.

** An 8 pin RJ-45 data jack is needed. A 6 pin RJ-11 phone jack will not work. If you have a six pin RJ-11 jack you must replace it with an RJ-45 jack correctly terminated to Cat 5 or Cat 6 cable (not Cat 3).

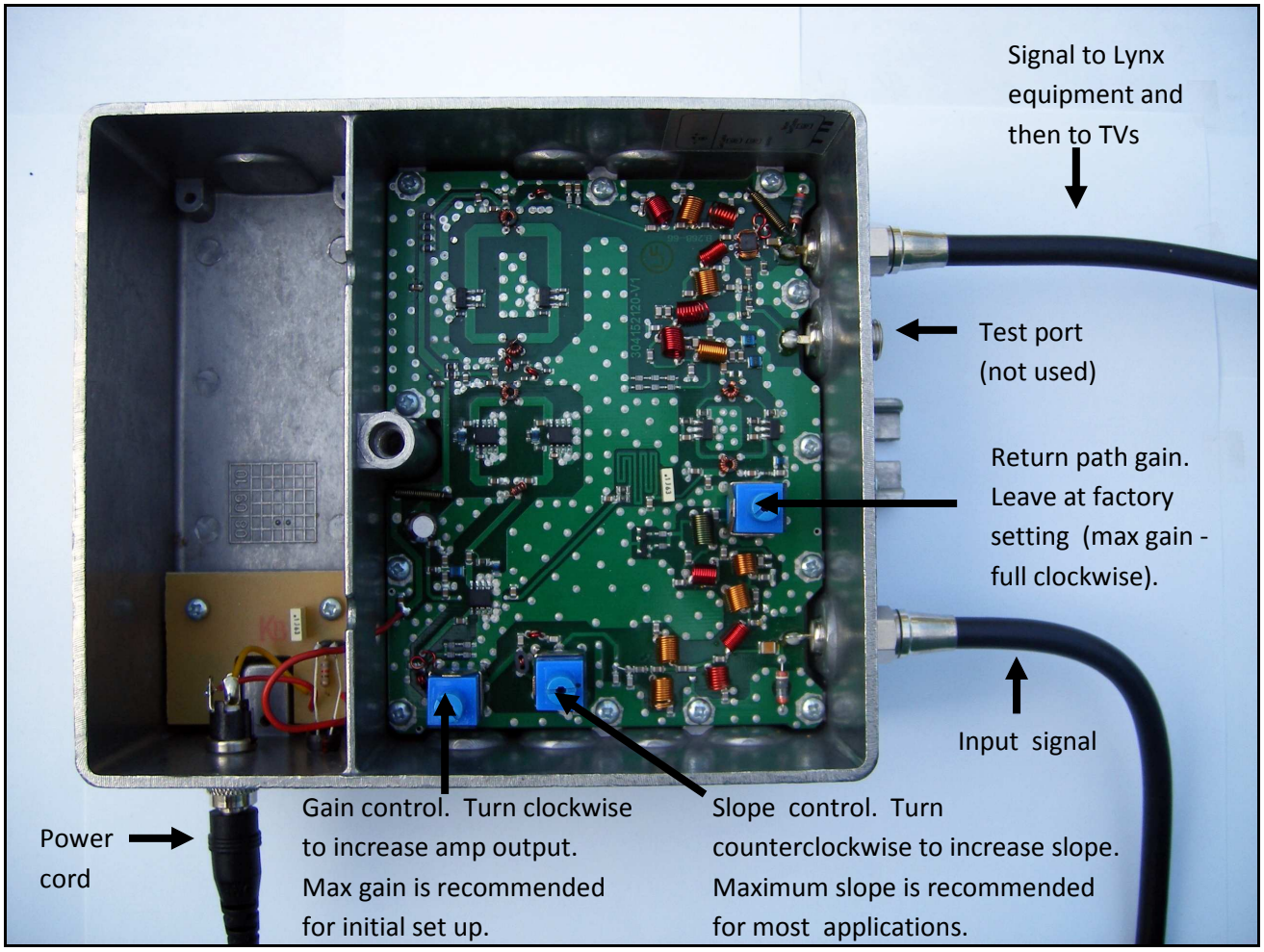
3. When installed as shown there will be some extra “F” elbows and attenuators left over. The extra elbows can be used to save space when connecting the 12 inch coax cable to the TV, or they can be used to save space when connecting either end of the 72 inch coax cable, but they do not have to be used. (The extra attenuators are discussed in step 9.)

4. Attach the power cord supplied with the amplifier to the amplifier as shown in the photo below. Then plug in the power cord.

5. Open the cover of the amplifier using the Allen wrench shipped in the box for the amplifier. Insert it into the set screw in the center of the amplifier and turn counter clockwise until you can remove the set screw. Then lift off the cover.

6. Use your fingers to adjust the slope control to the maximum slope setting. The slope control is the blue terminal between the other two blue terminals (see photo below). Turn this terminal counterclockwise with your fingers until it will not turn any farther, then back off ¼ turn. (The full counterclockwise position is maximum slope – contrary to the markings on the cover of the amp.) Making this adjustment sets up reverse slope that compensates for the forward slope created when the signal travels through the cable (where high channels lose more signal strength than low channels). Ideally the reverse slope in the amp will offset the forward slope in the cable, resulting in a relatively flat signal at the TV (meaning that the high channels and low channels have approximately the same signal strength).

7. Use your fingers to adjust the forward path gain control to the maximum setting. Turn the control clockwise until it will not turn any further, and then back off ¼ turn (see photo below).

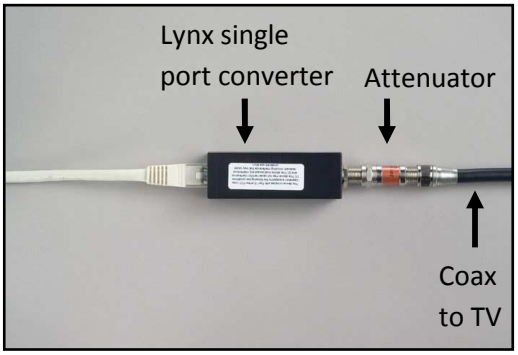


8. If your application has analog programming, see Exhibit B on page 11. If your application has digital programming (as most do) turn on the TVs and observe the picture quality on your **longest run.** If some channels are frozen or pixelated use the following procedure:

   a. If your application includes a set top box, disconnect the power to the set top box, wait 20 seconds, and then connect the power again. Wait for the set top box to initialize as indicated by the message on the set top box and the picture on the TV screen. Initializing may take a few minutes.

   b. Confirm that the amp is set to max gain (full clockwise position less ¼ turn) and max slope (full counterclockwise position less ¼ turn) as shown in the photo on the previous page. This is typically the optimal setting for the longest run. If this setting still has some problem channels on the longest runs, tune to a problem channel and gradually reduce the slope (by turning the slope control clockwise) until the frozen or pixelated channel clears up. If this process does not work, return the slope control to its full counter clockwise position less ¼ turn, identify another channel that is frozen or pixelated, and repeat this process (step 8b). Then see if any other channels that were frozen or pixelated have cleared up. If they have not, tune to a frozen or pixelated channel and gradually reduce the slope further until the picture clears up. (Reducing the slope increases the signal strength of low and mid frequency channels.)

9. When step 8 is completed successfully, observe the picture quality on the **second longest run**. If some channels freeze or pixelate on this run, but not on the longest run, install one attenuator between the Lynx single port converter and the 12" coax cable going to the TV, as shown below. (The problem may be caused by a signal that is too strong at the TV, and the attenuator addresses this by reducing the signal strength).



10. Continue the process described in step 9 for the next shortest run (if there is one).

11. Continue the process described in step 9 for the next shortest run (if there is one).

12. Attenuators should almost always be installed on very short runs. Specific recommendations follow:

   a. For installations with one TV, attenuators are not supplied and should not be necessary. If you have a short run you can make adjustments by reducing the gain provided by the amplifier.

   b. **For installation with two TVs, install the 10 dB attenuator on any run less than 65 feet.** (If both runs are less than 65 feet, do not use attenuators and simply reduce the gain provided by the amplifier. Set gain control at max gain (full clockwise) and then turn control counterclockwise 2½ full rotations.)

   c. **For installations with three TVs, install the 6 dB attenuator on any run less than 55 feet.** (If all runs are less than 55 feet, do not use attenuators and simply reduce the gain provided by the amplifier. Set gain control at max gain (full clockwise) and then turn control counterclockwise 1½ full rotations.)

   d. **For installation with four TVs, install the 6 dB attenuator on any run less than 50 feet.** (If all runs are less than 50 feet, do not use attenuators and simply reduce the gain provided by the amplifier. Set gain control at max gain (full clockwise) and then turn control counterclockwise 1½ full rotations.)

Troubleshooting Guide

No picture at the TV: Make sure that the amplifier, television, and set top box (if applicable) are plugged in and that the TV and set top box are turned on. Test all Cat 5/6 connections by un-plugging and then re-plugging the cables. When a Cat 5/6 cable is plugged in there should be a "click" sound and it should not be possible to remove the cable without pressing down the tab on the plug. Test all coax connections by turning the hexagonal ring until it is finger tight.

If you are delivering signals to a set top box, disconnect the power feed to the set top box, wait 20 seconds, and plug it in again. Then wait for the set top box to initialize. (This may take a few minutes.)

If this does not solve the problem try connecting a small TV directly to the incoming cable or antenna feed (if possible) to be sure that you have a good incoming signal. (This test removes all amplifiers and Lynx equipment from the circuit.)

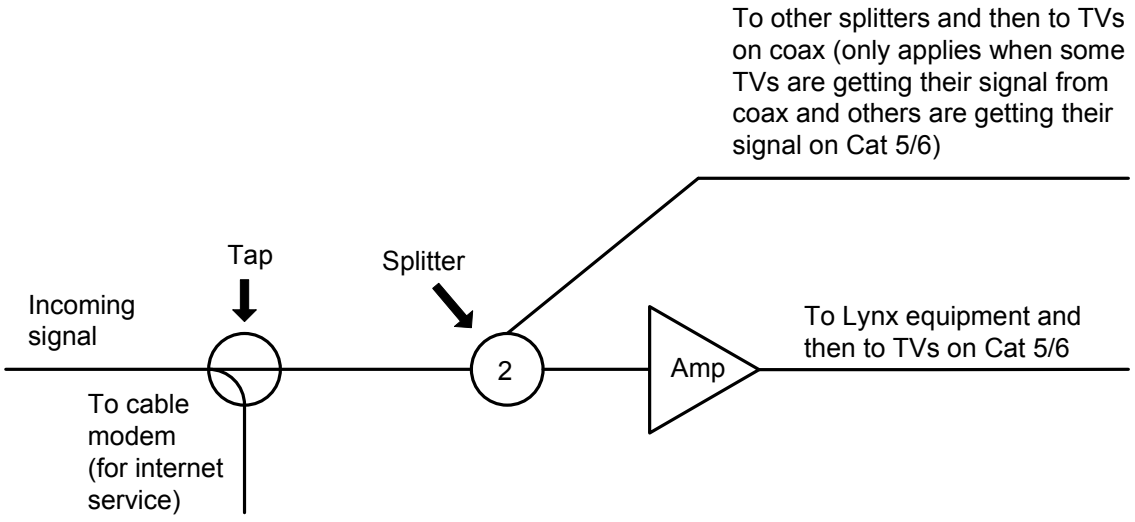
If the incoming signal provides no picture, or a poor picture, contact your cable TV provider. Or if the incoming signal is from an off-air antenna is not clear, adjust the antenna to improve picture quality. After the incoming signal has been adjusted and tested to confirm that it is a good signal, reconnect the Lynx equipment and retest.

Picture quality problems on analog channels: See Exhibit B on page 11.

Digital channels that sometimes freeze or pixelate: Check all connections between the signal source and the TV using the methods described above. Then repeat steps 6 through 12 on pages 6 & 7.

If you are using a cable modem for internet service, be sure to install the 9 dB tap to deliver signal to the cable modem rather than using a splitter. (A tap passes more signal strength to the TVs than a splitter does.) See the "cable modem" instructions on page 4 and be sure that the cables are connected exactly as shown in the photo - with the "out" terminal delivering signal to the TVs, and the "tap" terminal delivering signal to the cable modem.

If some TVs are receiving their signals on coax, install one (and only one) splitter ahead of the amp, as shown below.



If the preceding steps do not solve the problem, call the cable TV company and ask them to determine the incoming signal strength. They are required by FCC regulations to deliver an incoming signal strength of 3 dB. If this level of signal strength is not present, ask them to bring their signal up to at least 3 dB at the entry to the home, and preferably 10 dB.

Estimate the length of the Cat 5 or Cat 6 cable between the two Lynx converters. If the distance is greater than the distances shown on the table on the top of page 4, your application environment exceeds our performance claim. Contact Lynx Broadband for assistance.

Technical support

If you are unable to obtain good picture quality using the procedures above, you can call 952-894-9590 for limited phone support.

Warranty information

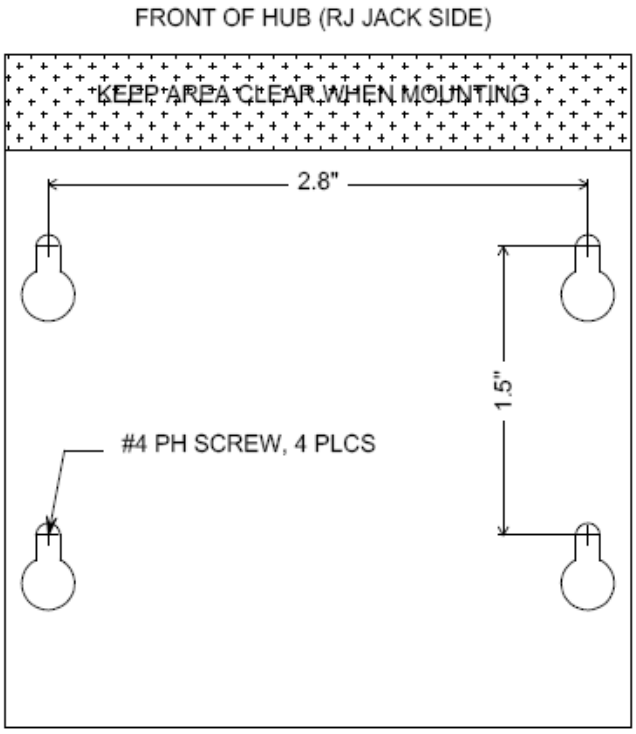
See www.lynxbroadband.com /reswarranty for warranty information.

Exhibit A

Instructions for Mounting the Four Port Lynx Hub

Note: Not all kits include a four port hub. This section only applies to kits providing service to four TVs.

1. Determine where you want to position your hub. Use the mounting template below to mark two "opposite corners" for two mounting screws. Mark the "plus sign" at the small end of the hole. Additional screw locations can be marked if desired.



2. If you are installing the hub on a wood surface, the screws can be screwed directly into the plywood without drilling pilot holes. If you are installing the hub on a metal surface, drill holes in the marked locations and then install the screws.

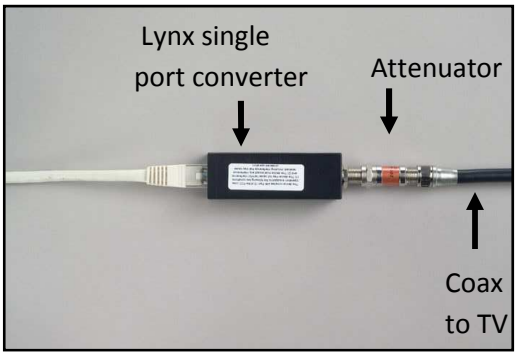
3. Slide the hub over the mounting screws until it drops into place. Then secure it by sliding it into the smaller section of the keyhole slots.

Exhibit B

Set up adjustments for analog TV

1. Turn on the TVs and observe the picture quality on your **longest run** when the TV is tuned to the **highest channel** you may want to watch. If the picture quality is good, no amplifier adjustments are needed. If there are static horizontal lines across the screen, turn down the gain adjustment until the lines go away. (If you turn the gain down too far, the picture will start to look grainy or snowy.)

2. Next observe the picture quality on the **second longest run** when the TV is set to the highest channel. If there are static horizontal lines across the screen, install one attenuator between the Lynx converter and the 12 inch coax cable going to the TV, as shown below. (An attenuator reduces the signal strength going to a TV).



3. Repeat the process outlined in step 2 for the remaining runs. Step 12 on page 7 has general guidelines on when to install attenuators. These guidelines apply to both analog and digital applications.

Troubleshooting guide for analog TV

Snowy analog channels: This usually results from low signal strength at the TV. Remove any attenuators that are installed directly in front of the TV that is affected and re-test the picture quality. Check all connections between the signal source and the TV. Then make sure that the amplifier is plugged in and gradually increase the gain setting on the amplifier until the picture improves. (See photo on page 6). If the picture is still snowy or grainy at full gain, gradually reduce the slope setting on the amplifier by gradually turning the slope control clockwise. (See photo on page 6.)

Static horizontal lines across the screen: This condition usually indicates that the signal strength going to the TV is too strong. The signal strength can be reduced by either turning down the gain setting on the amplifier, or installing an attenuator before the signal reaches the TV. However, in systems where the amplifier is serving multiple TVs, turning down the amp can fix a problem on one TV, but at the same time create a "weak signal" problem on longer runs.

Thus it is always best to adjust the amplifier gain by observing picture quality **on the longest run**, as outlined in the steps below.

1. Set the slope to its maximum setting (full counter clockwise).
2. If all TVs have horizontal lines, turn down the amp to optimize the picture quality on the longest run. Then install attenuators as needed on the shorter runs, as described in steps 9 – 12 on page 7.

If all TVs still have horizontal lines after completing steps 1 and 2, it is possible that the input to the amp is too strong. Install an attenuator at the input to the amp, and observe picture quality.