

Completely  
revised  
Sixth Edition

**DIRECTV**  
FOR BUSINESS  
AUTHORIZED DEALER  
NATIONAL ACCOUNTS

# THE ULTIMATE GUIDE TO UPGRADING YOUR DIRECTV SYSTEM

for Home, Business, RV, and Marine



 **SIGNAL**  
CONNECT

**SOLID**SIGNAL

DIRECTV launched in 1994 with one satellite, one receiver, and one dish. In the thirty years that followed, an almost astounding array of different equipment has been available to customers. While the original service was designed for hobbyists and do-it-yourselfers, DIRECTV customers have largely opted for professional installation since the 1990s.

There's still a thriving DIY spirit out there, and this document is dedicated to those folks who want things to be "just so." The goal is to give you the diagrams and information you need to make your system work exactly the way you want it to.

## READY FOR COMMERCIAL INSTALLERS

In the years since this document was originally published, it's become a "must-read" for commercial installers in businesses, on boats, and in RVs. This edition of the document focuses as much on commercial installs as it does on home installs, giving both DIYers and pro installers the tools they need to succeed.

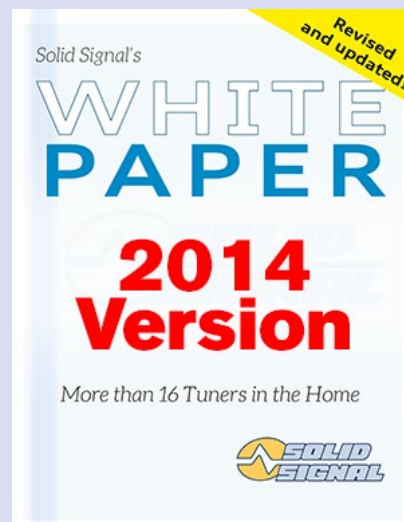
## HOW TO USE THIS GUIDE

This guide lists current and recently obsolete equipment. In some cases, equipment will work if it's already in place but can't be bought anymore.

Whenever possible, you'll see clickable links to products at SolidSignal.com. If you don't see a link, call our team at 888-233-7563. In some cases we are able to help with older or obsolete equipment. We can also help you choose the right path to upgrade your equipment as you see fit.

As you go through this guide, you'll see equipment for home, business, marine, and mobile use. If you have any questions about which equipment is for you, reach out. We're here to help!

Looking for much older information? [Click here to download the 2014 version of this document, which contains everything you'll need to maintain your older DIRECTV system. Some parts might no longer be available, of course.](#)



## OBSOLETE DISHES THAT SHOULD BE REPLACED



The satellite dishes you see above date back over 20 years to the early days of DIRECTV. They won't receive all current broadcasts and should be replaced immediately. Chances are, you won't see them in the field, though. These dishes have generally been already been replaced. If you see one, it's a good sign that you should go through the entire installation from top to bottom and check the quality of cables and equipment.

## LNBs THAT YOU SHOULD REPLACE EVENTUALLY

### SLIMLINE-3 LNB



The Slimline-3 LNB was designed to pull in signals from DIRECTV's three primary satellite locations (99°, 101°, and 103°). It is available in a version with a built-in SWM multiswitch, and one without (pictured.) The built-in multiswitch version has one wire coming out and supports a maximum of 8 tuners. If you want more than 8, you must replace it with something else. This LNB will work for now, but should be replaced with a more modern one.

### SLIMLINE-5 LNB



The Slimline-5 LNB pulled in signals from all the same locations as the smaller Slimline-3, plus the 110° and 119° locations. It was the default dish for most installations throughout the country from the late 2000s through the 2010s. DIRECTV no longer operates service at the 110° location and is rapidly phasing out service at the 119° location, so this LNB is not needed. As with the Slimline-3, it comes with a built-in multiswitch or without.

### "GEN2" & "GEN3" SLIMLINE-3 LNB



You may find LNBs in the field labeled as "3DLNB" or something similar. These were available for a very short while. While they support the same digital SWM technology as modern LNBs, they do not receive all the same frequencies as current LNBs.

This LNB will work for the time being, but should be replaced with a more modern one.

## 18" ROUND DISH



Yes, there are still some applications out there for the traditional round dish. This LNB can be used with virtually any satellite system in North America. For DIRECTV systems, it provides standard definition channels and a very limited selection of high definition channels. While most people gave up on this dish long ago, tailgaters and others still rely on it. It is only compatible with non-Genie equipment and cannot be used with Genies at all. In order to use this dish, you will need to buy the [reflector and mast separately](#) from the [LNB](#). Both are available at Solid Signal.

## WORLDDIRECT DISH



Until 2023, DIRECTV operated a second fleet of satellites for international programming. Its technology was different from the standard used for other dishes, so international customers generally needed to add a second dish. This dish was capable of picking up programming from the 72.5° and 95° locations, or from one of those locations in addition to the 101° location.

All DIRECTV international programming has been moved to the primary satellite fleet, so this dish isn't needed. If you see this dish in the field, you can feel comfortable removing it, since it is not capable of picking up any DIRECTV programming.

## 1.2 METER DISH



Customers in Alaska and Hawaii can receive DIRECTV programming using a 1.2 meter dish. This dish is specifically designed to work in those distant locations. It doesn't give any benefit to anyone who lives down in the "lower 48."

In the past, you would need two of these large dishes to get all the DIRECTV programming. However, there is now one LNB that will work for all DIRECTV programs. However, Solid Signal doesn't sell this dish as a kit, to discourage it from being misused. You'll need to get the [reflector, back](#), and [LNB](#) separately, as well as a 2.375" mast.

## DIRECTV INSTALLATIONS ONLY REQUIRE 3 SATELLITE LOCATIONS

DIRECTV systems don't need the 95, 110, or 119 satellite location to receive all high-definition, 4K, and international channels. While the Slimline-5 LNBS will continue to work for the near future, it is best to use only Slimline-3 technology when installing a new system. Some areas still get standard-definition locals at from the 119 location but this is expected to end soon.

There are two LNBS currently in use by DIRECTV. The (first generation) Slimline-3 and Slimline-5 are still in use in some cases but for the most part they are being replaced by more modern LNBS that support 4K service and international channels.

## REVERSE BAND 3 SWM-ENABLED LNB

This is the “go-to” LNB for all higher-end home installs. Its built-in digital SWM multiswitch supports up to 21 tuners (depending on configuration) and will receive signals from DIRECTV’s three primary satellite locations, including the “reverse band” signals required for 4K and international service. It does not support the use of an external multiswitch. Also, due to limitations with the H24 and H25 receiver lines, a maximum of 13 tuners is supported if an H24 or H25 receiver is used.

This LNB is supported by any DIRECTV HD or 4K hardware made since 2010 but will not work with standard definition hardware. [Get it from Solid Signal.](#)



## REVERSE BAND 5 LEGACY LNB

This is DIRECTV’s all-purpose LNB for commercial use. It supports 4K programming and can be used alongside DIRECTV’s international dish to provide both 4K and international programming. It is also the only 4K-capable LNB to support an external multiswitch and it is the one you should be using if you are planning on supporting more than 16 tuners and remaining future-proof. Support for the 110 and 119 satellite is built-in, but is not used in modern installations. DIRECTV simply never built a Legacy LNB without support for 110 and 119, so this LNB must be used for installations with a multiswitch. It has 6 outputs and an external SWM30 multiswitch must be used for any DIRECTV installation as, unlike older LNBS, all lines are not capable of carrying all signals. [Get it from Solid Signal.](#)



## USE ONLY REVERSE-BAND LNBS ON NEW INSTALLATIONS

If you’re installing a new DIRECTV system, these are the only LNBS you should consider. The Reverse Band 3 is used for simple home installations, while the Reverse Band 5 is used for all larger installations and commercial installations.

In the future, many channels will require a reverse-band LNB, even traditional HD channels. If you have an older LNB, you may not get warning that one of your channels won’t work anymore.

## INTELLIAN i-SERIES



Small and medium-sized boats will want the Intellian i3. It has the ability to receive broadcasts from DIRECTV's 101 satellite, giving mostly standard definition programming. All i-Series dishes are compatible with programming from around the world, making them a good choice for large yachts. There are several sizes in the i-Series. As the model number goes up, the dish size does as well. [Shop for Intellian products at Solid Signal.](#)

## INTELLIAN s6HD



The s6HD is the system to choose when you want the same satellite experience you get from a home-based satellite system. This 60cm dish picks up programming from DIRECTV's 3 primary satellite locations. It has a built-in SWM multiswitch to make installation easier, and can be upgraded to support a virtually unlimited number of satellite TV receivers. [The s6HD is available by special order from Solid Signal.](#)

## KVH TRACVISION



The KVH TracVision series are marine satellite antennas designed for worldwide use. They are available in multiple sizes, with the 30cm Tracvision TV3 being the most common for US DIRECTV customers. It will receive programming from the 101 satellite only. As such, it is generally limited to standard definition. [Shop for KVH products at Solid Signal.](#)

## KVH TRACVISION UHD7/HD11



The KVH TracVision UHD7 is a 60cm satellite antenna designed to pick up broadcasts from DIRECTV's 3 primary satellite locations. It features a built-in SWM-30 multiswitch for 26 receivers on a residential account or 30 receivers on a commercial account. It's expandable to 120 receiver capacity. [The UHD7 is available by special order from Solid Signal.](#) A larger version, the [HD11](#), is available for larger vessels which go further offshore.

## KING PHOENIX



KING's Phoenix is a premier solution for RVs. The Phoenix folds down for storage while the RV is in motion. With the push of a button, it opens to aim itself perfectly, with just a good view of the sky. The Phoenix will pull in programming from all three main DIRECTV locations and works with any SWM-enabled satellite receiver. Phoenix can be installed by a DIYer, but many opt for professional installation. [Solid Signal is your source for the KING Phoenix.](#)

## WINEGARD TRAV'LER PRO



The Trav'ler Pro from Winegard is a proven solution for RV owners who want to get the "in-home" experience. This dish is easily installed by advanced DIYers or pro installers. It receives all HD and 4K programming from DIRECTV's 3 primary satellite locations. The Trav'ler Pro is completely self aiming with just the push of a button, and works with any SWM-enabled receiver. [Get the Winegard Trav'ler Pro.](#)

## KVH TRACVISION RV1



KVH's legendary quality in large satellite dishes allows them to bring RV and truck customers the RV1 satellite system. Like the other members of the TracVision TV line, it brings the ability to watch programming from DIRECTV's 101 satellite while you're in motion. It works with both SWM-enabled and non-SWM receivers, making it more futureproof. [It is available for order from Solid Signal.](#)

## KING ONE PRO



The KING One Pro will automatically detect and receive satellite signals from the 101 satellite just by connecting it and placing it on a level surface. It's a great, economical choice for those people who want a quick portable solution. It's used with the DIRECTV H24. You can run two receivers from this device. A less expensive version, the KING Quest, works with DIRECTV and not other services. The [KING One Pro](#) and [KING Quest](#) are available from Solid Signal.

## WINEGARD CARRYOUT G2



Winegard's Carryout G2 is a reliable, economic way to get broadcasts from DIRECTV's 101 satellite. It's best used with the DIRECTV H24 receiver since it does not have a built-in SWM multiswitch. Up to two receivers can be connected at once. The Carryout is available in white or black and can be mounted on a tripod or on a flat surface. [The Winegard Carryout G2 is available from Solid Signal.](#)

## WINEGARD ROADTRIP T4



The Roadtrip T4 from Winegard is a great choice for watching satellite TV while the RV is moving. It automatically tracks DIRECTV's 101 satellite to give you great reception no matter where you are. It is designed to work with up to two DIRECTV H24 receivers and is available in white as well as black. Installation is easy for DIYers and installers who are familiar with basic RV modifications. Get your [Winegard Roadtrip T4 from Solid Signal.](#)



### SWM-8

DIRECTV's original single-wire multiswitch was a revolution in the industry. It allows for 8 tuners on a single cable run, plus 3 standard definition receivers through its legacy ports. It was designed to be a single-wire functionality without having to go up on the roof. SWM technology also allows for the use of splitters instead of using a separate cable for each tuner.



### SWM-16

The SWM-16 was the "go-to" multiswitch for most medium to large installs due to its low cost and ability to serve up to 16 tuners in two banks of 8 each. The SWM-16 was used for almost a decade in commercial, residential, and apartment installations. It performed well but suffered from heat issues that made it fail prematurely in some cases.



### DSWM-13

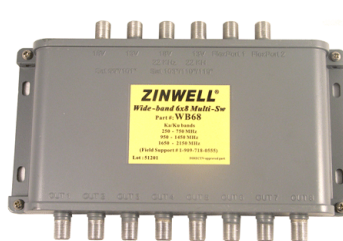
DIRECTV's DSWM-13 is the rarest of all DIRECTV multiswitches. It was produced for only a short time in the mid-2010s and was only available to DIRECTV's lodging and institutional customers. It supports 13 standalone receivers on a single line with a high-power output which makes it dangerous for use in a residential setting.

### SWM-32



This once-popular multiswitch is essentially four SWM-8s in a single case, providing 32 tuners. It has been obsolete for some time and should be replaced with a SWM-30 when seen in an installation.

### WB68



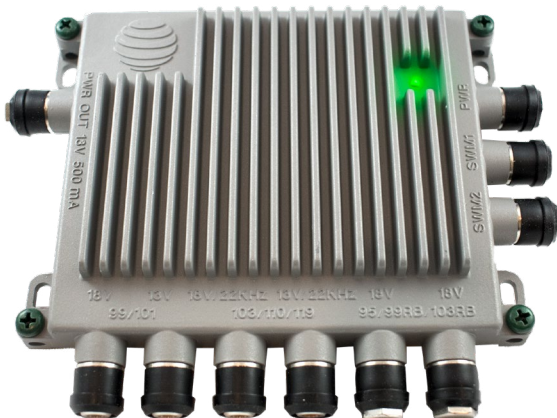
DIRECTV's original 8-tuner multiswitch support up to 8 tuners, but you need a separate line for each tuner. **[It is still available in very small quantities from Solid Signal,](#)** for customers who need to support much older hardware.

### 3x4



This multiswitch is only used with round dishes and other pre-Slimline dishes. If you have any of these in your system, you should definitely be replacing them.

## SWM-30 DIGITAL SINGLE WIRE MULTISWITCH

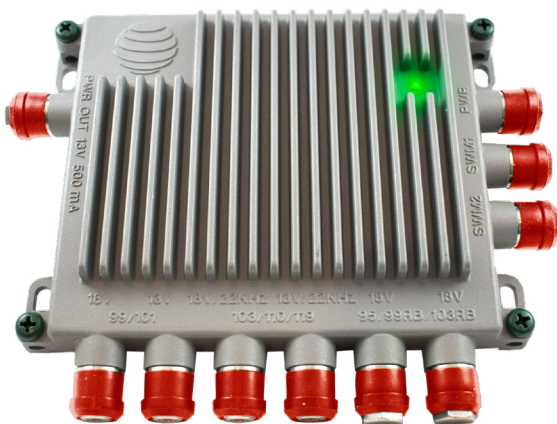


The SWM-30, also known as the DSWM30, is the current generation DIRECTV multiswitch, replacing the SWM-8, SWM-16, and SWM-32. With the correct receivers, it supports up to 30 tuners in two banks of 15 each. In most installations, it will support two banks of 13 tuners each, 26 tuners in total.

The SWM-30 is the only multiswitch compatible with the Reverse Band 5 legacy LNB. Just like other DIRECTV multiswitches, multiple SWM30s can be used in a single installation through the use of taps or splitters. It supports Whole Home Viewing on each

output port, but there is no crossover between ports, so special steps must be taken to share programming on all tuners. [It is available at Solid Signal.](#)

## SWM-30 HP DIGITAL SINGLE WIRE MULTISWITCH



This is a special version of the SWM-30 that has about 100x the output power of the regular SWM-30. It isn't designed for residential use because it could overload a receiver potentially causing permanent damage. However, when used in a commercial environment, it allows longer runs than the standard SWM-30, or allows the use of RG-59 cable instead of RG-6, which is important when working with existing cable.

The SWM-30 HP has red-orange weather boots. Do not use it in smaller-sized installations where it can damage other equipment. [Order the DSWM30HP from Solid Signal, but use with care.](#)

## POWERING A SWM MULTISWITCH OR LNB



[The PI-29Z power inserter](#) is the only way to power a multiswitch or LNB. Any LNB with a single wire out, or any external SWM multiswitch, requires power to work. The power inserter is connected to the dedicated PWR port (except in SWM-8 multiswitches which are powered through the SWM1 port.) The PI-21 power inserter, which is black instead of grey, should no longer be used. DIRECTV HR54 and HS17 Genie DVRs are capable of powering a dish but should not be used to power an external multiswitch.

DIRECTV refers to its previous-generation receivers as “legacy” products. These receivers and DVRs will work with current generation dishes and multiswitches but may not work in the future. Any receiver with an “H” model will work in the short term, but receivers with model numbers starting with “D” should be replaced.

## HR44 “GENIE” DVR



The Genie DVR has the ability to record 5 programs at one time, up to 200 hours of HD programming and feed up to 3 active clients at the same time. It has built-in Wi-Fi for on-demand and interactive features. It also supports both IR and RF remotes at the same time, unlike older receivers.

## HR24 DVR



HR24 is a basic dual-tuner DVR that has been in use for DIRECTV customers since 2010. Most customers will only be able to get one as a replacement for an older one, [but they are available at Solid Signal.](#)

## H24 RECEIVER



The H24 HD receiver is a standalone HD receiver. As DIRECTV’s only non-SWM receiver, it’s the preferred choice for RVs and marine installations with smaller dishes. [It is available at Solid Signal.](#)

## H25 RECEIVER



The H25 HD receiver is used in commercial installations as well as hotel and institutional installations. It has been in service since 2011 and most receivers in the field have been refurbished multiple times. [It is available here.](#)

## NEED A RECEIVER FOR RV OR MARINE?

DIRECTV Single-Wire Multiswitch technology has been the standard for all installs since 2009. However, RV and marine installations have only just now started to require SWM-enabled receivers. If you are replacing a receiver in a non-SWM system, you will need an H24 receiver or HR24.

Some very old mobile systems do require special DIRECTV receivers that also issue control commands to the mobile dish. If you have a KVH M10 or any other special receiver like this, contact Solid Signal at 888-233-7563 to discuss your options for upgrading.

DIRECTV's Genie system allows the DVR to do all the work and replaces receivers with "clients" or smart TVs that have no tuners of their own. All the work is done by the Genie DVR and every location can pause live TV and view recorded programs. The original "HR34 Genie" model will continue to work but should be upgraded due to its slow processor. Genie DVRs are not permitted on commercial accounts.

## HR54 "4K GENIE" DVR



The HR54 4K Genie has no front buttons other than the power button. It has all the same features as any other Genie. Unlike the HR44, it has the ability to power a SWM-enabled dish without a power inserter. However, even though the HR54 can only record 5 programs, it counts as 7 tuners when connected to a multiswitch because it has the hardware required to tune 4K programs from DIRECTV's "Reverse Band" 4K

satellites. HR54s come in two styles: one with a shiny front (pictured) and one with a matte black appearance. There's no difference between them. [Get your HR54 from Solid Signal.](#)

## HS17 "GENIE 2" HEADLESS SERVER/DVR



DIRECTV's HS17 "Genie 2" can record up to 7 programs at once with 400 hour HD recording capability. With Genie 2, you can watch live HD in 5 locations and live 4K in 2 locations. If you have a Gemini, you can stream 4K in all locations depending on your internet speed. It does not output live TV itself. It can power a SWM-enabled dish, connect to the internet over Wi-Fi, and connect to wireless clients without any additional hardware. It is designed as a "set and forget" device that sits near the customer's router instead of near a television. It is designed to pull 13 tuners from a SWM-enabled reverse-band dish or SWM-30, but will work with an older SWM where it will pull 8 tuners. Due to DIRECTV restrictions, if a Genie 2 is installed, no other receivers or DVRs may be on the same account so this may not be the best option for people seeking to load up. If you are looking for more than 7 recordings at the same time, or the ability to serve more than 7 rooms, you may wish to use the HR54 4K Genie instead. However, this DVR should serve the needs of the vast majority of DIRECTV customers while minimizing extra wiring and extra "black boxes." [It's available from Solid Signal.](#)

## CHOOSING THE RIGHT GENIE SYSTEM FOR YOU

This is a simple one. If you want to keep your existing DIRECTV receivers, go for the HR54 Genie. If you are ready to jump in 100% to the Genie world, get the Genie 2. Overall the Genie 2 is going to be a more reliable and easier installation, with fewer wires and less interaction.

The Genie Client looks and functions like a tiny DIRECTV receiver but it's all “smoke and mirrors.” The client receives input from the remote and outputs video to the TV, but all the hard work is done by the Genie DVR. The clients can pause live TV and do everything that the DVR itself can do, but run completely silent and use less power than any other DIRECTV product. The Gemini adds the ability to run apps as well as other features.

## GENIE HD CLIENTS (MODELS C31, C41, C51, C61)



The Genie HD Client displays SD and HD video over HDMI. An adapter cable can be used to output over component or composite connections. It does not require an access card since it has no tuner and relies on the Genie DVR for all programming and functions. All models other than the older C31 work with the [Genie Remote](#). The C61 model has AT&T branding. All of this generation's clients work the same, and none is faster than another. [The Genie client is available from Solid Signal.](#)

## WIRELESS GENIE HD CLIENTS (MODELS C41W, C61W)



The wireless Genie HD Client outputs HD programming without a coaxial cable connection. When used with an HR44 or HR54 Genie, a separate [Wireless Video Bridge](#) must be used. When used with a Genie 2 system, no separate video bridge is required. The client may be placed up to 50 feet away from the video bridge or Genie 2. Up to 3 wireless clients may be used with an HR44 or HR54, and up to 5 wireless clients may be used with a Genie 2. [It's available from Solid Signal.](#)

## 4K GENIE MINI CLIENT MODEL C61K



The 4K Genie Client is designed specifically for use with 4K TVs with HDMI 2.0 and HDCP 2.2. It does not have the ability to output over component or composite. If connected to an HDTV it may occasionally show “nag messages” saying that the TV is not 4K compatible. It is somewhat larger and much heavier than a traditional Genie Mini Client, and uses quite a bit more power. The C61K is generally obsolete since the Gemini does the same things and more. [It's still available though.](#)

## GEMINI MODEL C71KW



Gemini is the all-new client experience for DIRECTV satellite. It runs both satellite TV and apps from the Google Play Store. It does everything the old Genie clients can do and more. It can run wired or wireless, outputs every resolution in HD and 4K, and can run streaming apps like Netflix and Disney+. It also has a voice-capable remote and is the first DIRECTV client designed for self-installation. While the older clients are still available, it's hard to know why people would not [choose the Gemini.](#)

Most of DIRECTV's products work for both commercial and residential customers. However, there are products like Genie that are only slotted for residential use. On the other hand, there are three products which are only available to commercial customers.

## H44 COMMERCIAL RECEIVER



The H44 is a repurposed residential receiver that was rolled out in the early 2020s to combat a shortage of H25s. It uses the same interface as Genie DVRs and clients, uses the Genie remote, but does not have recording capability. Like the H25, it displays SD and HD, is SWM-only, and has a built-in coaxial networking adapter. While it is larger than

the H25, it's generally considered to be more reliable than the H25, which was last manufactured in 2011.

## H26K 4K COMMERCIAL RECEIVER



Don't let the model number fool you. H26K is newer than H44, and has more features. It's DIRECTV's first ever purpose-built commercial receiver. Like H25 and H44, it is SWM only but unlike those two it does not have built-in coax networking. This lets it work efficiently with

SWM-30 multiswitches and IP control systems. H26K outputs SD, HD, and 4K but unlike earlier HD receivers, does not support component output.

## COM3000 COMPACT HEADEND SYSTEM



It looks like nothing else in the DIRECTV product line, and there's a reason: this isn't just one receiver. This system, which fits into 6RU in a server rack, can support up to 138 channels of programming with a modulated output. These can include SD, HD, and 4K programs. COM3000

systems require special contracts and specific installers to work properly. One COM3000 system can support a reasonably unlimited number of televisions over coaxial or IP distribution. The system is modular, allowing parts to be swapped without bringing down the whole system.

COM3000 systems require the use of TVs with MPEG-4 tuners and Pro:Idiom decryption. Pro:Idiom ensures that it's impossible to make pure digital copies of the programming that's coming over the wire.

## AVAILABLE DIRECTV LNBs

Model	Description	Nº. Lines out	Nº. Tuners Supported	4K Reception	Upgradeable to External SWM
<a href="#">SL3-SWM</a>	SWM-Enabled 3	1	8	Yes**	No
<a href="#">3D2RBLNB</a>	Reverse Band 3 SWM	1	21*	Yes	No
<a href="#">SL5KRB</a>	Reverse Band 5 Legacy	6	4	Yes	Yes

\*\*LNB may be limited to 13 tuners if non-Genie receivers are present

\*\*\*Reverse Band LNBs may be required for 4K in the future

## AVAILABLE DIRECTV MULTISWITCHES

Model	Description	Nº. outputs	Nº. Tuners Supported	Outputs bridged for Whole-Home DVR
<a href="#">DSWM30</a>	30-channel Multiswitch	2	13-15/output, 26-30 total <sup>1</sup>	No
<a href="#">SWM30-HP</a>	Commercial Multiswitch <sup>2</sup>	2	13-15/output, 26-30 total <sup>1</sup>	No

<sup>1</sup>Maximum number of tuners per output leg is 13 if pre-Genie/pre-H26K receivers are present

<sup>2</sup>High power multiswitch may destroy receivers if not used properly

## AVAILABLE DIRECTV RECEIVERS/DVR/CLIENTS

Model	Description	Output	DVR Function	Outputs to TV	Nº. Tuners Used	SWM Required
<a href="#">H24</a>	Receiver	SD, HD	No	Yes	1	No
<a href="#">H25</a>	Receiver	SD, HD	No	Yes	1	Yes
<a href="#">HR24</a>	DVR	SD, HD	Yes	Yes	2	No
<a href="#">HR54</a>	4K Genie DVR	SD, HD	Yes	Yes	7 <sup>3</sup>	Yes
<a href="#">HS17</a>	Genie 2 DVR	None	Yes	No	13 <sup>4</sup>	Yes
<a href="#">C31/C41/ C51/C61</a>	HD Client	SD, HD	Yes <sup>5</sup>	Yes	0	Yes
<a href="#">C41W/C61W</a>	Wireless Client	SD, HD	Yes <sup>5</sup>	Yes	0	Yes
<a href="#">C61K</a>	4K Genie Client	HD, 4K	Yes <sup>5</sup>	Yes	0	Yes
<a href="#">H44</a>	Comm. Receiver	SD, HD	No	Yes	1	Yes
<a href="#">H26K</a>	Comm. Receiver	HD, 4K	No	Yes	1	Yes

<sup>3</sup>HR54 DVR uses 7 tuners but only records 5 shows

<sup>4</sup>HS17 uses only 8 tuners when connected to SWM-16 and records max. 7 shows

<sup>5</sup>Clients will not function unless connected to Genie DVR

Now that you've had an overview of the hardware that's available, let's take a look how that hardware can be used in homes and RVs. Generally speaking, home installations tend to be simpler. There's nothing stopping you from putting 100 DIRECTV receivers in your home, but in practice it's rarely done. Most home installations are centered around the Genie system and fewer than 8 rooms. It's still possible to do some very complex setups if you want.

## LIMITATIONS TO RESIDENTIAL INSTALLS

Here are some things you need to know when you're upgrading your home DIRECTV system.

**SWM-enabled dishes are limited to 13 tuners if you want the most stability.** The SWM-enabled Slimline dish will support 21 receivers, however a maximum of 13 H24/H25/HR24 receivers may be used. In order to get to the maximum of 21, you must use an HR54 Genie and power up all the standalone receivers/DVRs first.

**SWM-30 multiswitches are limited to 26 tuners for residential use.** Similar to the limitation on SWM-enabled dishes, residential systems are limited when using the SWM-30 multiswitch. You'll need to build two banks of 13 tuners, and the two banks can't share programming due to the 16-device limitation built into DIRECTV's whole-home networking system.

**Genie 2 users may not use H24/H25/HR24 boxes.** Genie 2 is designed to be a simplified system supplying up to 7 rooms with content. DIRECTV policy prevents customers from using any other receivers or DVRs if there is a Genie 2 on the account. If you want a completely upgradeable system, you should choose an HR54 Genie instead.

## LIMITATIONS TO MOBILE INSTALLS

DIRECTV's RV-based accounts generally have the same limitations as residential accounts, with a few additions:

**Portable and single-satellite systems only see DIRECTV's 101 satellite.** With the exception of systems like the KING Phoenix and Winegard Trav'ler Pro, all mobile systems won't receive programming from the 99 and 103 locations. This means that most programming will be in SD.

**Mobile HD/4K systems are limited to 13 tuners for maximum stability.** The KING Phoenix and Winegard Trav'ler Pro use the same SWM LNB as residential dishes. This means that they only support a maximum of 13 receivers and one HR54 Genie. These dishes can't be upgraded to support an external SWM.

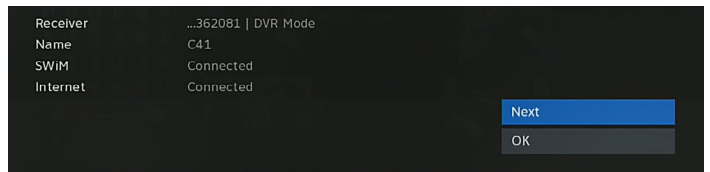
**Mobile users who use their home accounts should never upgrade to Genie 2.** Because a Genie 2 installation means that you can't have additional H24/H25/HR24 boxes, you can't have a receiver in your RV if you have a Genie 2. RV satellite users who use the same account for their homes should use the HR54 in their homes and that way they can have as many receivers as they want on the account.

The following pages discuss the most common upgrades for residential and mobile customers.

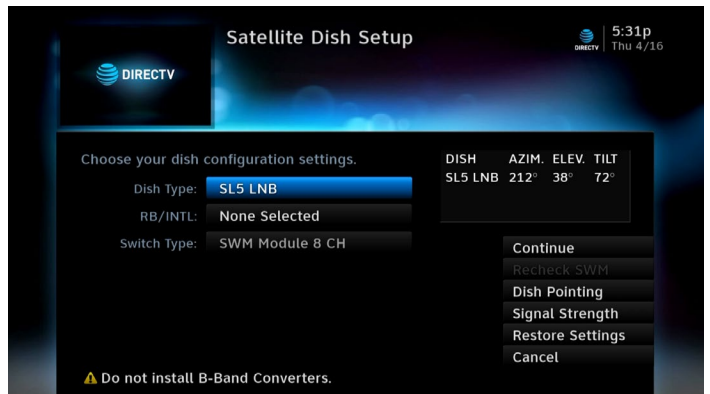
The first step in knowing how best to upgrade is to know as much as you can about the equipment you have now. First things first, you'll need to know what receivers you have. If this is a system put in since 2010, chances are you have some combination of H24, H25, HR24, and Genie products. Model numbers can be found on a green sticker on every receiver, usually on the underside.



Then, you'll need to know for sure if you have a SWM system. If you have a Genie system you have SWM. On other systems, start by pressing the DASH button on the remote (to the left of the number 0) twice and you'll see a popup that tells you. If it says, "SWiM Connected, then you are. This is important to know because in order to be current, you'll need to upgrade to a SWM system. Most likely, though, you're already there.



Finally, you'll need to know some more details about your dish setup. On non-Genie receivers, Press MENU then go to Settings, Satellite, Repeat Satellite Setup. On Genie receivers and Gemini, press MENU or Home, the Settings, Satellite. You'll see the same menu.



Next, look at the dish you have. Is there one line coming out of it, or more? If there is one line and you have more than one receiver, that's a "SWM LNB" and may be limited to between 8 and 13 tuners. You may need to swap it out for something else in order to stay futureproof.



If you have four or six lines coming from your dish, trace the wires and find the multiswitch. Unless this is a very old system, there are only a few possibilities: The WB68, SWM-8, SWM-16, SWM-32, and DSWM30. Depending on your needs, you may be able to simplify your system significantly by eliminating the multiswitch and using a DIRECTV LNB that can handle up to 21 tuners.

Before getting into actual upgrades, take an inventory of the equipment you have now. You may want to plan to replace an LNB or a multiswitch to make wiring easier.

In order to get everything to work properly the first time, you should take some time to plan your system. There are a number of things you'll need to consider.

## Do you need to upgrade your dish?

If your current dish has only one line out, it's possible that it won't support the number of tuners you want. If that's true you'll want to change out the LNB for a "Legacy" version and run 4 or 6 lines into an external multiswitch. Follow the directions on the next page.

## How many tuners do you need?

Remember, DIRECTV systems count the number of tuners, not the number of receivers. Look at the table on page 14 to count the number of tuners you need. If that number is over 13, you may need to use at least one external multiswitch.

## How many devices will share recorded programs?

As a general rule, no more than 15 devices can share programs and no more than 10 of those can be DVRs. If you want more recording/viewing capacity you'll need to break them up into groups where each group has no more than 15 devices. If the devices aren't all on the same output from the SWM, you'll need to take special steps as well.

## Do you need the system to be "rock solid?"

If you have more than 13 tuners in use, you can upgrade to 21 tuners without adding an external SWM. However, this means you'll have to power up your receivers in a specific order, and that may create problems for others in your household.

## Considerations for Specific Receivers

**H24/H25/HR24:** If these receivers are present in your system, the output from your dish or multiswitch can be limited to 13 tuners. There is a technical limitation of these receivers that keeps them from getting signal if 13 other tuners are in use. While it's not "officially supported," many people have had luck in using all available tuners by making sure that the non-Genie receivers are powered up first, since the Genie DVR will work no matter what order it's powered up in.

**HR54:** Although this DVR records only 5 programs it can reserve 7 tuners.

**HS17 Genie 2:** This is the only DIRECTV DVR that does not output to a TV, so plan for an appropriate number of clients. Also, the HS17 Genie 2 cannot be combined with any other receiver or DVR on the same account.

**Clients/Gemini:** Clients must be used with a Genie DVR. You can have up to 8 clients on your account, but not all can be used at the same time. If you have an HR44 or HR54, you can watch TV on 3 clients at a time. If you have a Genie 2, you can watch TV on 7 clients at a time. HR54 supports one 4K stream at a time, while Genie 2 supports three 4K streams at a time.

**If you plan to upgrade your LNB or change to an external multiswitch, make sure to take it one step at a time.**



**IMPORTANT: Carefully mark your dish's position on the back of using a pencil so you will know if you've knocked anything out of alignment.**

Unless you are using the latest Reverse-Band capable LNBs, you'll want to do an upgrade to your dish. You'll also want to do this upgrade if you choose to move to an external multiswitch for greater stability or more tuners.

## Choosing the right LNB for your needs

[The SL3 Reverse Band LNB](#) is the right choice for almost every residential setup. With it, you can connect an HR54, three client boxes or Geminis and six standalone receivers, or five HR24 DVRs and one standalone receiver. If you are willing to power up your devices in a particular order, you can get an HR54 DVR, three client boxes or Geminis, five HR24 DVRs, and four receivers. If you feel you need more than that, you'll want a legacy LNB.

If you want ultimate flexibility, you can use the [Reverse Band 5 Legacy LNB](#) instead. This LNB has six lines out and requires the use of a [SWM-30 multiswitch](#) to work. Diagrams on the following pages show how to connect this LNB to the multiswitch. Commercial customers use this setup for virtually unlimited flexibility.

## Changing the LNB on your dish

If you need to change out the LNB, do that first. Be careful. Use a pencil to note the mounting angles on the dish. This will help you see if you have inadvertently moved the dish. Gently mark the position of the dish on the dish bracket and also mark the angle on the top and bottom adjustment areas on the mounting arm. Disconnect and remove the old LNB and attach the new one. The LNB may have a spring which will release as you remove it from the arm.

If this is a SWM LNB, you will only need one line from it. A legacy LNB will need six lines. Four of them feed through the arm, while two are designed to sit outside the arm.

## CAN YOU UPGRADE THE LNB ON A MOBILE OR MARINE SYSTEM?

Generally, the answer is no. If you have a dome-type satellite system, it's very likely you'll destroy the delicate electronics by opening the dome. If you have a motorized system on the roof, it's possible to do the upgrade, but professional installation is strongly recommended.

## **IMPORTANT: Consult local ordinances for the proper use of grounding equipment.**

In general, your DIRECTV hardware will work just fine without grounding. However, grounding isn't just a legal requirement. By properly grounding your equipment, you provide a path for electricity to safely dissipate. This keeps you safer over the long run. It's worth taking some time to learn how to properly ground your equipment.

Like grounding, your equipment will work just fine without proper drip loops. However, taking the time to create drip loops from your dish will make sure that water doesn't get inside, ruining wooden beams and causing problems with your electrical system.

## Basic Grounding

Grounding is simple. You connect a copper wire from a high point on your roof to something that touches the ground. In most cases, you'll use a ground block or grounding screw to connect that copper wire. The connection to the ground can often be an outdoor breaker box, cold water pipe, or grounding rod.

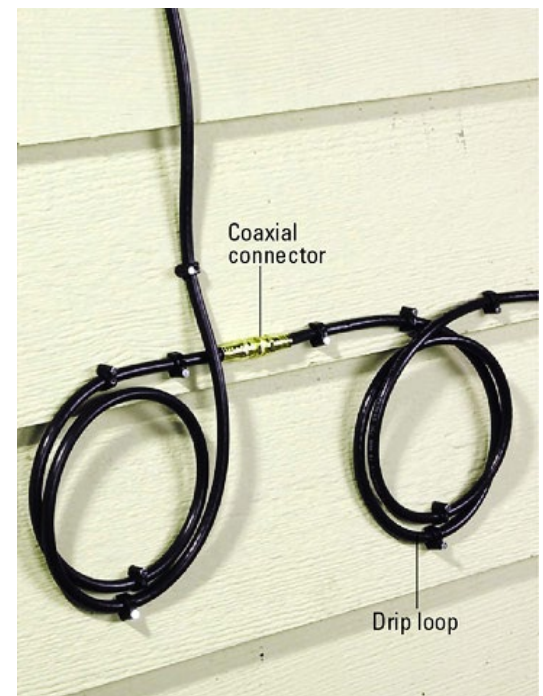
Grounding requirements change from city to city, and you should definitely consult with a contractor or your local city clerk to find out what is legal in your area. However, grounding is definitely a case where doing "something" is better than doing nothing. Even an improperly grounded system will keep you safer than no grounding at all. Here are some parts you might need to properly ground your satellite system:

- [Single Ground Block](#)
- [4-cable Ground Block](#)
- [Copper Ground Wire](#)
- [Ground Rod](#)
- [Ground Strap](#)
- [Grounding Supplies at Solid Signal](#)

## Basic Use of Drip Loops

A drip loop is just a loose bit of cable that is coiled up and hangs lower than other cable in use. It has two purposes. The first is to give you a little bit of slack if you need it. The second is to create a place for water to drip off rather than flowing into your home. Often, drip loops are found near places where a cable ends and is spliced onto another cable, but that's not mandatory.

There's no hard and fast rule for how big a drip loop should be, but you should make sure that the loop is loose enough that it's not putting stress on the cable. Drip loops are often attached to the outer wall, but they don't have to be. The only important thing is that they be placed in a way that water collects and drips off from the bottom.



**First:** choose the correct LNB for your use. In most cases that will be the [Reverse Band 3](#).

**Take Note:** This method does supply 21 tuners, but officially, non-Genie equipment can only see 13 tuners. Some people have reported that using HR24 DVRs instead of receivers lets them use all 21 tuners, and others report that powering up the H24/H25 receivers first, followed by HR24 DVRs, followed by the Genie DVR allows all 21 tuners to be used. Remember that this method is completely unsupported. If you want a more stable installation, you should use an external multiswitch to supply your DIRECTV system if you have over 13 tuners. **If you are only using H24 or H25 receivers, use an external multiswitch to connect more than 13.**

**Remember “Tuner Math:”** Use the chart on page 12 to determine how many tuners you will need. Remember, you’re counting tuners, not physical boxes.

**Powering the Dish:** If you have an HR54 or HS17 DVR, it can power the dish. Otherwise you will need a [PI-29Z Power Inserter](#).

You’ll need the following parts (it is presumed you already have a DIRECTV dish)

- [Reverse Band 3 LNB](#)
- [PI-29Z Power Inserter](#) (optional if you have an HR54 or HS17 DVR)
- [DIRECTV MSPLIT2](#), [MSPLIT4](#), and [MSPLIT8](#) splitters as needed
- [DIRECTV Broadband DECA Kit](#) (optional if you have HR44, HR54, or HS17 DVR)
- [Terminators](#)
- [Cable](#)

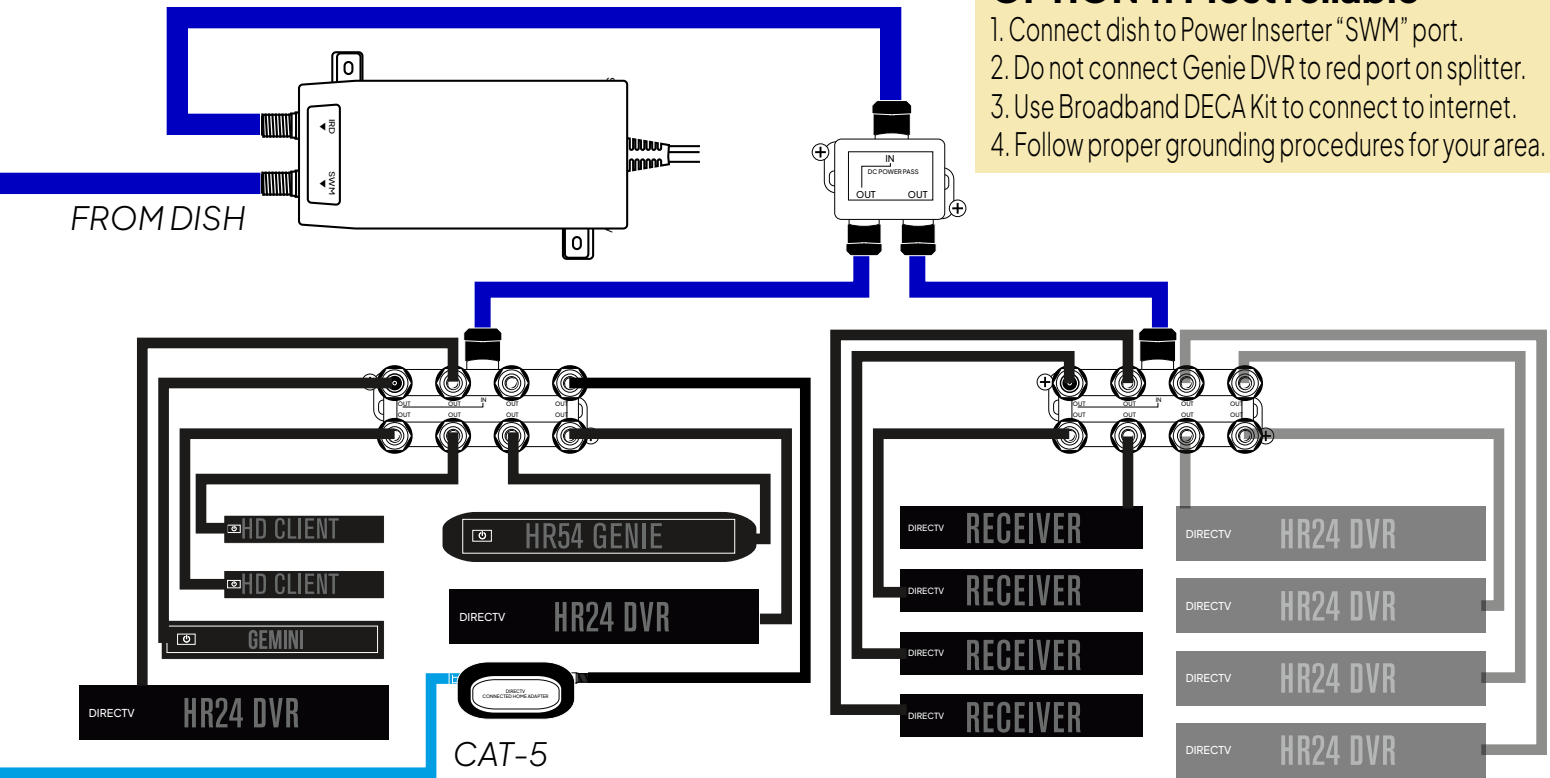
Remember, do not oversplit the signal and terminate any unused connections. Also, remember to ground your equipment whenever possible. Better to ground too often than not often enough.

**Using a PI-29Z Power Inserter:** Run the line from the satellite dish to the SWM port. Run a line from the IRD port to appropriate splitters, then to your receivers. If the PI-29Z is used with a Genie, do not connect the Genie DVR to the red port on the splitter.

**Using an HR54 or HS17 without PI-29Z Power Inserter:** Run the line from the satellite dish to an appropriate splitter. Connect the Genie DVR to the red port on the splitter. Other splitters may be connected to the first splitter if needed.

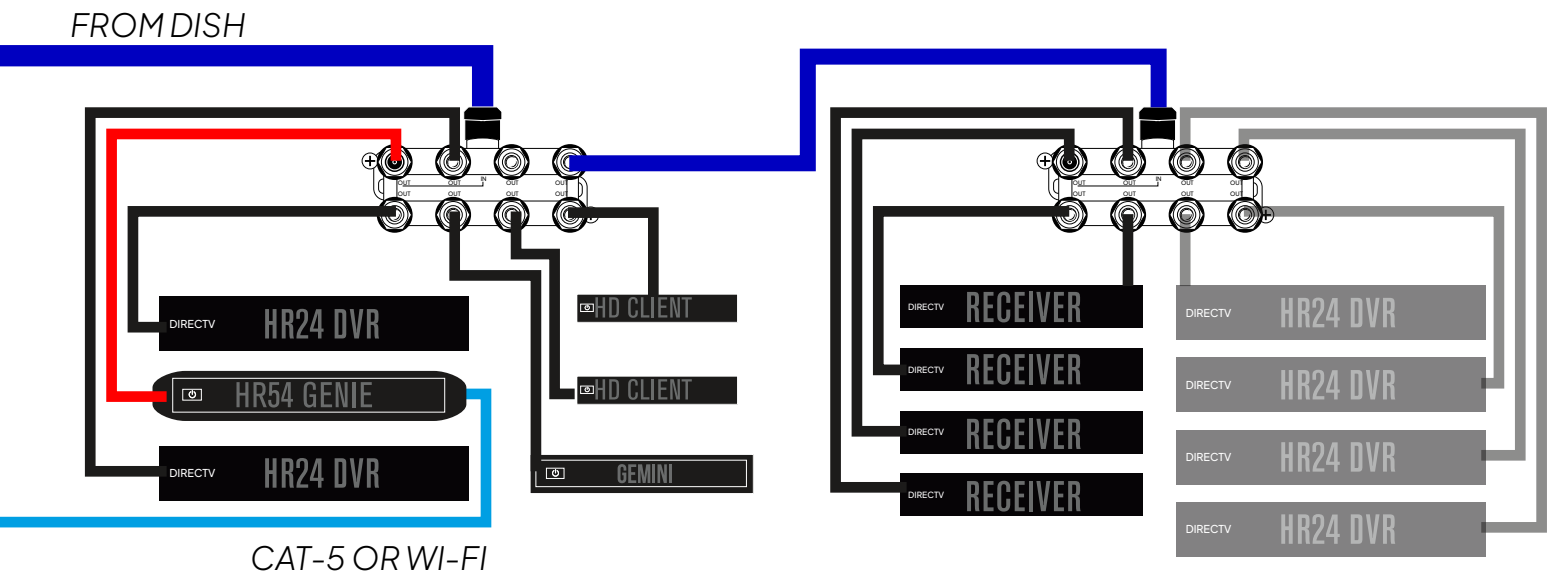
**Internet Connection:** To use on-demand and interactive features, you must connect to the internet. You can connect a Genie DVR (HR44, HR54, HS17) over wired Ethernet or Wi-Fi, or you may use an external Broadband DECA kit. If you are using a Broadband DECA kit, connect coax to the kit, connect its Ethernet cable to your router. One internet connection can supply your entire DIRECTV system, but remember that there is a maximum of 15 receivers or DVRs that can be connected this way, and no more than 10 DVRs.

The following page shows a diagram of the two most common ways of using a Reverse Band LNB to supply up to 21 tuners. Your selection of receivers may vary, and you should always follow proper grounding ordinances.



## OPTION 2: Simplest

1. Connect splitter #1 to dish. Connect HR54 DVR to RED port on splitter.
2. Connect splitter #2 to splitter #1. Run lengths from splitter #2 should be 75 feet or less. For longer runs use option #1.
3. Use HR54 Genie to connect over Wi-Fi or wired connection.



**Warning: DIRECTV officially supports only 13 tuners if older receivers are present**

**First:** choose the correct LNB for your use. The only acceptable LNB is the [Reverse Band 5 Legacy LNB](#). Legacy non-SWM LNBs will work in this installations but they are hard to find at retail.

**Take Note:** This method officially supplies 13 tuners per SWM output. It is possible to connect up to 15 tuners in an unapproved installation. Some people have reported that by using HR24 DVRs instead of receivers, they have used all 15 channels. This method should be used with caution and may simply not work.

**Remember “Tuner Math:”** Use the chart on page 14 to determine how many tuners you will need. Remember, you’re counting tuners, not physical boxes.

**Powering the Dish:** The dish must be powered by the [PI-29Z Power Inserter](#). **To be safe, do not connect the Genie DVR to the red port on the splitter to make sure it does not attempt to power the multiswitch.**

You’ll need the following parts:

- Dish with [Reverse Band 5 Legacy LNB](#)
- [SWM-30 Multiswitch \(Includes Power Inserter\)](#)
- DIRECTV [MSPLIT2](#), [MSPLIT4](#), and [MSPLIT8](#) splitters as needed
- [DIRECTV Broadband DECA Kit](#) (optional if you have HR44, HR54, or HS17 DVR)
- [Terminators](#)
- [Cable](#)

Remember, do not oversplit the signal and terminate any unused connections. Also, remember to ground your equipment whenever possible. Better to ground too often than not often enough.

**Using a PI-29Z Power Inserter:** Run the line from the SWM to the PWR port of the SWM-30. The green light on the front of the switch lights up when it is being powered.

**Internet Connection:** To use on-demand and interactive features, you must connect to the internet. You can connect a Genie DVR (HR44, HR54, HS17) over wired Ethernet or Wi-Fi, or you may use an external Broadband DECA kit. If you are using a Broadband DECA kit, connect coax to the kit, connect its Ethernet cable to your router. One internet connection can supply an entire output leg of a SWM-30, The SWM-30 multiswitch does not allow sharing of programs between its two output ports, due to the 15-device limit of the DIRECTV Whole Home system. If you connect a Broadband DECA or Genie DVR to a wired network connection and run both lines to the same network switch, it may be possible to share programming. However, only 10 DVRs may be visible. See the section on “Whole Home Considerations” for more information.

The following page shows a diagram of a common installation of a SWM-30 multiswitch to service up to 26 tuners with one switch.

# RESIDENTIAL INSTALLATION: UP TO 26 TUNERS (STABLE)

Use the smallest splitter possible.

Terminate all unused ports

Power Supplies not shown.

Devices on different SWM outputs cannot share programming.

POWER FROM "SWM" to PWR PORT

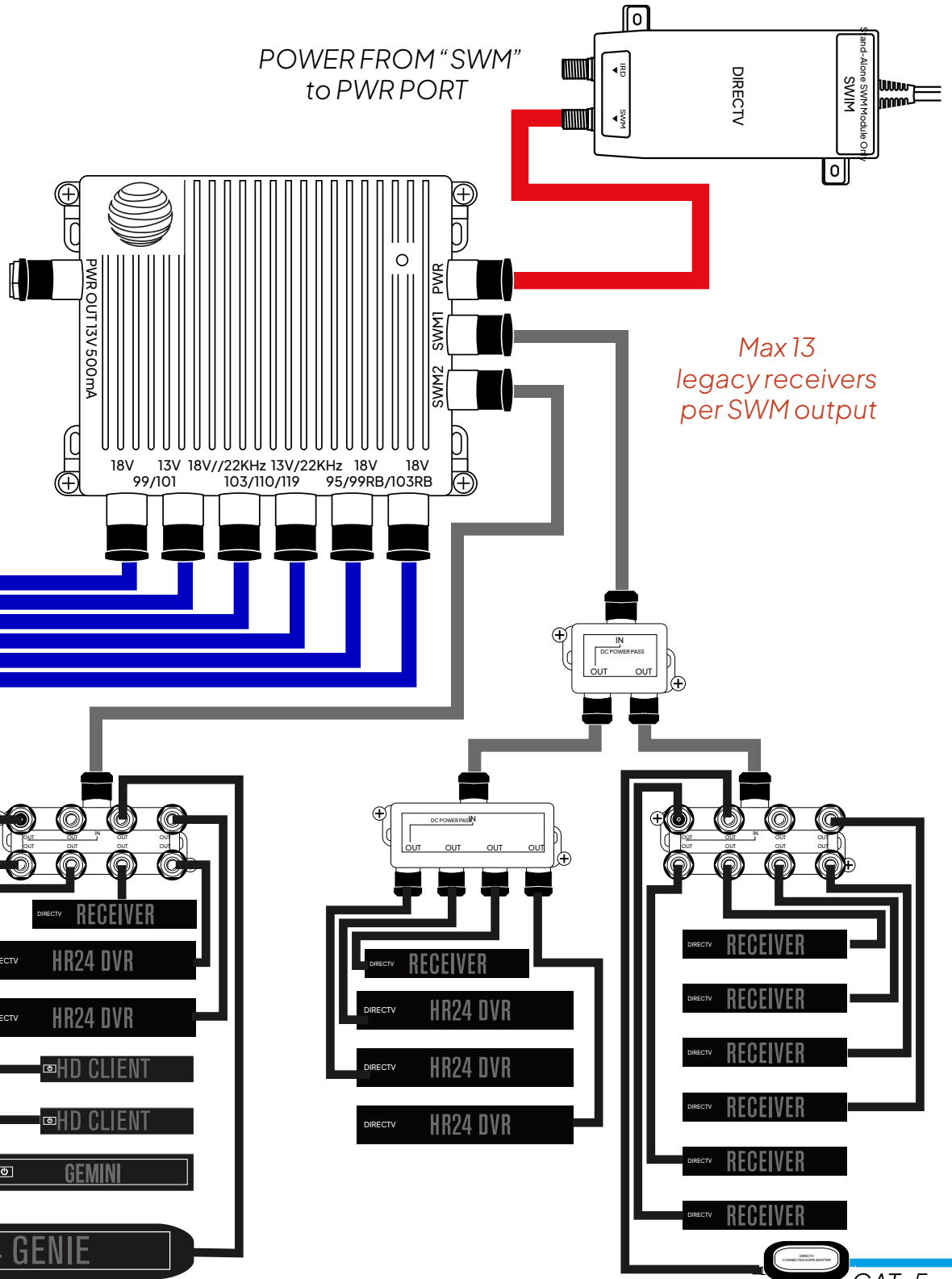
Max 13 legacy receivers per SWM output

LINES FROM DISH

**DO NOT**  
Connect Genie DVR to red port on splitter.

CAT-5 TO ROUTER OR WI-FI

CAT-5 TO ROUTER



Gemini is the latest and greatest client system for DIRECTV. It essentially replaces HD and 4K clients and adds the capability to run apps, as well as use voice control. The [Gemini for Satellite](#) hardware was originally designed for DIRECTV's streaming service so it does not have a direct coaxial input. However, you can choose to run your Gemini wired or wireless; for wired installations you simply attach an off-the-shelf DECA adapter to create a coaxial connection. That DECA can be powered by any MicroUSB cable connected to the Gemini, or through a separate EPS10 power adapter, supplied with the DECA.

## Installation considerations

The installation process for Gemini is designed to be done by the end user, not by DIRECTV installation professionals. However, it does require that you have a working DIRECTV system before you begin. It's best to do all dish and SWM upgrades before starting with a Gemini upgrade.

Because Gemini supports streaming apps, your Genie must be connected to the internet in order to use a Gemini. If you intend to connect wirelessly, you should be in range of an available Wi-Fi network from your home router in order to complete the installation. When the Gemini is ready to attach to your Genie, you will get on-screen instructions on how to pair it.

## Co-locating a Gemini

Gemini is designed to work with HR54 Genie or Genie 2. In the case of an HR54 Genie, you have the option to put the Gemini in the same room as the HR54, connect the Ethernet cable straight to the HR54, and use the Gemini for all TV services. The HR54 will not output live TV in this scenario.

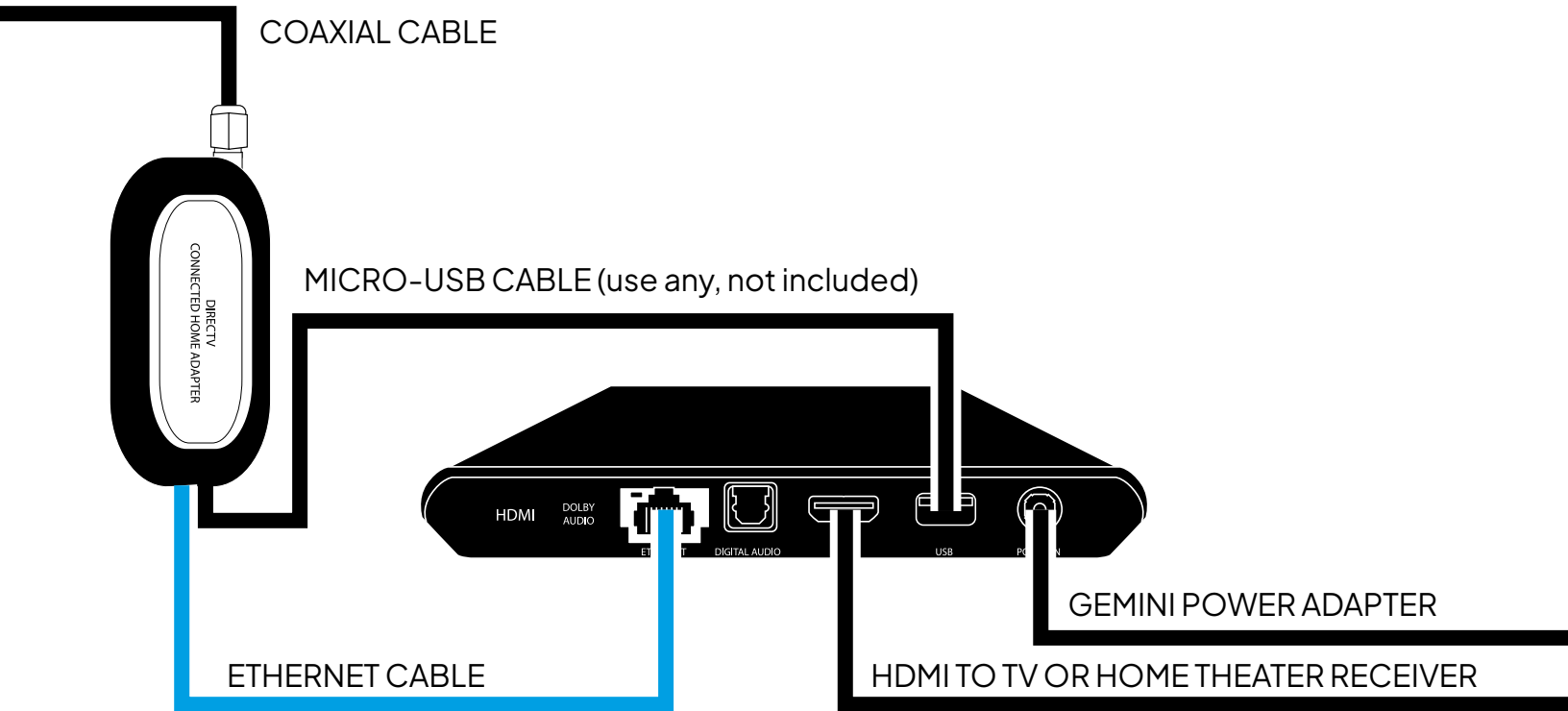
## The parts you need

In addition to everything you will need for installing a Genie system, you will need:

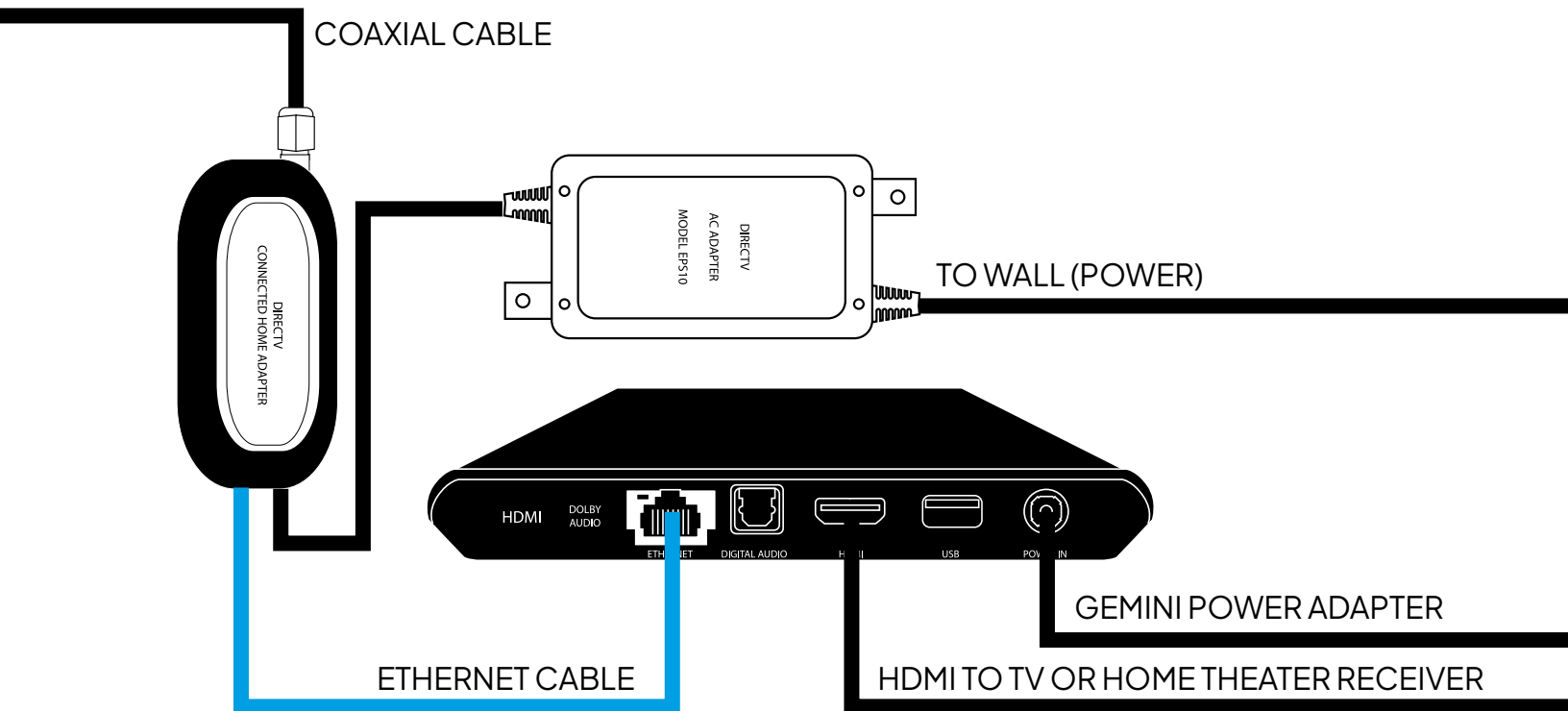
- [Gemini for Satellite](#) (comes with power supply)
- MicroUSB cable (optional, if desired for wired installation)
- [DIRECTV Broadband DECA Kit](#) (for wired installation)
- [Any Ethernet cable](#) (for co-located installs, comes with the DECA kit as well)

The following pages show the most common Gemini installations. For additional installation help, [check out our Gemini review document](#).

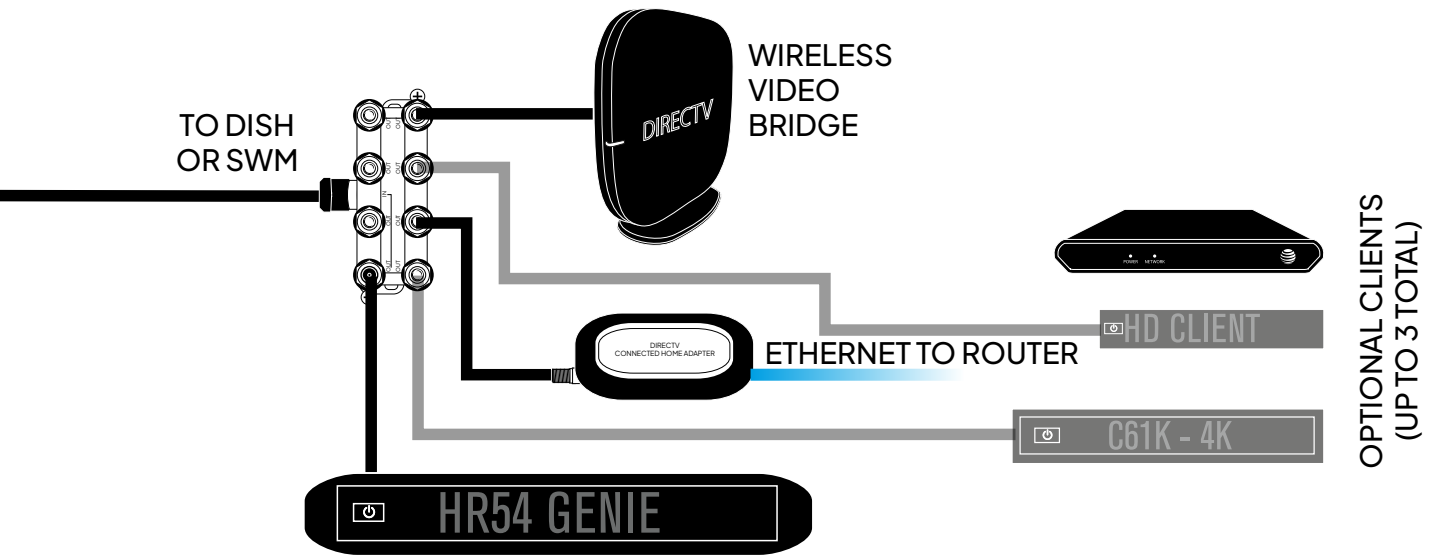
# WIRED GEMINI INSTALLATION (OPTION 1)



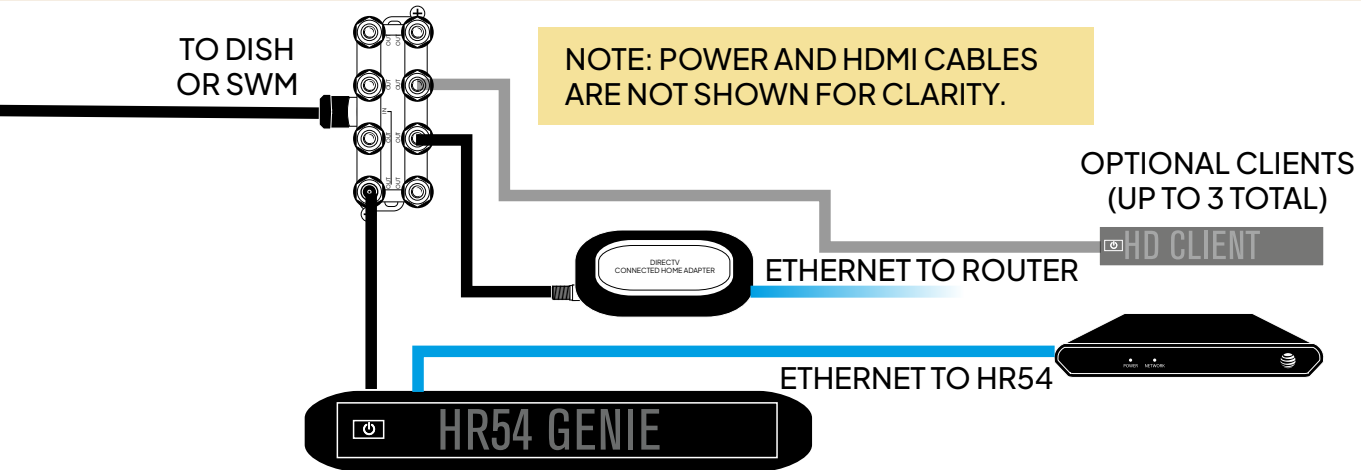
# WIRED GEMINI INSTALLATION (OPTION 2)



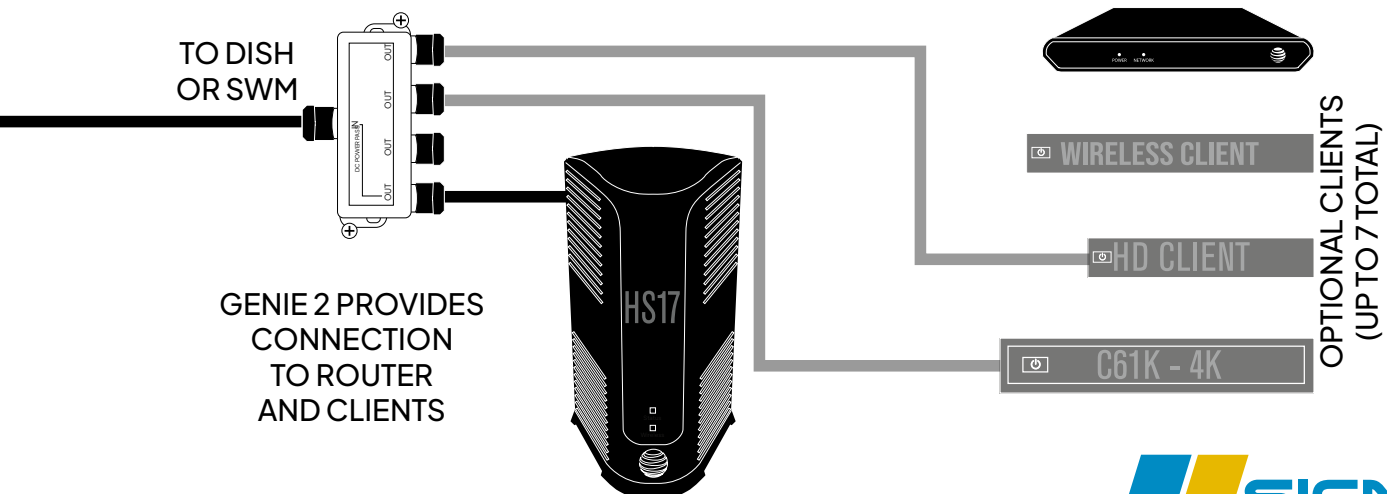
# BASIC INSTALLATION: WIRELESS GEMINI WITH HR54



# BASIC INSTALLATION: GEMINI WITH HR54 (CO-LOCATED)



# BASIC INSTALLATION: GEMINI WITH GENIE 2



# INSTALLING A MOBILE SATELLITE DISH

If you look at the big picture, there are two types of mobile satellite dishes. The “gumdrop” or dome style like the KING One Pro is the least expensive and most common, but it won’t receive most HD channels on DIRECTV. There’s also the permanently mounted type like the Winegard Trav’ler Pro which looks like a home DIRECTV dish.

The Trav’ler Pro and KING Phoenix are simply DIRECTV residential dishes and the installation of them is the same as any SWM-enabled dish. Use the [installation guide starting on page 20](#).



**KING One Pro**

## Installing a dome-shaped dish

Installation of a dome-shaped dish is simple. If you are using an H24 receiver, you can connect one line straight to the power inserter. However, if you are using an H25, H44, H26K, or any SWM-only receiver, you’ll need to install an external multiswitch. This makes the installation a little more difficult but once you’ve done it once or twice, it’s simple to do.

Keep in mind that every mobile dish is going to be a little different, and that the diagrams on the next page are only intended to be a general guideline on how to install this sort of dish.



**Winegard Trav’ler Pro**

## The parts you need

In addition to the mobile satellite dish itself, you may need these items depending on your choice of receivers:

- [DIRECTV H24, H25, H26K, or H44 receiver](#), or [HR24 DVR](#)
- [SWM-30 multiswitch](#) (needed for all but H24 and HR24)
- [Coaxial cable](#)

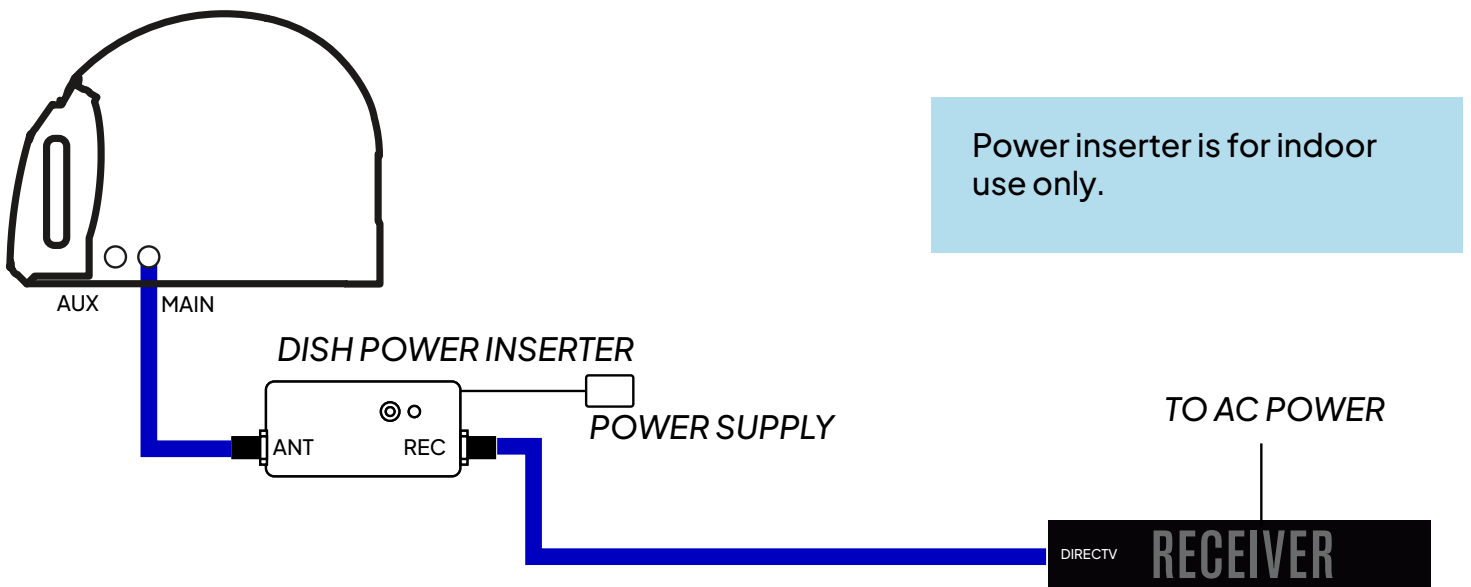
The following pages show the most common mobile satellite dish installations. Keep in mind that every dish is different.

**IMPORTANT INFORMATION:** If you are using the same account for your RV as for your home, you cannot have a Genie 2 DVR at home. You must use an HR54 Genie instead, which will allow you to add receivers to your account.

## INSTALLING A MARINE SATELLITE SYSTEM

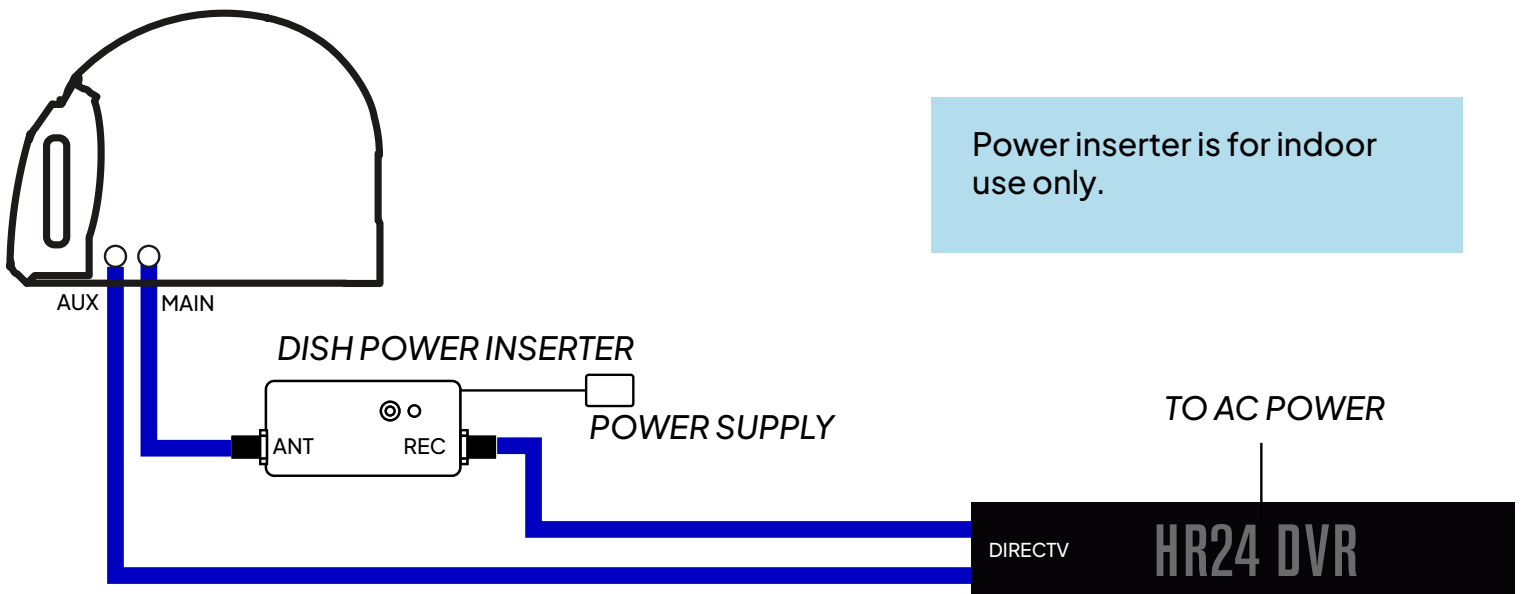
[Page 33](#) has tips and tricks for installing marine satellite systems. Marine installs should be performed by a qualified marine installer, because every installation is different. Different satellite antennas have different requirements for the way they are set up, and there may be a need for additional wiring if you’re taking the boat out of the country and want to use satellite TV from another country.

# MOBILE INSTALLATION OF DIRECTV H24 RECEIVER



Power inserter is for indoor use only.

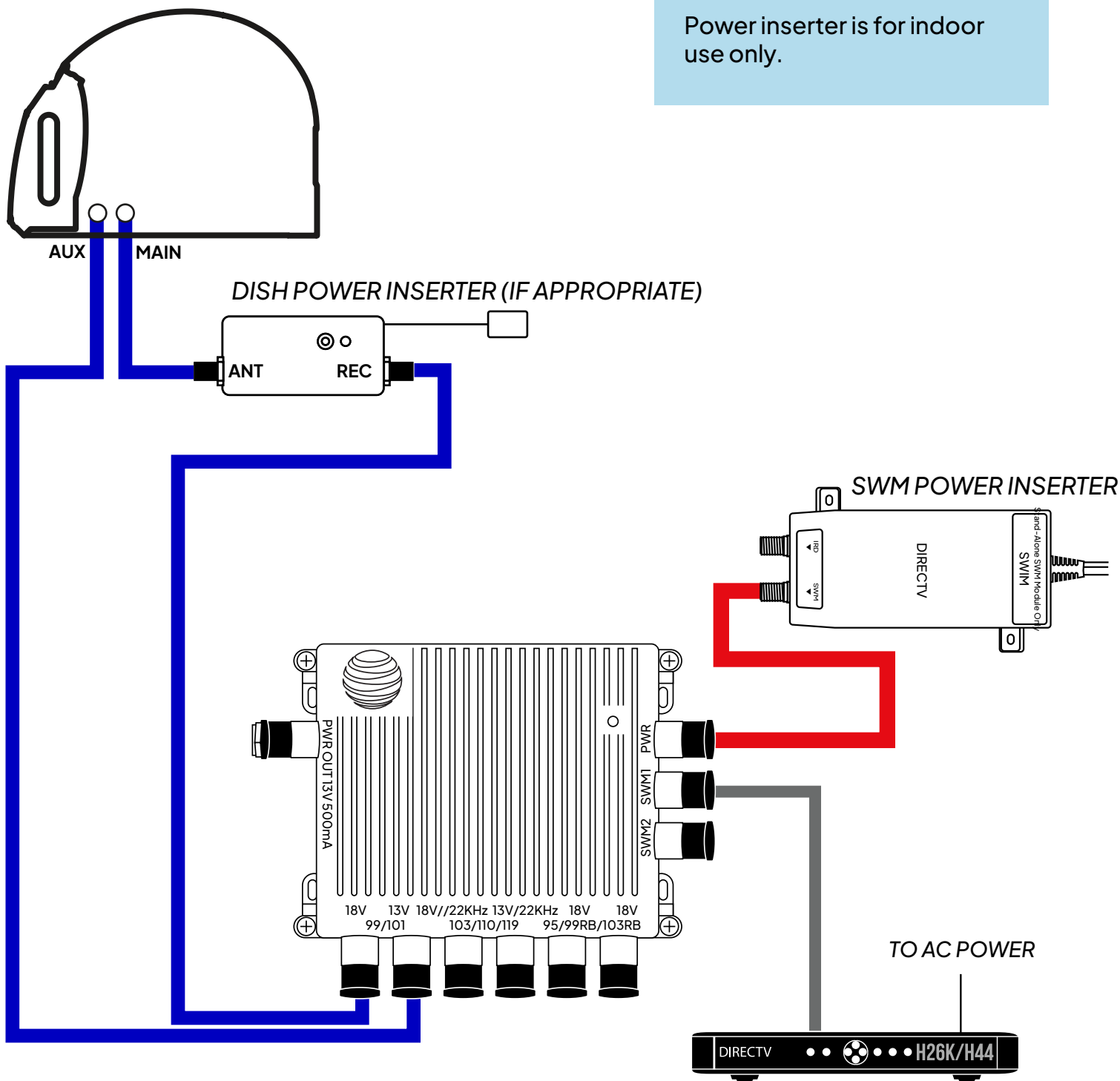
# MOBILE INSTALLATION OF DIRECTV HR24 DVR



Power inserter is for indoor use only.

# MOBILE INSTALLATION OF SWM-ENABLED RECEIVER

Power inserter is for indoor use only.



DIRECTV's Whole-Home DVR platform (previously known as multi-room viewing) has some serious limitations. It's based on the MoCA 1.1 standard, which has a maximum of 16 connected devices and a maximum speed of 175Mbps throughout the network. This 16-device limit includes the connection to the internet, which is why the number usually quoted for a limit is 15 devices. In addition, DIRECTV's systems can only recognize 10 DVRs so if you have more than that, your other devices may not see them.

## Counting devices is different from counting tuners

When you're planning to implement your system, you count tuners in order to figure out what kind of multiswitch you need. With whole-home DVR, you count devices. Every device, whether it's a receiver, DVR, or client, counts as one. So there is a maximum of 15 devices total that can share programs. That's not a problem since no more than 13 devices would ever be connected to a multiswitch. However, when everything is connected to the same network switch or router there can be problems.

## Connecting devices to the same switch causes problems

If you connect all your devices to the same network switch or router, they will try to discover each other and most of the time they will succeed. Each Broadband DECA has a maximum of 15 devices, but there is no limit to the number of Broadband DECA's on the same network. However, the 10-DVR limit is still in place, and this will make it hard for you to connect to the DVR you want and can cause other connectivity problems.

## Isolate groups of receivers from each other

The best plan is to isolate your receivers from each other so that only receivers on the same SWM output can share programs. There is no internal crossover in the SWM-30 so that is a start. However additional steps can be taken to keep your devices isolated. For example:

- The easiest way to isolate receivers from each other is simply not to connect them to the internet. You will lose on-demand and interactive features.
- If your router has a guest network, connecting the Genie DVR over Wi-Fi to the guest network and other receivers to the wired network will isolate them. This works if you have one SWM-30 but not if you have multiples.
- If your router has the ability to have multiple firewalled networks, you can assign each SWM output to its own network.
- You can manually assign IP addresses in different subnets to keep devices from seeing each other. This requires some advanced knowledge of networking and subnet calculation.

You may be reading this document with an eye on installing DIRECTV service in a business, in a restaurant or bar, or in an apartment complexes. Each different installation has different challenges, however, there are some common concerns. The following pages apply to commercial installations where you have access to the H44 and H26K receivers.

## Choosing an LNB for commercial installations

The only acceptable LNB for commercial installations is the [Reverse Band 5 Legacy LNB](#). LNBs with built-in SWM modules are a bad fit for commercial installations in general, although sometimes ingress restrictions mean they are the only choice.

## Running the proper cables

All wire used in commercial installations for DIRECTV should be [solid copper core RG6](#). Quad shield cable is not generally necessary unless the installation goes through areas with high RF interference. RG11 cable may be used for runs over 100 feet. It is generally recommended that seven lines be run. Six lines are used for a 4K installation, four for a standard installation. The seventh line is a spare or can be used for off-air antenna. It is also possible to diplex antenna signals if you are using H26K receivers.

## Powering the dish and amplifying the signal

In commercial installations, it is always best to use an amplifier and polarity locker. Although the SWM-30 multiswitch will supply power to the dish, it is best to have an independent power source. In addition, the long runs between dish and multiswitch could mean that insufficient power got to the dish. An amplifier is used to compensate for long runs and losses due to splitting.

## Networking receivers in commercial installations

In commercial installations like bars and restaurants, you may wish to network all your receivers to be able to control them with the DIRECTV app for tablets or through another automation system. If you are using H44 receivers, each output leg of a SWM-30 can be connected to a network switch using a [DIRECTV Broadband DECA Kit](#) and there will be no conflicts. If you are using H26K receivers, use the built-in Ethernet port to go straight to your network infrastructure. It is usually desirable to set IP addresses manually in commercial installations.

## Considerations for multiple apartments

When installing a large system for an apartment complex or other case where there is more than one DIRECTV account, it is critical that groups of receivers be isolated by a [Band Stop Filter](#). This device completely blocks networking signals over coaxial cable, keeping people from seeing other DVRs outside their homes. Failure to properly isolate apartments can cause problems including fraud investigations, and it's best to try to avoid problems altogether.

DIRECTV's H44 and H26K receivers are only for commercial use. The H44 was originally a residential receiver, and may require a modification onsite to work with commercial software. The H26K is DIRECTV's only receiver without coax networking built in. This makes it possible to diplex signals but requires a completely different networking scheme in order to work with matrix switches and apps.

## Putting an H44 into commercial mode

When the H44 was originally conceived in 2015, it was seen as a residential receiver that was convertible to a 5-tuner DVR. When used as a commercial receiver, it will take up 5 slots on a SWM-30 output leg. This means that unless modification, it will only be possible to put a total of six H44s on a SWM-30 multiswitch.

There is a simple procedure for converting an H44 to commercial mode. It is shown in detail [here](#), but here is a simplified set of instructions for those who are familiar with the receiver and simply need a refresher. The H44 must be able to receive a satellite signal in order to take these steps.

1. Make sure you have the latest software by pressing **0 2 4 6 8** on the remote as soon as you see the welcome screen. The download takes up to 20 minutes.
2. Press **MENU** then go to **Settings, Satellite**, and press **SELECT**.
3. Arrow to the right so that any of the options on the right are highlighted but *do not press SELECT*.
4. On the remote, press **4 9 7 5 7** and you will see a confirmation screen. Press **DASH** to confirm.

## Adding an H26K to a matrix switch or using baluns

The H26K, because it outputs 4K, strictly enforces HDMI 2.1 and HDCP 2.2 compatibility. This can make it stop working with older matrix switches or HDMI to Ethernet baluns. If you see a moment of live TV followed by a black screen, you have two options.

**Option One:** If possible, use the matrix switch's EDID management features to tell it to expect a 4K/60, HDCP 2.2 source. This should solve most matrix switch issues. If you are using a balun, you may need to look at another brand designed for this compatibility.

**Option Two:** You can temporarily bypass HDCP by switching the receiver to output 480 resolution. Press and hold the **EXIT** button on the DIRECTV-branded remote and the resolution will switch. Press and hold it again to go back to HD. Depending on your distance from the TV, you may not notice any difference in resolutions.

Signal Connect is the leader in activating marine satellite television. Marine installations should be done by a qualified local marine installer, as every marine installation is different. Below are some basic things to consider when planning a marine installation.

## Marine installs require an antenna control unit

You won't find an antenna control unit in residential or typical commercial installs. The ACU handles all the extra tasks needed for a self-aiming dish, including satellite selection and general monitoring.



Always make sure the ACU is located somewhere the boat owner or operator can find it. It will be necessary from time to time to reset the ACU and it's important that it be accessible. If the ACU has a traditional serial port, make sure you leave a USB to serial adapter with the ACU so the customer can connect using a modern laptop. You can [get one from Solid Signal](#) or any other retailer.



## Smaller dome antennas will not get all channels

It's been customary for many years to fit smaller boats with 30cm antennas like Intellian's i3 or KVH's TracVision TV3. However, these smaller domes will only receive channels from the 101 satellite. Because DIRECTV is actively retiring standard definition local channels, more and more customers will lose locals unless they have a larger antenna like Intellian's s6HD or KVH's UHD7. Obviously, these antennas are a lot more expensive but they are going to make the customer much happier in the long run.

## Consideration for international installations

Larger boats may travel outside the US and therefore may want to watch satellite TV from other countries. Unfortunately, DIRECTV's SWM system is not compatible with systems in other countries, not even in other countries where DIRECTV service is offered. You can choose a satellite antenna which has both a SWM and international output, but you will need to have two separate wiring schemes, two sets of receivers, et cetera. There is no universal part to allow for both DIRECTV and non-DIRECTV satellite reception.

When upgrading older boats, you may see a Spaun multiswitch like the one pictured here. Spaun was a popular manufacturer of satellite equipment in the 2000s and 2010s. However, they have ceased operations and their older stock is not compatible with modern DIRECTV systems. If you encounter one of these multiswitches "in the wild," it's best to advise the customer to replace it and plan a new wiring scheme that's both current and futureproof.



**First:** choose the correct LNB for your use. The only acceptable LNB is the [Reverse Band 5 Legacy LNB](#). Legacy non-SWM LNBs will work in this installations but they are hard to find at retail.

**Take Note:** You can connect up to 15 receivers to each output leg of a SWM-30. However, this requires that **ALL** receivers be H44 or H26K. If there is even one H24 or H25, that receiver may have connection issues. If you have H24 or H25 receivers, limit the installation to 13 receivers per SWM leg and plan the number of multiswitches accordingly.

**Remember “Tuner Math:”** Use the chart on page 14 to determine how many tuners you will need. In most commercial installations, the number of tuners and the number of receivers is the same.

**Powering the Dish:** The dish may be powered by the [PI-29Z Power Inserter](#). However, a proper installation requires an amplifier and polarity locker, which are discussed later in this document.

You'll need the following parts:

- [Reverse Band 5 Legacy Dish](#)
- [SWM-30 Multiswitch \(Includes Power Inserter\)](#)
- [DIRECTV MSPLIT2, MSPLIT4, and MSPLIT8](#) splitters as needed
- [DIRECTV Broadband DECA Kit](#) (H44 only, one for each output leg)
- [Terminators](#)
- [Coaxial Cable](#)
- [Any Ethernet cable](#) (H26K only, one per receiver)

Remember, do not oversplit the signal and terminate any unused connections. Also, remember to ground your equipment whenever possible. Better to ground too often than not often enough. Refer to local grounding ordinances for the proper way to ground or bond your equipment.

**Using a PI-29Z Power Inserter:** Run the line from the SWM to the PWR port of the SWM-30. The green light on the front of the switch lights up when it is being powered.

**Internet Connection:** An internet connection is required to control receivers using a matrix switch or using the free DIRECTV App for Business, which is available at your tablet's app store or play store. The app requires an account at DIRECTV.com in order to work. H44 receivers have a built-in coax networking adapter, so connect one Broadband DECA kit to each SWM output leg, and also to your network. If you are using H26K receivers, these have a built-in Ethernet port. Connect each receiver individually to a network switch. In either case, you should always set static IP addresses for each receiver.

The following page shows a diagram of a common installation of a SWM-30 multiswitch to service up to 30 commercial receivers with one switch.

# COMMERCIAL INSTALLATION: UP TO 30 RECEIVERS

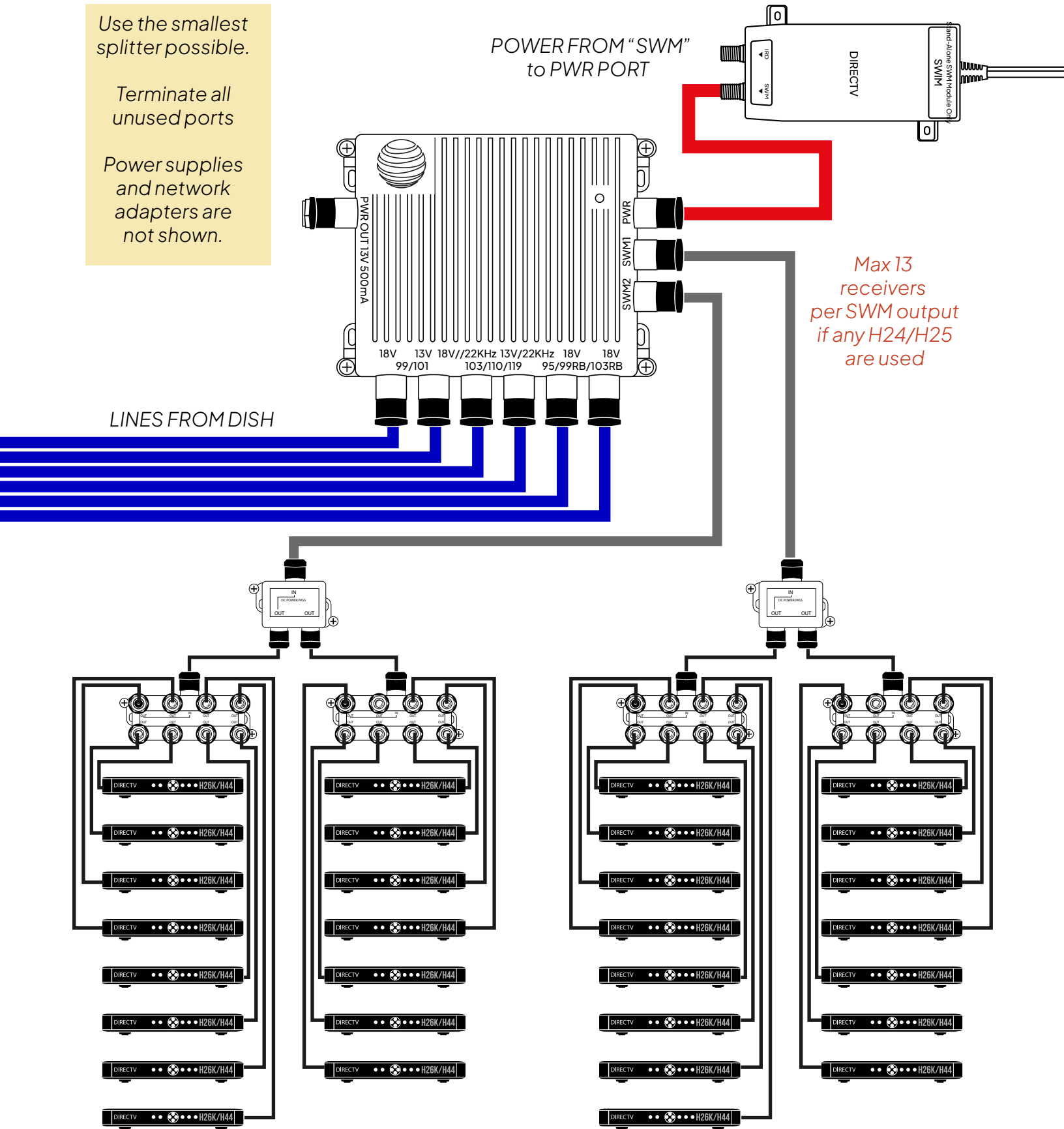
Use the smallest splitter possible.

Terminate all unused ports

Power supplies and network adapters are not shown.

POWER FROM "SWM" to PWR PORT

Max 13 receivers per SWM output if any H24/H25 are used



**First:** choose the correct LNB for your use. The only acceptable LNB is the [Reverse Band 5 Legacy LNB](#). Legacy non-SWM LNBs will work in this installations but they are hard to find at retail.

**Take Note:** You can connect up to 15 receivers to each output leg of a SWM-30. However, this requires that **ALL** receivers be H44 or H26K. If there is even one H24 or H25, that receiver may have connection issues. If you have H24 or H25 receivers, limit the installation to 13 receivers per SWM leg and plan the number of multiswitches accordingly.

**Remember “Tuner Math:”** Use the chart on page 14 to determine how many tuners you will need. In most commercial installations, the number of tuners equals the number of receivers.

**Powering the Dish:** The dish may be powered by the [PI-29Z Power Inserter](#). However, a proper installation requires an amplifier and polarity locker, which are discussed later in this document.

You'll need the following parts:

- [Reverse Band 5 Legacy Dish](#)
- [Two SWM-30 Multiswitches \(Includes Power Inserters\)](#)
- [Six Skywalker Power Passing Splitters](#)
- **DIRECTV MSPLIT2, MSPLIT4, and MSPLIT8 splitters as needed**
- [DIRECTV Broadband DECA Kit \(H44 only, one for each output leg\)](#)
- [Terminators](#)
- [Coaxial Cable](#)
- [Any Ethernet cable \(H26K only, one per receiver\)](#)

Remember, do not oversplit the signal and terminate any unused connections. Also, remember to ground your equipment whenever possible. Better to ground too often than not often enough.

**Using a PI-29Z Power Inserter:** Run the line from the SWM to the PWR port of the SWM-30. The green light on the front of the switch lights up when it is being powered.

**Using the Skywalker Splitters:** It is critical that the lines from the Skywalker splitters go to the same port on both SWMs. In other words, if one line from the splitter goes into the leftmost port on the SWM-30, the other line must go into the left port on the other SWM-30.

**Internet Connection:** An internet connection is required to control receivers using a matrix switch or using the free DIRECTV App for Business, which is available at your tablet's app store or play store. The app requires an account at DIRECTV.com in order to work. H44 receivers have a built-in coax networking adapter, so connect one Broadband DECA kit to each SWM output leg, and also to your network. If you are using H26K receivers, these have a built-in Ethernet port. Connect each receiver individually to a network switch. In either case, you should always set static IP addresses for each receiver.

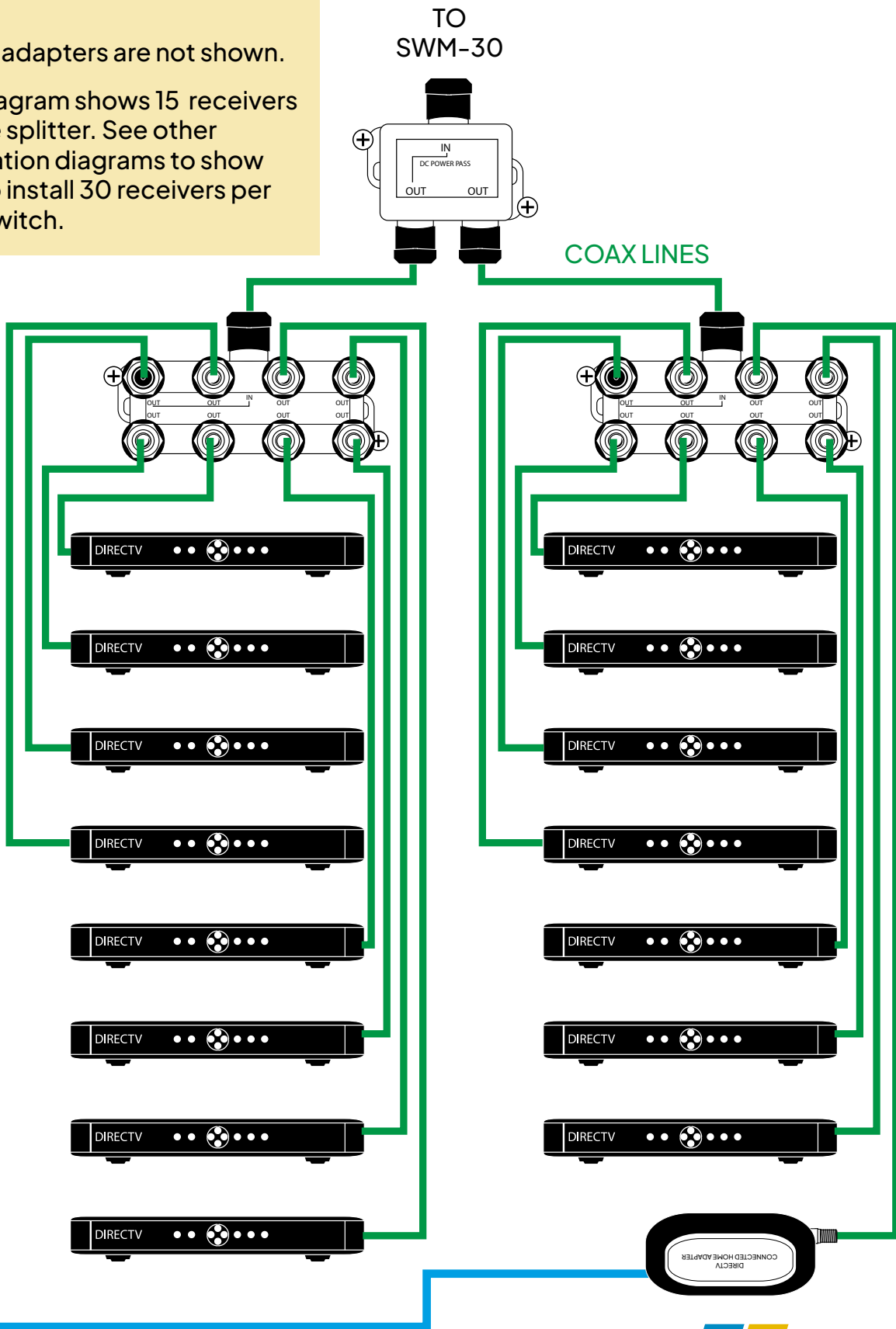
The following page shows a diagram of a common installation of two SWM-30 multiswitches to service up to 60 commercial receivers.



# NETWORKING H25 OR H44 RECEIVERS

## NOTES:

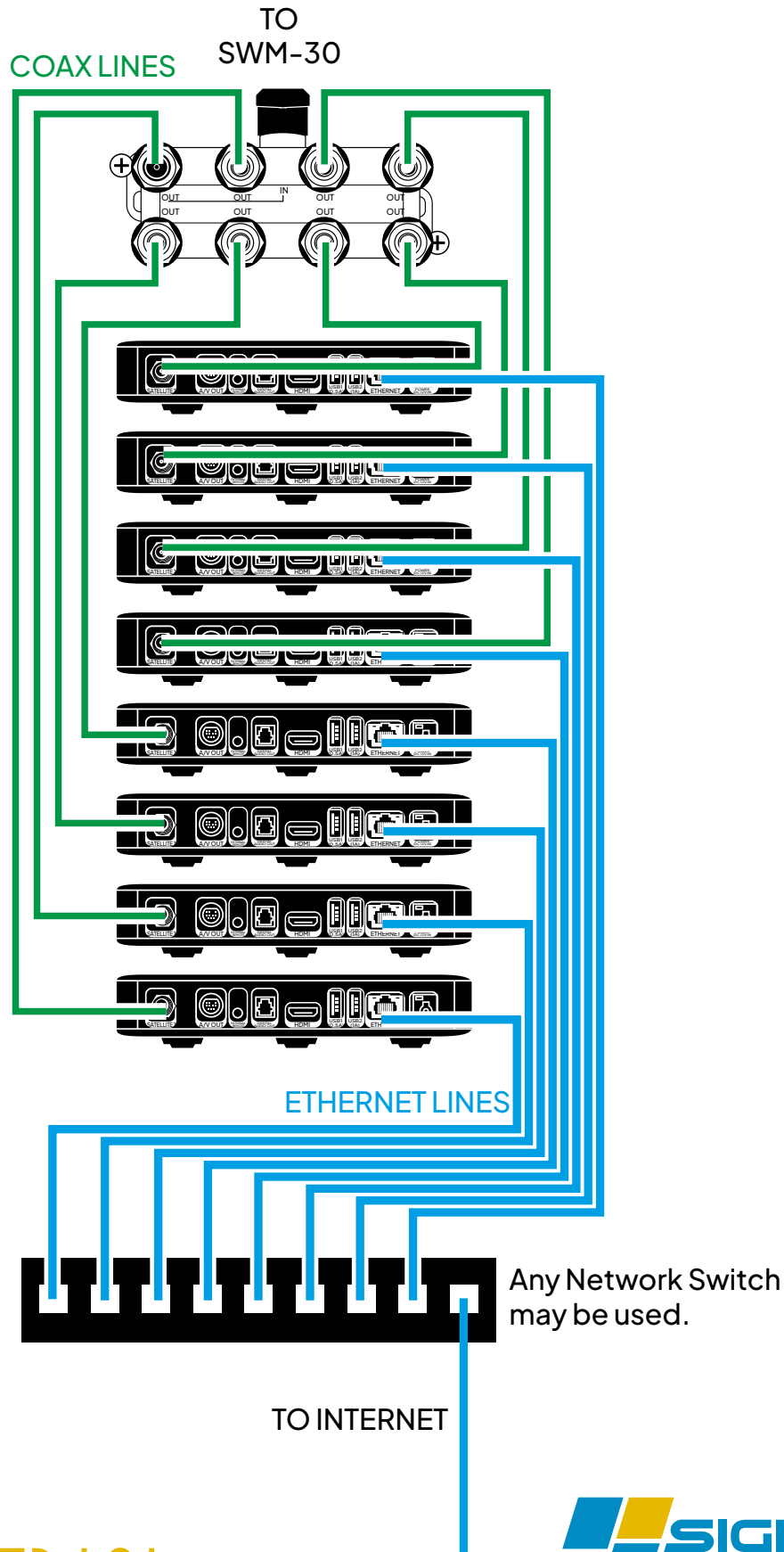
1. Power adapters are not shown.
2. This diagram shows 15 receivers on one splitter. See other installation diagrams to show how to install 30 receivers per multiswitch.

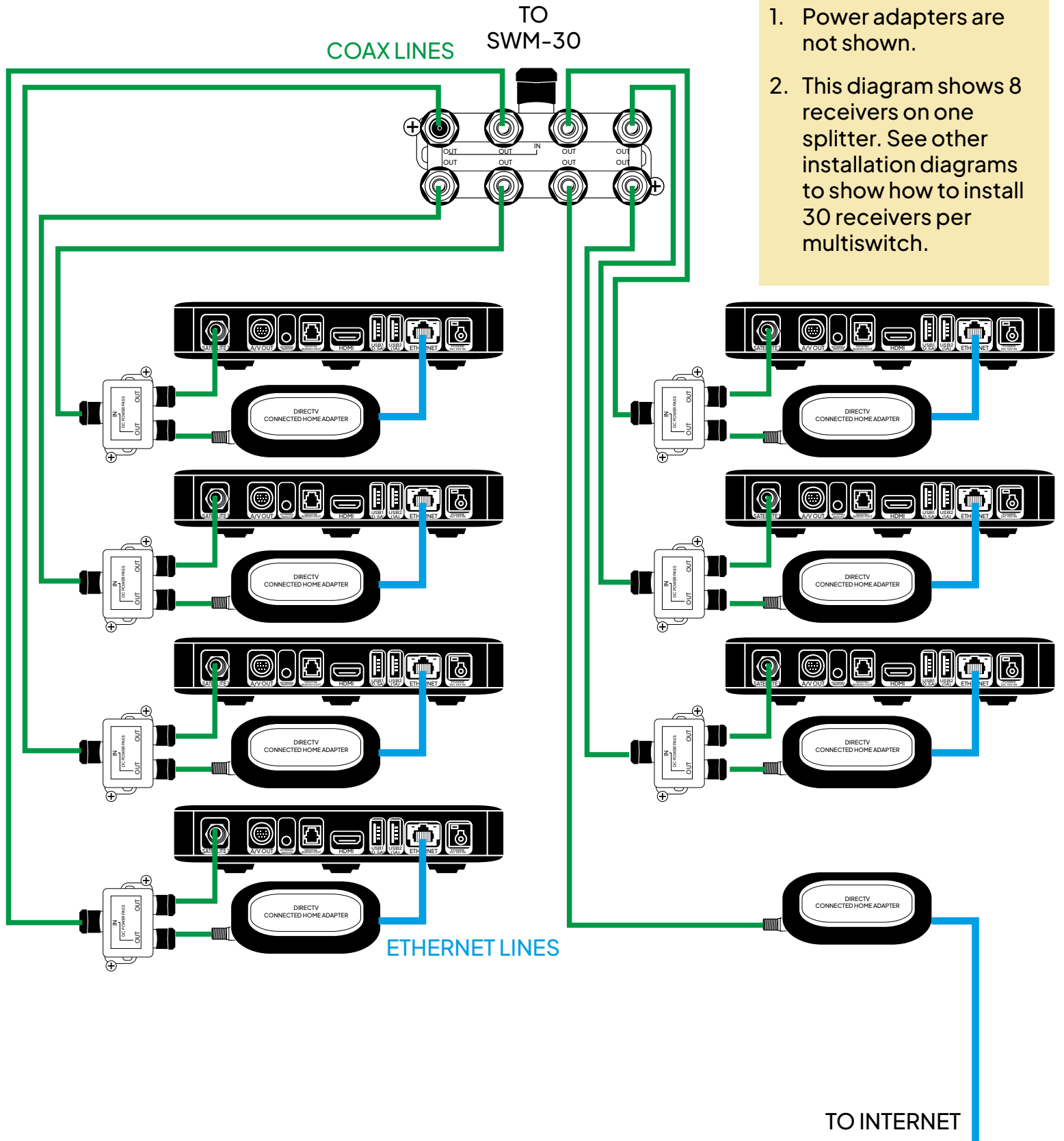


TO INTERNET

## NOTES:

1. Power adapters are not shown.
2. This diagram shows 8 receivers on one splitter. See other installation diagrams to show how to install 30 receivers per multiswitch.





**NOTES:**

1. Power adapters are not shown.
2. This diagram shows 8 receivers on one splitter. See other installation diagrams to show how to install 30 receivers per multiswitch.

DIRECTV for the enterprise takes a lot more planning than just a home or simple business system. When you are serving hundreds of receivers, you have to plan out every step carefully. The process can take months before a single foot of cable is laid. Here are some basic considerations for enterprise installations.

## Plan the type of installation well in advance

Enterprise installations aren't necessarily the same as other commercial installations. Generally you will find an enterprise installation will fall into one of these categories:

**Lodging/Institutional with receivers at every TV:** In this installation, there's a receiver at every television. This is often the most expensive choice but it does offer a lot of flexibility. Often times, hotels will use separate hardware to connect to billing and on-demand TV services.

**Headend solutions:** In a headend solution, all the receivers are located at a single point. Modulators are used to put all the channels on a single wire. That single wire can then easily feed an unlimited number of receivers. Amplifiers are used to keep signal levels high. You'll find headends already in place in hotels, hospitals, prisons, and other institutional facilities. It's generally possible to build a headend solution offsite and roll it in for a quicker installation.

**Multi-dwelling units (apartment buildings):** In apartment complexes, you don't need a separate satellite dish for every unit. You can pre-wire the entire building for DIRECTV and keep most equipment in a central closet.

## Working with existing buildings and older installations

Often times, you'll be called in to replace existing hardware with new hardware. This can be a challenge since the equipment that's already there may not be up to the task. Before you start, here are some steps you should take.

**Do a full, in-person site survey.** There's no substitute for laying eyes on the location you're planning to use. You'll easily be able to tell if the cable is in generally good condition and if there's sufficient room in conduits for the wires you'll need to put in place.

**Find out what's staying.** Often times you'll be asked to combine a new DIRECTV install with existing digital signage or content delivery. This may seem like a challenge but with headend systems this is very easy to accommodate.

**Build extra time into the project.** One thing that's 100% certain when working with older buildings: you need to expect the unexpected. There will always be a challenge that wasn't budgeted for, and time that needs to be spent fixing it. If you don't have the luxury of tearing every single piece of cable out, your schedule needs to be flexible enough to encompass all the little things that can happen when working with older buildings and older equipment.

**Make sure you understand the local laws.** In large installations, things like grounding are of extreme importance. Your work may be inspected by a local fire marshal, so make sure that you're aware of every ordinance. Also, be aware that some cities and towns have laws that may affect the kind of cable you use and the safety equipment installers are required to use.

Enterprise installations should never rely on multiswitches or receivers to power the dish. Often times it's not possible to put the equipment rack within 50 feet of the dish, and DIRECTV spec says that the power source must be within 50 cable-feet of the dish.



That's one of two purposes for a polarity locker. A polarity locker provides an independent source of power to the dish, and it also "locks" each line so it is only supplying one of the six possible signal types that can come from a modern DIRECTV dish. This ensures stable signal flow into the multiswitches and avoids switching problems which can be very hard to diagnose.

The preferred polarity locker is the [DIRECTV PLPI-R0-09](#). It isolates the signals from the LNBS and gives priority to only those signals that should come through each of the lines. Locking in each line's polarity should help compensate for noisy or weak signals. It also provides a power source for those LNBS to make them as efficient as possible. Normally this is done by your receivers or the power inserter in your system. Adding voltage specifically to power the LNB helps to avoid voltage drops that can cause problems for the receiver. If you decide not to install an amplifier and polarity locker into your system, it's wise to leave room for one later, and make sure that cables from the dish can reach to where the amplifier would go.

Earlier generations of this polarity locker are not guaranteed to work with the current 6-wire LNB, so it's worth picking up the latest one.

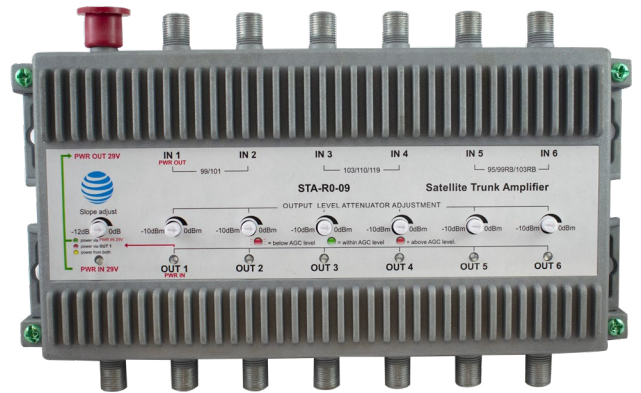
Installation is easy. Install the polarity locker closest to the dish, followed by a short run to the amplifier. The diagram on the next page shows proper installation, with the polarity locker closest to the dish.

## Where to place the polarity locker

The polarity locker should always be placed so that there is no more than 50 feet of cable between it and the dish. Why 50 feet? It has to do with the amount of voltage that the polarity locker supplies, the amount of voltage the dish needs, and the amount of voltage that the cable loses per foot. It's something you can't and shouldn't try to change. Always try to find a way to put the polarity locker where it needs to be. In a worst case scenario you can run new power lines or even use solar. You'll only need to supply 45 watts of continuous power to run a polarity locker.

Everything that comes between your dish and your receivers causes some signal loss. This is an unavoidable fact. That's why the best practice is to use as few splitters as possible, and use the smallest splitter possible.

If you're using more than one multiswitch, you are losing at least 6dB of signal. That probably isn't a problem by itself, but it can be a problem if you have many splitters further down the run. If you are using more than two multiswitches, you're losing at least 10dB of signal. That could be a real problem when rain, snow, or even dense cloud cover come into play. That's why an amplifier is so important.



The most commonly used amplifier is the [DIRECTV STA-R0-09](#) amplifier. This is an automatic gain amplifier with a fixed output level as high as -15dBm from a minimum input of -52dBm. The output can be adjusted if it is too high. It features three different levels of slope compensation, which is used to make sure that high frequencies, which have more loss over long distance, have a higher power output than lower frequencies.

## What you need to know about amplifiers

An amplifier by itself is not going to solve all the problems that may exist. The amplifier is only going to work with the signal it has, and that signal may benefit from further processing. For that reason, we recommend the use of a polarity locker as well. A polarity locker does not remove noise from a signal but it does help stabilize the signal by adding more voltage and locking in the specific signals required for a high-definition dish.

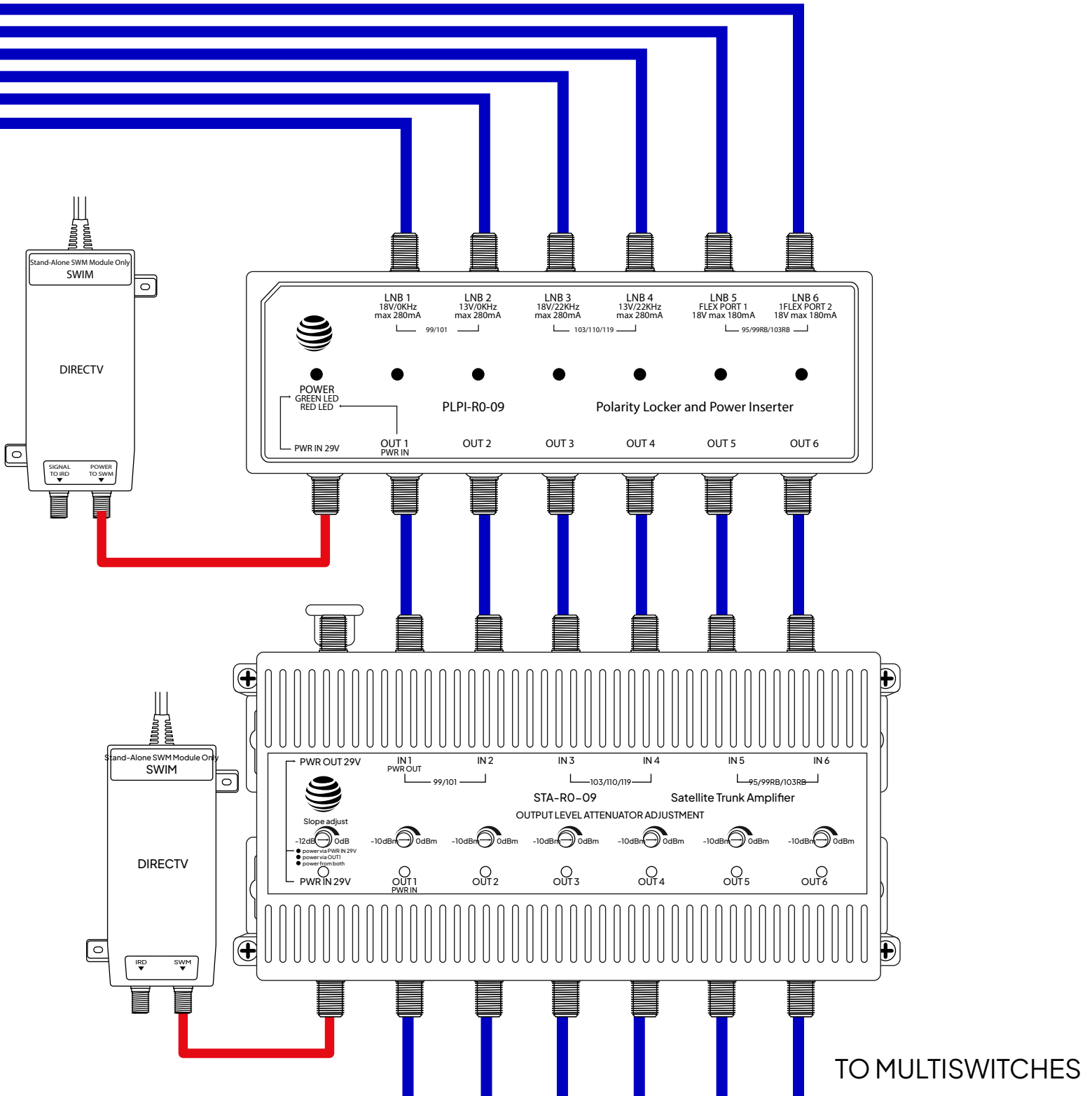
While DIRECTV standards require the use of a trunk amplifier, there are cases where you don't need one. For example, if your dish is only 10 feet from your equipment rack, you may have too much output power when you go into the multiswitches.

The best thing to do is measure the signal level at the multiswitch. The level should be -25 to -45dBm. You can adjust the screws on the front of the amplifier to make sure the input and output level are as close to spec as possible. The amount of amplification will be set automatically to a normalized level. That level should be high enough to match the input window on the multiswitches and no higher.

The following page shows proper installation of a polarity locker and amplifier, with the polarity locker powering the dish.

# INSTALLATION: AMPLIFIER AND POLARITY LOCKER

LINES FROM DISH - MAX RUN 50'



# SPLITTERS VS. TAPS

Splitters provide the same output level to each line, while taps provide a differential output — the output to the multiswitches is weaker so that a stronger signal goes down the “trunk line.” Taps are generally used when there is more than one distribution closet, while splitters are used if all the multiswitches are in the same closet. Here is a table showing the losses expected from each common splitter and tap.



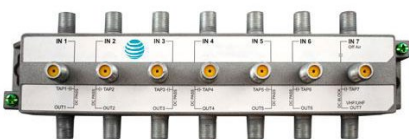
Model	Description	Nº. outputs	Loss to multiswitch lines	Loss to trunk lines
<a href="#">SP2WAPHL</a>	Power-passing splitter	2	3.5dB	N/A
<a href="#">SKY23304D</a>	Power-passing splitter	4	7dB	N/A
<a href="#">STTAP20</a>	Tap for 1st drop	7	20dB	2dB
<a href="#">STTAP16</a>	Tap for 1st/2nd drop	7	16dB	2dB
<a href="#">STTAP12</a>	Tap for 2nd/3rd drop	7	12dB	2dB
<a href="#">STTAP09</a>	Tap for 3rd/4th drop	7	9db	2dB
<a href="#">STTAP06</a>	Tap for last drop	7	6dB	2dB

## Proper use of splitters

Splitters are used when all multiswitches are in a single closet. One splitter is used for each incoming line and the output from each splitter must go into the same port on each multiswitch. In other words, if you are feeding the leftmost port on one multiswitch using a splitter, all the other outputs from that splitter must be fed into the leftmost ports on other multiswitches.

## Proper use of taps

Taps are used to send as much signal as possible from closet to closet through the “trunk” lines.



The maximum level of amplification is used — more amplification than a multiswitch needs, and taps are used to send the appropriate amount of signal to each closet. In the first closet, the tap drops the signal by 16dB, the second by 12dB, the third by 9dB. A fourth closet may be fed directly from the trunk output of the last tap, or those lines can be fed into another amplifier to feed three additional closets. If you choose a high-powered SWM-30, you can start with

a 20dB tap which will yield a total of 5 drops before going to an additional amplifier in many cases. It is critical that you measure signal levels on site rather than relying on “typical” or “calculated” levels.

## Combining splitters and taps

If there is more than one multiswitch in each closet and more than one closet, splitters may be used from the tap outputs to feed each multiswitch. However, this method can cause the signal to drop lower than expected due to all the extra wiring, so a signal meter should be used to make sure that each multiswitch has a signal level of at least -45 dBm at its input.

For smaller installations, there's a simple option. It's more expensive, but it makes installation a lot easier. The DIRECTV [SWM Expander](#) takes up to four SWM-30s and mounts them securely in a nice small space. You can hot-swap one module out without affecting other modules. Another nice feature is that you can power all four SWMs with two power inserters.

**Remember “Tuner Math:”** Use the chart on page 14 to determine how many tuners you will need. Remember, you're counting tuners, not physical boxes. In order to achieve full 120-tuner capacity, you must use H26K or H44 receivers. If older receivers are used, capacity drops to 104 tuners.

**Powering the Dish:** With this configuration you must use the [PLPI-R0-09](#) to power the dish for best results.

You'll need the following parts:

- [Reverse Band 5 Legacy Dish](#)
- [Two SWM-30 Multiswitches \(Includes Power Inserters\)](#)
- [DIRECTV SWM Expander](#)
- [DIRECTV MSPLIT2, MSPLIT4, and MSPLIT8](#) splitters as needed
- [Terminators](#)
- [Cable](#)

Remember, do not oversplit the signal and terminate any unused connections. Also, remember to ground your equipment whenever possible. Better to ground too often than not often enough.

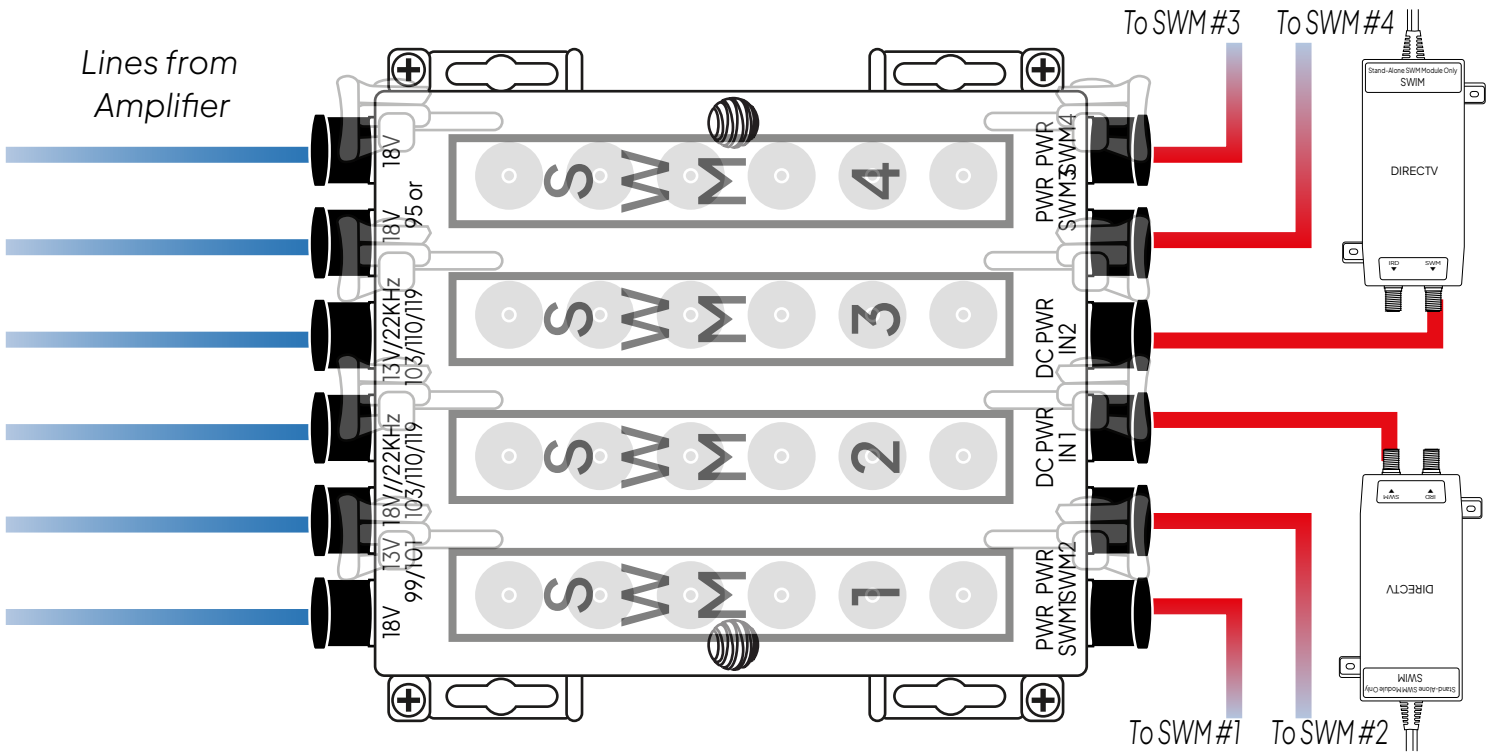
**Using the PI-29Z Power Inserters:** Run the line from the SWM ports into PWR SWM1 and PWR SWM2 on the expander. The green light on the front of the SWMs light up when they are being powered.

**Internet Connection:** The internet connection methodology used here depends on the needs of the specific installation. If this installation is a large-scale residential complex, receivers should be networked within the premises and [Band Stop Filters](#) should be used to prevent bleedover between units. Hotels have their own networking schemes depending on the nature of the install, and many industrial installations have no need for networking at all.

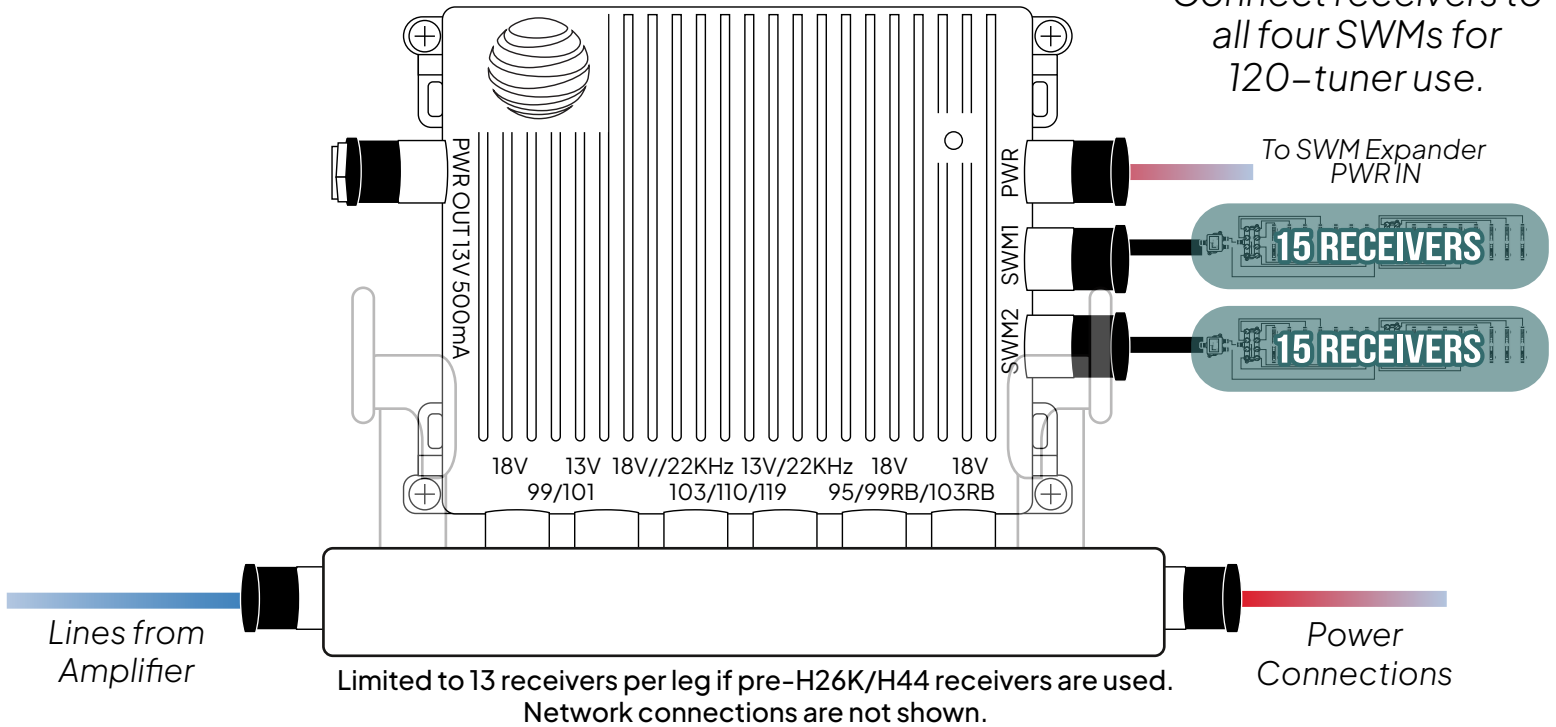
The following pages show a diagram of a common installation of four SWM-30 multiswitches to service up to 120 tuners. The page after that shows the same configuration using traditional splitters, for comparison. After that is a typical installation using taps, for multi-floor use.



## TOP VIEW

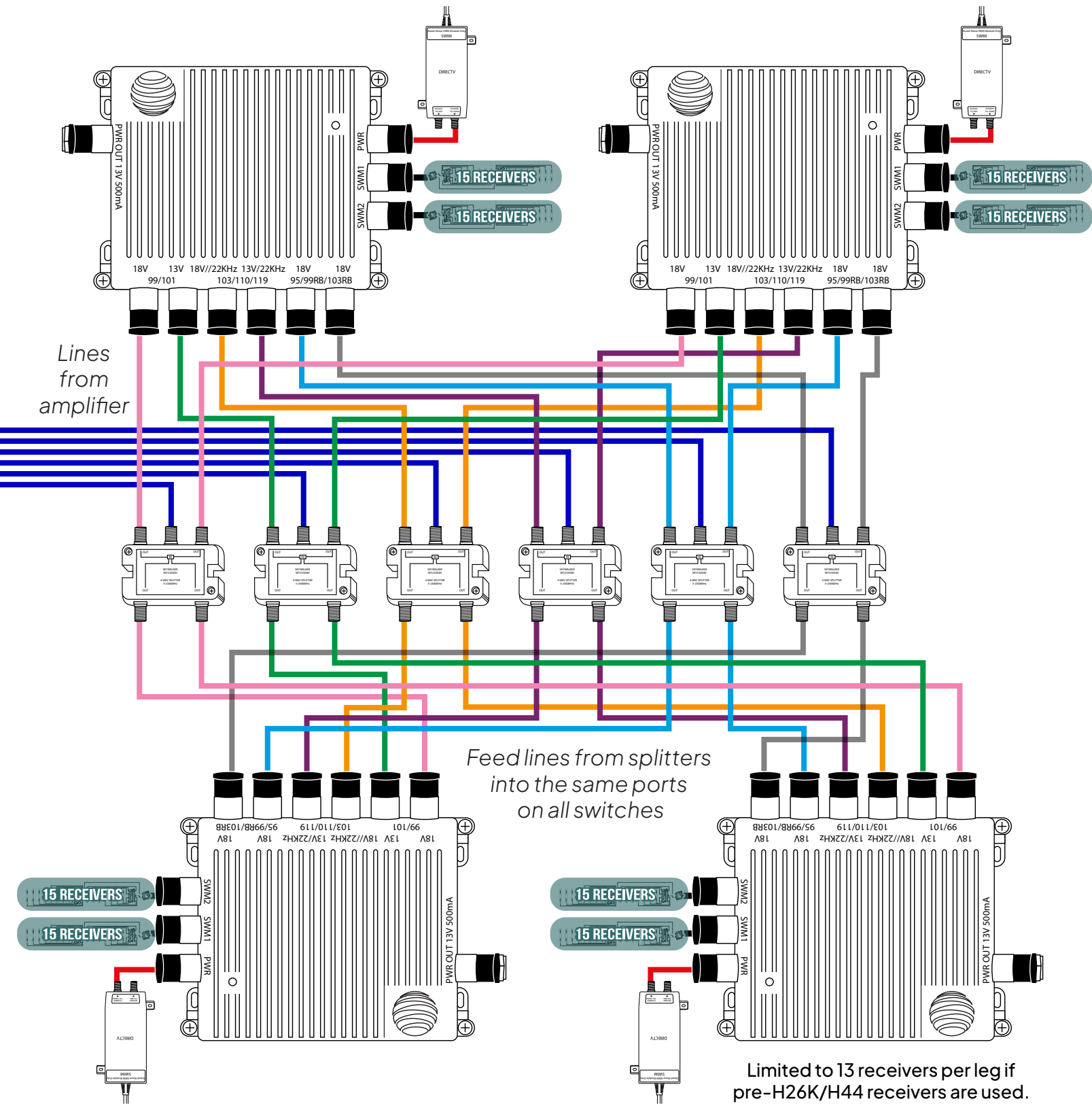


## ELEVATION VIEW



Front SWM is shown. Connect receivers to all four SWMs for 120-tuner use.

# INSTALLATION: UP TO 120 TUNERS (using splitters)

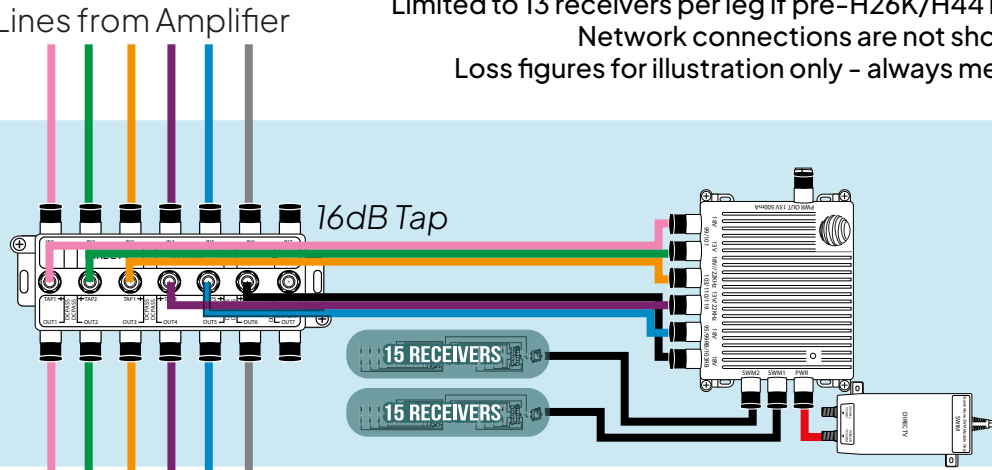


# INSTALLATION: UP TO 120 TUNERS (using taps)

Limited to 13 receivers per leg if pre-H26K/H44 receivers are used.  
 Network connections are not shown.  
 Loss figures for illustration only - always measure on site.

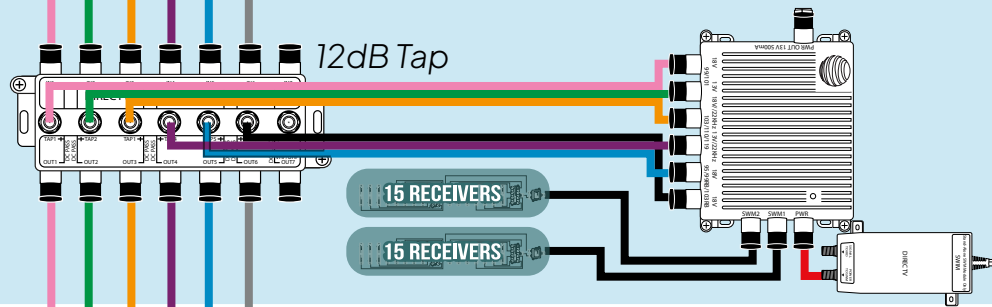
## CLOSET 1

Output from amp -15dB  
 Loss from cable 5dB  
 Input level -20dB  
 Tap output -36dB  
 Trunk output -22dB



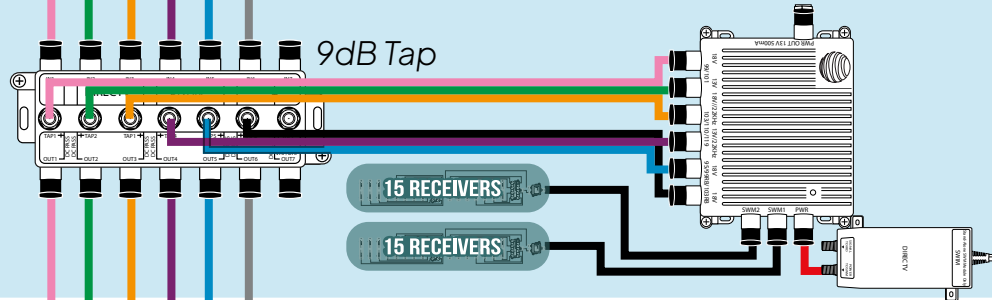
## CLOSET 2

Loss from cable 5dB  
 Input level -27dB  
 Tap output -39dB  
 Trunk output -29dB



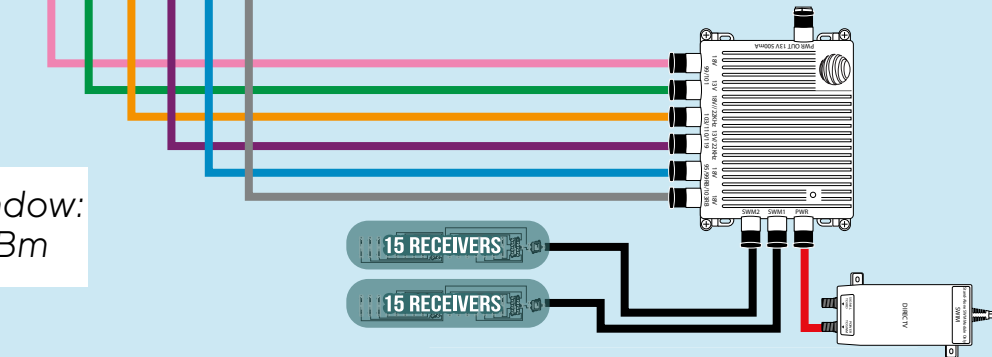
## CLOSET 3

Loss from cable 5dB  
 Input level -34dB  
 Tap output -41dB  
 Trunk output -37dB



## CLOSET 4

Loss from cable 5dB  
 Input level -42dB



SWM input window:  
 -25 to -45dBm

A headend system is different from a traditional DIRECTV system, even though it uses a lot of the same components. Where a traditional DIRECTV system puts the receiver near the TV, a headend system puts all the receivers in the same place and creates a system where the viewer can choose from a very limited number of channels.

## Why choose a headend system?

There are two advantages to a headend system: cost and ease of installation. If you are putting 200 receivers into a building, you're paying for every single receiver to watch every possible channel in your programming package. That's going to be a lot of money. On the other hand, if you find that you really only need 16 channels, you can configure a 16-channel headend. You'll pay a lot less in programming fees.

Installing and wiring a headend system is a lot easier than installing a traditional DIRECTV commercial system. A commercial DIRECTV system will use one multiswitch for every 30 receivers, and you need to plan your system so that the multiswitches are never more than 150 feet from the receivers. You'll generally need more amplifiers and more expensive cabling to make all of it work.

With a headend system, you can often use wiring that already exists in the wall from an earlier cable TV installation. If you're doing new wiring, you can generally get up to 300 feet of cable before adding another amplifier, and the overall amount of cable will be a lot less.

## Using taps instead of splitters

Using taps instead of splitters can save a lot of time and money when cabling. Taps allow televisions to be strung like Christmas lights, with a TV branching off from a main line rather than requiring its own line from a splitter. [The diagram on page 52](#) shows a typical installation using taps, but this is only one possible way to use taps in a headend installation.

## Concerns with existing wiring

One of the best reasons to use a headend system is the ability to use existing wiring. If the building currently has a headend system or even a cable TV distribution system, that wiring can probably be used "as is." However, it's a good idea for you as the installer to check every line to make sure it's not only connected but has good strong signal. The majority of service calls for headend problems involve bad wiring, so it's smart to take some time during the site survey to see what condition the existing wiring is in.

## A MATRIX SWITCH IS NOT A HEADEND

Typically, bars and restaurants will rely on matrix switches to feed multiple televisions. A matrix switch allows the output from any receiver in the rack to go to any television. However, unlike headends, a matrix switch requires HDMI cables from the switch to the televisions. This makes it unsuited for long runs such as those you'll find in hotels or larger buildings.

If you're considering installing a matrix switch, contact the experts at Signal Connect. There are specific things you need to know about using DIRECTV products and matrix switches. Call 888-233-7563 to find out more.

# THE COM3000 COMPACT HEADEND SYSTEM

If your customer wants a reliable headend system that scales to meet their needs, is easy to administer, and takes up very little space, you should consider offering the COM3000 solution from Vantiva (formerly Technicolor.) This system was developed in tandem with DIRECTV's own engineering staff to offer the best possible experience in the smallest possible space.

The COM3000 system can be configured to work with coaxial cable systems or can also be used for IPTV distribution. With IPTV distribution, the existing computer network cable infrastructure can be used to distribute video as well. However, depending on the level of network traffic, it may be better to use a second category cable network for this purpose. Using IPTV distribution requires televisions or converters capable of working with standard IPTV protocols. Just because a television has an Ethernet port does not mean it will work with IPTV.

## COM3000 SYSTEMS

### COM3000 WITH COM400 CHASSIS



The COM3000 system can use the COM400 chassis to provide up to 138 channels of HD programming. It can also provide a limited number of 4K channels as well. It will output QAM (coaxial cable) or IPTV content and takes up 3RU in a standard rack plus space for power supplies, multiswitches and other in-premises equipment. Multiple COM400s can be combined for even more channel capacity.

### COM3000 WITH COM421 CHASSIS



The COM3000 system can use the COM421 chassis to provide up to 46 channels of HD programming. It will output QAM (coaxial cable) or IPTV content and takes up 1RU in a standard rack plus space for power supplies, multiswitches and other in-premises equipment.

The COM421 chassis can not be combined with other COM3000 systems in a managed headend, so this system should only be used in smaller systems where space is a priority.

COM3000 systems require the use of Pro:Idiom encryption except in certain cases. This means that the TVs themselves must have Pro:Idiom built in or you must use a separate converter box at each television. For a complete list of markets that can use COM3000 without encryption, contact Signal Connect at 888-233-7563.

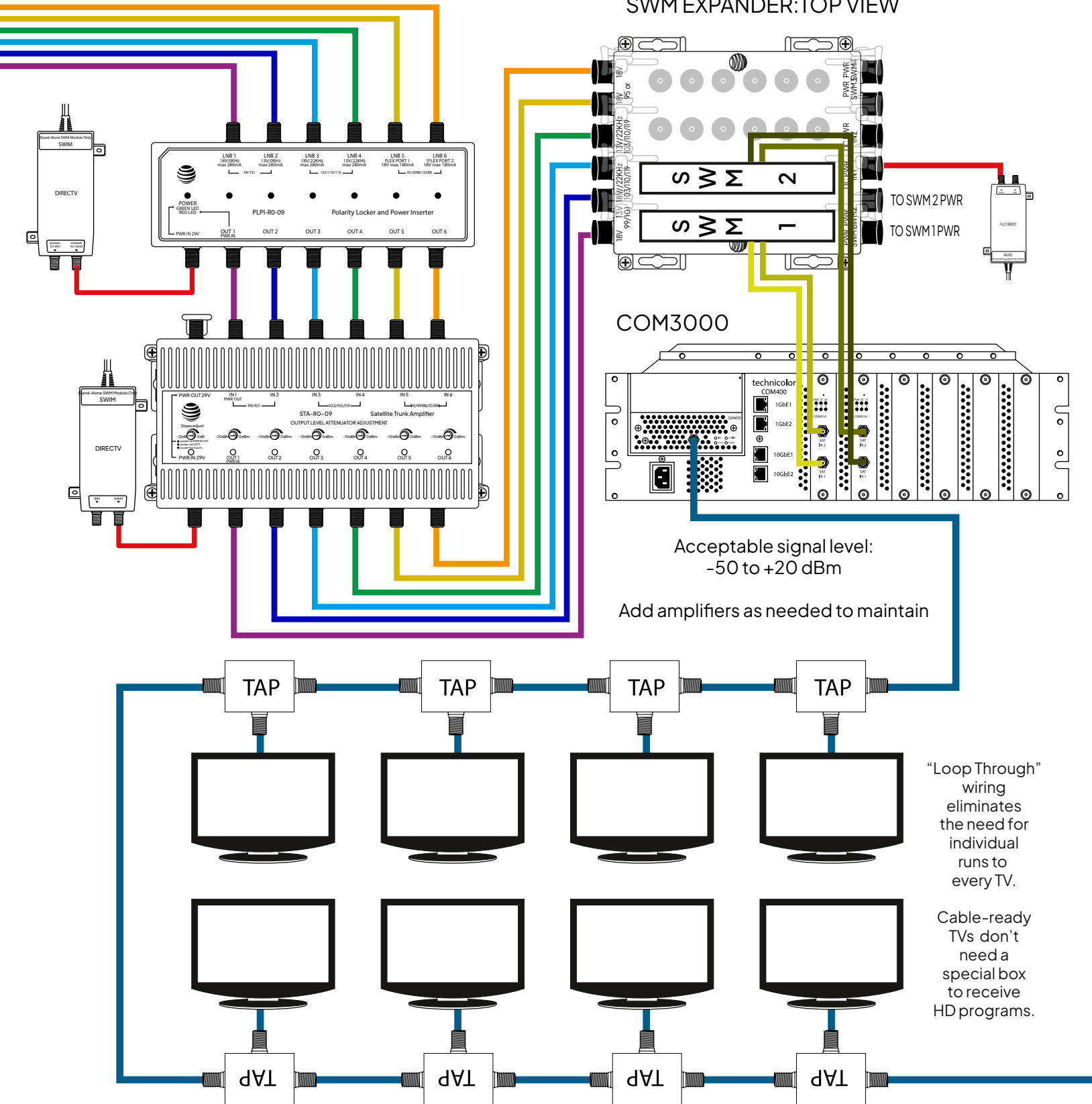
## Mediatune and Flexitone

COM3000 systems can be used as part of smaller installations in place of a matrix switch. Vantiva offers two solutions. **Mediatune** offers a single-screen solution that allows channels in a COM3000 system to be mapped on the fly. **Flexitone** allows direct IP control on a single channel by single channel basis through any IP endpoint such as a traditional IPTV box, computer, or streaming app.

The diagram on the next page shows a typical COM3000 installation. More TVs and more channels can be easily added.

# TYPICAL HEADEND DISTRIBUTION - 46 HD CHANNELS

LINES FROM DISH - MAX RUN 50'



# TRADITIONAL HEADEND SYSTEMS

Traditional headend systems offer more flexibility and in some cases, lower cost. They can be scaled more easily and can easily incorporate systems like digital signage and equipment from other television providers. Traditional headends will work in all environments without the need for encryption and are often a good replacement for existing headend systems.

The major issues with traditional headend systems are size and complexity. You will need one receiver for each channel, unlike COM3000s which are self-contained. All the wiring will be external to the unit meaning that each receiver must have its own satellite input and video output. Special cables can be used to provide analog component out, since HDMI signals from DIRECTV systems are fully encrypted with HDCP. This provides slightly lower quality but allows for “digital watermarking” which satisfies most content provider requirements, eliminating the need for HDCP or any other content protection.

## TRADITIONAL MODULATOR/ENCODERS

### ZEEVEE HDBRIDGE 3000



ZeeVee’s HDBridge 3000 is an all-in-one system that can be configured to suit practically any need. Using receivers supplied separately, it can output up to 72 channels of standard definition or 24 channels of HD over coaxial or IPTV distribution, all in a 3 RU space (plus space for receivers, multiswitches, etc.)

You can specify your HDBridge exactly as you’d like it for maximum flexibility.

In addition to DIRECTV sources, you can add any SDI source, any unencrypted HDMI or VGA source, or any composite video source. This lets you incorporate digital signage, in-house video, security camera footage, and practically any other video source you’ll want.

Traditional headend systems are generally at least one full rack of equipment so it’s important to plan for the space you’ll need. Your Signal Connect representative will work with you to figure out the right size space for your system.

The diagram on the next page shows a typical rack with all the components installed. More TVs and more channels can be easily added. Your installation will vary of course.

### ZEEVEE HDBRIDGE 2000

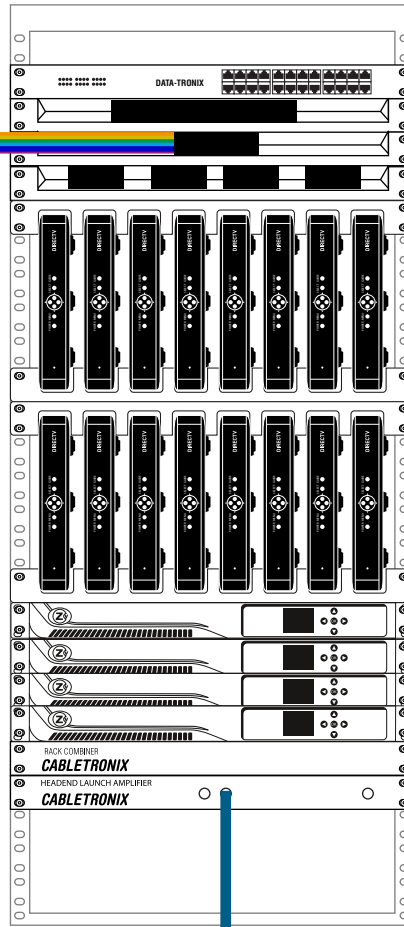
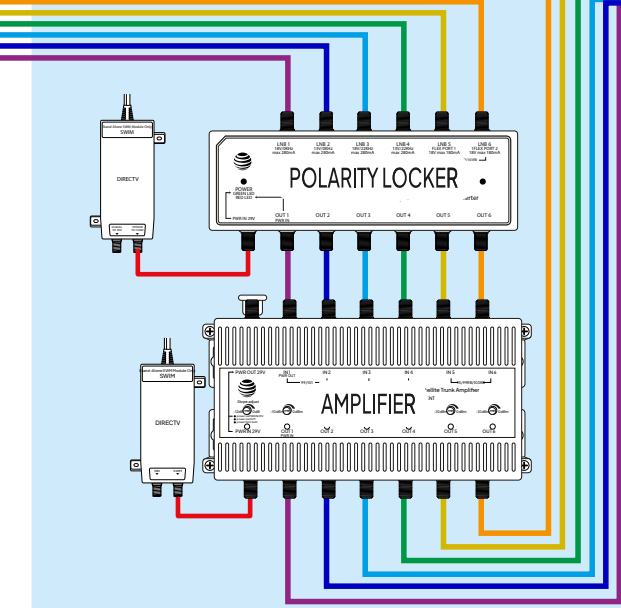


For smaller installations, ZeeVee has a line of 1RU modulators that can accept a variety of inputs from unencrypted HDMI, component, or standard-definition composite sources. A system with these modulators can be expanded and combined with other sources for the ultimate headend system. You’re only limited by the amount of space you want to use in your rack system.

# TYPICAL HEADEND DISTRIBUTION - 16 HD CHANNELS

## OUTDOOR DISTRIBUTION FRAME

LINES FROM DISH - MAX RUN 50'



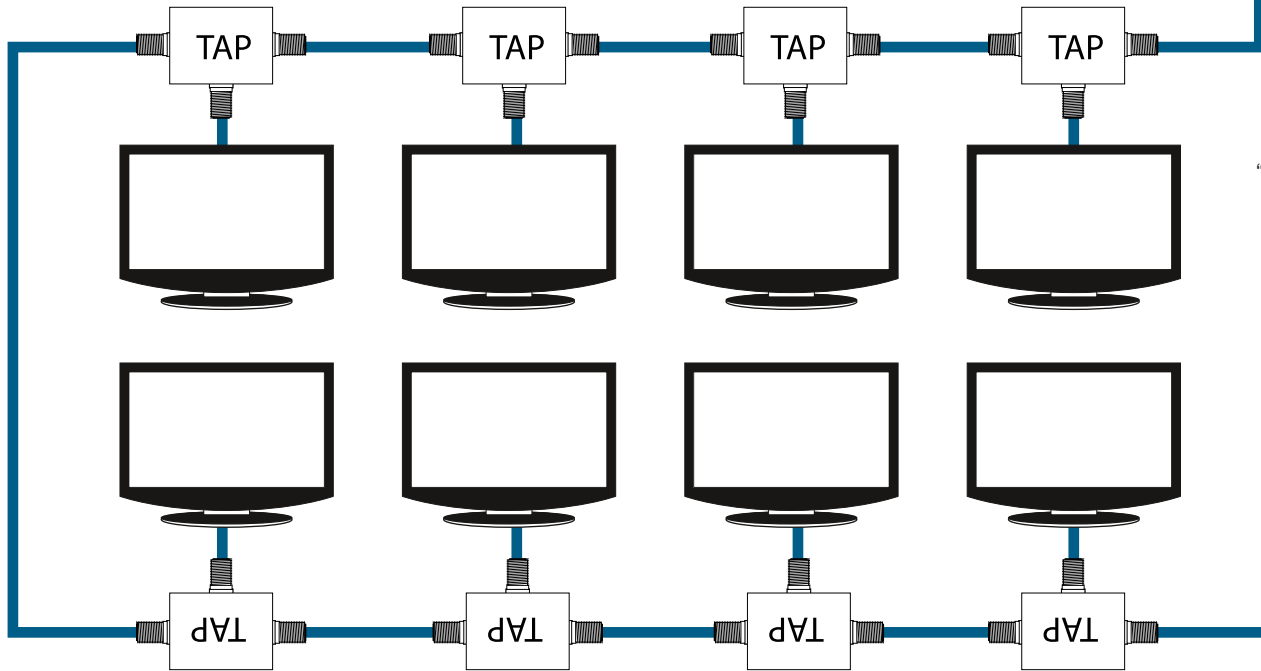
Rack wiring omitted for clarity.

24 PORT UNMANAGED SWITCH  
 4 PORT GIG ROUTER FOR REMOTE ACCESS  
 SWM-30 MULTISWITCH  
 POWER SUPPLIES (VARIOUS)

DIRECTV RECEIVERS

DIRECTV RECEIVERS

FOUR-CHANNEL MODULATOR/ENCODER  
 FOUR-CHANNEL MODULATOR/ENCODER  
 FOUR-CHANNEL MODULATOR/ENCODER  
 FOUR-CHANNEL MODULATOR/ENCODER  
 COMBINER TO COMBINE MODULATORS  
 RACK MOUNTABLE AMPLIFIER



“Loop Through” wiring eliminates the need for individual runs to every TV.

Cable-ready TVs don't need a special box to receive HD programs.

Acceptable signal level: -50 to +20 dBm  
 Add amplifiers as needed to maintain

## IPTV Distribution

Nearly every DIRECTV installation uses coaxial cable to distribute video to the televisions or satellite receivers. However, a large installation may choose to use IPTV distribution instead. With an IPTV headend, all the signal goes through the same types of category cable used for computer networking. This results in a less expensive install that needs fewer amplifiers. However, you will need to be aware of how IPTV differs from regular distribution.

**You will probably need special TVs, or a converter box at every TV.** The TVs your customer wants to buy absolutely will not support IPTV distribution, even if they have Ethernet jacks. Special institutional TVs are required. If you're asked to use existing TVs you will have to put in converter boxes at every TV which will add cost to the project.

**Your customer may ask you to run separate cable.** Many institutions have IT departments which limit third party access to their networks. Even though your TV distribution can happily coexist with other computer network data, be prepared to run new wire and budget accordingly.

**Other services may need special encoders.** If your installation is expected to include digital signage, canned video, or non-DIRECTV live video, your budget should include space for encoders for these sources.

## Fiber Distribution

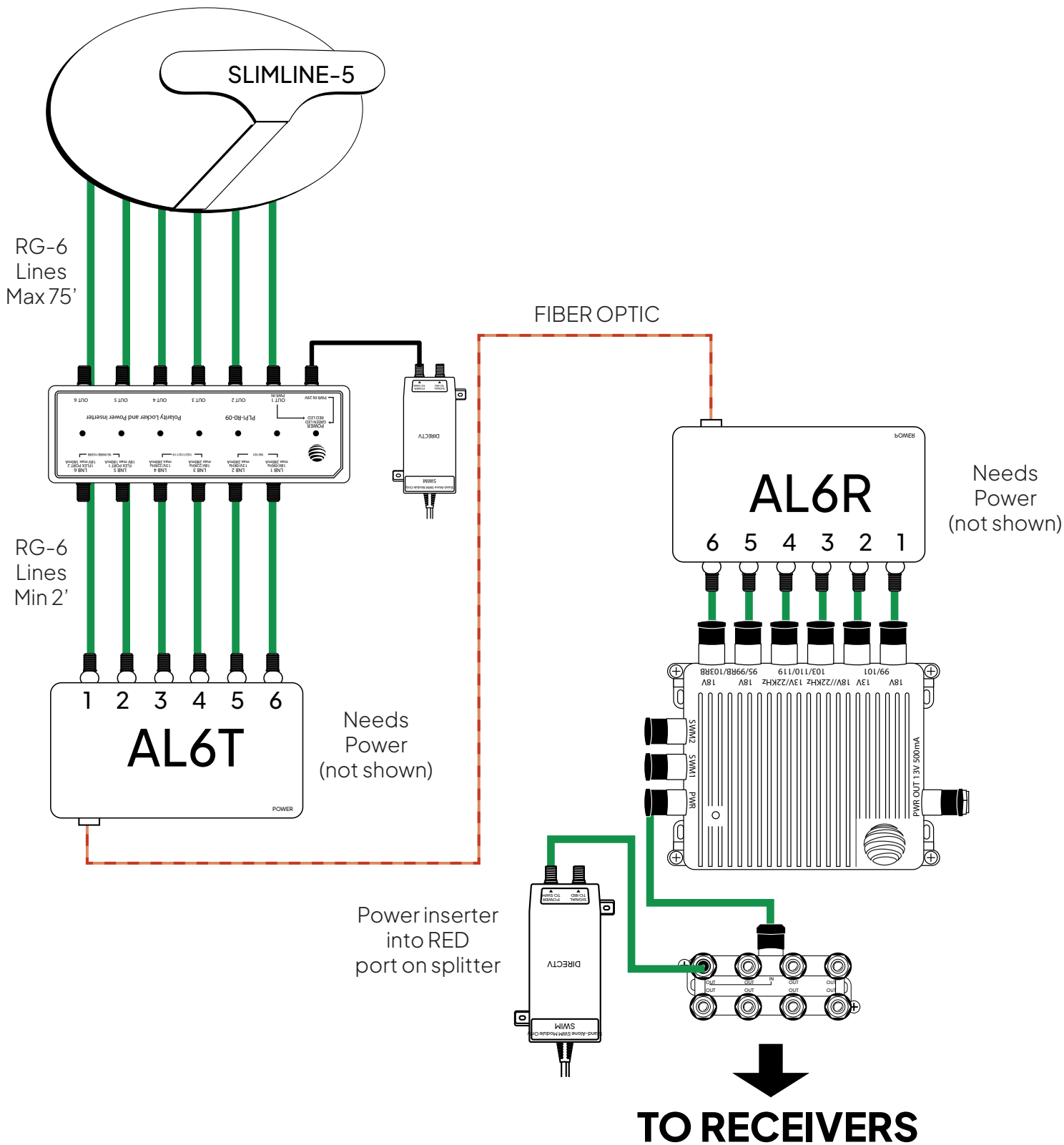
There are sometimes logistical reasons why you would need to use fiber to distribute DIRECTV signals. In some cases it's not possible to place the dish near the receivers. Fiber has a potential run length of over 5 miles in some cases. There are also government installations where you're not allowed to use copper cable to enter a facility. In cases like that, you'll want to use fiber.

There are several options for fiber transmitters and receivers which will take the output of a DIRECTV Reverse Band 5 Legacy dish and transmit it over single-mode fiber. **Note: all fiber distribution must take place before the SWM.** There is no device that will pass SWM technology over fiber.

Here's a typical parts list for a fiber distribution. This does not include splitters, receivers, or any parts after the multiswitch.

- [Reverse Band 5 Legacy Dish](#)
- [DIRECTV Polarity Locker](#)
- [SWM-30 Multiswitch \(Includes Power Inserter\)](#)
- [Single Mode Fiber with SC/APC connectors](#)
- [Coaxial Cable](#)
- [Foxcom BSmarTV Fiber Transmitter](#)
- [Foxcom BsmarTV Fiber Receiver](#)

The following page shows a typical fiber installation.



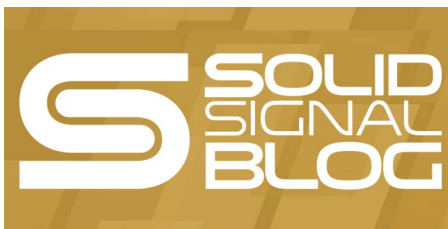
This document can take the place of an expensive certification course. However, if you are interested in getting official certification, check out the [Satellite Broadcasting and Communications Association](#). The SBCA offers training and advocacy programs for the satellite television industry, its suppliers and installation professionals. Signal Group is a member, of course. [Click here for more information on DIRECTV certifications](#) for residential and commercial installers.

As an installation professional consider supporting [CEDIA](#), the trade association for audio, video, and smart home installation professionals. Signal Group is a member.

## LEARN MORE FROM SOLID SIGNAL

Solid Signal supports the tech community! No matter what level of experience you have, you'll find resources to help you go further in your quest to understand the world we live in. We have offered free training materials and guides since our founding in 2002, and we're looking forward to supporting the next generation!

Here are some resources to help you learn more about Solid Signal's full line of products and services.



[The Solid Signal Blog](#) is your source for the best news, views, tutorials, and fun! Since 2007, The Solid Signal Blog grown to be the most comprehensive source for information on satellite television, antennas, cellular, and commercial equipment.

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Are you looking to double down on a concentrated dose of learning? Learn more about all the different aspects of technology when you check out [Solid Signal's Ultimate Guides!](#) Each article gives you a master class in one unique subject

All of Solid Signal's downloadable resources are completely free.



YouTube is everyone's favorite source for tutorials. And that's why [Solid Signal's YouTube Channel](#) is the place to go when you need to see how to do something. You'll find hundreds of tutorials and reviews, plus the award-winning Solid Signal Podcast.

There's no substitute for seeing it with your own eyes!

Over the years, DIRECTV has gone from an “early adopter” service, to a mainstream service, to a service that’s near and dear to a group of real enthusiasts. Some come to DIRECTV for the programming, especially the sports programs. Others come to DIRECTV because they are one of the few companies that let you build your system, your way.

This document originally started as a way for home enthusiasts to expand their DIRECTV systems. By January, 2024, it had been downloaded over 400,000 times. The commercial installer community has embraced it, and it’s become a “must-have” for thousands and thousands of regular folks who just want things “just right.”

Whether you are an installer, a DIYer, or an end user, this document has shown that DIRECTV installations don’t have to be confusing or complex. Just follow the diagrams and use high-quality supplies available at Solid Signal.

## GET A CUSTOM QUOTE FROM SIGNAL CONNECT

**Signal Connect is Signal Group’s full-service division.** The sales engineers at Signal Connect have over two decades of experience designing and configuring DIRECTV systems. Whether you are at home, on the road in an RV or truck, in a business or government office, or on a boat at sea, our team will provide you with a solution that lets you watch the channels you want. We even handle oil rigs! Call [888-233-7563](tel:888-233-7563), to start working with the best in the business.

Signal Connect also maintains a network of installation professionals all over the country. If you’re interested in joining our installer network, call [888-233-7563](tel:888-233-7563).

## GET SUPPORT FROM SOLID SIGNAL

**Solid Signal’s tech support team is here for you!** Solid Signal’s technical support line, [888-233-7563](tel:888-233-7563), is open during the week during East Coast business hours. After hours, send a message to [info@solidsignal.com](mailto:info@solidsignal.com) and we’ll get back to you. You can also find thousands of answers at [The Solid Signal Blog](#), the world’s leading resource for DIY DIRECTV support.

And of course, [shop at Solid Signal](#) and live your best digital life!

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**SolidSignal.com** is your source for DIRECTV equipment, supplies, and support. We have 20 years' experience with satellite equipment. Our technical staff is ready to answer all your questions!

**SOLID**SIGNAL

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THE SOLID SIGNAL BLOG is your information destination for news, reviews, and tips!



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**We have skilled technicians ready to help you before, during, and after the sale.**

Commercial Customers: We're here for you!  
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