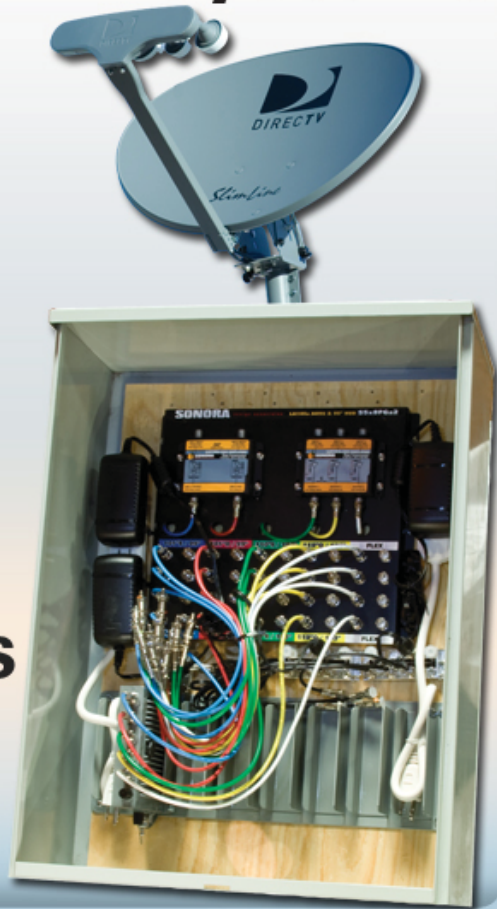




ABOUT SONORA DESIGN

- SONORA DESIGN ASSOCIATES LLC. is a Ventura California based design company manufacturing digital TV coax network products.
- We design coax networks that allow TV's to connect to digital TV broadcasts similar to computers connecting to the internet via a CAT5 network.
- Our products create networks that provide DBS and off-air signals to apartment buildings, commercial high rise properties and custom homes.
- We design custom distribution hubs for many manufacturers and software labs in the DBS industry.

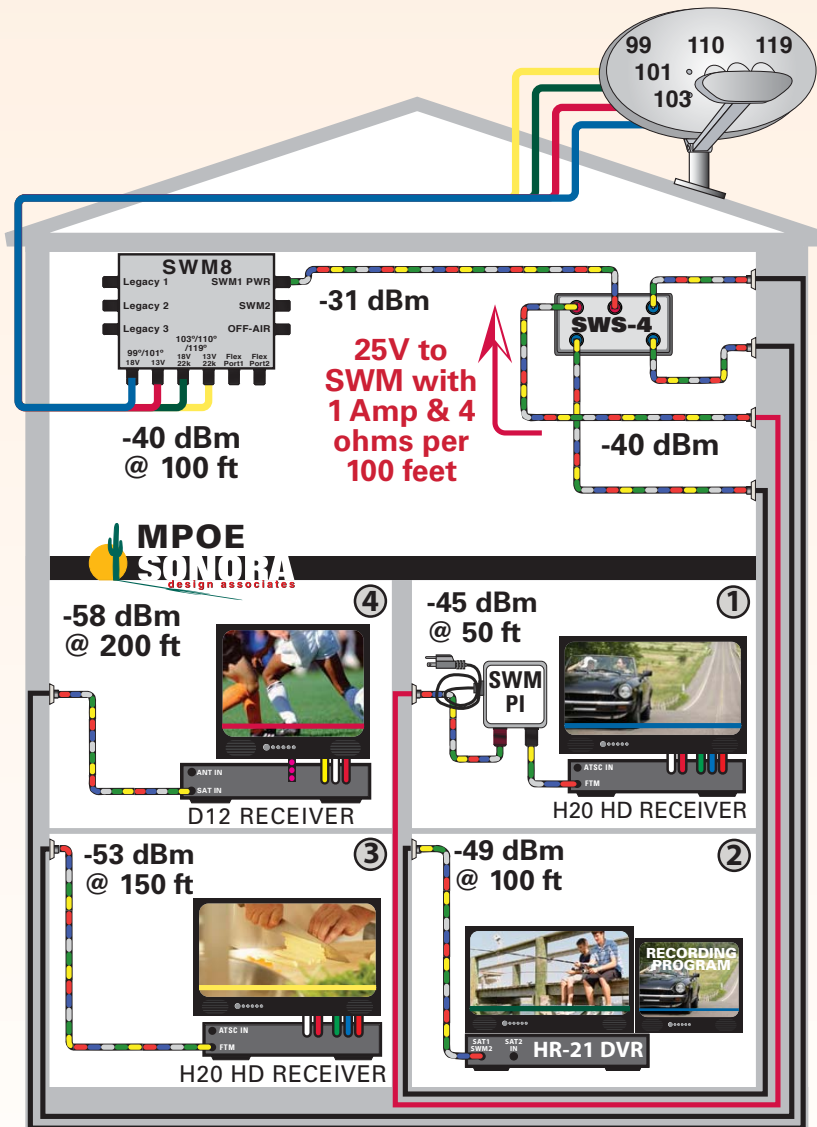
DIRECTV® Systems



**Dish to
Hub to
Switches**

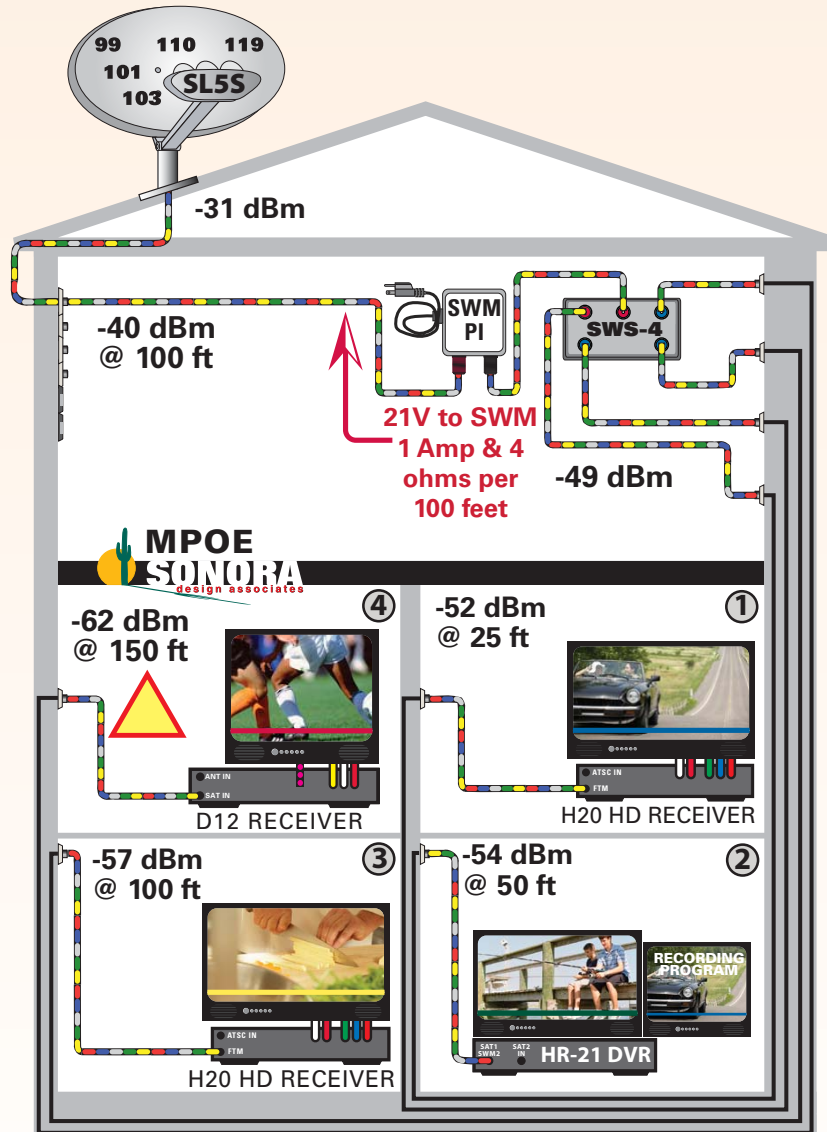
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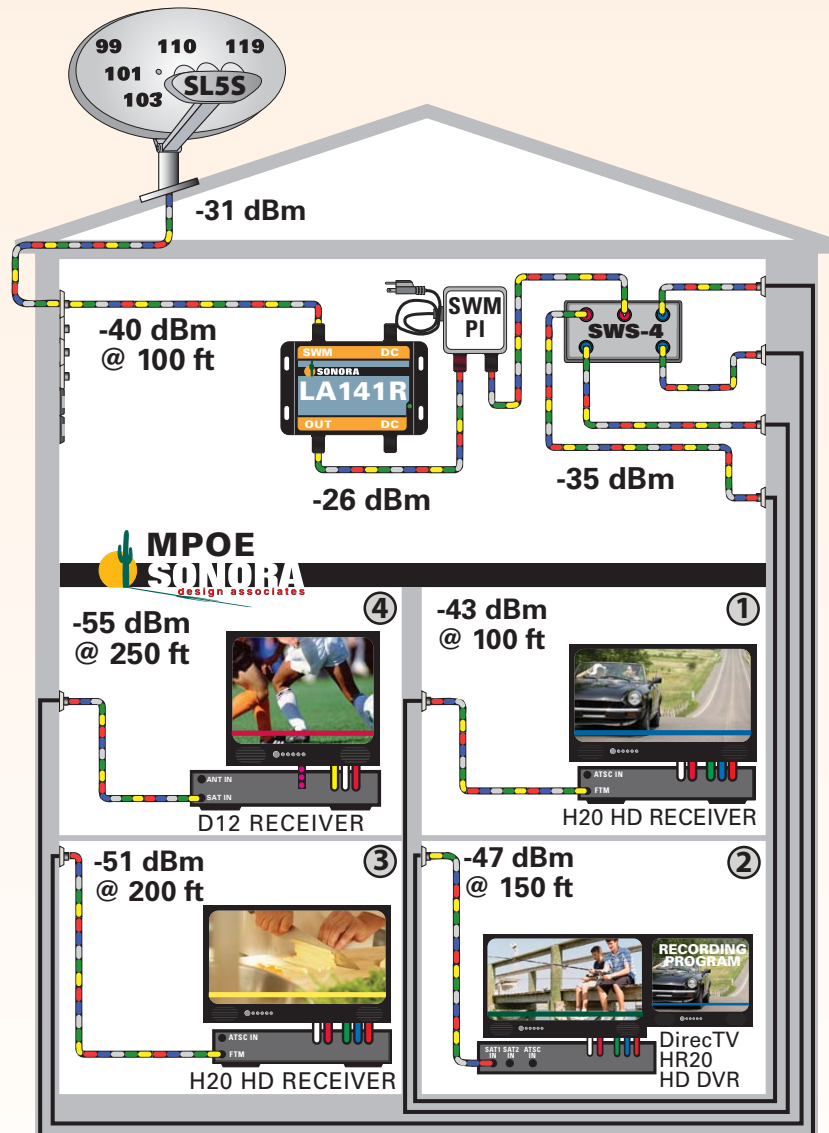
Indoor SWM8, (4) Outlets

- (4) RG-6 coax cables connect the indoor SWM8 switch to the **AU9S** dish.
- Model **SWM8-Kit** includes the 29V **SWM-PI** power inserter that powers the **SWM8** and **AU9S**.
- The **SWM-8** includes automatic gain control for a constant output of -31 dBm.
- Receivers are shown in (4) rooms at distances of 50 feet, 100 feet, 150 feet and 200 feet. Signal levels are noted in each room.
- A single coax to room (2) is sufficient to provide the dual tuner DVR with independent channel selection.
- Model **SWS-4** is a **DIRECTV®** specified splitter that provides low insertion loss and passes power from a single output.



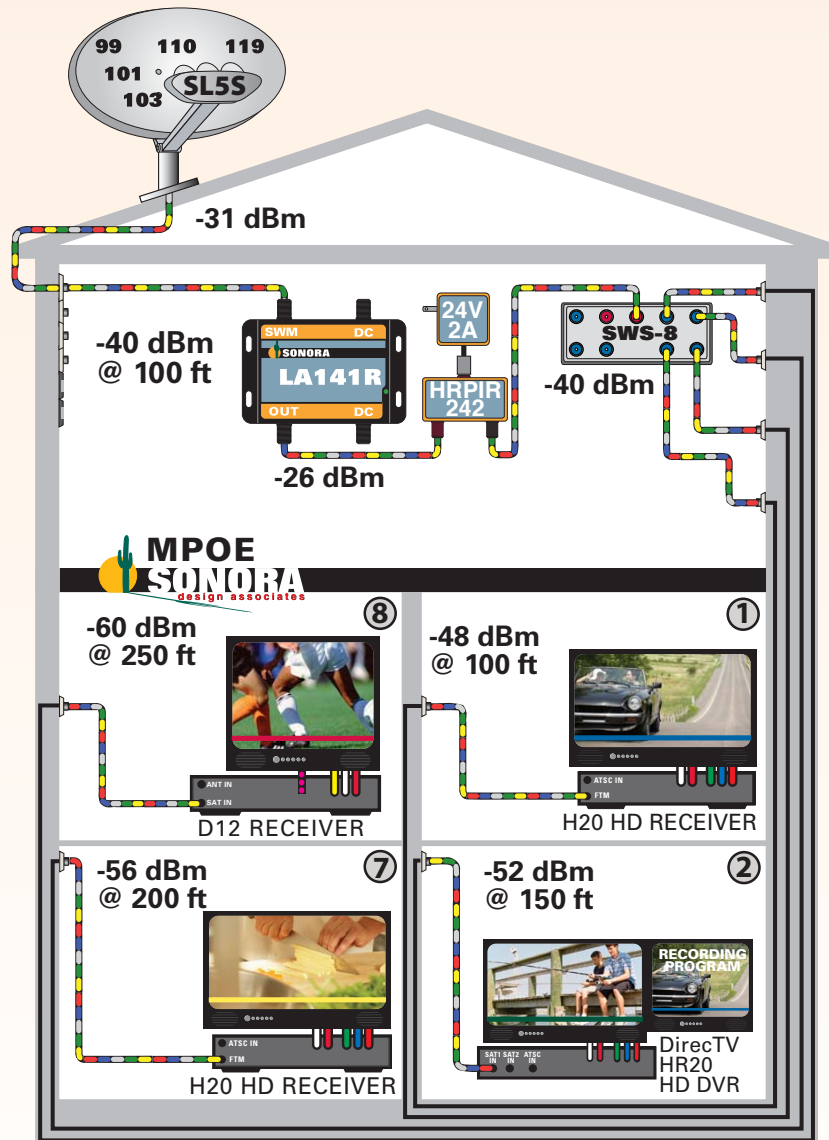
SL5S, (1) coax, (4) Outlets

- In many cases running (4) coaxes from the dish to the home is not convenient. *DIRECTV*® released a video presenting the SL3S & SL5S AU9S with integrated SWM8 switch.
- A single coax carries transponders requested by the receivers on the coax network.
- Model SWM-PI provides 21V to offset the coax voltage drop ⁽¹⁾ and power the SL5S dish.
- Receivers *up to 200 feet* through the SWS-4 splitter to SL5S dish have sufficient signal.
- The receivers at 250 feet through the SWS-4 splitter to SL5S dish may experience signal drop out issues.
- ⁽¹⁾ RG-6 solid copper cable has a DC resistance of 4 ohms per 100 feet. A SWM8 and AU9S draw close to 1 Amp. The IR loss is 4V.



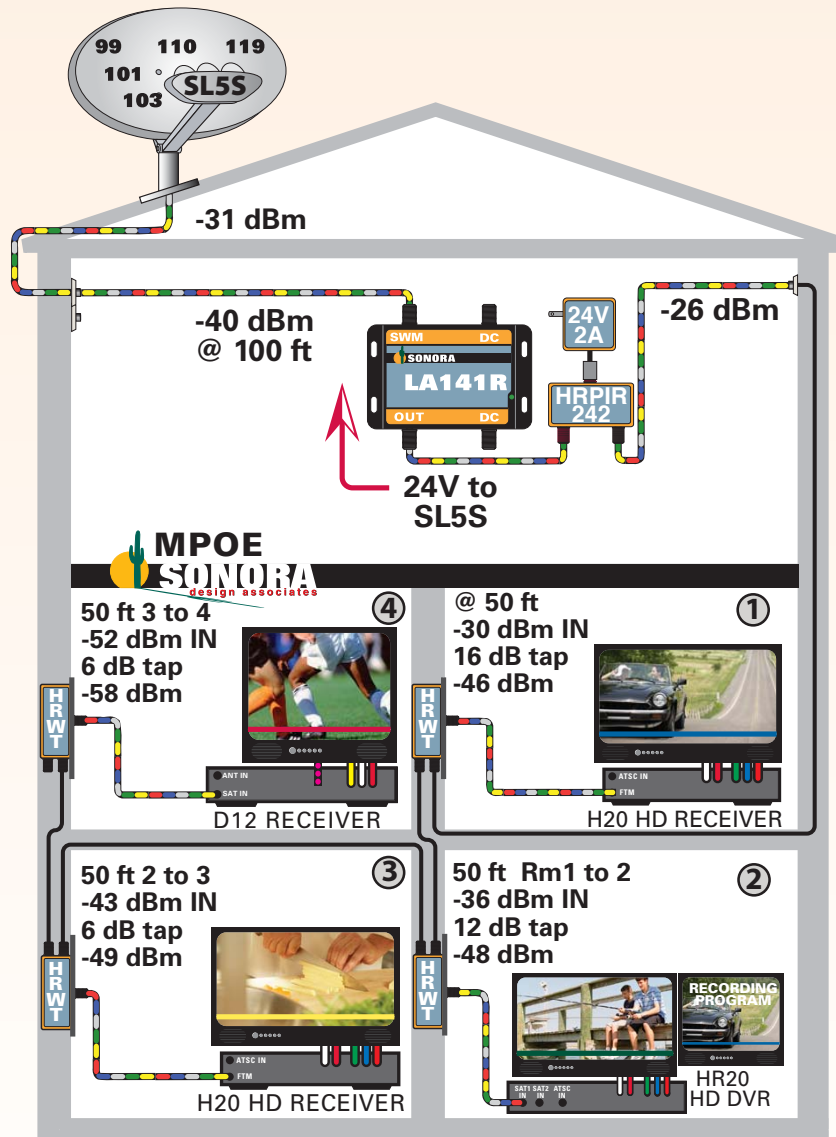
SL5S, LA141R, (4) Outlets

- In the previous example, signal level was low at receivers 250 feet from the SL5S through the SWS-4 splitter.
- Model LA141R is a line powered amplifier that increases the SL5S output by 150 feet of RG-6. Model SWM-PI powers the LA141R and SL5S dish.
- Control signals from the receivers @ 2 MHz must return to the SWM8 to request programs. The LA141R passes the 2 MHz signals.
- Receivers at *350 feet* from the SL5S through the SWS-4 splitter have sufficient signal for operation.



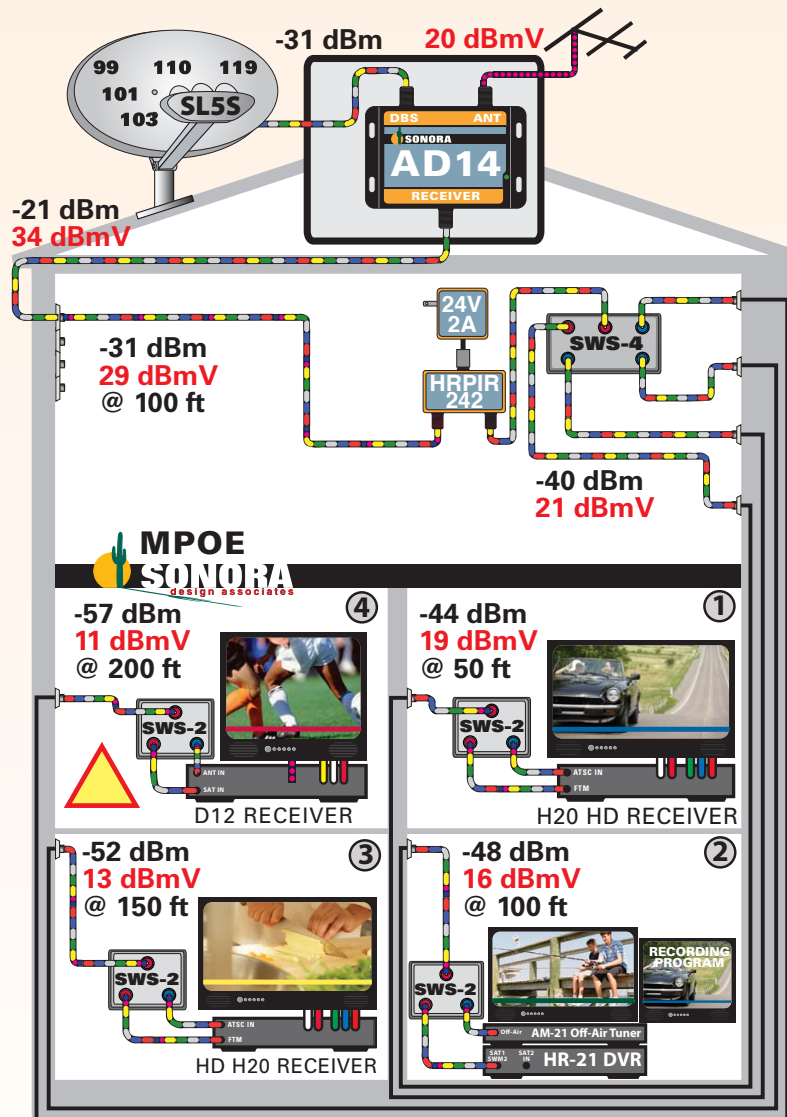
SL5S, (1) Coax, LA141R, (8) Outlets

- Homes with a single coax from the dish and (8) outlets may have rooms 200 to 250 feet from the Main Point of Entry.
- Model LA141R is a line powered amplifier that increases the SL5S output by 150 feet of RG-6. Model HRPIR242 powers the LA141R and SL5S dish.
- Control signals from the receivers @ 2 MHz must return to the SL5S to request programs. The LA141R passes the 2 MHz signals.
- Receivers up to 350 feet from the SL5S through a SWS-8 splitter have sufficient signal for operation.



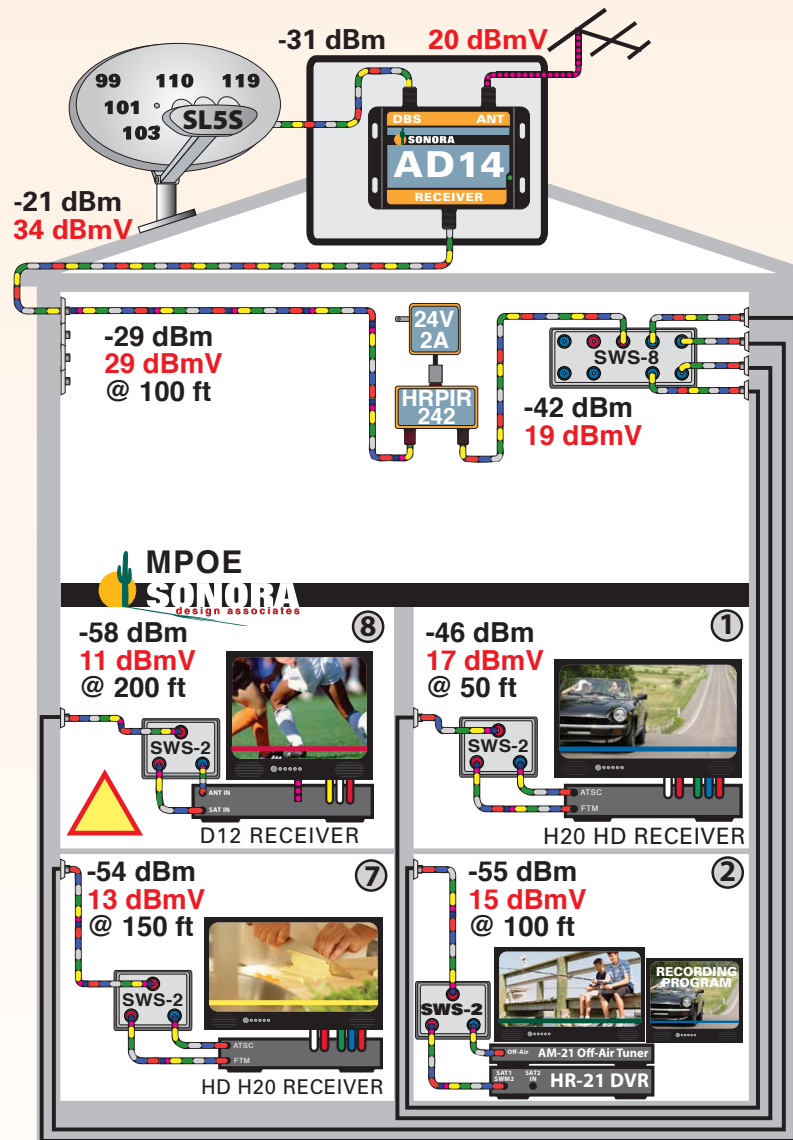
SL5S, LA141R, HRwT Series Taps

- Some homes have a single coax that loops from one room to another as opposed to one coax from each room back to the MPOE.
- Model LA141R is a line powered by model HRPIR242 which provides voltage to the LA141R and SL5S dish.
- The amplified SL5S signal goes 50 feet to room 1 that has a model HRwT116 tap. The input is -30 dBm, the tap output is -46 dBm and the thru output is -32 dBm. (2 dB insertion)
- From room 1 the signal goes another 50 feet to room 2. A model HRwT112 tap is used.
- From room 2 the signal goes 50 feet to room 3. A model HRwT106 tap is used.
- From room 3 the signal goes 50 feet to room 4. A model HRwT106 tap is used.



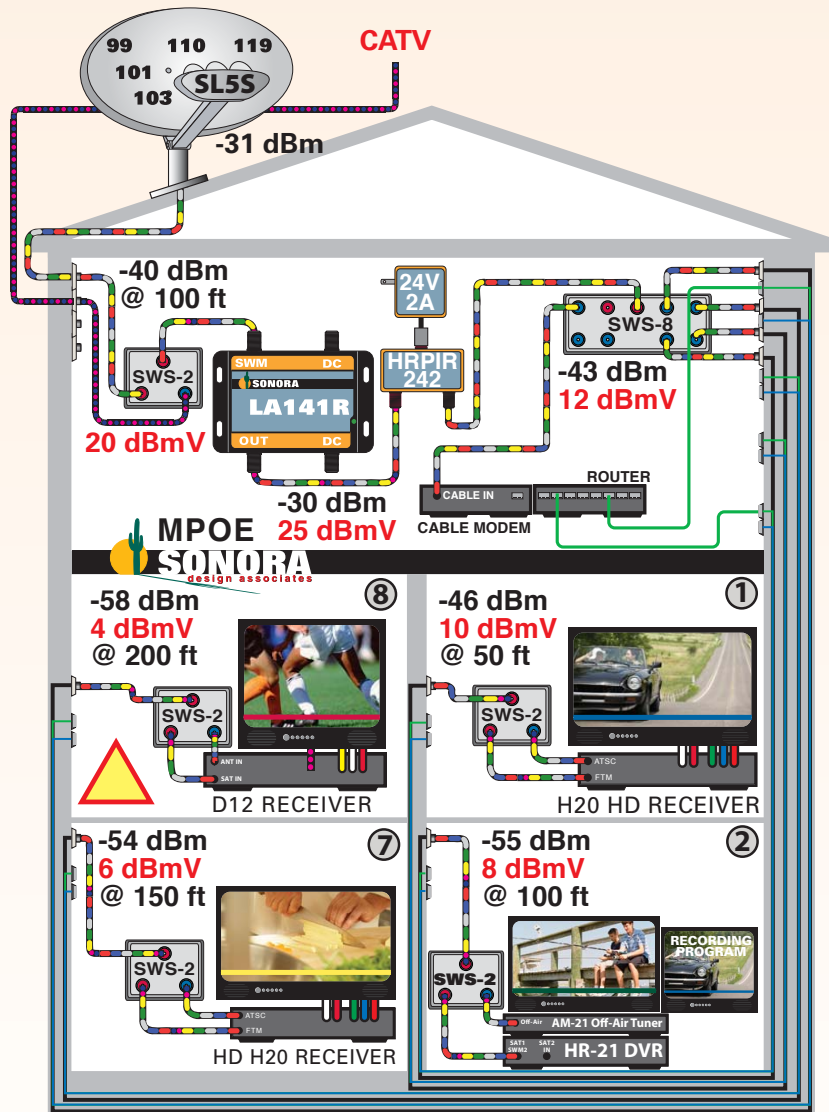
SL5S, Off-Air, AD14, (4) Outlets

- Some local programs may not be carried by DIRECTV® or you want a back-up signal source. Model AD14 actively combines the SL5S output and off-air input. Power and 2 MHz signals are passed to the SL5S.
- Sonora model HRPIR242 provides 3 more volts than the PI-21 to power the AD14 and SL5S at extended distances.
- Off-air signals are best amplified before the level decreases into the noise.
- Receivers up to 250 feet from the SL5S through the SWS-4 splitter have sufficient signal for operation.
- SWS-2 splitters divide the off-air and SL5S output signal to the DBS and ATSC tuners. DBS diplexers may not be used since they do NOT pass the 2 MHz control signal. Budget 4 dB of loss for the split.



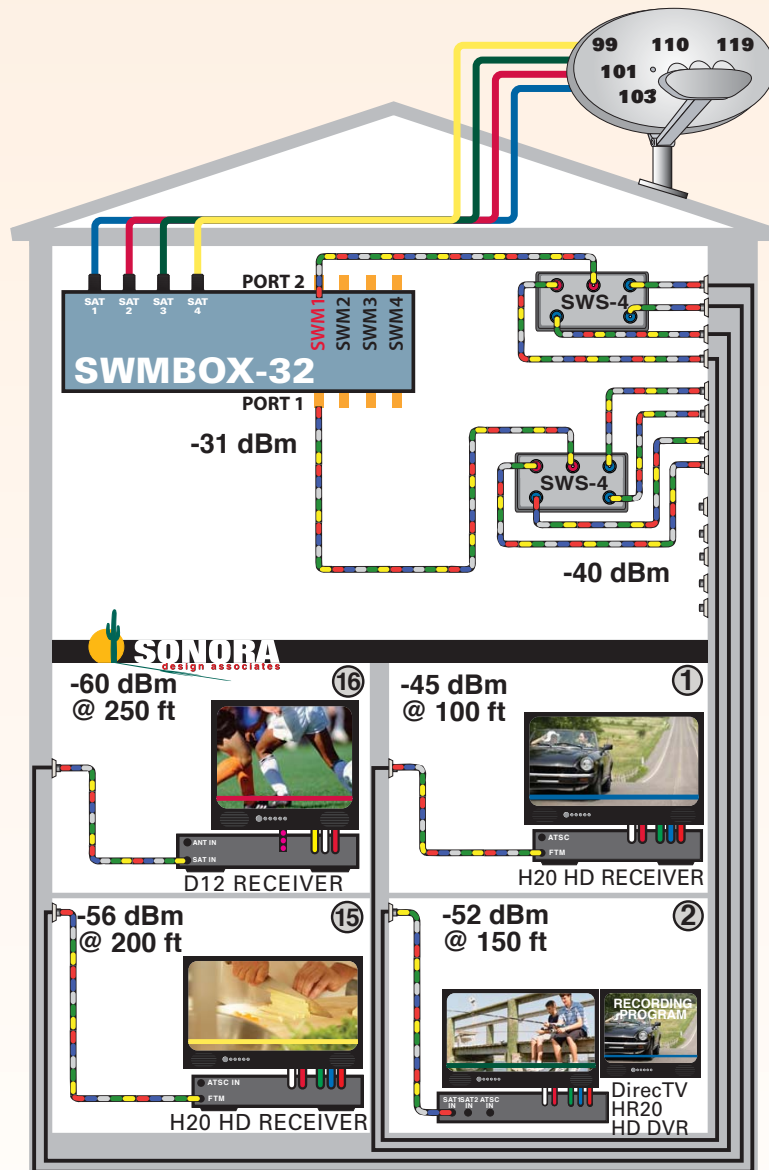
SL5S, Off-Air, AD14, (8) Outlets

- Some local programs may not be carried by DIRECTV® or you want a back-up signal. Model AD14 actively combines the SL5S output and off-air input. Power and 2 MHz signals are passed to the SL5S.
- Sonora model HRPIR242 provides 3 more volts than the PI-21 to power the AD14 and SL5S at extended distances.
- Off-air signals are best amplified before the level decreases into the noise. An outdoor enclosure is recommended.
- Receivers up to 250 feet from the SL5S through the SWS-8 splitter have sufficient signal for operation.
- SWS-2 splitters divide the off-air and SL5S output signal to the DBS and ATSC tuners. DBS diplexers may not be used since they do NOT pass the 2 MHz control signal. Budget 4 dB of loss for the split.



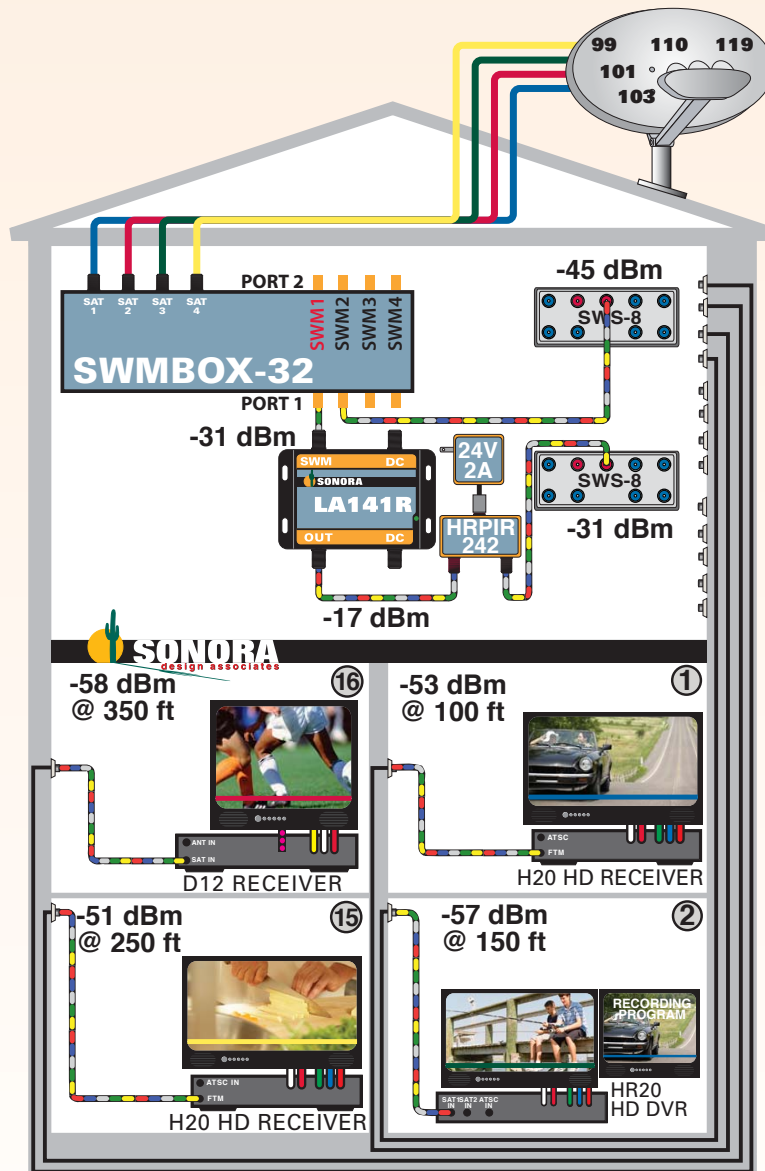
SL5S & CATV, LA141R, (8) Outlets

- CATV is one source for high speed data. The CATV signals with sub-band return can be combined with the SL5S input.
- Model SWS-2 splitters may also be used as combiners. The combining loss is 4 dB.
- Model LA141R is a line powered amplifier that increases the SL5S by 14 dB and CATV signals by 10 dB.
- Control signals from the receivers @ 2 MHz must return to the SL5S to request programs. The LA141R passes the 2 MHz signals and the cable modem sub-band signals to both the CATV input and SL5S input.
- Additional CATV amplification may be required if CATV input levels are below 20 dBmV, See model CA14R or CA24R.



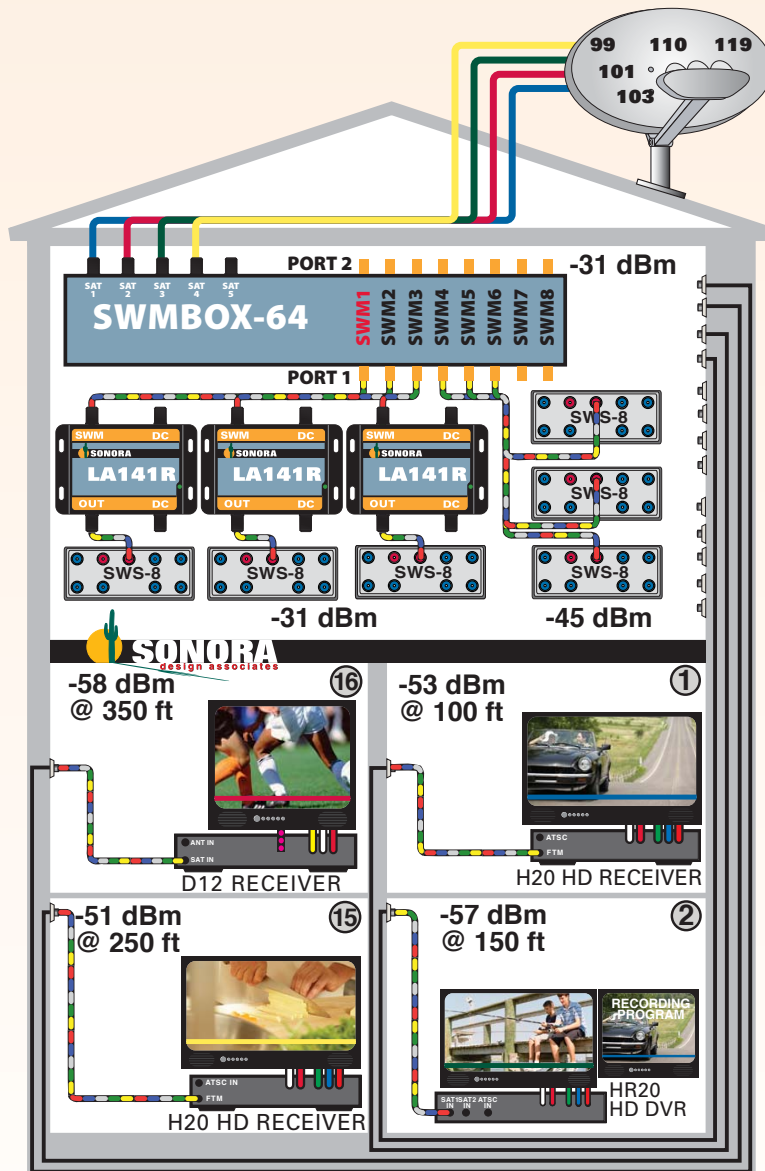
SWMBOX-32, 32 Outlets

- Larger home may have numerous outlets and any may be used to connect a DIRECTV® receiver to the coax network.
- Model SWMBOX-32 is a router of SWM8 outputs to up to 32 outlets.
- The base unit ships with a single SWM8 switch mounted in a rack capable of holding up to (4) SWM8 switches.
- Additional SWM8 switches can be added as the system grows. Color coded cables are included to connect the additional switches.
- Receivers up to 250 feet from the SWMBOX-32 splitter have sufficient signal for operation.



SWMBOX-32, LA141R, 32 Outlets

- Model LA141R used with model SWS-8 offsets the loss of the splitter.
- Receivers up to 350 feet from the SWMBOX-32 splitter have sufficient signal for operation.
- Model HRPIR242 power inserter is included with the SWMBOX-32. The inserter powers the LA141R, SWMBOX32 and AU9S dish.
- Non-amplified SWM outputs are capable of serving receivers up to 150 feet from the router.
- Amplified SWM outputs are capable of serving receivers up to 350 feet from the router.



SWMBOX-64, LA141R, 64 Outlets

- Model **SWMBOX-64** provides a dock for up to (8) SWM8 switches to serve up to 64 outlets.
- Using model **LA141R** amplifiers, receivers in rooms 15 & 16 up to 350 feet from the **SWMBOX-64** have sufficient signal for operation.
- Non-amplified **SWS-8** outputs are capable of serving receivers in rooms 1 & 2 up to 150 feet from the router.
- Additional **LA141R-T** amplifiers may be used in cascade to serve receivers up to 700 feet from the **SWMBOX-64**.
- Within the **SWMBOX-64** are (2) **PS6-242000** power hubs that provide power to the SWM8 switches and **LA141R** amplifiers. (Model **LA141R** amplifiers sold separately.)