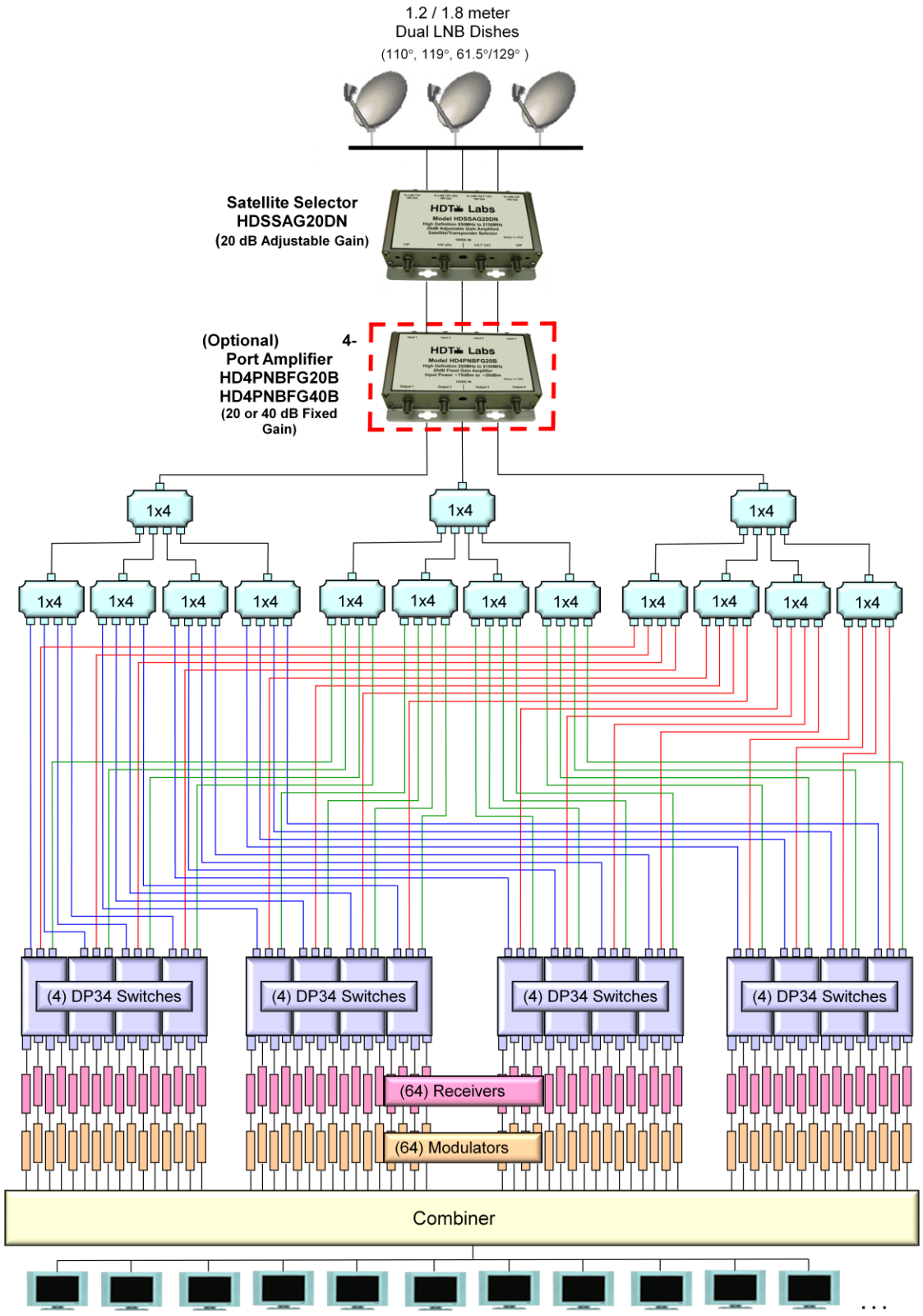
Typical HDTV 64-Channel SMATV System Diagram for DISH Network



Typical HDTV 64-Channel SMATV System Description for DISH Network

DISH ANTENNAS

In most typical SMATV (Satellite Master Antenna Television) systems, the satellite dishes used range from 1.0 - 1.8 meters in diameter. The increased size improves the quality of the satellite signal and also helps to keep rain fade to a minimum. One dish is normally used for the reception of each desired satellite. The RF output signal levels of the smaller dishes are typically about -25 to -30 dBm, depending upon configuration parameters. The output levels of the larger dishes can vary between -15 and -25 dBm. Recommended RG-6 coaxial cable will have a loss of about 10dB per 100' at 2150MHz, when the connectors and ground blocks used are rated to 2GHz.

SATELLITE SELECTOR

Since most SMATV installations will have signal loss due to the number of devices and cable runs in the system design, a Satellite Selector should be used to optimize system performance. The **20dB Adjustable Gain Satellite Selector (HDSSAG20DN)** is a combination of four power inserters, a 20dB adjustable gain amplifier, and independent power supply that ensures strong and consistent DC voltage levels to the dish LNBs and adds signal strength to the system.

Use the Adjustable Gain Satellite Selector to more accurately tune each of the four system channels and maximize the multi-switch output levels to the highest C/N ratio possible. Connections from the dish LNBs can be to any of the four Satellite Selector input ports. Unused channels on the Satellite Selector do not require termination. The Adjustable Gain Satellite Selector allows you to build more reliable systems, use fewer parts, and produce a cleaner C/N output on all channels.

4-PORT AMPLIFIERS

If the amplification from the Satellite Selector still does not allow you to hit the desired input windows of the multi-switches and receivers, optional 4-Port Amplifiers can be used. The **20dB Fixed Gain Amplifier (HD4PNBFG20B)** when paired with the adjustable gain of the Satellite Selector would be a preferred solution for relatively small system losses. If very large system losses exist, the **40dB Fixed Gain Amplifier (HD4PNBFG40B)** should be considered. Although gain adjustment is provided through the satellite selector, the **20dB Adjustable Gain Amplifier (HD4PNBAG20B)** could be an option if special circumstances exist.

Input power levels to all three amplifiers can be as low as -75dBm. Since the amplifiers can detect these very weak signals, longer cable runs may be used before amplification is required. All three amplifier types have gain/slope networks built into each of their four channels. As system channel frequencies

increase, so does the loss associated with that channel. The gain/slope circuitry essentially keeps the output signal at a consistent level across all frequencies by applying more gain at the higher frequency channels and less gain at the lower frequency channels.

SPLITTERS

The common 2-way, 4-way, and 8-way splitters may be used in any combination and number in order to produce the desired number of channels, our sample diagram showing 64 channels. Each splitter, however, does introduce loss into the system and reduces signal strength accordingly. Care should be taken when wiring splitter outputs to multi-switch inputs in that each multi-switch input must be from a different satellite, as the color coded lines in the diagram indicate.

MULTI-SWITCHES

Three multi-switches used in SMATV installations are the DISH Pro Plus 44 (DPP44), DISH Pro Plus 33 (DPP33), and DISH Pro 34 (DP34). For reception of three satellites, all three types of multi-switch could be used, but for four satellite reception, the DPP44 would be the selection.

The multi-switches in DISH Network installations are designed to receive signal levels identical to that of a receiver and the parameters thus are the same. This means that the SMATV system designer should hit the input of each switch within a -30 to -55 dBm window. All switches provide satellite TV signals to the inputs of any combination of multiple receivers.

RECEIVERS, MODULATORS, COMBINER

The SMATV system can contain any number of channels for distribution. A dedicated commercial satellite receiver is needed for each channel in the system and sends the signal for that particular channel to a modulator. Modulators take baseband audio and video signals from the satellite receivers and modulate these signals onto the desired channels. The headend combiner then takes the multiple modulator signals and produces one common output that is passed through amplifiers if necessary to the subscriber television sets.

TV'S AND DVR'S

Since individual channel receivers are built into the SMATV system, set top boxes are not required for signal reception. The built-in television tuners are used instead.