

Spot Beam Technology

WHY SPOT BEAMS?

“Spot beams” take satellites to the next level. Spot beams enable EchoStar to deliver more local channels to specific, precisely defined areas, improving its ability to compete with cable broadcasters. Echo I through Echo VI satellites use beams that cover the entire nation. To provide local broadcast coverage, channels intended for only one local market are scrambled so customers elsewhere cannot view them. The new “spot beam” satellites are designed to aim spot beams at selected metropolitan markets, allowing the same radio frequencies to be reused in different cities, thus increasing the channel capacity. For example, by focusing over a very small area, like the New York City metropolitan area, the frequency can be reused in several other places like Miami, San Francisco and Chicago (these cities are used as examples, and will not actually share the same spot beam frequency). EchoStar VII and EchoStar VIII are both spot beam satellites. Why do these benefit our customers? With these two highly powerful spot beam satellites, we can direct about 50 different spot beam “projections” to the continental U.S. and deliver a lot more local programming to those specific areas. Each spot beam has an approximate diameter of 300 miles, making them powerful satellites!

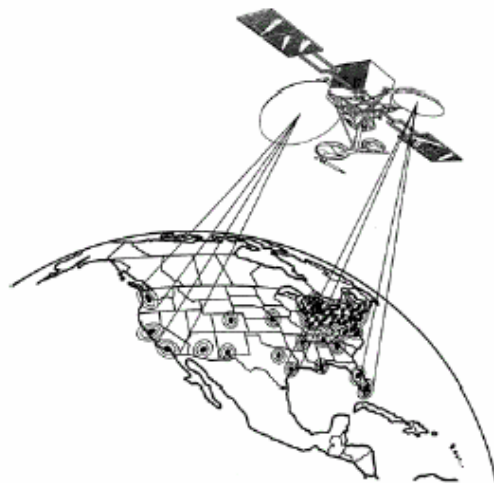
FREQUENCY TYPES:

- **Frequencies Explained:** When programming from our content providers is sent (“transmitted”) to the satellites from one of the uplink centers (Cheyenne, WY or Gilbert, AZ), the “transmission” uses a unique radio frequency (RF) channel. It is similar to traffic lanes on a highway. Each RF channel represents a traffic lane that keeps the signals (vehicles) from interfering with one another en route to the satellite (this is also called “uplinking”). Unique frequencies are also used to “downlink” programming from the satellite to the customer’s homes.
- The satellite’s “transponders” receive signals from earth on one frequency and amplify and transmit them back to earth on a different frequency.
- On a CONUS (“CONTinental United States”) satellite, each frequency downlinks programming to the whole United States.
- On a spot beam satellite, frequencies are re-used and downlinked to up to five different spot beam locations (“projections”).

CONUS Beam



Spot Beams



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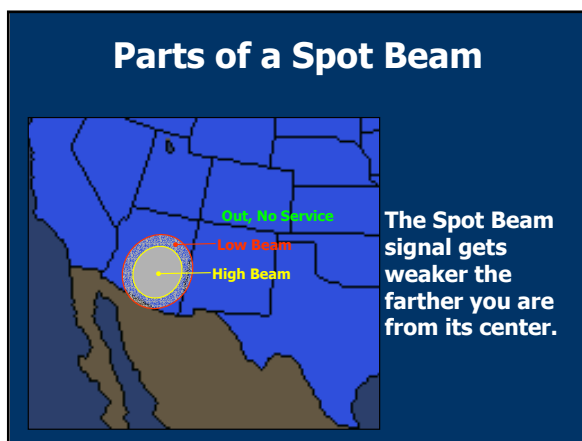
QUANTITY OF SPOT BEAM FREQUENCIES:

- There are 5 downlink spot beam frequencies available for use on each of the two new satellites (Echo VII and Echo VIII), and each frequency can be used in five different beams (5 frequencies x 5 beams = 25 spot beam frequencies available per spot beam satellite).
- Each beam (“projection”) carries between one and three of the different re-used frequencies, depending on the number of programming channels needed in that DMA (Designated Market Area). For example, City A may just use frequency 3; City B may use frequency 3 and 5.
- Each spot beam frequency can broadcast 10 - 12 programming channels (e.g. ABC, NBC, CBS, FOX, WB, UPN)

SPOT BEAM FREQUENCIES BEING USED:

- Echo VII provides spot beams at the 119° orbital location.
 - 119 spot beam frequencies: 1, 3, 5, 7, 9
- Echo VIII will provide spot beams at the 110° orbital location.
 - 110 spot beam frequencies: 2, 4, 6, 8, 10

Spot beams have two areas:



- **High beam** - Center area in a spot beam projection: customers located here will have the strongest spot beam signal strength (nearly as good, just as good, or better than the CONUS signal in the area). This area is approximately 300 miles in diameter.
- **Low beam or “fringe area”** - Area just outside the “high beam” area: customers located here may have marginal signal strength, as their spot signal will be weaker than the CONUS signal in the area.

LOCAL CITIES THAT WILL REMAIN “CONUS” (a.k.a. “Flagship” Locals)*

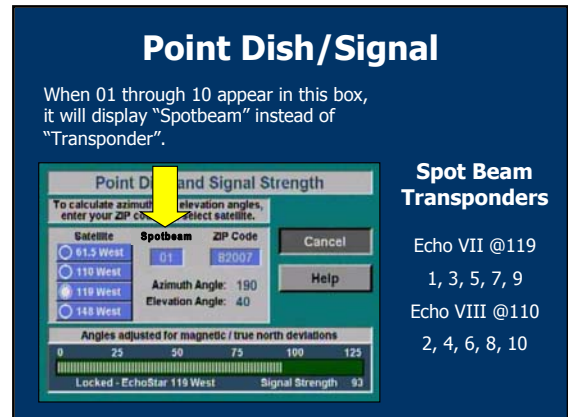
Los Angeles, CA	Chicago, IL
Denver, CO	Atlanta, GA
Dallas/Ft. Worth, TX	New York City, NY

**Only includes ABC, CBS, NBC, FOX, WB, UPN and PBS.
Other channels on spots, 61.5° or 148°.*

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SPECIAL CONSIDERATIONS

- Home transponder is now transponder 11. You will use this to determine signal strength when peaking the dish antenna. Looking at signal strength on transponders 1 through 10 will give you an incorrect reading.
 - Some transponders in 1 through 10 will show no signal at all - the customer does not reside in that spot beam area.
 - Transponder(s) for that spot beam area may show a higher signal than a CONUS transponder – you should never peak on a spot beam transponder.
- On the Point Dish screen, if 01 to 10 is chosen in the “Transponder” box, the word “Spotbeam” will be displayed instead; when transponders 11 or higher are chosen, “Transponder” will display above the box.
- Some spot beam projections may not cover the full DMA (“Designated Market Area” – the FCC’s boundary for reception of local television signals). There are very few customers in this situation (less than 1% of our full customer base). See also “Note” below.
- A spot beam projection can cover more than the DMA, but only qualified customers (based on their address (“network qualifying”)) will be able to see the local channels in that spot beam.
- Mobile customers (RV or truck customers) or customers that move to a new location that had spot beam locals will have receivers that expect to see a particular frequency. When they move from that DMA/spot location, their receivers will no longer be able to receive their original local channels, nor function in the new location until they update their information with the CSC.



NOTE:

- Some cities will include customers that are in the DMA, but might not be able to see the spot beam (they are in “fringe” areas). Although these “fringe” customers will be listed as “eligible” on the customer and retailer websites, they will be offered the local package by CSRs with a warning that additional hardware may be required to receive the spot beam satellite signals.
- Some cities include only “non-flagship” channels within the spot beam. “Flagship” channels are ABC, CBS, NBC, FOX, WB, UPN and PBS.