

HD Radio Power Increase Basics

Definition of Power Increase

The FCC is presently allowing most FM stations to increase their digital power.

See this link for the FCC document: http://fjallfoss.fcc.gov/edocs_public/attachmatch/DA-10-208A1.pdf

The aforementioned document explains that the FCC will:

- Permit most FM stations to immediately increase total digital power by 6 dB, a four-fold power increase
- Limit power increases for stations currently licensed in excess of class maximums, i.e., "super-powered" stations, to protect analog radio service from interference
- Establish application procedures for power increases up to 10 dB
- Establish interference remediation procedures that require the Media Bureau to resolve each *bona fide* dispute or impose tiered power reductions within 90 days

It is suggested that stations take advantage of whatever power increase is possible without exceeding the NRSC 5 out of band emissions mask for HD operations.

Below is a chart that shows the different terminology involved with the various levels of power increases.

Please note that -20dBc is the reference power level of the digital signal compared to the analog signal.

Total Digital/Analog power ratio (dB)	dB Increase	Power Multiplier	Total Digital/Analog power ratio (linear)
-20dBc	0	0	1/100
-18.5dBc	1.5dB	1.4	
-18dBc	2dB	1.6	
-17dBc	3dB	2	1/50
-15dBc	5dB	3	
-14dBc	6dB	4	1/25
-13dBc	7dB	5	
-10dBc	10db	10	1/10

Methods and Options for Increasing Digital Power

There are several ways to increase your digital power depending on your existing equipment setup and capabilities.

These are the basics:

If you are using a separate digital antenna and transmitter:

- Increase the power output of the digital transmitter (if there is enough 'headroom' to allow this increase). Be aware that the transmission line and/or antenna may need to be upgraded to handle the additional power.
- If space is available on the tower, you may increase the number of antenna bays to increase the antenna gain factor.

If you low-power combine analog and digital in one transmitter:

- Increase the digital exciter/excine drive power (may require re-optimizing amplifier Bias).

If you are high-power combining analog and digital using separate transmitters:

- A new digital transmitter may be needed. Be mindful that this method may necessitate electrical service and building cooling upgrades and require a higher power dummy load.
- Asymmetric sideband technology can also be employed to independently adjust sideband levels in order to maximize sideband power for a given protection ratio. This feature will be integrated in iBiquity's latest transmit software release v4.4. This feature has not yet been approved by the FCC; however stations may begin to implement it under a test authorization from the FCC.
- For asymmetric sidebands, the power levels of one of the sidebands can be increased. Neither sideband shall be reduced in power below the nominal level.