Attachment A.

STATEMENT BY JEREMY LANSMAN
REGARDING
ON CHANNEL DTV CONVERSION FOR LPTV OPERATIONS

We suggest that there is no reason in the world that ***any*** television station should not be allowed to convert its analog channel to digital as a matter of right, so long as interference caused to and received from other stations does not increase. If the station is operating under part 74 as an LPTV or translator station, as would be the case for stations considered in this NPRM, then increased interference received by the converting station should also be allowed.

We believe a safe power back off if converting an existing analog station to digital is approximately –6 dB, and for retrofitted equipment approximately -7 dB plus a factor accounting for band pass filter losses.

We are assuming that we are considering only those cases where a licensed station changes the mode of modulation from NTSC analog to 8vsb digital, but not antenna location, power, directivity, or elevation. Interference changes that might arise when an analog station converts to 8vsb can be analyzed by looking at d/u interference ratios for the two modulation modes.

The d/u ratios are found in Section 73.622 (c)(2) of the Rules and Regulations. Is the d/u ratio more or less permissive with digital than with analog? If the ratio is less permissive, then the allowed ERP of the analog station converting to digital must be reduced so that interference caused is equal to or less. Thus, looking at the list below in which we have added analog to analog interference, if the analog to analog number is lower than DTV to Analog number, a conversion from analog to DTV at the same ERP will result in lower interference levels.

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FCC 73.622 (c)(2) with analog values appended

	D/U Ratio	
Co-channel:		
DTV-into-analog TV.....	+34	
Analog TV-into-DTV.....	+2	
DTV-into-DTV.....	+15	
Analog into Analog Offset	***+28***	
Analog into Analog Not Offset		***+45***

First Adjacent Channel:

Lower DTV-into-analog TV.....		-14
Upper DTV-into-analog TV.....		-17
Lower analog TV-into-DTV.....		-48
Upper analog TV-into-DTV.....		-49
Lower DTV-into-DTV.....	-28	
Upper DTV-into-DTV.....	-26	
Analog into Analog first Adjacent UHF		***-15***
Analog into Analog first Upper Adjacent VHF		***-6***
Analog into Analog first Lower Adjacent VHF		***-12***

Other Adjacent Channel (Channels 14-69 only)

DTV-into-analog TV, where N = analog TV channel and DTV Channel:

N-2.....	-24
N+2.....	-28
N-3.....	-30
N+3.....	-34
N-4.....	-34
N+4.....	-25
N-7.....	-35
N+7.....	-43
N-8.....	-32
N+8.....	-43
N+14.....	-33
N=14 Analog into Analog	-23
N+15.....	-31
N=15 Analog into Analog	-6

The above list of co-channel, adjacent channel and + 14 and +15 shows that if an analog UHF LPTV station converts to DTV with the exact same parameters, including ERP, but changing from NTSC to 8VSB it will cause less interference in all cases except one. Interference will increase if the converting LPTV station is one channel below an analog UHF station by one dB. We propose that the converting LPTV station reduce ERP by 6 dB, thus affording 5 dB of protection even in this example. We have ignored the N +/- 2-8 ***Taboo*** channel relationships because those are not relevant for LPTV stations having less than 50 kW ERP.

If the LPTV station is a VHF station, then comparing NTSC analog to 8VSB DTV modulation still passes our above test, so long at the converting station has reduced ERP by 6 dB, that is to _ ERP.

The NPRM seeks comment regarding use of less stringent filters in order to reduce cost for a converting analog station. I am not prepared to analyze the use of less stringent filters. It is clear to me that use of filters that would meet full service FCC rules and a power reduction of 6 dB should be sufficient to protect all other television licensees.

It happens that 6 dB is the power back-off typically used when putting an 8VSB signal through an RF power amplifier. We also believe that stringent filters will not be all that expensive if an LPTV operator retrofits an existing transmitter or translator with an 8VSB exciter or channel converter. After all, the major expense IS SAVED -- that of the transmitter power supply and power chain. The cost of a new filter is not too much to ask.

A slight complication is that a converting station using an old transmitter may not be able to monitor output power. Turning the power up will lead to reduced coverage due to excessive signal distortion, and greater out of channel splatter. Additionally, conventional analog RF power meters are inaccurate when used with 8VSB signals.

One can use indirect measurement by transmitting a CW signal. Before the transmitter is converted, the operator can turn off the aural carrier and video modulation. Then the operator can measure output power with an inexpensive FM power meter such as a Bird model 42. The operator can adjust for target average DTV power and note final amplifier input power by reading current and voltage. The operator can then connect the 8VSB signal source and adjust to the same input power.

ACTUAL POWER TO BE PERMISSIVELY ALLOWED.

If the conversion uses a new transmitter rated for an output power that can result in an ERP of
–6 dB (1/4) of the analog power, then that should be the permissive limit. If an old transmitter is retrofitted then there are additional considerations.

For example, replacement of a normal with a stringent output filter will result in additional RF power loss which must be accounted for. The filter replacement must be mandatory.

Certain older equipment may not perform well at –6 dB from analog power. Since older bi-polar transistor transmitters are sufficiently linear only to about 20% of NTSC peak power, while newer LDMOS devices are sufficiently linear to about 25% of NTSC peak power, We suggest the permissive value be set at –7 dB (20%) plus output filter loss for any but LDMOS transmitters where the value will be –6 dB plus output filter loss.

-Jeremy Lansman November 25, 2003