

# ADAPTRUM

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March 20, 2008

## Ex Parte

Marlene H. Dortch, Secretary  
Federal Communications Commission  
445 12th Street, SW  
Washington, DC 20554

*Re: Unlicensed Operation in the TV Broadcast Bands* Docket 04-186,

Dear Ms. Dortch:

Under the provisions of §73.622(g) of the Commission's Rules certain DTV stations now operating in the channel above a nearby (within 88 km) analog NTSC station must maintain a specified frequency offset with respect to the NTSC station. Since NTSC stations themselves can have several offsets this results in a greater number of frequency offsets for DTV stations now than will be permitted beyond 2/09 transition.

WSDs are very sensitive specialized signal detection devices. They achieve their great sensitivity, more than a thousand times more sensitive than a DTV receiver, by exploiting *a priori* knowledge of the signal that is being detected. Some WSD designs, including Adaptrum's, are sensitive to the precise frequency of the DTV signal and have decreased performance in the presence of offsets that weren't anticipated. It would be an unnecessary burden for WSD designs to consider detecting pre-transition offsets beyond 2/09.

The potential issue of offset was first discovered by FCC staff members Bob Weller, Hugh VanTuyl, and Steve Jones during the RF capture testing on WSD prototypes in the FCC Lab, when I was also present. Subsequent over-the-air test performed in our Lab also demonstrated the effect of offset. Our scan (see attachment) from Channel 27 to Channel 52 detected a total of 13 DTV channels. At least 3 of the detected DTV channels showed clear signs of offset.

While some WSD detection algorithms may be immune to these offsets, we believe that the highest performance designs must consider the offsets that are expected to exist. By taking into account the anticipated DTV signal offsets, it is possible to achieve a DTV sensing performance similar to that in the absence of offsets. In fact, a simple software update to Adaptrum's WSD prototype will extend its capability to detect DTV signals with offsets without degradation in performance.

By filing this letter, we intend to remind the Commission, in the testing and deliberation of rules regarding the white space technology, to separate out a technical issue that may

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be nonexistent post 2/09 transition and that, even as of today, can be adequately addressed through technical means.

Sincerely,

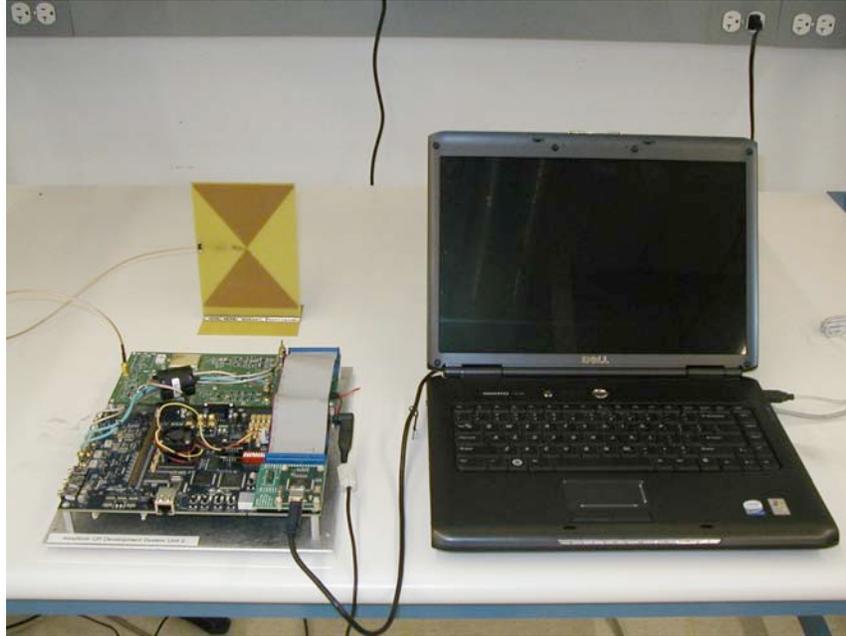
*/s/ Haiyun Tang*

Haiyun Tang, Ph. D.

Cc:

Julius Knapp  
Rashmi Doshi  
William Hurst  
Steve Jones  
Bob Weller  
Hugh VanTuyl

## Attachment



**Figure 1: Over-the-air DTV sensing setup.** Note that during the actual testing, the antenna was placed about 2 meters away from the setup and connected to the system through a coaxial cable.

Time: 03/09/08 10 pm PST		
Location: 37°24'19"N 121°53'59"W		
Equipment: Adaptrum CR Development System Unit 2		
Antenna: Indoor bowtie UHF		
Channel ID	DTV Sensing Result	Offset
27	1	
28	0	
29	1	
30	1	
31	0	
32	0	
33	1	YES
34	1	
35	0	
36	0	
37	0	
38	0	
39	1	
40	0	
41	1	

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42	0	
43	1	YES
44	0	
45	0	
46	0	
47	1	
48	0	
49	1	YES
50	1	
51	1	
52	1	

Figure 2: DTV sensing results. The prototype unit 2 was set to a DTV detection threshold same as that used by an identical unit currently being tested in the FCC Lab. In the column under “DTV Sensing Result”, 1 represents a positive DTV signal detection.

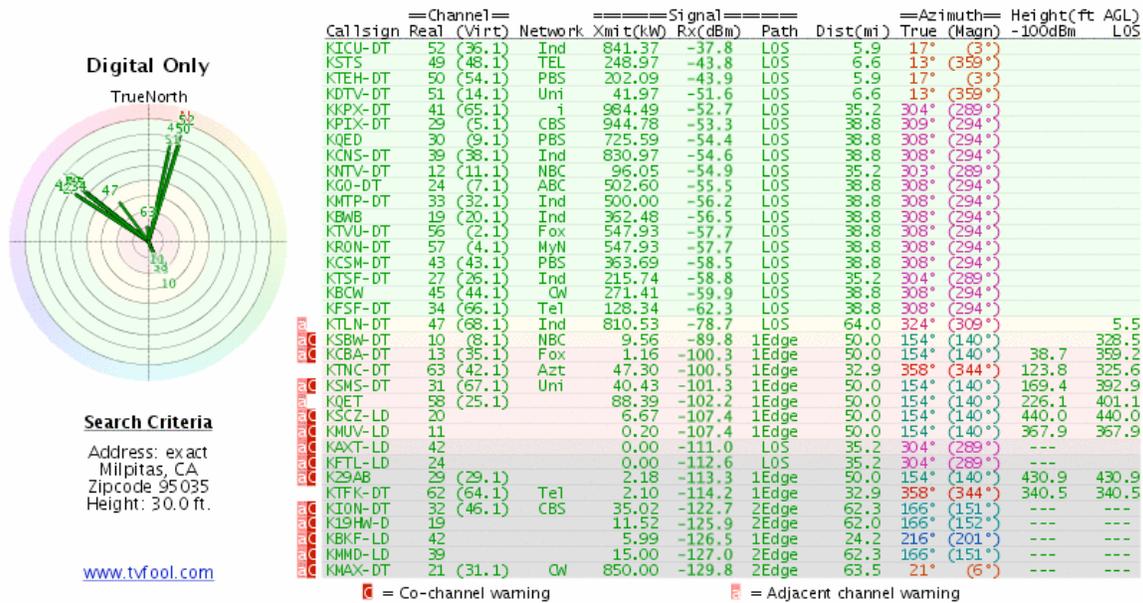


Figure 3: From [www.tvfool.com](http://www.tvfool.com); simulated DTV reception levels at the test location (based on Longley-Rice Model and FCC DTV transmitter database and assuming an outdoor receiving antenna about 30 feet above ground).