



January 23, 2007

Julius Knapp  
Chief  
Office of Engineering and Technology  
445 12<sup>th</sup> Street, SW  
Washington, DC 20554

Re: OET Testing of Unlicensed Devices; ET Docket No. 04-186

Dear Mr. Knapp:

Ensuring an open and transparent testing process in this proceeding, of such great importance to the American public, is imperative. Accordingly, the release of the OET Test Plan is a necessary step towards achieving this goal.<sup>1</sup>

Unfortunately, however, the current OET Test Plan will be insufficient to provide OET and the Commission with the information that is necessary to determine whether unlicensed devices will cause harmful interference to television operations and other licensed services in the band. During the October 5, 2007 meeting, OET asked that parties submit testing requests and suggestions to OET for its consideration. MSTV complied with that request and on October 15, 2007 submitted a number of questions as well as proposed testing recommendations to ensure that OET's second round of testing would be representative of the performance of the devices under real world conditions.<sup>2</sup>

Despite the fact that no parties submitted objections to MSTV's proposals, OET with little explanation or comment failed to address MSTV's questions or implement most of its testing recommendations. Instead, the OET Test Plan simply states that suggestions in the public record "were considered and included where appropriate and practicable."<sup>3</sup> MSTV appreciates the importance of a practical testing plan and drafted its recommendations with this concern in mind. However, if these tests are truly to be used "to provide additional information for the record that will be considered in assessing the interference potential of such devices and appropriate requirements," as suggested in

<sup>1</sup> See Public Notice, *Office Of Engineering and Technology Announces Plans for Conducting Measurements of Additional Prototype TV White Space Devices & Plan for Tests of Prototype Personal/Portable TV White Space Devices*, FCC/OET DA 08-118 (released Jan. 17, 2007) (OET Public Notice & Test Plan).

<sup>2</sup> See Letter from MSTV to Julie Knapp, ET Docket No. 04-186 (filed Oct. 15, 2007)

<sup>3</sup> OET Test Plan at 2.

the OET Test Plan, then further modifications or additional testing will certainly be necessary.<sup>4</sup>

In the attached technical Appendix, MSTV provides detailed information on the five most serious deficiencies in the current testing plan. They are as follows:

1. The OET Test Plan fails to test or quantify the impact of the key component of any white spaces devices -- the receive antenna.
2. The OET Test Plan fails to properly test or quantify how personal/portable devices will actually be used and the impact that the operator of the device will have on its ability to sense TV signals.
3. The OET Test Plan fails to adequately test the effect of multiple DTV signals, such as third order intermodulation (IM) products.
4. The OET Test Plan fails to test or quantify the impact on new mobile TV operations.
5. The OET Test Plan fails to provide any scientific methodology or test procedure to determine whether an appropriate sensing level can be set that will protect TV viewers. Further, it fails to provide any details on the number and variety of locations that will be used to conduct field testing.

It may well be that OET and the Commission have future tests in mind to evaluate a number of these issues, and that additional testing will be undertaken. Whether these issues are taken into account in this round or in a future round of testing, it is imperative that they are evaluated in order to prevent harmful interference to television services and other licensed operations in the band.

The stakes in this proceeding are far higher than ever before. If unlicensed devices are allowed to operate in the band, without first ensuring that they will not create harmful interference, the result will be that America's free, universal and local television service will be jeopardized. In the past week, millions of applications for over-the-air converter boxes have been filed with NTIA and millions of consumers are now spending billions of dollars preparing for the digital transition. Consumers deserve interference free digital television.

Thus, it is essential that OET and the Commission have the information required to determine that interference to these valuable services will not occur. OET must not rely on the certification process and limited and incomplete testing to protect television viewers and services. If the rules are flawed due to inadequate testing, or because the devices that were tested differ from those sold to consumers, then a certification program based on flawed testing will not protect consumers.

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<sup>4</sup> *Id.*

In light of these issues, MSTV asks that OET either amend its current testing plan or undertake further testing to evaluate the issues discussed in the Appendix attached hereto.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Jodi M. Steiger". The signature is written in a cursive style and is positioned to the left of the typed name below.

Jonathan D. Blake  
Jodi M. Steiger  
*Counsel to MSTV*

## **Deficiencies in the OET Test Plan to Evaluate the Performance of Prototype TV-Band White Space Devices**

**1. The OET Test Plan fails to test or quantify the impact of the key component of any white spaces devices -- the receive antenna.** All of the devices rely on the use of an external antenna to capture and sense the presence or lack of a TV signal. Yet the OET bench and laboratory tests completely ignore the impact of the receive antenna on the devices' performance.

Under the OET Test Plan, laboratory and bench testing of the devices is limited to conducted testing only and does not include any radiated testing to determine the actual performance of these devices under controlled conditions. MSTV provided detailed suggestions on how this testing could be conducted. There were no opposing comments to the use of these tests.

**2. The OET Test Plan fails to properly test or quantify how personal/portable devices will actually be used and the impact that the operator of the device will have on its ability to sense TV signals.** Personal/portable devices are likely to be hand-held devices that will be used close to the body. Microsoft and others have suggested for example such devices could include game controllers, digital cameras, MP3 players, etc. Body absorption and attenuation of radio signals can have dramatic impact on the signal levels received by a portable device. In fact, this is an area that should be well known to the FCC in the mobile telephone area where testing by the OET Laboratory has shown that the antenna pattern of a mobile phone can change by tens of decibels when the impact of the user's body or head is taken into account. Testing devices as proposed under the pristine case where the RF signal is feed by a cable directly into the device will bear little relevance to the device's actual performance. Again, MSTV provided detailed proposals on how to test the impact of the user on the device and there were no opposing comments to the use of these tests. These test proposals also recognized that not all impacts could be quantified and were deliberately restricted recognizing the OET testing would be time limited. To do no testing in this area, however, is negligent and irresponsible.

**3. The OET Test Plan fails to adequately test the effect of multiple DTV signals, such as third order intermodulation (IM) products.** Bench Test 3 indicates that the multiple DTV signal tests will be limited to two signals only. This includes the desired signal and one additional "strong" adjacent channel signal. However, this ignores the real world where more than two TV signals are present in most markets and where such signals may combine to produce intermodulation products on a third channel. To simulate real world conditions, multiple DTV signal tests must include at a minimum three channels to simulate the presence of two nearby DTV signals with at least one pairing that would be assumed to generate third-order IM distortion on the channel being sensed, as suggested in MSTV's earlier test proposals.

**4. The OET Test Plan fails to test or quantify the impact on new mobile TV operations.** One of the Commission's goals for digital television was the promise of new services to the public. Broadcasters and electronics manufacturers are currently spending tens of millions of dollars to meet that promise and are developing the ability to provide new mobile digital TV operations and services. Receivers used for this new mobile television reception will operate at significantly lower signal thresholds and will have different interference characteristics than the DTV receivers previously tested by the FCC. Furthermore, TV mobile devices and portable unlicensed may operate in much closer proximity and this fact must be taken into account to ensure that these primary mobile broadcast operations are fully protected as required under Part 15 of the rules.

At OET's open meeting on October 5, MSTV was assured that the OET would account for mobile TV in its testing plan. The current OET Test Plan, however, does not provide for any testing of mobile TV. Members of the broadcast industry have offered to make equipment available to OET and to cooperate in testing of mobile devices. OET's test plan should be amended to include testing of the interference characteristics of new mobile receivers and other mobile testing.

**5. The OET Test Plan fails to provide any scientific methodology or test procedure to determine whether an appropriate sensing level can be set that will protect TV viewers.** MSTV has already presented data that signals at -125 dBm and below can be present well within a TV station's service area. No one has provided any analysis or measurements to refute this data. Microsoft has submitted its own data that, as MSTV has pointed out, has shown that its device with a sensing level of -114 to -116 dBm capability fails to properly detect TV signals. Google, in its recent filing, claims that its device has the capability to sense at -120 dBm level. Google has provided data to the FCC that shows that it measured signals at this threshold level or very close to this level of -120 dBm at its headquarters which is only thirty miles away from and well within the protected contour of TV stations serving the San Francisco area. Clearly, lower TV signal levels undetectable by the Google device would be present slightly further from the stations or in indoor locations where building attenuation would be greater. However, the -120 dBm level is the lowest sensing level claimed by these concept devices or "not finished consumer products," a level already clearly shown in the record of this proceeding to be inadequate. MSTV is therefore concerned that the field testing proposed in the OET Test Plan makes no attempt to determine an appropriate sensing level. Further despite its claim to the contrary, the OET Test Plan does not suggest that these devices would be tested under "real world" conditions using practical antennas, taking into account the body attenuation of the user, the impact and overload of device transmissions on the device's receiver, etc.

MSTV has suggested that field testing must include enough different locations to be representative of both TV reception and unlicensed operation throughout the United States. However, the Public Notice announcing the OET Test Plan suggests that field testing would be conducted over a limited time period of four to six weeks. This field testing is also to include both TV and cordless microphone testing. Given the scanning time of many of these devices is on the order 30 minutes and more and that different

rooms will be tested at each location, it is unlikely that more than one location can be tested per day. If testing is limited to the work week, this means that a maximum of 30 locations can be tested in a six week period. The OET Test Plan suggests that these locations will include “a sample of personal residences (single family and multiple unit dwellings) and business structures located in urban, suburban and rural environs.” Clearly, a 30 location sample is inadequate to even be representative of one of these environs within a single TV market let alone all TV over-the-air viewers across the United States. Without such an adequate and statistically valid sample, it is impossible to determine what an appropriate sensing level would be to protect those viewers as required under Part 15 of the FCC rules.