National Association of NAB BROADCASTERS

MSTV MAXIMUM SERVICE TELEVISION

September 10, 2007

The Honorable Kevin J. Martin
Chairman
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

RE: *Ex Parte Filing*
Unlicensed Operation in the TV Broadcast Band, OET Docket No. 04-186

Additional Spectrum for Unlicensed Devices, OET Docket No. 02-380

Dear Mr. Chairman:

As you know, the White Spaces Coalition[1] is advocating that the Federal Communications Commission (FCC) allow personal and portable unlicensed devices on television frequencies. The National Association of Broadcasters (NAB) and the Association for Maximum Service Television, Inc. (MSTV) are very concerned that allowing these devices in the television band will jeopardize the success of the impending digital television (DTV) transition, and cause permanent damage to the over-the-air digital broadcast system.

At the outset, however, we would like to emphasize a key point -- NAB and MSTV embrace the national goal of ubiquitous rural broadband deployment. We also believe that there are ways to utilize spectrum through fixed systems that can offer the advantages of broadband to rural consumers without threatening viewers who rely on over-the-air television. As we have noted throughout this proceeding, rules can be enacted to ensure that fixed systems do not cause harmful interference to all existing spectrum users.[2] However, sensing technology alone is not an adequate technique for avoiding harmful interference to television reception. The key is to know the location of the transmitting device, which can only be achieved effectively with satellite based geolocation systems.

As the Commission is aware, the spectrum sensing devices submitted to the FCC's Office of Engineering and Technology (OET) failed to adequately detect broadcast signals and can cause interference. According to studies submitted by the NAB and MSTV to the FCC, even if the devices operated "as advertised," the proposed sensing thresholds were

[1] The White Spaces Coalition includes: Microsoft, Dell, HP, Intel, Philips, Earthlink and Google.
[2] Indeed, IEEE 802.22 has nearly completed standards for such a fixed system that can be used to promote rural broadband services.

inadequate to avoid interference to digital television reception. Moreover, even if the proposed sensing had worked, the FCC's data released last spring revealed that operating these devices on an adjacent channel could cause interference to digital television sets located in 80-87% of a TV station's service area.

Mr. Chairman, in order to achieve our national goals, broadcasters are committed to helping the FCC develop the necessary database to facilitate the deployment of fixed broadband systems in rural areas. We are prepared to work aggressively on the rural broadband issue towards a goal of ubiquitous broadband deployment in all 50 states and in tribal and other territories. We are also prepared to continue to work with the Commission on interference zone issues to make sure the science ensures consumers are protected from potentially permanent interference.

There can be no doubt that this is a momentous consumer issue. Over the next two years, consumers will spend billions of dollars on new digital television sets. This investment should not be jeopardized by the introduction of unlicensed personal and portable devices that are sure to interfere with television reception. We hope you will agree that our country should enact policies that facilitate the deployment of rural broadband without permanently endangering reception on millions of new digital television sets and government subsidized digital to analog converter boxes. Thank you for your leadership, Mr. Chairman.

Sincerely,

David K. Rehr

David K. Rehr
President & CEO
National Association of Broadcasters

David Donovan
President
Association for Maximum Service Television

MSTV
MAXIMUM SERVICE TELEVISION

National Association of NAB BROADCASTERS®

New FCC studies confirm serious interference problems.

TV WHITESPACES: INTERFERENCE FROM PERSONAL AND PORTABLE UNLICENSED DEVICES WILL DEVASTATE OVER-THE-AIR DIGITAL TELEVISION

Interference causes DTV pictures to freeze and become unwatchable. This affects new DTV sets and government-subsidized digital-to-analog converter boxes. This interference will be permanent because it occurs on our final digital TV channels.

- **Sensing Does Not Work and Devices will Turn On to Occupied TV Channels: July 2007, FCC study evaluated "unlicensed prototypes." The study found that the devices "do not consistently sense or detect TV broadcast or wireless microphone signals." One device failed to sense operating TV signals 40 to 75% of the time and "is capable of causing interference to TV broadcasting." The other device was not tested outside the lab and "performance declined rapidly" as signals got weaker.**

- **Operating on "Vacant" Adjacent Channels Causes Widespread Interference Analysis of FCC data released in March 2007 shows even low powered unlicensed devices operating on unused adjacent channels could cause interference in 80 to 87% of a TV station's service area.**

- **Interference to Cable-Ready Sets: July 2007, FCC study found that "unlicensed prototypes" interfered with digital cable service connected directly to a TV set.**

Once millions of unlicensed devices are in consumers' hands, they cannot be traced or recalled. As the FCC found, devices can break and cause interference. Interference may come from the next apartment or from a neighbor down the street.

To protect consumers' DTV sets and the DTV transition, personal and portable unlicensed devices should not be allowed to operate in the TV band.

The FCC can promote rural broadband by conducting a careful spectrum analysis and deploying "fixed" broadband services.

For information contact: **David Donovan ddonovan@mstv.org/Kelly Cole, kcole@nab.org**

MSTV
MAXIMUM SERVICE TELEVISION

National Association of NAB BROADCASTERS®

The record is clear: personal/portable devices reliant on spectrum sensing do not belong in the TV Band. Concerned parties include:

Television Broadcast and Cable Organizations
Association for Maximum Service Television, Inc. (MSTV)
National Association of Broadcasters (NAB)
Association of Public Television Stations (APTS)
National Religious Broadcasters (NRB)
The Community Broadcasters Association (CBA)
National Translator Association (NTA)
National Cable Television Association (NCTA)

Spanish Language Networks
Univision Communications, Inc.
Telemundo
TuVision
Entravision

DTV Set Manufacturers
Panasonic Corporation of North America
Hitachi Home Electronics (America) Inc.
LG Electronics USA, Inc.
TTE Corporation
Samsung Electronics
JVC Americas Corp.
Thomson Inc.

Local TV Broadcasters
ABC Television Network
ABC Owned Stations
Capitol Broadcasting Company
CBS Corp.
Colorado Public Television (KBDI)
Cox Broadcasting, Inc.
Hubbard Broadcasting Company
Belo Corp.
Gannett Broadcasting
ION Media Networks

KCIN-LP
KHEM-LP
KJLA, LLC
KMCE-LP
KULU-LP
McGraw-Hill Broadcasting Company, Inc
Media General, Inc.
Mid-State Television, Inc.
Morris Network of Mississippi
Pappas Telecasting Companies
Pikes Peak Broadcasting Co.
Red River Broadcasting Co., LLC
Region 1 Translator Association
Southwest Colorado TV Translator Association
Utah Translators
WDLP Broadcasting Co., LLC
White Pine Television District No. 1
Willamette Valley Television
Wind River Group, Inc.

News and Entertainment Providers

Radio-Television News Directors Association (RTNDA)
ABC Radio and ABC News
BET
C-SPAN
CBS News
Christian Festival Association
City of New York
FOX GROUP
Infinity Broadcasting
MTV Networks Inc.
NBC Universal
Tribune Company
Turner Broadcasting System, Inc.

Sports Leagues, Conferences and Sportscasters

ABC Sports and ESPN
Major League Baseball (MLB)
National Association of Stock Car Auto Racing (NASCAR)
National Basketball Association (NBA)
National Football League (NFL)
National Hockey League (NHL)
The PGA Tour
Sports Technology Alliance

Sports Video Group
National Collegiate Athletic Association (NCAA)
North Carolina State WolfPack
Learfield Sports (sports rights holder and producer)

- **Alabama Crimson Tide**
- **Army Black Knights**
- **Black Coaches Association**
- **Bowling Green Falcons**
- **Clemson Tigers**
- **Colorado Buffaloes**
- **Fresno State Bulldogs**
- **Idaho Vandals**
- **Indiana Hoosiers**
- **Iowa Hawkeyes**
- **Iowa State Cyclones**
- **Kansas State Wildcats**
- **Maine Black Bears**
- **Memphis Tigers**
- **Miami Hurricanes**
- **Minnesota Golden Gophers**
- **Missouri Tigers**
- **Montana Grizzlies**
- **Montana State Bobcats**
- **New Mexico Lobos**
- **Nevada Wolf Pack**
- **North Carolina Tar Heels**
- **Oklahoma Sooners**
- **Oregon State Beavers**
- **Penn State Nittany Lions**
- **Purdue Boilermakers**
- **San Diego State Aztecs**
- **San Jose State Spartans**
- **South Carolina Gamecocks**
- **Stanford Cardinals**
- **Texas A&M Aggies**
- **Toledo Rockets**
- **Tulsa Golden Hurricanes**
- **Utah State Aggies**
- **Wisconsin Badgers**
- **Wyoming Cowboys**

Music and Performing Arts Organizations

American Arts Alliance
American Federation of Musicians (AFM)
American Federation of Television and Radio Artists (AFTRA)
American Symphony Orchestra League
Association of Performing Arts Presenters
Country Music Association (CMA)
Dance/USA
Grand Ole Opry
International Music Products Association (NAMM)
The League of American Theatres and Producers
Masque Sound
National Alliance for Musical Theatre
OPERA America
The Recording Academy (GRAMMYs)
The Recording Artists' Coalition
Theatre Communications Group

Additional Audio Groups and Companies

ATK Audiotek Corp.
Audio-Technica U.S., Inc.
Billboard Magazine
Front of House Magazine
Guitar Center, Inc.
iLiveToPlay Network
International Communications Industries Association
National Systems Contractors Association
The Pro Audio Manufacturers Alliance (PAMA)
Production Resources Group (PRG Audio)
Professional Wireless Systems
Samson Technologies
Sennheiser USA
Shure Incorporated
Singer and Musician Magazine
Sevier Valley Communications
Sound Associates, Inc.
Springboard Productions, Inc.
Stage Directions Magazine
Telex Communications Inc.
Total RF Marketing, Inc.
Wireless First

Commercial Wireless Industry

QUALCOMM Inc.
Sprint Nextel Corp.

Medical Equipment and Radioastronomy
American Society for Healthcare Engineering
GE Healthcare
National Academy of Sciences
National Radio Astronomy Observatory

Engineering and Professional Organizations
Society of Broadcast Engineers, Inc. (SBE)
IEEE 802.18 Working Group
IEEE Broadcast Society

MSTV

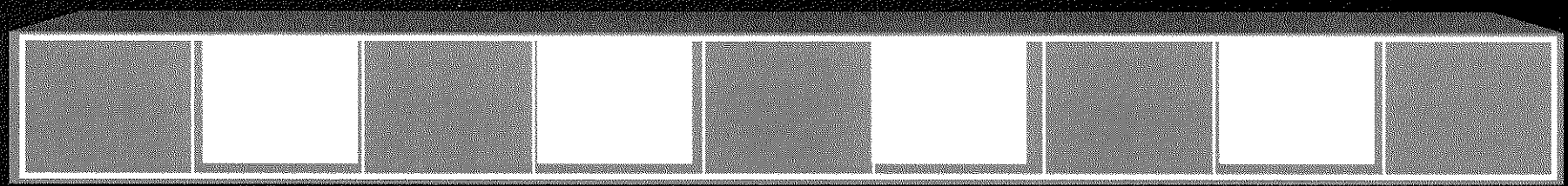
MAXIMUM SERVICE TELEVISION

TV White Spaces Unlicensed Devices

Threat to the DTV transition and our digital future

Television Spectrum

Future TV Band Ch. 2 - 51

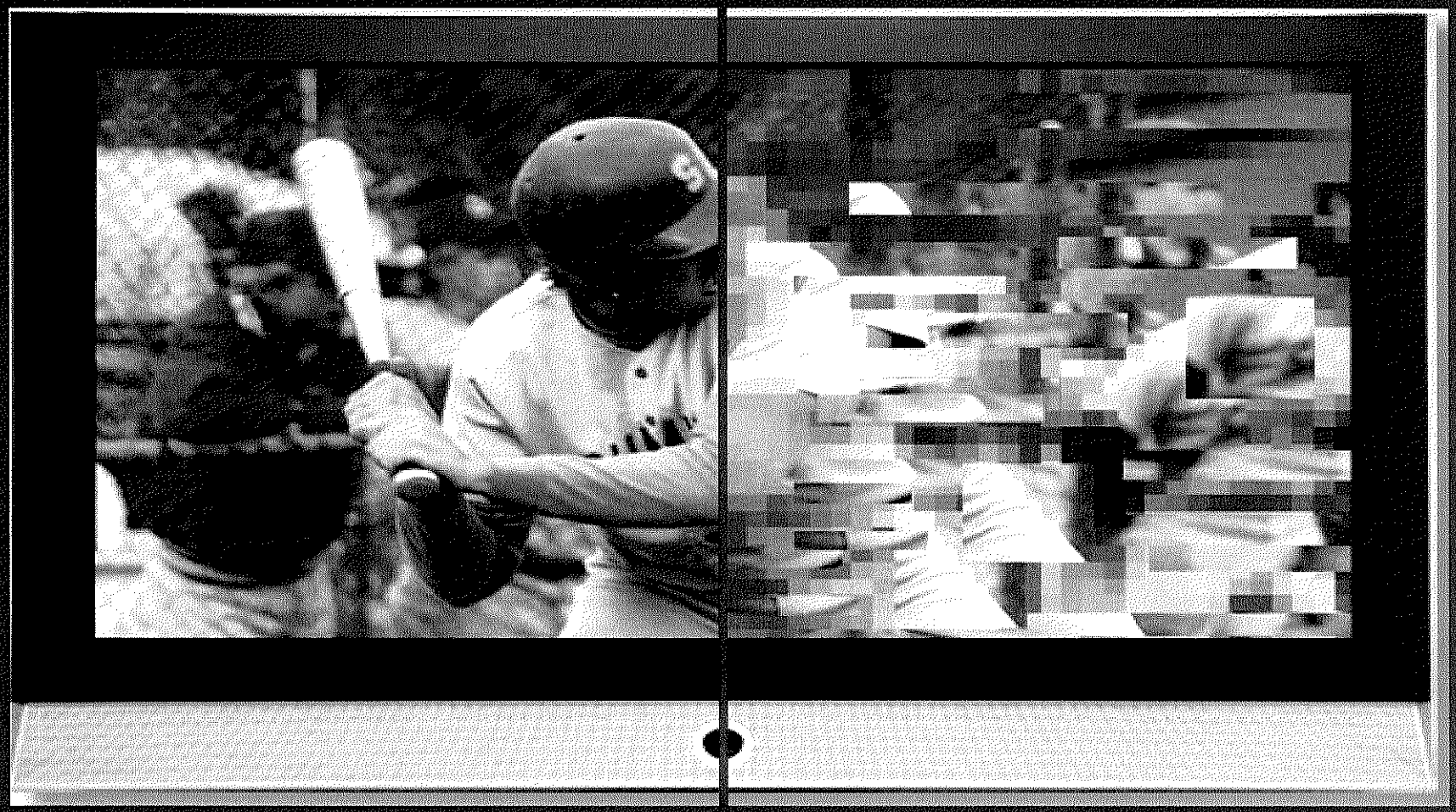


So-called vacant TV channels

Occupied TV Channels

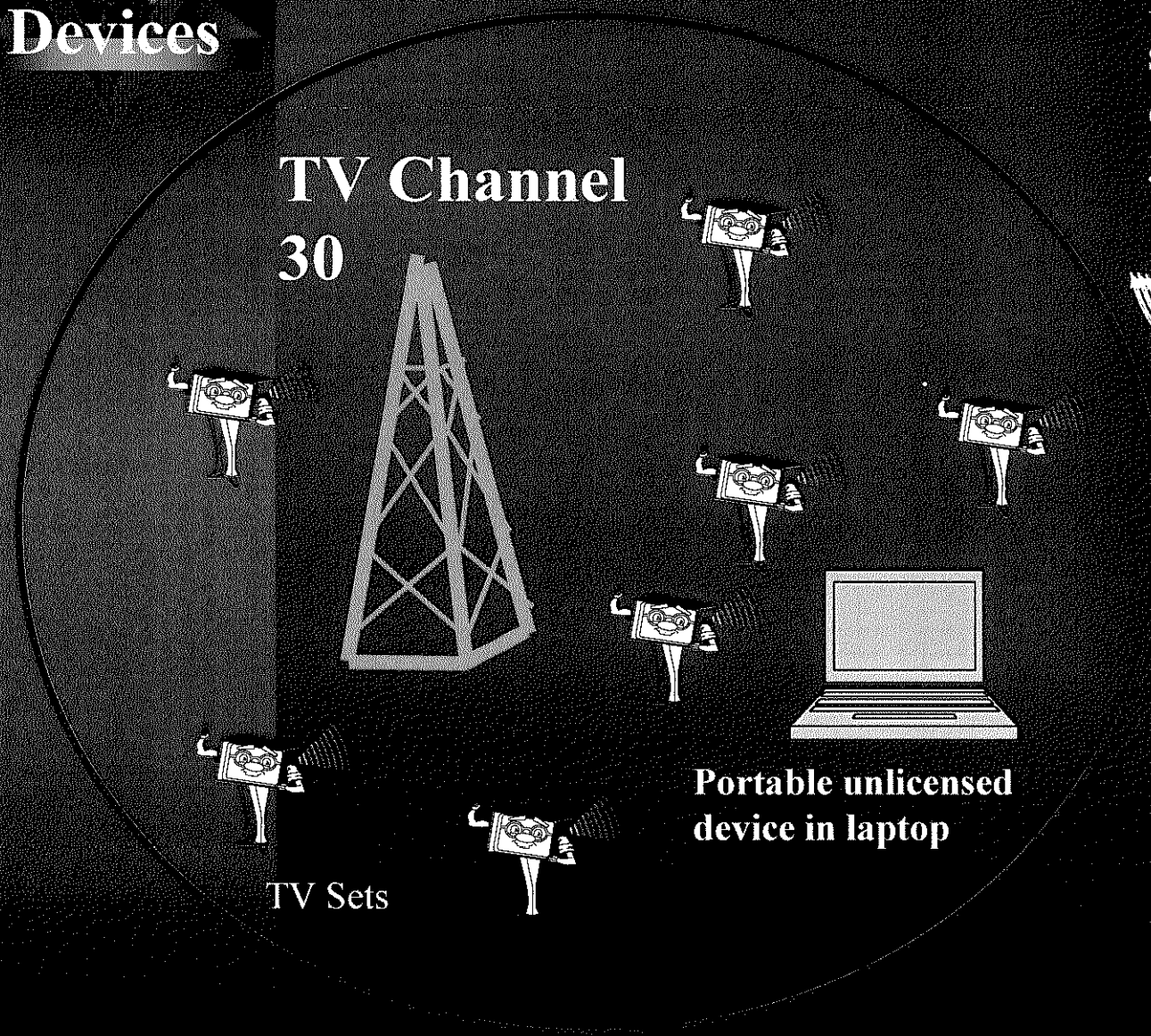
Note: these frequencies are heavily used for licensed wireless microphones by news and sports departments.

Small Amount of Interference Makes the DTV Picture Unwatchable

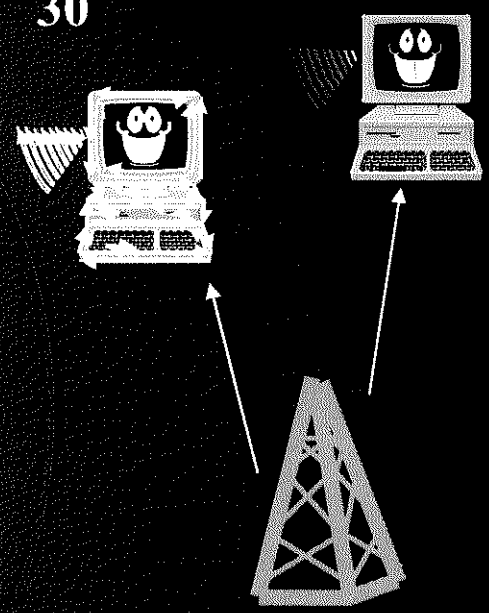


Crystal Clear | Interference

Fixed vs. Personal Portable Devices



Fixed unlicensed system operating on co-channel TV-30



Unlicensed base station located outside station contour via <u>geolocation.</u> This system avoids interference!

MSTV
MAXIMUM SERVICE TELEVISION

Interference distances from a very low power (100 mW) unlicensed device to a digital TV set

Out of Band

75 feet

Adjacent Channel

Up to a **hundred meters** depending on digital TV set!

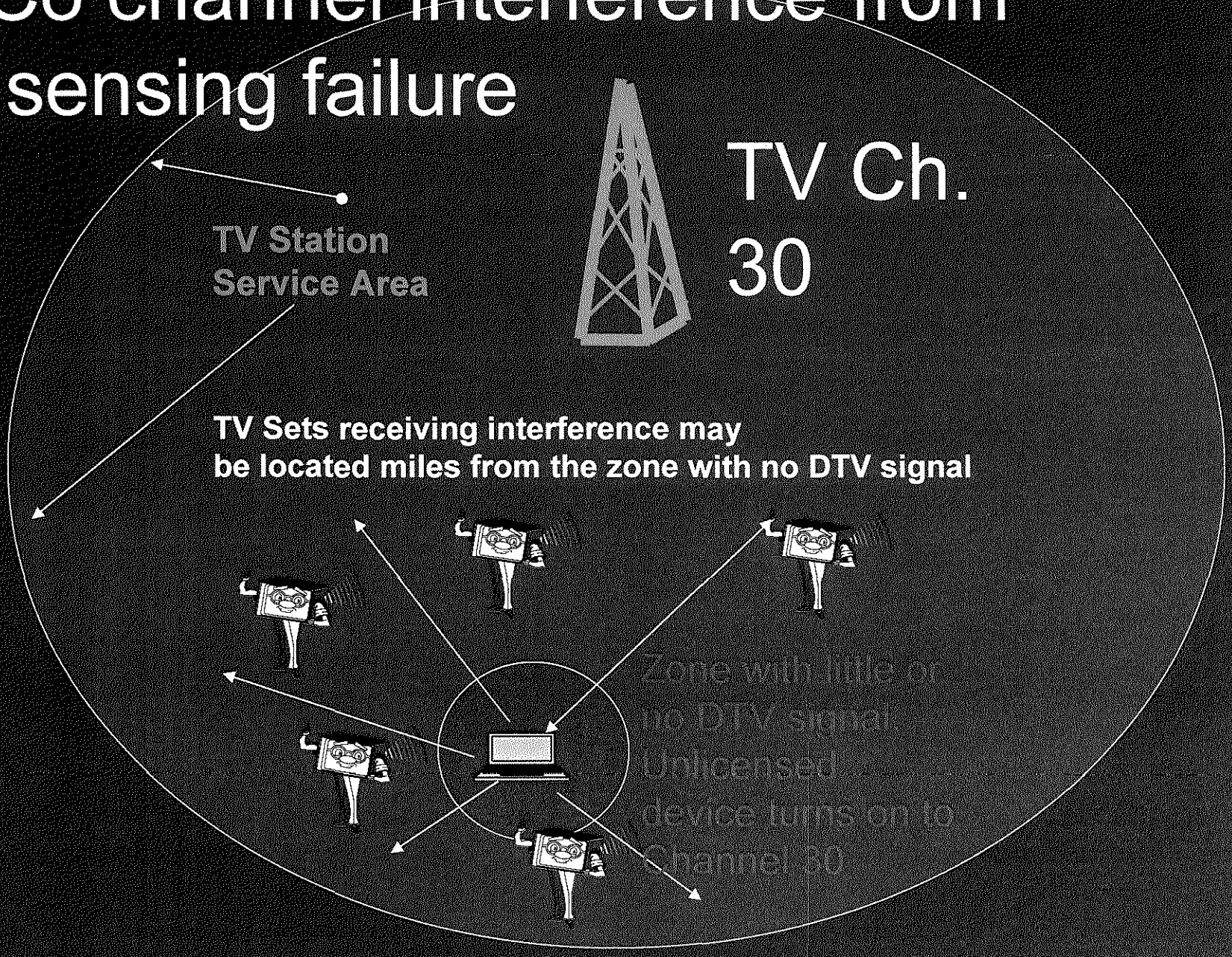
Co-channel

Up to 75 sq. miles!!

FCC Report: Sensing Technology Does Not Work

- Sensing TV signal does not work: (FCC Report July 31, 2007)
  - Microsoft Prototype:
    - Failed to detect a broadcast signal 40-75% of the time. The device turned on to channels that were being watched.
    - Transmitter caused interference
  - Philips
    - Only tested in the lab. Philips did not want any field testing.
    - Performed better but dropped off with weak signals that are typical in broadcast service area
- Failed to consistently detect wireless microphones
- **Result is co-channel interference which can range for miles (75 sq. miles)**
- **Your neighbor's device interferes with your TV set**

Co channel interference from sensing failure



FCC Report: Sensing Technology Does Not Work

- Even if devices worked "as advertised" they would still cause co-channel interference
  - Sensing level of -114 dBm is not sufficient to protect DTV sets from interference
  - MSTV study of Washington/Baltimore found receivable signals levels well below -114 dBm
  - Devices would turn on to occupied channels

TV White Space: Interference From Adjacent Channel

- Even if sensing worked (it does not), Microsoft & Philips want to operate on the next "vacant" adjacent channel.
- Data from the March, FCC study shows operating on the next adjacent channel" causes interference in a zone equal to **80 -87% of a TV stations service area**
  - At 20 miles from tower, interference range is about 10 meters (30 feet)
  - At 50 miles from tower (well within TV service area) interference range is 80-100 meters.
- Neighbors using a device will interfere with your new digital TV set.
  - If you live in the interference zone your new digital TV set will not work if a neighbor is using an unlicensed device nearby.
  - Even if you are closer than 20 miles, you will receive interference if you receive weak signals due to buildings.

MSTV
MAXIMUM SERVICE TELEVISION

Analysis of OET Report: Interference from operating unlicensed device on first adjacent channel

MSTV
MAXIMUM SERVICE TELEVISION

-84dBm

Adjacent Channel Interference
@ 10 meters from TV set

-67.3 dBm

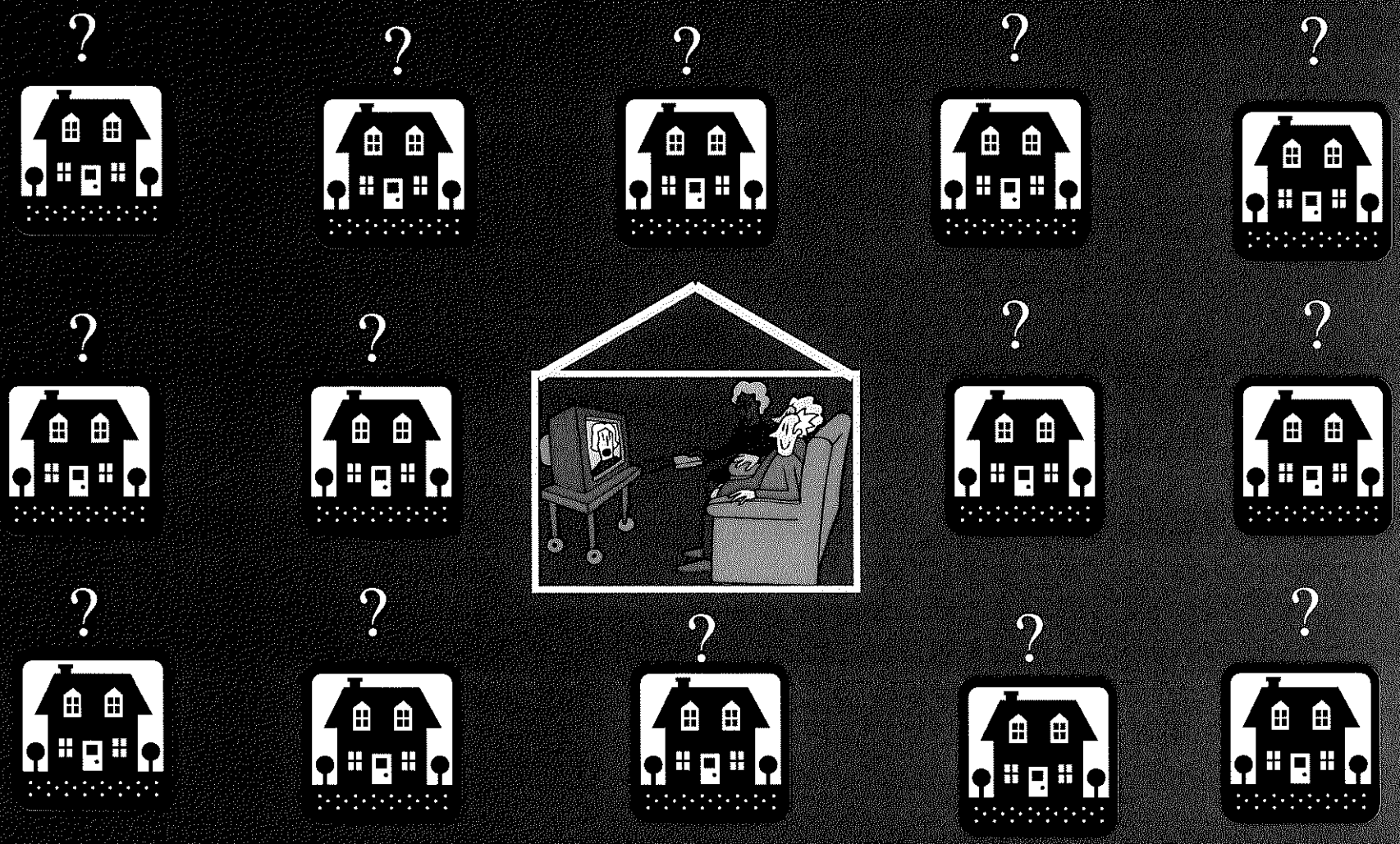
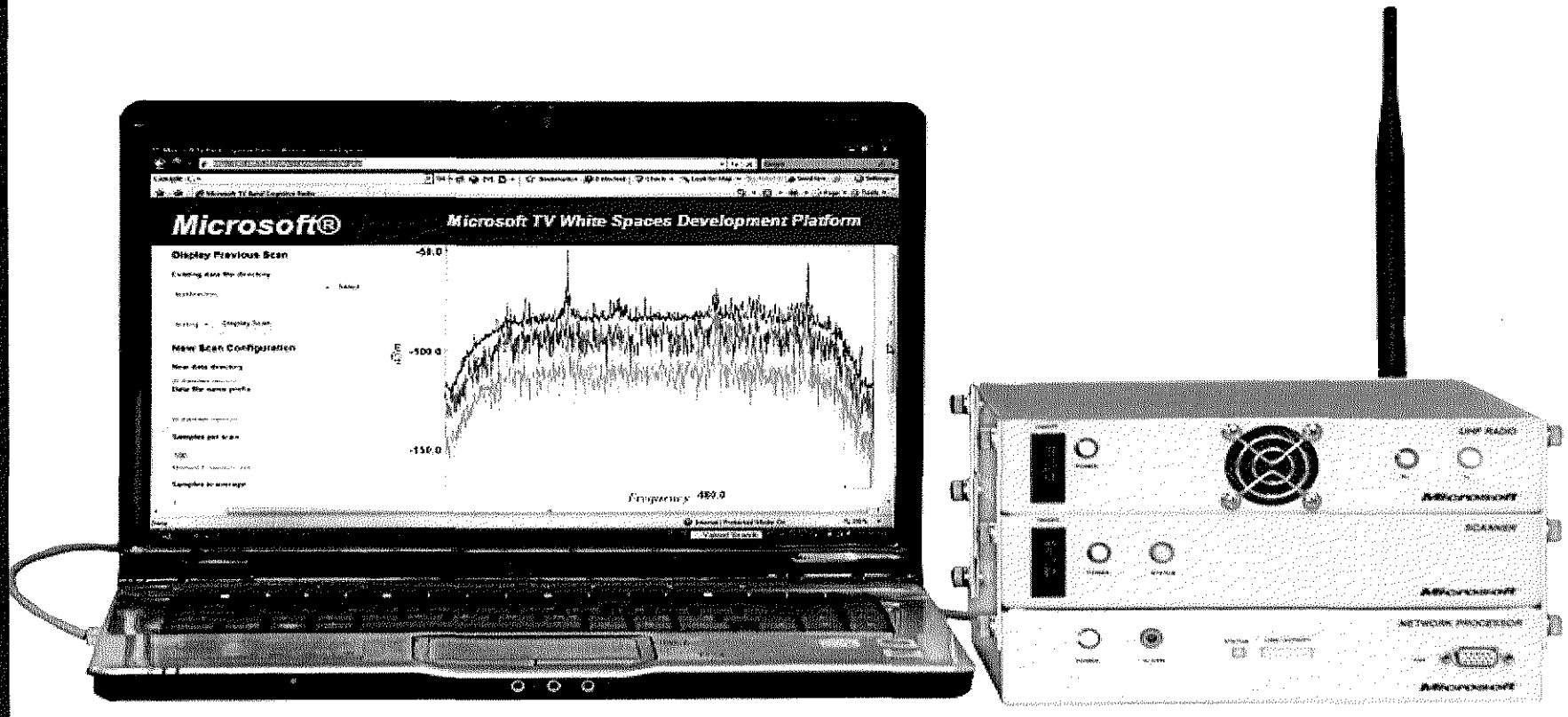
20 miles

50 miles

Interference zone 80-87% of a stations' geographic service area

Adjacent Channel Interference @ 80 meters from TV set!

Impossible to track down and police interference



Microsoft TV White Spaces Development Platform Version 2