

HDTV + Linux

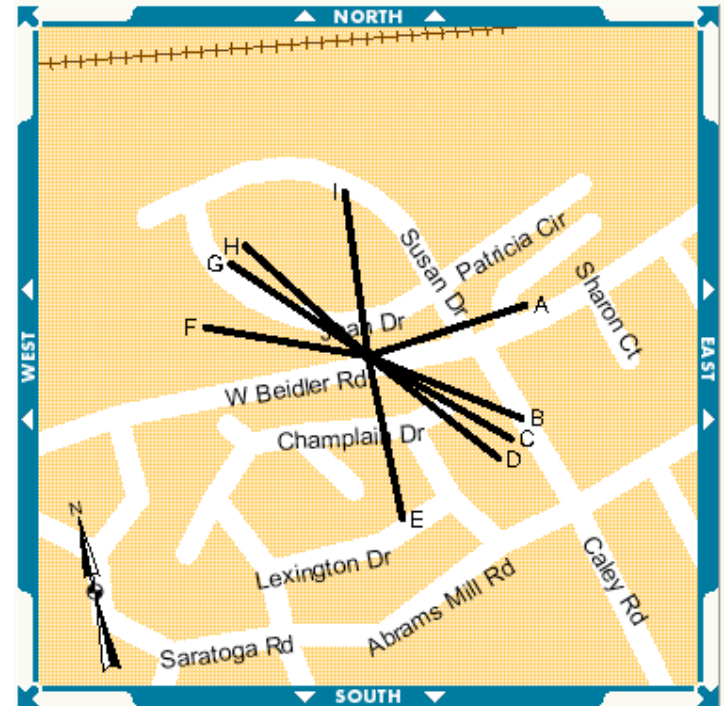
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Agenda

- Over the air HDTV reception
- High Definition TV Acronym Soup
- HDTV on your Linux system

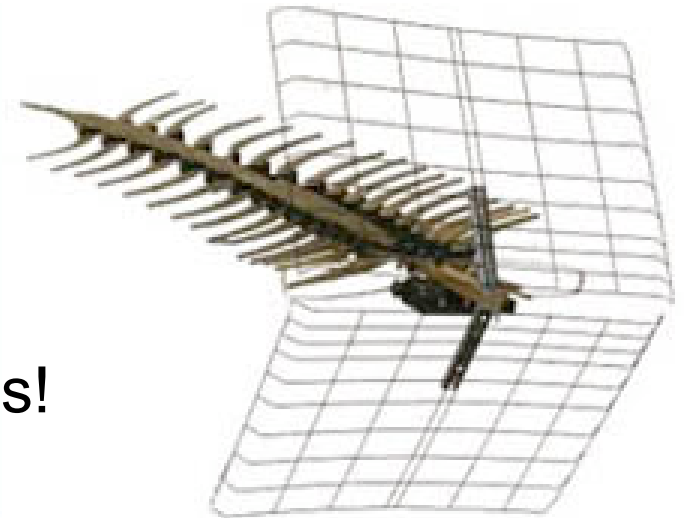
Receiving HDTV

- Over the air
 - ATSC using 8VSB
 - 19.39 Mbit/s data rate
 - 2 1080i streams / channel
- Cable Company
 - QAM 256
 - 38.4 Mbit/s data rate
 - 6 SD vs 2 HD channels
 - QAM 64 used by mom'n'pop cable operators



Antenna Orientation

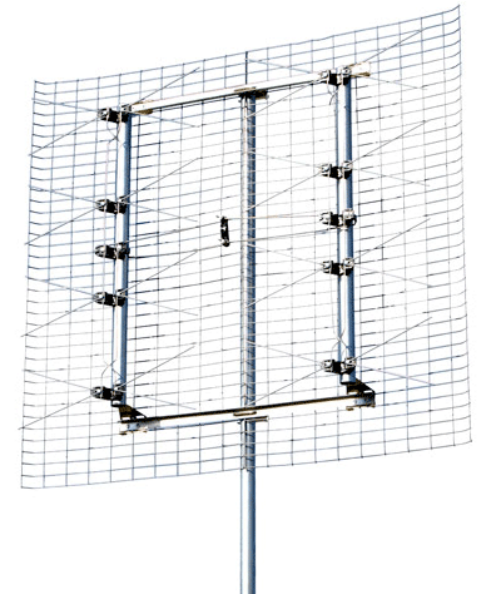
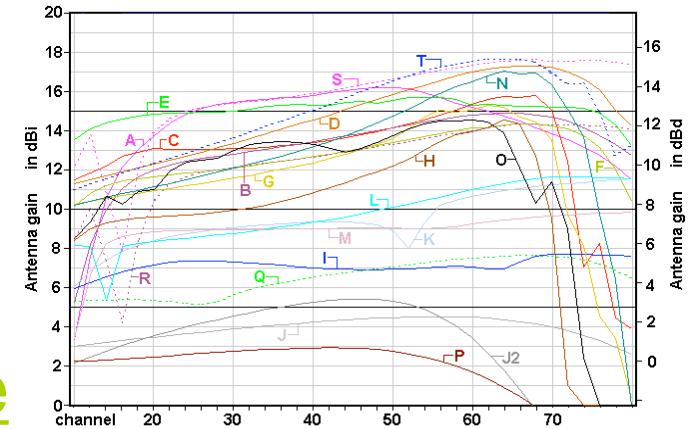
- AntennaWeb.org
 - <http://www.usps.com/zip4/>
- UHF vs VHF
 - Some areas need both antennas!
- FCC Database
 - <http://www.fcc.gov/mb/video/tvq.html>
- Broadcast Television Station Search
 - <http://www.2150.com/broadcast/default.asp>
 - Google Maps “Link to this page” URL reveals GPS location





Antenna Type

- HDTVPrimer.com
 - Amazing site!
- AVSForum.com
 - [HDTV Reception Hardware](#)
- Silver Sensor
 - Recommended [indoor](#) antenna
- Channel Master 7777 pre-amp
- Channel Master 4228



Buying and Regulations

- Buying
 - AntennasDirect.[com](http://AntennasDirect.com)
 - SolidSignal.[com](http://SolidSignal.com)
- FCC Rules
 - Over-the-Air Reception Devices Rule
 - CableCard on July 1, 2007
 - Must Carry





TV Tuners

- [pcHDTV](#)
 - 5500 PCI
- Air2PC
 - HD5000AV PCI
- [HDHomeRun](#)
 - Dual tuner
 - Network appliance
 - (GUI) winDOWS, (CLI) Linux and Mac OS X*



pcHDTV 5500

- Xine-hd
 - Audio and video drop outs
- dvb-atsc tools
 - <http://pchdtv.com/downloads.html>
 - dtvscan -d Card#
 - dtvsignal -d Card# Channel#
- Kernel module issues
 - Upgraded Etch to 2.6.21
 - LG and Conexant drivers are up-to-date in the mainline



atscap

- Previously pchdtvr by inkling at nop.org
- Simple standalone recording software
- Channel scanner
- Signal strength meter
- Built-in EPG
- SourceForge [project](#)
- Use this to test your cards

```
atscap1
EPG38                               3t 149m 20G (181/279G)   Mon Feb 26 04:25:03
k Chn Call Net Strength% NONE .JUNK -ECHO +SKIP -POOR #FAIR $GOOD IBEST dvb1
3 27 KRIV FOX SCAN OFF
EPG# Pgm# Day Time Len Events on FOX27 KRIV [Rating] Description [?] help
12 .3 Mon 12:00 30 Fox 26 News at Noon [CC] n/a >
13 .3 Mon 12:30 30 Access Hollywood [TV-PG-CC] Actress Abigail B>
14 .3 Mon 13:00 60 Montel Williams [TV-PG-CC] Guests share how >
15 .3 Mon 14:00 30 Divorce Court [TV-PG-CC] He says she takes >
16 .3 Mon 14:30 30 Divorce Court [TV-PG-CC] She says he put h>
17 .3 Mon 15:00 30 Judge Alex [TV-PG-CC] A woman seeks rep>
18 .3 Mon 15:30 30 Judge Alex [TV-PG-CC] A woman sues for >
19 .3 Mon 16:00 30 Judge Judy [TV-PG-CC] A car is stolen a>
20 .3 Mon 16:30 30 Judge Judy [TV-PG-CC] A pregnant woman >
21 .3 Mon 17:00 30 The Simpsons [TV-PG-D-CC] Bart finds Home>
22 .3 Mon 17:30 30 Malcolm in the Middle [TV-PG-L-CC] Lois joins a wo>
23 .3 Mon 18:00 30 King of the Hill [TV-PG-CC] Peggy secretly us>
24 .3 Mon 18:30 30 The Simpsons [TV-PG-D-CC] Bart displays a>
25 .3 Mon 19:00 60 Prison Break [TV-14-L-V-CC] Lincoln, Mich>
26 .3 Mon 20:00 60 24 [TV-14-V-CC] President Palme>
27 .3 Mon 21:00 60 Fox 26 News at 9 [CC] n/a >
28 .3 Mon 22:00 30 King of the Hill [TV-PG-L-CC] Nancy goes to e>
29 .3 Mon 22:30 30 That '70s Show [TV-14-D-L-CC] When Red refu>
30 .3 Mon 23:00 30 That '70s Show [TV-PG-D-CC] Kitty throws a >
KRIVDT 26.1 Video: 0 Audio: 0 PIDS: 0000 0030 0031 0034
38 Events on FOX.3 [ w]
```

Using atscap

- Channel Scan
 - `pchdtvr -i0 -S`
 - `/etc/pchdtvr.0.conf`
- Manual Record
 - `pchdtvr -i 0 -c pchdtvr.0.conf -s 300 42 -o 42Fox.ts`
- Interactive use
 - Not easy
 - Web Interface is under development

KnoppMyth

- Built with R5E50
- Steps
 - Pre-partition your disk
 - LVMs will be added AFTER install
 - Install to disk and choose manual config
 - Boot
 - mythtv-setup
 - mythfilldatabase
 - /etc/init.d/mythtv-backend start|stop

mythtv-setup

- Add Cards
 - Choose the DVB DTV Capture Card
- Video Sources
 - Choose bcast frequency
- Input connections
 - Associate cards with video sources
- Channel Editor
 - Defaults to broadcast, ATSC and 8VSB

Additional Information

- ATSC
 - Linux drivers are called dvb
- PSIP
 - Channel and system information
- Signal Strength
 - Digital meter, not the same as analog

Playback

- Processor
 - Dual core
 - Multimedia features
- Video Card
 - Intel GMA
 - Nvidia GeForce 6150
- Hard Drive
 - Any 7200 rpm IDE/SATA will do
 - Capacity is key, not speed

Playback continued

- Audio
 - Audiophile cards support is poor
 - S/PDIF pass through to your receiver
- Memory
 - Follow manufacturer specifications
- Power Consumption
 - [Silent PC Review](#)
 - [Logic Supply](#) to buy SFF boards

480 720 1080 What?

- Progressive Scan vs Interlaced
- Frames per second
- Compression
- Scaling
- Viewing distance
- 16:9 vs 4:3 vs 3:2 Pulldown

Station Resolutions

- ABC 720p
- CBS 1080i
- NBC 1080i
- Fox 720p
- CW 1080i
- MYNTV 1080i
- PBS 1080i

Cabling Options

- HDMI.org
 - HDMI Specs
 - 1.2 Adds some extra PC support
 - 1.3 Adds Dolby TrueHD audio
 - Scales to 1080p
- [DVI](#)
 - Usually works with a converter and HDMI 1.2
- Component
 - RGB (analog) or Y'PBPR (digital)
 - Scales to 1080p
- VGA
 - Not all HDTVs have this input

Technical References

- ATSC
 - <http://www.atsc.org/>
- PSIP
 - <http://www.psip.org/>

MythTV References

- The Linux HTPC Howto
 - <http://www.linuxis.us/linux/media/howto/linux-htpc/>
- PenLUG
 - <http://www.penlug.org/twiki/bin/view/Main/DigitalTelevision>
- KnoppMyth
 - <http://www.mysettopbox.tv/>
 - <http://www.knoppmythwiki.org/>
- LinuxTV (V4L, DVB)
 - <http://linuxtv.org>