

INTRODUCTION TO DIGITAL AMATEUR TELEVISION DATV - TERRESTRIAL



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TOPICS...

- The Digital Video Broadcasting standard for ATV
- Equipment for TX/RX Digital ATV
- “Homebrewing” an interface for the Amp/TX/RX
- On-line resources and publications

AMATEUR TELEVISION

- FCC rules allow wide bandwidth, analog and digital TV on 70cm (420-450MHz Cable Channels 57-61) and higher frequencies into the microwave bands
- On 70cm 2 to 6 MHz BW channels are used. Second popular band is 23cm (1.2GHz)

WHAT IS DVB-T?



- **D**igital **V**ideo **B**roadcasting – **T**errestrial is a European developed TV system introduced in the UK (1998)
- Uses modern compression techniques (MPEG2/H.264) and efficient modulation schemes (QPSK/QAM) to transmit (stream) Standard and High Definition video

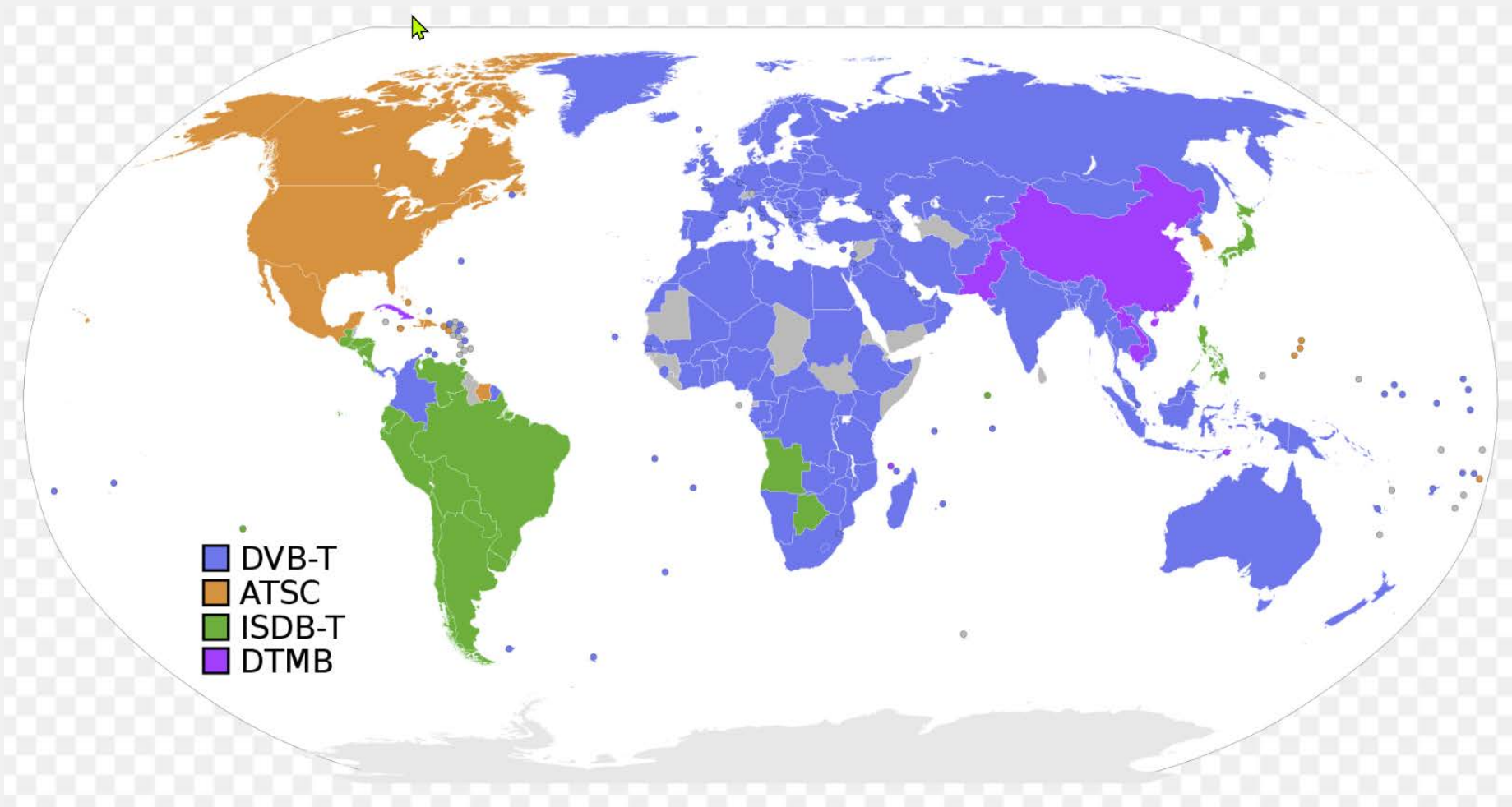
MPEG = Moving Pictures Expert Group

H.264 = Advanced Video Coding / MPEG4

QPSK = Quadrature Phase Shift Keying

QAM = Quadrature Amplitude Modulation

WHERE IS DVB-T USED?



ATSC	Advanced Television Systems Committee
ISDB-T	Integrated Services Digital Broadcasting
DTMB	Digital Terrestrial Multimedia Broadcast

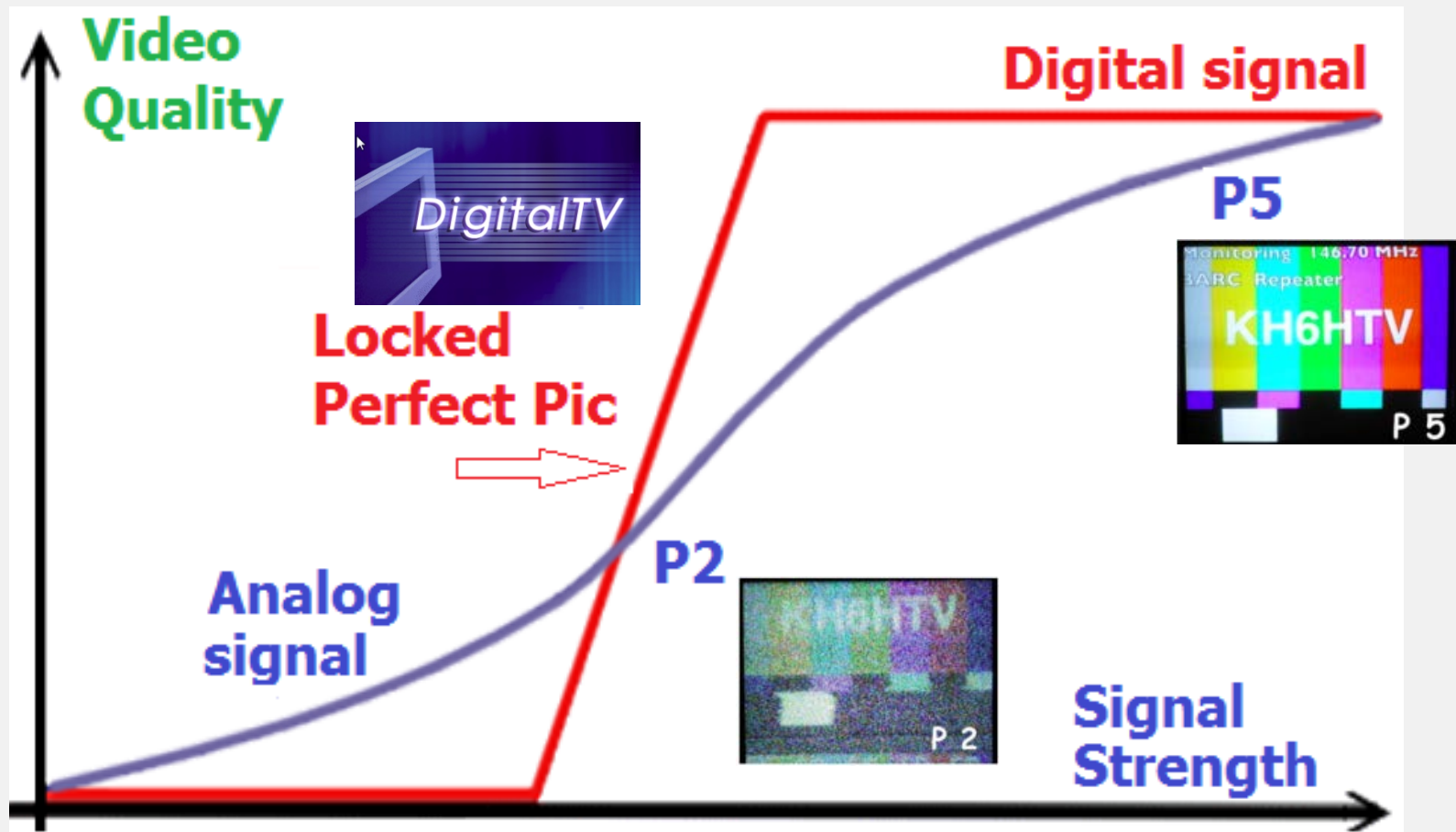
Hamvention'23

Wikipedia 2022

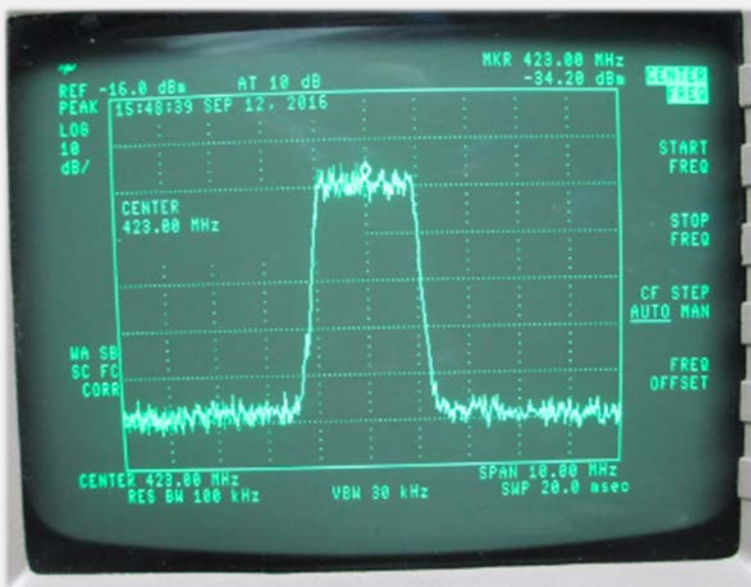
WHY USE DVB-T OVER OUR U.S. ATSC STANDARD?

- Lower modulator/transmitter costs
- Adjustable/Adaptive Transmission parameters
- Excellent multi-path and mobile performance
- Variety of readily available TX/RX equipment

DIGITAL SIGNAL ADVANTAGE OVER ANALOG ATV



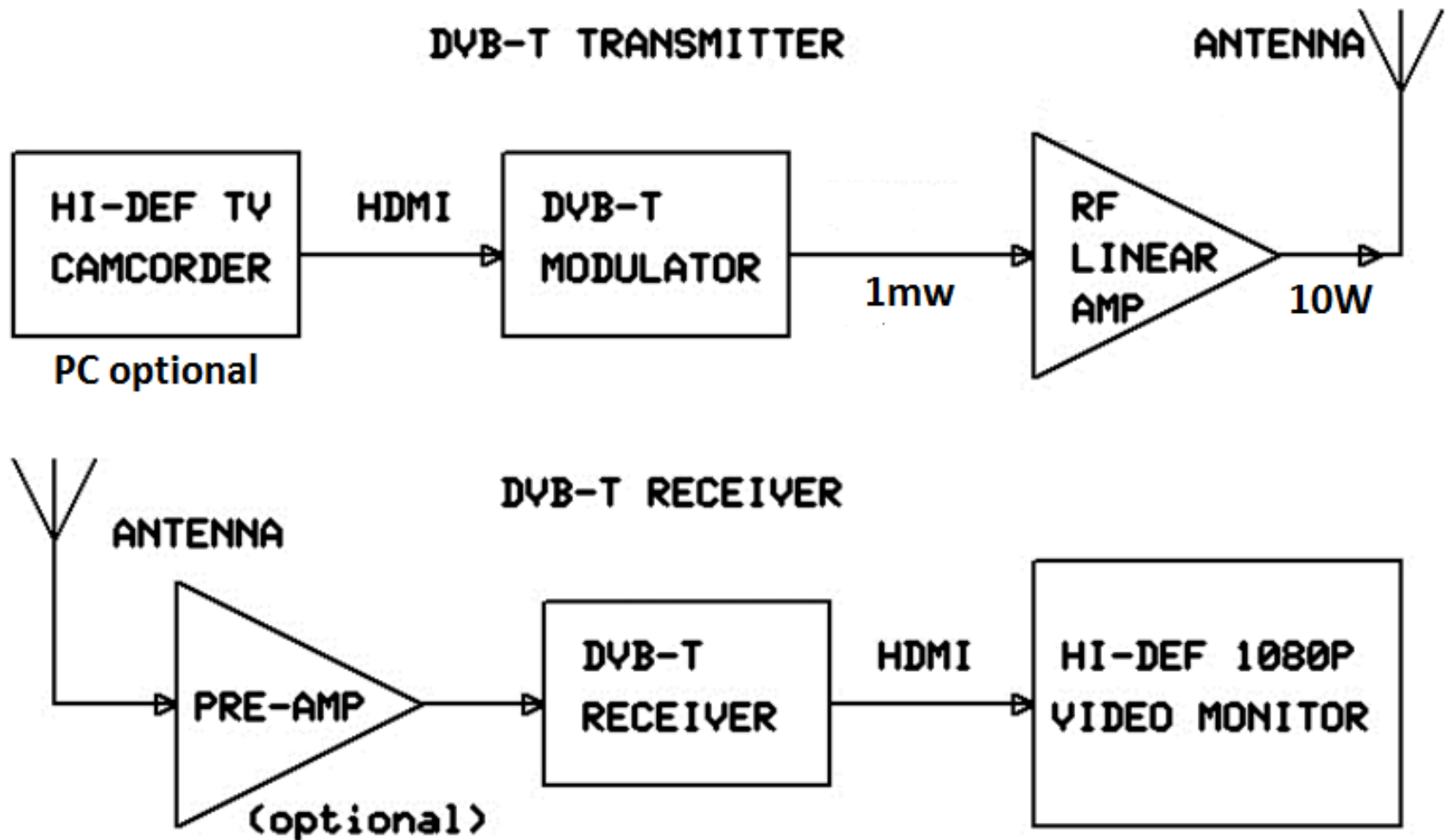
DVB-T'S COFDM MULTI-CARRIER SIGNAL



- Typically 2, 4 or 6 MHz spectrum BW
- Requires linear amplification to avoid intercarrier interference (data errors) and spectrum spreading

“Flat-top” Signal

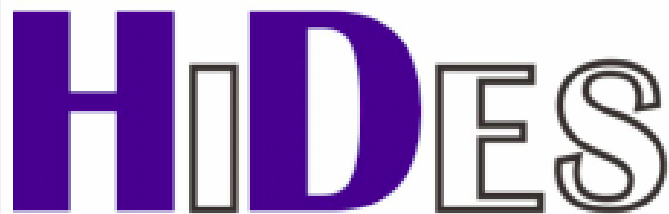
TYPICAL AMATEUR DVB-T STATION



WHAT DO I NEED TO GET STARTED?

- ***HiDes, Inc*** DVB-T Receiver and Transmitter
- Linear Amplifier, power supply, 70cm antenna
- Camera
- PC/laptop

WHO IS HIDES, INC ?



New Taipei City

info@hides.com.tw

+866-2-29172417



- Taiwan manufacturer of digital video equipment for broadcasting, surveillance, signage and HAM RADIO!
- English docs and English speaking technical support staff
- Responsive to ham's requests for changes

WHERE DO I FIND HIDES?

HiDES




Maintained by: [hides168](#) (392 ★)
HiDes has expertise in Full HD broadcasting by DVB-T and ISDB-T/Tb. Our products are for a variety fields which need cost effective and easy to deploy broadcasting systems, such as video broadcasting in a small area, digital signage, and surveillance by wireless or existing cable deployment.

Store search

☐ in titles & description

Store categories
[Store home](#)
[ISDB-T/Tb Modulator Adapter \(4\)](#)
[ISDB-T/Tb FullHD Modulator Box \(9\)](#)
[DVB-T Receiver Adapter \(2\)](#)
[DVB-T Modulator Adapter \(5\)](#)
[DVB-T Full HD Modulator Box \(11\)](#)
[DTV Gap Filler/Repeater \(2\)](#)
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[DVB-T Full HD Receiver Box \(3\)](#)
[Programmable LO Down Converter \(1\)](#)

View: [All Items](#) | [Buy It Now](#)
54 results found in all categories
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Shipping to 63044, USA

 HV-320E DVB-T 100~2500MHz HV-320E FPV Full HD Video Transmitter 100~2500Mhz, HDMI/ CVBS to DVB-T modulator Buy It Now \$369.00 Time left: 1d 8h 30m	 DC-099H-PA-1200 DC-099H-PA-1200 FPV/UAV DTV CAM Module (Barebone+ 1.2G PA+ Antenna, 1200~1350MHz) Buy It Now \$369.00 Time left: 2d 5h 26m	 BU-500 13cm Up Converter for SSB CW FM FM-ATV DVB Buy It Now \$169.00 Time left: 2d 9h 58m
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DVB-T Receiver and Transmitter



HV-110 Receiver
(\$119)



Hamvention'23

HiDES



OSD
Remote

ebay



HV-310E Transmitter
(\$279)



4"W x 1.25"H x 3"D

HIDES SPECIFICATIONS AND FEATURES

- Standard and High Definition video capable (HDMI)
Up to 1920 X 1080P w/16:9 Aspect Ratio
- 2/2.5/3/4/5/6/7/8 MHz variable Spectrum Bandwidth
- COFDM w/QPSK, QAM16 and QAM64 modulation
- 170 to 1350 MHz in TX, to 950 MHz RX in 1 KHz steps
- TX power 1-3mW with programmable gain/attenuator
- Callsign transmitted w/video to satisfy ID requirement

HIDES SPECIFICATIONS AND FEATURES

- MPEG audio quality
- NTSC (720x480i60) Composite Video (CVBS) I/O
- Video recorder (PVR) with micro-SD card memory

NTSC = National Television Standards Committee

CVBS = Color Video Baseband Signal (analog)

PVR = Personal Video Recorder

RECEIVER INSTALLED WITH IR REMOTE

Main Menu



Installation

You can set some default settings by this item, such as region, OSD language, time zone, summer time... etc.

-  **Installation**
-  Channel Manager
-  Time Manager
-  Multimedia
-  Settings
-  Tools



: Select



: Adjust



: Save



: Exit



TRANSMITTER SET UP USING PC SOFTWARE (USB CABLE)

IT9919

ComPort: (COM9) P1 Status: Connected

MediaConfig TransmissionConfig TS Info EIT Info RegisterControl System Info Raw Data Network Config SerialPortConfig Web Authorization Encrypt

Open / Close Auto Detect Get All Config Reboot Reset to Default Set All Config Save Config to file Get Config from file

TransmissionConfiguration

Channel#(0 for manual config): 0 TV Standard: ☒ DVB-T ☐ ISDB-T

Channel Table: User defined Segmentation Mode: Full segment

Bandwidth(MHz): 4 One-Seg Constellation: QPSK

Frequency(KHz): 440000 One-Seg Code Rate: 1/2

Constellation: QPSK 12-Seg Data Rate(Mbps): --

FFT: 2K One-Seg Data Rate(Mbps): --

Code Rate: 5/6 TV Standard Option: ☒ DVB-T ☒ ISDB-T

Guard Interval: 1/16 ChipID: 9517

RF Attenuation/Gain(db): -1 PCR Restamp Mode: Disable

Modulation Data Rate(Mbps): 4.88

TPS Cell ID(hex): 0x 0

Set TransConfig Get TransConfig

Edit User Channel Table

Get

DVB-T Table

Ch #	Freq	BW
00	440000	4
01	426000	4
02	434000	4
03	439000	4
04	441000	4
05	177500	7
06	184500	7
07	191500	7
08	198500	7
09	205500	7
10	212500	7
11	219500	7

Get from file Save to file

SystemInfo Source Info

FW Version Date: 0/0/0 System Config: No config System State: No video input TimeZone: Dateline (UTC-12:00)

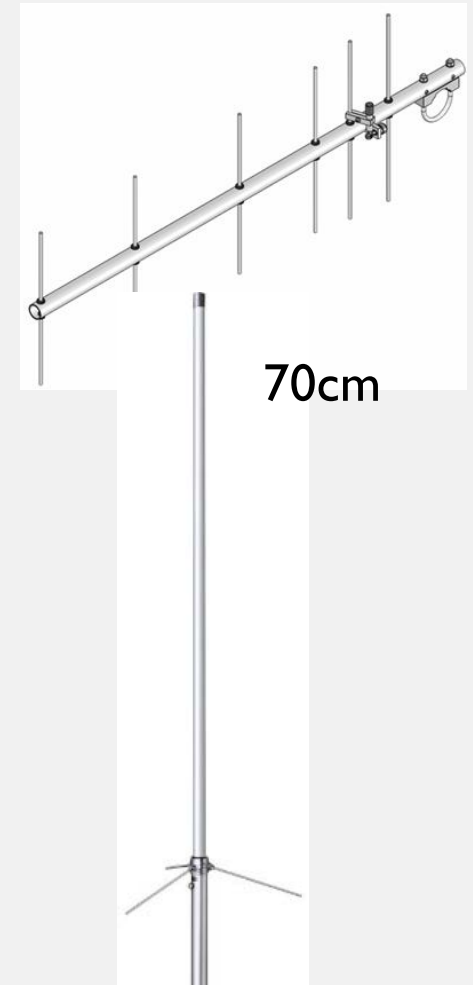
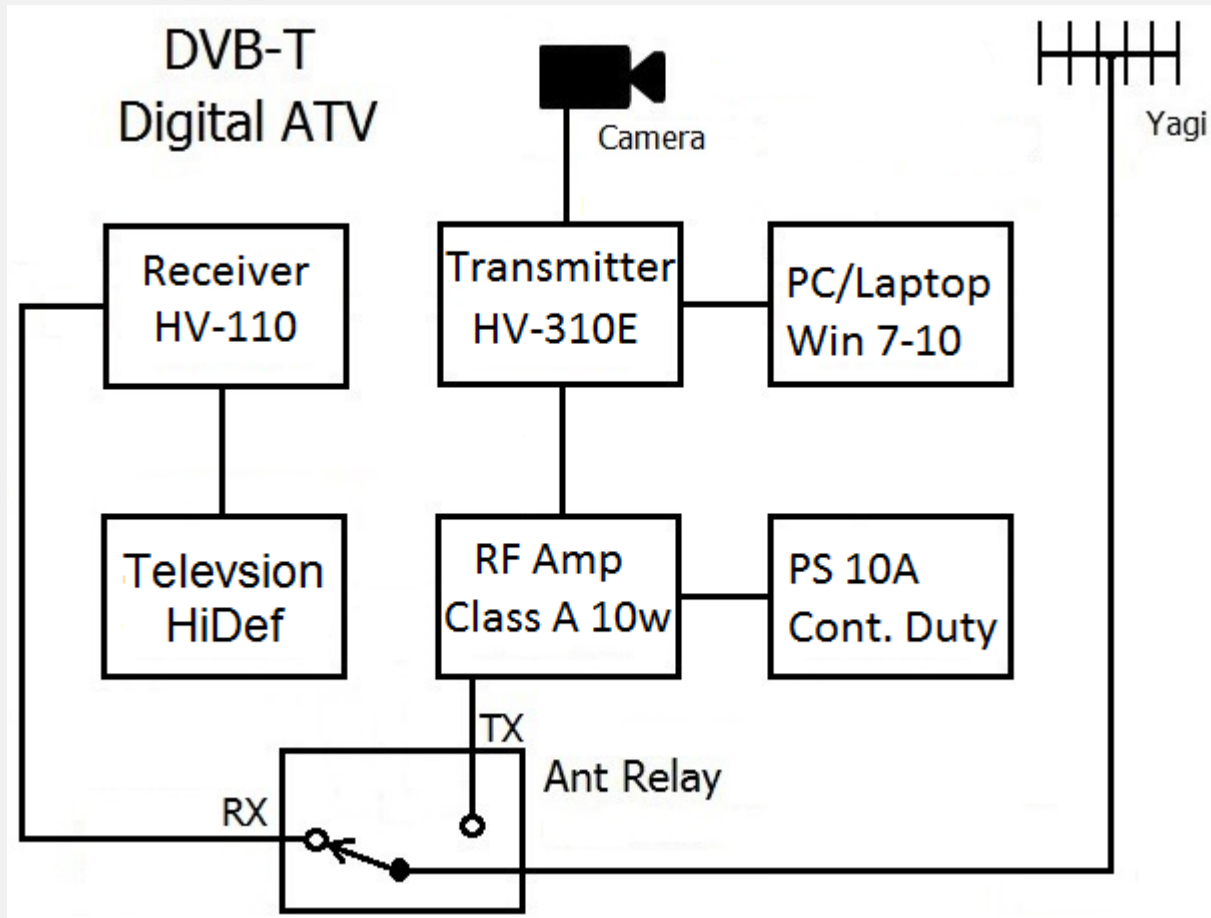
Software Version: 55.14 System Date: 0000/00/00 Board Model Name: IT9919 Daylight Saving: Disable

Device Type: HDMI/Composite System Time: 00:00:00 UART API Version: 1.75 NTP Update Counter: 0

NTP Client NTP Server

Get SystemInfo

TYPICAL ATV STATION



WHY A HARDWARE INTERFACE?

- Convenience - one switch for TX/RX
- Enclosure for an RF Amplifier
- Sequencer for delayed antenna switching w/amp
- 12v DC input power switching for HiDes TX/RX
- Pre-Amp on/off control
- RF Amp Current monitoring

'22 INTERFACE CONTROLLER WITH EXTERNAL AMPLIFIER



“Bud” box
3”x 5”

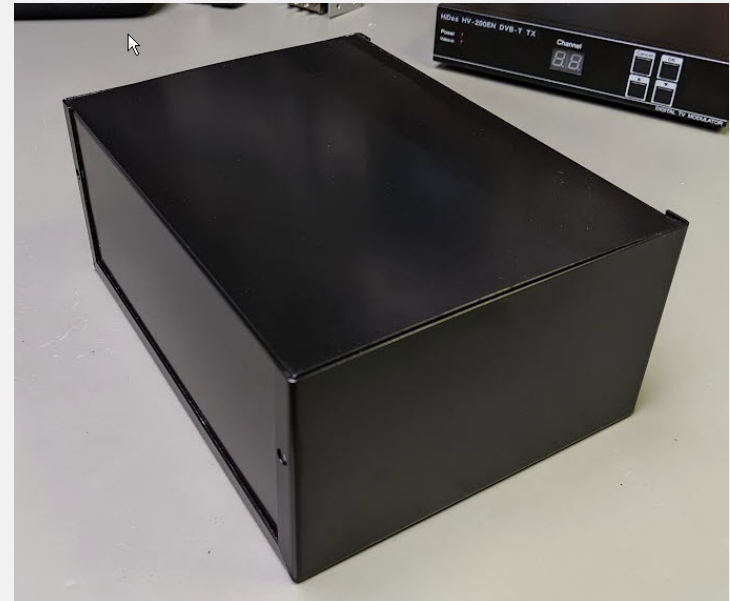


10w Class A Amp

'23 INTERFACE CONTROLLER WITH BUILT-IN AMPLIFIER

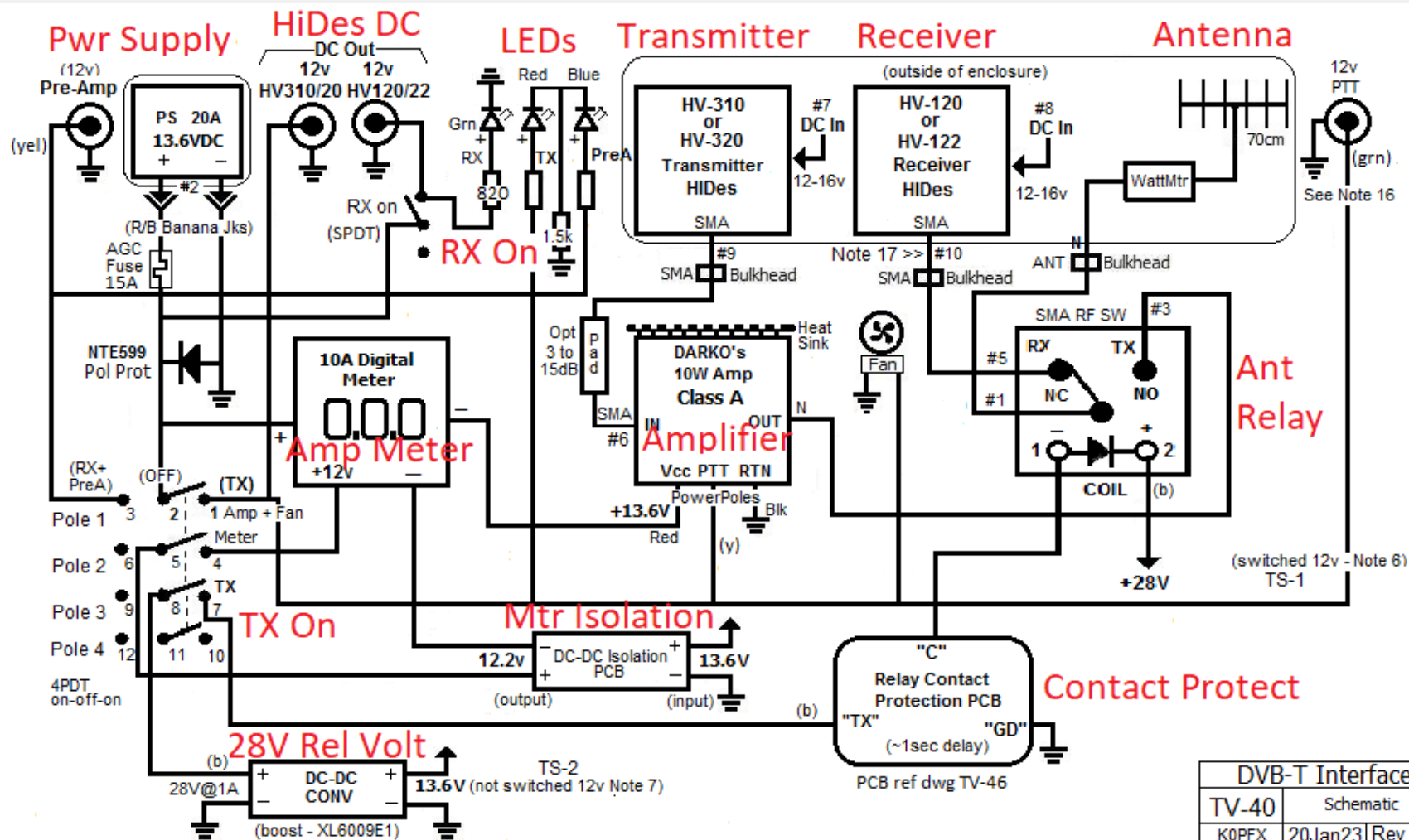


Hamvention'23



“Bud” box
8 x 6 x 3.5”

DATV INTERFACE



DVB-T Interface	
TV-40	Schematic
KOPFX	20Jan23 Rev 14

HOMEBREWING YOUR ATV INTERFACE E-BOOKLET



Jellybean Academy

1/80

hv-110



HiDES

Home Brewing your
ATV Interface

DV3-T

SLATS St. Louis Amateur
Television Society

Mel,
KØPFX



6 PART STEP BY STEP HOMEBREW PROJECT WWW.SLATSATN.NET



Jellybean Academy

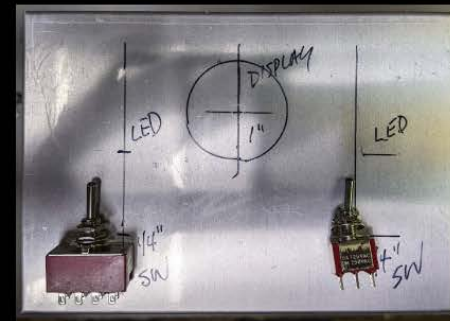
26-27/80

hv-110



Part - 3 *Mechanical, Layout*

Begin with layout of front panel switches/amp meter/LEDs



Mini Toggles – 4 pole is a center-off – Jameco supplier



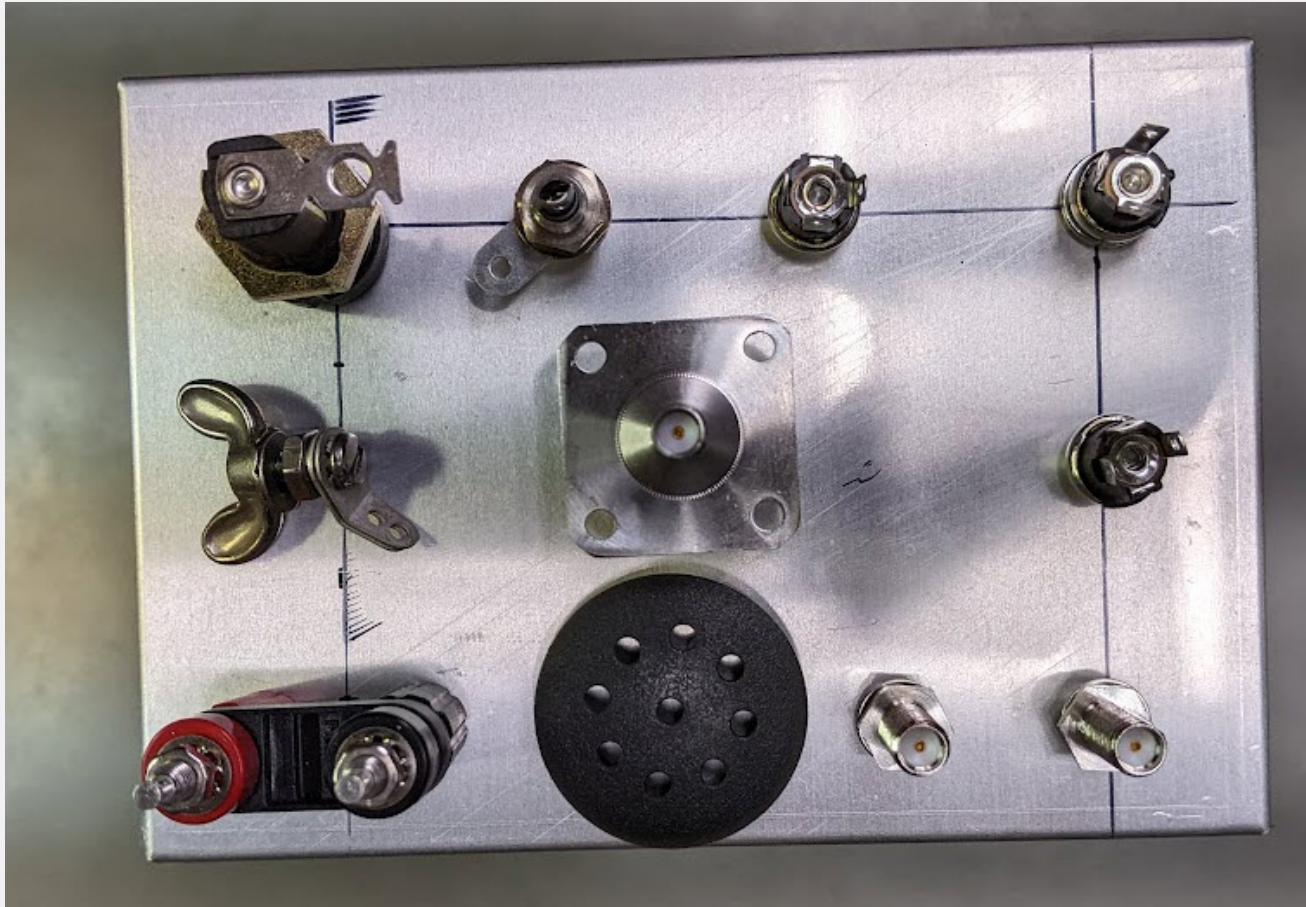
TOOLS



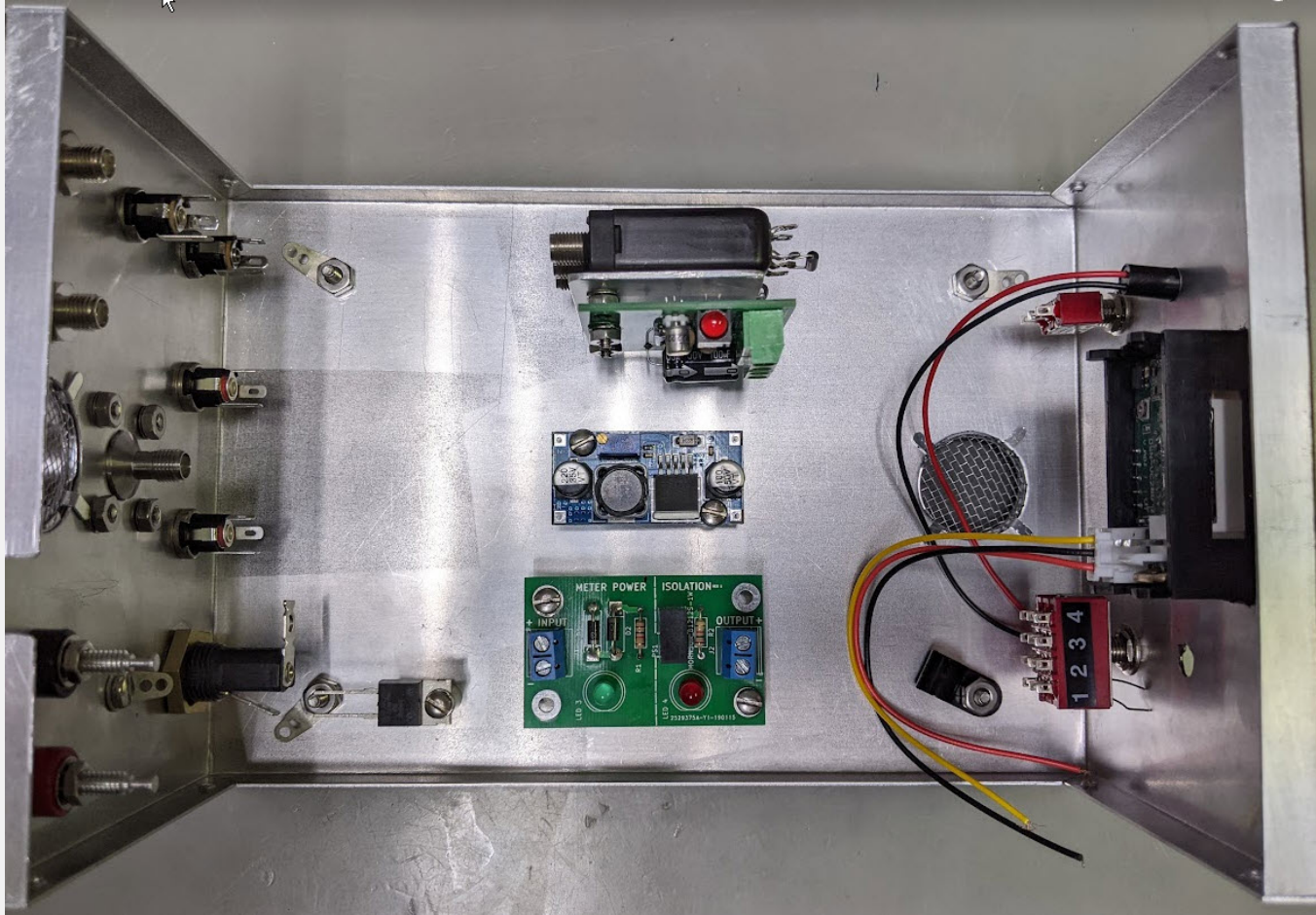
PARTS



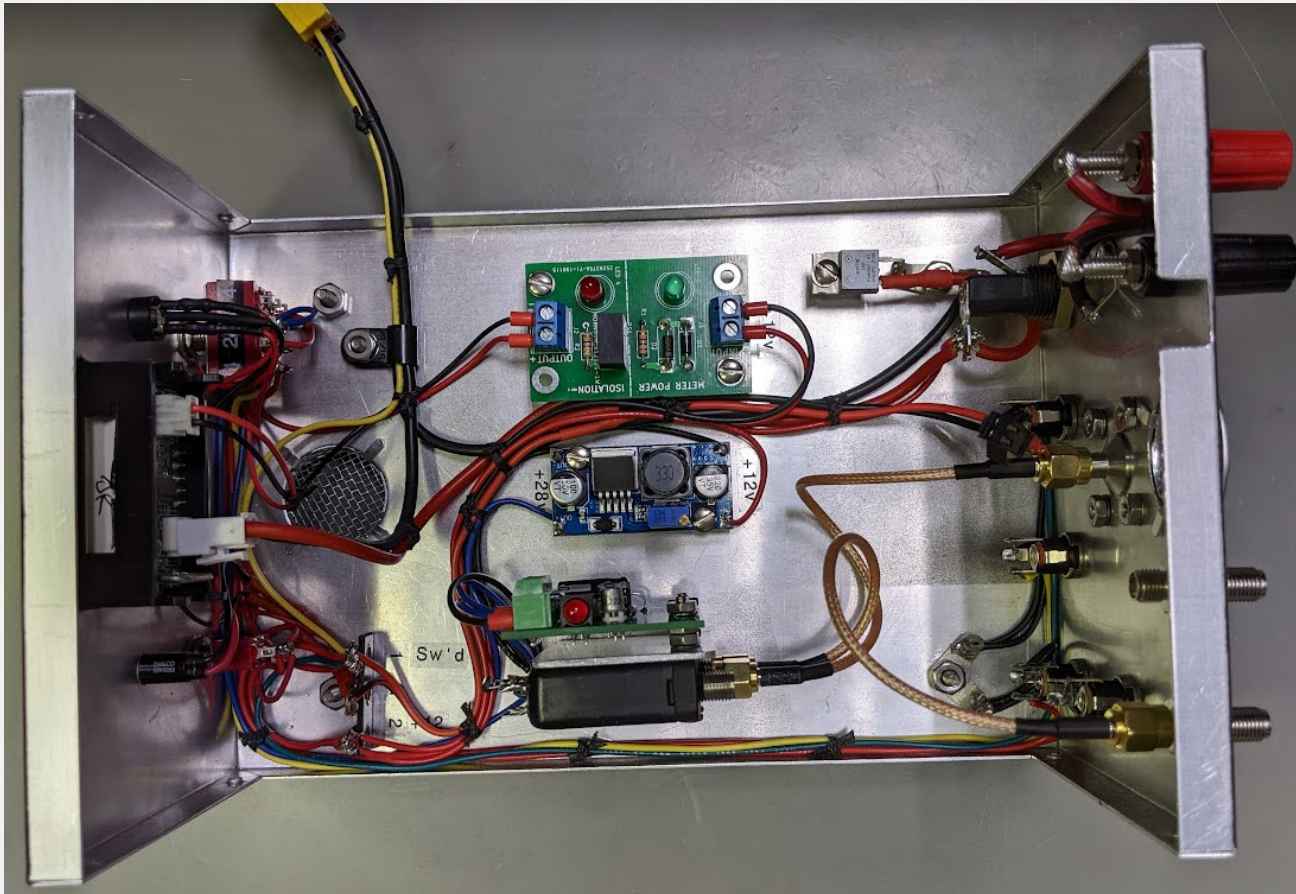
MECHANICAL LAYOUT



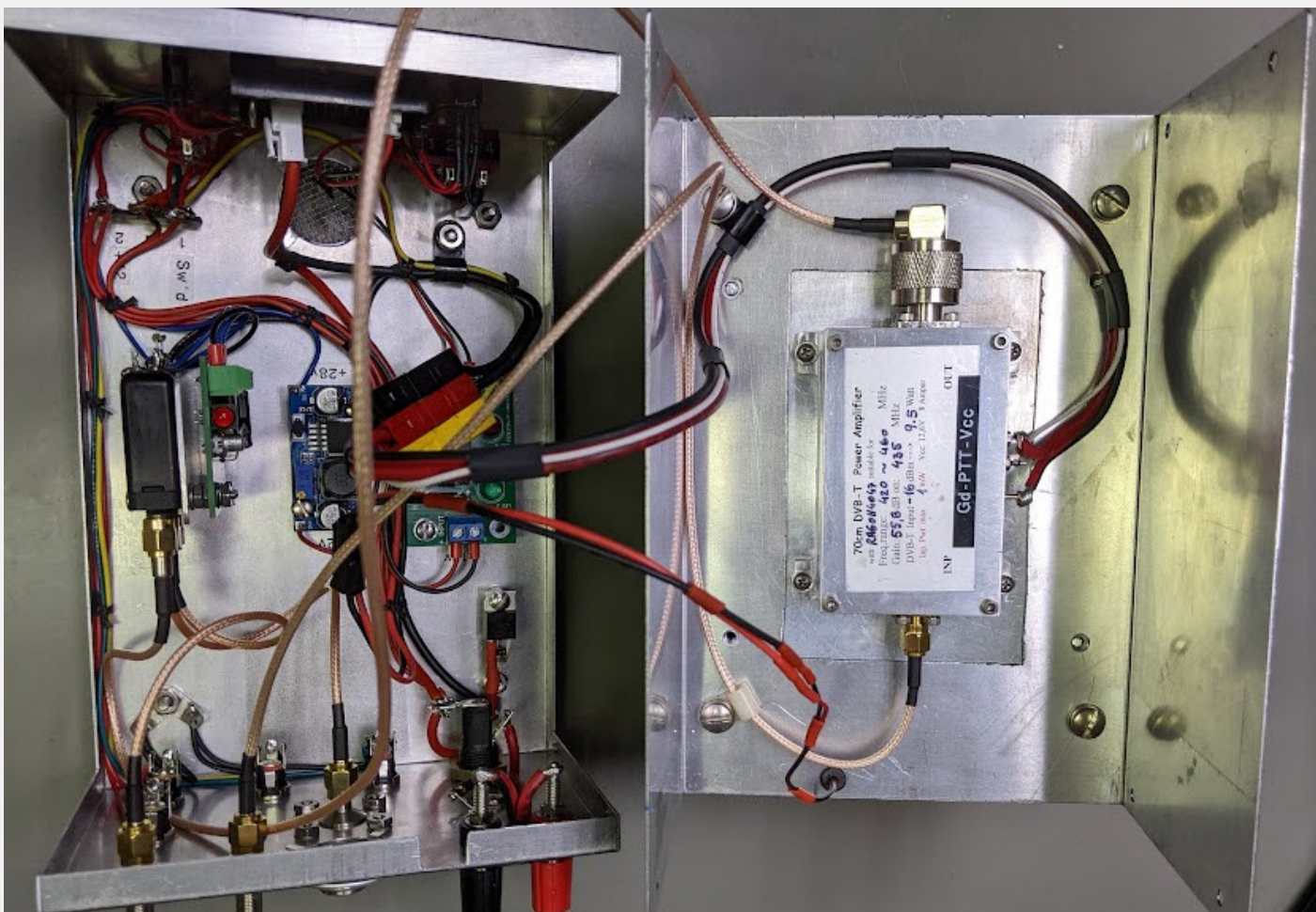
ASSEMBLY



WIRING



AMPLIFIER



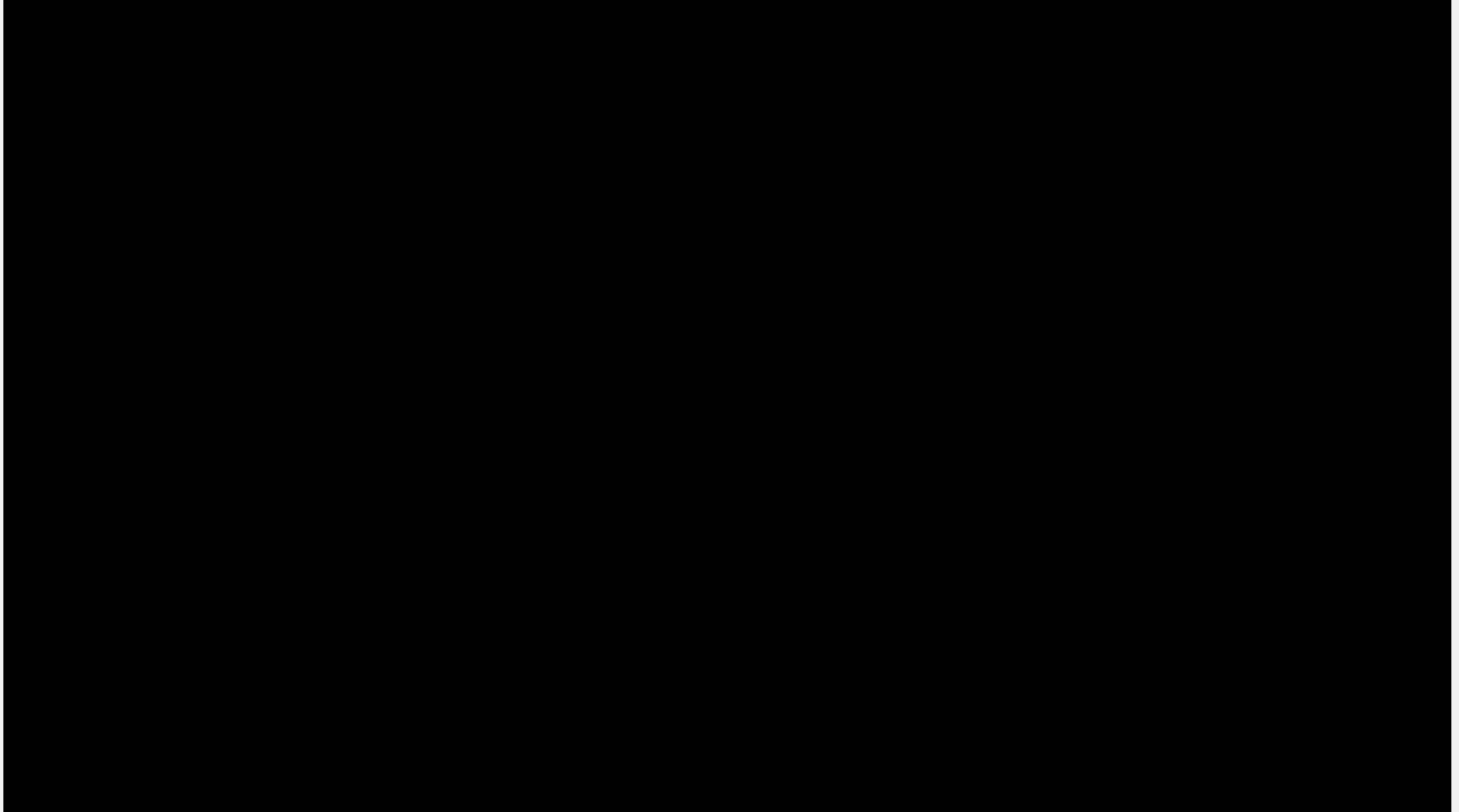
CHECKOUT

- 1 - Using a DMM, verify there is not a dead short between the +PS input and chassis ground. (***both switches Off – RF amp disconnected***)
- 2 - Install a 3AG fast blow 1-2 amp fuse and apply DC power.
- 3 - Both LEDs on the Meter Isolation PCB should be on. Boost PCB on.
- 4 - Turn the RX switch on, verify the green LED is on and 12v is present at the RX power connector. Return it to OFF.
- 5 - Push the TX switch (center off) down and verify the LED is blue and 12v is present at the Pre-Amp connector. Return it to OFF.
- 6 - Push up the TX switch and verify the LED is red on the front panel, the Contact Protection PCB and the Amp meter are on/reading 00.0A.

'23 DVB-T INTERFACE CONTROLLER



A Digital ATV QSO in progress...



SD AND HD CAMERA OPTIONS



USB Logitech 920
Or use your Laptop's
built-in Camera



Camcorder's HDMI connects
to the HiDes TX HDMI

VIDEO/AUDIO HDMI SOURCES



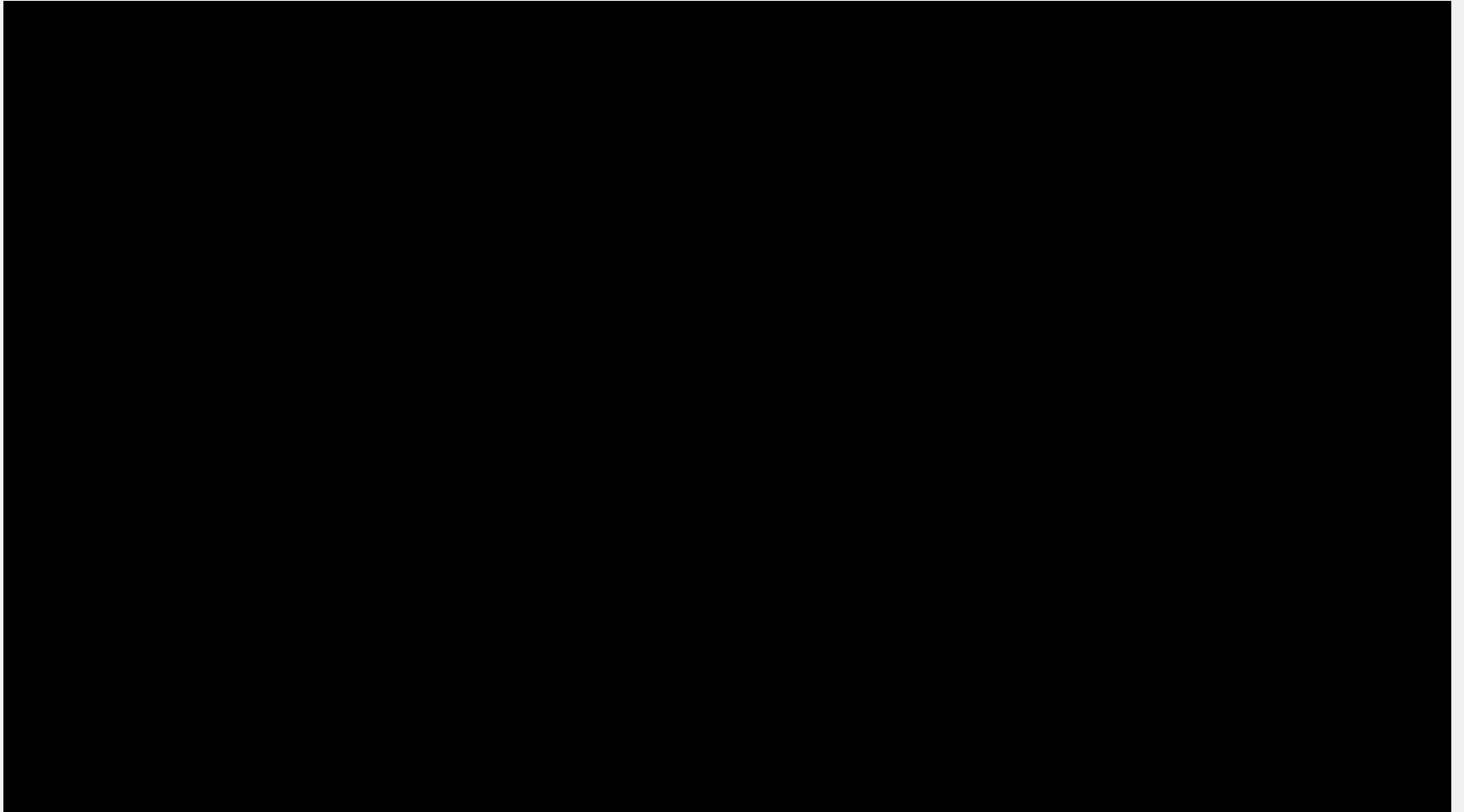
HDMI
Switch



DVR



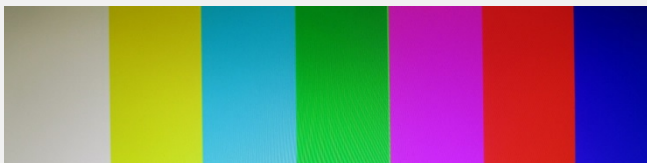
Examples of adding video content...



REALLY SIMPLE DATV STATION USING A HIDES DVB-T USB DONGLE



“DATV...ALWAYS A GOOD PICTURE”



EM -48
440 mhz
Digital Amateur
Television
www.melwhitten.com



WEB RESOURCES

- Jim Andrews Amplifiers and Application Notes
<http://kh6htv.com>
- HiDes, Inc. Transmitters and Receiver
www.hides.com.tw/index_eng.html
- Amateur Television Network (ATN)
www.atn-tv.com
- St Louis Amateur Television Society (SLATS)
<http://slatsatn.net/>

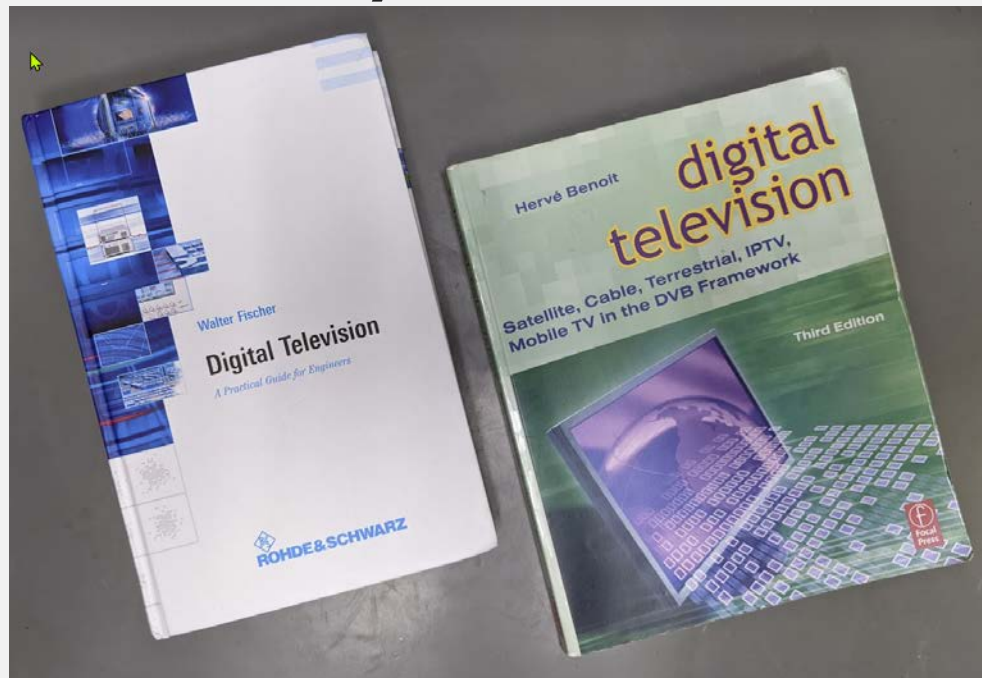


WEB RESOURCES

- digitalATV Group digitalATV@groups.io
- DMR Brandmeister ATV TalkGroup #3196
- British Amateur Television Club www.batc.org.uk
- Q5 Signal RF Amps/PreAmps
<http://www.q5signal.com/>
- OE7DBH Darko Design Class A RF Amps for HiDes TX
<http://dl1mfk.de/Sonstiges/Darko/>

DVB BOOKS FOR HAMS

Digital Television by Walter Fischer (R&S)
digital television by Herve Benoit, 3rd Ed.



TAKEAWAYS

- *Hams are now using digital ATV capable of HiDef video and high quality sound just like my TV at home*
- *DATV-T transmitters and receivers are available on eBay*
- *I may get started receiving with a \$119 RX and my TV set*
- *DATV uses HDMI so a variety of video equipment for both the RX and TX is compatible*
- *Help is available from ATV web sites and email reflectors*

Am I gonna be
on DVB-T ATV?



Thanks and C U on



QUESTIONS?