

Amateur Television Journal

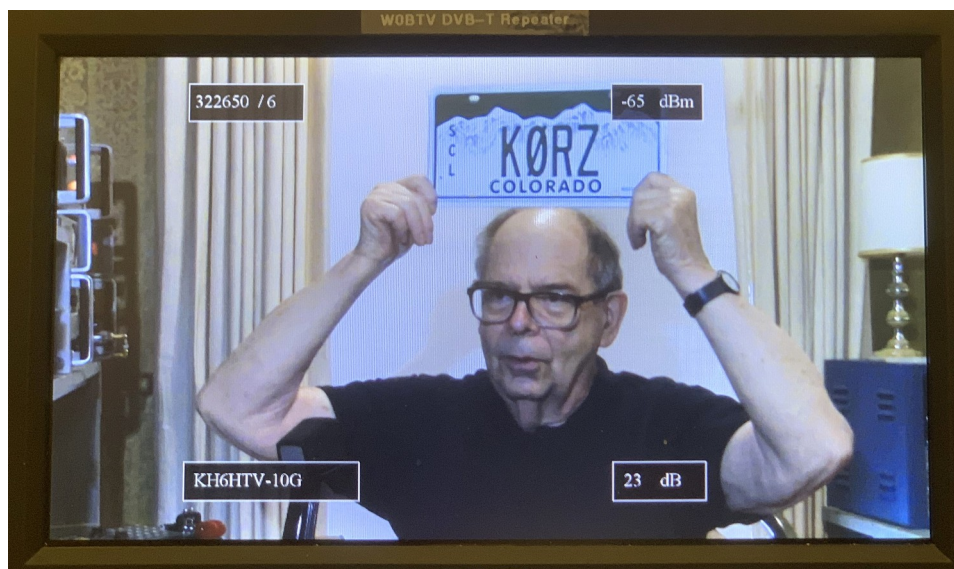
**October, 2024
issue #172**

BATVC web site: www.kh6htv.com

ATN web site: www.atn-tv.com



Jim Andrews, KH6HTV, editor - kh6htv@arri.net www.kh6htv.com



W0BTV-DATV Repeater back on the air

Now on 10 GHz !

As of Monday, Sept. 16th, the Boulder, Colorado ATV repeater gang can now claim to truly be a Microwave group. The above photo documents the first 10 GHz signal to go through our W0BTB repeater. The smiling face belongs to Bill McCaa, K0RZ. He was followed a couple of hours later by Don Nelson, N0YE.



10G antenna with radome removed



Don, N0YE, installing new 10G antenna (on left)



Field of View as seen by new 10 G antenna

W0BTB has been out of service for a couple of weeks under going repair and modification. The DTMF touch-tone decoder/relay board had failed earlier this summer. It was repaired and re-installed. The 441 MHz / 2 MHz BW receiver was de-activated. Its 2 MHz band-pass filter was removed. The receiver was reprogrammed to function as the IF DVB-T receiver for the new 10 GHz receive system. The repeater now has DVB-T receivers for three different bands -- 70 cm, 23 cm & 3 cm. The transmitters operate on two bands. DVB-T on 70 cm and analog FM-TV on 5 cm.

We had experienced issues with the HDMI quad switch, so we took the opportunity to install a newer model. It now is an OREI model HDS-402MV. The previous switch used an RS-232 buss for external computer control. The new one was advertised to also use RS-232. False advertising! When we got it, we found that it instead used a USB port for computer control. Thus our old Arduino and its F/W were not compatible. Bill, AB0MY, volunteered to work it out and write new code for us. He provided a modified Arduino and new control program. The new 402 model includes picture-in-picture (PIP) capability. So Bill added this as an optional feature to be enabled/disabled as desired.

We thought we had given the rebuilt repeater adequate bench testing before hauling it to the repeater site. Unfortunately, we only had 75% success. After installation and then testing by members of the group later in the afternoon, we discovered a serious bug which caused the repeater transmitter to turn off unexpectedly. To clear it required a system Reset. Fortunately, we have a master digital systems reset command included in our remote control codes. Now, Bill and Don have their work cut out for them to scratch their heads to find and kill the nasty Bug. Bill thinks he has found the problem in his code, but the fix will have to wait until he gets an opportunity to visit the repeater site again. On a positive note -- The new 10 GHz Receiver worked flawlessly !

ATSC 3.0 on Ham Bands ?

We recently received an inquiry from Aldo Cugnini, W2AGC. He was asking if any ATV ham groups have done any experimenting with the NEW USA digital broadcast TV system called ATSC 3.0 ? I was only aware of Mario, KD6ILO, and the San Diego group.



Aldo, W2AGC



Mario, KD6ILO

Are there any others out there who have tried out **ATSC 3.0** ? If so, please contact Aldo at acugnini@gmail.com Plus, let us know so we can let our readers know of your work.

Aldo is the president of AGC Systems. He is an active member of the **ATSC 3.0** committee. Aldo has been heavily involved in the development of much of the broadcast technology we are using today. His background includes CBS Labs, Phillips, Advanced Television Tech Center, etc. He holds fourteen patents in the fields of DTV, audio and broadcasting.

Mario's reply to Aldo's inquiry was: "Just to let you know we are not experimenting with **ATSC 1.0** anymore, we are using it as a full time mode of operation since Spring 2020 on 70 cm DATV.

The key advantages to **ATSC 1.0** is that it does transmit on the Amateur Radio Television 70 cm spectrum. All current consumer market TVs receive the signal and do not require a set top box, just a good external antenna. I {we} use THOR Broadcast modulators which transmit two channels on one RF signal as well as IPTV. It has never failed us in any way with zero downtime. Jim's [KH6HTV] rf power amplifiers works well with them.

ATSC 3.0 Yes, we have experimented transmitting with it. But the [1] modulators are costly, [2] you will need a set top box for 3.0 and [3] current HDTV aren't really ready for it nor the public at large nor the Amateur Radio TV community. But we here in San Diego have adapted to move forward. RF modes are very restricted and limited. That's why we moved on to optic communications. Our backhaul transport is now laser optic and user access is on RF/IPTV on 23 cm DVB-S2." --- Mario, KD6ILO

Editor's Note: Mario's optical link which he calls DVB-OC works at 1550-60nm, with CVV. H.266 DVB, UHD at 8K with 80p60.

Has your ATV group done any experimenting with the new ATSC 3.0 ? If so, will you please let both Aldo and your editor know about it and your results. Thanks !

FEED-BACK:

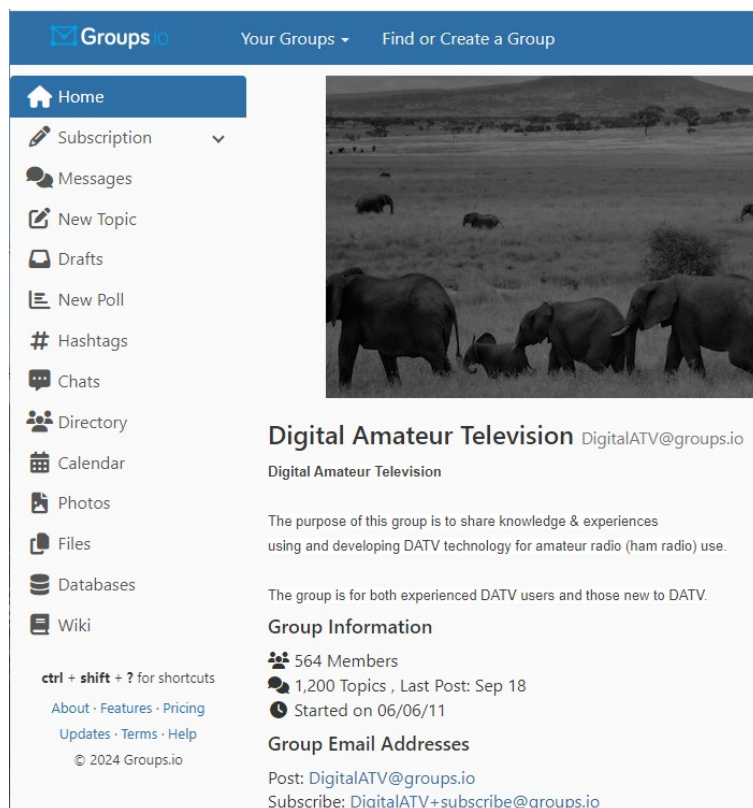
Feedback on Narrow Band DATV for HF:

Editor's Comment: *I obviously kicked over a hornet's nest when I asked the ARRL for a ruling on the bandwidth issue for ATV on HF.*

There are now appearing a whole lot of posts and comments and controversy on the [DigitalATV@groups.io](https://groups.io/g/DigitalATV) web site. There are way too many of them, and some are very lengthy, to be reprinted here. Interested readers are referred instead to go directly to that web side.

As I see it the biggest issue is the FCC used words and verbage, not real numbers in their regulations. It would have been a whole lot clearer and simpler if they were to simply specify the exact allowed bandwidths in numerical kHz. Using only words allows numerous interpretations, such as those on the groups.io web site. Also related is the fact that the FCC regs are out of date and not in tune with the current state-of-the-art in communications technology. They were written many years ago when we were only doing voice comms with either simple AM, SSB, or FM and text comms with either CW Morse code or RTTY.

Jim Andrews, KH6HTV, Boulder, Colorado



More Feedback on 3 cm ATV Frequencies:

Jim --- The METS ATV system (<https://www.qsl.net/kc6ccc/>) has been in operation for nearly three decades on 10.400 GHz without a single known complaint from other users of the band. This was with average station powers of +65dBm EIRP (2 Watts into a 18", 32dB dish). One station ran a TWT amp with 10 Watts into a one meter dish, +78 dBm = 63 kW EIRP.

73, Mike Henkoski, KM7MH, Athol, Idaho

Microwave Experimenters Television System

METS has two microwave ATV repeaters in Southern California. They have been on the air continuously since 1995. The first one was on Santiago Peak. The second is on Heaps Peak. The two sites are linked. The repeaters use analog FM-TV with 11 MHz deviation (i.e. "C" band standard). The input frequency for both repeaters is 10.400 GHz. The outputs are on the 3.4 GHz band. .

3.48 GHz (Santiago) & 3.38 GHz (Heaps). They use 10 dBd slot, omni-directional antennas with horizontal polarization. They use antenna mounted transmitter amplifiers running 5 Watts (Santiago) and 2 Watts (Heaps). They operate as a microwave beacon running continuously 24/7. When there is no incoming signal, they transmit video from a tower mounted camera. www.qsl.net/kc6ccc

Also available on this web site is a link to Mike's YouTube video of his Digital Airborne ATV test to a distance of 12 statute miles using DVB-T 2K modulation - 0 dBd linear polarized dipole on helicopter to a 9dBi linear polarized omni on receive - 437 MHz at 2 Watts average power output



Santiago Peak, California



Missing Boulder ATV Net:

"I missed the last nets! I hope you guys can fix the streaming issues, even though I understand that it is not a priority. "W0BTV ATV Net" is the best net among those I follow as is always full of high-level technical content!" 73 de Claudio, I2NDT

Editor's comment: Tnx Claudio for the compliment. Our issue is not streaming via the BATC. We actually were unable to hold our regular weekly, Thursday afternoon ATV net for the past couple of weeks because our W0BTV repeater was off the air. It has been sitting in my QTH ham shack undergoing repair and upgrade modifications. KH6HTV

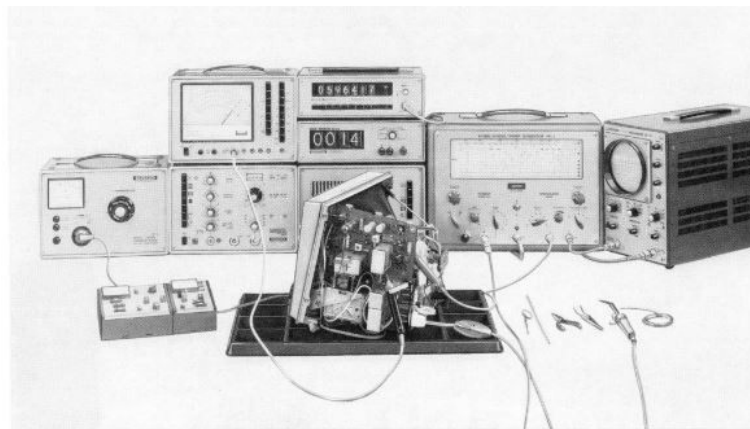
Jammers in the Night-- A Criminal Case

(remembering the good old days of vacuum tube TV repair shops)

Klaus Welter, DH6MAV, Upper Bavaria, Germany

So as not to be misunderstood: Crime occurs in all companies. Here is a crime story from the television technician trade. And it is also a bit of a contemporary document.

To get more orders for the radio and television workshop, what do you need? Defective devices that need to be repaired, of course. Preferably with a clear fault pattern so that the repair is easy. I don't know how the guys came up with the following idea for work procurement. In any case, the technical requirements were as follows:



Ein moderner Fernsehgeräte-Meßplatz

Typical workshop workplace of a master craftsman at the end of the 1960s

We are in the early 70s. Every television workshop received sets that could not be repaired by simply replacing the tubes on the customer's premises. Sometimes there were also known serial faults that could be repaired “in the living room”, such as defective capacitors from the manufacturer WIMA. So there were typically four repair stations in the workshop. The 1970s were still the era when faults were systematically searched for. The soldering iron and a “multimeter” (jokingly called “Zappelmax”) were the most important tools. A circuit diagram with signal diagrams or voltage values was also stuck to the back of the television to make troubleshooting easier.

At the master's place there were a number of measuring devices that were even suitable for recalibrating filters. Of course, there was also an image pattern generator. This will play an important role below.



Grundig SG4 Image Pattern Generator

In Germany, it was around this time that a 24-hour TV-program, was slowly being broadcast. This meant that during the day there was not always a suitable test picture available from the antenna for adjusting the picture geometry. In addition to the antenna signal for repairing tuners, the aforementioned picture pattern generator with integrated RF transmitter was therefore necessary.

Briefly about the roof antenna: its reception level was increased by a booster so that both the four workstations in the workshop and a large number of demonstration devices in the sales room were well supplied.

Both the amplifier and the image pattern generator played an important role in the criminal scenario. They were the protagonists. The generator not only supplied a VBS signal, but - and this was important - it also contained an RF transmitter to which various image patterns were modulated according to approximate standards. The output signal could be fed into the antenna input of any television set if, for example, no test picture was currently being broadcast by the transmitter.

What follows is not a prank, but truly criminal. --- The RF amplifier for distributing the antenna signal to the TV sets was simply turned around, i.e. again for signal amplification, but now in the direction of the roof antenna! The RF output of the picture pattern generator was used as a signal generator. This configuration was in operation for one night. Do I need to tell you more about what the consequences were?

The next morning, the phone rang countless times. Customers were calling in and complaining about picture interference in the evening program - from unsightly moiree to total failure. Logically, only customers within the reception characteristic - now transmission characteristic (radiation pattern) - of the Yagi antenna were calling.

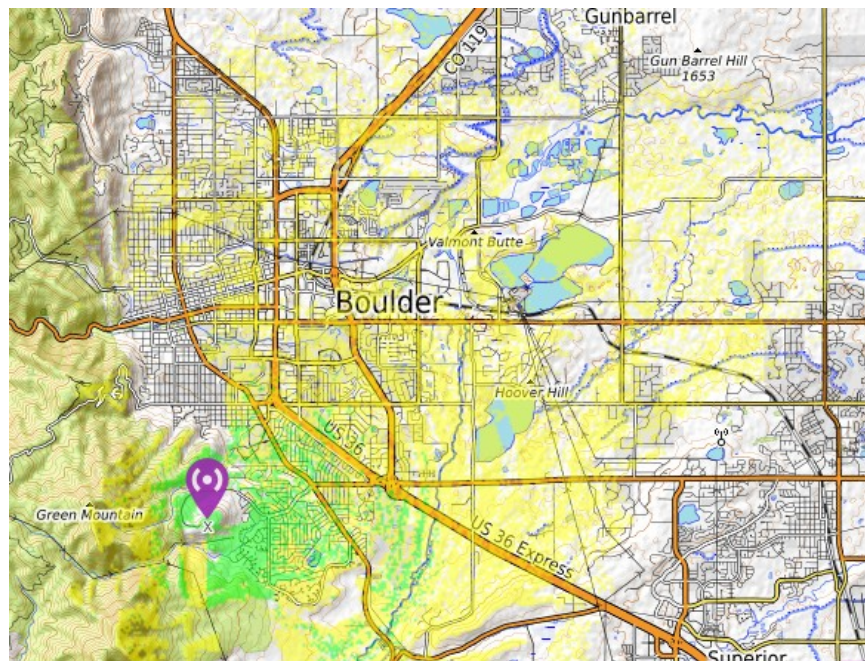
“So, in this difficult case, we can already say that your device needs to go to the workshop.” The conversation could have gone something like this. After all, it would not have been possible to see and repair it on site at the customer's premises. In the meantime, the “configuration” had long since been turned around correctly in the workshop.

73 de Klaus, DH6MAV

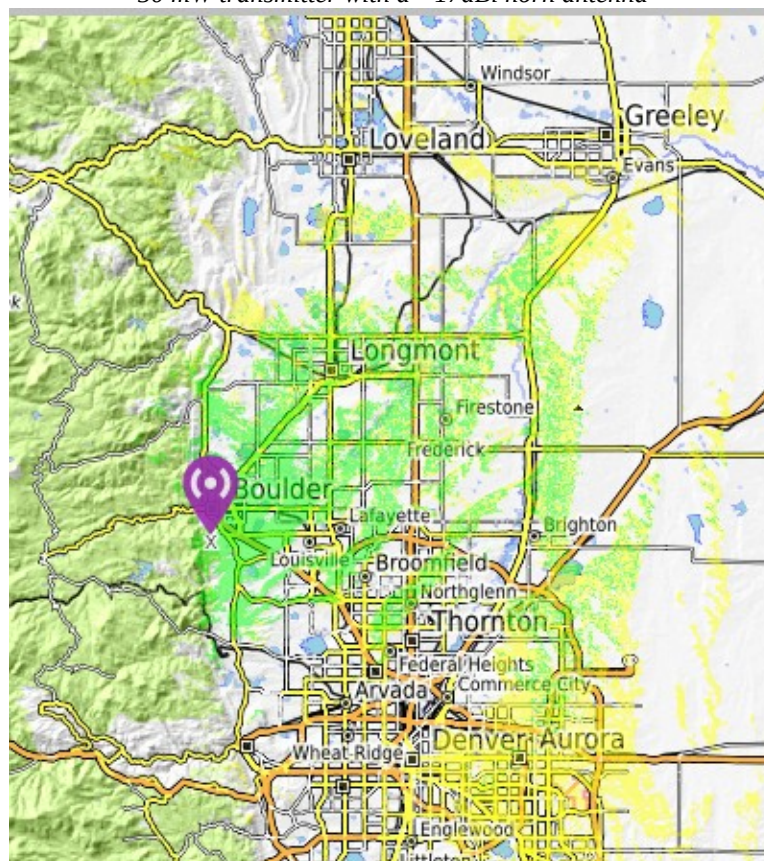
W0BTV Repeater's 3 cm Receive Coverage Area Maps

For the *Radio Mobile* coverage map calculations, the following assumptions were made:

The Alford Slot antenna was modeled as a cardioid pattern antenna with a gain of +10dBi pointing on an azimuth of 90°, due east. (for details on this antenna, see AN-53e. The measured max. gain was +14dBi. The pattern was rather lumpy with a -6 dB beam-width of about 70°) The antenna height was 31 meters with a down-tilt of -1° The receiver sensitivity was -93 dBm. For the first map, the remote transmitter was assumed to have an rf output power of 50 mW (+17 dBm). Frequency = 10,380 MHz. The transmitter was assumed to be connected directly to the back of a horn antenna with +17 dBi gain and mounted on a tripod at a height of 2 meters. No coax line loss assumed. The second map shows the dramatic effect of using a higher power (+23dBm) transmitter with a high gain, 33dBi, dish antenna, but still at 2 meters height on a tripod mount.



50 mW transmitter with a +17dBi horn antenna



200 mW transmitter with a +33dBi dish antenna

W0BTV's 3 cm Receiver predicted coverage areas. Yellow shaded areas are weak signals (-93 to -83 dBm). Green shaded areas are for strong signals (> -83 dBm)

ICOM Rip-Offs Used against Hezbollah:

Japanese radio equipment maker ICOM said Thursday (9/20) that it was looking into reports that two-way radio devices bearing its logo have exploded in Lebanon. Hand-held radios used by armed group Hezbollah detonated on Wednesday (9/19) across Lebanon's south, just one day after similar explosions of the group's pagers. Reuters was able to obtain a model of the handheld radio said to have been used in Wednesday's attack, known as the **IC-V82**. In a video of Reuters' disassembly of the device, "ICOM" branding and "made in Japan" labels are clearly visible. Sales of the device were reportedly discontinued about 10 years ago. ICOM said that the batteries required to operate the device had also been discontinued. ICOM has previously warned about counterfeit versions of its devices circulating in the market, especially discontinued models.

Editor's Note: *Bottom line, if you want a real ICOM radio, only buy from authorized distributors such as Ham Radio Outlet, DX Engineering, etc. We don't want any bombs from China or Israel exploding in our hands or hand shacks !*

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WOBTB Details: **Inputs:** 23 cm Primary (CCARC co-ordinated) + 70 cm & 3 cm secondary all digital using European Broadcast TV standard, DVB-T with standard 6 MHz wide TV channels. Frequencies listed are the center frequency of the TV channel.

23cm = 1243 MHz (primary), 70cm = 441 MHz & 3cm = 10.380 GHz

Outputs: 70 cm Primary (CCARC co-ordinated), Channel 57 -- 423 MHz with 6 MHz BW, DVB-T Also, secondary analog, NTSC, FM-TV output on 5.905 GHz (24/7 microwave beacon).

Operational details in AN-51d Technical details in AN-53d. Available at: <https://kh6htv.com/application-notes/>

WOBTB ATV Net: We hold a social ATV net on Thursday afternoon at 3 pm local Mountain time (22:00 UTC). The net typically runs for 1 to 1 1/2 hours. A DVD ham travelogue is usually played for about one hour before and 1/2 hour after the formal net. ATV nets are streamed live using the British Amateur TV Club's server, via: <https://batc.org.uk/live/> Select *ab0my or n0ye*. We use the Boulder ARES (BCARES) 2 meter FM voice repeater for intercom. 146.760 MHz (-600 kHz, 100 Hz PL tone required to access).

Newsletter Details: This newsletter was started in 2018 and originally published under the title "Boulder Amateur Television Club - TV Repeater's REPEATER" Starting with issue #166, July, 2024, we have changed the title to "Amateur Television Journal." This reflects the fact that it has grown from being simply a local club's newsletter to become the "de-facto" ATV newsletter for the USA and overseas hams. This is a free ATV newsletter distributed electronically via e-mail to ATV hams. The distribution list has now grown to over 800+, both in the USA and overseas. News and articles from other ATV groups are welcomed. Permission is granted to re-distribute it and also to re-print articles, as long as you acknowledge the source. All past issues are archived at: <https://kh6htv.com/newsletter/>

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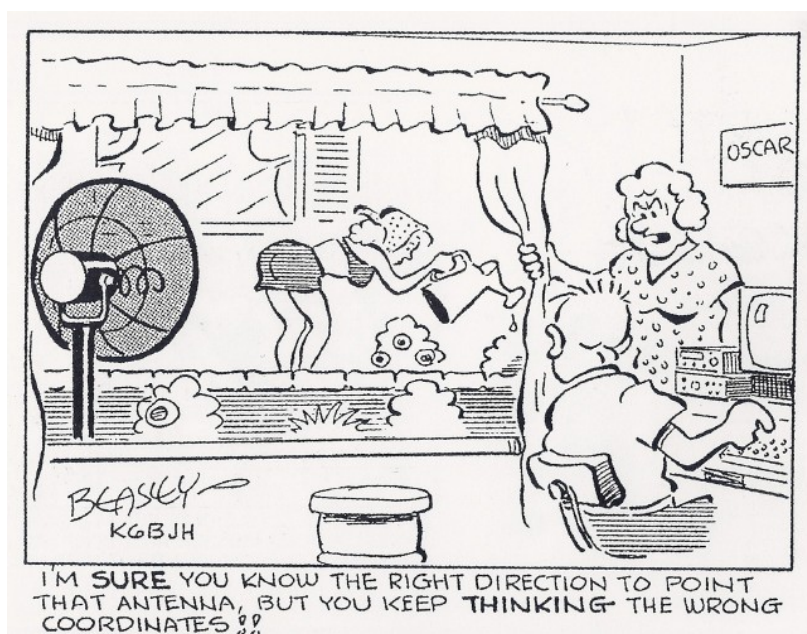
70 cm Band-Pass Filters -- FOR SALE

I used to be an avid ATV nut back in the 80s with analog stuff. Retired now. Formerly worked for 32 years for City of Chicago as radio tech for police & fire. Now living in Dwight, Illinois. I can't find anyone here that wants to play with fast scan ATV. These BPFs are from my ATV repeater when I lived in Chicago. Interested ? -- contact Wayne Strickland, W9BBB, at waynew9bbb@gmail.com

Editor's Note: *These filters were made by Spectrum International. They were the most loved BPFs for ATV back in the 90s. Very rugged and built from brass and copper. The PSF-432 is a three pole, 30 MHz BPF covering the whole 70cm band with very low insertion loss. The PSF-434 was specifically designed for ATV work. It is a five pole filter with a 6 MHz band-width. While Wayne's filter is tuned for 434, it could be retuned a bit to adjacent channels. You can not retune them across the entire 70cm band. To find out a lot more details about these filters, see my application note, AN-22b "Inter-Digital Band-Pass Filters". Available on my web site, www.kh6htv.com*

Top 20 Replies by Programmers when their programs don't work...

20. That's weird...
19. It's never done that before.
18. It worked yesterday.
17. How is that possible?
16. It must be a hardware problem.
15. What did you type in wrong to get it to crash?
14. There has to be something funky in your data.
13. I haven't touched that module in weeks!
12. You must have the wrong version.
11. It's just some unlucky coincidence.
10. I can't test everything!
9. THIS can't be the source of THAT.
8. It works, but it hasn't been tested.
7. Somebody must have changed my code.
6. Did you check for a virus on your system?
5. Even though it doesn't work, how does it feel?
4. You can't use that version on your system.
3. Why do you want to do it that way?
2. Where were you when the program blew up?
1. It works on my machine.



Must be a BATVC member trying out his new 10 GHz rig