BOULDER TV Repeater's REPEATER

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Jim Andrews, KH6HTV, editor - kh6htv@arrl.net

REPEATER STATUS: Don, N0YE, reports that the Boulder ATV repeater is presently working fine. Don, N0YE, has now started streaming the TV repeater's weekly ATV nets over the BATC server under his own call sign. Details about the repeater are available on our web site: www.kh6htv.com AN-43 gives all the technical details. If you have any questions about the current operations or status of the repeater, contact the asst. trustee, Don, N0YE.

2019-002-20, 01:19 Z, 20m, Scottie 2

2019-02-20, 01:22Z, 20m, Scottie 2

2019-02-20, 01:48Z, 20m, Scottie 2

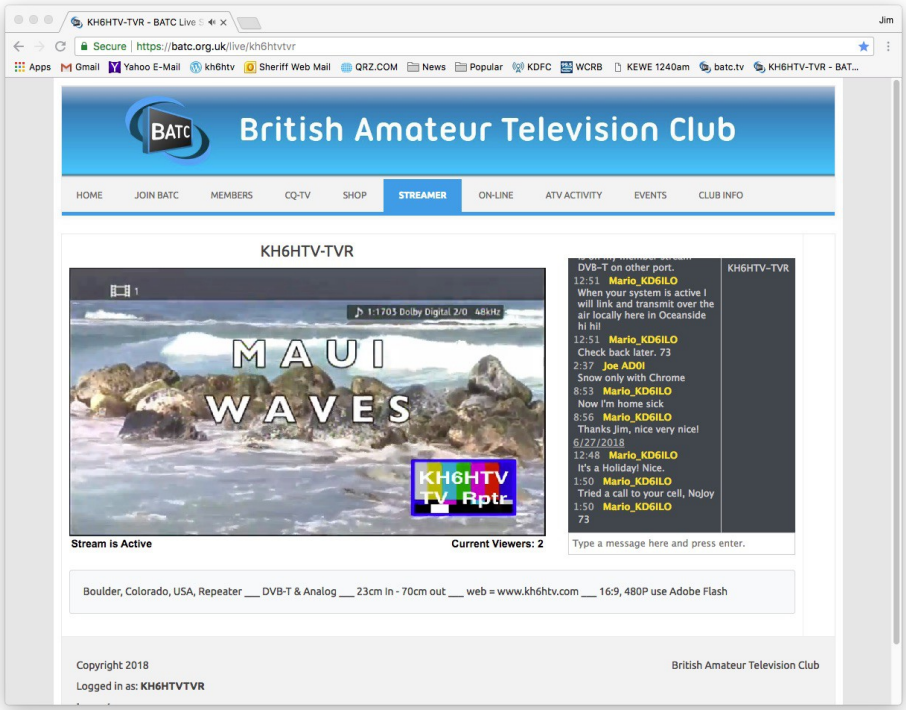
2019-02-20, 20:09Z, 20M, Scottie 2

SSTV from the PACIFIC: Sometimes it pays to transmit even if you think the HF bands are dead. There might at least be SWL (short wave listeners) or SWVers (short wave viewers) out there. On Tuesday, Feb 19th (20th UTC) between 3 & 4 pm local Hawaiian time, I transmitted the above pictures on SSTV on 20 meters (14.230MHz). I had been monitoring the band on my new Icom IC-7300 with it's great spectrum analyzer display. With the exception of FT-8 signals at 14.074, I saw nothing. No USB, CW, RTTY, PSK, nothing ! I said "What the Heck !" I will try anyway. So during that time, I fired off several SSTV images into the unknown ether hoping they might land in someone else's receiver. I pumped 30 watts of rf into my fan dipole at 23ft. Sure enough, later that evening, I received an e-mail from Rex, KG7YZY, in Riverside, Washington, confirming he received my pictures. He attached to his e-mail the images he received. He gave me a signal report of 4x3. These are about the highest quality SSTV images I have ever seen. I would rate them at P4. Rex also has a modest HF station with a Yaesu FT-450 rig and a G5RV antenna.

VHF/UHF PROPAGATION: At the January meeting of the Maui ham club, I gave a talk on this subject. I used Power-Point slides. I first discussed the issue of line of sight propagation, then the free space rf path loss equation. I then introduced the basic rf transmission equation of :

Rcvr Power (dBm) = Trans Power (dBm) - Trans cable loss (dB)
+ Trans Antenna Gain (dBi)
- RF Path Loss (dB)
+ Rcvr Antenna Gain (dBi) - Rcvr cable loss (dB).

I then gave some typical examples. I next introduced the powerful, free, on-line, rf path/map calculator, ***Radio Mobile*** (www.ve2dbe.com) by Roger Coude, VE2DBE. I also gave our own Roger, K0IHX, credit for his pioneering work at the Boulder Labs in helping with the radio research and writing the first computer program. I then showed how to use ***Radio Mobile*** and showed some examples of point to point rf path predictions and also generating repeater coverage maps. I used the Maui, 2 meter, 146.76 repeater as an example. If anyone is interested, I would be willing to e-mail to you a .pdf copy of the slides I used.



NOTES on STREAMING TV REPEATER VIDEO via BATC

Jim Andrews, KH6HTV

In June of 2018, I worked out the ability to receive the Boulder TV repeaters' signal and stream it over the internet to the general public. The above computer monitor screen capture shows the result.

The key hardware/software items required included: (1) A DVB-T receiver with composite video and line level audio output. (2) A composite video (+audio) to USB converter. (plus driver software) (3) A PC windows computer (4) computer program ***vMix*** and (5) A connection to the internet.

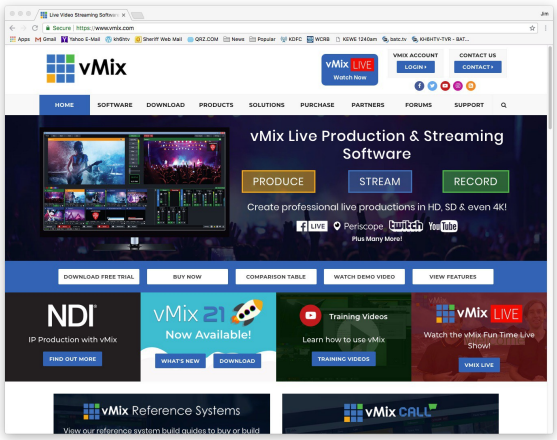
RECEIVER: The receiver used for the DVB-T signal from the TV repeater was what is referred to by the local, Boulder, Colorado hams as the "Combo" receiver. Most Boulder

ATV hams are using this receiver. We call it the "combo" because it is capable of receiving both UHF, DVB-T, and L-band, DVB-S. The receiver is very low cost and has been imported from China. It was intended for the consumer electronics market in Europe, etc. It was previously sold by KH6HTV VIDEO as the model 70-14. Recently the firmware has been changed by the manufacturer in China. In the newest units shipped it can no longer be programmed to amateur, 70cm band frequencies. It thus is no longer available for ham TV use. I chose it for use because it always puts out a valid TV signal (both HDMI and also composite video) even when it is not receiving a signal. When there is no signal, it displays an image of a TV tower and the text "No Signal". When these receivers are no longer available, I would suggest that the Hi-Des model HV-110 be used. It will however give a totally black screen when there is no input signal, unless the on-screen-display is activated.

VIDEO/USB CONVERTER: The USB dongle used to input standard. definition (480i) composite video (plus stereo audio) into the computer via USB was a StarTech.com model SVID2USB23, recommended by Don Nelson, N0YE. It is available for purchase on-line direct from the manufacturer. It sells for $54. Driver software for this converter must be down loaded from the StarTech.com web site and installed in the PC computer to be used. The composite video and stereo audio signals from the DVB-T receiver are connected directly to the RCA jacks on this converter.

PC COMPUTER: The computer used was an HP laptop running Windows 10. Nothing special, most any decent PC running windows should work OK.

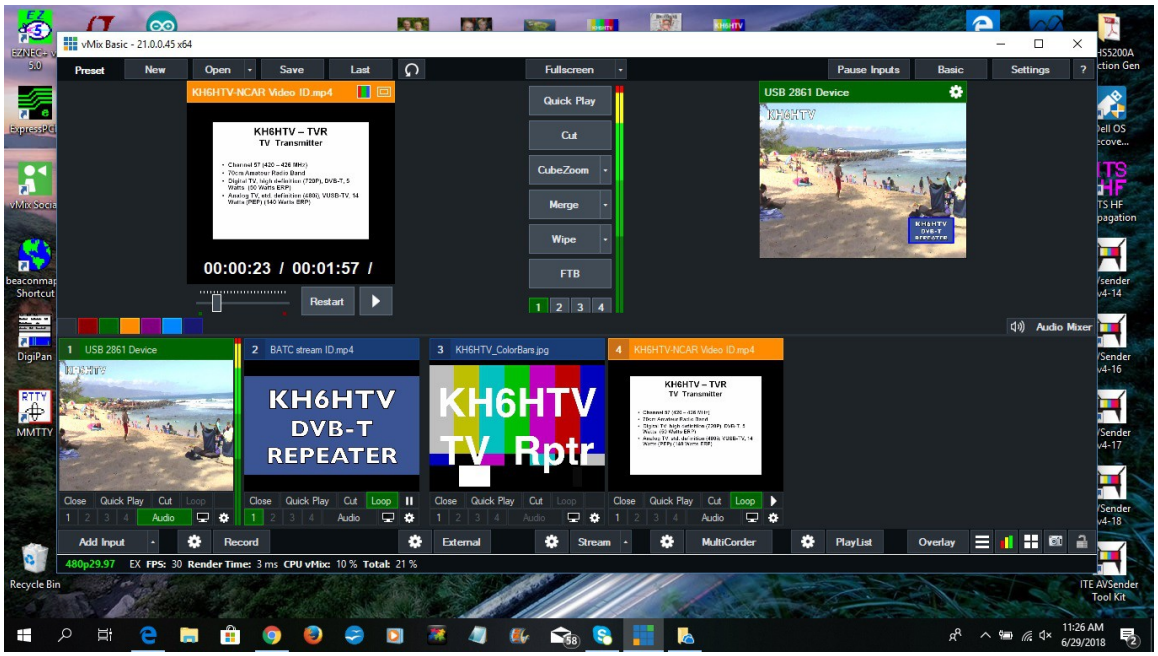
SOFTWARE: The program ***vMix*** was used to control the input video source and stream it out over the internet. A free version is available from www.vmix.com The program is an extremely powerful program for mixing various video (& audio) sources, plus adding various graphical effects. The resultant video and audio can then be output over HDMI, or recorded to a file, or streamed over the internet. Depending upon the version purchased it supports standard definition



(480i), Hi-Definition (1080P) or ultrahigh definition (4K). The prices range from $60 to $1200. A Basic version is also available **Free** at no charge. The Basic version supports up to four (4) A/V inputs with max resolution of 768 x 576. While the basic version is intended for use a demo program, there is no time limitation on how long it can be used. What I am using is the free, Basic version. To use ***vMix***, it must first be activated with a registration key. This is obtained by registering your name, e-mail, etc. first with vMix. They then email to you the 18 character registration key.

I would suggest that you first do some experimenting with ***vMix*** using various video sources, such as the external USB dongle video input, the built-in web camera, a stored .mp4 video movie file, a .jpg photo image, etc. Try out all the various, available (*not all available in the Basic version*) features. I found it helpful to just work my way through the 263 page ***vMix*** User's Guide book. It is available in .pdf format from vMix's web site.

The screen shot shown below is the typical ***vMix*** screen. The four images on the lower row are the four selected video sources. The source on the left was the external video source of the combo receiver feeding live video to the USB converter. The next source was a continuously running .mp4 file with repeater ID information. The third source was a simple .jpg file with color bars and the repeater call sign. The fourth source was another, more extensive, .mp4 file with a 2 minute slide show of the repeater's photos and information. The image in the upper right corner is the actual image going out of the program currently. The image in the upper left corner is the next video source selected to be moved into the output position.



To select the external USB dongle video source -- first click on the arrow on the "Add Input" button found in the lower left corner on the task bar. This source does not appear in the available choices on the list. Select "More". This brings up the Master Settings menu and the sub-menu, "Video". Next select "Camera". On the next sub-menu, first line, click on the down arrow for a list of available devices. The composite/USB dongle is listed as "USB 2861 Device". Select it. Then make sure the Audio Device is also selected as "Line (USB2861 Device)". Then click "OK". The video from the DVB-T receiver should now appear in one of the pre-view boxes on the lower 1/3 of the ***vMix*** screen.

Access to most of the Settings is via the "settings" button on the upper right hand corner of the task bar. Other individualized "settings" are accessed via the Gear symbols found next to a particular item. I recommend that you do NOT change the vast majority of these settings, but leave them in the factory pre-set condition.

I used the Picture-In-Picture (PIP) feature to super-impose some additional info to help the internet streaming viewer know that he is watching the Boulder TV repeater's stream. I wrote a simple movie file of a few very simple slides to give some brief info about the repeater, to be used in the PIP box. Each slide lasted 4 seconds. It was saved as an .mp4 file on the PC. The size and position of the PIP is controllable. This is accessed by clicking on the "Overlay" button in the lower right hand corner on the task bar. The values I opted to use were: Zoom = 0.2, Pan X = 0.65 and Pay Y = -0.65. I also added a Blue border with Thickness = 25 and Radius = 5.

BATC STREAMING SERVER: To stream the Boulder TV repeater's signal over the internet, I chose to use the open server provided by the British Amateur Television Club (BATC) in the U.K. Steaming on the server is a free service, available to all BATC members. The streaming from it is open and available to the general public

at no charge and with no log-in procedures. Plus, their streaming is directly viewable with most browsers and does not require proprietary software. The BATC web site is: www.batc.org.uk

The first step is to join the BATC. Annual dues are 8 £ (about $10). The next step is to contact the BATC administrator and request that he set you up for a streaming account. Note: if you are wanting to stream a repeater's video, he will then also set up a separate repeater streaming account with you as the administrator. The man I worked with at BATC was Dave, G8GKQ. Dave then sent me to a separate web site, not directly accessible from their public site. This page gives full details about using their video streaming service and how to set it up. After Dave sets up your account (or 2 accounts if you are also doing a repeater stream), you need to go into your account(s) and enter some more data and make a few choices on streaming. Here below are a few extra instructions Dave sent me via e-mail.

I sent Dave the question --- "Does BATC have recommendations on the resolution settings of the video stream sent to your server? For example: can I use H.264, at 29.97 frames/sec and 720x480 ?? Or should it be at lower resolution, etc. ??"

Dave's Reply was --- "The streaming server will package up exactly what you send to it, and send it back out. I use H264 25 fps 720x576 at 576 Kb/sec for all my streams, but H264 29.97 fps 720x480 will work perfectly. It will have black bars either side as the window is 16:9, so you could send it 480x853 or 720x1280 if you have a 16:9 feed. You can adjust the bit rate depending on your target audience and your uplink bandwidth."

There was an issue with the name for our Boulder repeater. In the U.K. repeaters have a unique call sign. Here in Boulder, our repeater uses my own personal call sign. I explained to Dave that the FCC discontinued many years ago issuing separate call signs for repeaters. Thus Dave had to setup a unique name on their system for our repeater.

Once you have the assigned server password (key) from Dave, log in and, from the Members tab (where you should be straight after login), select account dashboard. Scroll down and under streaming details you will see the "Stream RTMP Input URL". The 6 lower case characters there are the stream key. This key is private to you and prevents anyone else hijacking your stream. It should be kept confidential.

You should also tick the "Stream Listed" box so that your stream shows up on the list of available streams. I would also suggest you tick "Chat On" and "Guest Chat Log In" to allow stream viewers to send text comments about your video stream.

Streaming Type: choices are either FLASH or HTML-5
This is a controversial selection. BATC's default is to use FLASH. It directly impacts the user's ability to view the stream. BATC's wiki page discusses the differences. The older HTML5 works with any browser, but introduces a very serious 15-20 second latency (i.e. delay). The newer Adobe FLASH has less latency (but still significant), but it does not automatically play on every browser. To be viewed, the user must install

Adobe Flash player on his computer and then enable his browser to use FLASH. Not every computer/browser allows Flash. I first tried to use FLASH, but found too many issues with it, so the Boulder ATV stream is now using the older HTML-5.

Stream Description: We can type anything we want in this box. It will appear on the steaming web page below the streaming video.

Don't forget to click the "Save Changes" button after making (or changing) settings.
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vMix STREAMER SETTINGS:

After you have your account(s) set up at BATC and you have the streamer name and key, etc. You now need to make some final settings in the ***vMix*** program.

Step 1: First click on the Gear symbol beside the STREAM button on the lower task bar. Enter the following data:
Profile = Default
Destination = Custom RTMP Server
URL = rtmp://rtmp.batc.org.uk/live/
Stream Name or Key = call sign + (secret 6 character key)
Quality = h264 480p 1mbps AAC 96kbps
Application = FFMPEG
Then click on the "SAVE and CLOSE" button

Step 2: Next open the General Settings Menu. i.e. click on the "SETTINGS" button in the upper right corner on the task bar. Next click on "EXTERNAL OUTPUT". In this sub-menu table: select ***vMix*** Video/Streaming do NOT select Use Streaming Settings, External Renderer nor Use Display Settings

For Frame Rate - set both boxes to NTS 29.97p
For Output Size - set the left box to 854 x 480 & set the right box to 720 x 480
(note: per Dave at BATC, 854x480 should give the proper 16:9 display ratio)
For Audio Delay -- do not change, leave at 0
Then click "OK" button to save these settings.
When these changes are made, ***vMix*** needs to be restarted.

Step 3: Click on the "STREAM" button on the lower task bar. Once your computer has established a link to BATC, this button will change colors to red. At this point, your computer should now start streaming your repeater video and audio to BATC. To check that it is working, fire up another computer and go to: https://batc.org.uk/live/ Click on your call sign. You should now see a web page which looks like the screen capture photo shown on page 1. If so, **CONGRATULATIONS -- You are Streaming ! ! !**

World-Wide, Remote, HF Receivers

Jim Andrews, KH6HTV

At the January, Maui Ham Club meeting, there was a new member present. He was Rob Robinett, AI6VN. Rob told the club about his interest in setting up remote HF receivers that can be accessed over the internet.

Rob lives in Berkeley, California, but also has purchased a plot of ground for a future home on Maui. His Maui site is in a remote part of the island at Kahahuloa on the side of the west Maui mountains at an elevation of 1,200 ft. with an excellent view over the ocean towards N. America. It is a very quiet radio area.


Rob's major interest is in establishing remote HF receiving sites. He has been working with other Bay area, California hams to develop antennas and receivers for the old HF marine coastal station, KPH, site at Point Reyes national seashore, north of San Francisco. KPH operated from 1906 until 1998. It had HF receivers at Point Reyes and transmitters, 20 miles south at Bolinas. For more details on KPH, see Wikipedia https://en.wikipedia.org/wiki/KPH_(radio_station)

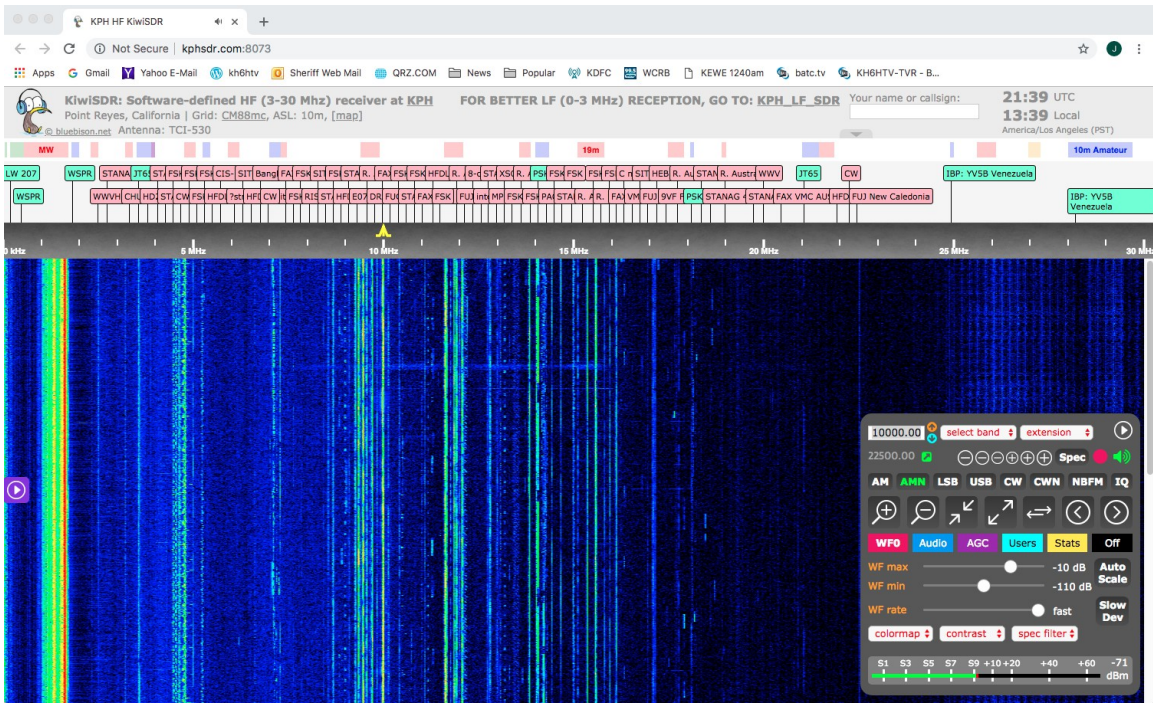
Rob and friends have installed a 200 meter Marconi T antenna at KPH and some SDR radios. Rob has installed on his Maui property an 80 thru 10 meter, OCF dipole, a loop antenna and a 20 meter dipole and some SDR radios. See photo. He eventually hopes to install a beverage antenna on his Maui property. For internet he set up a really long

distance Umbiquti, microwave link from his property to a tall office building in downtown Wailuku.

The SDR radios are being used to monitor amateur WSPR transmissions, but also as internet accessible, general coverage receivers. The radios they are using are KiwiSDRs. http://kiwisdr.com/ See the photo above.

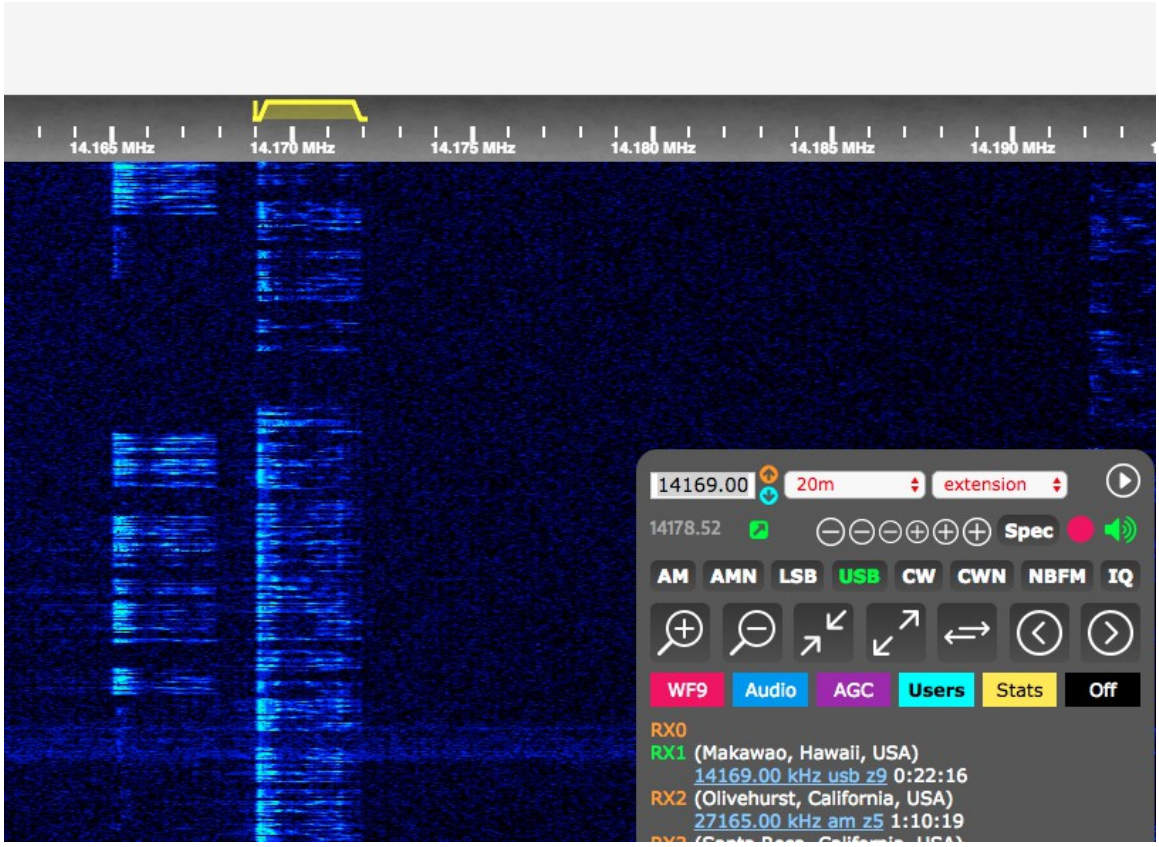
Rob told the club "There are 8 independent receive channels available at http://kiwisdr.robinett.us:8073 which are available for public use, so please feel free to use and publicize that site. " He also said, feel free to access the KPH radios at: http://kphsdr.com:8073/ There is also a web site which lists 363 similar radios world-wide. It is: https://sdr.hu/ The KPH and AI6VN sites are included at sdr.hu

I have tried out Rob's Maui receiver, and also KPH, via the internet and have found it to be an extremely valuable tool for my HF operations. I am handicapped at my own Maui QTH with intermittent high levels of background RFI on 40 & 20 meters. I found it to be really an eye-opening experience to simultaneously tune Rob's remote KiwiSDR radio to the same frequency I was listening to at home. His radio was hearing a whole lot of stuff that I could not hear ! ! !



KiwiSDR: Software Defined Receiver at KPH, Point Reyes, CA

The receivers are extremely easy to use. Simply go to the listed web site and immediately, the above screen appears and audio starts coming from my computer's loud speaker. At KPH, it seems the receiver is preset to scan up to 30MHz and is receiving WWV at 10 MHz. The control panel in the lower right is easy to navigate. For a help menu, click on the arrow at the extreme left of the screen.



This screen image shows I have tuned the KiwiSDR to 20 meters, USB and am listening to a ham chatting on 14,169MHz.

I encourage other hams to try out these various remote HF receivers. I think you will have a lot of fun doing so. You can try listening to your own signal. You can also listen to many other signals on HF, include airplanes over the oceans, ships at sea, international broadcasts, military comms, etc.

Future Newsletters: If you have contributions for future newsletters, please send them to me. Jim Andrews, KH6HTV, email = kh6htv@arrl.net