



# CHEESE BITS

W3CCX  
CLUB MEMORIAL CALL

ARRL  
Affiliated  
Club



Volume LX

April 2019

Number 4

## PREZ SEZ:

Well the ARRL June contest is right around the corner and I know many Packrats are busy getting all the rigs and antennas ready for the field. Thanks to Phil, K3TUF and Gary, WA2OMY, the lower 4 bands will all be running SS high power amplifiers this year. Also new this year are Omni antennas for these bands. Keep the June Contest dates open. Try to come up for the whole contest weekend if possible, or just come up for a few hours to operate. At least one Packrat is looking for a hotel roommate for the weekend. Check the Packrat reflector for info on this. If you cannot make it to the site itself, please get on the air and give the club some points. We're LOUD and easy to find! Also remember Assistance is permitted in this and all ARRL contests. The dates are June 7-10<sup>th</sup>. Friday, the 7<sup>th</sup> is setup and Monday, the 10<sup>th</sup> is take down. We can always use extra help those two days. Lots of hands make the job go quickly and easily. This is one of the BIG Packrat efforts of the year – **don't miss it**. Several clubs have cut back or even ended their efforts in June. With your help the Packrats will not be one of them.

But there are lots of activities before June!

The April General meeting will be Awards night and presentations by ARRL staff Tom Abernethy, W3TOM, Bob Famiglio, K3RF and George Miller, W3GWM. These gentleman will also be at the Meet the Speaker dinner starting at 6 pm at Giuseppe's on Street Road, just in front of the Ben Wilson Senior Center. Be sure to come out and welcome them.

April is also Sprint Month: 144 MHz on April 8, 222 MHz on April 16, and 432 MHz on April 24. ( Note – these are week night dates). These are not ARRL sponsored contests but are short (4 hours long) and can be lots of fun. See the internet for times and rules. <https://sites.google.com/site/springvhfupsprints/home/2019-information>. For more information Lenny has a link on page 20 of this month's Cheese Bits. The contest's purpose is to encourage weak signal VHF/UHF amateur radio operation & to have fun.

Then there's the VHF Super Conference April 25 – 28, in Sterling, VA. just outside Washington DC. There are over 195 registered already. This **is** the one you want to go to. Early Bird registration ends Sunday April 7<sup>th</sup>. There's still time to register and go! Consider bringing your "significant other" to this event as there will be two bus tours and other things to do in the area. The Udvar-Hazy Center of the National Air & Space Museum is less than a mile away.

May has multiple activities. May 4<sup>th</sup> and 11<sup>th</sup> (Saturdays) more Sprints on the Microwaves and on 50 MHz

Next, the Hamfest & EPA section Convention is at the Warminster Amateur Radio Club on May 5<sup>th</sup> at the Lower Bucks Campus of the Bucks County Community College. See [k3dn.org](http://k3dn.org) web site for more info. This one is usually fun and larger than many others in the area.

Our May general meeting will feature several virtual Ham Shack presentations.

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**PACKRAT 222 MHz REPEATER - W3CCX/R**

222.98/224.58 MHz (PL 136.5) Hilltown, PA

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**PACKRAT BEACONS - W3CCX/B**

FM29jw Philadelphia, PA  
50.080 144.300 222.062 432.290 903.072 1296.264 **2304.043**  
3456.200 **5760.195** 10,368.034 MHz (as of 1/17, red = off the air)

**MONDAY / TUESDAY NIGHT NETS**

**VHF/UHF Monday:**

<u>TIME</u>	<u>FREQUENCY</u>	<u>NET CONTROL</u>
7:00 PM	224.58R MHz	WR3P FN20kb Ralph
7:30 PM	50.145 MHz	N3RG FM29ki Ray
8:00 PM	144.150 MHz	K3GNC FN20ja Jerome
8:30 PM	222.125 MHz	KB1JEY FN20je Michael
9:00 PM	432.110 MHz	WB2RVX FM29mt Mike

**Microwave Tuesday:**

7:30 Coordinate QSO's on 144.260 for all Microwave bands you'd like to work. Also setup Q's at [w4dex.com/uhfqso](http://w4dex.com/uhfqso) or **Packrat Chat Page W3SZ.COM**  
Visit the Mt Airy VHF Radio Club at: [www.packratvhf.com](http://www.packratvhf.com) or [www.w3ccx.com](http://www.w3ccx.com)

Finally in May, there's the Dayton Hamvention on the 17, 18 and 19<sup>th</sup> at the new location in the Greene County Fair Grounds. This will be the third year for this location and many of the 1<sup>st</sup> year "bugs" have been worked out. I always find Dayton interesting and usually bring home more than I should. Just ask my wife.



Given the time of year, the geographic location and the fact that it's 3 days long, it just may rain! Or it just might be sunny and hot! So bring a wide range of clothing. But it's pretty hard not to have a good time if you try. If you've never been, I suggest you go. It's still one of the biggest in North America.

This time of year is antenna and tower season - before the heat sets in. I know I need to replace several feed lines and put up some loopers. Did you have some winter storm damage? Rotor acting up or stop working? Let your needs be known to the rest of the club. Schedule an antenna party! It's amazing how hard your fellow Packrats will work for a hoagie and a beer afterwards.

The last full weekend of June is the ARRL Field Day weekend and several Packrats informally known as Team VHF will be on 6 and 2 meters as part of the WARC group. More info on when and where to find us is coming soon. Also look for a reminder on the Packrats Reflector that weekend.

Don't forget those projects on your workbench. Spend some time, have some fun, learn more and build something

**73, George KA3WXV**

# March Meeting Pictures



For Homebrew Night, Jim brought in his fully packaged 222 MHz rig, which includes the no-name Ukrainian transverter, available on "that auction site".



Lee recycled the case from an old NTSC Bar / Dot generator to house his homemade I.F and Keyline selector.



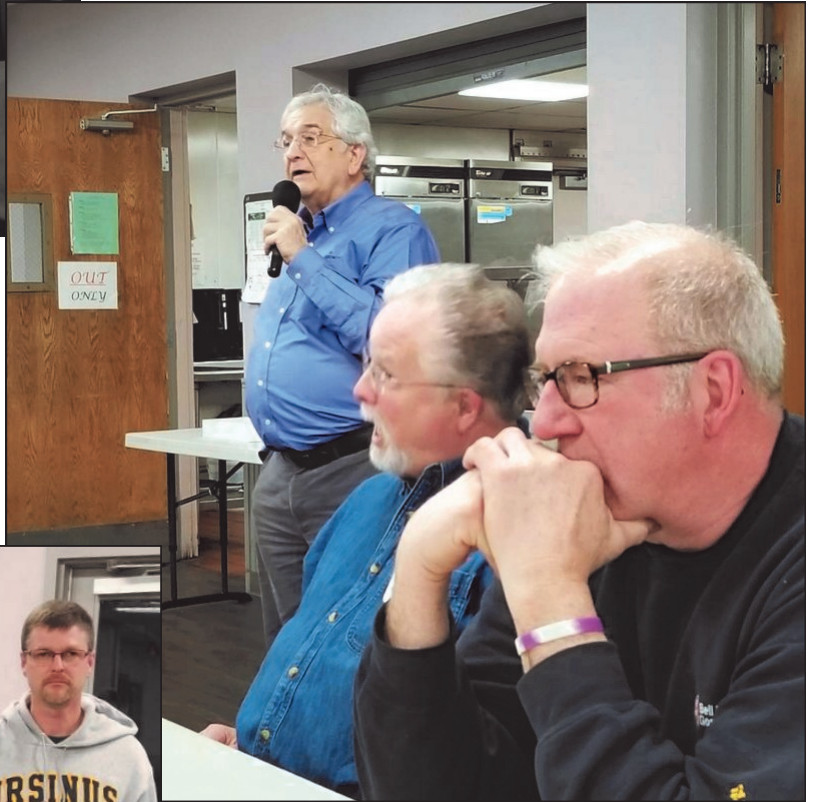
Lots of test equipment was set up so Gary could test and characterize various items brought in by members



After remarkably spirited bidding, Andrea won the auction for one of the last "Packrat in Acrylic" souvenirs left over from the Packrats 50th Anniversary Celebration, about 10 years ago. There are probably no more of these items left.



Vitaly won the Homebrew Contest with an HF Power amplifier and a tube type audio amplifier. Photos of his shack before and after 2019 showed a remarkable number of projects completed in just one year. Excellent craftsmanship!



# THE PACKRATS GO TO ALBANIA

We were looking for something out of the ordinary for a family vacation this spring, and after talking to some friends who had gone, we decided on Albania. Albania (or Shqipëria in Albanian) is a country about the size of New Jersey just to the north of Greece in the Balkans and across the Adriatic from Italy. The climate varies from Mediterranean beaches in the southwest to rugged snow covered mountains in the northeast. A communist dictatorship took over the country at the end of WW2. A break in relations with the USSR and China in the 60s (the Albanian government considered them to be insufficiently pure communists) resulted in almost complete isolation from the world until a revolution in the early 90s deposed the communists and installed a parliamentary democracy. Albania is now a NATO member and hopes to join the European Economic Union soon. Tourists are still uncommon and American tourists doubly so. In getting ready for our trip I sent an email to Fatos ZA1F who I had worked a couple of times on 20 meters. He was very receptive and offered to meet us when we got to Tirana. He arrived at our hotel with friends Edmond ZA1U and Bill ZA1KC. This represented half of the active ham population in the country. We had a great visit and Fatos and crew showed us the sights and took us out to a restaurant at a castle in nearby Kruja (hometown of Skanderbeg, the Albanian national hero, who saved Europe from the Turks in the 1500s). They explained that the NARA (National Albanian Radio Assn) is trying to increase activity through training young operators and getting them licensed. Radio equipment is still expensive and hard to get in the country. VHF/UHF activity is nil although some visiting German hams have activated ZA on 2 meter EME. All in all a great trip. The Albanian people are very friendly and go out of their way to welcome visitors to their country. If we are able to go again I would try to bring some gear to operate with (Albania is a CEPT member so reciprocal operation is easy) and leave it for the local hams. Here are some pictures of Fatos and company at Kruja.



W2KV, ZA1KC, ZA1U, ZA1F at Skanderbeg Castle in Kruja. The hilltop in the background was the next stop.

Hilltopping with Fatos' 20 meter mobile



April 1, 2019.

Hi Lenny,

Still trying to get back on NJ time, I was up at 3:30 this morning. A really fun trip. We were 5 days on our own in Tirana, which is a modern and busy city and then 5 days with a 4 wheel drive and driver touring around the countryside with a side trip to Budva, a beach resort in Montenegro (40). The plane trip was the most expensive part with 2 legs going and 3 legs coming back, but everything in country once we got out of Tirana was very cheap. We were stuck an extra day at the Tirana airport hotel after our flight out was canceled. If you need anything else let me know. --73, Dave

# A Transverter Interface for the Elecraft K3/K3S

By Tom Frederiksen KA3FQS

The Elecraft K3/K3S is a popular transceiver with very good performance that is easy to interface to transverters. The K3 with the KXV3 option and the K3S provide low level, 1.27 mW, transmit output and a receive port specifically designed to interface to transverters. Additionally the rig's firmware supports direct frequency read outs of up to 9 transverter RF frequencies and binary coded signals on an accessory connector to allow switching between these transverters. This project is a transverter switch that uses the signals from the accessory connector on the K3 to control and route the I.F. and KEYOUT (PTT) signals to external transverters.

My personal preference in transverter interfacing is to combine all of the interface signals between the IF rig and the transverter into one. This allows a single coaxial connection to the transverter and a single pole relay switching network to be used to select between multiple transverters. To accomplish this a method of combining the TX and RX I.F. signals and the PTT into one is needed. Combining the TX and RX I.F. signals can be done with a simple switch controlled by the PTT signal. Isolation between the TX and RX signals does not have to be very good as these signals will never exist at the same time and the power is low. Therefore an inexpensive relay or simple diode switch can be used for this purpose. Adding the PTT signal to the I.F. signal can be done with a simple bias tee consisting of a capacitor and either an inductor or a resistor.

Commonly transverters below 900 MHz use a 28 MHz I.F. while transverters 900 MHz and above use a 144 MHz I.F. In the case of the K3 that means there will be three transverters that will be driven directly from the 28 MHz signal from the radio and the rest will be driven through a separate 28 to 144 transverter. With this approach the transverter switching section of this project will need four outputs, the first three will drive transverters for the 144, 222, and 432 MHz bands and respond to only a single binary code coming from the K3 while the fourth output will go to the 28/144 I.F. transverter and respond to all of the remaining binary codes put out by the K3. The 144 MHz I.F. signals will be switched by another set of relays which are not included in this project. The project does however provide control outputs to drive external relays for five additional bands. Figure 1 illustrates this setup.

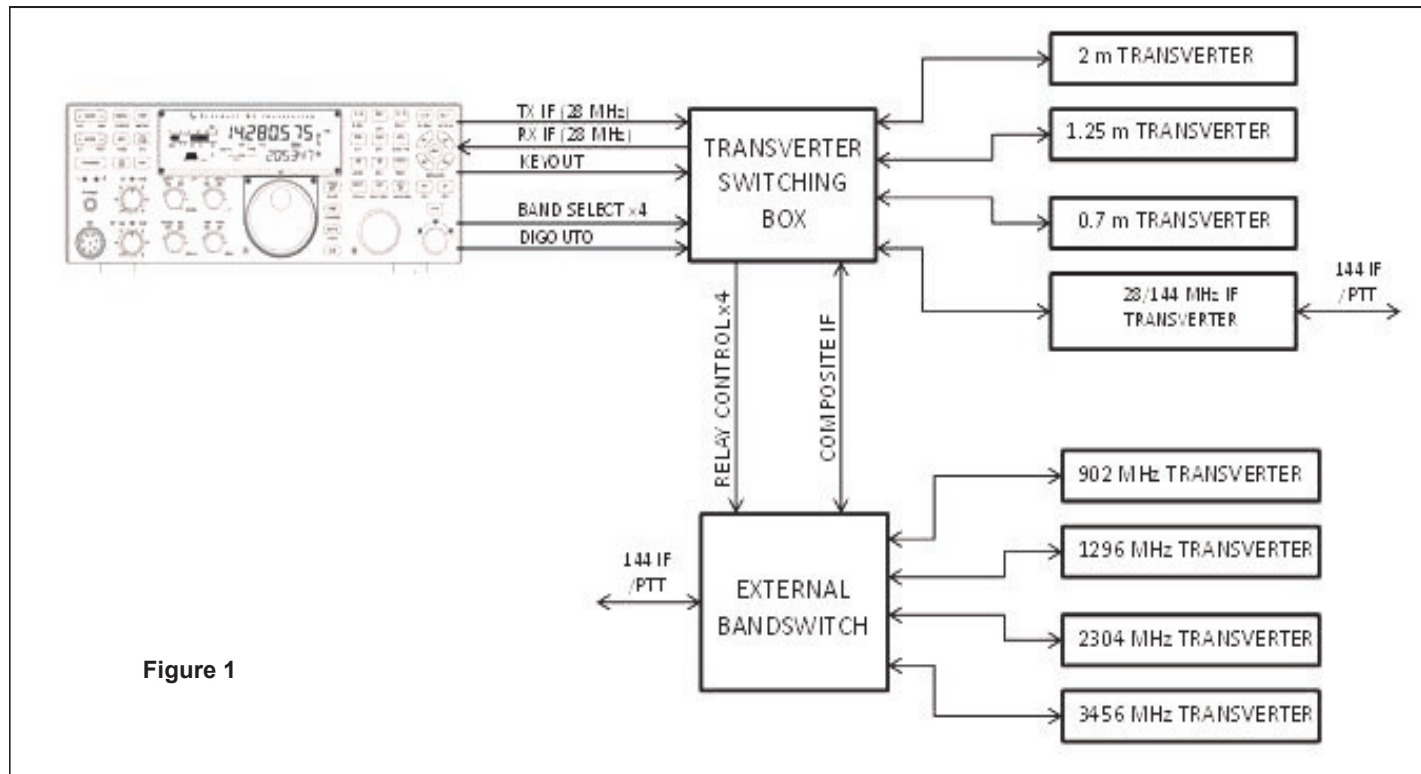


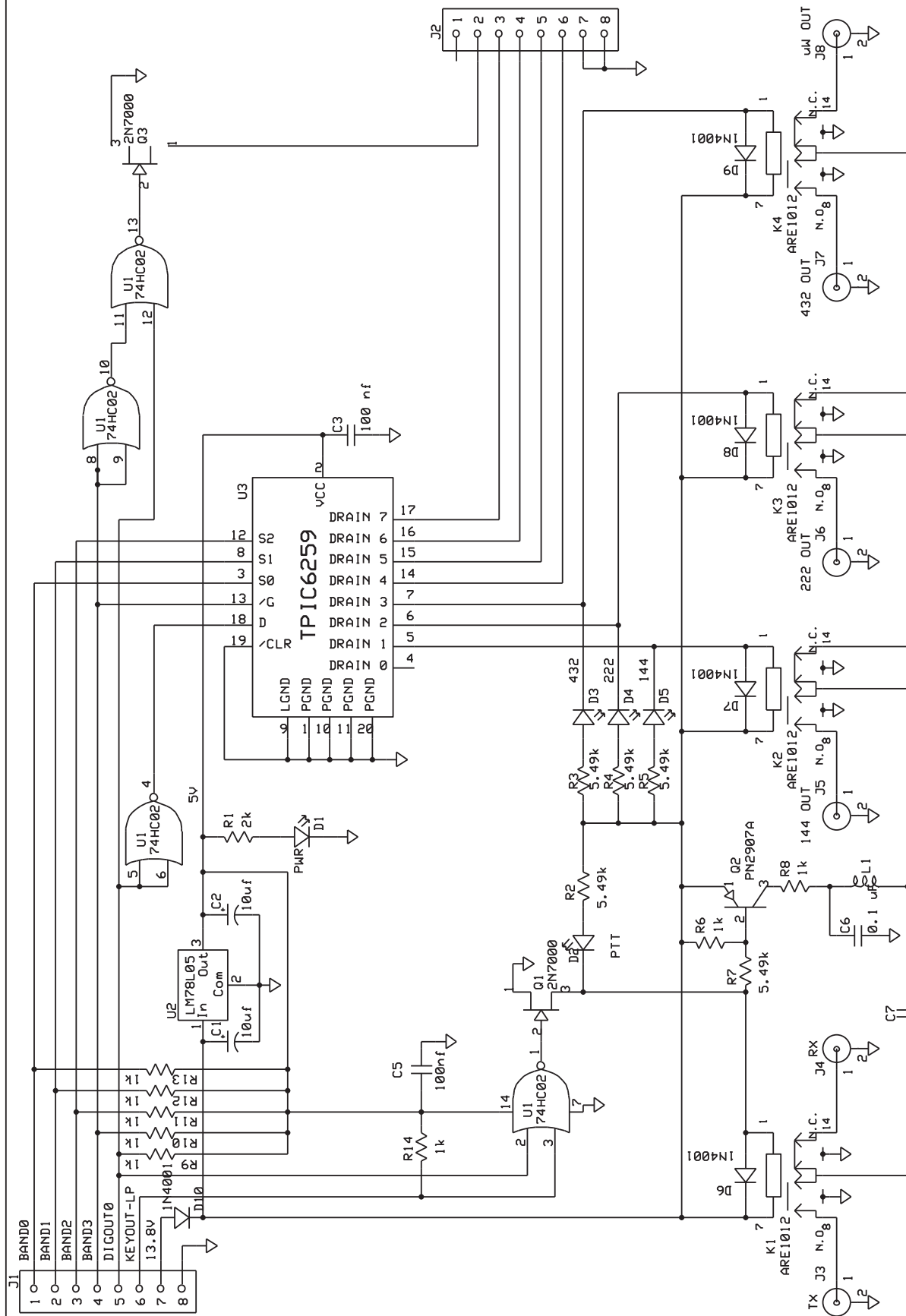
Figure 1

Given the preferences stated above, I set out to design a circuit to accomplish these functions.

Figure 2 is the schematic diagram of this circuit. Connector J1 receives control signals from the K3 and a power supply of 13.8 V. Signals BAND0 through BAND3 are the binary encoded band select signals from the K3 that correspond to which transverter band is selected from the K3 front panel. DIGOUT0 is a signal from the K3 to indicate it is in transverter mode. KEYOUT-LP is a signal from the K3 that indicates it is in transmit mode. All of these outputs are open collector/drain so pull-up resistors R9 – R14 are required. The BAND signals are positive logic (active high) while the DIGOUT and KEYOUT signals are negative logic (active low).

The TX and RX I.F. signals from the K3 are connected to BNC connectors J3 and J4. Relay K1 connects either the TX or RX I.F. signal onto a single bus that goes to the transverter select relays, K2, K3, and K4. Relay K1's coil is controlled by the DIGOUT0 and KEYOUT-LP signals from the K3 through a negative logic AND function consisting of U1 and Q1. This logic is used to prevent relay K1 from being actuated when the K3 is not in transverter mode. (DIGOUT0 can be programmed not to be activated during HF operation.) This AND function forms the internal PTT signal for the switch box. The internal PTT signal also switches Q2 on to provide 13.8 VDC to the composite I.F. signal through R8 and L1. This voltage is used to key the selected transverter. C7 blocks this DC voltage from being sent back to the K3. The internal PTT signal also lights LED D2 to provide an indication that the system is in transmit mode.





**KA3FQS**

**P3\_XVERTER\_SWITCH**

KA3FQS	Rev 1.0 B71372016
SHEET 1	

Figure 2

The heart of the band decoding function is handled by U3, a Texas Instruments TPIC6259 which is a "Power Logic 8-Bit Addressable Latch". For this application this IC can be thought of as a 3 to 8 line decoder with open drain power MOSFET outputs similar to the 74HC138 but with high current/high voltage open drain outputs. There is also an octal latch similar to a 74HC373 and a one-to-eight demultiplexer in U3 but these functions are not used for this project.

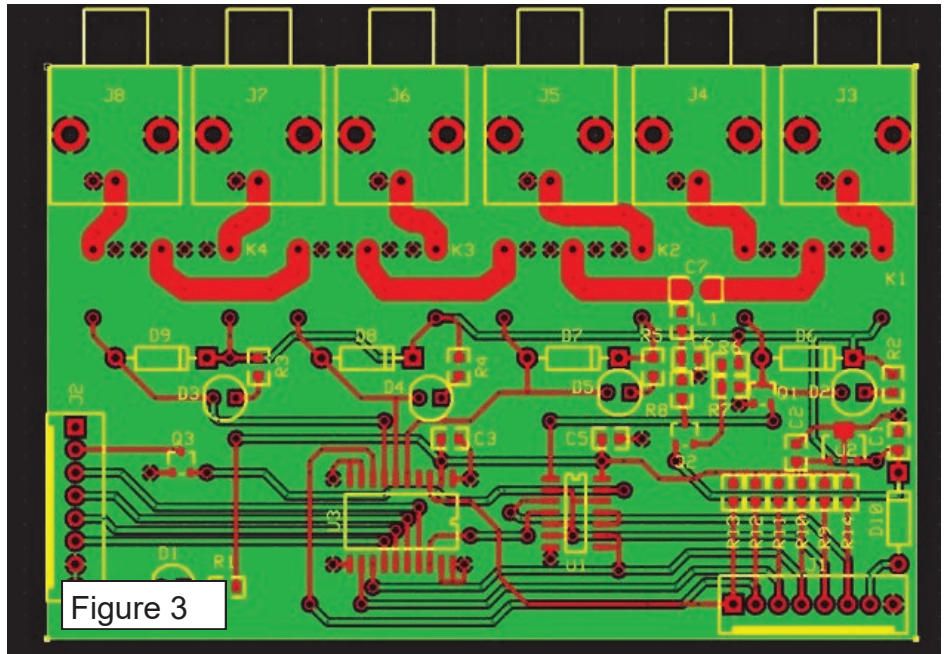
Signals BAND0 through BAND2 from the K3 are connected to the binary decode inputs, S0, S1, and S2 of U3 to select transverter bands 0 through 7. Signal BAND3 is connected to the active low enable input, /G, of U3 to prevent any of its outputs from becoming active when transverter bands 8 or 9 are selected by the K3. The DIGOUT0 signal is inverted by another section of U1 and routed to the D input of U3 to prevent any of the decoded outputs from going active when the K3 is not in the transverter mode. Finally the remaining two sections of U1 in conjunction with Q3 are used to decode transverter bands 8 and 9 and provide a high current drive for an external relay.

The K3 reserves transverter decode 0 for the its internal six meter band so the output DRAIN0 from U3 is not used. (Note, if you have the internal 2 meter option in the K3 it will use transverter decode 1 so that output will not be available for use with an external transverter. The design of this band switch assumes that the internal 2 meter transverter option is not installed in the K3.)

U3 output DRAIN1 goes active when the transverter 1 band is selected on the K3. U3 DRAIN1 drives the coil of relay K2 to route the composite I.F. signal to BNC connector J5 which is connected to the IF port of an external 2 m transverter. U3 DRAIN1 also drives LED D5 to indicate that transverter one has been selected. U3 outputs DRAIN2 and DRAIN3 work similarly to DRAIN1 to energize relays K3 and K4 to route the composite I.F. and PTT signals to the external 222 MHz and the 432 MHz transverters and to light LEDs D3 and D4 to indicate the selected band. If none of these transverters is selected the composite I.F./PTT signal is routed to BNC connector J8 so that it can drive an external 2 meter IF transverter to produce an I.F. signal to drive the microwave transverters. All of the decoded band signals that are not used internally, except for band 0, are routed to connector J2 to be used to drive external relays used to route the output of the external 2 meter I.F. transverter to various microwave transverters.

The selection of the relays used to route the IF signals is critical. Since all of the transverters in this system will typically be down converting receive signals regardless of whether or not they are selected, it is important that the relays provide enough isolation so that a strong signal on a non-selected band does not appear as a weak signal on the band to which you are listening. As an example of this if you are working on the 222 MHz band and there is a very strong station on 2 meters you will hear a weak signal on the 222 MHz band if the switches do not have sufficient isolation. I have personally experienced this when using some surplus BNC coaxial relays. K1WHS provided an estimate that 90 dB of isolation is required between switch ports in a paper he co-wrote titled, "Elecraft Transverter Application Notes" which can be found on the Elecraft TechNotes website. (In general I find it is a good idea to read anything that K1WHS writes.) The relays used in the prototype are the now obsolete Omron G6Y type but as the schematic shows you can use the Panasonic ARE1012 which I believe are direct replacements and are currently available from Digi-Key. These relays have an isolation rating close to 90 dB at low frequencies. A rough measurement of the finished project showed an isolation of 60 dB but I have noticed no band to band bleed through in actual use.

Once the circuit design was done it was time to put it all together. I used ExpressPCB to layout a double sided board. Figure 3 shows that everything fit on their standard low cost 3.8 x 2.5 inch MiniBoard. The I.F. connectors are through hole right angle BNC connectors. In the area of the board where the IF signals are routed there is uninterrupted ground plane and traces are kept short so as not to degrade the isolation of the relays. The rest of the board has signals routed on both sides of the board. A mixture of surface mount and through-hole parts was used. When I ordered the board I chose the cheapest option that has no silkscreen or solder mask. This was a prototype and I didn't want to spend extra money on the finishing touches if there were any mistakes. As it turns out I did make two mistakes when I created the footprints for the FET used in Q1 and Q3. This was fixed with the time honored cut and jumper method of rework during assembly of the prototype but the error was never corrected in the artwork.



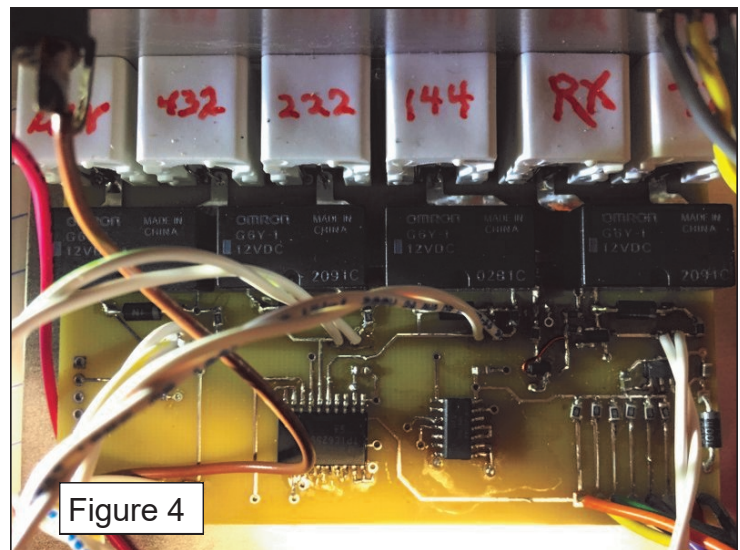
The assembled board mounted in an enclosure is shown in Figure 4. Notice the magnet wire jumper used to fix the footprint error. Much of the wiring seen in the picture goes to the LEDs that which are mounted on the front of the enclosure.

This switching set up has worked well for me over the past year or so. There have been no crosstalk issues noticed in spite of the measured performance being short of the desired goal of 90 dB. The isolation may be better than I measured as it is difficult to measure values this low in my basement shack.

I hope that this may have provided some ideas to anyone who may be considering building a band switching set up for the K3 or other radios. This is not intended to be a kit or a step by step procedure to build a transverter switch. Do not copy the artwork without first verifying the footprint and pin out of all devices.

As noted in the text there are errors that need to be corrected. I did not correct the artwork because I was able to get my board to work with some delicate rework.

No instructions have been provided as to how to modify the transverters to work with the signals produced by this switch. It is conceivable that with out modification the transverter might be damaged if it were connected to the switch. I accept no responsibility or liability for the use or performance of this circuit or any damage it may cause. If you build it you do so at your own risk.



# My Short Career with Bill Orr

by Reid Brandon W6MTF

[ This is the first of several anecdotes / articles written by Reid Brandon W6MTF. All of them stem from Reid's career at Eimac. Additional articles on Eimac, high power tubes for ham radio and military applications will be forthcoming in subsequent issues of Cheese Bits. Thanks to Steve W1SMS for introducing Reid to Cheese Bits. --W2BVH]

I feel honored to have worked with Bill Orr, W6SAI, albeit for a very short time.

Bill was a great writer, he had a style for presenting technical information in clear fashion to the lay person as well as engineers and professionals or anyone interested in ham radio. His many fine articles printed in ham magazines are a testament to his writing skills and his Radio Handbook is still useful to builders of communications equipment, antennas, amplifiers, etc. Bill had a knack for presenting technical articles in a way that even beginning hams could understand and he had a way of including humor in his writing that led to his being included as a prominent author in ham magazines for decades.

When I was hired to work at Eimac in 1983, Bill was around 68 years old and still writing for Ham Radio magazine. Bill had replaced John Reinartz, K6BJ, (ex-W1QP of military fame) who previously had responsibility for running Eimac's Amateur Service department until he retired in 1960.

Bill's office at Eimac was filled with literature, books of all sorts, several file cabinets and a large desk. I used to stop by and see him when I had time, after all he was responsible for getting my resume into the hands of George Badger, W6TC which ultimately led to my being hired as applications engineer. Bill was eager to show me his latest work: some text he was writing, photos, articles, etc.

## **The Times they Were a Changin'**

Unfortunately most of what I saw in Bills office would never be published.

Bill showed me a large box of bright red covers imprinted with the Eimac logo, they were hardback covers he was planning to use as binders for all the Eimac Amateur Service Newsletters. Bill was unhappy that Varian (the new owners of Eimac) wouldn't pay for the binding so his vision of a hard-bound collection of the Newsletters was dashed. He wanted me to have a few of the covers before they went into the trash so I took one.

One morning not long after that George Bader invited me to sit down in his office. As marketing manager at Eimac he was a busy man but always had time to ask how I was. This time he looked bothered, he was not his usual self and he confided to me that he was facing one of the most difficult things he had ever had to do at Eimac; he said he had to terminate Bill Orr. He said "you know Varian cut off all the Eimac advertising!" – I knew that from a previous conversation with Bill but I suppose I hadn't fully realized its implications. I found it hard to accept the fact that Varian management wanted a business without Ham Radio advertising, and along with that there would be no new product development for amateur related products. Since 1934 Eimac had advertised with the ARRL's QST magazine, holding the prestigious back cover (known as cover IV in the trade) for decades. Subjects ranged from advertising the latest tubes to showing Eimac's role in amateur radio EME. Over the years, the ARRL published many articles containing technical articles directly related to Eimac tubes. Bob Sutherland joined Bill Orr as a prolific writer, showing hams how to construct high power amplifiers and other related subjects.

On that day George somberly said that Varian had decided to remove anything related to amateur radio from the Eimac operating budget going forward and in doing so they eliminated Bill Orr's position. I could not predict that 26 years into the future the same corporate powers would eliminate my job as applications engineer at Eimac. And who could imagine that without a chief engineer on staff, Eimac would become

...Orr cont'd

basically a "cookie cutter" operation without the ability to develop new products. Of course advances in solid state technology would play a role in that destiny too but that's a subject for a future story!

### **Bill was More than Just an Author!**

Bill Orr also was a bit prophetic. One day I recall him pointing out over the land east of the highway that ran along the Eimac property where the KGEI transmitter towers could be seen in the distance. Around the KGEI transmitter site, homes were being built at a rapid rate (this was part of Redwood Shores, a large housing addition East of US highway 101 in Belmont, CA. Eimac's plant was on the West side of the freeway). Bill said he believed rapidly rising real estate prices would someday lead to Eimac being sold for the value of its commercial property. I was pretty much in denial, who would imagine tearing down the Eimac building that employed hundreds of fine people!? Unfortunately this became reality in 2005 when CPI, the new management that followed in Varian's footsteps, sold the Eimac property for \$25M then, due to poor planning, it would spend more than that amount relocating the factory to Palo Alto!

### **Bill's Retirement Days**

I didn't speak much with Bill the day he was packing his boxes to leave Eimac but he wasn't the same jovial person I had come to know. My fellow hams that worked in the plant were all talking of the changes taking place, and it was not a happy time for any of us.

I visited Bill at his home several times after his retirement. In the entrance foyer to his home was a large urn, it was positioned under a spotlight and caught one's attention immediately on entering. Bill told a story about a young man who came up to him while he was on a trip to Greece and said he had a large urn that had been dug up on the beach and wanted to sell it. Bill was able to strike a bargain and buy it for not much money. It was later discovered to be a relic from a Roman shipwreck from centuries past and being of Museum quality it was quite valuable so he had it shipped back to the States.

On a few occasions I met Bill's wife. Sunny was a private pilot and occasionally went up on solo flights while Bill stayed home on "terra firma". Just a few years later I learned that Sunny died from cancer and Bill was lonely so my friend Peter, KN6BI and I set up a 1.3 GHz Icom radio at Bill's house to chat with him through a local repeater but I never saw him after that and he died in his sleep in 2001.

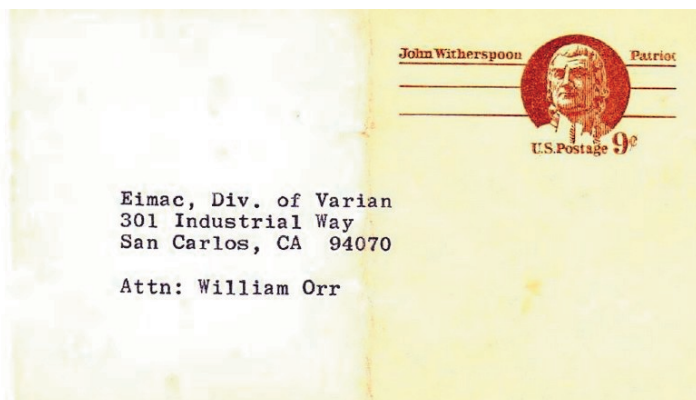
Bill gave me this QSL card when I started working at Eimac. The reverse is inscribed "The First of Many, Aug. 13, 1984, RST 59 146.01/61" (the unofficial Eimac repeater operated by Dick Rasor, W6EDE):



### **(Addendum) Isn't it a Small World?**

I am always looking for good unused 4CX250B tubes as spares for a repeater I operate (52.62MHz in Oakland). I recently saw a 4CX250B offered on eBay and placed a bid which turned out to be high bid at \$34.99 and I was quite happy with that but when I received the tube the day after Thanksgiving I was

pleasantly surprised to find a post card with the return address of Bill Orr on it inside the carton! It was folded in half and not shown in the auction so I guess it was just waiting to see the light of day some 38 years since it was placed in the Eimac box with the familiar logo on it! I've never see a card like this before, perhaps Bill sent the tube out as a sample or something and wanted feedback. The back of the card is blank however so we will never know what it was intended for. NB. The tube has a date code of 7936, indicating it was packed the 36th week in 1979. Note the 9-cent postage for a post card of that era.



## MUD 2019

The North Texas Microwave Society would like to invite you to the annual Microwave Update Conference to be held October 3rd through the 5th 2019 at the Hilton Garden Inn and Conference Center in Lewisville (Dallas) Texas.

Microwave Update is the premier microwave conference of the year. This is the ideal conference to meet fellow microwave enthusiasts and share ideas and techniques that will help you conquer your next microwave band.

We have a full slate of speakers already set up including Rex VK7MO, Tony Emanuele K8ZR, Rick Fogle WA5TNY, Paul Wade W1GHZ, Joe Jurecka N5PYK, Doug Miller K6JEY, Greg McIntire AA5C, Steve Kostro N2CEI, Kent Britain WA5VJB, Bob Stricklin N5BRG, Barry Malowanchuk VE4MA, Tom Williams WA1MBA, Tom Apel K5TRA, Tom McDermott N5EG and Al Ward W5LUA. If you are interested in speaking, please let us know.

Topics will include small dish EME, microwave propagation, parabolic dish feedhorn design and construction, SSPAs, circuit design, latest microwave devices, software defined radios and digital modes just to name a few.

We plan to have an informal program for the spouses which will include local shopping and sightseeing in the Lewisville, Grapevine and greater DFW area on both Friday and Saturday.

Our Saturday night banquet speaker will feature Rex VK7MO who has activated over 100 grid squares on 10 GHz EME in both Australia and New Zealand. Rex will show us some of the beautiful places he has visited and talk about his adventures to some of the more remote places down under. This should be a real treat for hams and spouses.

Kent Britain WA5VJB will coordinate the publishing of the proceedings by the ARRL. We are always looking for additional papers for the proceedings. You don't have to be a presenter to have your paper published in the proceedings. If you have an article on your latest microwave related project that you would like published, please send your article to Kent WA5VJB at [wa5vjb@flash.net](mailto:wa5vjb@flash.net) [wa5vjb@flash.net](mailto:wa5vjb@flash.net)

Hotel registration is being setup. The hotel link will be available shortly.

## Cheap Spectrum Analyzer (Sort Of)

If anyone has an SDRPlay, here is an alpha release of a tool to make it a spectrum analyzer:

<https://www.sdrplay.com/spectrum-analyser/>

--AI KB3SIG

## VHF to Microwave SDR Transceiver for \$125

The March issue of N.E.W.S Letter has a nice article by Mike N1JEZ on using the ADALM Pluto SDR for 6M to 10 GHz communications.

It requires outboard power amplifier, LNA and harmonic filter, but there's a lot in there for \$125.

See <https://nam04.safelinks.protection.outlook.com/?url=http%3A%2F%2Fwww.newsvhf.com%2Fnewsletter%2F2019%2Fnews1903.pdf&data=02%7C01%7C%7C3e16dadb7cdb4f0e2bd408d6a2b36073%7C84df9e7fe9f640afb435aaaaaaaaaaaa%7C1%7C0%7C636875288630881152&sdata=zvUldr1VRriQRW3QCy23MkY%2BxZnHGmR%2F3FmjmGCpig%3D&reserved=0>

## QRP Pioneer Rev. George Dobbs , G3RJV, SK

Noted radio builder and QRP stalwart Rev. George Dobbs G3RJV has become a Silent Key. In his memory, someone posted a link to a book he wrote in 1972 called "Making a Transistor Radio". Since it was published in England I suspect I'm not alone in never having seen it before, but it's beautifully illustrated and very well done. A copy can be read online: <https://archive.org/details/MakingATransistorRadio>

I purchased a CD of the back issues of the G-QRP club newsletter after reading just one of his project articles. He inspired many to build simple radios and use them on the air.

73, Bob W9RAN

[A personal hero of mine... RIP --Lenny W2BVH]

John KC3CEW and I have been meeting twice a week on 144.550 for a year or two. Sundays 9:20PM and Tuesdays 9PM. We both live in Philadelphia. We start with phone and move to FLDigi, a free multi OS program for using scores of different digital modes contained within. The purpose of our sked is technical assistance on subjects of radio, digital modes, gardening ... among others. Sometimes we send, (MFSK), photos of the problems needing solutions. We are always appreciative of visitors. K3GNC has been known to tune in.

Stop by and say hi with phone or digi  
Jim KC3BVL

# K0BAK Cuts Up K1DS' Microwave Bands or, Why "Breaking Up Is Hard To Do"

By Pete K0BAK

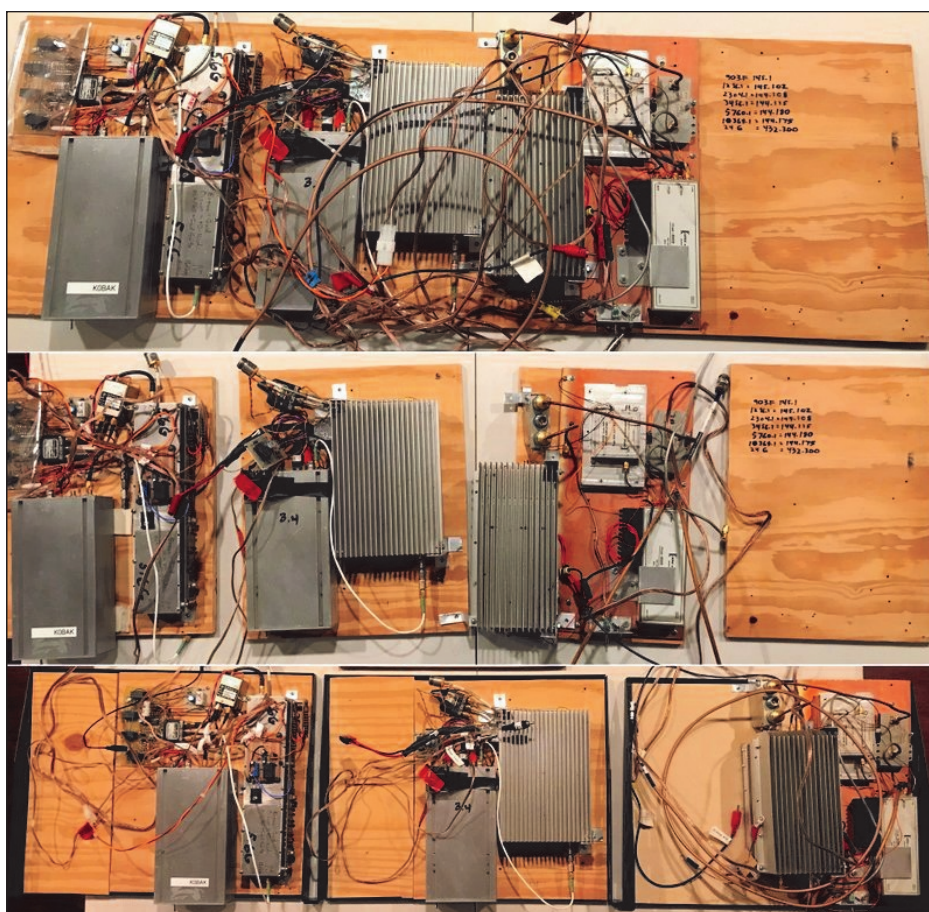
Three of Rick K1DS' microwave bands were mounted on a single long plywood board, part of which also served as a table. This board was a good fit in the open cargo area of Rick's roving van, but would never fit in my more crowded TV van. Ever since Rick sold his equipment to me I had been moving that awkwardly-long fairly-heavy board around my house due to floods, construction, parties, and boomerang children. When my basement recently became available again for ham and woodworking projects, I finally decided to make progress on physically separating those bands. Intended to stack them vertically in my van's racks instead of horizontally.

Although removing all the components of each band and then reassembling them on rack shelves would be an obvious approach for many Packrats with decades of experience in reliable electronics assembly, I was more circumspect. The compact layout and many connections for each band were intimidating for this software engineer to contemplate reassembling successfully. Also, it would take a tremendous amount of time considering my inexperience. I made a bold or dumb decision to cut the board apart with most of the components in-place.

Only a little more than a year before I had bought my first table saw (for the rover van project), and had only made maybe 10-15 cuts so far ... so I wasn't exactly Norm Abram. I was confident I made the right project choice mostly because of time savings, but I procrastinated making the cuts for many days due to fear of a thousand-dollar mistake that would be a shameful secret forever after.

Finally forcing myself to start the work, I first had to remove all the saw's guards and other safety devices because of the height of the components right next to the cut lines; that was not a good feeling for an inexperienced saw user. One of the transverters overlapped a component on another band, so I unscrewed it from the board and was able to move it out of the way with only one SMA disconnection. Cutting the board wasn't too hard except for how long and heavy it was. It was a great feeling finally having that scary task completed successfully.

Ironically, I ended up removing and remounting components for the 2304 band because Rick's board was just a little too long front-to-back to fit into the rack shelves I

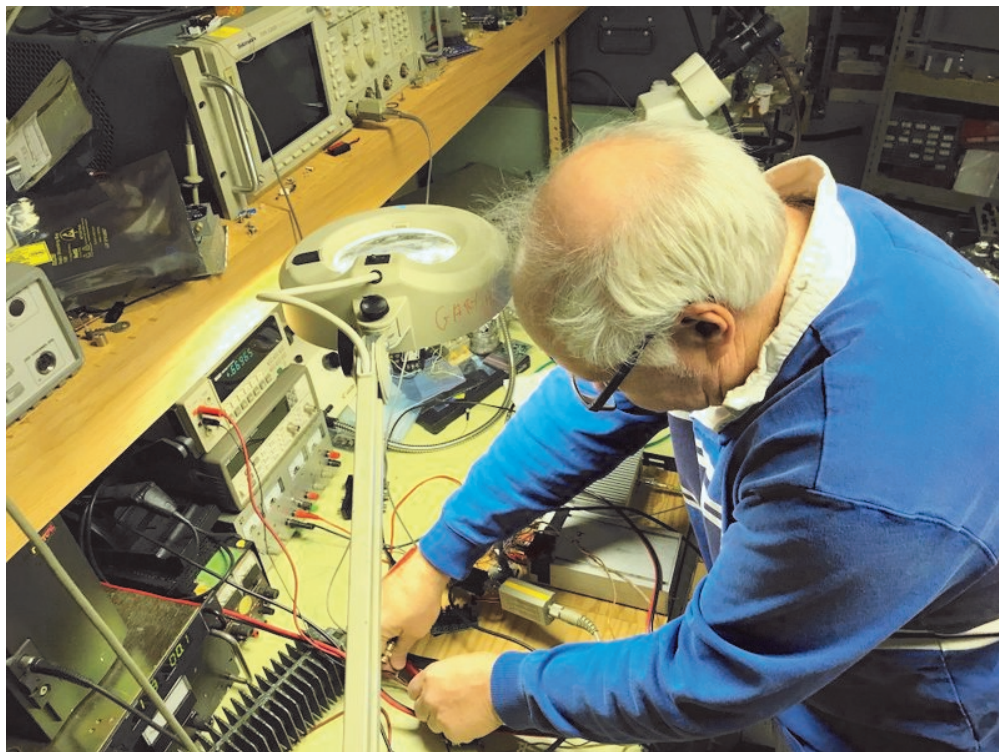


Before, during and after separation

bought. On the other two bands, I was able to saw off a little material to make them fit, but most 2304 components were mounted on a copper plate that was too near the edge to cut with a table saw. At least the presence of the copper plate meant when I moved it, along with the components mounted on it, there would be few reconnections that needed to be made.

On the 5760 band I had additional work to do. Shortly before the June 2018 contest, a call went out on the reflector that W3CCX needed a replacement transverter for 5 gig. Since I was a long way from using Rick's 5 G Demi transverter and wanting to be a good 'Rat, I removed it from the board. But I was in too much of a hurry and unsoldered too many wires. I brought the box with me on my minivan to deliver while on my rove. But by then Paul already had found a replacement for the W3CCX station. Now I would pay the price for that hasty removal. I ended up re-connecting the transverter and output relay after removing the previous adhesive and substituting fresh Velcro. The solder joints were pretty ugly, and I wasn't 100% sure I connected everything correctly.

Gary WA2OMY generously offered to test these three bands in his home lab, as he previously did for my 903 and 1296 rigs. (Thanks Gary!)



I was relieved that all bands were found to be at least usable, though 2304 has an oscillation on RX and 5760 has low RX and TX performance possibly indicating a transverter problem with L.O. power. I'll probably leave 2304 as-is for now, and Gary is looking into specs and other data for the transverter to see if it can be fixed.

The amplifiers draw a significant amount of quiescent current; Gary said that's probably because they're class A. I'm considering adding a DC supply relay for the amplifiers to reduce battery drain, though this would be significant (for me) unplanned work.

Next I need to remount the 903 and 1296 components onto rack shelves, which I think won't be too challenging. Then I'll build a bespoke power shelf to take the nominal 24vdc from two AGM batteries, and output regulated 26, 12.6, and 5 volts DC for the microwave components and TBD TTL logic. I'm aiming at bringing the van back home from the garage for a little while to install all those shelves just as the weather turns reliably warmer. I haven't really designed anything yet for I.F. and PTT distribution, though I do have Rick's old manual switchbox and I bought a new DP7T switch so I'll have manual switching options before getting the band switching automated. Onward!



## Windows on Raspberry Pi

It's possible to run a full version of MS Windows 10 on a \$30 Raspberry Pi computer board. In reality it's a bit more than that since you'll need to supply a keyboard, mouse, monitor, wall wart and microSD card (for the program memory). Depending on what's laying around your shack you might be running Windows on as little as \$60 of hardware.

See <http://pi64.win> and <https://www.tomshardware.com/reviews/install-windows-10-on-raspberry-pi.5993.html> for details.

Whether the copy of Windows installed on the board is "legal" is currently ambiguous. So far Microsoft has not complained.

Not for the faint of heart, and once its running don't expect it to be a speed demon, but it will be functional and usable for many purposes..

--W2BVH

## 2 Meter Activity in UK Rejuvenated by FT8

FT8 has completely re-juvenated 144 in the UK. The band was dead of activity most times on CW/SSB, except for our monthly 1st Tuesday evening activity contest, and the bigger weekend ones.

Now almost any time you can get a QSO, and as soon as there's any activity people start to see it and come on. Many callsigns I've never seen before, in 40 odd years on the band.

73, Bob G8HGN JO01fo

(Tnx W2SJ for the info)

## Central States VHF Conference

Organizing for the 2019 Central States VHF Conference, July 25-28, 2019 in Lincoln NE, is in its preliminary phase. The web page for the conference is at <http://http://2019.csvhfs.org/>. Additional details will be forthcoming as the year progresses.

The Peekskill / Cortlandt Amateur Radio Association of New York is having a "UHF Simplex Challenge" on April 20th. Brochure at:

[http://www.pcara.org/images/UHF-simplex\\_4-20-19.pdf](http://www.pcara.org/images/UHF-simplex_4-20-19.pdf). This is an FM simplex activity. Interestingly, it doesn't list any grid square reference.

But, I figure anything to drive more activity is a good thing, and since my calendar happens to be open that day, I am going to see if I can reach them. I did inquire, and the 6-digit grid square for the operation will be FN21xh.

Bill WS30

## Second VHF / UHF Super-Conference

VHF Super Conference II – April 25-28, 2019  
Holiday Inn - Washington-Dulles Airport  
45425 Holiday Drive  
Sterling, VA

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[vhfsuperconference.com](http://vhfsuperconference.com)

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ask for "VHF Super Conference 2019" special rate  
Hotel Reservations: 877-875-9823  
\*\*Special Hotel Rate EXPIRES April 7th\*\*

The conference location is in the western suburbs of Washington, DC. It is very close to Dulles Airport and the Udvar-Hazy Center of the Smithsonian National Air & Space Museum.

**Bus Trips are on registration page now:**  
Thursday Bus Trip \$45 after 3/31, if available). 3 hour Guided Bus Tour of Washington DC plus 3 hours on your own to visit the Smithsonian area museums and/or the Capitol. Bus Leaves at 10am, returns to Hotel about 6pm

Friday Bus Trip \$29 before March 31 (\$35 after 3/31, if available). 4 hours on your own at the National Zoo. Bus Leaves at 10am, returns to Hotel about 4pm

**We anticipate a sellout**  
**It's Going to be a SUPER Conference!**

# ***The Wayback Machine*** In CHEESE BITS, 50 Years Ago

Nibbles from April 1969. Vol. XII Nr. 4  
de Bert, K3IUV  
*(author's comments in italics)*

**Format changes.** While not mentioned within the body of this issue, several “appearance” items were noted. **1)** The page size (formerly 8-½ x 14”), was changed to the more common 8-½ x 11”. **2)** The “printer” was listed as Lloyd, K3ZPN, rather than Doc, K3GAS. **3)** The cover sheet listed the Officers, nets and related items which had previously been relegated to page 2. (The Prez Sez moved to page 2.) No mention was made as to the reason for these changes. As a reminder, the Editor at the time was our current auctioneer, K3JJZ, EI. Stay tuned for further clues.

**“Our Prez Sez”.** The Prez, Charlie, K3HSS promoted “Ladies Night,” to be held on April 19<sup>th</sup>. *(It's too bad that this event has disappeared from the club calendar. It fostered camaraderie among the members, and brought the “ladies” into the fellowship of the club. Could we rethink the status?)* He mentioned that K3ZPN, Lloyd, the June contest chairman would be preparing a list of participants. Charlie said “If you have not already volunteered, don't be surprised if you receive an appointment!”

**ARRL Bulletin 210, 2/27/69.** The ARRL identified a number of operating aids designed to help “those desiring to increase their code proficiency.” The aids included a list of (then) current code practice stations. An SASE would get you a copy of each of the aids.

*(I suspect that most of these are still available. We have a few members that could benefit by their use to add / improve CW skills. If the shoe fits .... .)*

**ARRL Bulletin 211, 3/6/69.** With the travel season approaching, a reminder was issued about taking advantage of reciprocal operating agreements. Those traveling to Canada should allow for a 40-day processing time for their permit *(the address for the application office was included)*. Those traveling to other countries should allow at least two months. (Bureaucracy, even then.)

**The Old Grouch Rebuttal.** Recall the complaints voiced in last month's issue by the anonymous “Old Grouch?” EI, the Editor, had noted that he would publish replies, so that anyone could have a forum. As expected several replies were received, and two were published. They both took umbrage with the Grouch's comments, trying to refute them point by point. *(I'm not sympathetic to their viewpoints. I think the Grouch's comments were well taken. If you want to see more details, go to W3CCX.com and read them in the copy I scanned, posted by the webmaster).*

**The Old Grouch Returns.** The Grouch was back, with comments on the lack of activity on the bands by members. He noted the activity leading up to the January contest, lots of stations on for the contest weekend, and then “silence.” He described his attempts at contacts on several bands, to no avail. The only activity he heard was club members using the 220 club intercom frequency. *(Sound familiar? The Packrat Monday night nets now get*

*members on the air. But when was the last time you got on and called CQ on another night?)*

**“From the Book Rack.”** Another interesting book was reviewed on the book review net, conducted by member Paul Behrman, K3WEU. This month’s book was “Popular Tube and Transistor Substitution Guide,” published by Tab books. \$4.95 leatherette bound, \$2.96 paperback, 160 pages, and 6 sections. The book was advertised as “includes substitutions for 99% of the tubes and transistors ever needed to be replaced.” (*Sounds like a worthy addition to your bookshelf. How about those 1969 prices?*)

**Stolen Gear.** (*Think theft is a new problem?*) In 1969, EI, K3JJZ reported that all of his mobile gear was stolen from the car. Salient items included in the theft: an Elmac PMR-7 receiver; an Ameco 6-meter Nuvistor preamp (*Michael, take note*); a “Link” (*Taxicab rig*) transmitter; and some miscellaneous gear (microphone, HB switch box, etc.). EI described a number of distinguishing marks on the equipment, and requested a report to the Philadelphia Police should anyone spot some of the gear. (*I don’t recall if any of the gear was ever recovered. EI, your comment?*)

**Technical Stuff.** An article by W2AXU, Jack, was titled “Some thoughts on Antenna Heights.” Jack included tables showing the “radio horizon” for a variety of transmitting and receiving antennas at different heights. He commented that “the higher the better, but by how much?” The distances he

listed were “straight line to the horizon,” not including any reflection, refraction or other propagation aid. The (*maybe*) surprising fact in the tables was how slowly the distance increased with tower height.

**Ridley TOWNSHIP Tower Problems.** On 3/2/69, K3MTF, Harry Woodrow, was digging a hole beside his house, in preparation for a tower installation. He was stopped by a Ridley Township Police Officer who stated that a permit was needed. On 3/4, he submitted an application to the Township. On 3/5, the regular Commission meeting was held. On 3/9, the local newspaper reported that “The board approved a resolution confirming an ordinance that prohibits ham radio antennas.” On 3/10, Harry and another ham went to the township office and requested a copy of the ordinance. The township secretary was unable to supply a copy, and stated “there is no such ordinance presently in effect.” (*!! Interesting.*) A letter was then submitted by Harry’s attorney, requesting to be heard in this matter. (*Stay tuned for later updates.*)

**Swap Shoppe. By W3ZRR.** (*Always nostalgia.*) For sale by Ed, W3HKZ: a Utica 650A transceiver with all accessories, “transistor powered” excellent condition, for \$90. By Dave, K3BPK: A PE-120 vibrator power supply, new, with regulators and ballast, input voltage 6-12-24 vdc; A trailer hitch for a Beetle; wanted, a Gibson Girl 550 Kc hand operated SOS transmitter. Cash or swap. By Ray, WA2YGY, a 5-element Cushcraft 6-meter beam and an Alliance T-45 rotor. No price given.

**Meeting Notice.** Next general meeting will feature a film on “The travels of

Apollo 8.”

**Ladies Night.** Chairman John, K3KTY reminded us of the ladies night plans. April 19<sup>th</sup> at 6:30, at The Buck Hotel (*Still there today. Maybe a good place to restart?*) Tickets are \$7.50 per person. A great meal, a good band and lots of other things.

**Miscellany.** *Postage for this copy (It was from Ernie, W3KKN) was a single 6-cent Roosevelt stamp. (6 double sided, 8-½ x 11” sheets.) As in previous editions, many “folksy” comments about members, their families, and activities were included in this edition of Cheese Bits. If interested, or for more detail on the above items, visit our website (www.W3CCX.COM) and read the full issue scanned by K3IUUV (me), and posted on the website, by W3SO, our webmaster. Remember, I have also posted the club Officers history, club Membership history, and Packrat Inventory (updated frequently) on the W3CCX website. These files are password protected, and only accessible to registered members. Have you registered? I hope you enjoyed reading these bits of nostalgia as much as I did in writing the article. If yes, you might let me know. Thanks to those that did.*



thirty, de K3IUUV (K3IUUV@ARRL.net)

## Events

**For inclusion, please direct event notices to the editor.**

**2M Spring Sprint - Contest** - April 8, 2019, 7:00-11:00 pm local. See <https://sites.google.com/site/springvhfupsprints/home/2019-information> for details.

**222 MHz Spring Sprint - Contest** - April 16, 2019, 7:00-11:00 pm local. See <https://sites.google.com/site/springvhfupsprints/home/2019-information> for details.

**432 MHz Spring Sprint - Contest** - April 24, 2019, 7:00-11:00 pm local. See <https://sites.google.com/site/springvhfupsprints/home/2019-information> for details.

**VHF Super Conference - Conference** - April 26-28, 2019, in Sterling, VA, near Washington, DC. See <http://vhfsuperconference.com/> for details.

**Microwave Sprint Sprint - Contest** - May 4, 2019, 8AM - 2PM Local time. See <https://sites.google.com/site/springvhfupsprints/home/2019-information> for details.

**Eastern PA Section Convention and Warminster ARC Hamfest** - May 5, 2019. Bristol PA. See <http://www.k3dn.org/hamfest/> for details

**6M Sprint - Contest** - May 11-12, 2019, 2300Z - 0300Z. See <https://sites.google.com/site/springvhfupsprints/home/2019-information> for details.

**Murgas ARC Hamfest & Computerfest - Hamfest** - July 7, 2019. Plains PA. See <http://hamfest.murgasarc.org/> for details.

**June VHF Contest - Contest** - June 8-10, 2019. Details to follow.

**CQ WW VHF - Contest** - July 20-21, 2019. See <https://www.cqww-vhf.com/> for details.

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### The Pi Day Pie

The Packrats BoD meeting on Pi day (3/14) featured a pi pie, baked from award-winning preserves by Mrs. K0BAK



Jim Klitzing W6PQL <https://www.w6pql.com/> has designed a band data control board for the FT991, FT897 and FT857 that may also be used to control ptt for amplifiers for each band output. (If the FT817 uses the same band data output it may be adaptable for that radio also.) He is interested in gauging interest in either a kit that would be mounted as an individual saw fit or a completed plug and play unit. His email is [jim@w6pql.com](mailto:jim@w6pql.com). If you would be interested in a unit please drop him a brief email to let him know. Seems like it would be ideal for rover/portable VHF setups.

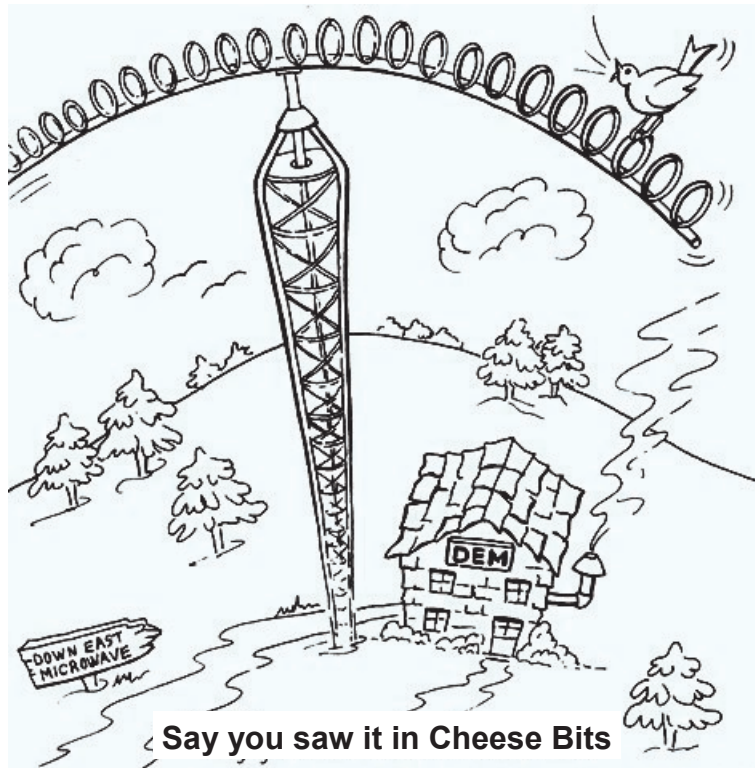
73, Chris W3CMP

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