Mt. AIRY V.H.F. RADIO CLUB, INC.

# CHEESE BITS

ARRL Affiliated Club

**W3CCX**
**CLUB MEMORIAL CALL**

**Volume LXIII** **May 2020** **Number 5**

## PREZ SEZ:

Well, here it's May and like most of you I'm tired of hearing the Covid -19 related news. I know I need to keep abreast of what is happening but I find I'm just "burned out".

But, my wife Joanne came to the rescue with the Honey Do list!

So, one of the projects was to install a night light in the upstairs hall. Wait, there's no electricity in the upstairs hall. A trip to the basement finds some Romex cable and a outlet box. A trip to Lowes provides a nice 2 Outlet/Nightlight receptacle. After running the Romex and mounting the new nightlight, it's time to try it out. Wait – it doesn't work! How hard can this be! After deciding to read the instructions – I don't think I threw them out yet – I find out this nightlight is far more sophisticated than I could ever imagine. If you press the light cover momentarily it allows you to cycle through "OFF" and 4 different levels of light brightness.
But wait there's more! If you hold the light cover for a long second you can cycle through several levels of sensitivity to ambient light. This thing must have a small micro-controller in it. It IS very nice and I guess that's why it cost 23 dollars! I couldn't find a cheaper one. This was just one of several "electrical" jobs I completed over the last week but definitely the most interesting….

At the last Camelback planning committee meeting, the committee discussed if we should go to Camelback this year. The consensus was to recommend to the BoD that the Packrats NOT go to Camelback this year. Many who had planned to go expressed very valid points about their personal health and family concerns.

The group then discussed the need for all Packrats to operate from their home station instead and try to turn in as many logs as possible along with the best possible score. We will promote operating from home for the June contest at the next virtual General meeting. We think we can still have a great total club score if we encourage each member to get on and operate the contest from home. Mike N2DEQ has volunteered to be Contest Chairman for this June and will give a short presentation at the virtual General meeting. Leading off the meeting will be a presentation from Roger W3SZ on the new map extension to the K1RZ/W3SZ database. The Business portion will be at the end of the meeting. Next virtual General meeting is May 21st. This will be a WebEx meeting. Ken K2WB will be hosting again. The Password and meeting numbers are the same as last month.

Most members have heard the sad new that a great friend of many Packrats has passed away, Dick, K2RIW. We took Russ' K2TXB email remembrance of Dick along with one of Dick's technical discussions on Circular Wave Guide and posted it to the Packrat web site under TECHNICAL ARTICLES . If you get the chance, it's worth the read.

Don't forget the Spring Sprints. The next (and last) one is on 50 MHz, Saturday May 9, 2020 -

Pack Rats **CHEESE BITS** is a monthly publication of the
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222.98/224.58 MHz (PL 136.5) Hilltown, PA

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**PACKRAT BEACONS - W3CCX/B**
Located at FN21be except 2304 which is at FN20dh
50.080 144.300 222.062 432.290 903.072 903.3 1296.264 2304.3 3456.200 5760.3 10,368.3 MHz ( red = temporarily off the air see https://www.packratvhf.com/index.php/on-air for details)

**MONDAY / TUESDAY NIGHT NETS**
**VHF/UHF Monday:**

| TIME | FREQUENCY | NET CONTROL |
|---|---|---|
| 7:00 PM | 224.58R MHz | WR3P FN20kb Ralph |
| 7:30 PM | 50.150 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 or **Packrat Chat Page W3SZ.COM**
Visit the Mt Airy VHF Radio Club at: www.packratvhf.com or www.w3ccx.com

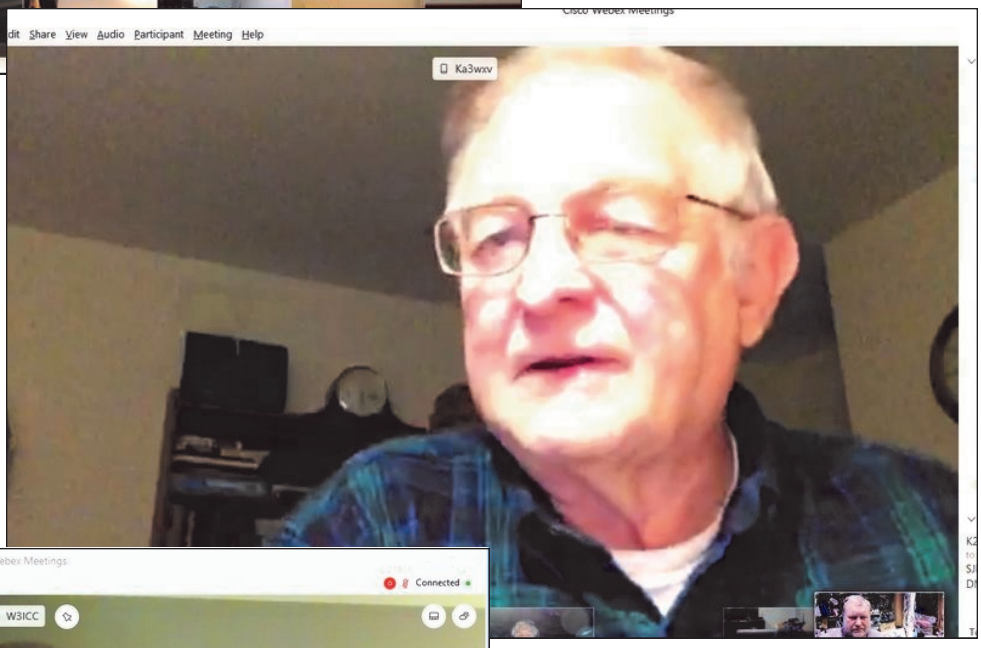
2300z through Sunday May 10, 2020 0300z.

So take a break from the Honey Do list and have some fun, spend some time on the bench, learn more and build something.

Stay safe.

**73, George KA3WXV**

# April (WebEx) Meeting Pics



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K1DS
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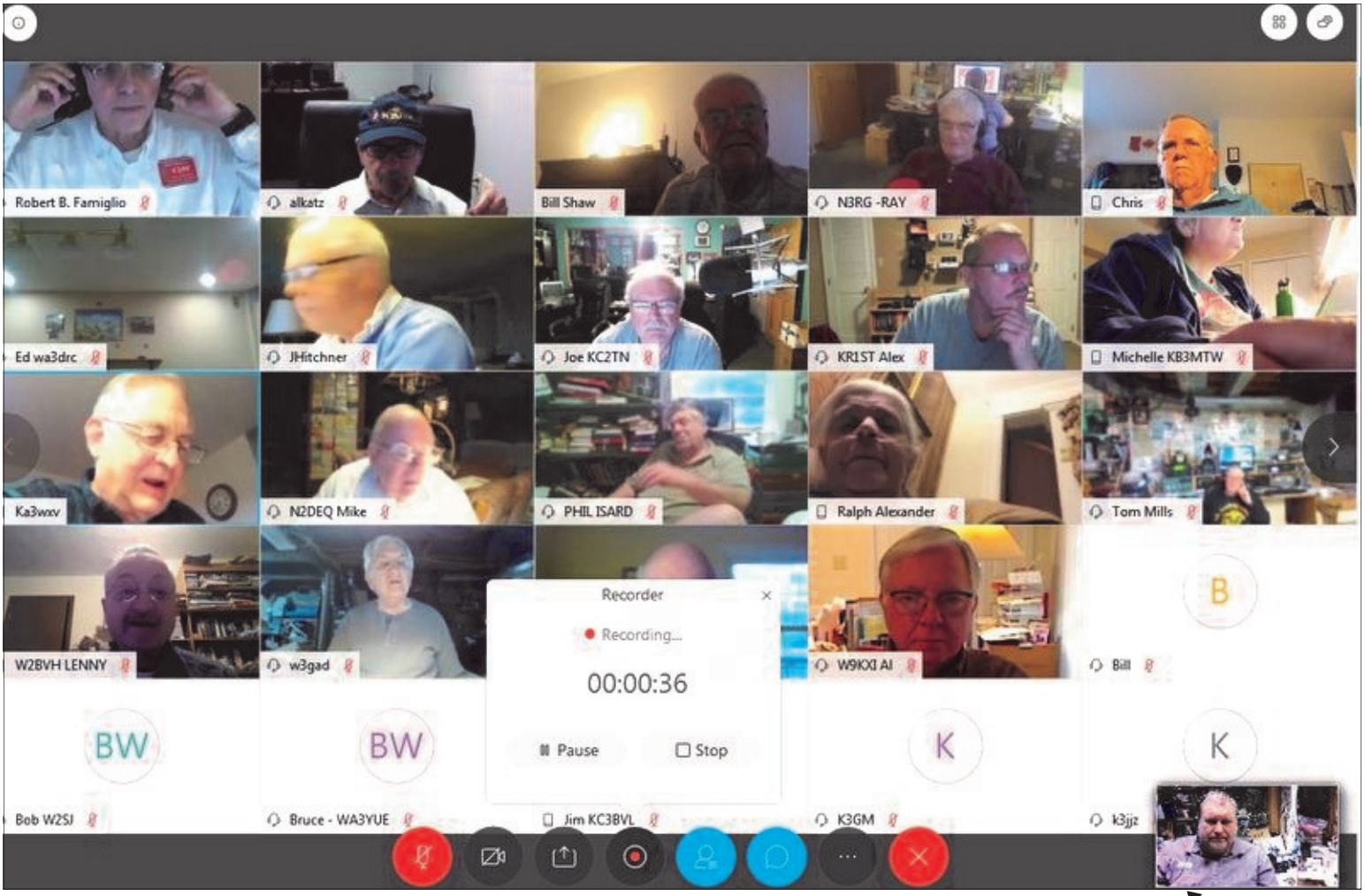
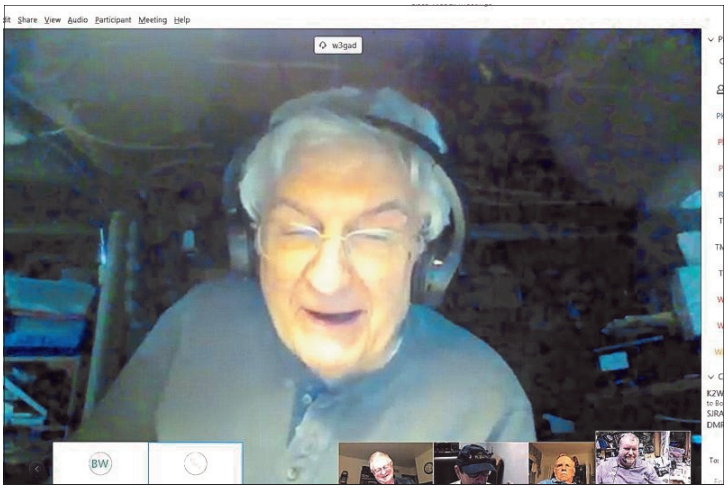


Tnx to Ken K2WB for hosting the April meeting on Zoom. Thanks also for snapping some stills for Cheese Bits. Hopefully, as we gain experience, the meeting pictures will have some increased resolution. And (to be even more optimistic) we'll be back to in-person meetings some time soon. (But not too soon!!). —W2BVH

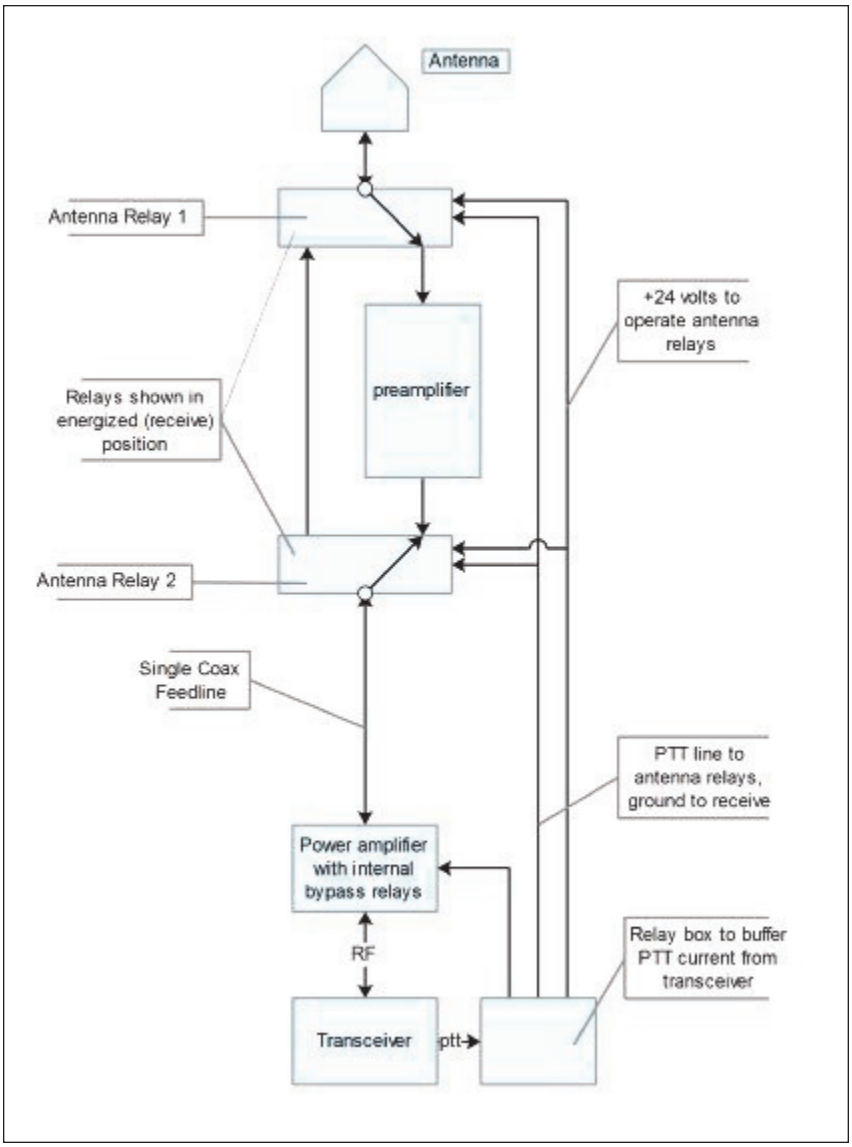
# Sequencing for VHF Stations

By Russ K2TXB

From time to time I see questions and comments on the various reflectors and chat pages, about the best way to protect equipment via sequencing. Having some experience in the matter I thought I would write something up.

First, why do we need sequencing? Well if you have a simple setup where you just have a transceiver connected directly to an antenna, you don't need to sequence. But with more complicated setups you almost always do. There are two crucial pieces of equipment that need to be protected, your external antenna relay and your external preamplifier.

The normal setup for a well performing VHF station is a transceiver, possibly a transverter, an external power amplifier, an external (to the radio) antenna relay, and possibly an external preamplifier. This will be more complicated if the power amplifier has a set of internal relays to bypass the amplifier. The radio has a PTT output line that we use to operate the antenna relay and key the amplifier. Also, if only one transmission line is in use, a second antenna relay is required on the tower, to switch the coax feed from the output of the preamp, to the main antenna relay when it is in the transmit position. Both relays are operated at the same time. (See the diagram below.)




Note that this is wired so the antenna relays are energized to receive. This is necessary for safe remote relay operation. In transmit the relay coils are not on. This means that if relay power is lost for any reason while transmitting, the relays will not switch, and your equipment is protected. Also when you power down your station, the preamp will not be connected to the antenna, so it will be safer from any nearby lightning strikes or static discharges.

Many lower power amplifiers have a feature called RF sensing. This can be used to key the amplifier automatically, without having to connect a wire to 'hard key' the amp. This is a bad idea! I will discuss that issue in a bit, but for now only consider the situation where you hard key the amplifier.

When we want to start transmitting, we grab the mic, press the PTT button and start transmitting. If there is no sequencing, the transceiver starts making power immediately. At the same time the

antenna relay is switching and the power amplifier is keyed. Since it takes a little time for the antenna relay to switch, what happens is that power is sent up the coaxial line before the relay has finished switching. This can cause 2 problems:

1. Since there is RF power on the coax line, the relay will generate a spark across the contacts when it closes. This is called 'hot keying' and must be avoided in nearly all cases (except when doing it with very low power – a few watts at most).
2. If you have a single feed line going up the tower then the rf will be sent into the output port on the preamp, for a split second every time you key up. If you are not running a lot of power, you may get away with doing this for a while, but eventually you will damage the preamp, the relay, or both.

So how do we solve the problem. A sequencer is a device that you connect to the PTT output of your radio. It has several output lines that send the PTT signal to your amplifier, your antenna relay, and anything else that needs to be operated from the PTT line. It is arranged so that each output line from the sequencer is keyed sequentially so that everything is not keyed at once. The output lines are usually numbered, 1 through 4 if there are 4 outputs. So, first line 1 is activated, then 2, etc. When the PTT from the radio is released, the sequencer operates in reverse, releasing #4 first, then 3, etc. Most sequencers have switches or relay options to allow an open or a closed contact, for each line, when activated. Here is a simple setup for each stage:

PTT from radio applied to the sequencer:
Line one activated, operates just the antenna relay.
Line 2 operated, keys the amplifier.
Lines 3 and 4 activate but are not used in this setup.

PTT from radio released from the sequencer.
Lines 4 then 3 are deactivated.
Line 2 is released, turning off the amplifier.
Line 1 is released, switching the antenna relay back to the receive position.

Now you can see that the antenna relay would not be hot switched. The amp is not turned on until after the relay has operated. But there is a problem. The radio started making power immediately, before the sequencer could operate any of its outputs. This is where the RF sensing feature of a power amplifier is bad. The amp can start making power before the sequencer tells it to turn on! So, in all but a simple, low power situation, RF sensing should not be used. Hard key the amplifier and disable the RF sense. Some amplifiers have the ability to disable the RF sensing, but in many cases one would have to actually disconnect the RF sense mechanism inside the amplifier. This problem is normally only present with what we call 'brick' amplifiers, solid state amps that generate up to a few hundred watts. Tube amplifiers and high power, solid state amps normally do not have RF sensing.

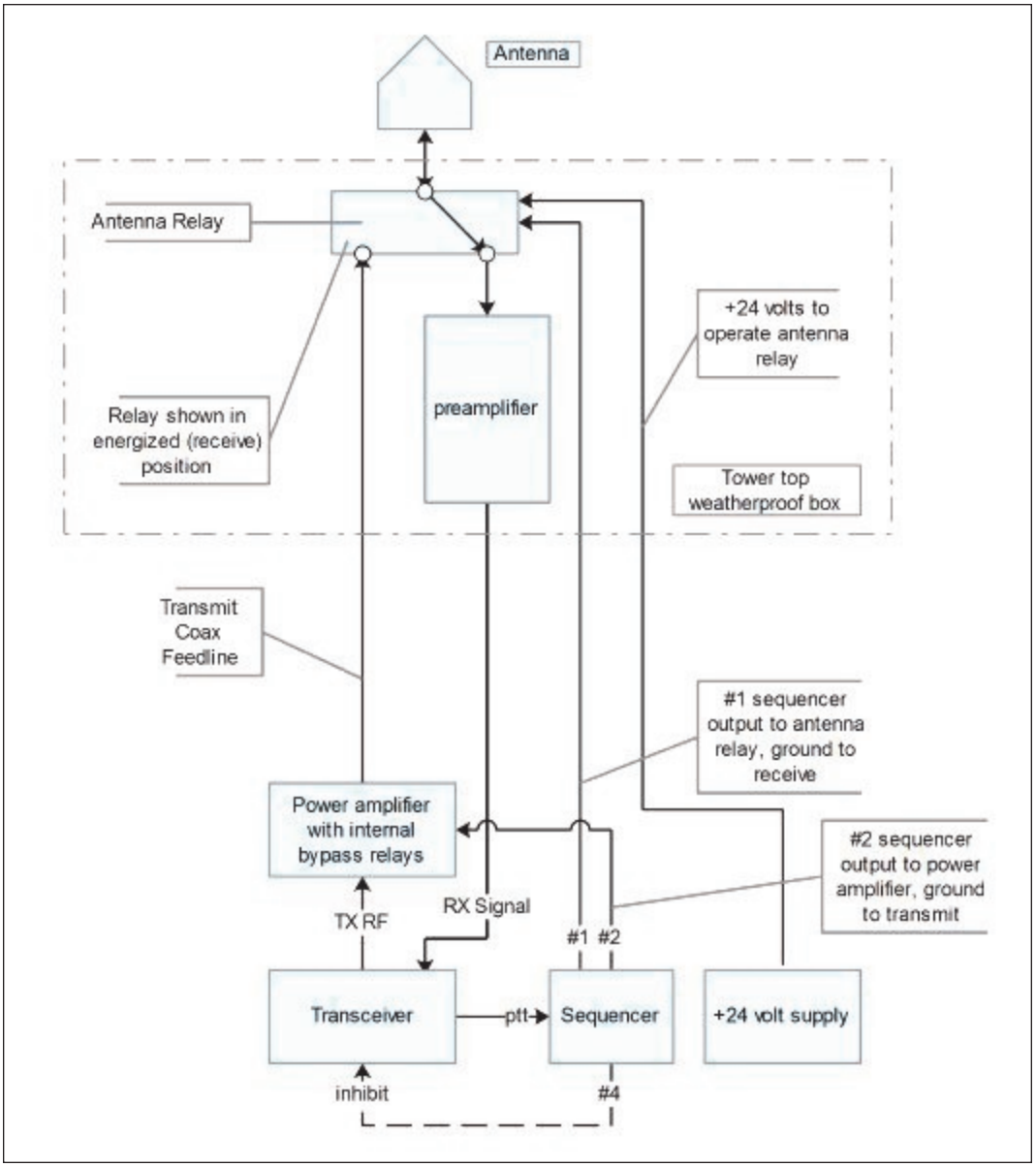
Ok, so we have done away with RF sensing, but there is another problem. Most 'brick' amps, and many high power amps have bypass relays. This is needed so that the receive signal can pass through the amp on the same coaxial line that is used for transmitting. It can also be useful when the amplifier is turned off if you only want to run low power. But now what happens when you key the radio? The RF from the radio immediately passes through the bypass relays on the amplifier and is applied to the antenna relay, before it switches. Again, the relays will be hot switched and the preamp can be damaged.

So, what is the fix for this? Well there are several possibilities. For many years I have used two feed

lines up my tower. The main line is only used for transmitting. The other, smaller, line is only for receive. The small coax is connected directly to the output of the preamp, so no relay is needed there. In the shack the receive coax goes directly to the receive input to the radio, or transverter. (In most cases the radio will have to be modified to provide a separate coaxial connection for receive only.)

This provides a couple of improvements. Only one antenna relay is now needed, switching the antenna from the transmit line, to the preamp during receive. So, there is never any possibility of damaging the preamp by applying RF to its output port. (Another advantage is that it is now possible to apply your receive signals to more than one receiver at the same time.)

Notice how much simpler the tower top circuit is now. See Diagram at right. ⟶




Now if the drive requirements for your power amplifier are low, it won't matter much if power goes through the bypass relay for an instant when you first key up. The antenna relay can handle being hot switched with a few watts. But these days most HPAs need 40 or more watts drive to produce full output. That is enough power to destroy that expensive antenna relay over time. One solution is to remove the bypass relays and use the amplifier all the time. I did that for years with my tube amplifier. How it works is that the RF power is always applied only to the input of the amp, and so the amp will not pass or make power until it is keyed; so all is well. But what if you want that bypass feature? Well there have been a number of solutions to that problem suggested and that is the main reason I decided to write this article. My assertion is that there is only one fool proof way to handle this situation. First let me address a solution that is often proposed and used.

Many times I have seen the suggestion to not let the radio key the PTT line. Instead, key the sequencer directly with the microphone PTT line (or foot switch) and then let the sequencer key the radio when everything else has finished switching. Sounds great, right? Yes, it will work in the simple case where you are only operating in voice modes and you never key the radio any other way. But what happens if you want to use CW VOX or even voice VOX. Now there is no way to key the sequencer if it is not connected

to the radio PTT. If you never use VOX maybe you are ok, but what if VOX gets turned on by mistake. It happens, and when your radio keys up via VOX the sequencer is totally bypassed. In fact it never comes on. So, in the single coax system, your power is applied to the output of the preamp and it blows – immediately! The same thing would happen if you press the MOX or send button on your radio. Especially if you were in FM mode, full power from the radio will be applied. So, I find this approach of keying the sequencer directly, dangerous. What else can be done?

There are still a couple of solutions that are completely safe. One is called 'transmit inhibit'. This is a connection to your radio that, when asserted, will prevent the radio from producing RF power even when it has been keyed. A few transceivers have such a line, but most will require some kind of modification, or special external circuit to make a TX Inhibit function. More on that later. Now let's look at the sequencing:

1. PTT activated from the radio. No RF output because TX inhibit is asserted from the last stage of the sequencer.
2. Line 1 is activated, operating the antenna relay.
3. Line 2 activates the amplifier.
4. Line 3 not used.
5. Line 4 de-asserts the TX inhibit line to the radio and RF starts being produced.

1. PTT from the radio is released.
2. Line 4 from sequencer is released, putting radio back into TX inhibit mode. RF stops.
3. Line 2 is released unkeying the amplifier.
4. Line 1 is released switching the antenna relay back to receive.

Look back at the diagram above, at the bottom there is a dashed line that shows the transmit inhibit line connected from the sequencer to the radio. Now, no matter how you key your radio, nothing can damage your expensive, hard to work on, tower mounted relays and preamplifiers.

Ok, so how do you implement TX inhibit. Well, the radio may need to be modified if that function is not available natively. But one solution that can work is to use the ALC input line on the radio. That line is normally connected to an external amplifier so it can reduce transmit power if the peak signals from the amplifier are too high. It usually works by applying a negative voltage to the ALC input line, reducing power. But if you apply a sufficient amount of negative voltage, **the radio will not make any power at all**. So, if you wire your system to apply negative voltage from the sequencer to the ALC input during receive, and remove it during transmit, you have a TX inhibit line. That will work fine, but there is one possible problem - the ALC time constant. In my Kenwood TS-2000 it took about 2 seconds to discharge the ALC timing capacitor once -7 volts had been removed from the ALC input. That is way too slow for most operators to contend with. Other radios seem to have faster acting ALC and so this scheme may work much better for them. I had to find another solution.

After much investigation of the schematics and service manual I finally found a trace called VTXB that supplied +7 volts to the lower level circuits during transmit. I cut the trace and put an NPN transistor across the cut. Now when I supply + voltage to the base of the transistor the transmitter comes on (if PTT was asserted). But the PTT circuit and everything else still work normally. So now I have a fool proof system. No matter what I do, I cannot cause power to hit my relays or preamps before everything is in transmit mode.

Most other radios likely have some similar circuit that can be exploited to provide a TX inhibit and I believe that is the best way to go. I only wish that manufacturers of all amateur radio transceivers would provide that function.

For those who use transverters, there is another option. You can provide a small antenna relay on the VHF output of the transverter. The relay switches the output to a small load resistor when the sequencer is in receive condition. Then the last stage of the sequencer switches the transverter output back to the amplifier. This will only work for low power transverters, but it is a very effective solution and does not require modification of the transceiver.

In the final configuration, here is the sequencing of my station:

1. PTT from radio applied to sequencer.
2. Line 1 of sequencer disables my manual polarity switch for the two meter crossed Yagis (so I cannot accidentally switch polarity when transmitting).
3. Line 2 of sequencer switches the antenna relay to the transmit position.
4. Line 3 of the sequencer keys the power amplifier.
5. Line 4 applies voltage to the TX inhibit line to the TS-2000, enabling RF power.

1. PTT from radio dropped.
2. Line 4 from sequencer removes voltage from the TX inhibit, stopping radio from making power.
3. Line 3 unkeys the power amplifier.
4. Line 2 puts the antenna relay back into the receive position.
5. Line 1 enables my manual polarity switch (used for EME operation).

I should note that with the TX inhibit line I could likely just turn everything except the polarity control on and off at the same time, only needing 3 positions on the sequencer. But the sequencer makes connection to control lines for all the external equipment easy, and I like the safe feeling of controlling exactly how things are working.

There is one more thing I should mention about antenna relays. It is not part of the sequencing discussion but should be noted. It is essential to place a power silicon diode directly across the coil connections of all relays. Failure to do so will allow a large reverse EMF voltage ( sometimes up to 1KV for a short time), that is generated when the relay is de-energized, to feed back into your equipment and cause damage. Never use a DC relay without this protection!

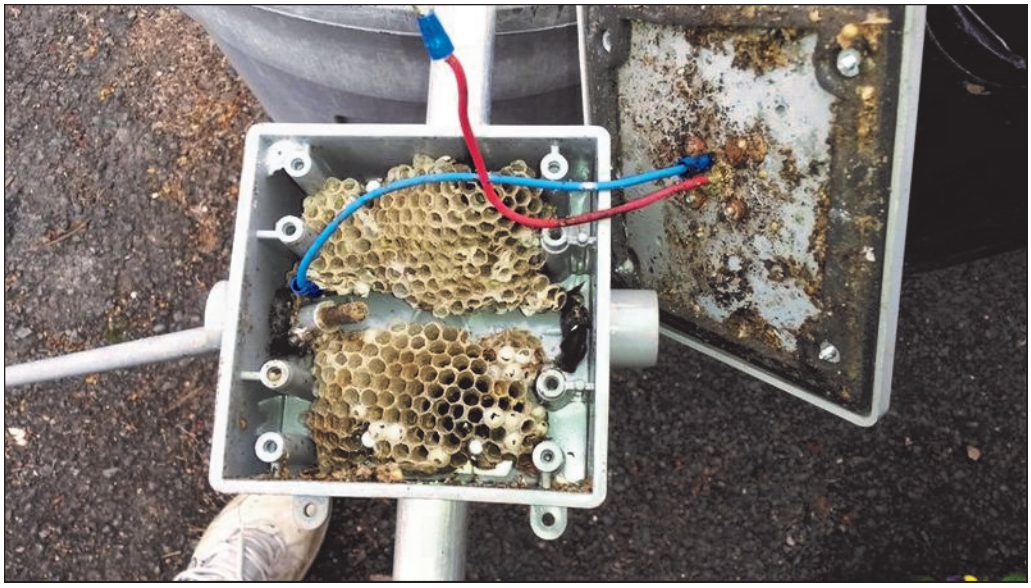
73 to all and I hope this article will help.

**Russ K2TXB**

The high winds we had in November 2019 had brought down my 6m yagi. Last weekend, (3/30/20) I finally got around to salvaging what parts I could from it. When I opened up the box with the connections, I discovered that yellowjackets had taken up residence in there. They really made a mess of it too.

I apparently don't run enough power to scare them off.

**-Bill WS3O**



Hi Lenny,

Here's a photo you might find amusing, in light of recent 2M AM discussions in the newsletter. I'm taking advantage of working from home to finish up some projects that have been kicking around for a while. I have a nice, working Heathkit Two'er, and also had an old case with bad paint and corrosion, but no extra holes or dents. So I built a **high-end 1w 2m AM transmitter-receiver** inside the cabinet, and gave it a classic 1960 paint job. Jim Davey and I call these Hot Rod Radios, a natural consequence of growing up in Michigan.

Best Regards,
**Rick KK7B**

# 2m Spring Sprint in Florida—K1DS

Since I had the antenna out and the rig set up for the ARI EME weekend, I was able to keep it out for another day as the 2M Spring Sprint was on the following Monday. With my first CQ at the start, I managed to get a response from a ham in my own grid in EL96. Things went quiet for the next 15 minutes despite multiple CQs on both SSB and CW. I scooted down to 144.174 and saw several FT8 signals and I was able to work all three callers within minutes. I was using my 350W SSPA but the 14 element Yagi antenna was only 8' off the ground. Propagation to the north was limited as there is only a 12' slot between two buildings, and pointing the antenna in that direction was very noisy. There is a higher location a few miles away in the parking lot of a golf course, but the gate is locked at sundown and I would have needed to take my generator to have power up there. Of course, everything is locked down at this time with the corona virus pandemic. As the time wore on, I picked up another 6 stations for a total of 10 QSOs in 4 grids. Things were very quiet by 9PM and I went QRT. Tuesday morning found me disassembling the antenna and minitower and getting it back into storage in our CCR community. 73, **Rick K1DS**

## K1DY 432 Sprint Results

Wasn't shaping up to be a great contest night! Couple inches of snow in the AM then a front came through with strong winds and below freezing temps. Conditions were WORSE than 222 last week, if you can believe that. Struggled with K1TEO in FN31 early on CW, then just before 11 he was LOUD on SSB. Once again didn't work my own grid or any contiguous grids.. Well, anyway thanks to all that got on! Results : 3Q's, 2 Grids for a SOLP op in FN54JQ
**Bill, K1DY** in Maine

## *122 GHz Rig Construction*

This month's QEX (the ARRL bimonthly experimenters magazine has a fine article on how to build a 122 GHz transverter. All the 122 GHz "magic" resides on a single chip so making the transverter is reasonably accessible to mere mortals. You can read the article by going to http://www.arrl.org/arrl-magazines and clicking on the current hyperlink to QEX . By the way starting this month QEX is now free to all ARRL members (internet only — not hard copy). There was a group buy for this project, but it is oversubscribed and is now closed. But there is still useful info. Go to https://fundrazr.com/122GHzProject

# K1DS 432 Sprint Results from FL

I spent a few hours putting up the long 432MHz Yagi and assembling the station the day before the Sprint. Using the fiberglass military mast and rotating the antenna with a guide rope on the front of the beam, I was able to erect it and rotate it easily, and disassemble it easily. Now for the serious part--activity and results in southern Florida. If you thought that the 10 QSOs in the 2m Sprint was weak, what would you say about the 4 QSOs I made in the 432 Sprint? I guess I really can't complain as I wasn't expecting much more. There are very few active VHF stations down here, save for 6m. Most of the VHF and Up gang are in the northern part of the state. From where I live down here, we have Ft. Lauderdale, Miami and Cuba to the south, Atlantic Ocean east and mostly the Everglades to the west. Considering that the beam has a small slot between my building and the next, with large trees and other buildings to the north, I was lucky to work WB4OMG in EL98 to the north of me. I worked 3 others to the south of me. That's why EME is likely more successful than terrestrial VHF in South Florida, or perhaps I ought to go back to HF! 73,
**Rick K1DS**

## Transatlantic QSO's on 432 MHz

The first transatlantic QSOs on 432 MHz were completed 4/7/2020 between FG8OJ (Guadeloupe) and D4VHF Cape Verde) at a distance of 3867 KM. This is a first for a terrestrial QSO on that band. Propagation mod was probably marine ducting. A few days later a QSO was completed between D4VHF and WP3ND in Puerto Rico at a distance of 4367 KM. Both these are at distances further than recent VHF / UHF attempts between Nova Scotia and Ireland. More details can be found at https://ei7gl.blogspot.com/2020/04/first-trans-atlantic-contact-made-on.html?m=1 Congrats to the ops!!

Courtesy of Ron, WZ1V, the contents of the WZ1V beacon list have now been added to the database map page at: http://w3sz.com/map.php Ron's excellent beacon list is at URL: http://www.newsvhf.com/beacons2.html
As with the other data, you can see all the beacons or select by band or by call sign. The pop-up data presentation is slightly different than for the fixed and rover stations. For the beacons: Hover shows call sign, grid, (bearing-distance-reverse bearing), and frequencies. Left-Click shows call sign, grid, (bearing-distance-reverse bearing), frequencies and band details as given on Ron's site. Double-left -click shows path profile.

73, **Roger Rehr W3SZ**

## *K1DY 222 MHz Sprint Results*

Another half-hearted attempt.. We finally got AC power back after 4 days but I still had no internet so was on ON4KST chat with a cellphone with a very marginal connection. Condx were poor but still better than they were on 2 last week.. Guess things built up at the end but I was pretty fried by then.. Best DX FN31 (K1TEO and WZ1V). Didn't work my own grid or even any contiguous grids.. Total: QSOs = 6 Mults = 4 Total Score = 24 CU.

**Bill, K1DY** in Maine

# MICROWAVE SPRINT 2 MAY 2020

**By Ken KA2LIM**

This story starts back in mid-March when I acquired a 1296 transverter in a trade deal. Previously I had gotten rid of all the spare 1296 equipment when I the dismantled the K2LIM contest station in 2019. So here is a photo of the DEMI 1296 transverter that I acquired (25W output). I added the double oven 10 MHz reference so I could be stable and on frequency.

So I got to thinking, what am I going to do with this? (Light bulb comes on!) The microwave sprint is coming up. I'll put together a 1296 station and run that band only for the sprint.

Next I got the two 25 element loopers that Al—W9KXI has hanging in his garage. Brought them home and mounted them vertically stacked, then put them on a 30' tower (tilt-up) that came from the K2LIM contest station. The tower already had a rotor installed so I only had to add the rotor cable and add ¼" super-flex (hard line) to the antenna system. Here is a photo of the tower up with the antennas pointed toward FM29 (New Jersey way). Elevation where I was setup is 1330' asl with a horizon of 3 miles closest to 15 miles the farthest.


And, here is the IF rig (Yaesu FT-847) transverter and rotor control. You can see the horizon to the South out the car window.

I started operating just after 0800 local time. My goal was to work 5 stations on 1296 with 25W and the 2x25 antennas. Band conditions were pretty bad after 2 days of rain and cool temperature. My first contact went in the log at 1212 UTC and the last at 1503 UTC. I worked a total of 7 stations in 4 grids. They are as follows:

W9KXI-FN12ne (5mi), AA2UK-FM29pv (194 mi), N3RG-FM29ki (217 mi), K2UA-FN12gm (40 mi), K1RZ-FM19jh (202 mi), N2WK-FN03xe (92 mi) AND VE3DS-FN03fq (172 mi).

This little project shows what can be done with a small setup and it is now available to loan out to anyone who wants to experience some FUN. Maybe new fun on a new band for someone. See you in the June contest.

**Ken KA2LIM**

# *Microwave Sprint de W9KXI FN12ne*

I was <u>really</u> looking forward to this Sprint. I was… **<u>excited</u>** by the prospects of this Sprint even though I only had one band: 23cm.

Going into Saturday, the following thoughts ran through my head:

The weather for Saturday looked good.
I had made improvements. Modest, but improvements nonetheless.
50 watts to a 45 element looper at 35 feet.
I had had an objective of 5 Q's for January but fell short of that. Certainly 5 Q's were attainable this time.
I've worked K1RZ before - slam dunk
I've worked AA2UK before - slam dunk
I've worked K1TEO before - slam dunk
To my North, less than a mile away from my house, is an obstruction, Prospect Hill, which towers another 400 feet over my elevation. But I worked Rochester once, in spite of that hill.
I've copied VA3ELE, in spite of that hill before my "improvements".
This time, Ken, KA2LIM, from his LOFTY portable perch and I would be sharing the same frequency. He would have the *location* advantage and I would have the internet with all of its resources. He and I had 2M FM Liaison at 146.50.

Certainly, No **<u>definitely</u>**, 5 Q's were definitely "in the cards."

I was Ready (spelled with a capital R). As I went to bed Friday night, I was filled with anticipation, the anticipation of a very successful Sprint. [Certainly, No **definitely**, 5 Q's were definitely "in the cards."] Friday night I slept terribly.

By 7:45am Saturday morning I was on the chat page, mug of hot coffee in hand. At 08:00am I started looking for my 5 Q's…

In short order my hopes were DASHED! There is NO SANTA CLAUS!!!!

The dialogue went something like this:
Ken: Do you hear X3XXX (I forget the call)?
Me: Nnnnno, I stuttered.
Ken then holds his FM microphone up to the speaker of his FT-847. That signal was "hammering"….HAMMERING in at his location…just 6 miles away.

That scene was repeated again and yet again.

My hopes for 5 Q's were dashed. I was crushed. Humiliated. It was like that High School dance where I asked the cute girl to dance and she said, "No." Yes. Something like that.

My results? In the end I had 3 Q's, only two of which counted. Ken had a (ham) visitor and I worked him on Ken's equipment. In addition to Ken, I also worked Russ K2UA.

By 10:30 or 11:00am. I was done. Done!!! Would I go through all of this again?? You betcha!

# K2EZ Microwave Sprint in Texas

Sorry I missed you all in the northeast. I did get out and roved down here in TX during the microwave sprint. This was my first Microwave operation in Texas. Ironically I saw more activity in this sprint than I have in any of the lower frequency bands in Texas. It also was my best Microwave Sprint ever for any location. I attribute this to having more microwave practice and 902 thru 3456 being part of Rover's full time setup.

This was also my first ever 6 grid sprint. It was also the first time I ever got Qs on 3456 further than 10km. The furthest being 142KM. That alleviates my concerns about that setup and I now better know what to expect out of that band. In fairness, the only prior opportunity to use 3456 (and 2304) was the January VHF contest. Somehow I got more 902 Qs than 1296 Qs. I would have expected to get more 1296 Qs.

Best DX in the sprint was with K5TRA at 187km and worked him on 902, 1296 and 2304 at that distance.

Results: 13 Qs on 902, 12 Qs on 1296, 8 Qs on 2304, 5 Qs on 3456. So 38 Qs total yielded the 5112KM total distance. I also burned 19 gallons of fuel in the sprint for an even 2Qs/gal. 73 **Andrea K2EZ**

# K2EZ Big Tropo Opening in Texas

The southeast has been wild these past few days (5/4/20). Hot conditions managed to stretch far enough into TX to cover my location down here in Brenham TX, EM10. In these conditions I worked stations in AL, MS, GA and FL. About half the contacts were with Florida and almost all were SSB.

Some of the big guns like K5LLL were able to run FL stations up the bands to 23cm, but I missed the early opening he did that on. I did make two contacts into FL on 1.25m and one CW contact on 70cm into FL.

One station, Jose K4IS in Ft Lauderdale was my best DX on 2m at about 1,650KM (1,025 miles). Jose and I tried for higher frequencies, and we could hear each other on 1.25m but just couldn't close the contact. No copy at all higher.

I was able to connect with N4TWX on 2m, 1.25m and 70cm at about 1350km, (840 miles). We tried to go to 33cm and 23cm but no copy on those bands.

So my personal best stands at 1025 miles on 2m and 840 miles on 1.25m and 70cm. This was using my regular rover setup at a higher spot in town, but it wasn't particularly high in the low rolling hills of this area.
73 **Andrea K2EZ**

This is my spot about 2 miles from where I stay. Beams are pointed across the road towards Florida in these pics. It isn't exactly an exceptional location, but it is a higher spot away from the noise in town.

# 23 CM "First Light" at WA3QPX

[Sent to Cheese Bits by Al, K2UYH]

Hi Al, Made first contacts today on 23cm with 3.5meter tvro dish, 250 watts, Demi preamp and transverter with Flex 6300 on WSJT. Shiny stuff on dish is duct tape reflecting sun to check focus on OK1DFC septum. The focus was not where the tvro dish manufacturer said it would be. I also use the Demi weak signal source, LWSS, unit to peak signal while sliding septum looking at my Iphone remotely connected to my Flex. It saved a lot of back and forth to shack. LWSS covers amateur bands 24 MHz to 47 GHz with internal synthesizer or 10MHz input. It runs on 9v so I put it a 1/4 mile away in a field. Tnx DL0SHF AND OK1IL for putting up with this newbie on 23cm.

73, **Paul WA3QPX**

## Update to My Log Download / Data Analysis Article in Cheese Bits

I wrote an article in the last Cheese Bits about my work in downloading the available VHF public logs from the ARRL and processing them into structures for analysis. I had intended to put that work aside for now and come back later to it, but an editor for NCJ had some interest in turning it into an article.

The submitted article is the PDF document in the following URL (the same as in Cheese Bits), **along with my completed work on a second JSON structure.** I don't have an "ask" here, just updating the membership if anyone has an interest in this work. (For now, this is just going to the members' reflector.) See http://k0bak.com/VHF/ARRLlogs/downloads/

**-- Pete K0BAK**

# Dick K2RIW, SK

[ Dick became a SK recently. Here are just a few remembrances of this “genius” of UHF/ SHF ]

It is with great sadness for LIMARC and the amateur radio community to report to you the passing of Dick Knadle, K2RIW. For 38 years we have been blessed by the presence of someone who wanted nothing more than to teach others about all there was to know about electronics, ham radio, and just about anything else an inquiring mind would want to know. Dick was brilliant and all of us were covered by the light of learning that he cast upon us. There are no funeral arrangements at this time and in the present circumstances, much is uncertain. We will keep you informed. At some point, we believe there will be a memorial service for him when we can all be together. —**LIMARC**


Our deepest condolences to the family. We will miss you Dick. K2RIW was a real leader and a ham’s engineer. Dick would take sometimes very advanced technical topics and transfer them down to practical working designs. I built many of the W6AJF Frank Jones designs and drooled at some of the others and then Dick came out with his Tripler Amplifier design which put into practice some of the W6AJF concepts along with detailed technical descriptions. A number of folks tried 2 4x250 in push pull configurations with very little success, Dick’s parallel 4x250 design became a real performer on 432 with many many copies produced. He was one of the main motivators of the Rodanthe, N.C. DX expedition (see the Pack Rat web site write up) . His 12 foot stressed dish was always a hit at antenna measuring parties (and at the Pack Rat June contest 1296/2304 operation). The ratiometry and snow shovel techniques to optimize a scaled 13 element 2 meter yagi to became one of the most used 432 antennas through the 70’s and 80’s. 16 of these designs with the separation option for 6 foot crates made it to South America for the HK1TL expedition along with the half wave length strapline 8938 amp concept. You now share the legend with many of the bright stars of VHF + radio world. **Walt K3BPP**

For several years during the 1970s I had almost nightly QSOs with Dick on 432 MHz. Propagation was usually no problem with his16 antennas on 432 mHz with the ability to feed one, two, four, eight or all sixteen when needed. I built from scratch his 4CX250 amp design and his RIW-19 element beams. The amp took me close to a year to complete and I doubt it would have worked without his guidance. I used the amp and antennas for EME until a move in the mid 1980s. The amp was again used up unitl about five years when a power supply problem developed. You can tell by the mule eating briars grin on my face how glad I was to finally meet him thirteen years ago: http://www.w4dex.com/albums/Microwave-Update-2007/DSCN2283.jpg RIP OM, **W4DEX**

I would say that Dick Knadle was a true genius. Looking at all he accomplished, it is mind boggling. He developed a fantastic method for building an in expensive parabolic dish antenna. He developed two fantastic 432 yagis at a time when things were done the hard way, by intuition, smarts, and hard work with an accurate antenna range. He also popularized the hardware for such a range using the ratiometer. Add in the stripline 432 kilowatt amplifier, and his 432 "Zoom" antenna. That is quite a list. He even worked on using rain gutters for ham waveguide construction. He stumped me many a time with his simple questions about electrical phenomena. The 432 band will never be the same after his passing. 73 **Dave K1WHS**

Besides being a Genius, the other part is that Dick Knadle was a really Nice Person. He was always helping new folks. He was patient. He was the kind of person that, never mind how intelligent he was, we will all miss his smile and his positive outlook the most. I remember working him on 10 GHz back in the Mid -90's from Quabbin Tower in Central Mass to his QTH on Long Island. My CW is awful but he copied my 200mw and sent back at my speed (about 2 wpm), and we completed. It took about 20 minutes but he was just as enthusiastic and happy with the contact as I was! After one N.E.W.S. meeting, I had a bunch of the guys over to my house for some cheeseburgers on the grille and a soda or a beer. Of course, he had his calculator with him. We were on our front porch. He came over to me and said it's FN32sb84eh09 at this end of the porch. He told us all the story about listening to one of the Apollo Moon Missions. I asked him what frequency NASA used and he said it was in the 2 GHz range. And he told about some government folks that knocked on this door when the government found out that he had listened in to the Apollo communications. He didn't get in any trouble, but they scrutinized his listening activities for a while. And, he was answering questions and helping new hams weekly on the Limarc repeater for years and years. A True Giant of our Ham Radio Community, Bless You! 73 **Mark Casey, K1MAP**

I remember Dick, K2RIW, very well. It is so sad to hear about him and a lot of others that have passed in the last few years. But they are good memories. When I first got on 10 GHz, I had 200 milliwatts into a 30 inch dish, atop my 100' tower. I would work dick over a 101 mile path almost every day, sometimes several times a day. Sometimes it was very weak signal CW, but more often SSB quality. We discovered that sometimes at night the band would suddenly open and we would work with 20/9 signals (Dick was also running 200 or 300 milliwatts at about 100 feet). We could not tell when the band was going to open by observing conditions on 2 meters. Later Dick was fascinated by listening to the doppler shift of signals when it was raining and cars were passing by on the street. I think he had a way to calculate their speed. As many here have said, he was extremely knowledgeable, and very kind and helpful to those of us who were not at his level. We have wonderful memories of all the old timers who have passed on. **73, K2TXB**

Dick is seated, Jay with the cig and sideburns.. They were both in engineering school at Pratt Institute in Long Island at the time, but Dick looks like a high school kid!! **—Bill K1DY**

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

Nibbles from May 1970. Vol. XIII Nr. 5
de Walt K3BPP
(*author's comments in italics*)

[This month's "Wayback" is conducted by Walt K3BPP, while Bert K3IUV recovers from his recent illness. Thanks for picking this up Walt and allowing the column to continue while Bert rests up. And thanks to Bert for the many years of coverage … on behalf of the club: "feel better" —Lenny W2BVH]

- This issue started out with some great words of wisdom from Ernie (W3KKN ) current pres. His comment is that strangers instantly become friends once they each realized they are both hams , a world wide activity. *( P.S. No dues for Ghost Writers )*

- Cheese Bits contributions (May1969 Through April 1970 ). Contributions were made by 18 members. The leaders were K3WEU Paul Behrmann and W3KKN Ernie Kenas both with 10 articles.

- Silent Key W3MVF Dave Block. Dave joined the club in 1958 and was treasurer from 1960 until 1970.

- Greatest Transmitter Hunt. Lee K3MXM, Candy WA3CND and John WA3ERQ put on the greatest transmitter hunt. 11 cars showed up. This was the last of the 6 meter hunts. Most realized that 6 meter direction finding antennas are quite large. *(If they could only see some of the super rovers of today )*

- May Calendar of Events. May 2 Ladies Night *(first one held Nov.8, 1956 ).* May 13 Board meeting K3MXM's QTH. May 17 and 24 June QSO Party Planning at W3CXU's QTH. May 20 Monthly Meeting, West OaK Lane Jewish Comm,Ctr.

- Future Events. June QSO Party ; Antenna Measuring Contest ;Pack Rat Picnic 2nd Sunday in August.

- From The Book Rack. (By Paul Behrmann K3WEU ). Installing and Servicing Home Audio Systems by Jack Hobbs, $7.95 Hardbound. Everything you needed know. (*Back when you could still fix things.)*

- ARRL Bulletin. Western Union facsimile equipment will be coming available to the amateur community.

- New Products ( By Lyn Roland W3NSI ) VHF UHF Solid State Equipment by Spectrum International Topsfield , Mass. Braun of West Germany importing: 432 converter $69, 144/432 Varactor Tripler $75, 144/432 Transverter $47.50, 12V Rechargeable Battery, Various Gel Cells, Wescom Transistorized Noise Blanker. And by W2AXU Jack Power, a nice write up on a very short pulse noise blanker for $29.95.

- First January VHF SS Contest. January 1957 (by W3SAO Frankie Club Historian ). Recap of the club score with 27 entries and a total score of 50,177. W3CCX was in 3 rd place overall, with 84 contacts and 6 sections. (Not one call from back then is with us today.)

- Membership. Lifetime membership W3IA Tom New Members: K3ZSG Bill Murphy Norristown, K3DMA John Taylor Philadelphia

- Power Supply Design for SSB (by Jack Power W2AXU). Jack has a very detailed 3 page description of the design of a high voltage power supply to go with his 6 and 2 meter 4CX250 Amp described in the April 1970 issue of Cheese Bits. Both of these articles are worth studying in that very little home brew work of this type gets performed anymore.

- Swap Shop. (by Ray Whitehead W3ZRR) Comco 221.4 transceiver with power supply

…. Wayback cont'd

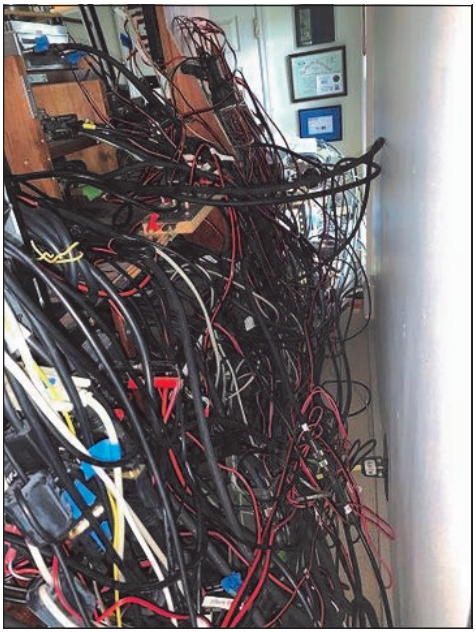
$35. Estate Sale: Heath Seneca $90, Clegg 99R with 4 ring Halo $100, 6 and 2 meter antennas with CDR rotor and control box $25 Signal Corps code Machine with 14 reels of tape $25.

- Meeting Notices. Directors Mtg May 13th at QTH of Lee K3MXM. Regular Meeting: May 20th West Oak Lane Jewish Community Ctr.

Inspired by the Corona Virus Outbreak — **Warren WB2ONA**


Lenny,
This...is the back side of the operating desk. I wonder if this would win some kind of contest? (I just added 2 more wires).

Stay well and 73,
**Al - W9KXI**
FN12ne



# Events

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

**6M Spring Sprint –Contest** - Saturday May 9, 2020. See https://www.sites.google.com/site/springvhfupsprints/home/2020-information for details.

**June VHF Contest - Contest** - June 13-15, 2020. See http://www.arrl.org/june-vhf for details.

**CQ WW VHF Contest -Contest** - July 18—19, 2020. See https://cqww-vhf.com/ for details

**222 MHz and Up Contest Contest** - August 1-2, 2020. See http://www.arrl.org/222-mhz-and-up-distance-contest

**10 GHz and Up Contest Round 1 - Contest** - August 15-16, 2020. See http://www.arrl.org/10-ghz-up .

**September VHF Contest - Contest** - September 12-14, 2020. See http://www.arrl.org/september-vhf for details.

**10 GHz and Up Contest Round 2 - Contest** - September 19-20, 2020. See http://www.arrl.org/10-ghz-up .

**2.3 GHz and up and Up Contest - Contest** - Details to follow

**Gloucester County ARC Hamfest - Hamfest** - September 13, 2020 Mullica Hill NJ. Details to follow.

**50 - 1296 MHz EME Contest - Contest** - Details to follow

**RF Hill ARC Hamfest - Hamfest** - October 18, 2020. Sellersville PA. Details to follow.

*KPH The Last Morse Code Station*

An article about the last commercial morse code station, call "KPH", can be found at https://techcrunch.com/2020/01/18/the-last-radio-station/ . There's a youTube tour at https://www.youtube.com/watch?v=UPTzvciqgJ0

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## Dayton Contest University Online and Free

This is a great online opportunity for those that have never been able to attend Dayton's Contest University. These are premier seminars held by the best of the best, covering a wide range of subjects. The normal $85 entry fee is being waived this year. You can now participate via Zoom online teleconference for FREE. — **Joe KC2TN**

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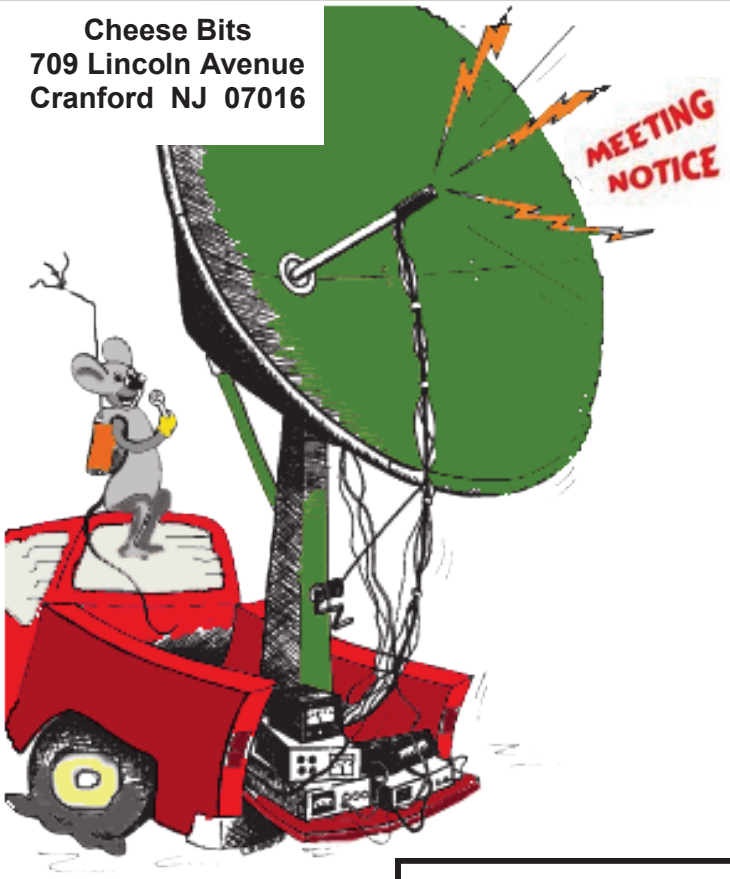


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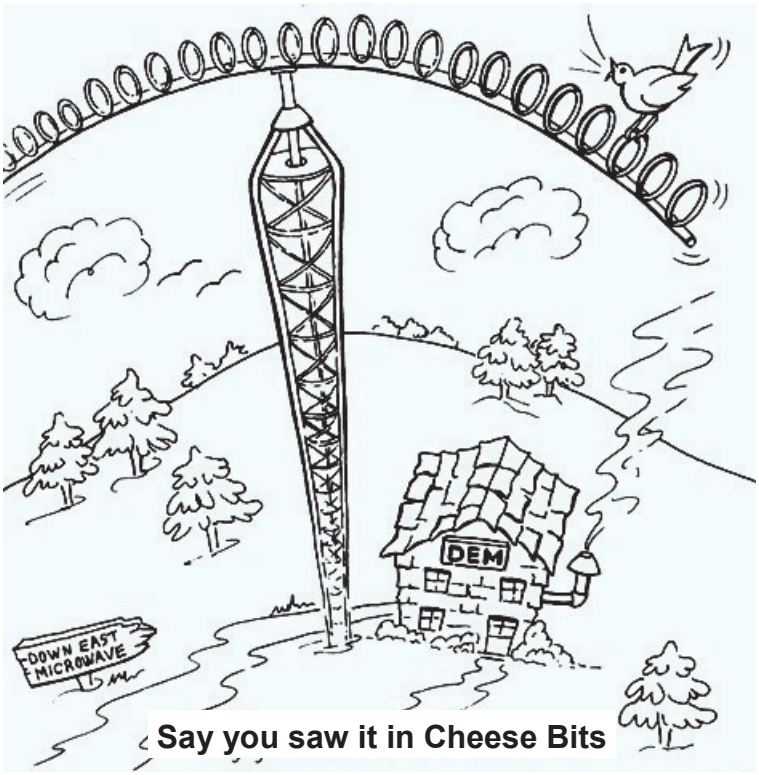


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