K9YA Telegraph

Robert F. Heytow Memorial Radio Club

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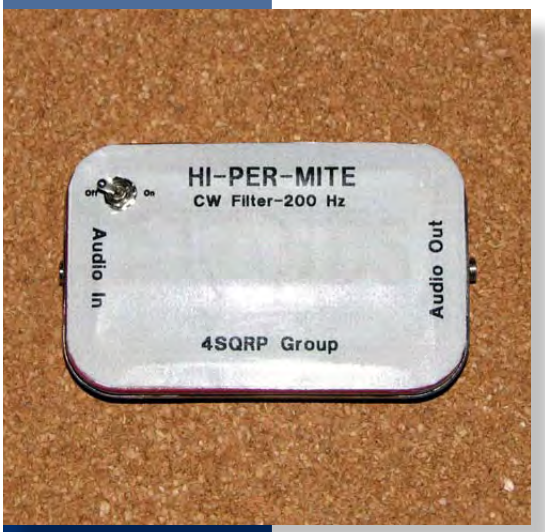

HI-PER-MITE

Audio Filter Kit by NMØS & 4SQRP

Philip Cala-Lazar, K9PL

Here's a neat little CW filter and audio amplifier kit, the Hi-Per-Mite from the 4SQRP Group. It's an inexpensive and quick-to-build station accessory that can pay big dividends in your operating efficiency and pleasure.

The "HIgh-PERformance SMALL audio filter" is another innovative design by David Cripe, NMØS, and can be built in to an existing rig or shared among rigs when housed as a separate unit. The Hi-Per-Mite is an improved version of David's original Hi-Per Audio Filter design published in the May 1994 issue of *73 Amateur Radio Today* magazine.

"…your operating efficiency and pleasure."

The Kit

My kit arrived with all components listed in the bill of materials; including sockets for the kit's two ICs and the resistors needed to configure the builder's choice of amplifier gain options. There are no toroids to wind and the club Website notes the kit can be assembled in 60 minutes—or less. That's right on the money—60 pleasant minutes at ARS K9PL. Prepping the enclosure including drilling, mounting, wiring and labeling occupied another 90 minutes or so.

Specifications from the 4SQRP Group Website

- Center Frequency: 700 Hz
- 3 dB Bandwidth: 200 Hz
- Signal Gain: 0 dB to 50 dB, user selectable
- DC Power: 5 to 13 VDC, <15 mA
- Audio Power: 500 mW into 8 ohms, from 9v supply

I chose an Altoids® tin to house my Hi-Per-Mite. Within the *Curiously Strong*™ mints container there's a 9-volt battery, power switch and two 1/8" stereo headphone jacks (Radio Shack® #274-0249). Now it can be shared by any of my several QRP rigs. The tin's inside bottom surface was insulated with clear 3M™ packing tape and the PCB secured with three strips of 3M™ double-coated foam tape.

From the assembly manual's configuration chart I chose amplifier gain option two, 20 dB, simply a matter of resistor(s) installed, or not. That boost is needed for my PFR-3; the Hendricks rig has been a great performer for me since 2008, in all but audio output. The Hi-Per-Mite now solves the low audio on that rig and others in the shack.

At this point I've foregone installing an audio bypass switch, but did include a SPST switch to conserve the 9-volt battery as I plan to use the filter as a semi-permanent attachment to whichever rig it's patched; primarily the PFR-3. The switch's terminals were insulated with shrink tubing to prevent shorts in the tin's tight quarters.

The Hi-Per-Mite enclosure label was created using the free software application Front Design . It is available for Windows, Mac OSX and Linux operating systems. Front Design is rather intuitive and 30 minutes spent investigating its menus are well invested. Two labels were printed, one to use as a drilling template for the power

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Inside This Issue...

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A Work in Progress

Part II

Paul W. Ross, W3FIS

1910 Vibroplex© Double-Lever Bug
Restored by KT5X

In my previous article on the Arduino microcontroller, I showed you a simple keyer for my QRP rigs. The basic idea was to use the controller to sense which key paddle had been pressed, then to generate a series of dots or dashes accordingly. The output was sidetone from a piezoelectric speaker, and a keying signal provided by a switching transistor, which is satisfactory for most modern solid-state transmitters.

After I had completed the project, and shown it to some of my amateur radio pals at our weekly informal breakfast meeting they said, "This is not a *real* keyer! You need to have, at least, a 'bug' mode to emulate the classic Vibroplex keys." Oops, more grist for the mill. By "bug" mode, this means that one lever of the paddle generates dots, and pressing the other paddle keys the transmitter as long as you hold it closed, like a "straight" key.

"This is not a real keyer!"

So, how to reconfigure our experimental keyer to do this, and perhaps many more things? The more-or-less obvious strategy is to sense a third switch contact, perhaps a simple push button, to shift modes between "normal" and "bug" mode. If we were to put the button sense inside of the main polling loop, which looks at the paddle switches, we are going to be doing a lot of useless work, when all we want to do is to change the order going through the program–normal dashes, or simply key the transmitter on as long as the dash paddle is held closed. We want to look at that button *once,* and then use the results to alter the sequence of events in the program.

The answer to this is to use what it known as an interrupt. By this, you have some code, off to the side, so to speak, that is activated by some external event, the "mode" button in this case. When the button is pushed, this code, known as interrupt code, is executed. It sets a global parameter than can be easily sensed in the main polling loop for the two dash generation modes.

Take a close look at the code that follows.

```
/*
Keyer program - keyer and bug modes
Version 2.0
Light up led on key closure
Send tone & closure for DIT
Send tone & closure for DASH
Use an interrupt on Pin0 to select
bug mode
P.W.Ross, W3FIS  8-11-12
*/
// set pin numbers and other stuff
const int buttonPin1 = 6;     //
first key - dot side
        const int buttonPin2 = 0;
        // second key - dash side
        const int myLed = 3;  // my
        local led
        const int myAudio = 4; //
        output to piezo speaker for
        sidetone
        const int myOut = 5; //
        output switch to xmitter
        const int unit = 100; //
        unit for code element
const int myTone = 440; // tone for
output sidetone
const int modebutton = 2; // Button
for mode switch
volatile int modestate = HIGH; //
mode parameter - start in keyer mode
void setmode(){
modestate = !modestate; // switch
mode state;
}
void setup()
{
pinMode(buttonPin1, INPUT); // set
up paddle switches
pinMode(buttonPin2, INPUT);
```

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```
pinMode(myLed, OUTPUT);  // set up my LED for output
pinMode(myAudio, OUTPUT); // set up piezo speaker for output
pinMode(myOut, OUTPUT); // set up output line for switching transistor
attachInterrupt(0, setmode, LOW); // connect the interupt 0 - digital pin 2
}
void loop()
{
// read the state of the paddles into local variables:
  int reading1 = !digitalRead(buttonPin1);
  int reading2 = !digitalRead(buttonPin2);
// dot code here
if (reading1)
{
digitalWrite(myLed, HIGH); // set my LED on
digitalWrite(myOut, HIGH); // key transmitter for dot
tone(myAudio, myTone); // tone to speaker
delay(unit); // wait a smidge
digitalWrite(myLed, LOW); // turn off the LED
noTone(myAudio); //turn off the sound
digitalWrite(myOut, LOW); // turn off transmitter
delay(unit);
}
// dash code here
{
if (modestate)
{
if (reading2)  // normal dash mode
{
digitalWrite(myLed, HIGH); // set my LED on
digitalWrite(myOut, HIGH); // key transmitter for dash
tone(myAudio, myTone); // tone to speaker
delay(3 * unit); // Fahnestock timing
digitalWrite(myLed, LOW); // turn off the LED
noTone(myAudio); //turn off the sound
digitalWrite(myOut, LOW); // turn off the transmitter
delay(unit);
}
}
else
{
if (reading2) // Bug mode here
{
digitalWrite(myLed, HIGH); // set my LED
digitalWrite(myOut, HIGH); // key transmitter for dash
tone(myAudio, myTone); // tone to speaker
}
else
{
noTone(myAudio); // turn off tone
digitalWrite(myOut, LOW); // turn off transmitter
digitalWrite(myLed, LOW); // turn off the LED
        }
    }
  }
}
```

Arduino Uno

"Arduino Uno microprocessor"

There are essentially four parts to the program. The first is definition and initialization of variables and constants for the program, such as LEDs, switch contacts, the drive to the keying transistor, and to the piezoelectric loudspeaker. If the wiring for the interface changes, just alter the constants. The pin for the interrupt, however, has to be pin 2 or pin 3 on the Arduino Uno microprocessor.

The second part is the interrupt handling routine. This is executed when the "mode" button is pushed. Nothing else goes on here except to invert the "modestate" variable from 1 to 0 or 0 to 1.

The third part is the setup portion. Here the connections between the processor and the interface are established, and the link between the interrupt pin (mode switch) and the interrupt service routine is established.

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Ms. Lillian Ruocco, W2PMA, Bronx, N.Y.

Pleasant Memories Always! Ours is for you Herewith.

Bob Ballantine, W8SU

Lil, W2PMA

Lillian was a cheerful shut-in who loved her radio and the YLRL. This is a story of a lady from the Bronx who spent many happy hours on the radio and encouraged a gravely ill youngster in 1949. There was a radio rally that Lillian organized on her own to provide cheer and encouragement to a young boy about to undergo heart surgery.

Our sample QSL card recently found says a lot about the persona of Ms Ruocco. May you have Pleasant Memories Always.

Lillian was proud to serve in the War Emergency Radio Service (WERS) and American Women's Voluntary Service (AWVS), which was the precursor to the Civil Defense. She suffered from complications following pneumonia. Ms. Ruocco, pictured here, earned her ham license through the AWVS Program. The war passes by and we are in the late 40s. Our subject, Lillian, was dedicated to her country and in her diminished capacity took on another major important task. Lil's young neighbor boy, Martin Gold, remembers the scrambled TV screen with the "CQ Ten, CQ Ten, this is W2PMA." Heard on their first TV at the Gold apartment, a DuMont set with the gigantic 15-inch screen! They enjoyed test patterns and material transmitted from the Empire State Building in the fledgling TV industry. The tests were viewed at the Gold family apartment in the Bronx, which was incredible in their viewpoint.

In 1949, our 11-year-old youngster, Martin Gold of the Bronx, was told to rest as much as possible by his heart specialist. To have a tutor and he couldn't engage in strenuous activity. Seems he needed a then rare heart operation from a birth defect. Lillian, W2PMA, became young Gold's Elmer holding a marathon operation over the air enlisting the faithful to send cards to Martin's hospital room wishing him get well greetings. The hospital room was full of mail and the Golds were elated that the ham community came through with such overwhelming kindness. Lillian, confined to the house, had achieved a most successful job and was humbled by the turnout to her project.

Gold came through the operation successfully and never forgot Lillian's kindness. He had lost touch with her, entered college and relocated out west. Such is life with relationships missed, but memories held close to the heart. In later years, Martin learned Lillian had expired a long time ago and the generosity she showed toward Gold was treasured still after all those years.

"…overwhelming kindness."

In those days, without air conditioning, I imagine a large apartment building in the Bronx was the usual summer trial. It was refreshing to learn Lillian enjoyed her ham radio and kept in touch with the outside world. Long live the memories of the Lillians of this world!

It is believed Lil became a silent key sometime in 1950.

With help from Louisa B. Sando's, W5RZJ, book, *CQ YL*. ■

A pfui! on Itchy DuSchwein
Who gives me a pain in my spine.
He twiddles and twaddles
His gold-plated paddle
While waiting for DX to sign.

Rod Newkirk, W9BRD

W2PMA QSL Card

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Conan Wyatt Burtram Barger, W3CVE

Part VIII

Scott B. Laughlin, N7NET

Soon I was promoted to sales and program manager. This promotion gave me full opportunity to outline a sales promotional plan, build and then supervise programming, sell radio time, instruct salesmen, and announce as well as operate the transmitter and copy Trans Radio Press reports. Some of the programs I built and put on the air were:

REVIEW OF THE NEWS – Hour-long broadcast featuring factual accounts of important events that transpired the previous week.

SUGAR MUSIC – Half-hour broadcasts featuring Clyde McCoy and his sweet trumpet.

WESTERN MELODY – Half-hour broadcast featuring Clem Morgan and his singing guitar.

LISTEN - A forty-five minute featuring select readings and poems.

In 1937, I earned my radiotelephone first class license at Kansas City, Missouri. The examining radio inspector (RI) was William McDonnell. He made several station inspections while I was at KIUL.

"Clyde McCoy and his sweet trumpet."

O'Conner (owner of KIUL) sold the station to an organization that was building a national chain of stations. Of course, they had their own engineering staff, so I left KIUL about 1940. I tried for jobs in Arkansas, Kansas, Missouri, and Texas, but they were all adequately staffed. I sold Electrolux vacuum cleaners, electronic refrigerators, hospital supplies, radios… you name it, all in order to get by.

While in Dallas, Texas I went to the RI's office and met Mr. Abbott and Mr. McKinney. They told me the FCC was organizing a National Defense Organization (NDO) and they needed operators and engineers who could copy CW. I applied and in two weeks, I received a long telegram from Washington telling me to report to the FCC monitoring station at Grand Island, Nebraska.

I headed for Grand Island as an assistant monitoring officer. My wife and I had a little red Ford roadster and made the trip with great anticipation.

Mr. Ben Wolf was the Chief RI and he gave all of us a good deal of instruction in what the FCC had in mind. This was shortly before World War II and I soon realized we were going to monitor the frequencies used by Nazi spy stations. We were to copy intercepts and take bearings on the transmitting stations' locations.

FCC Monitoring Station Grand Island, NE

While at Grand Island, I struck up a good and lasting friendship with Erie Coburn, an operator from Galveston, Texas. I still keep in touch with Erie via messages handled on the amateur bands. In addition, I was more than surprised when I met in person W7AAT, Orvil Viers from Red Lodge, Montana. He was the person with whom I kept traffic schedules while I was at Denver. We certainly had a lot to talk about, recalling the interesting times we had in handling traffic.

At Grand Island, I met a number of radio amateurs whom I had worked over the air.

After about three months of intensive training, I was instructed to report to the FCC office at Atlanta, Georgia.

After selling my Ford, my wife and I caught a train to Atlanta where I met Abbott again. He provided a Hudson car with special equipment and I proceed to St. Augustine, Florida. After two days of travel, I located the station the FCC engineers had set up.

I notified our boss, George Sterling, in Washington, D.C., telling him we were ready. Soon the Radio Intelligence Division, (RID) was known as "The Ears of Uncle Sam." We began monitoring radio transmissions around the clock. ■

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Confessions of a Closet Key Collector

Steve Silverman, KB3SII

Signal Electric R-48c Straight Key

It all began at the age of eight. After building many crystal sets and a few regens, it became clear that transmitting was the next challenge and somehow I got a Philmore key and code practice buzzer that ran off a D cell.

That grew into a pair of keys and flashlight bulbs that created a two-way Morse code capability that allowed my brother and me to communicate silently in our shared bedroom without our parents' knowledge. Our collective CW skills were somewhat wanting, but we managed. The range of this equipment was limited and it seemed that transmitting by radio would certainly expand my horizons.

My dad, who was not at all technically inclined, did the next best thing. He introduced me to a couple of hams in my small New England town who knew all about radio. I immediately had a couple of Elmers who were intent on seeing that I passed my Novice license test and had a station that could actually put RF into the ether.

> *"…a mecca for hams of any age."*

I bought a classic brass Signal Electric straight key to practice my sending. A set of 78-rpm code records provided sweet Morse characters to build my copying skills. Finally, at age 10, the day came to hop on a train to Boston with my mom to take the test in the ancient and imposing FCC field office. I was certainly a nervous kid, but managed to copy enough code at 5 wpm to pass that hurdle before taking the written exam.

Rock Bound

Soon thereafter, I built a Heathkit AT-1 to complement my Hallicrafters S-38B. A long-wire antenna and a homebrew antenna coupler had me sending CQs on a rock-bound 3,746 kilocycles (yes, kilocycles). I had many enjoyable QSOs on 80-meters and other Novice bands. A year later, there was another trip to Boston where code at 13 wpm passed into my ears and on to the yellow pad accurately enough to earn my General license.

Radio Row

As a reward for my technical achievements, my parents took me to New York City where I was allowed to go alone to Cortlandt St. and the famous Radio Row shops. These were businesses that advertised in every issue of *QST* and *CQ* and were, to me, a mecca for hams of any age. Piles of surplus ARC-5 radios were everywhere. Bins of components of every variety overflowed onto the floors and sidewalks.

Unfortunately, I had a very small budget to rein in my desire to buy almost everything in sight. So I settled on a brand new, shiny, brass AT&T straight key; an old telegraph sounder on a wooden base; and three military surplus keys: a Navy Flameproof key and a pair of J-44 keys on large Bakelite bases. The total cost was under $10 and I had enough left over to take the subway back to the hotel. When we got home, I was given a chrome Vibroplex Original Deluxe bug so I could really crank out CW. I was in ham heaven.

Throughout high school I was active on CW and AM, making many rigs from plans in the Handbook and magazines. I even made a ten-meter mobile rig which was installed in my Dad's 1958 Chevrolet with an nice stainless steel whip and a fat base spring. I continued to operate at my college ham radio station and, in 1963, made a tube-based W9TO electronic keyer in one of the electrical engineering labs. There was a newfangled paddle advertised in *QST* called the NIKEY, which was a real iambic paddle, the first one ever commercially offered for sale. I bought one and had it talking to the W9TO keyer in no time. My senior engineering project was about building wide bandwidth phasing networks for hi-fi SSB, of all things.

Fifty years elapsed punctuated by raising a new family, flying activities, and several entrepreneurial electronics businesses. Ham radio took a back seat until

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I stumbled across an ad on the Web for a Vibroplex key offered by Ten Tec as an anniversary limited edition of their first iambic paddle. It looked cool. I bought it. Are you beginning to see a pattern here?

Starting Anew

My radio juices started to flow again and the Web became my source for all things related to ham radio. I was in shock within hours of my initial explorations. So much had changed that I wasn't sure that it was the same hobby. There were no code requirements, not even for the Ph.D. of ham radio, the Extra Class license. There were new bands squeezed in between the bands I knew well. There were new modes that looked to me like Instant Messaging via radio. My favorite 80-meter stomping grounds were now relegated to high power SSB and AM operators. There were radios that used a PC connected to a black box with no knobs. There were ham satellites zooming around the world acting as repeaters and hams were successfully bouncing signals that they couldn't even hear off the moon. And rigs were powered with 13.8 volts and didn't have any tubes under the covers. And, of course, the Web was thoroughly integrated into every nook and cranny of ham radio.

But the pull of CW was still there and it wasn't long before I was looking at Websites offering a variety of keys and paddles. There were replicas of the Vail and Titanic keys. There were single lever paddles as an alternative to the iambic version for those who didn't need or want to use the squeeze techniques. There were key kits and miniature QRP keys for field use. There were massive straight keys and Russian keys and sideswipers. And there were expensive imports from Italy and Japan.

> *"…the Ph.D. of ham radio…"*

I succumbed and bought some of these keys, not antique collectors' items, but brand new keys and paddles to feed my newly rejuvenated CW habit. First there was an electronic keyer with a built-in side tone so I could practice sending with the various paddles and straight keys. It put the W9TO design to shame; it's amazing what a microprocessor can do in lieu of a few flip-flops.

Proud Elmers

Then I sat for my Technician and General licenses at a local clubroom in Maryland with a bevy of monitoring VECs. This time my mom wasn't there to accompany me and there was no Morse code to be heard. I bought a small QRP rig and some wire so I could put some CW into the air. My original Elmers would have been proud of me.

NIKEY Paddle Purchased by KB3SII 50 Years Ago

I settled on a nice single lever paddle that simply felt right. There is a reason they call these devices telegraph *instruments*. CW is music to my ears; good musicians deserve good instruments and so do we.

Those four keys I bought on Radio Row sit proudly in my shack next to my Vibroplex bug and that first Signal Electric key purchased 60 years ago. The Ni-Key is there too, and so are my newest instruments. Some habits are just hard to kick, especially the ones you never knew you had. ■

Steve Silverman, WN1ZPT, Operating W1AW in 1953 at age 11

Steve Silverman, KB3SII, Operating W1AW in 2012

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Continued - A Work in Progress from Page 3

The fourth part is the "meat and potatoes" part of the control program. Here is the basic polling loop, which generates dots and dashes to control the transmitter. If you look in my previous article, all that is essentially added is an "if" statement to sense which "mode" the program is in, and execute the proper "dash" code. At any time, pressing the "mode" button puts you into the other mode. I have configured the program so that it starts in "normal" keyer mode.

I had to "debounce" the mode switch with a small capacitor, or I would get erratic operation. The key contacts aren't an issue, due to the timing, as the dot or dash will "complete" before the key is interrogated at the top of the main loop. I might have problems if I went to higher keying speeds.

Next idea is to add a "menu" of items–use the "mode" to put you in menu mode–select keying speed, keying mode, then set you back to keyer/bug. Something for the future… ■

Great Caesar's Ghost!

Budding Jimmy Olsens and Lois Lanes needed.

The Daily Planet, aka, *K9YA Telegraph*, seeks articles. See your words and photos disseminated worldwide! Cub reporter? No problem, your copy will be emendated by the *K9YA Telegraph*'s team of professional editors.

Stop the presses!

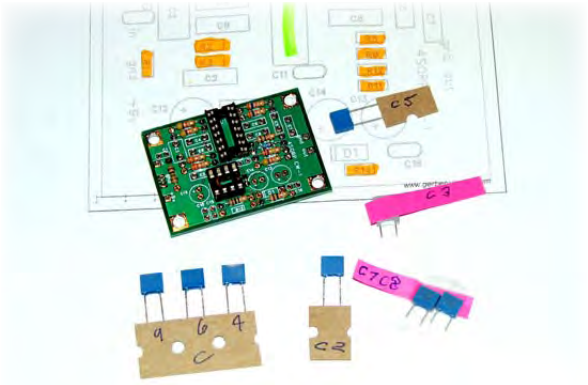
http://k9ya.org/write_for_us.htm

Ham Parodies DICK SYLVAN, W9CBT

MERCEDES-COLLINS GULL-WING SPECIAL

Continued - HI-PER-MITE from Page 1

switch and the second laminated with Avery™ film and mounted on the tin's lid with 3M Photo Mount™.



The filter draws 8.4 mA idling current and, at moderate listening levels, I saw 24 to 28 mA peaks on my DVM. That 's a rough gauge; the meter certainly doesn't refresh quickly enough to make more accurate measurements, but does indicate the filter is no battery hog.

On the Air

The Hi-Per-Mite works, its advertised 200 Hz bandwidth does a fine job of separating signals on the crowded low end of the nighttime 40-meter band. No ringing, as advertised, was noted.

Not expected, but much appreciated, the filter's noise reduction properties make listening more pleasant on everything from my Hendricks DC40A to, rather surprisingly, my shack's dreadnought Yaesu FT-1000MP. It simply performs a great job at subduing the harshness ever-present on the HF bands and listening fatigue, if not banished, is greatly diminished.

Thanks again to David, NMØS, and the 4SQRP Group for another worthy addition to their growing list of useful, economical and fun to build kits. ■

Video of Hi-Per-Mite in operation by BX2ABT:

https://www.youtube.com/watch?feature=player_embedded&v=Pk_GFJsux24#

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