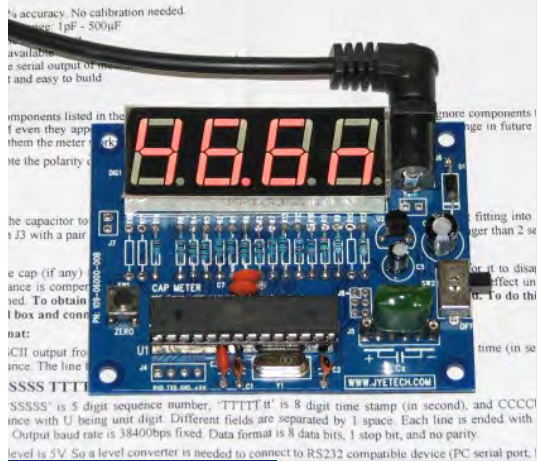


K9YA Telegraph

Robert F. Heytow Memorial Radio Club

Volume 14, Issue 6 June 2017

Capacitance Meter Manual



JYE Tech Capacitance Meter

Kit Review

Philip Cala-Lazar, K9PL

“Get me a 1,000-volt capacimotor stat!”

Dr. Nick Riviera, *The Simpsons*

My JYE Tech capacitance meter kit arrived nicely boxed and securely packaged from Kuman Trading in Shenzhen, China. Inventorying the supplied components against the Bill of Materials resulted in good news—No Missing Parts.

It may seem parts are missing, but not all components designated on the PCB are populated on the completed board, this discrepancy is noted on the supplied one-page (both sides) assembly instruction sheet. The instructions provided are concise; the builder is directed to install the parts listed on the BOM—that’s it. Also included on that one sheet are the schematic, PCB parts layout, and use and troubleshooting guides.

From soldering the first pad to first power up filled about two hours. No problem soldering the tiny closely spaced 1/8-watt resistors with a one-millimeter Hakko soldering tip. The resistors’ values were confirmed with a DVM, their color bands were too minute to bother with when a meter was at hand.

Powered by the same 9-volt wall-wart power supply accompanying the JYE Tech function meter kit reviewed in the January 2016 issue of the *K9YA Telegraph*, the meter worked from first switch on. The board features a large bright red four-digit (three numerals plus capacitance symbol) LED display, an on/off switch and a zeroing button that retains its setting until again zeroed. JYE Tech claims the meter provides 1% accuracy from 1 pf to 500 µF. Voltage requirement is 8-16 DC. The meter also offers ASCII output from the TXD pin of J4 containing “three fields: sequence number, measurement time (in seconds), and measured capacitance.”

Turn it On

The meter’s weakest link proved to be the test socket. Inserting even slim capacitor leads into the six-pin SIP socket can prove a hassle, and for larger gauge leads simply not possible. So, per the instruction sheet’s suggestion, I will be soldering flying leads terminated in alligator clips to location J3 on the PCB. Owners may also want to insulate the PCB’s underside and/or work on a non-conductive work surface. Note, unlike many of the now ubiquitous multi-component testers* flooding the market, this meter’s test socket is polarity sensitive.

Measuring

The JYE Tech was tested against the Drok multi-component tester and a Greenlee 830A (rebadged Brymen BM-829S) DVM. The test results were very close. The JYE Tech meter measured more quickly than the Drok or Greenlee, you may find that a slight advantage when inventorying a large number of kit parts or sorting your personal capacitor stash.

“Get me a 1,000-volt capacimotor stat!”

CONTINUED - JYE TECH ON PAGE 8

Inside This Issue...

JYE Tech Capacitance Meter	Page 1
A Modern Paraset	Page 2
“The Spies at Gilnahirk”	Page 4
Rose - Part XIX	Page 5
“Were They Really QRT?”	Page 6

Philip Cala-Lazar, K9PL
Editor

Mike Dinelli, N9BOR
Layout

Jeff Murray, K1NSS
Staff Cartoonist

Dick Sylvan, W9CBT
Cartoonist Emeritus

Rod Newkirk, VA3ZBB (SK)
Contributing Editor
2004 - 2012



Robert F. Heytow
Memorial Radio Club

www.k9ya.org
telegraph@k9ya.org

ISSN 2472-2340

Copyright © 2017 Robert F. Heytow Memorial Radio Club. All rights reserved.

Volume 14, Issue 6

A Modern Paraset

Paul W. Ross, W3FIS



I have always wanted to own a Paraset, the “behind the lines” spy radio of World War II. The original Paraset used vacuum tubes, a battery, and a vibrator power supply for the high voltage. Not being in the mood to scrounge the Internet for vintage parts, and having had quite enough of vacuum tubes in an earlier life, I put the idea of a Paraset on the “back burner,” perhaps

indefinitely. However, I suspect there are more replica Parasets extant now than were originally used in World War II!

Lo and behold, my dreams have been answered! The Four State QRP Club, who have sold some very interesting kits over the years, combined their regenerative receiver and low power transistorized transmitter designs to create a modern version of the Paraset, called the “Bayou Jumper,” a play on the “Ocean Hopper” radio of those whose ham radio experience goes back more years than I care to count.

Ordering

There was no way I was not going to get one of those! So, off goes my check and a little over a week later, a nice box, full of parts, circuit boards, and hardware arrives. In anticipation of the arrival of the kit, I purchased an appropriate-size wooden box from one of the local craft stores, and finished it with stain and tung oil.

The circuit is simplicity itself. In the original Paraset, the receiver was a simple Hartley regenerative circuit using a pentode 6SK7, with screen voltage control-to-control regeneration. This was followed

by a second 6SK7 as a high-gain audio amplifier, driving headphones. The modern version again used a regenerative receiver, but with some significant changes other than the obvious one of using transistors instead of vacuum tubes:

- Regeneration (Armstrong “throttle”) and tuning are done with varactors. For the more modest tuning range of the Bayou Jumper (lower end of the 40-meter band), this is sufficient.
- A toroid is used instead of the conventional coil form.
- A voltage regulator is used in the receiver to improve the regenerative detector’s stability.

Calibration

The receiver is easily calibrated by using your station receiver to find the weak carrier emitted by the regenerative detector when in full regeneration mode. A calibration chart, made using a spreadsheet and its graphics capability is a good idea. One was included in the original Paraset. Just paste your calibration chart inside the lid of the carrying box. The tuning now is marked from 0 through 10.

Likewise, the transmitter varies slightly from the original Paraset design:



Bayou Jumper PCB

N2HTT photo

“Lo and behold...”



Robert F. Heytow
Memorial Radio Club

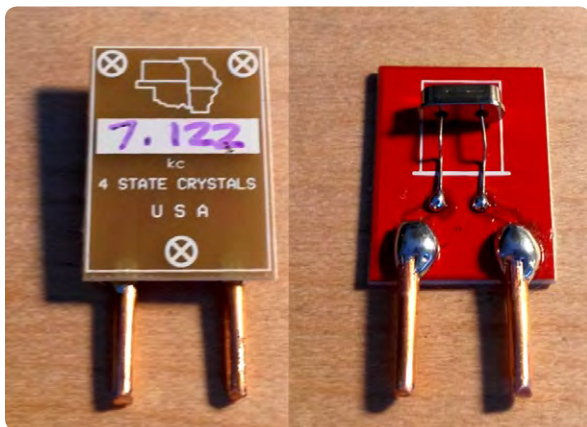
www.k9ya.org
telegraph@k9ya.org

- A MOPA (master oscillator/power amplifier) design is used with a Class E mode FET final, kicking out a solid 4.8 watts for my radio (50-ohm dummy load, peak-reading diode rectifier). This is in contrast to the 6V6 pentode-keyed crystal oscillator in the original transmitter.
- Keying is done with what we might call conventional cathode keying, with an option to “spot” our crystal frequencies by keying when in receive mode.
- The radio has a three-position switch—On, Receive, and Transmit. No QSK or sidetone for us! Visions of my original 6AG7 Novice transmitter! I admit this took a bit of getting used to, for those of us spoiled by the QSK and sidetone capabilities of modern rigs.
- There is a key built into the radio, just as in the original Paraset, and provision is made for an external key. Since the key passes the full output current of the final amplifier, a keying relay or substantial FET will be necessary in any electronic keyer. A straight key or Vibroplex style key will do the trick. Time to break out my vintage J-38 key again, though the built-in key works quite nicely.

Batteries Not Included

The kit comes with all necessary parts, excluding headphones, box (some ham wood workers have made their own). Two crystals are provided, one for 7.030 MHz, and a second for 7.122 MHz, both common “watering holes” on the 40-meter band. The crystals are plugged in with an adapter made to function as the original FT-243 style

“...tip of the hat to our predecessors...”



Faux FT-243 Crystal (front/back)

N2HTT photo

crystals. FT-243 style crystals are available from various sources on the Internet, and give a more authentic appearance. There is room in the lid of the radio for a crystal holder that can be easily fabricated from a small block of wood. I am powering my rig from a 3,000-mAh lithium ion battery pack bought on eBay. I used these a lot for field QRP CW operations, and they should last for a day’s activities. One more tip of the hat to our predecessors with the original Parasets who had to deal with dry batteries and uncertain power sources.

The only significant task I found was in getting the tuning range of the receiver (about 200 KHz) to be at the low end of the 40-meter band. Between fooling around with the turn spacing of the tuning coil on the toroid and an on-board trimmer, I could get it to tune from 7.000 MHz to about 7.150 MHz. When the tuning range

was to my satisfaction, it was suggested to put a coat of clear fingernail polish on it to secure the coil. The XYL wondered just what I was up to.

Tuning operation is typical of a regenerative receiver—increase the regeneration level until you just detect an increase in noise, then tune for your desired signal. With the fairly broad tuning of the receiver, and the limited

tuning range, no vernier or bandspread tuning is necessary.

On The Air

There is no tuning or coupling adjustment on the transmitter as there was in the original Paraset. This means you need to either have a resonant antenna, or some sort of tuner, such as a Z-match or T tuner. I like to use a simple length of wire strung up in a tree, and a barbecue skewer for an impromptu ground rod. For use in the home QTH, I simply connect the radio to my regular tuner and antenna.

Now to “park” on the 40-meter watering holes and see what I can come up with! ■



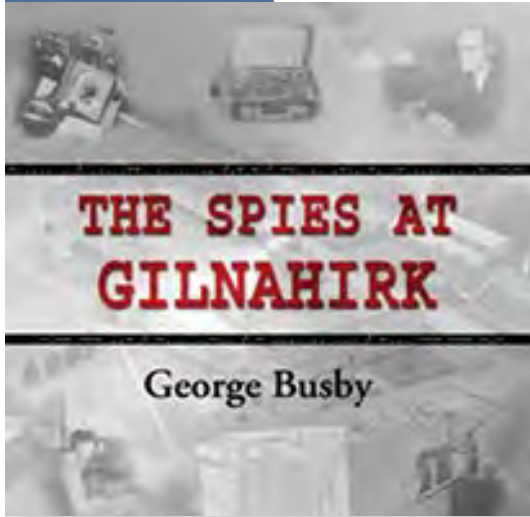
Robert F. Heytow
Memorial Radio Club

www.k9ya.org
telegraph@k9ya.org

“The Spies at Gilnahirk”

Book Review

John Swartz, WA9AQN



A new and very welcome addition to the literature touching on the contributions of British amateur radio operators to the prosecution of the war against Nazi Germany is *The Spies at Gilnahirk* by George Busby. To date, *The Spies at Gilnahirk* provides the most extensive description of the origins and development of the Voluntary Interceptor corps thus published.

George Busby was curious about the history of what had been the Gilnahirk Wireless Station, located near where he lived in Northern Ireland. Being both inquisitive and tenacious, he spent more than a decade researching the history of what had been one of the Bletchley Park “outstations” which had been established to search the airwaves and provide raw material for the Bletchley Park codebreakers. Most of what had been the work of the intelligence services remained secret for at least three, if not more, decades after hostilities ceased. Because much of what had been learned remained valuable after the war, when tensions between the Soviet Union and the Western Allies grew into the Cold War, secrecy was maintained.

Busby tracked down the identities of several dozen of those who worked at Gilnahirk. Among them he found a number of the Voluntary Interceptors who we know were the amateur radio operators recruited through the Radio Society of Great Britain to search for suspicious signals from their home stations. Busby recovered those identities despite the fact that substantially all records identifying the operators had been destroyed immediately following the end of the

war. In telling his story about the station, he profiles a number of the operators who passed through its doors and whose efforts contributed to the raw material decrypted at Bletchley Park.

To give a background and context for the history of the Gilnahirk station and its personnel, Busby examined original source documents from the British National Archives. These included minutes of the meetings of the military and intelligence officers who authorized and carried out the organization and work of the Radio Security Service.

These sources give great detail to the background and origins of the Voluntary Interceptors. Busby’s attention to operations at Gilnahirk offers a look at the wartime work that was undoubtedly duplicated at the other major listening outposts. Typical of other full-time outstations, Gilnahirk grew to have 26 listening posts, each employing a pair of state of the art receivers from American manufacturers, National and Hallicrafters, and a separate direction finding operation. The antenna fields for these stations were immense, and Busby describes the measures undertaken to disguise the location and its purpose from what might have been otherwise prying eyes.

“George Busby was curious...”

Ireland itself, Gilnahirk’s neighbor, claimed neutrality and was potentially a source from which spies and espionage agents might be expected to attempt to penetrate to Northern Ireland and Britain, so the measures taken were tailored to the unique environment of the station.

Busby has done a remarkable job in rendering an account of the listening establishment at Gilnahirk and placing it in context with the larger intelligence effort, which so vitally assisted in the prosecution of the war. ■

The Spies at Gilnahirk, George Busby, Ballyhay books, 2016 ISBN 978-1-910657-08-9



Robert F. Heytow
Memorial Radio Club

www.k9ya.org
telegraph@k9ya.org

K9YA Telegraph

Scott B. Laughlin, N7NET

Charlie leaves his shop books and waits outside as Rose wheels into the service drive.

“What’s up?” He asks, concerned from her tone that something has gone awry with their relationship. There is always the stiff competition at the college and he has so little defense against it. He braces to hear the worst.

“I’ve been offered a job,” she blurts.

An instant flood of relief washes over him and for a moment he’s lost his voice. “But...but you already have a job earning your degree,” he finally sputters. “What’s changed?”

“Nothing’s changed. It’s just that that I learned this morning that I’m qualified to teach first through eighth grades. I can do that now,” she exclaims breathlessly.

“But I thought you wanted to teach high school sciences.”

“I do, but that can wait. This job offer came available just this morning. It came to me directly from the superintendent of the school district. I’d be teaching in a small rural school.”

“Does it pay well? Where is it? Will you have to board out somewhere?” Charlie asks, bombarding her with questions in random order.

“It’s a one-room school about fifteen miles west of here, close to the Kansas state line. It’s called Greenville. The teacher suffered a heart attack earlier this week. A retired teacher has taken over while they search for a replacement. It pays better than the grammar school in Buter. At the present time there are nine students—grades third through eighth,” she explained.

“And?”

“Well, I need your support. Do you think I’m wise to change my focus is midstream like this? I will have to drop out of college, but I can go back later and pick up where I left off.

“Whatever you want is okay with me. But the last time we discussed your teaching plans you wanted to build a ham radio station in your science room. Is that going to have to wait too?”

“No. I can build a radio station at Greenville. I’ll have to assure everyone that no one will be electrocuted, but that would be a problem to solve no matter where I teach.”

“But how would that work? With more than one grade it would be disruptive to those not interested in radio, or studying other subjects, don’t you think?”

“I thought about that. I can teach radio after school hours.”

“True enough, I suppose, if they don’t object.” He pauses for a moment then adds, “I’m behind you all the way.”

He thinks about the Bates County Bush Leaguers. Teaching Morse code in the grade school will dovetail right in with Burt’s baseball broadcasting plans.

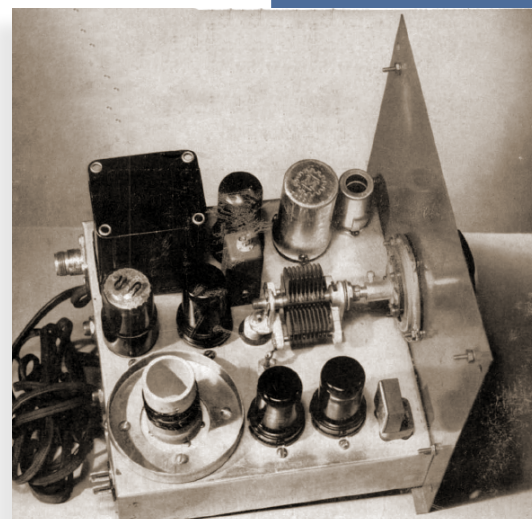
“When do you start?” he finally asks.

“Next week. I left it up in the air until I talked to you.”

“Okay. Do it,” he says, holding the car door open for Rose.

Rose drives away to finalize the teaching job and Charlie returns to his office to finish the books. When they are ready for the accountant he warms up the radio and begins CQing. The 40-meter band is overflowing with activity. And the evening passes in a flash.

Glancing at the clock, Charlie realizes bedtime is approaching. He switches his transmitter to standby



“What’s up?”

CONTINUED - ROSE ON PAGE 8



Robert F. Heytow
Memorial Radio Club

www.k9ya.org
telegraph@k9ya.org

“Were They Really QRT?”

John Swartz, WA9AQN



Hut 1 - Bletchley Park

Photo: Antoine Taveneaux

Immediately following the German invasion of Poland in September 1939, Britain's amateurs were notified that their transmitting privileges were suspended. The Post Office was the government agency that regulated the amateur radio service in the UK, and as such it promptly confiscated all amateur transmitting equipment.

So, did they really go QRT? The question has several possible answers, so let's say, "Well, yes and no, depending

upon what you mean by 'QRT?'"

In Part 1, we'll take a quick look at what may have been some "unofficial" activity on the air. Then, in Part 2, we'll continue the story and take a look at what was an officially sanctioned amateur radio action fabricated to aid the Allied intelligence activities at the end of the war.

Part 1

On a trip to the UK in October 2015, I had a chance to renew my acquaintances with David White, G3ZPA, Bob King, G3ASE, and with Stan Ames, G4OAV. I also met another student of signals intelligence, Brian Styles, G3NSD.

David has an extraordinary collection of historic diplomatic wireless equipment, which had been on display for many years in what was the original "Hut 1" at Bletchley Park. His was one of several private collections that helped keep BP open and available to the public in the leaner years before its recent restoration. Sadly, as a result of the restoration, David has had to store his collection and search for another permanent home. Bob is a WWII voluntary Interceptor and Radio Security Service veteran whom I met when he was a presenter at the 2002 Enigma conference sponsored by Christ Church, Oxford. He has been an organizer of annual reunions of VI/RSS/SCU veterans at Bletchley Park. Stan is an historian who has

unearthed a wealth of information about the Radio Security Service and the Voluntary Interceptors from original sources as they are released. He, too, plays a primary role in the annual reunions. Brian has been a great supporter of the Voluntary Interceptor/Radio Security Service veterans' organization, and has his own fine collection of period gear.

Pete Windle, G8VG, whose father, Bill, was a V.I., is spearheading an effort to install a permanent interactive display at the RSGB's National Radio Centre to commemorate the Voluntary Interceptors. Pete, his fellow countrymen, and I gathered for a pub lunch near Bletchley Park. The pub was relatively new and had not been in existence during the war, so the spirits around us were only of the imbibable variety. Pity...

David's interest traces to his own post-war work at Hanslope Park, which had been a listening post during WWII. Many British amateurs who had been Interceptors later became active full-time members of the Radio Security Service. Many had worked at or passed through Hanslope during their service.

David brought along a sack full of documents for us. One of the gems was an album containing 57 QSL cards. Pete and I were immediately interested. In an effort to protect the secrecy of what had been accomplished during the war, all known records identifying the

listeners had been destroyed. Pete has undertaken a daunting task to attempt to identify them all and to honor them. To date, he has identified almost 800. Those QSLs may have contained information about VIs whose names and callsigns might have escaped Pete's efforts. Various sources have reported that there were 1,000 to 1,700 amateurs or shortwave listeners who had been active during the war, volunteering their time from their home listening posts to work in secrecy, copying the enciphered groups of Axis message traffic.

The QSL collection had belonged to G5HN, Ted Handcocks. Handcocks, who had been a VI, left his civilian employment to serve full time in the Radio Security Service (RSS). He was stationed at Hanslope. In what could have been the first instance of SO2R

“...did they really go QRT?”



Robert F. Heytow
Memorial Radio Club

www.k9ya.org
telegraph@k9ya.org

K9YA Telegraph

operating, each Hanslope operator had two, and some had three, National HRO receivers to carry out the assigned searches. Handcocks described the installation and history of his service in an article written in 1990 (See <http://cdmnet.org/RSS/SecretListeners/Handcocks.pdf>).

Most of the cards are made out or addressed to him. Some cards were not dated, but those that were bore dates after 1939 and before the restoration of transmitting privileges. Instead of the usual detailed information about the date, time, or band of a QSO, most of the cards were blank. That was curious but supportive of the conclusion that the cards probably evidenced “eyeball” contacts with fellow Hanslopian.

One card in particular caught my eye. It was from “2BTO.” Some years ago, I had corresponded with Gerry Openshaw, G2BTO (now SK), who had written about his wartime work in direction finding. Gerry had an unusual quirk in his QSL. As printed, his card read, “On ACTIVE SERVICE...Royal Corps of Signals, Somewhere in England.” “That’s bizarre,” I thought. 2AUA had a similar pre-printed note: “On ACTIVE SERVICE,” and also reported his “TX: - in Dry Dock . . .”

Several other cards in the collection bore similar entries. The most common notation showed that the card evidenced a “Personal Contact,” 2DQL’s card says “Working: Farmyard.” Hanslope was affectionately known as “The Farmyard.” (G)2CIW reported: “RMX: At the Country Farmyard Hanslope.” G3IV’s card noted that his transmitter input is “10 pints...beer.”

But, G6LL’s QSL to G5HN particularly noted that HN’s signals were 5/1/9 on 28 Mcs.

Were these guys just playing around?

Pretty clearly, much of what was going on was “eyeball” QSOs among hams who circulated through Hanslope Park at various times during the war.

Some of the cards had been freshly printed during the war years, so there must have been an expectation of some communication among fellow amateurs. Was something else happening?

According to David, there was something else. He had known Handcocks and told us that some of these cards memorialized “real” QSOs between the operators at Hanslope. Gerry Openshaw, G2BTO, whose card had attracted my attention precisely because it appeared to have been printed after the war had begun, recounted what happened in correspondence Bob had given to me, and what had transpired on

a date that would otherwise have been the National Field Day for British amateurs:

“For normal use each set had its own ‘long wire’, which was about 30 feet of wire going through the shack windows and slanting upwards at about 45 degrees to a row of poles. So many aerials in close proximity produced a problem, which we turned to our advantage. The local oscillator in the HRO radiates quite well and could be heard on a nearby set. By using the aerial switch as a key we soon realised we could work each other. Real DX was across to the opposite end of the station, so, of course, the inevitable happened: use one set as the TX by setting it to the chosen frequency minus 455KHz [note: the IF frequency], monitor on the other HRO and call “Test.” At 0300 with no skeds and some

bands dead anyway, 28 MHz became quite active. One genius, realising from the calendar that it was appropriate, suddenly came up with “TEST NFD.” Most of the station, already in semi-slumber listening to dead bands, re-awakened to join in with their own calls. Some operators who were ‘not licensed’ took on the role of DX. I well remember working a W6 and, after going off duty, finding a home-made QSL resting on the pillow of my bunk! That’s much quicker than a real NFD.”

The story lends some life and levity to what must have been the drudgery of copying hours and hours of cipher groups. I’m not saying that any of the Voluntary Interceptors or RSS operators took their work lightly—far from it. As was portrayed in the movie, *The Imitation Game*, when Menzies, of SIS, asked Alan Turing if he knew how many people died because they hadn’t broken the Enigma, Turing confesses he didn’t know. Menzies responds, “Three, while we were having this conversation.” [1] The VIs, RSS, and the Y services were the source of all the raw material the codebreakers of Bletchley Park had for their endeavours, and while the almost religious application of the “need to know principle” may have kept them in the dark about what was done with their work, there is no doubt they understood that what they were doing was of grave importance to the survival of their country.

CONTINUED - “WERE THEY REALLY QRT?” ON PAGE 8



Bletchley Park Museum

Photo: Garrett Coakley

“That’s bizarre”



Robert F. Heytow
Memorial Radio Club

www.k9ya.org
telegraph@k9ya.org

So, while the official policy was that amateurs were QRT, we now know that some of the enterprising few kept themselves innocently occupied, in close quarters. Handcocks himself goes further in his published summary:

“Back at the park later—the authorities turned over the use of a full Tarrant hut for us to use as a club, shack and workshop—needless to say it was not long before we had built up a transmitter and of course there were loads of receivers about, so before long we were on the air working any amateurs that were on the band—funny, but there were quite a number of amateur calls on the air and I guess not any of them were really licensed, but we did not let a little thing like that worry us too much.”

Maybe there was more than just the innocent fun of playing with the local oscillators?

73 until next time, John, WA9AQN ■

Note: [1] This dramatic interchange set the stage as Turing became aware of just how critical his work might be at Bletchley Park. We don't know that this exchange actually occurred between the real Turing and Menzies, however. Curiously, I came across virtually the same exchange in another British mystery-spy-thriller, which had been filmed a bit before *The Imitation Game* was released:

A: ...violence never achieves anything.

B: That's a good one, Doctor. Where have you been the last five years and how many people in the world have been killed while we're sitting here having this cozy little chat?

How many readers recognize that? I'll give two hints. It is British, and, it is also set in World War II. (Propagation is still lousy, so I'm not missing much by watching videos and writing this instead of being on the bands....)



Component	JYE Tech	Drok	Greenlee
0.01 µF	10.3 nF	10.2 nF	10.22 nF
0.047 µF	46.6 nF	46.6 nF	46.38 nF
100 µF	114 µF	108 µF	116 µF
220 nF	219 nF	219 nF	219 nF
0.1 µF	71 nF	62 nF	63 nF

The JYE Tech Capacitance Meter kit is an enjoyable build. It offers quick and accurate measurements and versions are available from online vendors in the U.S. and elsewhere priced between \$7 and \$16. Multi-component testers can be found beginning at the higher end of that price range. The multi-component testers display schematic symbols of capacitors, inductors, and resistors with their values and operating characteristics. They can also identify semiconductors while providing lead labeling and basic operating parameters. The JYE Tech capacitance meter was designed to do one job and do it well at an enticing price. ■

*Based on a design originated by Markus Frejek and refined by Karl-Heinz Kübbeler: http://www.mikrocontroller.net/articles/AVR_Transistortester

JYE Tech Web site: <http://www.jyetechnology.com/Products/CapMeter/e060K.php>

<http://kumantech.com/>

CONTINUED - ROSE FROM PAGE 5

and then logs in his final contact, a fellow named Terry. The QSO was truly a rag chew that continued for nearly an hour. Charlie issued him a 599. Even though the band was still wide open, he switches off the power and makes preparation for bed. As he skips into his pajamas he thinks again about his last Terry.

Terry is an engineer at a radio station in Cleveland, built it from the ground up, he claimed. He has taken a job on the west coast and is now combining his move with a vacation. Slowly, he's working his way there, stopping to visit friends along the way. Terry made tonight's contact from a friend's shack in Indiana, a town in which Charlie is not familiar. Eyeball visits are rare in Charlie's radio world, so he's pleased when Terry suggests stopping by. They agree to meet and shake in a few days. ■

Copyright © 2017 Scott Laughlin



Robert F. Heytow
Memorial Radio Club

www.k9ya.org
telegraph@k9ya.org