K9YA Telegraph

Robert F. Heytow Memorial Radio Club

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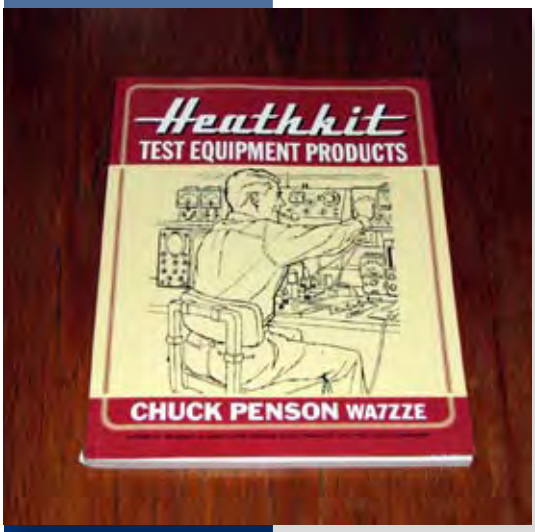

Heathkit Test Equipment Products

Book Review

Philip Cala-Lazar, K9PL

Do you recall the joy, the utter elation upon spotting the latest Heathkit catalog in the mailbox? Like the Sears catalog, Heathkit's catalog was every bit a *Wish Book*.

Now, with the publication of Chuck Penson's, WA7ZZE, *Heathkit Test Equipment Products* we have that joy multiplied by all the years Heath produced its myriad products. It is an engrossing book, a combination catalog and history of Heath products from 1947 on. That's a whole lot of happiness.

> *"…every bit a Wish Book."*

In its 22 chapters the book comprehensively lists Heathkit's test gear from its inaugural O-1 oscilloscope in 1947 to their last, the IG-5260 video alignment generator, 1989-1991. The IG-5260 is noted in the text as "The last new kit product sold by Heath, appearing just months before the end." It was "Probably designed and packaged off-shore and sold under Heath's name…." For purists, the last Benton Harbor kit was the IM-2320 DMM introduced in 1987 and discontinued in 1990.

The equipment chapters are prefaced by an 11-page introduction. The introduction provides an overview of Heath company history, *Production Volume*, *Engineering Considerations*, *Industrial Design*, *Correspondence Education Products*, *Berkeley Physics Lab*, *Product Dating*, *Serial Numbers*, *Manuals*, *Product Evolution* and *Legacy*. The author also graciously acknowledges the cooperation of a number of Heathkit enthusiasts in the creation of *Heathkit Test Equipment Products*.

Mr. Penson describes Heath's genius in model proliferation and marketing. Numerous versions of its test equipment lines were based on a limited number of originals. A change of color scheme, knobs and enclosures, updated model numbers and the occasional tweaked circuit enabled Heath to freshen their quarterly catalogs with a consistent flow of *new* models.

Heathkit Test Equipment Products offers detailed and engaging product descriptions that include product histories, model numbers, dates of production and prices. Product histories are frequently enhanced with the author's insights. Included is a fascinating and instructive glimpse at Heathkit's cabinet design and decoration. From Pre-Classic (1947-1952) to Post New Look (1975-1990), it's all there as emblazoned on our collective memory as we recall Heathkits to our mind's eye.

The book is a comprehensive reference, profusely illustrated with the author's photographs and vintage Heathkit drawings, charts and tables. Included are model number, product type and chronological indexes.

Happily, lesser-known product lines including the ES series analog computers and peripherals and the Malmstadt-Enke EU-100A Instrumentation Labora-

Continued - Heathkit on Page 8

Inside This Issue...

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The Magic of Radio in the 50s

My Air Champ 200 Radio

Darron Sanchez, WA5TCZ

Darron, WA5TCZ, and his New Air Champ 200

I remember when I was 11 years old in 1950.

For Christmas my Mother and Father gave me a radio in a cardboard box because I was always fooling around with some kind of radio. The radio was the most exciting present I had ever received.

You have to remember radio in the 50s was still big time entertainment for most people and TV was in its infancy with only a few stations around the country radiating snowy and grainy pictures that signed off at midnight.

I would listen to my radio in bed at night when stations from far and near would come in loud and clear then disappear. This was the magic of radio, hearing a station from New York or the Voice of America or the BBC from England. Wow, what a treat. How could this be possible?

"Wow, what a treat."

Having built many crystal sets and stringing antennas on top of the house and ground wires out the windows, to say I was a radio nut was completely correct.

Air Champ 200 Radio

The radio I sought had two tubes powered by two flashlight batteries and a large 90-volt battery. I have been looking for the company or name of this radio for a long time. Just by chance, after countless searches and many hours on the Internet, my persistence paid off. I found out the radio was called the Air Champ 200.

The Air Champ Company of New York offered the radio. Air Champ was located at 577 East 156th Street, New York, 55, New York. Mr. Cavolina and his father founded the company around 1949 or 1950. Mr. Cavolina saw there were no companies offering complete parts in one package for building simple and easy to use radios. His radios were advertised in the various electronic magazines of the day.

The Air Champ Company made several radio kits. These kits were simple to build and sold in major department stores to young boys interested in radio. They were also sold to Boy Scouts so they could earn a Scout radio badge. As a result, many young people were introduced to amateur radio.

Air Champ Company Kits

A complete crystal set with all the parts to make a working radio. The kit contained the crystal, tuning coil, earphone wire and step-by-step instructions to insure the set worked, at a price of $2.95.

A one-tube radio kit for the standard broadcast band. The kit contained all the necessary parts except batteries, for making a working AM band radio. This kit sold for $7.25.

A two-tube kit containing all the parts to make a radio that could be used with a speaker instead of an earphone, at a price of $11.95

The latter two kits also offered instructions and parts to make them into shortwave radio sets.

The neat thing about these kits, in the 50s, was the introduction of a way to make the building simple and easy for a young person with no radio skills to complete a working and useful radio.

A pictorial diagram was used in the construction of the radio, one was sent with each kit. The diagram comprised a drawing of each part including wiring. The diagram was glued to the wooden building board. This eliminated any errors in wiring and parts placement for the novice builder. These pictorial schematics were a common building aid in the 50s.

Powering the Kits

The one-tube kit used one D size battery for the filament and a 22½-volt battery to supply the plate voltage to the tube.

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The two-tube radio used two D size batteries and a 90-volt battery to supply the plate voltage to the tubes.

However, in the 1950s, the 90-volt and 22½-volt batteries were quite expensive and most people could not afford them.

The Air Champ Company knew this and came out with a B battery eliminator to be plugged into an AC wall socket to replace the expensive batteries. The B battery eliminator was just a simple half wave rectifier that could supply 90 volts and 22½ volts for the tube plate. You still had to supply the D size 1½-volt batteries for the tube filaments.

The Air Champ radio my parents gave me that Christmas was the Air Champ 200. This was the deluxe two-tube radio using two 3V4 tubes. I think I was 11 years old at the time.

My father helped me with the construction. The pictorial was glued to the wooden base. You then screwed 29 Fahnestock clips to the board to hold the components–no soldering required.

The radio was a regenerative receiver, a design typical for the time. After completing the radio the cardboard box the kit came in also served as a nice cabinet with handles to carry the radio.

My New Air Champ 200

After finding out what the radio was called I made the decision to build an exact clone. The clone of the Air Champ 200 I built would not have been possible without the help of several people. My radio is an exact clone of the two-tube kit.

"…29 Fahnestock clips…"

Those who helped were:

Darron's New Air Champ 200 and Battery Eliminator

Bob Voss, N4CD. He sent great pictures and e-mails of his two complete Air Champ 200s one built and one not built, in original packages. The 16 pictures he sent were very detailed and included every conceivable angle of his completed Air Champ 200. He also sent the pictorial diagram of the original kit.

Without these pictures there would not have been a clone. This is why the radio is as close to the real thing as one can get.

New Air Champ 200

He also sent detailed measurements of all dimensions needed to build the radio. This was a Super effort on his part and time consuming.

Kees Talen, K5BCQ. Kees supplied the needed coil dimensions and winding instructions with the correct number of turns for each part of the coil. Kees has a neat Web site with the one-tube Air Champ he built shown. The detail is so good one could build it just by looking at the radio on his Web site.

Craig Baker, K3NQD. Craig sent copies of all magazine ads used in the 1950s for Air Champ products.

Melanie Sanchez, my daughter, is a graphic designer. She designed the cardboard cabinet box. She took all the dimensions and made the cardboard box cabinet with handles. She replicated all the artwork on the cabinet and all the other boxes shown in this article. Three complete boxes were made before the final one was made just right.

The outside covering on the box is actually some wallpaper found on the Internet; it matched the original shown in all the photos we had.

So, after about three months the radio was built and the story written.

Oh! And by the way.

This finally puts to rest my memories of a great time when I was 11 years old. Now I know what this radio was called. ■

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R.C.M.P. - Early Radio System

The National Police Force of Canada

Bob Ballantine, W8SU

The Royal Canadian Mounted Police was formed in 1920 by the merger of the Royal Northwest Mounted Police, founded 1873, and the Dominion Police, founded 1865. What kid wouldn't join up after watching Sgt. Preston, his dutiful steed Rex and police dog Yukon King!

Of this pioneering communications system precious little is written or available. Present era R.C.M.P. communication units are considered "D" Division. They have a total of 22 provincial and federally operated communication centers across Canada. "D" division members are not sworn police officers.

In the beginning, the "Far North" radio era saw shortwave receiving equipment sent to interior outposts where officers enjoyed shortwave and broadcast listening, while making hobby reception lists of distance and stations heard. In October of 1938 the R.C.M.P. concluded an agreement with radio station CKCK in Regina for the broadcast of twice-daily police bulletins, reports of stolen cars, warrants, missing persons and escaped prisoners. Regina Station CKCK, 10KW, 620 kc, operated by the Leader-Post News Corporation, was one of the world's pioneering AM radio stations.

By 1939 the Force's total strength numbered more than 2,600 men. A new commissioner, Stuart T. Wood, had been appointed a year earlier following the death of J.H. MacBrien. The R.C.M.P. was firmly established as a modern police force.

As a mode of transportation, the horse had virtually disappeared, replaced by radio-equipped motor vehicles, aircraft and a large marine service. (The R.C.M.P. Marine Service polices international waters, the Great Lakes and St. Lawrence Seaway.) One of the air section's aircraft was stationed at Regina to transport members of the crime detection lab throughout the country to give evidence in court cases. A seaplane with two-way radio equipment was purchased for the Mackenzie River district, the first police airplane to operate in the far north.

Early R.C.M.P. stations utilized all types of point-to-point MF-HF communications. In eastern Canada, for example, H Division HQ was located in Halifax, Nova Scotia assigned call sign XJA88. L Division, Prince Edward Island and J Division, New Brunswick, and so on across the country, including subdivision stations.

All mounted police radio station call signs had a three-letter prefix beginning with X followed by two digits. Every division HQ and sub-division station was fitted for radiotelephone, radioteletype and telegraph service. The Canadian Marconi Co., RCA, and the Wilcox Company in Missouri, U.S.A, manufactured some of their radiotelegraph equipment.

In 1948 one of the first FM radio towers in the R.C.M.P. communications network was a 404-foot tower near Winnipeg, Manitoba. It was the

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tallest tower in the service at that time. Radiotelegraph was used until the mounted police stations replaced code with a standard Telex® machine, however, secrecy was needed and a scrambling device secured from the armed forces. Frequencies used for radiotelegraph services were retained by the mounted police and used for SSB, but rarely used in other than certain isolated areas.

Those midnight shifts with earphones on, fading signals, static and poor atmospheric conditions were conquered by landline overland Teletype® service. Sounds familiar.

The Canadian Police Information Computer (CPIC) pronounced "Sea Pick," replaced the Telex® equipment in the 1970s.

Some R.C.M.P. seagoing radio operators had amateur radio licenses and their equipment was used extensively. Many amateurs will recall Sgt. Ed Hartling, R.C.M.P. ret., technician and engineer. Until his death, he was heard on the bands using VE1AIF. He is well remembered as net control collecting the weather early each morning from around eastern Canada and the U.S.A. on the weather net frequency, 3,770 kc. The marine division was closed in 1975.

Note: The idea of the one-way broadcast was utilized by other police services and agencies. This satisfied their basic communication needs.

A toast to the obsolete CW Op!

"A toast to the obsolete CW Op!"

The old right-hander rounding third and headed home, it was a good run. "Let's Go Home King, This Case Is Closed."

Dedicated to the memory of Rod Newkirk, W9BRD/VA3ZBB. With appreciation and thanks to Spurgeon Spud Roscoe, VE1BC, for the material quoted from his fine manuscript, "Radio Stations Common? Not This Kind." ■

Call for Articles

Have a story to share? An experience to relate? Some gear to review? A technical tip to dispense? Feeling didactic or pedantic? Write it up, add a couple of appropriate photographs and send them off to the *K9YA Telegraph*. Hams worldwide will thank you, and so will we.

Here's the place to start:

http://www.k9ya.org/write_for_us.htm

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Packet

Scott B. Laughlin, N7NET

I wonder how many readers recall the original packet mode that required a handshake and featured blinking mailbox lights? I remember it as one of my favorite modes. I was not overjoyed to see the arrival of APRS. APRS, in my opinion, removed the personal touch, the opportunity to keyboard with local friends. Without a doubt, those of us who enjoyed slow-motion chess could have continued our quest with email, or reverted back to the USPS postcards. We could have even continued our games by way of the short message service offered by APRS. But the sanity of running a computer 24/7 didn't appeal to some of us, so we simply stopped.

When Barb and I retired in April 1999, we loaded a Suzuki motorcycle and headed south. Eventually, we found ourselves lured to a scar on Arizona's Sonoran Desert floor. A place called Why.

"…blinking mailbox lights?"

Off The Grid

We'd always lived on the grid, expecting a hardwire telephone, water at the twist of the tap, lights at the flip of a switch. The place where we decided to pause and experience for ourselves offered none of that. Water came from a nearby hose, a telephone was a quarter-mile away and electricity came from a solar-charged battery (if we didn't learn anything else, we learned to switch off lights that were not in use).

The primitive park offering these sparse amenities was called Coyote Howls. After a few days we discovered an individual with his amateur radio call affixed to the door of his travel trailer. Shortly there after, Charlie, the person in question, disclosed that a nest of Technicians, eleven in all, resided within simplex range. This gaggle of hams was the result of classes he taught. In addition, he already conducted a nightly, two-meter net.

Digipeater

The village, Why, was located about midway between Tucson and Yuma. Richard, another local ham, and an employee of Pima County, had already installed a mountaintop repeater, which gave us two-meters coverage into Yuma. With Richard's help and expertise, a packet digipeater eventually shared space with his repeater.

Of course it was more complicated than simply installing the system. The site was a remote Air Force location. Permission was granted only after a lengthy application period. When it came time to install the digi, and for each additional trip to the site we were required to visit the sheriff's office with the names and call signs of those in the work party one day prior. The following day we were allowed to sign for the key to the gate.

The digi provided a great deal of pleasure. Our beacon was heard in Yuma as well as the north rim of the Grand Canyon, more than 300 miles north of our location. The mailbox light never had a day off. For sending distant messages I often connected with a ham in Prescott, who, in turn, sent them on via HF.

In the Offing

Some of us in North Texas are in the process of forming a local packet group. We have no mountaintop digi. We only have each other. How well this turns out is still under evaluation—a topic for another article. ■

Correction

Photo caption on page 4, October 2014, incorrectly identifies Bob Cashdollar, NR8U. The photo is actually of Fritz Tender, WD8E.

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The Road Not Taken

Paul W. Ross, W3FIS

With a nod to Robert Frost, whose poem has that title; there are many paths to take in our adventures in amateur radio. Some bear more exploration, and are well within the means of practically every ham radio operator. This is one of those roads.

Every time I fire up my WSPRnet software, which is used for *very* weak signal propagation beaconing, it defaults to the 30-meter band. The 30-meter band (10.100 to 10.150 MHz, 200 watts PEP maximum, CW and data only, no contests) is the child of the WARC–World Administrative Radio Conference–in 1979. The 30-meter band was made available in the 1980s for Amateur Radio use. The 30-meter band and, in addition, the 17- and 12-meter bands are small "slivers" in the HF spectrum. These bands provide some places to "hide" during heavy band activity, such as contests. And, because of there specialized access, are great for carrying on experimental activities.

The 30-meter band provides propagation characteristics intermediate between the well-trodden territories of the 20- and 40-meter bands, which I work extensively. My expectation was that the best conditions would be after dark, which turns out to be the case. With the 30-meter band, we should see some nice D and E layer skip, which has been my experience with digital modes, such as JT65/9 and WSPRnet. Of course, better yet, it is not crowded, which gives you a better shot at DX!

> *"a better shot at DX!"*

Combined with my interest in QRP CW, building stuff and generally poking around in new areas of ham radio, I decided to explore 30-meters a bit more. I have commercial equipment that nicely covers the 30-meter band, but I wanted to see what I could stir up with some single-band equipment designed just for that band. I had basically two choices—crystal controlled or "rock bound" transceivers, such as the DC30A from QRP Kits, or one of the Chinese crystal-controlled transceivers.

More to the point, there are two "watering holes" published for the 30-meter band—10.106, and 10.116 MHz. Initially, I did not want to be limited by a crystal-controlled rig, so opted for an MFJ "Cub" for the 30-meter band for just a little more money. In the past I had built a "Cub" for 20-meters with good results, so a 30-meter "Cub" seemed to be the way to go.

MFJ QRP Cub XCVR

I placed an order with MFJ and a few days later a familiar package arrived in the mail. A complete parts inventory turned up two missing components and a quick call to customer service at MFJ generated the missing parts in the mail in a few days. I have had nothing but excellent customer service from MFJ over the years.

Assembly of the "Cub" transceivers is quite straight forward The "Cub" comes in 80-, 40-, 30-, 20-, 17- and 15-meter versions, either as a kit or assembled. The 40-meter version is also available as a package from the ARRL including a book on low power radio.

A number of the parts–my nemesis—SMT devices, were already placed on the board. That left me with some transformers, two semiconductors, a handful of capacitors, some connectors, and a few other parts to insert and solder. There are only two toroids to wind, which is great for those of us with "fat" fingers! Total construction time was spread over two evenings, with due care to make sure each connection was sound before moving on to the next one. It is useful to make a "blow up" of the parts placement diagram of board layout, marking off each component as it is inserted and soldered. The "in place" SMT parts are

CONTINUED - THE ROAD LESS TAKEN ON PAGE 8

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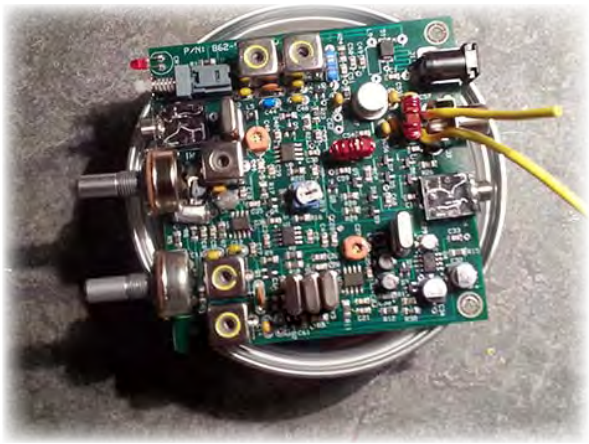
Continued - The Road Less Taken from Page 7

clearly defined. This provides a double check on either missing something, or putting it in the wrong place.

Well, time for the "smoke" test. The bench testing procedure is clearly outlined. As the board and associated connectors are a bit of a tight fit in the case, it is wise to check things out and perform the basic alignment tasks before case insertion. Final "tweaks" can be made once the case is on. In fact, there is an access hole in the top of the case for adjusting the final amplifier drive level, in case you want to drop to QRPp levels—*really* low power. Measurement with a dummy load and peak reading diode-metering system gave a nice solid one-watt output. A different output transistor, as suggested in the manual, might give more output. However, I wanted to stick to "stock" construction.



Completed PCB Assembly

The provided RF connector is an RCA pin plug, which really works fine, but since my shack is pretty well standardized on BNC and UHF connectors, I opted to add a BNC connector in the hole provided on the back of the case. In addition, I replaced the stock knob with a larger one for ease of tuning, and marked the 10.106 and 10.116 points on the case with a small colored marker dots from the local office supply house. A check with a good receiver showed tuning from 10.101 to 10.126 MHz, which covers most of the 30-meter band quite nicely.

If you are exploring unknown territory WSPRnet offers a method to check actual propagation conditions on any amateur band. In addition, the VOACAP program run by Voice of America (freely available access on-line) provides an additional propagation prediction mechanism. There is no point calling "CQ" in the wilderness if there is nobody there to listen!

Now, off to see what I can shake loose on 30-meters. You can never have enough radios! ■

Continued - Heathkit from Page 1

tory Series are included. The latter lists the curious, yet eminently useful, EV-2 Demonstration Servo-Meter with its oversize servo-driven pointer and 7 foot x 44-inch meter face (screen) "designed specifically for classroom demonstrations" lest anyone at the back of the room miss the teacher's instruction.

In addition to its value as a reference volume, *Heathkit Test Equipment Products* is an entertaining and thought-provoking book. Open it to the beginning of any chapter and commence reading, it doesn't take many pages to discern the arc of U.S. DIY electronics post-WWII to the early 1990s in lockstep with Heathkit's rise and fall.

The author's encyclopedic knowledge and devotion to Heath's products is obvious. No one can come away from *Heathkit Test Equipment Products* without a greater understanding of its subject, the company and people who made it all possible.

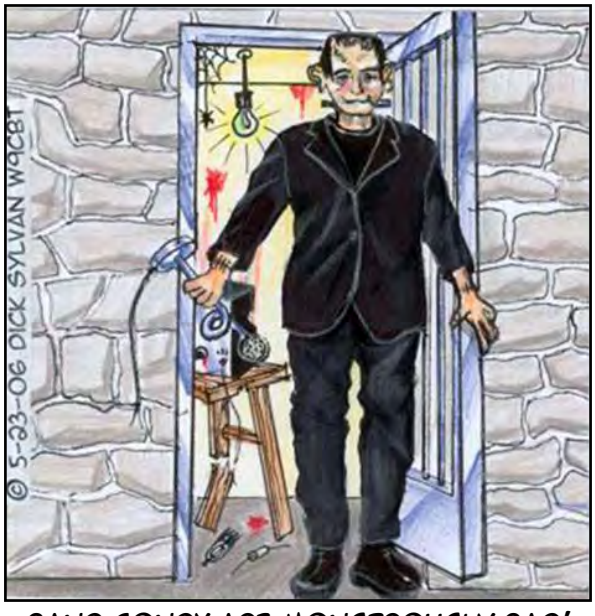
From the book's cover: *Chuck Penson is an industrial archeologist working as the historian for the Titan Missile Museum south of Tucson, Arizona. Penson has been studying the Heath company and collecting Heathkits since 1980. His other books include* Heathkit: A Guide to the Amateur Radio Products*, and* The Titan II Handbook: A Civilian's Guide to the Most Powerful ICBM America Ever Built. ■

Heathkit: Test Equipment Products, Chuck Penson, WA7ZZE, 2014, ISBN: 978-0-615-99133-7

Available from: http://www.amazon.com

Ham Quips

DICK SYLVAN, W9CBT



BAND CONDX ARE MONSTROUSLY BAD!

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