County Hunter News

July 2018
Volume 14 Issue 7

Welcome to the On-Line County Hunter News, a monthly publication for those interested in ham radio county hunting, with an orientation toward CW operation**.**

Contributions of articles, stories, letters, and pictures to the editor are welcomed, and may be included in future issues at the editor's discretion.

The County Hunter News will provide you with interesting, thought provoking articles, articles of county hunting history, or about county hunters or events, ham radio or electronics history, general ham radio interest, and provide news of upcoming operating events.

We hope you will enjoy the County Hunter News. Feel free to forward, or provide links. Permission is given for copying or quoting in part or all provided credit is given to the CHNews and to the author of article.

CW County Hunter Nets run on 14.0565, 10.122.5, and 7056.5, with activity occasionally on 3556.5 KHz. Also, there is SSB activity now is on 'friendly net' 7188 KHz. The CW folks are now pioneering 17M operation on 18.0915. (21.0565, 24.9155, and 28.0565 when sunspots better). Look around 18136 or for occasional 17M SSB runs usually after the run on 20M SSB. (21.336 and 28.336)

You can see live spots of county hunter activity at ch.W6RK.com

For information on county hunting, check out the following resources:

The USACA award is sponsored by CQ Magazine. Rules and information are here:

http://countyhunter.com/cq.htm

For general information FAQ on County Hunting, check out:

http://countyhunter.com/whatis.htm

MARAC sponsors an award program for many other county hunting awards. You can

find information on these awards and the rules at:

http://marac.org/awards.pdf

The CW net procedure is written up at:

http://www.wd3p.net/ch/netproc/netproc.htm

There is a lot more information at www.countyhunter.com . Please check it out.

Back issues of the County Hunter News are available at www.CHNewsonline.com

Want county lines on your Garmin GPS?

http://pages.suddenlink.net/w4ydy/hamlinks.html#County

Download the file to a flash card that fits in your GPS unit, turn it on, and the county lines should appear!

De N4CD, Editor (email: telegraphy@verizon.net)

Notes from the Editor

N4CD Rumblings

Wow! Bands have been good this month. Jerry, W0GXQ made a trip back to MN and put hundreds of contacts on 10, 12, 15 and 17M in the log from the counties. Lots of 'band counties' for those working on that. There was fairly short skip that helped a lot too! Then after FD had a day or two of Geomagnetic Storm with A index up at 75! On those days, not much happens!

There's been a few mobiles on epic trips out for weeks at a time running whole states – helping a lot of folks get their awards. More in the activity section. N4UP has really been busy running whole states lately. Most active mobile of the month for sure!

In June, there were two QSO Parties, two VHF contest and Field Day operating events to keep folks entertained and busy.

MARAC now seems 'caught up' on the backlog with many issued to date from a few months ago.

This month two interesting articles on sunspots – and a few on regen receivers that have been added to the N4CD collection – things happen in bunches it seems – nothing for months then some luck occurs.

On the Trail of Regens I

One of the rarest of the rare showed up on Ebay. How rare? This was one of two known radios of its type in the entire country – a DeForest Model CS-5 – maybe one of two in the entire world! The other known radio is in the AWA Antique Wireless Museum in Broomfield, NY which they recently acquired from an estate – and was donated. There are many fanatical DeForest radio collectors – and most of those other early radios are rather scarce as well. This one was being sold by a collector in NC who has been downsizing for the last couple years selling some real rare stuff.

First, let's look at the life of a significant contributor to radio – as we know it today.....

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Lee de Forest (August 26, 1873 – June 30, 1961) was an American inventor, self-described "Father of Radio", and a pioneer in the development of sound-on-film recording used for motion pictures. He had over 180 patents, but also a tumultuous career. He boasted that he made, then lost, four fortunes. He was also involved in several major patent lawsuits, spent a substantial part of his income on legal bills, and was even tried (and acquitted) for mail fraud. His most famous invention, in 1906, was

the three-element "Audion" (triode) vacuum tube, the first practical amplification device. Although De Forest had only a limited understanding of how it worked, it was the forerunner of modern day electronics and others improved it to make it useful.

DeForest early on as a youth was convinced there was a great future in "wireless telegraphy but Italian Guglielmo Marconi, who received his first patent in 1896, was already making impressive progress in both Europe and the United States. One drawback to Marconi's approach was his use of a coherer as a receiver, which, while providing for permanent records, was also slow (after each received Morse code dot or dash, it had to be tapped to restore operation), was insensitive, and was not very reliable.

So De Forest set out to devise a better system, including a self-restoring detector that could receive transmissions by ear, hopefully making it capable of receiving weaker signals and also allowing faster Morse code sending speeds. The coherer was limited to about 12-15 wpm. Landline telegraphers could routinely do 40-50 wpm.

His first job after leaving Yale was with the Western Electric Company's telephone lab in Chicago, Illinois. While there he developed his first prototype receiver called "responders". It used an improved telephone receiving earpiece. You'd hear 'clicks' in the earpiece. Not very good but on a par with coherers for sensitivity which were also not very good. (Tens of thousands or hundreds of thousands of micro-volts to hear anything. Needless to say, range was usually fairly short at this point although growing by leaps and bounds quickly as transmitter power increased and antennas got even larger – but still 'short'.)

You'll recall the Amateur Radio League (ARRL) was formed around 1915 to relay messages across the country. Most stations had a range of 25 miles with very well equipped ones reaching out 50 miles and truly exceptional ones to maybe 100 miles. Just imagine now a message hopping from station to station with a distance of 25 miles between them. Hundreds of relays to get message from coast to coast! That was the limits of the technology of the day – other than very high power stations involved in marine communications. Well, hams had been banished to those 'useless frequencies' above 1.7 MHz – and without 'tubes' and gain you didn't get far – spark gap transmitters and crystal receivers!

By 1900, using a spark-coil transmitter and his responder receiver, de Forest expanded his transmitting range to about four miles.

De Forest made the bold decision to go to New York to compete directly with Marconi in transmitting race results for the International Yacht races. Marconi had +already made

arrangements to provide reports for the Associated Press, which he had successfully done for the 1899 contest. De Forest contracted to do the same for the smaller Publishers' Press Association.

The race effort turned out to be an almost total failure. None of these companies had effective tuning for their transmitters, so only one could transmit at a time without causing mutual interference. Although an attempt was made to have the three systems avoid conflicts by rotating operations over five-minute intervals, the agreement broke down, resulting in chaos as the simultaneous transmissions clashed with each other. De Forest ruefully noted that under these conditions the only successful "wireless" communication was done by visual semaphore "wig-wag" flags.

It would take Marconi's work – and the famous 'Four Sevens' patent - #7777 – that gave Marconi the rights to the 'tuned circuit' years later that would put different companies on different frequencies. (or at least keep others out of Marconi's systems – he was not one to license patents – you had to use his equipment to get the benefits). Until that time, everything was 'untuned' or accidentally tuned by antenna configuration and coupling circuits. Of course, with spark transmitters, your signal was wider than a barn door- everywhere! If you could put up a 'full size antenna' you'd do better – but a full size vertical for 160m where hams operated - is – well, 130 ft for a ¼ wave vertical. 260 feet for a dipole – up 130 feet in the air.....Not easy! Most others - military and commercial operated around 400-500 KHz.

In January 1902 he met a promoter, Abraham White, who would become de Forest's main sponsor for the next five years. White envisioned bold and expansive plans that enticed the inventor — however, he was also dishonest and much of the new enterprise would be built on wild exaggeration and stock fraud.

The original "responder" receiver proved to be too crude to be commercialized, and de Forest struggled to develop a non-infringing device for receiving radio signals. (Just like the early computer days – where there was a battle between different emerging companies – and technologies – with DOS, Windows, and Apple IOS taking over within a few years as competitors couldn't match them – or the smartphone era with either the iPhone or Android systems taking 90% of the market and squashing nearly all competitors – the early days of radio were dominated by patent battles. Marconi dominated the maritime 'wireless' field with only a few competitors serving businesses who sharing a small remaining part until WW1).

The deForest company's most important early contract was the construction, in 1905–1906, of five high-powered radiotelegraph stations for the U.S. Navy, located in

Panama, Pensacola and Key West, Florida, Guantanamo, Cuba, and Puerto Rico. But the main focus was selling stock at ever more inflated prices, spurred by the construction of promotional inland stations. Most of these inland stations had no practical use and were abandoned once the local stock sales slowed.

De Forest eventually came into conflict with his company's management. His main complaint was the limited support he got for conducting research, while company officials were upset with de Forest's inability to develop a practical receiver free of patent infringement. (This problem was finally resolved with the invention of the carborundum crystal detector by another company employee, General Henry Harrison Chase Dunwoody). On November 28, 1906, in exchange for $1000 and the rights to some early Audion detector patents, de Forest turned in his stock and resigned from the company that bore his name. American DeForest was then reorganized as the United Wireless Telegraph Company, and would be the dominant U.S. radio communications firm, albeit propped up by massive stock fraud, until its bankruptcy in 1912.

De Forest moved quickly to re-establish himself as an independent inventor, working in his own laboratory in New York City.

De Forest's most famous invention was the "grid Audion", which was the first successful three-element (triode) vacuum tube, and the first device which could amplify electrical signals. He traced its inspiration to 1900, when, experimenting with a spark-gap transmitter, he briefly thought that the flickering of a nearby gas flame might be in response to electromagnetic pulses.

After determining that an open flame was too susceptible to ambient air currents, de Forest investigated whether ionized gases, heated and enclosed in a partially evacuated glass tube, could be used instead. In 1905 to 1906 he developed various configurations of glass-tube devices, which he gave the general name of "Audions". The first Audions had only two electrodes, and on October 25, 1906, de Forest filed a patent for diode vacuum tube detector, that was granted U.S. patent number 841387 on January 15, 1907. Subsequently, a third "control" electrode was added, originally as a surrounding metal cylinder or a wire coiled around the outside of the glass tube. None of these initial designs worked particularly well. He was insistent that a small amount of residual gas was necessary for the tubes to operate properly. However, he also admitted that "I have arrived as yet at no completely satisfactory theory as to the exact means by which the high-frequency oscillations affect so markedly the behavior of an ionized gas."

In late 1906, de Forest made a breakthrough when he reconfigured the control electrode, changing it from outside the glass to a zig-zag wire inside the tube, positioned in the

center between the cathode "filament" and the anode "plate" electrodes. He reportedly called the zig-zag control wire a "grid" due to its similarity to the "gridiron" lines on American football playing fields. Experiments conducted with his assistant, John V. L. Hogan, convinced him that he had discovered an important new radio detector, and he quickly prepared a patent application which was filed on January 29, 1907, and received U.S. patent number 879,532 on February 18, 1908. Because the grid-control Audion was the only configuration to become commercially valuable, the earlier versions were forgotten, and the term "Audion" later became synonymous with just the grid type. It later also became known as the triode.

(Fleming is usually given credit for the invention of the 'diode' tube)

The grid Audion was the first device to amplify, albeit only slightly, the strength of received radio signals. However, to many observers it appeared that de Forest had done nothing more than add the grid electrode to an existing detector configuration, the Fleming valve, which also consisted of a filament and plate enclosed in an evacuated glass tube. The U.S. courts were not convinced, and ruled that the grid Audion did in fact infringe on the Fleming valve patent, now held by Marconi. On the other hand, Marconi admitted that the addition of the third electrode was a patentable improvement, and the two sides agreed to license each other so that both could manufacture three-electrode tubes in the United States.

Because of its limited uses and the great variability in the quality of individual units, the grid Audion would be rarely used during the first half-decade after its invention. It was too finicky and some worked, some didn't, and no one knew how to fix the quality issues. Even though there were two separate filaments inside the envelope, they burned out after a few dozen hours of use typically.

All of commercial wireless at this time was `down below 550 KHz – for Marconi – 600 and 300 meters. Range was better at night – several hundred miles.

Marconi, meanwhile, came up with his famous 'Magnetic Detector' (Maggie) which he used very successfully from 1906 to well after 1912 when it was replaced by Audion and crystal (cat whisker type) and carborundum back up receivers. Some Marconi ships had multiple detectors – the Maggie, an Audion detector, and a crystal or carborundum one.

De Forest moved to San Francisco, California, and in early 1911 took a research job at the Federal Telegraph Company. One of de Forest's areas of research at Federal Telegraph was improving the reception of signals, and he came up with the idea of

strengthening the audio frequency output from a grid Audion by feeding it into a second tube for additional amplification. He called this a "cascade amplifier", which eventually consisted of chaining together up to three Audions.

At this time the American Telephone and Telegraph Company was researching ways to amplify telephone signals to provide better long-distance service, and it was recognized that de Forest's device had potential as a telephone line repeater. In mid-1912 an associate, John Stone Stone, contacted AT&T to arrange for de Forest to demonstrate his invention. It was found that de Forest's "gassy" version of the Audion could not handle even the relatively low voltages used by telephone lines.

However, careful research by Dr. Harold D. Arnold and his team at AT&T's Western Electric subsidiary determined that by improving the tube's design, it could be more fully evacuated, and the high vacuum allowed it to successfully operate at telephone line voltages. With these changes the Audion evolved into a modern electron-discharge vacuum tube, using electron flows rather than ions.

After a delay of ten months, in July 1913 AT&T purchased the wire rights to seven Audion patents for $50,000. De Forest had hoped for a higher payment, but was again in bad financial shape and was unable to bargain for more. In 1915, AT&T used the innovation to conduct the first transcontinental telephone calls.

Radio Telephone Company officials had engaged in some of the same stock selling excesses that had taken place at American DeForest, and as part of the U.S. government's crackdown on stock fraud, in March 1912 de Forest, plus four other company officials, were arrested and charged with "use of the mails to defraud". Their trials took place in late 1913, and while three of the defendants were found guilty, de Forest was acquitted.

With the legal problems behind him, de Forest reorganized his company as the DeForest Radio Telephone Company, and established a laboratory in the Bronx in New York City. The company's limited finances were boosted by the sale, in October 1914, of the commercial Audion patent rights for radio signaling to AT&T for $90,000, with de Forest retaining the rights for sales for "amateur and experimental use".

The Radio Telephone Company began selling "Oscillion" power tubes to amateurs, suitable for radio transmissions. The company wanted to keep a tight hold on the tube business, and originally maintained a policy that retailers had to require their customers to return a worn-out tube before they could get a replacement. This style of business encouraged others to make and sell unlicensed vacuum tubes which did not impose a

return policy. One of the boldest was Audio Tron Sales Company founded in 1915 by Elmer T. Cunningham of San Francisco, whose Audio Tron tubes cost less but were of equal or higher quality.

In April 1917, the company's remaining commercial radio patent rights were sold to AT&T's Western Electric subsidiary for $250,000. During World War I, the Radio Telephone Company prospered from sales of radio equipment to the military. However, it also became known for the poor quality of its vacuum tubes, especially compared to those produced by major industrial manufacturers such as General Electric and Western Electric.

Deforest's Radio Telephone Company survived till the mid 30s and got wiped out during the Great Depression.

WW1 saw major and quick advances in tube technology – mostly from the European side who were involved early in the war and were up to their necks in the need for communications. The first mass produced tubes – the VT1 and VT2 were designed and produced during the war and put into use. After WW1, the new 'broadcast' industry kick started the tube industry and over the next decade, 100 milllion tubes would be made.

As a side note, many of the early BC receivers, run on batteries, used a 'gassy tube' detector – the UV200 that worked a bit better as a grid leak 'detector' tube than a high vacuum tube at the time, but fell out of favor a few years later with higher voltages possible with AC powered radios. Early BC radios ran off 22.5v and 45v batteries for B+. Sometimes 90v if you had money to spend on batteries all the time to drive a horn speaker. With a/c power now reaching most homes, your radio could run on 150v or more B+ easily, and pentode power amps took lots of current and put out lots of power. Superhets had more tubes and needed more DC power.

Regeneration patent controversy. Who 'invented' 'regeneration'?

Beginning in 1912 there was increased investigation of vacuum-tube capabilities, simultaneously by numerous inventors in multiple countries, who identified additional important uses for the device. These overlapping discoveries led to complicated legal disputes over priority, perhaps the most bitter being one in the United States between de Forest and Edwin Armstrong over the discovery of regeneration (also known as the "feedback circuit" and, by de Forest, as the "ultra-audion").

Beginning in 1913 Armstrong prepared papers and gave demonstrations that

comprehensively documented how to employ three-element vacuum tubes in circuits that amplified signals to stronger levels than previously thought possible, and that could also generate high-power oscillations usable for radio transmission. In late 1913 Armstrong applied for patents covering the regenerative circuit, and on October 6, 1914 U.S. patent 1,113,149 was issued for his discovery.

With an eye to increasing the value of the patent portfolio that would be sold to Western Electric in 1917, beginning in 1915 de Forest filed a series of patent applications that largely copied Armstrong's claims, in the hopes of having the priority of the competing applications upheld by an interference hearing at the patent office. Based on a notebook entry recorded at the time, de Forest asserted that, while working on the cascade amplifier, he had stumbled on August 6, 1912 across the feedback principle, which was then used in the spring of 1913 to operate a low-powered transmitter for heterodyne reception of Federal Telegraph arc transmissions. However, there was also strong evidence that de Forest was unaware of the full significance of this discovery, as shown by his lack of follow-up and continuing misunderstanding of the physics involved. In particular, it appeared that he was unaware of the potential for further development until he became familiar with Armstrong's research. De Forest was not alone in the interference determination — the patent office identified four competing claimants for its hearings, consisting of Armstrong, de Forest, General Electric's Langmuir, and a German, Alexander Meissner, whose application would be seized by the Office of Alien Property Custodian during World War I.

The subsequent legal proceedings become divided between two groups of court cases which would drag on almost one and a half decades. The first court action began in 1919 when Armstrong, with Westinghouse, which purchased his patent, sued the De Forest company in district court for infringement of patent 1,113,149. On May 17, 1921 the court ruled that the lack of awareness and understanding on de Forest's part, in addition to the fact that he had made no immediate advances beyond his initial observation, made implausible his attempt to prevail as inventor.

However, a second series of court cases, which were the result of the patent office interference proceeding, had a different outcome. The interference board had also sided with Armstrong, and de Forest appealed its decision to the District of Columbia district court. On May 8, 1924, that court concluded that the evidence, beginning with the 1912 notebook entry, was sufficient to establish de Forest's priority. Now on the defensive, Armstrong's side tried to overturn the decision, but these efforts, which twice went before the U.S. Supreme Court, in 1928 and 1934, were unsuccessful.

This judicial ruling meant that Lee de Forest was now legally recognized in the United

States as the inventor of regeneration. However, much of the engineering community continued to consider Armstrong to be the actual developer, with de Forest viewed as someone who skillfully used the patent system to get credit for an invention to which he had barely contributed.

The practical effect of de Forest's victory was that his company was free to sell products that used regeneration, for during the controversy, which became more a personal feud than a business dispute, Armstrong tried to block the company from even being licensed to sell equipment under his patent. It was an ugly situation for years and years. By the time the final decision came out, it was pretty well over for regen technology. The world had moved on to the superhet for broadcast radios and commercial use. Before deployment of superhet technology, a competing technology – the TRF receiver was quite popular.

By 1934, the era of the tube regen receiver was in its waning days for broadcast and shortwave use. While the shortwave craze, starting in the late 20s, was going full tilt, most people back then bought 'kits' that avoided the patent fees – and this continued all the way into the 1960s with the low cost Knight Kits and similar – and the patents did expire in the 30s. (there are no patent fees for self assembled radios for 'experimenters'). DeForest didn't collect a whole lot of money on his regen patent. Indeed, today you can still buy a solid-state regen shortwave receiver from MFJ (the World Band receiver kit) that performs fairly well)

However, a few companies did make regens – including Silver Marshall and National Radio among others in the early 1930s. Recall that the Great Depression was happening and money was tight for most people. The famous 1930 design National SW-3 of the early 1930s can still be found for sale at many hamfests and antique radio auctions – it incorporated all the 'right' features for a set of its time plus simplicity – only a few tubes, good shielded construction, stable, low cost for an assembled radio, and low power requirements. Sold up to WW2.

By the mid to late 30s, the technology was going 'superhet' (invented and patented by Armstrong) and a good percentage of console and table radios had shortwave bands included. These radios tuned in AM foreign broadcasts, usually high power broadcasters, with little difficulty. Other than hobbyists building 'their own' radio, the need for regens for commercially sold radios pretty much faded away other than for 'long wave' (15-600 KHz) where they still were used extensively even up to the 1990 time frame. Part of the reason is they used fewer tubes – only a small handful - more reliability compared to a complicated superhet – and could easily be run off standby batteries for emergencies. The other problem, of course, is what do you use for an IF

frequency to tune in 50 KHz? You need to 'upconvert' then downconvert – lots more complications!

The grid Audion, which de Forest called "my greatest invention", and the vacuum tubes developed from it, dominated the field of electronics for forty years. It could also be used as an electronic switching element, and was later used in early digital electronics, including the first electronic computers, although the 1948 invention of the transistor would lead to microchips that eventually supplanted vacuum-tube technology. For this reason de Forest has been called one of the founders of the "electronic age".

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OK.....back to actual receivers.....

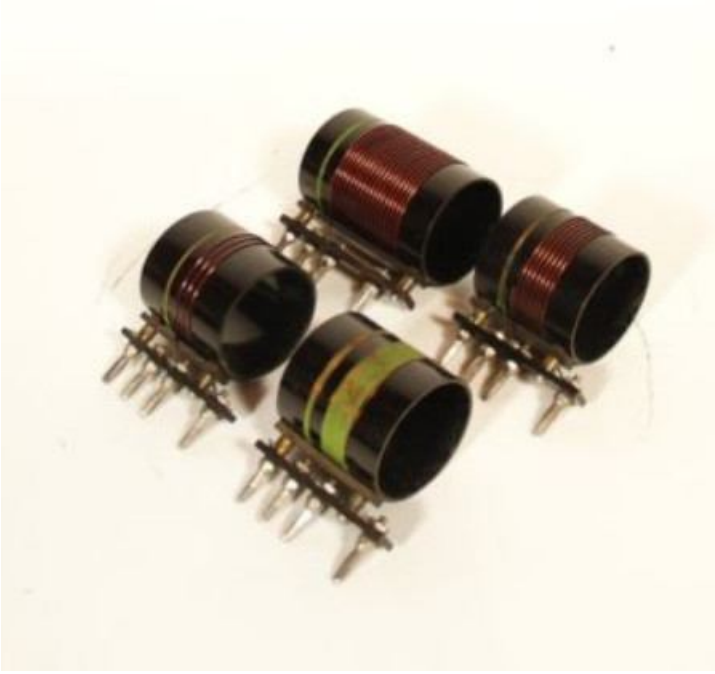
Below is a DeForest Model CS-5 Shortwave Receiver made around 1930. It was a 4 tube model and very lightweight – aluminum chassis - just a few pounds. One of the big markets for HF radios at this time was commercial aviation – especially overseas routes. Weight was a prime concern along with power consumption. This model was likely aimed at that market. There were two versions – one with 'battery tubes' and one for fixed operation off conventional supplies using a/c powered tubes. It consisted of an untuned RF stage, a 'regenerative detector', and two stages of audio. Probably not all that sensitive but likely adequate when you are up 8,000 to 10,000 feet flying along. It used plug in coils to cover 1.5 to 23 MHz in 4 ranges. Probably less than 200 were ever made. Maybe not even that many. No one knows as there are no records.

(About the same time, the National SW-3 came out – and it was oriented toward the same market. It weighed a few pounds more – steel and lots of shielding – but was a very sensitive **regen** receiver with tuned RF amp stage before the detector. It was made by the thousands and thousands.) Likely was more sensitive than the Model CS-5 with better operation due to the tuned RF amp.

No one has ever compared the two.

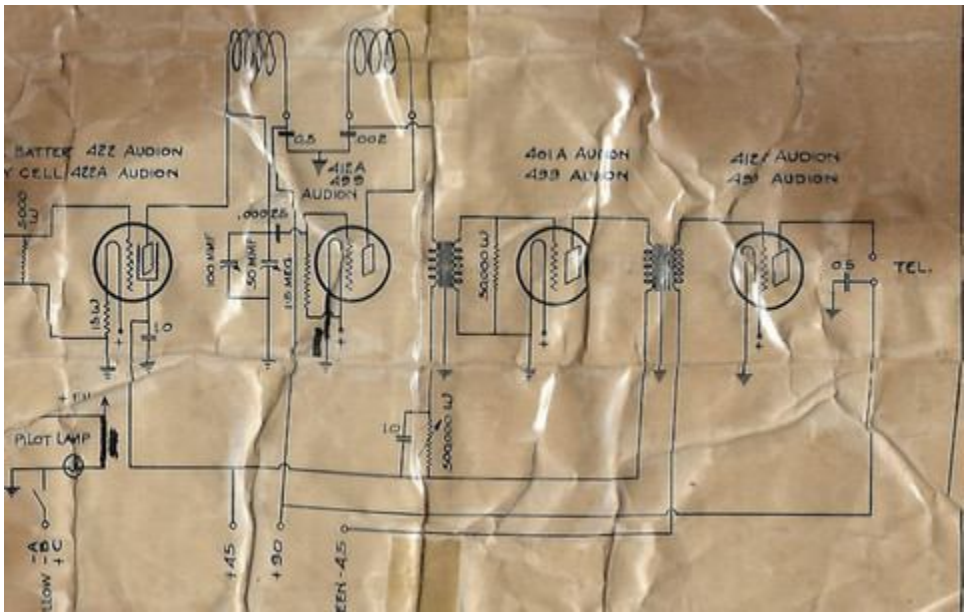
The DeForest CS5 had an untuned screen grid RF amp – a 422 Audion – with a 412A triode detector, followed by a transformer coupled 401A tube and another transformer coupled 412 tube for more audio power. The ad stated this radio could drive a 'magnetic speaker'. To run it, you'd need a 6v storage battery, 2 45v batteries, and a 4.5v C battery for bias. The controls, left to right, were 'regen', on/off switch, main turning (and only tuning), and volume control. The radio cost $75, less tubes in 1930. Those were extra and of course, you needed them!

Ultra Rare DeForest Model CS-5



Plug in Coils for Model CS-5

Note the plug in coils go into a socket on top of the set – which makes changing bands easy but exposes the coils to hand capacity effects and damage. The National SW-3 coils are internal and in shielded compartments.



Caribbean Adventure – by AI5P

Caribbean Adventure - 2018

During the trip in April-May, Sint Maarten (Dutch) was the staging point and I eventually passed through the island four times. You might recall the island was devastated by Hurricane Irma in September, 2017. Major recovery work has been done but much more is needed. The estimate of damages to the island was $ 3 billion.

I managed to get 129 contacts in the log as
PJ7/AI5P - all on 20m CW.

One wrecked yacht

St. Eustatius (also known as Statia).

Little known American history fact:

On November 16, 1776, the 14-gun American brig Andrew Doria arrived. Flying the Continental Colors of the fledgling United States, the ship signaled Fort Oranje with a salute and received a salute in return. This was the first international recognition of American independence.

Operating as PJ5/AI5P, a total of 1408 contacts were made with 90% on CW.

St. Barthelemy

Playground of the rich and famous with its luxury yachts, designer boutiques, and million-dollar villas dotting the hillsides. Also known for its 14 pristine, white beaches.

With my friends N0KV, W0ZA, and WD0E, the DXpedition made over 11,000 contacts with 2100 contacts on FT-8 and over 100 on various satellites. Operating as FJ/AI5P, my total was around 2600 contacts.

Saba

Only a 12 minute flight from Sint Maarten, this landing will guarantee your sense of awe, if not terror! Check it out on You Tube. The departure and landing at Saba is certainly one of the highlights of visiting. The other is climbing Mount Scenery, at 877-meters (2910 feet), the highest point in the Kingdom of the Netherlands. You will break a sweat in this 90 minute climb.

https://www.youtube.com/watch?v=bVdaFv6kbkw

Operating as PJ6/AI5P, 1763 contacts were made with about 77% on CW.

It was a lot of fun, but coming home was nice after being away for over a month.

73 Rick AI5P

Mobile Activity in June

At the end of May, folks were headed home from Dayton – most took the short route home.

Several mobiles including N5MLP and K8ZZ were on the road for weeks.

Ron, N5MLP, was busy headed across TX, LA, into MS on the 1st of June. Headed through AL putting many out then into GA. Back around through AL and into GA again then into SC and NC. Back down to FL for counties there. Many, many days on the road. Headed back home after more than 3 weeks on the road. Definitely one of the most active mobile this month!

K0MAF was noted in KY, into IL and IA

Bill, K0DEQ, busy in IL putting them out – circled around and back to MO.

N9JF spotted in MN counties – later in MI – putting out some counties and parks.

AB7NK/K7SEN headed from AZ to TX

Ed, K8ZZ, ran a lot of NE counties, then into WY and MT, into ND to MN. Spending time there on 'vacation' doing the ATV back roads bit.

KB0BA/N0XYL popped up in VT counties– headed over to ME for counties there.

VE2GT/W1 spotted in several parks in VT counties

AB7RW noted mobile in OR and WA counties on several days.

Kraig, KA2LHO busy putting out parks/counties in PA and nearby on many days this month. Still at it at press time.

Jerry, W0GXQ headed to NE from CO. Busy putting them out on bands up to 10m – good skip conditions while he was out. Lots of 'band counties' collected by those chasing him.

Peter, N4UP, headed up to NJ to run all the counties there. Circled around through WV then into PA and back to VA. Still putting them out all month long. He's another very active mobile this month.

End date 6/25/18

Solar Cycle News

Cycle 24 Solar Minimum: A Potentially Lengthy Period
of Very Low Solar Activity

Frank Donovan W3LPL

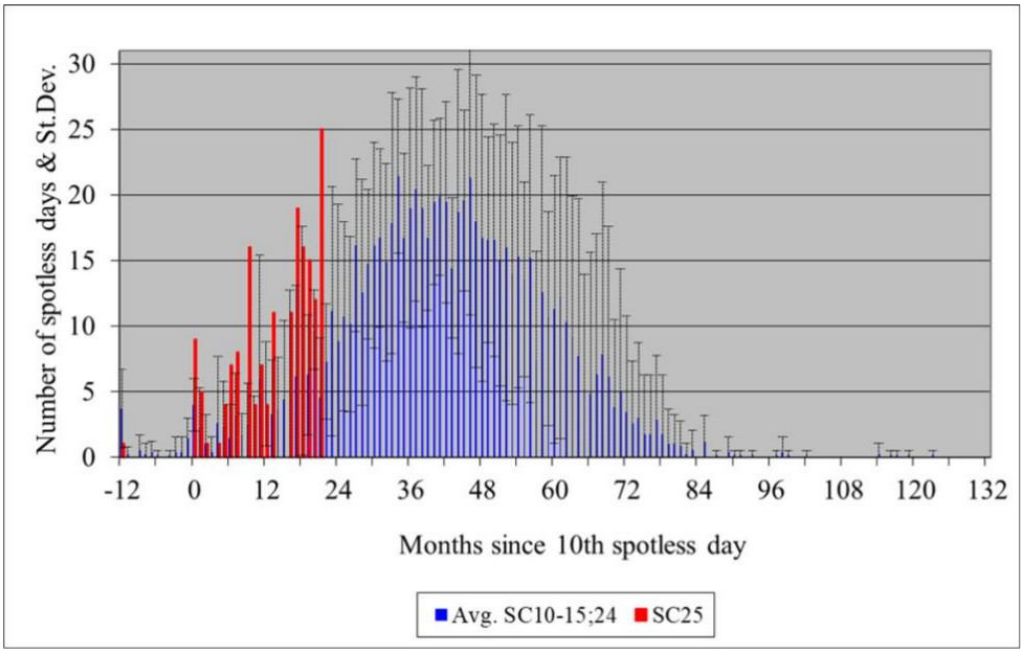
What is a solar precursor?

Solar precursors – correlating ongoing observations of solar physical phenomena to expected solar activity a few years in the future – have proven to provide more reliable forecasts than traditional statistics - based forecasts. Precursors also provide more reliable estimates of the future intensity and timing of the Cycle 25 solar maximum than traditional statistics- based forecasts. One type of precursor – spotless days – can be used to assess progress towards what is likely to be another deep and potentially lengthy solar minimum with similarities to the deep and lengthy Cycle 23 solar minimum. But it's important to understand that ongoing Cycle 24 has many unique characteristics, unlike any other recorded solar cycle in the behavior of many of its physical phenomena. Likewise Cycle 25 will have its own unique characteristics, distinguishing it from any prior recorded cycle. These unique characteristics can produce unexpected

outcomes. What precursors of solar minimum have already occurred?

The first precursor of the Cycle 24 solar minimum occurred when nine spotless days occurred in June 2016. There were 31 scattered spotless days during all of 2016 and only 9 percent of the days were spotless. Periods of spotless days lasting more than two weeks in a row are precursors of a deep solar minimum with potential similarities to the last solar minimum. There were 16 spotless days in a row in March 2017 followed by 14 in a row from late July through mid - August. The frequency of spotless days accelerated when 13 spotless days in a row occurred in November followed by more than 50% spotless days during every subsequent month through April 2018, signaling the beginning of the period of very low solar activity known as solar minimum. There were 109 spot-less days during 2017 and 30 percent of the days were spotless. And, 74 spotless days have occurred from January through May 2018 and 50 percent of the days were spotless.

How long will this solar minimum last?
Frequent spotless days are forecast to continue at least through July and are likely to continue through at least part of 2019 and perhaps into 2020. This chart (Figure 1) shows the number of spotless days – in red – since the tenth spotless day of the decline of Cycle 24 in July 2016.



Shown in blue are the average numbers of spotless days during solar minimums following weak sunspot cycles similar to Cycle 24. This data suggests that we've just begun a deep solar minimum with frequent lengthy periods of spotless days that are likely to continue for at least 12 months., but possibly much longer.

Recent published reports prematurely suggested that solar minimum may have already been reached based on the unexpected occurrence of many spotless days from March through mid-April 2018. However, the continuing slow increase of solar polar magnetic field strength through at least May 2018 suggests that we've just begun a deep and potentially lengthy solar minimum extending into 2019 and possibly much longer.

Will this be another deep solar minimum like we experienced last time? A precursor of a deep solar minimum – which is just beginning to emerge – is frequent periods of spotless days each lasting more than two weeks. We had 16 spotless days in a row in March 2017, 14 in a row from late July through August 2017, 13 in a row in November and 14 in a row in March 2018. More lengthy and more frequent periods of spotless days are likely later in 2018.

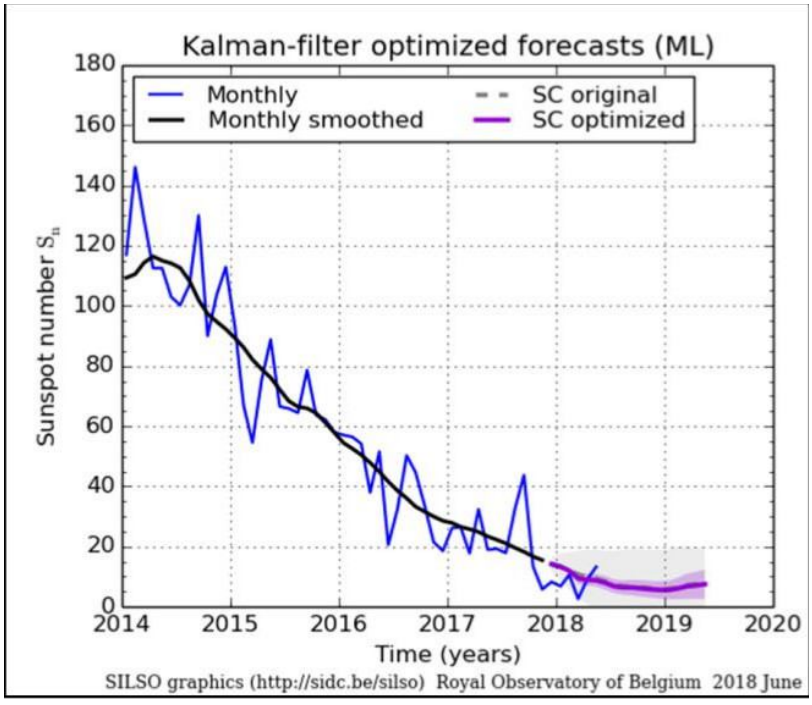
Long periods of spotless days will occur much more frequently as we progress deeper into a potentially lengthy solar minimum. For example, during the 24 months of the deepest part of the last solar minimum there were 15 lengthy periods of spotless days, each having a duration greater than two weeks.

Another precursor of a deep solar minimum is a sustained monthly average adjusted 10.7 cm solar flux index less than 72. Monthly average adjusted solar flux below 71 from November 2017 through April 2018 signaled that Cycle 24 has now entered a deep and potentially lengthy solar minimum.

Monthly average adjusted SFI rose to 72.5 in May 2018 caused by 21 days of weak sunspot activity. See Table 1

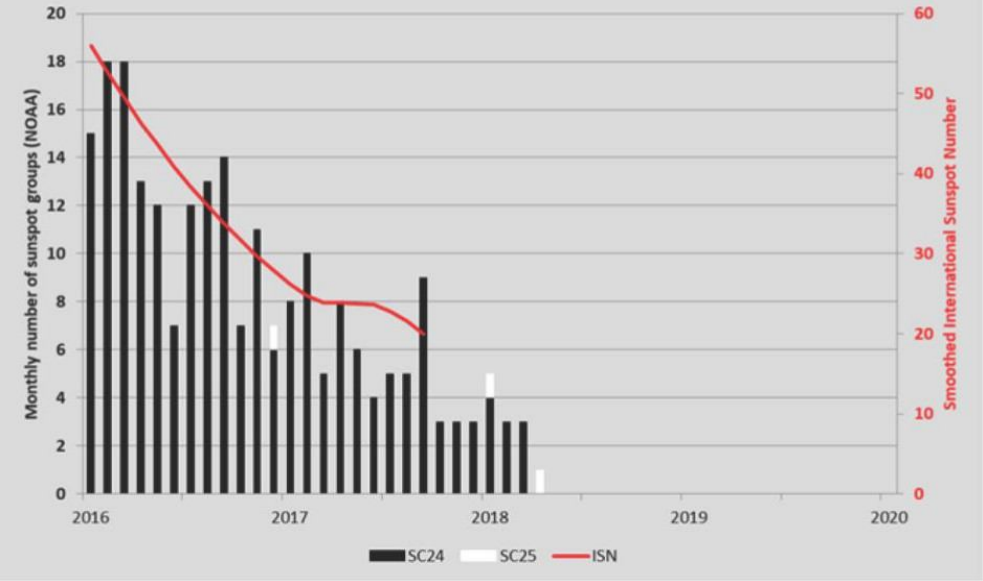
Year	Month	Monthly Average Adjusted SFI
2017	Nov	70.70
2017	Dec	69.46
2018	Jan	67.78
2018	Feb	69.96
2018	Mar	67.58
2018	Apr	70.45
2018	May	72.53

When will the next solar cycle begin? SILSO ' s forecast of the remainder of Cycle 24 calls for a solar minimum later this year and the onset of Cycle 25 early in 2019. Unfortunately SILSO's statistics based forecast is significantly at odds with current observations of ongoing solar physical phenomena. See Figure 2



A precursor of the onset of Cycle 25 will occur when more intense high latitude, opposite polarity sunspots begin to appear, perhaps later this year but more likely during 2019. The onset of Cycle 25 will occur approximately when the number of sunspots from declining Cycle 24 and emerging Cycle 25 are about equal.

Figure 3 (below) from the 2 - 8 April issue of the Solar - Terrestrial Centre of xcellence (STCE) Newsletter shows the progress of old Cycle 24 sunspots shown in black and new Cycle 25 sunspots shown in white. As of April 2018, only four very weak, short duration Cycle 25 sunspots have thus far been observed, signaling that the onset of Cycle 25 is likely to occur late in 2019 or possibly later.



Although an accurate forecast isn't possible until a few years after the onset of Cycle 25, a precursor – likely to occur very soon – will provide a more refined estimate of the future intensity of solar maximum. Another precursor providing an estimate of the future timing of solar maximum will occur several years in the future.

A precursor of the intensity of solar maximum is the total solar polar field strength. A more refined estimate of the intensity of solar maximum can be made when both the

north and south solar polar field strengths stabilize, likely to occur later in 2018. The onset of Cycle 25 is likely to occur at least a year after both the north and south polar fields become stable. While the south solar polar region field strength reached a stable peak during 2017, the north polar region has not yet peaked, suggesting that onset of Cycle 25 will occur no earlier than mid -2019. The good news is that the polar field strengths are already slightly stronger than they were prior to the last solar minimum, providing physical evidence that Cycle 25 solar maximum will be somewhat more intense than Cycle 24 and that another Maunder Minimum is very unlikely during Solar Cycle 25.

A precursor of a more intense than expected Cycle 25 solar maximum will occur if lengthy periods of spotless days end by early 2019. Conversely, a less intense than expected solar maximum will be indicated if lengthy periods of spotless days continue well into 2020.

What about the future timing of the Cycle 25 solar maximum?

Steady, sustained increase in monthly average solar flux – perhaps in 2020 or possibly even later – will signal the onset of Cycle 25. The rate of increase of solar flux will provide an early estimate of the timing of Cycle 25 solar maximum. Monthly average solar flux increased unusually slowly during the initial years of Cycle 24. Hopefully Cycle 25 will exhibit a more rapid increase, signaling a stronger than expected Cycle 25.

Accurate forecasts – rather than estimates – of the intensity and timing of solar maximum will be possible about two years after the onset of Cycle 25.

On the Trail of Regens II

There were half a dozen 'manufacturers' who jumped into the 'shortwave' area – above 2 Mhz - in the last half of the 1920s with assembled. But not many because – well, there wasn't a whole lot going on there. Shortwave broadcasting was just beginning in the late 20s. Hams were still experimenting with those 'higher frequencies' but mostly on 160M and 80M. Until the screen grid tube came along mid 20s, it was difficult to have a stable, high enough gain receiver to be useful for much of anything.

You had a few 'expeditions' like Byrd's to the arctic and south poles that needed HF – and radios like the Grebe CR-18 ($$$) receiver were popular for things like that. The aviation industry quickly picked up on higher frequencies for long distance flights especially over oceans. National came out with the SW-2 in 1927 that, along with the Grebe, were some the first 'mass produced' radios – although even there produced in the hundreds, not thousands. A large number of radios were sold as 'kits' during the 1920s to avoid the patents that could add $10 to the cost of a radio then – when radios sold for $20-50 each for the inexpensive ones.

At this time, most hams built their own. They just couldn't afford 'store bought'. Also, they bought kits and assembled them themselves – often buying or getting tubes elsewhere.

In his early twenties, Mr McMurdo Silver was an early radio enthusiast. He skipped most of his formal education early on – and wound up working for Westinghouse Tube Labs in NJ. He went back to college at night and finally got his degree. Three years later, he decided that Chicago was going to be a hub for the radio industry and so he moved back there. He started a businesses selling parts and kits for radio, and then started making assembled radios with his cousin, Mr Marshall. The joint company was known as Silver Marshall.

In the mid 20s, he even offered a 'superhet kit' ahead of most others.

Silver Marshall came out with their Around the World 4 shortwave receiver kit in 1927. It had a plug in coil on the top with the radio assembled upside down when you look at it. An untuned RF stage, tuned regen detector, and two stages of audio – transformer coupled. Power supply was external – or batteries – whatever you had. Only sold as a kit. There was no shielding inside the radio.

The key to a decent reasonably stable HF radio was shielding of the RF amp and Detector stages separately and 'boatanchor' mechanical construction to limit effects of vibration – and the radio folks didn't catch on until the late 20s. Most radios built in the early 20s were on wood chassis or no chassis at all – just point to point wiring of components screwed down or attached to a panel with a 'ground' consisting of bus-bar wire.

A bit later, some manufacturers now started using steel or aluminum chassis. Aluminum wasn't cheap but was easy to work..

- - - –

Around 1930, metal chassis radios, or radios built in or onto a metal subassembly were produced. The Silver Marshall factory churned out thousands and thousands of radios – and hundreds of thousands of parts for radios. Selling parts was a very profitable business for them and they were quality products.

During the 1920s, patent rights were controlled by the 'Gang of Four" (RCA, Westinghouse, GE, and AT&T) - you could not build a regen or superhet without paying a very hefty patent right – if you could do it at all. Silver managed to get together $100,000 a year in 1928 to buy a license to build superhet radios – a very significant sum.

- - - –

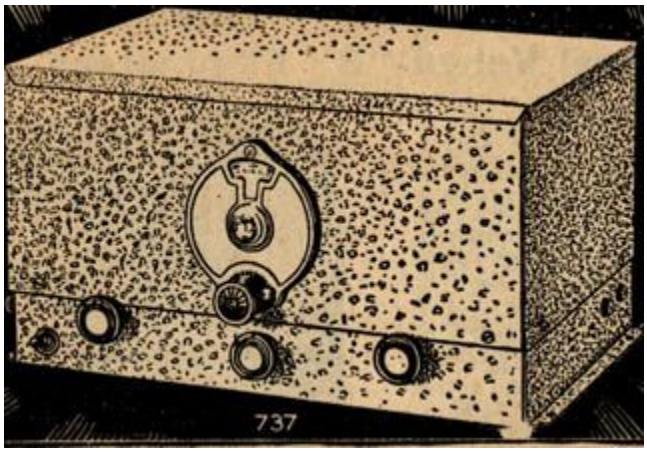
After 1929, Silver Marshall came out with a whole line of radios up until the end of the 1930s. Most were wood table and console models with heavy metal chassis inside and always 'top end'. The Great Depression hit – and folks didn't have the money to buy new radios. The company, like many others, went downhill and struggled just to stay alive. His company went bust, but he formed another 'laboratory' and still designed some of the classic collectible radios today – but they were manufactured by Howard Company. An interesting side note – The first Hallicrafters receiver, the S-1, a regen, was made in a "Silver Marshall" factory under contract. This company too folded in 1938. During the war, he worked for Lear Radio. After WW2, he started to try and get back in the business, but died suddenly (maybe suicide) in 1948.

- - - -

Here's some info on the Silver Marshall Model 737 Bearcat receiver found in the Dayton Flea Market. Sold, wired and 'licensed' for $139.50 in 1930. "Kit' form for $20 less. Needed external high impedance speaker – extra cost. 4 tubes – plus rectifier – and ran off 110VAC. Armstrong, who at this point 'held' the regen patent, charged a 5% royalty for use of the 'regen circuit' in wired sets. None for 'kits'.

Interesting, this radio used a National tuning dial instead of Silver Marshalls own tuning mechanism – which allowed smaller size. Tube line-up included a 224 screen grid RF pre-amp – tuned – followed by a 224 screen grid regen detector – with two stages of audio – a type 224 and a 'high power' type 245 tube capable of 3w output. (these days a new '45 tube will set you back about $50-70! - they are scarce and often are the first in the set to go 'soft' and wear out. Many console radios in the early 30s used them – often in pairs – push pull audio – for 5w or more audio.). If you see them at a flea

market for $3 each, buy them ALL. The set also used a type 80 rectifier.



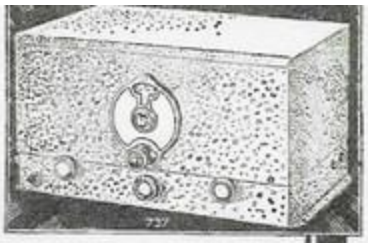
And a *Real* t. r. f. Short-Wave Set

The 737 Bearcat is the latest thing in short-wave receivers. It has everything: *built-in* power supply, *one-dial* tuning, a *real* gang condenser, a screen-grid circuit with *two* s.g. tubes, and you can spread the ham bands by a twist of the wrist!

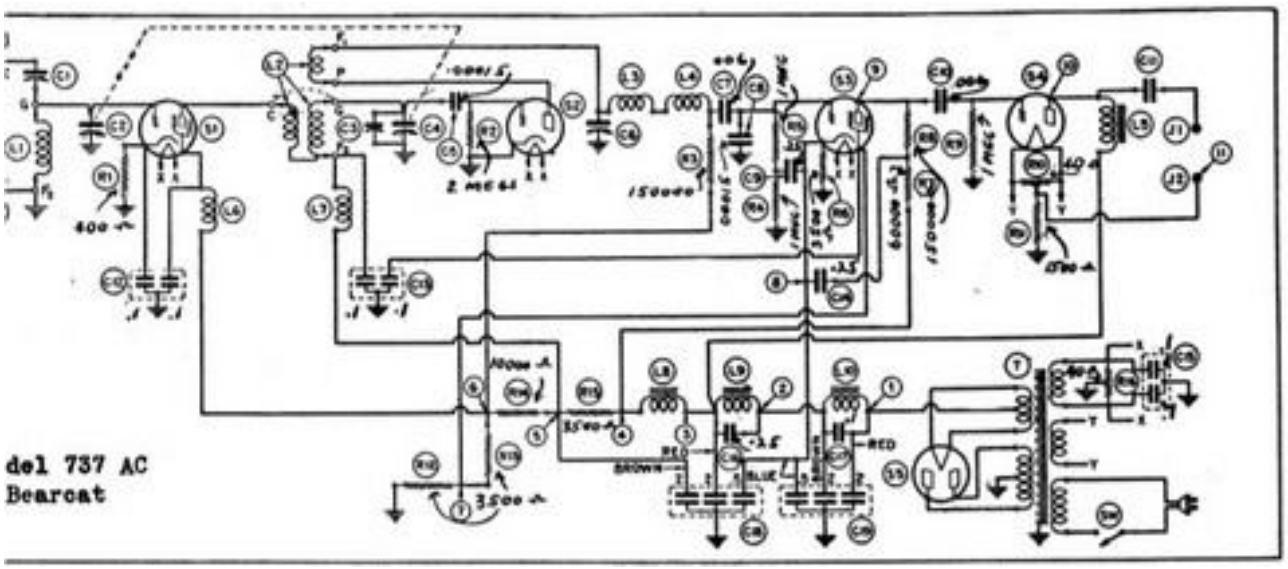
And there's nothing on the Bearcat just because it's pretty. Perfect battleship shielding, two double-shielded tuned circuits, a regenerative non-radiating detector, and a powerful '45 second audio stage. Eight specially designed plug-in coils (included in list price) cover a wave-length range of from 16.6 to 200 meters—all foreign and American short-wave broadcasting as well as the ham bands. Four extra coils ($5.50 *List*) cover the American broadcast bands.

Tubes required: 2—'24, 1—'27, 1—'45, 1—'80.

S-M 737 Short-Wave Bearcat, completely factory-wired and licensed, $139.60 *List*. Component parts total $119.50 *List*.



S-M 737 Short-Wave Bearcat



The '24 tube (224 or UY224) filament runs on 2.5vac at 1.75 amps – per tube! It came out in 1929.

further reading

http://www.durenberger.com/resources/documents/MCMURDOSILVER0629.pdf

http://newmexicoradiocollectorsclub.com/wp-content/uploads/2016/06/7-16-NL.pdf

http://www.antiqueradios.org/gazette/silver1.htm

Kentucky QSO Party

No reports from mobiles were noted on the 3830 contest reflector but one may have

been out there. One worked by somebody was WA5POK/m.

From fixed stations:

KK7YC Estill County KY - 842 SSB QSO

“Wow great fun this year! My first time in the KYQP, thanks to all for the contacts. The bands weren't very good but I managed to keep up a pretty steady QSO rate anyways. I am pleased with my score as I am just running a Carolina Windom at this time until I can get the tower together and up in the air.....the station is in our master bathroom at this time(very temporary LOL) so I did have to take about a 20 minute break for my daughter to take a shower! Thanks again, and see you next year!

73 de KK7YC Ronnie”

K4BAI - fixed GA – 20 CW 3 SSB 9 digital

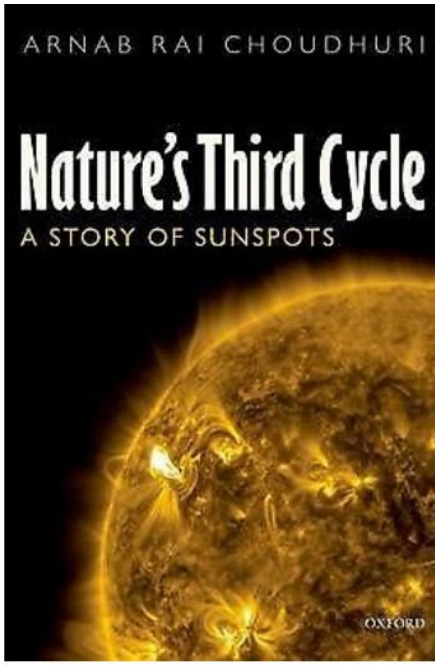
Thanks for all the QSOs, especially WA5POK/m.
73, John, K4BAI

WB8WKQ fixed MI - 25 CW 34 ssb

Fun contest, although conditions were a bit rough, especially working it on low power. Many repeats necessary. Thanks for the Q's, especially those who dug out this Michigan station out on 20M.

Book Review of the Month

Nature’s Third Cycle: A Story of Sunspots, Arnab Rai Choudhuri, Oxford U. Press, 2015. ISBN 978-0-19-967475-6



Pretty good read if you want to understand how sunspots are created, the mechanisms behind it, and a bunch about solar physics. It's not 'easy' reading but very informative and covers the entire area of solar physics, why sunspots are created and how, the different observations over time that led to many theories and how they eventually converged into the current solar magnetic-hydronamic theories.

From reviews on the web:

The cyclic magnetic activity of the Sun is among the most intriguing phenomena in the universe. It results from complex interactions in a magnetized, turbulent plasma that cover a wide range of spatial and temporal scales. Solar activity is usually associated with an 11-year variation in the sunspot number and in strong, highly energetic events—for example, coronal mass ejections and flares—that release energy equivalent to a billion 10-megaton hydrogen bombs. The resulting flux of high-energy particles interacts with Earth's magnetosphere, causing auroras and geomagnetic storms that can disrupt electrical power systems, navigation systems, satellites, and more.

In Nature's Third Cycle: A Story of Sunspots, solar physicist Arnab Rai Choudhuri presents the history of empirical and theoretical studies of global solar variations and discusses the influence of that activity on Earth's environment. Choudhuri's captivating narrative starts with the massive power blackout of 13 March 1989 in Quebec, an event caused by a strong solar flare from a few days earlier. Such strong solar eruptions are associated with sunspots, clusters of which form active regions with topologically

complicated magnetic field structures.

Choudhuri gives us a condensed history of the study of the sun and of sunspots over the past few centuries back to Galileo Gailiei, whose discovery of the Sun's 27-day rotation marked the serious start of solar physics.

The remarkable tale includes skilled amateurs as well as professional academics, the rivalries between the main players, and a probable husband-wife murder-suicide thrown into the mix. Yes, there is a lot in the story of studying the sun, and the author does a masterful job of making it a fascinating read. Not too shabby when many scientific books do more to muddle the reader than to enlighten.

The names which might be familiar include the following: space observatory pioneer George Ellery Hale; discoverer of Uranus William Herschel; and astronomer Edward Maunder. It was the last of those men who identified a period from about 1640 through 1715 when the spots on the Sun disappeared.

The author details such historical highlights as the discovery of the 11-year solar cycle and makes a brief excursion into the solar interior’s dynamics and evolution. His simple description of a turbulent plasma in a magnetic field serves as an introduction to the deep theoretical studies of magnetic field generation and to Eugene Parker, Horace Babcock, and Robert Leighton, the scientists who developed the foundation of solar dynamo theory.

The long record of solar observations shows that the duration and strength of solar cycles have varied over time. Our understanding of the solar cycle is determined by the ability of theoretical models to make reliable forecasts, and until recently, available models failed to correctly predict either a cycle’s amplitude or the time of the next solar maximum.

During the past 10 years, however, a new approach has emerged: Realizing that our knowledge of the Sun’s interior is still incomplete, solar physicists are combining theoretical modeling with observational data.

Although Choudhuri does not detail the new “data assimilation” approach in the book, he has previously suggested a weather forecasting scheme that combines observational data with a type of Babcock–Leighton mean-field dynamo model. Because of the known correlation between the strength of global magnetic fields during a solar minimum and during the next solar maximum, the magnetic field forecast is updated once per solar cycle, at the solar minimum, by means of an empirically determined dipole magnetic

index. The assimilation of that data with the dynamo model enabled physicists to correctly predict the observed amplitude of the current solar cycle, which began in 2008 and is the 24th since extensive recording of sunspot activity began in 1755.

Nature's Third Cycle includes approaches to model the solar cycles and their predictions using rigorous mathematical methods that are briefly described in the appendices. The next step is to incorporate nonlinear magnetohydrodynamic models and data assimilation; the new prediction models that result may be considered as an ensemble of possible states sequentially adjusted with observational data.

In his recent work with Alexander Kosovichev, they have applied that approach to describe the observed asymmetry of solar cycles, which grow faster than they decay (the so-called Waldmeier effect). The initial results are in good agreement with the actual observed evolution of the current solar cycle—the good agreement suggests the possibility of making reliable predictions at least seven years forward after a solar minimum.

Usually, the number of dark blemishes on the solar surface tends to rise and fall in somewhat predictable 11-year cycles. The period when the spots vanished, a so-called grand solar minimum, also coincided with a sort of mini-ice age with harsh winters and short cool summers. It became known as the Maunder minimum after the man who studied it. However, explaining why the various cycles differ in observed sunspot numbers is still not totally defined

You'll learn that the 11 year solar cycle (plus or minus) occurs because of magnetic energy interchange between the toroidial field (around the sun) and the polodial field – vertically through the sun as if it were a giant magnet over the 11 year cycle. Decaying sunspots, which typically last 10 days, move energy from one to the other – and at the end of the 11 cycle, by measuring the magnetic polodial field intensity, you can estimate the next sunspot cycle. There's a 'kicker' or two in there that seems to operate on different cycles and affect this energy interchange – still not totally understood but being worked on, which seems to be why you have strings of increasing, peaking, then decreasing intensity over 50-100 year periods. In 2018, we're on the downward slope of this. Over the past 10,000 years, there have been over 20 "Maunder Minimum" type events.

Of course, the idea that the temperature of the earth could be changed by mysterious fluctuating dark patterns on the sun's surface is nothing if not controversial. But that doesn't mean it isn't true, as the author states:

[...] the earth indeed becomes cooler when sunspots go missing. Exactly how this happens is still a question on which experts seem to have very differing views and which is unlikely to be settled definitively in the near future.

Choudhuri takes pains to add that none of this negates the effect of industrialization on climate change. They are both critical factors. However, the whole matter is complicated by the fact that while the world was warming up in the 20th century the number of sunspots were above their average count. Remember, other things being equal, more spots means warmer earth temperatures.

When the book was published in hardback in 2015, the author was reluctant to forecast the likely outcome of the current sunspot cycle. But what has become more apparent based on more recent research from NASA is that we are now in a period of very few or no sunspots.

The question is whether we will enter another grand solar minimum just like the Maunder minimum which if history is a guide would mean a period of much colder weather winters and summers. More than a few experts with whom the authoer speak regularly believe that we shall enter such a grand minimum along with the resulting bone-chilling weather.

If that happens, then there will be profound influences on the economy, including possible crop failures and rising energy use for home and workplace heating. Or in other words, expect bigger bills for food and energy. After a period in which the supply of both has been increasingly abundant then this change will likely come as a shock to many people and likely the broader global economy as well.

It's worth pointing out that the book's author, who is a professor of physics at the Indian Institute of Science, is nothing if not honest about the vast number of unknowns in the field of solar physics. Unlike mathematics which dates back millennia, solar science is a relatively new field, not even 500 years old. All of which means we all need to keep our wits about us and study the matter to see what happens next.

You can read the first chapter here -

https://books.google.com/books?id=B-eZBQAAQBAJ&pg=PA11&lpg=PA11&dq=natures+third+cycle&source=bl&ots=pBmhYfxjP2&sig=_9nbfq8Ic1w31cWEmLDagZMBv8U&hl=en&sa=X&ved=0ahUKEwipp

fyg5fHbAhXJ24MKHRpKC0g4ChDoAQg1MAI#v=onepage&q=natures%20third%20cycle&f=false

On the Road with N4CD

The road didn't go far – just over to the local hamfest – which is the biggest in Texas – the annual Hamcom held conveniently 10 miles from the house in Plano, TX. I had some stuff to sell (a dozen books, some QRP stuff, an old two meter FM transceiver – Kenwood TR7930 from the 1980 era – two Isotron antennas that have been sitting in the attic for 20+ years – and some other misc) so I obtained in indoor table to sell what I could. That also lets you get in early to see what else is for sale for the indoor flea market. . Books included a fairly new Antenna Handbook, one on Emergency Power, 3 fiction books – recent – some radio history – books that came along with other ones I wanted at local auctions or I bought new. Kept the ones I wanted and sold off the others. Well, most of them. Still have the 80m Isotron antenna – no one wanted to play with it. They are very poor antennas.

The fest starts out on Friday at 1pm but you can start setting up at 8am or so. I had breakfast then headed over there and unloaded the car 100 feet from the indoor flea market table. Covered things over, scanned other tables – mostly covered up - and then went back home for a few hours to await the opening to the public at 1pm. I did check the outdoor flea market area – nothing of interest and only partly set up at this point.

Not many county hunters show up these days for this hamfest but Rick, AI5P and Bill K8TE came over from NM. Several park hunters stopped by – N0RZ from KS, K5SVV and AE5B from TX, and a few others said hello. Many remember the fun of the National Parks on the Air program. Very few are even involved in the ARRL International Grid Chase. NM5G was there with the usual Texas QSO Party setup out in the lobby part of the event – and activity has been very good for the TQP each year with lots of mobiles to chase around and the vast majority of TX counties activated each

year. It's coming up at the end of September. Van, WC5D, who runs mobile in the TQP, stopped by. If you remember back 2 years, he had a fire in his car from the radio installation – wires shorted and set the back seat on fire. He hasn't been out mobile since – and has moved so he's been busy. Maybe he'll get back on by TQP this year.

There was an outdoor flea market but it was toasty warm with lots of sun and temps in the high 90s over the weekend. It's in a paved concrete parking lot and it definitely gets HOT. You have to be a real Texan to take that heat all day. I did find a nice, new looking W9UCW 40m resonator and mast for sale. Bought it for $7. There were many Hustler resonators for sale during the day. I don't think many of them sold – people ask too much for unknown working condition resonators. Most mobile type operators these days think only screwdriver antennas it seems.

By 3pm on Saturday, things slowed down, so I packed up the few remaining things and headed on home. There's a full schedule of programs all day long but I was tending the table and missed them.

Usually 8,000 folks show up – one of the largest fests in the country - maybe #3 or #4 in the country after Dayton Hamvention and Orlando.

As far as equipment up for sale, there were a handful of Knight Kits – R-100 tube ham band receivers from the 1960s, a six meter TR-106 AM transceiver, some test equipment, and one Space Spanner regen that sold for $60 (too much). Heathkit gear included a modified SB220 for 6m, two or three SB-100 type radios, some test gear, and a lone Sixer, as if anyone really needs a Sixer VHF entry level radio, a DX-100, and some test equipment. The Sixer was a nice inexpensive way to get on 6m back then with a few watts of RF and a super-regen receiver. They also made one for 10m and 2M – the Tener and Twoer. You had a lot of 2M FM mobile gear – that seemed to sit and sit – Yaesu and Kenwood. Did see a DX-40 for sale and it sat all day at a low price – surprising.

For the Collins Collectors there was a KWM-2, two 301B transmitters, and a few other things there. Other boatanchor type radios included half a dozen National, Hammurland, Hallicrafters radios from the 40s, 50s and 60s. One or two Tec-Tec rigs were up for grabs. Saw some Yaesu and Kenwood old stuff – TS520 type there. Most of it just sat there all day – no interest.

You could buy an IC-706 MK2 for $500.....asking price.

I think I spent all of a few dollars on some misc and that was it. Didn't need any more

things from the way-back days.

Major vendors were there including ICOM and Elecraft. During the day, there's 3 simultaneous programs going on and Saturday night there is a BIG Lone Star DX club dinner and presentation. CQ Magazine and ARRL were there, too.

On the Trail of Regens III

Wow...interesting month for uncovering Regen receivers.....

Here is a German WW2 shortwave regen that was designed in the 1935 timeframe and built and used all during WW2. With typical German super engineering, it used a cast turret system to switch coils – something that took a lot of manufacturing time but did provide excellent shielding.

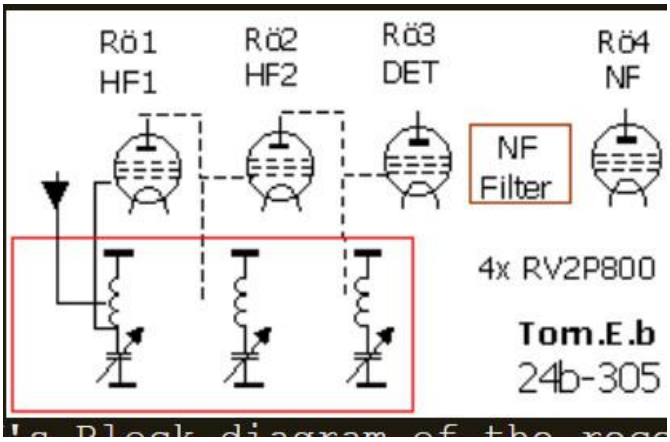
The receiver circuit consisted of a 4 tube design. Two RF stages, a regenerative detector, and an audio amp driving earphones. All 4 tubes were the same and used the large plug in assembly tubes – any tube could be used in any location. You didn't need to carry a box of spares. Of course, there's a compromise there – an RF amp tube is not necessarily a good candidate for audio amp, etc. However, this was not unusual in German radio equipment made before and during WW2.

The set had 8 separate bands to cover 0.9 to 7.1 MHz with high calibration on the dial.

Voltage requirements were 2v at 1 amp and 90v at 10ma – usually from batteries or a small dc/dc converter off 2v batteries.

Here's the front panel.

Here's a simplified schematic



You could switch in a narrower audio bandpass filter for CW. The set had 3 tuned circuits giving fairly decent selectivity – sensitivity was about 10 microvolts on both AM and CW. It was stable enough to tune in SSB transmissions (which didn't occur back then).

A lot more details including many pics of insides here

http://www.la6nca.net/tysk/torneb/index.htm

Sold at the local auction of antique radios in early June and added to the N4CD collection.

This is the tubes used in a lot of German WW2 radios. You'll note that it has a 'handle' at the bottom of the picture and the tube contacts are around the sides of the tube! You plug it into a socket using the guide pin. The tube is shielded. It makes it very easy to remove tubes from a radio and plug in a new one in very tight spaces.

RV 2P 800 tube

West Virginia QSO Party

W4XK - fixed TN - 15 CW 7 mults

WOW! Where were the CW stations? 8 callsigns, 15 contacts, 8 hours!

KN4Y - fixed - FL 5cw 3 mults

Working only CW and unfriendly band conditions produced a not so hot QSO party log. BUT did not get skunked.

N8XX - fixed MI 2 CW

Just stumbled across West Virginia QSO party while chasing parks on the air. Decided to work two stations which were near the frequency of a supposed POTA contact, which I couldn't hear.

WB8WKQ - fixed - MI 12 CW 22 SSB 18 mults

Conditions weren't the greatest, but a lot of good strong WV stations. Thanks for the Q's.

W4UT - fixed TN - 10 CW 8 SSB 8 mults

Contest was a bit slow & I never heard the WV bonus station. I don't know if he was active.

W4BBT - fixed - 17 SSB 12 mults

Not many WV stations on the air all day

W7KAM - fixed MO - 13 SSB 6 mults

Worked all that I heard with one exception. Never did hear the bonus station.

N8II – fixed WV – 45 CW 275 SSB

Averaged about 106 Q's/hour and worked a lot of DX without trying that hard. In the morning prior to the start I was hearing a lot of Italians on 10M working believe it or not the Italian 10M contest. Most were weak, but I called some of the louder ones and no one would take time out from their contest to work me (pretty certain I was heard). Of course it was all Italian language on SSB, but I can understand the calls no problem. I went to the W3LPL open house for the first time in 4-5 years and am really glad I did vs. working the QP full time. WX was nice and it was wonderful chatting with PVRC friends! Upon return (1 hr drive)the XYL and I were hungry, so dinner preceded operating. At 2207Z I turned on the radio still beaming EU and almost zero beat to where I left the VFO was IT9ACN working his contest. I called (he was S6-9) and he was thrilled to hear from the USA on 10M! He found a Sicilian friend to work me also. Then, my CQ's on 10 SSB brought in an IK7, IT9, and MM0. When I moved to 15 SSB, I worked a few mid west stations and was called by a EA2. Then, it was down to 20 SSB where I beamed west at first with a good run and plenty of callers at short distances and out to the west coast. I was being called by NY and New England off the back of the yagi, so after things slowed down out west, I turned it NE and had a good run of the W1 and NY stations plus was called by quite a few Europeans where it was now well after midnight. The 68 mults is close to my best ever 74 mults operating about 8 hours last year. My first WV QSO was on 40 and worked almost as many WV counties as last year all on that band. By the time it was slow again back on 20, I needed to quit, was exhausted.

It was a fun 3 hours, many thanks for the calls mostly from casual non-competitors.

73, Jeff

On the Road with N4CD II

Field Day weekend is a good excuse to be 'radio active'. Band conditions had been very good with the solar flux hitting highs near 80 for a few days - meaning the upper bands – 10M, 15 and 20m were opening and contacts being made. Over the weekend it would be 75 – which is a lot better than the 69 and 70 for the past months and months. However, the A index would kick up – not good. Sunspot number was 34. Bands were open up to 6m during FD.

On Saturday afternoon, I stopped by the Plano Radio Club site. They get about 40-50 folks out for the Field Day set up with five or six transmitter stations and a good number of operators manning the equipment most of the time including a GOTA station (get on the air for newcomers). The set up starts early – missed that – they have a bunch of eager beaver folks and the location is the same year after year – a nice local park with a pavilion – covered from the intense typical sun this time of year – plus lots of tables to set up equipment. The bands are usually filled up with "CQ FD" so it's not a good idea to be trying to put out parks or counties usually although you can rack up lots of contacts that way but not many county hunters or park chasers.

Temperature was near 100F on Saturday – slight breeze but 'toasty warm' for sure with heat index over 105. Worse for you if you are out in the sun without shade. This time of year, you can also experience thunderstorms – so some sort of shelter is very desirable.

Around the country, many CH were off at their local club events. Ed, KN4Y joins the K4WAF club group in FL, and usually Barry, N0KV joins others for their local club event. (One year on one of the trips to AK, well, actually both, I joined the Juneau club group for FD in the First District at KL7JRC. Listened for them but not heard this year. I did work one AK station. Fun to participate.) Joined Barry, N0KV, and his club group a year or two ago for FD in CO.

The CW slots at my local club were filled by others at the K5PRK site so let them operate. For some reason, one guy brings out his QRP radio and that's what they use for CW on 20M cw. Makes it tougher for sure! Usually there's a big dinner Saturday evening with 60-80 participating where the YL's show up as well. PARK had the usual HF, plus digital and satellite and VHF. Most of the ops are SSB or digital these days – the kids know their digital.

On Sunday I decided to go out mobile to the local town park – not a POTA – for a few hours to make sure the mobile was still running. It's been a while – several big events here and a few unplanned doctor appointments kept me in town. Next month I'll be

back on the road. I put the usual antenna on the car – 20/30/40. No WARC bands allowed in FD and had the 17M Hamstick but didn't use it. Also put in a Hustler 54 inch mast to see if anyone was on 6m. Just that mast on a typical mag mount will resonate around 50 MHz giving you a ¼ vertical. (Just a bit too long – works fine at 50.01 and about 3:1 at 50.2 MHz.).

Hit the local park at 9am local time. Bands were hopping – 20M was good – not too much on 40M and lots of t-storm static there. There was a line of storms from northern OK going east – maybe might be some E-skip. I was running class '1C' – mobile and there weren't too many others out there running 1C. Wow – lots of stations and I filled in the log. I was able to work most of the CW stations I could hear. Every now and then I"d call CQ and even worked 3rd District AK that way when KL7AA in Anchorage called me from their FD set up.

SSB was another story and a lot tougher to get through – plus a lot more folks on SSB and a lot more QRM. A mobile signal just doesn't compete well with full size dipoles or beams! I worked a few but CW was a lot easier!

I moved up to six meters not expecting much – but to my pleasant surprise the band was open to FL and WI and OH. Put a dozen 6m CW stations in the log – and another dozen on SSB in the 3 hours I spent in the park. Things would pop in – be there a while, then shift here or there – or go flat. If you spent the weekend just on 6M, you'd probably have 50-80 contacts and if you had a beam – a lot more.

I listened on 15 and 10M - even without an 'antenna' signals were all across the band. Wish I had set up for 10 and 15m! Would have been fun, but kept busy on 6m and 20m mostly, with a few on 40m cw. Wound up with 140Q in the log in 3 hours then headed home.

Worked a few county hunters/park hunters at club FD sites who said 'Hi Bob' but I have no idea who they were with their 'club call'.... hi hi. Chuck, NO5W in Louisiana said hello from his club call station and sent his greetings 'HI Bob form NO5W' on CW.

Uploaded the QSOs to LoTW for possible grids – but a lot of FD folks don't so we'll see how it turns out. Not looking too good so far with just a trickle of confirmations. Most 'club' calls not part of LoTW since they don't chase awards or no one has taken the initiative to get them on LoTW for the one or two events they do a year.

There were a few 1x1 calls on for FD – mostly out in 7 land. Not sure what was going on.

If you are a county hunter, maybe you can get a paper confirmation by mailing to their address – and most clubs do set up in their home counties for FD.

K9WX Editorial in CW Ops Newsletter

One of the things that makes Field Day unique is the wide range of abilities among participants. From seasoned veterans to newbies, Field Day brings us all together, often in the same geographic location, and most certainly on the air working each other.

Here's the Field Day thing for me, at least prior to 2017. I identify myself as a contester, and primarily a CW contester. Looking back, Field Day for me has always been another contest, albeit operating as a group instead of as an individual. But in my mind still a contest, and almost everything I did in past Field Days stayed true to the Prime Directive of trying to make as many QSOs as possible. Both for the benefit of my group, to claim bragging rights over other groups, and as an individual to claim bragging rights within my Field Day group. Consequently, I often found more frustration than joy working stations whose operators slowed me down.

In any contest you always have some QSOs that take longer than others due to the skills of the other op, but FD has a much higher incidence of slow QSOs. It's not just the slower CW speed of the other op that hurts your rate, it's the other op's inclusion of non -contesting debris in the QSO.

Worst case scenario: they answer my CQ by sending my call twice followed by de and then their call twice, include a signal report in their exchange (not required for the ARRL FD), repeat each element of their exchange twice including the signal report, and liberally sprinkle TUs RRRs, BKs and 73s throughout. At the least it slows your rate (there go the bragging rights) and in a worst-case scenario you lose your run frequency because you spend so much of your time listening instead of transmitting.

If you're a CWops member and you have been paying attention, you have noticed our

organization's commitment to teaching and mentoring CW, especially through the CW Academy. If you hang out very long in the presence of other members, this commitment is even more apparent, and it's a wonderful thing.

A discussion on the Society of MidAll of this inspired me to take a different approach to Field Day for 2017. "To hell with rate, " I said. I resolved to call CQ more slowly than usual, knowing there were CW ops at other stations who might find a slower rate more inviting. If my CQ was answered by someone who was sending even slower than I was, I would QRS to their rate to complete the QSO. I'd take lots of deep breaths during those extra-long exchanges to maintain my inner peace. And while I didn't always do it, I ended some of my QSOs with a "dit -dit, " my way of giving the other op a Gold Star.

How did I do? Our group finished 4th in our chosen 1A category out of 139 entries, which is typical of us. And, my approach may have cut my rate a bit, but I operated enough total hours to still claim the QSO-beast title for my club. So, I can't say my strategy either hurt our score or my total QSO count.

However, I worked a lot of slower stations, especially during those typically tedious, overnight hours. I'm a decent-enough CW op, but I was reminded of the gap between my CW skills and the skills of many CWops members who are so much better at "celebrating the unique art form" than I will ever be.

There is always room for improvement and when it comes to CW, that room for me is huge. It also felt pretty good to complete a Field Day QSO at 15 wpm, send the other op a "dit -dit," and have them send a "dit-dit" back to me.

The most important thing I may have accomplished was giving my Field Day efforts a new focus going forward. Even a hobby needs an occasional refresh and, this one feels pretty good.

73
Tim,
K9WX, Editor

Awards Issued

USA-CA 3rd Time #256,	W8FNW	8/27/2017
USA-CA 3rd time, #255,	AB7NK	6/9/2018
USA-CW I , #156	WA4UNS	5/20/2018
Bingo III, #41,	WA4UNS	3/15/2018
USA-CW II #39,	NU0Q	5/4/2018
USA-CA 6th Time, #54,	WA9DLB	4/21/2018
Callsign Combo 2X2, #6,	K5GE	5/5/2018
Callsign Combo 2X2, #5,	K4YT	5/31/2018
All CW 20 meters, #91,	KC3X	5/17/2018

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N9JF 475 Last Counties

K0PFV 50 Last Counties

WA4UNS 276 Last Counties

N5MLP 183 Last Counties

AB7NK 791 Last Counties

WQ7A 633 Last Counties

KB6UF 1534 Last Counties

KB0BA 328 Last Counties

AB7RW 265 Last Counties

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RAS Virginia #22,	K4YT	5/24/2018
RAS Alabama, #22,	AB4WL	5/11/2018
RAS South Dakota, #35,	K2HVN	10/2/2017
RAS Ohio, #31	K2HVN	4/25/2018
RAS Louisiana #27,	KB0BA	2/28/2018
RAS LOUSIANA #26,	N0XYL	2/28/2018

Operating Events for County Hunters

July has ZERO QSO parties. Enjoy the summer. Travel. Work parks..... QSO parties resume in August!

N4CD will be on the road to south TX around July 6-9 for a Hamfest /HVRA Antique Wireless Mega Auction – in Texas City TX down by Galveston. I'm sure others will be zipping all over. Maybe N4CD will head north to cooler climates? Next really big trip is mid August to Rochester NY (AWA Convention) and Chicago (ARCI Convention).

That's all folks!

73 de N4CD