

The Signal

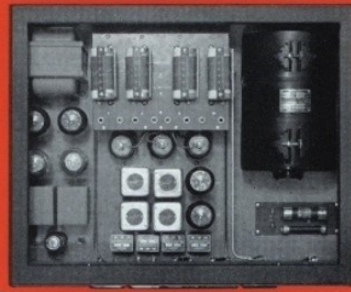
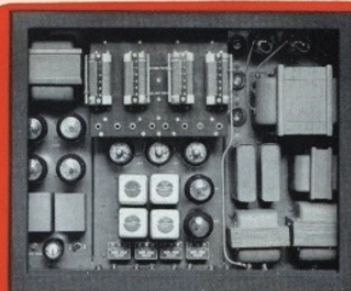
OFFICIAL MAGAZINE OF THE COLLINS COLLECTORS
ASSOCIATION * Q2 2014 Issue *

*Found
In The Wilds*

32RA (A-C)



(D-C) 32RB



Fifty watts radiotelephone, seventy-five watts radiotelegraph with operation from a-c or various d-c voltages is possible with Collins 32RA — 32RB Transmitters.

These two highly developed equipments have identical four channel "quick shift" radio frequency units, audio modulator units, transmitter cabinets and meters. For a-c operation (32RA) a heavy duty power supply chassis operates from a 110 volt 50/60 cycle a-c source. For d-c operation (32RB) a dynamotor having a primary input of 12, 24, 32 or 110 volts replaces the a-c power supply as specified.

Standardization of your a-c—d-c transmitter installations is completely solved with the 32RA—32RB combination.

Frequency Range: 1.5 to 15 mc.

Frequency Change Method: Panel control instantly selects any of four frequencies.

A-F Response: Uniform within ± 2 db from 200 to 4000 c.p.s.

A-F Amplitude Distortion: Less than 5% r.m.s. total harmonics at any modulation level.

Residual Noise Level: More than 40 db below 100% modulation.

R-F Output Impedance: 30 to 1200 ohms, power factor 70 per cent.

Cabinet Dimensions: 12½" high, 22" wide and 18" deep.

Net Weight: 32RA 127 pounds, 32RB 100 pounds.

COLLINS RADIO COMPANY

CEDAR RAPIDS, IOWA • • • NEW YORK, N. Y.: 11 WEST 42 ST.

\$7.50 USA \$8.00 Canada 700 円日本



FROM THE STAFF

by Bill Carns, N7OTQ & Don Jackson, W5QN

From the Desk of N7OTQ

Everyone here is here for a reason. Some collect Collins to use it. Some collect for the quality. Many of us are drawn by the thrill of the hunt, and, dare we say it, the thrill of the capture. This quarter's issue is all about that thrill and more importantly, the resulting preservation. We hope that you share some of this excitement as you read on in this issue.

You can tell when you are getting up there in age. Time seems to fly faster and faster. Time for another magazine and I am behind the curve again. I want to apologize because this issue is going to be late. Last year, during the 80th anniversary year issues, we suffered here from a loss of control. We talked about the fact that once we started to do a four quarter series on the history of Collins Radio's four historical eras, and we had defined the format, that the magazine took control. It was inevitable – we just did not see it coming. All's well that ends well though.

When the Q1 2014 issue was in works, it was back to business as normal we thought (albeit it was now the CCA's 20th birthday year). However, we struggled with length again because, after choosing "The Receivers of Collins" as a theme, there was just a lot of material that just "needed" to be in there.

After completion of the Q1 issue, your humble staff once again concluded that they were in charge – and they looked forward to a pretty normal quarter of work on the Q2 issue. A theme was chosen. It harkens back to the 30s and the days of Frank Buck and his *Bring 'em Back Alive* series of books and movies (You younger guys may have to do some research on Frank). It seemed like an appropriate way to deal with the recent fun capture of several rare and elusive species that most of us have never seen in real life. The articles on the 32RA, the very rare and exciting find of a "live" Collins 20C in New Zealand, and John's beautiful 4A (and other finds among our group) portended a great issue, so off we went – thinking we were back in the driver's seat.

Now! At the same time - and we have shared some of the background with you in the recent past issues - your CCA management has been working on a very strategic set of alliances and relationships that are proving effective and exciting. The details do not need repeating here because you read them in the last issue, but our recently inked alliance with the Antique Wireless Association (resulting in the Collins Radio Heritage Group) and the evolving relationship with Collins preservationists and the Rockwell Collins Corporation in Cedar Rapids has produced some very exciting results in a number of areas.

Again, the details are in another writing here in this issue, so we will just summarize here that another "reach out" 821A-1/VOA effort of the Collins Radio Heritage Group, in the works since fall of last year, became successful. This success however demanded a great deal of time on the part of a large team of people. The results were beyond our wildest expectations.

The story of this success fell right into the theme of our current issue and demanded to be told as part of the "Bring 'em Back Alive" issue. It does not get any wilder than capturing a Collins Model 821A-1 250 KW carrier, 1 Megawatt PEP, HF Collins Autotune shortwave transmitter in its native environment. SoStop the presses, and wait. The *Bring 'em Back Alive Signal Magazine* issue just had to include at least a preliminary story on that capture. Since that effort and result was not concluded until June 17th when the last truck reached New York, late we are. We hope you understand.

Finally, as always,, we look forward to your feedback and writings. We love to hear what you want to see. For now, and as always . . .

Best 73, de Bill, N7OTQ/K0CXX

email: wcarns@austin.rr.com

From the Desk of W5QN

We are now well along with our 20th birthday year and its features and themes. As we approach 2015, it is our intent to move the general focus of things back toward restoration and service of the amateur radio gear. We can't do this without your help. Whether it is a technical piece that might fit in the Service Line series, or a standalone project contribution, or even a feature article on some aspect of Collins, its history, or its equipment, we sure would like to talk with you about it. Drop me an email, or send in a rough draft and let's talk. This *Signal Magazine* has a great tradition to live up to. It was started by Art Collins and then published by the Collins Radio Company for many years. We are privileged to be able to continue the tradition. It can only continue to happen if our members (that is you) contribute when you have something to share. Do not be worried about time pressure. We schedule and work on content out several issues so that no one gets put in a bind.

I also am ever on the hunt for nice shacks that show off your Collins. If you would like to have your shack featured in the magazine, that starts with you also. Do not be shy.

73s - Don, W5QN

email: w5qn@verizon.net



The Signal Magazine

OFFICIAL JOURNAL OF THE COLLINS COLLECTORS ASSOCIATION

Issue Number Seventy Four - 2nd Quarter 2014

Join Us on the Air!



- Sunday 14.263 mHz at 2000Z
- Tuesday 3805 kHz at 8pm CST
- Thursday 3805 kHz at 8pm CST
- Friday (West Coast) 3895 kHz at 10pm CST
- Sunday 10m AM 29.050 mHz at Noon CST
- 1st Wednesday AM 3880 kHz at 8pm CST

Sunday for Technical, Buy, Sell & Swap
Tues., Thurs., Fri., & Sunday for Ragchew

The Signal Magazine

Published quarterly by the
Collins Collectors Association
Copyright © 2014 - All Rights Reserved

Editor & Publisher - Bill Carns, N7OTQ
Assistant Editor - Gail Sheehan, K2RED
Technical Editor - Don Jackson, W5QN

CCA Board of Directors* & Staff

Bill Carns, N7OTQ*	President & Editor
Scott Kerr, KE1RR*	Vice President & IT
Paul Kluwe, W8ZO*	Project Consultant
Dennis Kidder, W6DQ*	Secretary
James Green, WA3DJU*	Treasurer
Bill Wheeler, K0DEW,	CCA Advisor
	& President Emeritus
Kharma & Jesse Palmer	Staff Photographers
Danielle Toynette	Graphic Artist

The CCA is licensed by Rockwell Collins to reproduce and disseminate Collins copyrighted documents related to Collins products used in amateur radio applications.

The Collins Collectors Association
P.O. Box 1269
Wimberley, TX 78676-1269

Come Visit Our CCA Website

www.collinsradio.org

See our New Features & Members Area.

You can renew your membership or join the CCA on our website using the "JOIN US" link.

- 2014 -

20 Years of CCA Service to the Collins Collectors Community



Last quarter here, I shared with you the results of 2013 and discussed some of the plans for 2014. Now that we have two quarters under our belt, 2014 is starting to look pretty good. In this issue you will read more about our great 2014 Dayton HamVention presence and the report on our dinner meeting. This report also covers Dallas Ham-Com and the recent CCA contribution to the ARRL 100th convention in Hartford, CT just this past July 17-19th. You can see more info and photos on the website at collinsradio.org/ under EVENTS.

It is an understatement to say that I am excited about 2014, what has been accomplished to date, and what is still to come. I think you all will enjoy what remains to play out. There are two events left for 2014 - The AWA World Convention in August, and then our second west coast meeting and dinner. For sure watch our Events Calendar for the details and catch up with us if you can make it to either event.

In addition, we are going to all be watching as the story of the "rescue" of the mighty Model 821A-1 250 KW VOA shortwave transmitter continues to evolve. Read more in this issue and then watch our CCA website and the updated CRHG website at <http://www.collinsradioheritagegroup.org/>.

We are looking forward to welcoming many new members again this year since the rate of growth shows no sign of slowing down. This growth is not surprising when you think about the quality of the equipment that we collect, the history of the company and its people that we get to share, and the truly fun group of people who constitute our membership. Thank you all for what you bring to us as we try to support our membership and tell the story of Collins Radio and Rockwell Collins.

To further support our members and associates (as well as reflector users), we will be announcing a new entry level "Associate Member" status and making these member privileges available through our website.

Finally, due to the growth of your *Signal Magazine*, the workload has grown, and the need for more staff is obvious. We are very fortunate to be able to announce that Gail Sheehan, K2RED, has joined our staff as the new Assistant Editor and will be helping with both content and layout. Gail has served as the Assistant Editor of the *Signal* in the past, and she has also served for many years as an Editor for CQ Magazine. We sincerely welcome her back.

It is a privilege to work with you all and I hope to see as many of you as possible at the remaining CCA events for 2014.

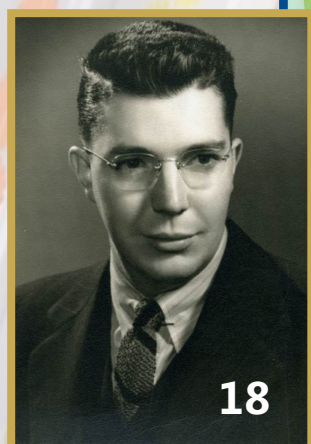
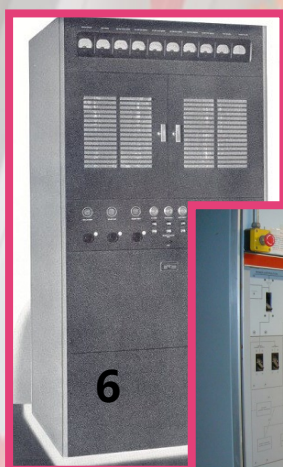
Best 73s, Bill Carns, N7OTQ

A Quick Look in This Issue

- Feature - Rare Species Located in the Wild
- Frank Davis—A Biography
- The Last Mohegan - Down Under with a 20C
- 2014 CCA Report - The Capture of the Big One
- Captured - Monster Species found in California



CONTENTS



ON THE COVER - QST 32RA/B ad from October, 1940. The 32RA was offered by Collins Radio from 1938 through the 1960 General Catalog - 22 years

BIRTHDAY FEATURES

- 6 CAPTURED IN WILD COUNTRY**
Four rare species find refuge in safer environments thanks to member's efforts
- 6 FOUND DOWN UNDER—20C**
A down under crew of passionate folks preserve what may be the oldest broadcast transmitter in regular operation
- 7 32RA FOUND IN WILD**
Plain, but a true survivor, this 32RA represents a strong breed of Collins work horses
- 8 821A-1 RESCUED**
Fate had doomed this behemoth 22 ton 250,000 watt Autotune HF Collins transmitter to the scrap heap until a committed group of Collins lovers stepped in.
- 9 30FXB CONSERVED**
First built in 1934, this rare example of Art's handiwork was saved and restored in 2012
- 10 CCA REPORT - Q2 2014**
Read the report—We had a great (and fun) quarter
- 18 FRANK DAVIS - A Biography**

Regulars

- 2 FROM THE STAFF**
News and views from your *Signal* Staff
- 16 Service LINE - 4A Rescue**
John Barnwell, a newcomer to the *Signal*, gives us his perspective on his acquisition, its place in history, and the decisions faced.
- 20 IN THE SHACK - The Firey Game Preserve** - We get a nice look at John's game preserve and he shares his 150C restoration ([page 21](#))
- 24 PRESERVING HISTORY**
We relive - and preserve - the past with an excerpt from a March 1935 30FX brochure

OUR CONTRIBUTORS



George Stewart

“Found Down Under - New Zealand 20C” *pg. 6*

George is senior technician and one of the announcers at Village Tauranga Radio, 1368 AM in Tauranga, New Zealand. His relationship with the Collins 20C transmitter goes back to the 1980s when the then retired 20C from 1ZB was moved to the Tauranga Village station. George is a man of many talents having had careers first in carpentry, then licensing and service in the broadcast industry rising to become Supervising Technician of 1ZB, Tauranga – the previous service site of the 20C. In 1988, George moved into the radio journalism field rising to News Editor of Coastline FM Tauranga (93.4) and then finally retiring in 2003. He still loves his broadcast work and enjoys his dual role at Village Radio.



John Barnwell, KE7TPA

“4A Rescue” *pg. 16*

If ever a man deserved to be called a perfectionist, it is John. This is meant only in the best sort of way. If I was a piece of 1930s Collins gear, my only hope would be to be found by the likes of him, and preserved for all time. He does not just collect Collins. He collects fine things. He once went on the hunt, found and restored a very rare R69S Sport BMW motorcycle. When finished, the bike went on to tie for first place in the huge international motorcycle show in Seattle that year. The other bike had been restored by a professional. He does not ride a motorcycle. John is retired career Coast Guard and it shows in everything he approaches. He does it right. He has been a ham only a short time and been collecting Collins for just 5 years. His collection is modest. He would not have the time for more – I am sure. Here he shares his story of his 4A find, its wonderful history, and some of the decisions that had to be made as he approached this restoration. We will see more from John on this subject. The BMW - Well, it now belongs to golf's Gary Player.



Brian Davis, W9HLQ

“Frank Davis - A Biography”, *pg. 18*

We are fortunate indeed to have a biography of Frank Davis, one of the pioneer engineers at Collins Radio. We are doubly fortunate when that bio is written by Frank's son. Brian Davis brings us a unique perspective on Frank and his life. After all, he grew up with him and Art himself came and went from Brian's home. Brian followed in Dad's footsteps and became a ham in high school. He went on to have a long career with IBM and raised two great kids. His son, an Instructor Pilot and Aircraft Commander with the Air Force is also a ham, KI6PBI, his daughter is a teacher in Holland MI, and his wife Sharon holds Frank's old call, W9VFM.



John Firey, W5ZG

“Firey Menagerie” *pg. 20*

John has appeared previously in the *Signal* during the 2013 history issue series. He is a collector of things vintage - including automobiles, firearms and tube radios... mostly Collins he observes. He is passionate about correct restorations and also using his vintage collectables. We are fortunate in this issue to have an article about one of his more challenging restoration projects – his Collins 150C. Beside his hobbies involving collectables, John loves to travel as his picture here from Switzerland would indicate. John has a BS in Computer Science from Texas University and spends his career working hours in the challenging field of Virtual Reality Simulation.

Wild Country - Rounding up the Rarely Seen

Introduction

Anyone who really "collects" Collins to preserve will probably relate to the next few stories. When the urge to preserve and protect has really set in, there comes a stage when you have "targets". Your efforts may go one direction or another. In my case, after desperately trying to restrict my focus to a limited range from post World War II to the end of Winged Emblem, the desire to learn and the desire to do research and share the finding has driven me now to the extremes of the full date range. I now find myself trying to find and preserve the rarest of things from 1933 through to the 1990s. I, apparently, have very little self-control.....but, I must admit to having a LOT of fun.

Sometimes the acquisition of the things we "just must preserve" take a lot of hunting, and then sometimes, through a chance sighting in the wild, or a twist of fate, they seem to pop up and call out to us; "Here I am". The last two years has provided several great examples of all of these "modes", and I must say it has been quite an adventure. Looking back on all of it, I could not help but draw an analogy between these *captures* and the life and times of one Frank Buck of "Bring 'em Back Alive" fame in the 1930s.

The following four stories together tell a tale of disappearing habitat, an endangered species, and the subsequent move of at least one example of the species to a protective home where it can live on and "tell its story" to the future generations. Now, George Stewart writes to us about a rare 20C.

A 20C Story - Thought to be extinct, this species was previously only known through descriptions based on past encounters and older pictures. The previously established habitat was thought to be mostly in North America. Even fossil remains are very rare. It was with surprise that there was observed to be at least one living example still extant in a remote village in New Zealand. Word has it that it is being cared for by loving attendants and is receiving appropriate medical attention when required - which they observe is not often.

In 1937 the National Commercial Broadcasting Service of New Zealand purchased four Collins type 20C transmitters for their ZB stations at Auckland, Wellington, Christchurch and Dunedin. At the time, these Collins transmitters were regarded by the New Zealand technical chiefs as "the Rolls Royce" of broadcast engineering. Apparently, at the time of the purchase, there was a huge political furore regarding the installation of a non-Australian produced transmitter.

The four little 20C 1kW Collins served for years but were eventually replaced by 10kW AWA "Black 10's". The 20C that was used for 1ZB was later relocated to the Bay of Plenty transmitting station at Paengaroa near Te Puke. It was there used as an emergency for stations 1YZ Rotorua and 1ZD Tauranga. It had switchable crystals in the exciter unit.

A working radio station had been proposed for the then "living" Tauranga Historic Village and in 1984 arrangements were made to have the now surplus Collins installed in the 1950's era studio at Tauranga. This studio also uses valve type amplifiers and equalisers. The historic "switch-on" was 13 April, 1984. Call sign ZL1XT "Village Radio". The aerial is an end fed "inverted L" antenna supported by two 70 foot steel poles. Transmission range is about 30 kilometres on 1368 KHz.

But, after several years of operation, the main HT power transformer under the Collins went open circuit. Lack of funding and the inability to find someone to rewind the transformer resulted in the transmitter sitting idle, until 2012. But in the meantime, a 1 kW Toshiba transmitter was gifted by the NZBC from its site at Gisborne. This Toshiba is still being used successfully each day by Village Radio, broadcasting on 1368 KHz.

Mid 2012 the faulty transformer was rewound and in October it was back underneath, on the bottom tray. But the final rectifiers would not fire! So, a team of three retired technicians spent half a day checking components, and eventually located a broken HT lead caused when the 3,000 volt transformer was moved. They all fit in like fingers in a glove under there!

So imagine the excitement, satisfaction and smiles when, after pushing the HT button, we had all the meters reading again! A half hour transmission followed - live on air again. Listeners reported that the signal and sound was of better quality than our Toshiba! Then on January 5 last year we ran the Collins all day, from 7:30 am until 5 pm. The only tricky component is the 1350 volt intermediate HT circuit breaker, which trips out occasionally. Still, after 75 years, who wouldn't be a bit temperamental! It has been decided to only run the Collins for special occasions, and to keep it as a working museum exhibit.



Tauranga Village Radio is a Heritage Radio Station owned and operated as a charitable organisation by a board of trustees. Transmission hours are 10 am to 5 pm, Monday to Friday, 8.30 am to 5 pm Saturday, and 9 am to 5 pm Sundays. Staff are all volunteers and consist of announcers, announce-operators, technicians and panel operators. Funding is through applications to various charities such as Trusts and the Lotteries Commission. We receive no money from the Tauranga City Council which charges us rent for the building. We have over 100,000 tracks, in the form of 78's, 45's, 33's as well as CD's.

The music format is nostalgia, from the 1920's up to the 1980's. There are no news broadcasts and we are non-commercial.

de George & the ZL1XT Staff: <http://www.villageradio.co.nz/online/welcome.csn>
For the complete story, visit: http://www.collinsradio.org/20C_Tauranga/



A 32RA Find - The 32RA is almost extinct. There are thought to be a very few NIB examples lurking in the far corners of the globe, but establishing a current range or habitat is nearly impossible. They have been known to frequent dank storage units, or out-of-the-way piles of civilization's refuse and dark wooded areas. The species is definitely endangered.

Last year, we were fortunate to become involved in the saga of the capture (alive) of one of these rare beasts. Now, you may think that the word beast is used metaphorically in the context of the "Bring 'em Back Alive" theme of this issue. In part it is. But . . . In its own right, it is a beast of fair proportions. Roughly the same size as a 32V-3 (itself a weighty wonder), it is a bit heavier at 120 pounds – not including the crate. Getting it home involved numerous people and a lot of heavy lifting. That is a separate story.

Actually, the unit involved here is the military version of the 32RA, the T-159A/FRT and it was made under contract for the Signal Corp in 1955. It is identical in every way to the 32RA with one exception. It is coated with MFP (Moisture & Fungus Protection) under the chassis – part of the saga. The 32RA and the T-159A had an amazing life span in production. First developed and introduced in 1937, the radio was still in production through the late 50s and in the Collins Radio Catalog into the early 60s. This is true testimony to the strength of the design and the capability of this transmitter. That puts it right up there with the S-Line in terms of production longevity.

Thanks to the previous owner's desire to see the species preserved, and given my weakness for same, the job just "had" to be done. So, another operating position was planned. Collins invaded my house (previously avoided in the interest of a happy marriage) - and the journey began.

In this case, preservation involved two perspectives as you will see. First and most obvious, was the physical preservation of the unit itself and returning it to operating condition. Secondly – and a rare opportunity it is – the beast was in absolutely "as built" condition just as it had left the factory and how often do we get to glimpse the work of the factory in 1950 and record the appearance and workmanship.

Now, the work began. After the trip home and the removal from the crate and inside wrapper and cardboard carton (try lifting a 120 pound transmitter with no handles out of a tight cardboard box that is inside a wood crate and itself requires preservation), the fun began.

We had been told by the previous owner that the transmitter "was not working" and that it had apparently not passed the incoming inspection test at the Signal Corp base where it was shipped. The crate had a yellow X painted on it and it was marked for return. The owner also said that someone had removed the screws from the HV transformer in the process of trying to repair or diagnose it. The gentleman who transported it half way to me, had opened the box and gotten two of the four bolts back in the mount before he transported it. Also, symptomatically, the Low Voltage fuse had a quick replacement in-line adapter in it, with replacement fuse, and the HV fuse was new and as shipped...Hmmmmm Mystery!

A look at the schematic quickly established that there was no way that anyone could have diagnosed, or done any logical trouble shooting without isolating the supplies and then running them separately. If there was a problem blowing fuses somewhere, it could be anywhere from the transformer itself all the way out to the circuitry deep in the box.

Fortunately the 32RA is built with modular construction and all of the modules can be isolated by disconnecting a very fragile internal connector. That was the good news – and the bad news. When the MFP coating was applied, it was allowed to run down in all of the module connectors and the result was MAJOR stuck connectors. Pulling or prying on them would be a death sentence. With the consult of good friend Scott Johnson, W7SVJ, solvents were identified and the Q-Tip work on the MFP began. It was slow, but it worked.



Now the real work could begin and no damage done so far. The B+ and HV supplies were brought up very slowly on a Variac. Hmm . . . They all work – perfectly. Now I make a conclusion. As is my usual practice when trouble shooting old supplies, I had replaced the vintage 866 HV rectifiers with solid state equivalents to make the Variac work at a lower voltage and to eliminate mercury vapor complications. Now I conclude that the problem blowing the fuse was in the circuitry of other modules, or there had been a rectifier flashover problem. I never did find out why the HV fuse was original and the LV fuse in "diagnostic" condition while the HV transformer was unbolted.

A careful review of the other module's circuits, and subsequent Hi-Pot testing, revealed no problems. Thus, the original problem must have been associated with the original 866 mercury rectifiers.

To now prove out that theory, the connectors for all of the modules were carefully reconnected and a dummy load arranged. The original channel elements and coils were still in their sockets so up she came on the Variac still using the SS diodes. Walla – at 60 Vac input, we have power output. More importantly, we have no fuses blowing. The rest of the story is both boring and gratifying – as well as amazing.

One year short of 60 years after it was manufactured, and for the first time, the T-159A came up to full AC input and made power and met specifications. No fuss – no muss. The entire time, from delivery day at the Signal Corp base, to attempts later to diagnose the problem, the issue had been one or more 866 rectifiers that decided to flash over when reinserted in their sockets after shipment. My guess is that they never burned them in for 24 hours before they hit the GO switch.

This leaves us with the fact that, were it not for a "bad" rectifier tube, this T-159A would have probably left its crate forever, gone into service somewhere, and then – well used – disappeared to some unknown fate. We are thankful for small favors. Today we have one perfectly preserved, still breathing and living, example of this fine radio. In addition, preserved for all time, we have photos of the fine workmanship that left the Collins factory in 1955. Hopefully this time warp will be around for another 60 years.

See the CCA website for the complete story of the additional preservation work that was done. -----CCA-----

Wild Country (Cont'd)

Model 821A-1 Preserved - The Model 821A-1 is a seemingly notional species. While it generally likes to hide for long periods amidst tall structures on rural farms, it also, apparently, from time to time enjoys the company of people.

It is observed to remain motionless for years at a time, but when prompted to move, is known to travel great distances - completely changing its habitat. It is also noted for its loud and resounding call which, when uttered, can often be heard around the globe.



In the fall of last year, centered on the CCA Pacificon activities on the West Coast, your CCA Board members became aware of the pending loss of a national treasure. Warren Bruene, the Collins Radio Guru of high power RF transmitters had recently passed away, and there had been much discussion of what we should do to honor him and his memory. At the same time, we were working on the yet to be signed alliance which ultimately led to the Collins Radio Heritage Group. Jim Stitzinger had personally been working on trying to save at least some artifacts and documentation from the Voice of America site in Dixon California that had been sold by the GSA to a farmer for the land value and scrap. Three more large Collins Radio Model 821A-1 250 kilowatt carrier (million watt PEP) transmitters had met their end.

In September of 2013, during a dinner, yours truly and Jim were having dinner and the subject turned to the eminent turn-over of the last functional (but turn-key shut down) Delano California Collins 821A-1 equipped site to the GSA for auction and scrapping. Much crying occurred. This Model 821A-1 was a superb piece of teamwork engineering at Collins Radio in the '60s and represents Warren's crowning achievement in terms of RF output power shortwave transmitters. It was one of the biggest Auto-Tune transmitters ever built.

During that dinner, a plan emerged (thought to be kind of farfetched at that time) to leverage the combined horsepower of the AWA and the CCA (in the form of the CRHG), and working with Collins preservationists in Cedar Rapids, to submit a proposal to the VOA/GSA. This proposal would ask that they donate one Model 821A-1 and the associated main VOA analog audio and switching studio control board via the AWA Museum 501(C)3 path.

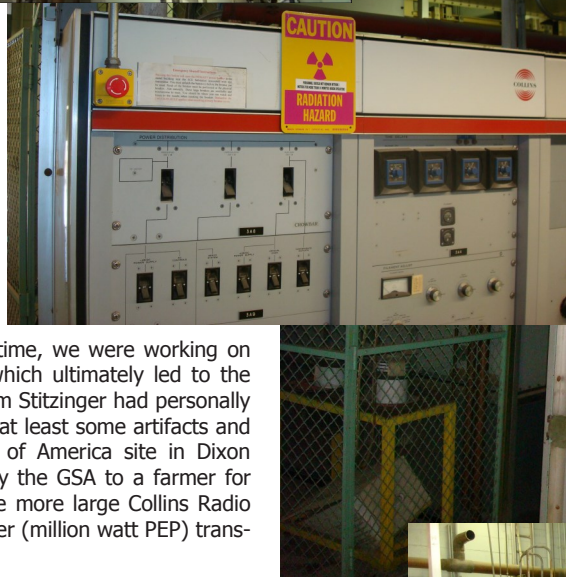
By the end of 2013, the joint proposal was submitted, and in May of this year - after the required government listing periods and processing - we were awarded the requested material. The vision presented was that the equipment would be used to display and preserve the story of the VOA's efforts starting during WW2 and running

through the cold war when satellite communication and the internet changed the broadcasting world forever. It would also tell the story of a fine piece of Collins technology.

This exciting news that the units had been donated was followed by the rapid fire formation (already in the planning) of an "extraction" team of engineers and technicians that would respond to the government requirement that we remove said property from the Delano premises within two weeks. Two weeks is not a lot of time when you are talking about a transmitter that weighs in excess of 20 tons....Yes that is 20 tons.... And takes up approximately 1000 square feet of floor space. As this is being written, that was three weeks ago.

Before we were finished, several very large trucks, including one 53 foot long 18 wheeler, had left the docks of the Delano transmitting site. More on this effort will be published at a later date, and we will be telling you more about our ongoing efforts to both use, and display, this beautiful transmitter in the future. The plans for this future are even more exciting than the happenings to date.

Suffice to say that one more significant historical artifact of the history of this country and the technology of the Collins Radio and Rockwell Collins



companies will NOT be going to the bulldozer and scrap yard.

Your help in the way of donations is required to tell this story and continue to provide safe habitat for this

wonderful giant. You can read more and see how to help by visiting the Collins Radio Heritage Group (CRHG) website at: <http://www.collinsradioheritagegroup.org/> and then donating to this worthy endeavor.

As you will see, the end game is to use the display of the history and the technology to stimulate the impressionable youth of our country into pursuing a STEM education and career path. It is hoped that this giant can then - again - earn its keep serving its country in a very different, but yet still patriotic, fashion.

30FXB Revival - The species 30FXB was significant indeed, as it was the last of the genus Arthur A. Collins-developed transmitters in that line of evolution. The development of Collins transmitters would never again be so pure. Now found in only the most isolated locals, the 30FXB is worthy of the most aggressive pursuit and conservation. Let's take a look at why this is true.



First, what is a 30FXB? It was the next transmitter following the 150 series in the evolution of the higher power AM modulated units developed and produced by Collins Radio during the very early years when Arthur was doing the engineering.

Technically it is a 100 watt AM or CW transmitter covering 1.5 to 15 Mc. It employs the 203A in the final and is modulated by two 830Bs (or 203As) . . . but, let's look deeper at the significance of this animal.

While it is well known that Art Collins always remained involved in the development work at Collins, the years be-



tween his start in 1932 and when he hired his first engineers in 1934 are significant because designs from that period were pure "Art". Following the very successful 150 series, the 30FXB was more advanced in design and construction – using the latest RCA tube designs. It was developed just prior to Collins employing their first engineers.



Modulator after Steve's rebuild

This 30FXB model would be produced for just 2 ½ short years, or until several key changes happened in its "habitat". The first significant change occurred just following the incorporation of Collins Radio in the fall of 1933. The engineering workload - combined with the management of the growth and legal issues of the

company – was starting to overwhelm Art and he needed help. Early in 1934 he hired Robert Samuelson (ME) and that was followed by a number of others including Frank Davis (EE), whose story also appears in this issue. Never again would the designs of the Collins Radio Company be just Art's handy work.

In addition, life at Collins was getting very much more complicated. RCA was trying its best to drive a monopolistic position in the rapidly exploding electronics communication market. By going into the transmitter business, Arthur, and Collins Radio, had become entangled in a

power struggle involving de Forest and Sarnoff that dated back to the 1920s. This struggle centered on (oscillator) tube patent rights. After applying to RCA – the apparent winner of the patent struggle of the 20s and 30s – for the right to use RCAs resulting patent rights and being turned down, Art continued to both look for options and produce equipment using the RCA patents. In June of 1934, he was sued by RCA – enjoining the Collins Radio Company from using RCA patents. This story, and Art's subsequent work-around design strategy, is well detailed in Ben Stearns' wonderful book entitled *Arthur Collins Radio Wizard*.

Suffice to say that the lawsuits involved complicated issues regarding both the tube patents mentioned above, as well as the use of capacitive neutralization. Art would go on to redesign his transmitters to use tubes of his own designs based upon earlier Goddard patent art and solve the neutralization problem by using a more elegant (make that complicated) inductive neutralization technique. This legal struggle would impact Collins designs until late in 1938 when Collins prevailed in a complicated appeal.

The 30FXB, designed before the injunction, was thus in production just a short 2 years before needing to be "updated" to work around these two significant issues. The 30FXC was the result. See: (<http://www.collinsradio.org/cca-collins-historical-archives/the-equipment-of-collins-radio/historical-equipment/30fxc-transmitter/>)

The particular 30FXB shown here is serial number 3018. This number has absolutely no meaning as far as the quantity produced. We do know, because of the history of this unit and when it was purchased, that it was produced very early in the course of 30FXB production, most likely in the fall of 1934. It was bought by a group of amateurs and installed as an aircraft beacon transmitter in Port Carling, Ontario Canada, just east of Lake Huron and in an area rife with tourism and commerce. It was apparently in service there until about 1938 when it was replaced with a higher power transmitter. Little is known about its history after that (except that it was poorly stored and treated) until it raised its head on eBay in November of 2011.

At this point, its fate turned around and it was purchased by Steve Darveniza, VK4VN, in Brisbane Australia. At that point it began its journey back to its original condition. In the course of this odyssey, a complete chassis was fabricated and the speech amplifier rebuilt using original components. The unit was completely disassembled and the rust and grime removed and finish redone as original. Steve even found and used the original conductive silver grey paint (also used on dirigible air bags in that era) and the master harness was refabricated using period correct cloth covered wire. In summary, a masterful – what might be called metaphorically – "frame off" restoration was done and the unit brought back into operation.



This is what "preservation is all about. More information from Steve can be found in the Q1 2013 issue of the Signal in that Service Line column. He has promised us a complete restoration process report in the near future. Well done Steve.

Your CCA - 2014 - A Second Quarter Report

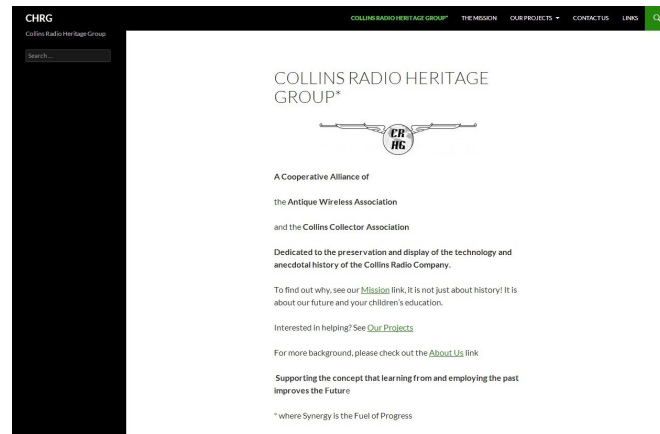
General Business

Where to Start? Happy we are to report that there is a great deal to report.

It is just Q2, and already the Orlando Hamcation, Dayton Hamvention, Dallas Ham-Com, and the ARRL 100th events and dinners are behind us. The CCA is growing and healthy and the *Signal* continues to be a big favorite with our members.

In addition, we have the progress that has been made with our Collins Radio Heritage Group alliance with the Antique Wireless Association - and its work which now includes two projects aimed squarely at the preservation of Collins Radio history and equipment as well as relating the story of the impact of the Collins technology on our country and its Voice of America efforts.

We have previously written in the Q1 2014 issue about the evolving alliance with the AWA. Since you read about the Collins Radio Heritage Group (CRHG) in the last issue, we have lit up the new CRHG website at <http://www.collinsradioheritagegroup.org/>.



You should pay that new website a visit to see more about the two projects that have already been started - as well as an opportunity for you all to help and support those efforts. You can read more about the VOA Collins Radio Model 821A-1 HF Autotune Shortwave Transmitter rescue in the pages of this issue.

Bottom line is that some of these results, and some of this progress has not come free and that we need donations to support our efforts. These opportunities to contribute your financial support are outlined on the CRHG website under OUR PROJECTS.

We are all proud of the progress in the CCA over the last decade particularly. The organization is stronger and contributing now, not only to CCA Member Support, but also to the overarching goals of fostering the general preservation and display of the anecdotal and physical historical artifacts that will impact our hobby positively for years to come.

In this report, we will focus on the Dayton and Dallas events as well as a last minute report on the CCA presence at the ARRL 100th Convention 2014 in Hartford Connecticut on July 17 through 19. More can be read about the VOA Transmitter Rescue elsewhere in this issue.

Finally, your CCA Board of Directors has decided to expand on our offering of membership related services. As you know, it has always been the policy of the CCA to make almost all of our support free to the general Collins collecting community. This is done to foster our

general objectives related to preservation, support and display. All of our archives, reflector membership, and historical content related to people and equipment are available on the CCA website free of charge.

The CCA Membership dues pay for maintaining these services as well as publishing the *Signal Magazine*.



Scan to see more about the CCA

Effective immediately, the CCA Board has authorized the creation of "Associate CCA Member" status. This "Associate CCA Member" status will be absolutely free of charge and give more participants the right to Log On to the "Members Only" area of our website where our new associates can have access to the member's design tools and database. In addition, after establishing their email and call sign data, the Associate Member will then receive a quarterly newsletter by email that will contain the CCA Business Report from the *Signal Magazine* as well as an occasional condensed version of technical support articles. As an "Associate Member of the CCA", they will also be able to print out an Associate Membership Certificate suitable for framing. The paid membership will continue to offer the same original benefits including the member's store and events discounts and their subscription to the *Signal Magazine* by mail.

Dayton Hamvention 2014

What a great Dayton Hamvention! Good Times! Good Attendance! There was lots of Collins in the Flea Market and some wonderful "Captures" were evident when it came evening story time. The weather was a bit rough (it's Dayton - after all), but that drove folks indoors and that made the booth a beehive of activity. We will certainly not complain about that.



The dinner on Friday was a full house, and - in spite of a complete debacle regarding the room setup and the computer/projector facilities provided - we managed to have an enjoyable evening and the crowd went away happy. Kudos to Jim Stitzinger for getting that all straightened out before we ate and the meeting started.

Now, even more good news. We are NEVER EVER going back to that Ramada Plaza Hotel. My guess is that they will not be there to go back to. It has continued to go downhill. Folks had their rooms left wide open by the cleaning staff, there were obvious fights among the employees while we were dealing with them, we were not the only guest and customers complaining, and all in all, it was totally unacceptable. We do apologize if you got caught up in all of that.

We have found a sparkling new and successful (Great Food) dinner venue and we are in the process of negotiating for another hotel. Stay tuned here on the website for the announcement. You all have seen your last nights at the Ramada with us.

Back to the 2014 Hamvention. Booth sales of membership and T-Shirts and Magazines were brisk and we welcome all the new and renewing members. The availability of some refreshments in the booth seemed to please everyone. This led Scott to expand on that theme at Dallas 2014 where we had free coffee and doughnuts and THAT was a huge success. Also a success was the fact that the "booth" was outside in a nice tent.

The theme at the dinner was our 20th birthday celebration of course and we honored Bill Wheeler, Floyd Soo and Jay Roman (who could not be there) with some wall décor as well as a big thank you and review of how the CCA got started. Then we talked about how it has grown and morphed into a bit more than just a "club" that supports its members.



The main program focused on bringing attendees up to date on what the CCA was doing outside the normal boundaries of a collectors support group. This covered the recent formation of the Collins Radio Heritage Group (CRHG) with the Antique Wireless Association as well as our fundraising and support work with them and other project participants in Cedar Rapids.

The balance of the evening's talk dealt with the prolifa of less-often seen Collins Radio memorabilia that is fun to collect. A number of folks were seen leaving the dinner with a bad case of "I wannas" – including yours truly.

Following the dinner, the staff brought out ice cream and birthday cake for everyone and we had a true birthday party. The cake was a nice rendition of the grounds around - and including - building 120, the Engineering Building in Cedar Rapids. It was accurate right down to the duck pond and even one duck. That was memorable for sure.



Floyd Soo and Bill Wheeler, original founding members of the CCA, admiring our cake

The evening ended of course with the usual round of door prizes which has gotten to be a real treasure hunt. The final prize was the evening's big raffle for, no less than, an original KWM-380 introduction banner that was gorgeous. It had been rounded up off eBay just for the occasion. The gentleman who won it (he will remain nameless – lest we embarrass him) was super gracious and looked across the room and spotted Wayne Spring who is Mr. KWM-380, and promptly gave it to him, saying he well deserved it. Nice thought and gesture Tony! ;-)

Following the dinner, there was a nice gathering and some operation of Jim Stitzinger's Collins S-Line Promotional Van which was parked outside the door and tuned up on 40 meters. Thanks again to Jim who does such a super job of providing us with experiences that are priceless.

Many of you may not know that Jim schleps that van – and his HF-80 shelter and generator - back and forth across the country for our enjoyment at his own expense.



Above: The beautifully restored and operational interior of the promotional Ford Econoline Collins Radio S-Line Van from the 1960s.

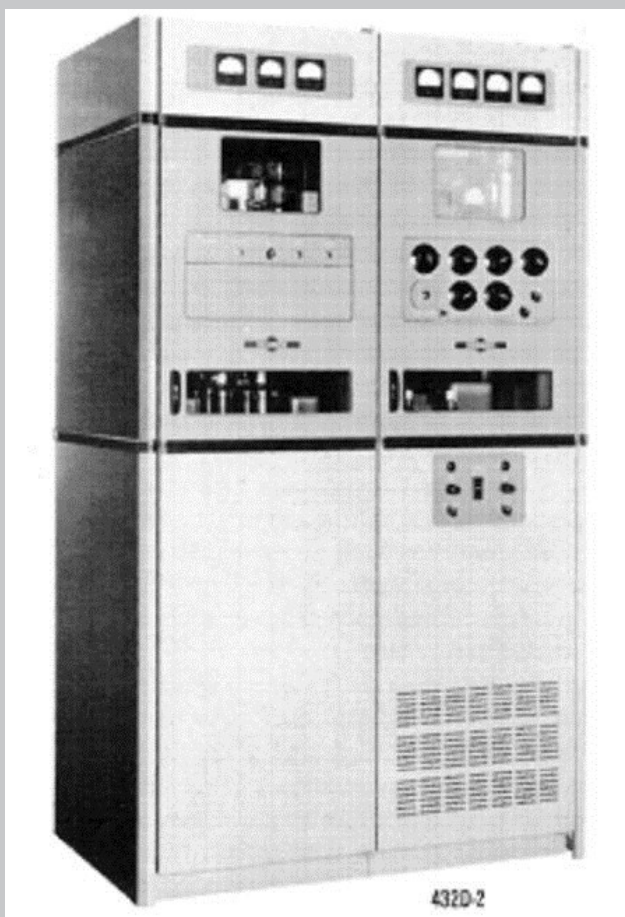
Below: Scott Kerr (left), Jim Stitzinger, Butch Schartau, Wayne Spring and Bill Carns discuss something undoubtedly very important at the usual Thursday evening Pizza bash.



(Photo by Zhang Rui Lin)



ATC/ART-13 (100 watts circa 1941)



**432D-2 or AN/FRT-24
(1000 watts circa 1953)**



**The Autotune and High Power AM
comes of age at Collins Radio**



**DL8, One of three Model 821A-1
250 KW Carrier (1 MW PEP)
HF Autotune Transmitters
(circa 1965)
Delano, California VOA Site
Photo taken 2013**

CCA Second Quarter Report (Cont'd)

The inside booth was again a double booth with a nice hospitality area where people could rest and talk. The equipment again spanned the Collins history, ranging from a 1934 10B prototype, through the S-Line era and then up through the Rockwell Collins 671U-4A/514A-4 Airborne Receiver/Exciter from the 90s.



It sure is nice to see 60 years of Collins design work spread out in front of you. If you missed it this year, try us in 2015 when the emphasis will be on the exotic.



Traffic at the booth was very brisk and the sales of magazines and other Collins related materials was excellent – including new memberships. This was one of our best Dayton Hamventions ever for traffic and recruiting.

Our thanks again to the team of folks that made this happen. Jim Stitzinger, Paul Kluwe and Rich Baldwin did a fine job overcoming the difficulties that the (not to be mentioned again) hotel handed us. Jim also – again – brought us his van to play with. We are getting spoiled. Scott Kerr was a huge help with the booth design and setup and did the team driving, bringing all of the supplies from Texas to Dayton. Floyd Soo and his booth set-up crew (Charlie Talbott, Rich McClung & Tony Sokol) did the honors again giving us a very professional booth. Then, the booth was manned by Jim Green, Tony, Scott and Jerry Kessler. I think Torrey Mitchell took a lap in there too as well as providing us with some great photography work at dinnertime. That is a lot of help, without which this all would not have happened.

Dallas Ham-Com 2014

Dallas is always one of our favorite venues. It is in Dallas - after all - and home to many retired Collins Radio employees. We love having them at our dinner and visiting the booth. It is always an honor. Also, because Dallas Ham-Com is a much smaller show and swap to start with, the attendance at the dinner is usually around just 30 plus folks and that makes for a more intimate setting and our being able to chat personally with more attendees than at Dayton.

2014 was no exception. It was, however, different. The Dallas Team – headed by Scott Kerr – had decided to try a different approach for the booth. Because of the crowded inside booth area, the team decided to have an outside “tent” booth and take a gamble on the weather. The team and Scott Kerr is to be congratulated on being imaginative and putting on a nice presence for the CCA. Thank you all!

They won! The weather was great. The free water and coffee and doughnuts in the morning was a huge success and, all in all, the tent booth in the tailgate area saved us a nice chunk of change and it was more fun. Membership applications flew off the table and we will try that approach again in the future.

Traffic at the booth was good and the dinner – again – a sellout. This was our first Dallas Ham-Com dinner without Warren Bruene following his passing last year. He was sorely missed by all, but his daughter Jo and her husband Tom Lilley attended and were pleased with what we had to announce at the dinner talk.

Just prior to the Dallas dinner, several of us had returned from the Delano California VOA site and the trip to extract and preserve the Collins Radio Model 821A-1 HF Autotune Shortwave 250 KW transmitter and the VOA studio audio and antenna switching control board. You can read more about that adventure in this issue of the *Signal*. Suffice to say that when Jo and Tom found out that we had saved one of Warren's favorite (and biggest) transmitters for the museum circuit, they were very very happy.



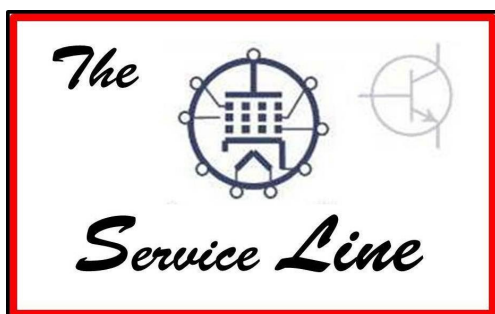
We were honored to have Jo and Tom Lilley attend our dinner this year following the passing of Jo's father, Warren Bruene, last year



The evening's talk was a review of the status of the CCA and its growth over the decade. It was topped off with the "surprise" announcement that the CCA and the AWA (the CRHG) had captured this rare and awesome 821A-1 transmitter along with the VOA Studio Board.



The evening was topped off by a nice round of door prizes and a raffle for complete 516F-2 rebuild kit including all critical replacement components and the On-Off relay and cap kit. This prize was donated by Mark Olsen, KE9PQ. Mark had also contributed many of the door prizes.



Conserving a Rare Collins 4A

by John Barnwell, KE7TPA AC13-12853

Editor's Note: This story is a bit different than most Service Lines. It is a story about two men and a radio – not just one. And . . . if we listen, it tells us a lot about why we do what we do and how we do it. Please see his more detailed story on our website.

About two years ago, late in the evening, an eBay listing caught my eye. It was a Collins 4A Transmitter. I studied the piece until the early hours of the morning, but was unable to make the decision to purchase. After a good night's sleep, I checked the listing and found it had been cancelled, re-listed at a much lower price, and sold. Something didn't

seem quite right, so I sent the seller a message indicating I was interested in purchasing if it might still be available. As the day ticked on, and I heard nothing, I lost hope. Late that evening my phone rang - it was the seller. The next day I was on my way to Grants Pass, Oregon from Seattle, a 1000 mile roundtrip.



Upon arriving at Steve and Starla Clarke's home, I learned that this radio belonged to Starla's grandfather Nino Sunseri. Starla told me that Nino was the original owner, and that it had been his shack centerpiece for as long as anyone in the family could remember. In the short time I was there, I got quite a glimpse into this man's life. Driving back to Seattle that same day, thoughts of this man and his relationship with this radio were foremost on my mind. I arrived home after midnight that same day and was thoroughly exhausted from the long drive. I placed the 4A on the kitchen table and decided to post my adventure on our reflector prior to retiring for the night.

The next morning I awoke to see a flurry of posts on the CCA reflector regarding my purchase of the 4A. Soon, my wife and I were sitting at the kitchen table having our morning coffee. The 4A was sitting proudly on the table as we were discussing the previous day's activities. As I began sharing my thoughts on the 4A, I found myself choking up as I told my wife this was a national treasure and that Nino, the original owner, was an early amateur radio pioneer.

Nino Sunseri was born on October 5, 1902, in Pittsburgh, Pennsylvania. His parents were immigrants from Sicily. At some point the family moved west and settled in Pasadena, California. Nino graduated from Pasadena High School in 1920. This was also the year Nino's first amateur radio license is listed in the June 1920 United States Department of Commerce, Radio Division's manifest. His call is shown as 6LW. Nino would go on to hold five different amateur call signs over the years. 1920 was also the year Nino enlisted in the U.S. Navy. After boot camp, he entered the Naval Radio School in Great Lakes, Illinois. His first shipboard duty assignment was to the USS New Mexico, a new class of Battleship. The New Mexico was the first naval vessel to have electric-turbine engines. The radio room aboard the New Mexico would have had the latest spark-gap transmitter for worldwide CW communications. In 1921 Nino transferred to the USS California, another Battleship of distinction - remaining aboard the California until his discharge from active duty in 1923. He remained an active member of the Naval Reserves until his retirement in 1946. Listed in his continuous service certificate, he also held a special qualification as a US Weather Bureau Operator. Upon leaving active duty in 1923 Nino went to work for the Bureau of Commerce as a meteorologist. He retired from this vocation in 1957 and settled in Grants Pass, Oregon. Later Nino would work for the local school district in Grants Pass as a janitor, retiring from this position ten years later. At this point, the 4A's owner was finally retired and he spent his remaining years tending his beautiful gardens and enjoying his hobby in amateur radio.

It is easy to see that Nino remained active in amateur radio his entire life. Being that he held a good steady job with the government during the midst of the Great Depression, he would have had a little extra to indulge in the latest offerings from a new startup company, Collins Radio. Home brewing was the natural way for these early amateur pioneers, so this acquisition of the 4A was undoubtedly something Nino would have thoroughly researched prior to its purchase. Nino reportedly operated the 4A in his shack up until just prior to his passing on January 8, 2000. That would make about 60 years of operation – allowing for the WW II timeout. The only repair ever made was the replacement of one electrolytic in the power supply.

As I studied this piece prior to any restoration, I got the real sense that this piece was always well cared for. The dirty chassis and corrosion in all likelihood was from the piece being stored in an outdoor shed for some ten years after Nino's passing. The 4A was only removed from this shed just prior to the family's decision to sell it.

My decisions made in executing what I believed to be a proper path towards restoring this piece, were made so with the utmost respect for the legacy of both Art Collins and Nino Sunseri. The path I choose was to restore only what was needed to bring the piece back to its original glory and nothing more. I wanted other amateurs and collectors to see what a 4A would have looked like as it was made in 1934. Nothing about this restoration was easy. My decisions were painfully deliberate and required more time simply pondering solutions than actual work towards that end. I second guessed every decision up until executing any work performed.

Service Line (Cont'd)

The first order of business was to determine the 4A's electrical condition. Fortunately, Jay Spivack, W7PJS, lives close to me and I had been acquainted with him from a local annual ham-fest. Jay has written numerous technical articles for Electric Radio and graciously agreed to help me in any way he could. Thus, we set up a rendezvous at his place. We then met weekly for several visits as Jay methodically tested the 4A's running legs. Other than the electrolytic capacitors, everything measured well within tolerance and Jay issued a clean bill of health. Our last visit consisted of substituting electrolytic capacitors under the chassis and running it up. A slight antenna coupling issue was resolved, and with Jay at the controls, we ran it up as per the manual attaining a little better than twenty watt output at the antenna. The only solder connections disturbed were those for the capacitors, and these leads were dressed for future replacement of same.



In a nutshell the restoration involved stripping the radio of everything that could be removed without disturbing any original wiring or solder connections. After clearing the chassis of all possible components, I was left with the two transformers in place, the solid wire leads to the variable capacitors including the ceramic standoffs, the AC power cord, two key line wire leads, and the two wires connecting to the Westinghouse meter. The chassis was then restored to its original appearance and then protected for the next step in restoring the transformers in place.



Restoring the chassis and transformers in place was tedious and tricky. The chassis end plates and topside exposed screws were all restored using original finishes which were a combination of nickel and cadmium plating. All of the other components were simply carefully cleaned with no other enhancements. Upon reassembly, every move was carefully calculated to ensure no damage to any surface. The nitty-gritty details of this restoration are a story all in itself.



A little about myself, I retired from the U.S. Coast Guard as a Radioman in 1995 after twenty years of service. As a Radioman I gained experience in operating complex communications systems aboard ship and shore stations. My technical abilities were limited to troubleshooting equipment failures and work-arounds to ensure reliable communications. The technical responsibilities of component failures were left to the electronics technicians. We broke "em", they fixed "em". I never had any real interest in amateur radio during that time. After retiring, I became interested in classic cars and motorcycles, eventually performing several total restorations. Approximately six years ago, I decided I wanted to get back into CW and get my first amateur license. As I explored this new hobby, vintage equipment became a passion. I went about collecting and learning what was what in vintage gear. CW being my main interest, I choose gear which had a reputation for solid CW performance. I have yet to set up my first shack and get on the air. I've actually given up the idea temporarily to concentrate on other projects, but I will have more time for this after my retirement in a couple of years.

The receiver I choose to display with the 4A is a National FBXA, vintage 1934. This receiver came out of the collection of Greg Gore, WA1KBQ. Greg is a very active member in the AWA, and a leading expert on National radios. The FBXA is a beautiful, all original piece complimenting the 4A quite nicely. The 4A is now referred to as "Little Nino" and will be paired with the FBXA and the history of the set and its previous owner.

A number of people went out of their way to assist me on this project. I am very grateful and must acknowledge that I could not have completed this project without the wisdom afforded by these individuals.

Bill Carns - I must have driven Bill nearly insane during the process of a photo shoot. The superb photos are a direct result of Bill's efforts in defining to me what a "good shot" really is supposed to look like.

Brian Harris - Having been the previous owner of another 4A, Brian offered great insight from his personal perspective.

Gary Halverson - Gary copied everything paper he had on the 4A. The operator manual and schematic were invaluable.

Jim Stitzinger - Jim gave me the personal contact information needed to obtain information and talk to the experts. Jim also sourced a "needle in the haystack" for me. He located an original, yes original, complete Operators Manual for the 4A. Bless you Jim!

JB Jenkins - JB and I spoke often on the telephone and had some pretty long chats. JB's insight into the 4A and just about anything pre-war Collins is legendary. JB listened to my "ideas" and tempered them with a good dose of reality. JB's approval of the finished project meant the world to me. Thank you my friend!

Pete Varounis - NL7XM - Call Sign Research.

Profections Metal Polishing, Inc. - Owners, Albert Malgarin and Michael Gotowka, the best metal men in the business. Michael and I spent a Saturday performing some miracle work on the 4A's chassis. My hats off to you guys!

de & 73's John Barnwell, KE7TPA

Frank Davis—A Biography

By Brian Davis, W9LHQ



The first Director of Research for the fledgling Collins Radio company in the mid '30s was Frank M. Davis.

Frank was a key developer of many Collins projects including the rare 51F model receiver. Later, as a member of the Collins board, he represented the company at many external functions including addressing the stock underwriters in 1944 when Collins was making its first stock offering ⁽¹⁾. He was also very instrumental in identifying and hiring some of the top Collins engineering talent. He personally holds three Collins patents ⁽¹²⁾.

Let's go back and look at Frank's background. He was born Feb. 13, 1912 to Will and Dora Davis. They lived for 17 years on a farm in Lawrence County, Missouri. Indeed, Frank was one of those kids who had to walk over a mile to school every day. One of his first "inventions" was the use of a jar full of lightning bugs to provide lighting for the car at night. His mother thought it was quite a cool idea. Due to Will's severe allergies, (a farmer with allergies!) the family moved south to Monett, Missouri in 1919. Will was active in civic activities and was the mayor of Monett. It was there that Frank grew up, attended high school and then Monett Junior College. In high school, he won first place playing the clarinet in the Monett Music Festival, 1929. He then attended college at the University of Arkansas, Fayetteville where he graduated with honors in June, 1934.

It is not clear how Frank got interested in radio, but he got his ham radio license, W9FVM, probably while in high school. Missouri was in the 9th call area in those days. He then went on to study electrical engineering in College. He was an excellent student and was president of both Tau Beta Pi, the engineering honor society, and Phi Mu Epsilon honorary scholastic fraternity.

In 1932, Frank Davis, W9FVM/W5CR and one William Stewart, W5CSQ/W5MU, set up an amateur radio station at the University of Arkansas, W5YM. It was common to use a different call sign when operating portable, thus the two letter call signs. They continued to operate that university station through 1934. As a budding communicator, Davis wrote an article to the Arkansas Engineer newsletter urging more engineering students to become operators at W5YM.

While in college Frank and Bill lived in the same boarding house. Their rooms were on a floor above and below each other. They wanted to set up a ham station at the boarding house. Since radio equipment was very hard to come by in those days, Bill and Frank shared a common station. Each had a key and headphones in his room. There was a switch that would transfer operation to either operator. It is not known who did the tuning for the rig, but it seemed to work out well. They were quite proud of that arrangement. Operating one rig from two locations can be tricky even today.

Ham radio was key to a job opportunity

In 1934 Frank heard that Collins Radio was hiring and he applied for a job. Frank went to Cedar Rapids for the job interview. Because of both Frank's activities in radio and written communications, Art was already aware of his abilities. Frank had two articles published in QST ^(2, 3). Art Collins - being an active ham - had read the articles and

was impressed. Frank became one of the first engineers hired by Art in June, 1934 and I believe Art hired him on the spot. Frank did not disappoint and became Chief Engineer early in his career at Collins.

Frank met his wife, Betty Cocayne ⁽⁴⁾ at Collins. Betty worked in the Collins finance department as a secretary. They had two sons, Brian and James. She remembers the stress of trying to pay bills as the early sales trickled in at Collins. Robert Gates was the financial officer at the time and was a master at juggling accounts receivable against the bills and payroll. Gates later became Vice President and General Manager of Collins. Their offices were located at 2920 First Ave. in Cedar Rapids.



Betty (Davis) Cocayne at desk, rear of room
This original picture gives us a rare look at the first floor admin level of the 2920 First Avenue Building

Not long after Art hired Frank, he was again expanding and looking for good engineering talent. Frank recommended Bill Stewart ⁽⁵⁾. Art Collins sent some money to Bill for transportation to Cedar Rapids, and hired him in July, 1935. Bill went on to work in the fledgling avionics division of Collins Radio as Sales Manager.

Frank's Work

During his early days at Collins Radio, Frank worked on audio equipment and speech amplifiers. He designed the transmitter for the Collins 18M. It was a receiver/transmitter unit for the military of the Union of South Africa. It was then marketed as the TCH for the US



Frank and Art review design of improved Autotune component in 1943

Navy as the war approached.

Following WW II, Frank worked with Roy Olson, principle designer of the ART-13, to develop a commercial aircraft radio ⁽⁶⁾. In two weeks they had designed the 17E-2 cockpit radio. The first sale went to Beech Aircraft Company ⁽⁷⁾.

Frank's responsibilities on the Board of Directors and the Director of Research ^(8, 10) moved him from the technical arena into being a spokesman for the company at business meetings and for local civic events. At one event he presented some new Collins products at



**Above: Roy, Frank and Art confer on a design.
Below: The Brain Trust (Board during the war)**



Rapids section. He was very interested in photography, and also the arts, painting and music.

As Manager of Engineering and Research, he had been elected to the Board of Director in late 1945.

In early 1946 Frank returned early from a business trip to Des Moines, Iowa. He had severe pains in his arm. He went to the hospital and they agreed he had a heart problem, but there was nothing they could do. Heart surgery was unheard of in those days. The hospital told him to go home and live a "normal life" and hope for the best.

Weeks later, the pains returned. He called Art Collins and Bob Cox to the house. Frank must have known that he was dying. They discussed company plans and Frank transferred his plans and schedules to Art and Bob. They took Frank to the hospital. Art ordered the company plane to fly to Monett, Missouri to pick up Frank's parents and fly them to Cedar Rapids that night. They were bed side before Frank died of a coronary thrombosis. Thank you Art! Davis was just 33 years old when he died.

His loss was heartfelt at Collins and with his associates. During the war, Frank had done a lot of work with the Navy – work that could not be talked about. Posthumously he received a "Certificate of Commendation for Outstanding Service from the US Navy during World War II", issued Feb. 1, 1947. The commendation was from E.W. Mills, Vice Admiral, USN and states in part: "This award is made for the outstanding work of Mr. Davis. . . . His direction of research and design activities covering the development of unique airborne, ship borne, and shore based radio communications equipment, together with his personal contributions to the development of this equipment, greatly aided in expediting their production for use in important operations of the United States Navy."

It is thought that the award is for his work with the breakthrough technology for radio direction finding (RDF). He had worked with Walter Wirkler on a critical and top secret direction finding project at Collins for the US Navy⁽⁹⁾. Much of this work was highly classified, so little is known of what Frank did in those years⁽¹¹⁾. The work of Walter Wirkler was critical to the success of the RDF or HF/DF⁽¹¹⁾. The

the Chamber of Commerce. This caused a minor stir of interest amongst the technical people present. Frank was a member of the American Institute of Electrical Engineers, Acoustical Society of America, and past chairman of the Institute of Radio Engineers, Cedar

British called it "huff duff" and it was used to locate and attack German submarines which were creating havoc for the Allies^(9, 11).

Frank Davis' loss was keenly felt by Arthur Collins, both in a personal way and in the Company at large. In his President's remarks for the 1946 Annual Report, Art Collins wrote; "To all of us who had the opportunity of intimate association with him, the sincerity and originality of his thinking, and his unselfish spirit of cooperation and teamwork in the achievement of the goals set for ourselves, remain an inspiration"⁽⁷⁾.

Frank's wife Betty later re-married Robert Becker. They moved to Cincinnati to raise Frank's two sons, and their new daughter, Shirley. Betty is now comfortable in a nursing home in Cincinnati at the age of 99. Brian, W9HLQ, lives in Tinley Park, Illinois and is active on the HF bands. Brian's wife, Sharon, proudly holds Frank's old call of W9FVM. James lives in Houston, Texas with his family. Shirley is married and living in Florida.

It is interesting to note that, while the older generation was making world shaking (and war winning) decisions and innovations, most offspring (including the author) were blissfully unaware of the world situation or the frightful war. We owe much to the creativity, dedication, and resourcefulness of those fighting the war at home. Of course not enough can be said about those in the military at that time who are also our heroes. At home, with Collins' efforts, and that of thousands of other non-combatants, the war was shortened. The "do it right" tradition continues today making Collins Radio (Rockwell Collins) a premier communications company.

de Brian, W9HLQ

About the author: Brian Davis, W9HLQ, attended Ohio State University and graduated from Valparaiso Technical Institute. He worked for IBM in Hammond, Indiana, Poughkeepsie, NY, and in downtown Chicago for 36 years. Now retired, he enjoys ham radio, water gardening, and visiting his family. Brian and his wife, Sharon, W9FVM, have two children, Daniel, KI6PBI, and Suzanne.

The author was five years old when his father died, yet he does remember first hand snippets of the Collins days. This may be the subject of a future article.

References:

- (1) "The Signal, Q4, 2013", pg. 20 references to Frank Davis
- (2) "A Four Band Transportable 'Phone and CW Transmitter"; QST August, 1934, pg. 34
- (3) "Applying the Tri-Tet Principle to Frequency Multipliers"; QST October, 1934, pg. 29
- (4) "The First 50 Years, A History of Collins Radio"; p26, photo Betty Cocayne Davis in the office
- (5) "Conversations about Collins Radio with Bill Stewart, K6HV" by Barry Wiseman; Electric Radio, #4, Aug. 1989, pg. 7
- (6) "The First 50 Years, A History of Collins Radio"; p59, photo Frank Davis with Roy Olson and Art Collins
- (7) "A Pictorial History of Collins Amateur Radio Equipment", Jay Miller, KK5IM; pgs. 20, 52
- (8) "A Pictorial History of Collins Amateur Radio Equipment", Jay Miller, KK5IM; pg. 21, Board shortly after death of M.H. Collins.
- (9) "Secret Weapon - High Frequency Direction Finding in the Battle of the Atlantic" by Kathleen Williams; discussion of importance of HF/DF and the military "DAB" RDF system.
- (10) "The Signal, Q2 2013", pg. 14; references about Arthur's "Brain Trust" and Frank's work with Walter Wirkler.
- (11) "The Signal, Q2 2013", pg. 30; "Top Secret Wirkler/Collins DAB"

(12) Frank Davis is the owner of three patents assigned to Collins Radio. 1) "Transmission Control System" providing efficient level control over an audio transmission circuit; 2) 'Limiting Amplifier Control Means' which is a seven tube low distortion limiting audio amplifier; 3) "Electrical Control Apparatus" which is a gain potentiometer or volume control for use in broadcast consoles. It featured the ability to service the control from the front – no need to remove the pot from the rear. ----- CCA -----

In the Collins *Game Preserve* of John Firey, W5ZG

Well preserved, and more importantly “conserved” in their natural environment, these species are exercised daily and fed only the finest sources of natural energy.

It is a rare treat when we not only get to share in an outstanding Collins Radio centric shack, but get some insight into the operation and preservation skills of the owner.

John Firey is much more than a “collector” of Collins. John is not only passionate about the preservation of early Collins gear, but he is well versed in the art of restoration and the operation of said equipment. We are fortunate here to have John share his experience in the restoration of two fine pieces of Collins which are now in almost daily operation. On the opposite page are photos of John’s magnificent 32G effort as well as his comments regarding the 150C that he patiently restored.

Part of John’s philosophy regarding preservation is that the pieces are completely functional and prove their worth in daily operation. No token operation this – as he has earned his WAS using only prewar 30s Collins transmitters and is well along with his DXCC. Currently he is only a few states (on just one or two bands) short of WAS/W1AW on all bands and the vintage Collins has been significantly involved.

John’s operating Collins equipment includes a KWT-6, ART-13, a 32RA and the beautifully restored 32G featured here in photos, a beautiful 4A (known now as the “Little Charmer”) and then his larger very rare 30J and 150C.

In this following article, John shares his experience and experiences during the fantastic restoration of his 150C. We will let John tell that story as only he can.

Enjoy a real operating Collins station from the 30s and try and arrange a schedule with John. He loves CW by the way.



Left, John at the helm of his rare 30J and 150C. These fine preserved examples are in almost daily operation.

Right, a closer look at an extremely fine 30J - Thanks to John's good work.



Left, a close-up look at the good restoration work accomplished on John's 4A CW transmitter.





Restoring & Preserving a Collins 150C by John Firey, W5ZG (AC12-12730)

The model 150C transmitter was the last of the 150 series built by Collins Radio. The first of this series was the 150BW, which was the first Collins transmitter to have its picture in QST (May, 1932). The 150C was introduced in 1935. A full page QST ad ran in June of that year. It is built in a fully enclosed rack, and shares some design features of its predecessor, the 150B. However, the RF deck was redesigned for use up to 10 meters. In fact, the QST ad of March, 1936 announces W6FQY and his 150C as the first transmitter to have worked all continents on 10 meter phone!

The last revision of the 150C transmitter appears to be the 150C-6, advertised in QST of November 1936 along with optional RF decks for operation up to 5 meters. It is interesting that the production of the 150C transmitter overlapped in time with the somewhat more common 30FXB and 30FXC series. Although the two lines of transmitters are similar, the advertisements tend to indicate that the 30FXB/C was more oriented to the amateur market as a "moderately priced transmitter", while the 150 series was somewhat more for commercial service. To quote the Collins advertisement in QST of November, 1936 "150 series transmitters are supplied for airways, police, military, point to point and deluxe amateur service".

With a price tag in the range of \$400 it is doubtful that many of these transmitters were made. Most of the Model 150C units produced were probably used in commercial operations such as early aviation ground stations. Only a few wealthy amateurs were likely to have one.

The construction is somewhat different from later Collins equipment. It is certainly high quality; however it is obvious that the construction techniques reflect a small shop operation rather than a precision production line. Most chassis holes appear to be hand drilled and mechanical alignment of things is not quite the level of perfection you see with later Collins equipment such as the KWS-1, 30K-1 or even the 30J (built in 1937-40).

I located my 150C in Cedar Rapids, Iowa, the home of Collins Radio Company. It is believed that this transmitter may have been used in the police service of that city. One can imagine that Art Collins would indeed want the local police in his hometown to use one of his fine transmitters! Wherever it was, it had many hours run time on it as there was an amazing amount of soot "plated" around all high voltage areas, probably from a coal-fired furnace.

The technical details - The 150C has full metering, with a switch to select oscillator plate or oscillator plate plus driver current. My particular unit also contains a final amp. plate voltage meter. This apparently was an added option. It appears to be original in that the metal tag stating "PA plate voltage" is an exact match to all the other meter tags.

One interesting feature on the main power control panel is the use of oil-filled delay and overload relays. Oil flowing through an adjustable metering orifice sets a delay for filament warm-up (before the high voltage can be energized). The front panel has nice large "Start" and "Stop" buttons to bring up the filament and high voltage. The large relays behind the panel slam shut with powerful authority!

Another interesting detail within the model 405CA power supply is that a type 45 tube is used as a bias rectifier in the keying circuit, with the grid and plate tied together. Type 45's must have been a little cheaper then than they are today!

The audio section and modulator are also similar to what was used in the 30FXB transmitter, only the location of the modulator tubes and transformer was swapped for some reason. The speech amp unit is a model 7C as in the 30FXB. The 203A modulator tubes operate in class B and use batteries for biasing.

The RF deck (model 10K) uses parallel oscillator tubes: Type 47. This was done to get more drive for operation in the 10 meter range. The crystal holder is a work of art: A giant ceramic enclosure with a 5 pin base. Type 46 tubes are used as frequency multipliers and driver. The final is a type 203A, delivering 100 watts output AM phone. I run my 150C a lot on 80 meter CW, and get a little more power output in that mode.

The original PA tank circuit was not inductive-link coupled: The plate tank coil was connected to the antenna matching unit via mica capacitors that could be tapped at any location on the coil. I bet this configuration was really rich in harmonic content! The schematic shows this and my 160 meter RF deck appears to have once been used this way. Later photos reveal the use of a link coupling coil on a bakelite form around the plate tank. The 80 meter RF deck I use has this arrangement and it appears to be factory original.

The model 2C antenna matching unit includes two antenna current meters mounted on a bakelite panel to minimize capacitance for better high frequency performance.

Restoration - Long ago, in my transmitter's early career, some modifications were done to connect to another 150-series rack containing additional RF decks for multi band operation. Along with the transmitter, I acquired one other RF deck that was set up for operation around 160 meters. There is a mysterious second pair of Pyrex glass insulators on top of the rack, possibly used as the feed point for a secondary antenna.

During the restoration process of this transmitter I first brought back the wiring to the original configuration. I also repainted the silver/gray power supply and modulator chassis modules and black transformers - but I did not remove anything from the chassis as the wiring insulation is quite brittle. This required some tedious masking.

I had to do very little component replacement to make this transmitter operate. Other than the electrolytic cans and paper capacitors, the only "bad" components were one of the inter-stage audio transformers and a wire-wound resistor in series with the main pilot lamp. This is quite a testimony to the quality of a transmitter built over 70 years ago!

The 7C audio section has four electrolytic capacitors that obviously needed to be replaced. In order to salvage the cans, I made a shallow cut around the base to allow the insulator at the base to pull out of the can. Then the original insides can be removed. I placed a pair of 22mfd 450v caps in series (with 1 meg-ohm equalizing resistors) to give a 900 volt rating, well above what is needed.

The next item on the list was the failed audio inter-stage transformer. First, I froze the case to harden the potting material. A swift tap on the end popped the core right out. Having no data on the exact transformer Collins used, I studied a few reference books on input and output impedances of the tubes on either side of this transformer and located a Stancor transformer that was "in the neighborhood" of the correct ratio. With the end caps removed, the replacement just barely fit inside the original compartment that held the original core.

With the new capacitors in place and the transformer installed the audio section was about ready for a test. After checking for ground faults I determined that the section was ready to go. I put together a dummy load to simulate the modulation transformer load and powered it up. Using a scope to look at the output I determined that the 7C audio unit was again meeting Collins specifications!

The oil-filled delay relays were something I certainly had no prior experience with. However, from my sports car days I remembered that automatic transmission fluid worked very well for damping variable-venturi carburetors! Would it work for a delay relay? After cleaning out the thick waxy residue from old oil, I gave it a try. Good old "Dexron" ATF gave me a 2 minute delay, which would be sufficient for the mercury in the 866 rectifiers to vaporize.

The main power supply uses all oil-filled capacitors, which in my experience rarely fail unless there has been oil leakage. A test for ground faults and leakage showed no issues, so I again set up some load resistors and powered up the supply on the bench. There were no problems at all with this module. I did opt to use 3B28 rectifiers instead of 866's to remove any hazards of mercury. No circuit changes were needed for this.

The last stage to test was the RF stage. All resistors and capacitors tested good. I used a grid-dip meter to determine the resonance of the coils I got with the two RF decks I had. One set fell in the 80 meter range. I fine tuned the turns to get the front panel capacitors to a similar mesh as Collins specified in some tuning charts I have for my Collins 4A, which uses the same capacitors and coil forms. This is not too critical, but for 3.5 Mhz I was looking for about a 2/3 mesh. The second stage coil has taps for the output point and neutralization of the driver stage. Getting this right took patience and some trial and error to find the point with the smallest value of oscillator feed thru (with the HV removed from the driver stage) and best power transfer to the final grid.

Power up time! - Testing was now complete on every module except for the modulator and antenna matching unit. I was fairly confident that I could at least produce a CW signal at this point. I only had to play around with the taps on the antenna tuner and output link to get the best power transfer. It turned out that I had some trouble getting the oscillator to restart after it had been tuned to peak. I experimented a lot with this, trying different coil values (using a test coil form to keep from damaging the original). I found a value that worked the best, but I still am not convinced I have this quite perfect. The oscillator needs to be tuned a little farther than I would like to the high "C" side of the peak to start reliably. I also believe it is impossible to find any reference or design data on an oscillator using two tubes! The only Collins oscillator design that would be harder to figure out would be the external-grid C100 tube used to get around the RCA patent! That came a few years later, with the 30FXC and the early version 30J transmitters.

I used a 4:1 toroidal balun to convert the open line feeder output to coax in order to use a coaxial wattmeter and dummy load for the initial tests. After seeing over 100 watts output I called on Gary, WA9MZU in California to have a listen. Conditions on 80 meters were not good that night but he did indeed hear my CW signal!

Later that night I tested the modulator and it worked perfectly. Apparently my inter-stage transformer was a close enough match - as I had plenty of audio drive!

Operation of the 150C - I like to display the 150C station with a National HRO Sr. receiver as a period and technical quality match. However I tend to operate it more with a Collins 51J-4 receiver. In order to shut off the crystal oscillator during receive periods I use a foot switch to cut off the B- from the tubes.

As with most transmitters of this time period there is high voltage across the key terminals (over 500 volts!) although the maximum current is about 35mA. I enjoy using McElroy "bugs" in most of my vintage stations and for safety concerns have built custom Plexiglas covers that protect against accidental contact with HV. With transmitters of this type, it is as essential in my opinion to do this as it is to ground the rack cabinet. I will thus deviate from being a purist and totally authentic on this point!

One of the biggest challenges has been to locate large crystals that fall in the frequency ranges used today. I finally found a Bliley that was big enough to fit the Collins ceramic holder and also cut to a useful frequency. I found the oscillator worked better using crystals in the 1750 KHz range, using the second overtone for 80 meter operation.

The transmitter keys cleanly and sounds very good on the air. If I locate additional coil forms I may set it up for 40 meter operation at some point, but I tend to believe it is best to run unshielded transmitters of this power level on the lower bands to minimize possible harmonic interference potential. It is probably one of the oldest Collins transmitters on the air!

de John, W7ZG

----- CCA -----

ARRL 100th—Just in

You could not have missed the fact that this year is the 100th anniversary of the ARRL. This past weekend the ARRL held its annual, and anniversary, convention in Harford, CT and it was a happening. There was a kick off reception on Thursday evening and then the main banquet on Friday. The floor show went Friday and Saturday.

Under the Collins Radio Heritage Group banner, and with the original 1964 Ford Collins Radio S-Line Promotional Van, the CCA and AWA were there as a large presence befitting the contributions of Collins to the Amateur Radio hobby and to the history of Communication in general. The CRHG booth included story boards on both of our current projects including the recent VOA Model 821A-1 save.

Due to the proximity of this show (the 17th through the 19th) to our printing deadline, the report here will be limited by many factors, but you can see better photos and read more about this event on our website under the Events link.



The S-Line Van was a notable player at this 100th show, as it had also been at the 50th ARRL anniversary in 1964. This beautiful S-Line Van was put together in part to go to that show in 1964.

What was really special was to have Dennis Day, now retired Collins Radio project lead on the development of the 75S-3 and 75S-3B/C – and then later the Engineering Group Head for all HF Amateur and Commercial Comm at Collins – sitting at our table and in the van greeting folks and sharing his perspective on the history of Collins and its technology.

Thank you Dennis, and thank you Jim Stitzinger, for giving us this wonderful memory once again. It was a great experience for all of us and for our many visitors. Read more and see more at http://www.collinsradio.org/ARRL_100



Did You Know?

We all know that Collins Radio launched into the broadcast business very early in the history of the company. In fact, right from the very beginning, broadcast was a key market. Even as Collins was being incorporated in the fall of 1933, Art and his few employees were building what amounted to a custom 20B broadcast transmitter to be shipped to the Antarctic and used by the Byrd expedition to make the first live broadcast from the polar cap. This 20B was quickly followed by the 20C developed for WTAD in Quincy Illinois and rushed to production model in 1935.

But . . . how many of you would guess that Collins Radio built their first television transmitter in 1937.

In 1936 and 1937, television was just a fledgling technology that centered on the concepts developed by Farnsworth. Band and broadcast standards were yet to be developed. But, Art saw an opportunity to show off the technological capability of his new company and place himself at the front of whatever line developed. Enter the 201FU (OK...No laughing about the model number – We all know Art was a little different when it came to assigning new model numbers). We think it stood for Farnsworth UHF.

By Late 1937, Collins Radio ran an ad in QST touting the technology and capability of his new 5 Meter television transmitter. It was in fact, a whisper of what was to come in future years. The transmitter had no LC components in the output. Sound familiar?

The 201FU used two water cooled PA final tubes that sat inside circular “tanks” that extended right on up and became part of the output transmission line and impedance matching networks. To quote the 1937 ad: “The water-cooled tubes in the output stage are mounted in water jackets which themselves form the output transmission line tank circuit. Parallel and concentric lines are used elsewhere as tank circuits, impedance transformers and as bypassing elements.”

Fast forward to 1964 and the development of the model 821A-1 which used a similar set of components then dubbed the “Pi-Line” by Warren Bruene. Coincidence, I do not think so.

----- CCA -----

Electric Radio Magazine

Serving the Dedicated Collector



Electric Radio magazine is published monthly for those who appreciate Vintage military & commercial radio and the associated history.

- ♦ Edited & Published by:
- ♦ Ray Osterwald, NØDMS
- ♦ Visit our website
- ♦ <http://www.ermag.com/>

Subscription Rates: Periodical: \$34.00 - US 1st Class: \$45.00 - Canada: \$54.00 (US) - All Other: \$70.00

COLLINS RADIO COMPANY

CEDAR RAPIDS IOWA, U. S. A.



THE 30FX TRANSMITTER

The 30FX Transmitter has the same CW performance as the 30FXB, since both models employ the 10K Radio Frequency Unit and the 405C Power Unit. It is, however, lower in cost, because of the omission of the high-level modulation equipment and it is furnished in a smaller frame for table mounting.

GENERAL SPECIFICATIONS

POWER OUTPUT: 100 watts CW nominal rating.

FREQUENCY RANGE: 1500-15,000 kc. (provision for operation on higher and lower frequencies available on special order at a slight additional charge). Coils for any one band furnished with the transmitter. New Isolantite coil forms are standard equipment.

FREQUENCY CONTROL: Direct crystal control with isolation of the crystal oscillator from the power amplifier by buffer stage.

RADIO FREQUENCY TUBES: 2 type 47 crystal oscillator, 2 46's parallel as buffers, 1-203A or 1-211 tube as power amplifier.

RECTIFIER TUBES: 2 type 866 high voltage rectifiers, 1-5Z3 low voltage rectifier, 1-45 keying rectifier.

KEYING: Grid block in the final amplifier. Provision is made for switching off the crystal oscillator to permit reception on the crystal frequency.

POWER SOURCE: 110 volts, 60 cycles, single phase is standard. Provision for other voltages on special order. Special converters and engine generators are available for use when no AC supply is obtainable.

INSTRUMENTS: Four flush type high-grade instruments are provided for reading oscillator and first amplifier plate current, second amplifier grid current, second amplifier plate current and antenna current. All tuning operations and adjustments to the transmitter can be checked by means of these instruments.

ANTENNA TUNING: A 2C pi Section Antenna Matching Network is furnished as standard equipment. This provision makes it possible to connect the 30FX to any available antenna and to accomplish efficient energy transfer with proper attenuation of harmonics. (Arthur A. Collins, "A More Efficient Antenna Coupling System," QST February, 1934).

DIMENSIONS: 26½" high, 19" wide, 11½" deep. A table mounting rack is furnished with the transmitter. The panels are of correct dimensions to fit a standard 60" relay rack and the units can be so mounted if it is desired to convert the 30FX Transmitter into a 30FXB.

Net Weight—110 lbs.

Shipping Weight—150 lbs.

RADIO FREQUENCY TUBE LINE-UP

The 30FX Transmitter uses the new 10K Radio Frequency Unit. The final amplifier uses either a 203A or a 211 in a straight neutralized amplifier with a split stator tank circuit. Low-loss tank coils, mounted on Isolantite forms, are used in all stages and the oscillator and buffer tank coils are provided with fixed taps which automatically match impedances and provide adequate excitation. The buffer can be operated as a doubler, especially for 14 mc. operation when a 7 mc. crystal is employed. The exacting design of this Unit has made it possible to realize very high efficiency in the final stage due to proper load relations and adequate grid excitation, especially on 14 mc.

FIXED NEUTRALIZATION

All neutralization in the 30FX Transmitter is fixed at the factory so that the user does not have to do any balancing of the various circuits. Shifting from one band to another is merely a matter of changing the plug-in coils and setting the dials to the calibrated position. The entire operation can be performed in a minute's time.

RADIOPHONE OPERATION

As explained above, the 30FX Transmitter has a radio telegraph output in excess of 100 watts, but provision is also made for modulating the Transmitter to obtain a carrier output of 40 watts with a modulation percentage of 100. The type of modulation employed is designated as "class B grid modulation" and it is applied in a very simple manner to this transmitter. The bias is fixed at a specified value and the modulation voltage is applied in series with the bias circuit. Modulation is accomplished by varying the bias voltage at an audio rate and the grid of the final amplifier draws current on modulation peaks. Distortion is prevented by utilizing audio and RF drivers with good regulation. The plate voltage to the final stage is 1250 volts. The rated plate dissipation of 100 watts is not exceeded, and the carrier output is 40 watts with a plate efficiency of 33-1/3%. Instructions furnished with the Transmitter describe a simple method of adjusting for distortionless modulation. Audio fidelity is limited only by that of the speech amplifier used. The COLLINS 7X amplifier is recommended.

TYPE 7X AMPLIFIER

The Type 7X Amplifier is a compact high-fidelity amplifier with a gain of approximately 70-75 db and a frequency response curve showing less than 2 db variation from 70 to 10,000 cycles. A type 57 tube is used in the first stage, followed by a type 56 and an output tube Type 2A3. The Type 7X Amplifier is complete with its own power supply and uses a type 80 rectifier. It is especially designed to supply the necessary audio power from a Type CD-104 crystal microphone to completely modulate the type 30FX Transmitter.

The Type 7X Amplifier is normally supplied mounted on a 7" x 10" chassis but on special order can be supplied in a crinkle finished housing.

CONSTRUCTIONAL DETAILS

The external dimensions of the 30FX Transmitter have been outlined under GENERAL SPECIFICATIONS. The 10K Unit employs a crinkle finish aluminum panel. The chassis sub-assembly is of burnished aluminum accurately formed and pierced. Wiring is either rigid conductor or laced cable. Coupling condensers are high-grade mica and the resistors are of the wire wound vitreous enamel type. Special Cardwell condensers are used for tuning. Inductances are wound on low-loss Isolantite forms.

The power supply chassis is heavily copper-plated steel finished with aluminum duco. Transformers are fully encased and every component is designed for continuous duty under full load. Connections are also provided for the key and standby switch.

GUARANTEE: In common with other COLLINS products, the 30FX Transmitter is unconditionally guaranteed to give complete satisfaction and every purchaser is given individual attention to see that his particular installation is performing at greatest efficiency.

— 30FX TRANSMITTER —
— 7X AMPLIFIER —

PRICES—ON APPLICATION

Printed in U. S. A.

No. D-125—5M-3-35

Preserving the History of the Collins Radio Company

