

The
Indiana
Historical
Radio Society

BULLETIN

Volume 44

July 2015

Number 2

RADIO Simplified

By Lieutenant Commander AM Stevens USNR

New York AMERICAN American



The BULLETIN

A publication of the Indiana Historical Radio Society
Forty-four years of documenting early radio.

The Indiana Historical Radio Society Bulletin

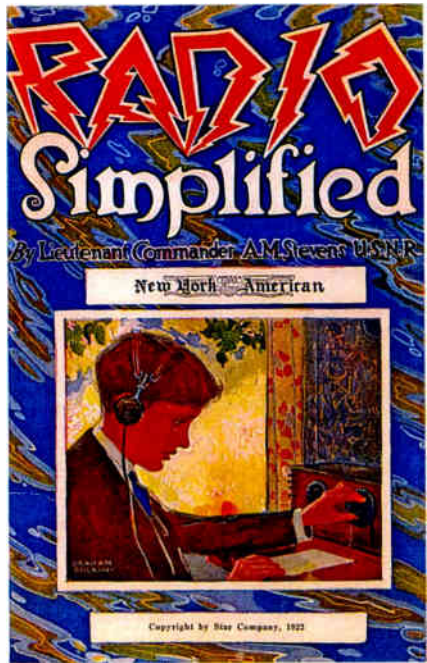
July 2015

On the cover: "Radio Simplified" is the cover of a radio "how to" booklet written by Lieutenant Commander A. M. Stevens USNR. Articles by Lieutenant Stevens are found in 1920's Radio Magazines. The cover artwork was submitted by Dr. Ed Taylor.

IHRS President Dave Mantor leads the articles in this issue telling us of his planned trip to pick up a BC-610 transmitter.

Jeremy Schotter follows with a description of his restoration of a Clinton table radio.

Ed Dupart shares his experience of salvaging parts from a "fresh from the barn" battery radio and creating a crystal radio.



The 2015 IHRS Spring Meet Old Equipment Contest results:

The DIY Crystal Radio category – Bill Morris placed first with his "Windclyffe" DIY Crystal radio entry. Ed Dupart's Apexed Recycled Crystal Radio was awarded 2nd place.

Michael Feldt won first in the Open category with his Norden-Hauck Super DX5 receiver. Bob Sands was awarded second place with his Baby Emerson One Tube radio.

In the "Barn Find" category, Michael Feldt placed first with his Leutz C-7. Tom Williams won second with a working Westinghouse mud dobber nested bird droppings table radio – playing "Moed Music".

The back cover of this issue pictures the contest radios.

Fred Prohl, IHRS Bulletin Editor

From Your President's Keyboard

Greetings to the IHRS Group from Dave Mantor.



Welcome and Reflections of Kokomo...

What a grand time we all were privileged to have at the Kokomo Shiner Club for our May spring meet. It was different to not have the Friday evening time together, but for this "one time," it was fine. I know there has been thoughts expressed about doing it either of the 2 ways for next year. Personally, I do like the Friday exposure to seeing what you have brought to the event; I enjoy meeting everyone in a very relaxed setting; I enjoy the time of pizza along with our tech session, of which both Fred Prohl

and Ed Dupart have been familiar fixtures; the camaraderie of radio people always makes for a good time; finally, to me, it's a notable part of our Kokomo experience.

Do you have a thought or question in regard to the workings of Kokomo? Please express them by either email or phone to any of your officers. We need your input; without it, we can't fine tune our IHRS activities to the membership's enjoyment and satisfaction.

I'd like to express from this point in my IHRS position as your club president, my appreciation for the other officers who have aided me and who have worked hard to do their specified jobs. They've done them well.



Herm and Shirley

Many of you probably know that Herm and Shirley Gross will be making the big move to Wisconsin soon, if they haven't already made it by the time you read this. They have been a joy to work with. And

President's Keyboard continued

work they did. If you have an opportunity to visit with them before they get to Badger-land, do so. Or send them a card. They've not only been a huge part of IHRS's administration, but we all know they are dear friends to us all. God Bless you, Herm and Shirley. Enjoy your "new" surroundings!! Herm and Shirley are original Badger-ites, so it's kind of like going back home, eh?

Newest Barebones Project...

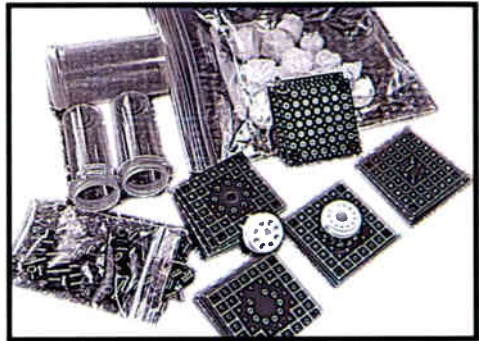
For 5 or 6 months, I've been collecting a double set of parts to accomplish what Steve waØmmz and I started out to do in the early '60s – communicate on equipment of our own manufacture.

When Mike w7dra offered to buy a number of plug-in boards that would accept a number of pin formations for various tubes and put them together as supply kits, VOILA!, my mind raced backward, and I could see latent projects waiting to suddenly fly together and onto a 40 or 80 meter ham band. Well, maybe not fly together... however, the dream remains alive, and we're moving forward on it.

The 4" x 4" project boards consist of 5 different tube set up strategies...7, 9 and 12 pin, plus octal and a blank board. The collection of parts also included the necessary tube sockets and stand offs for elevating the boards ½ inch. Tube

choice is entirely up to the builder; it depends only on what his / her imagination is and what the project will be used for. You'll note in the picture the pill bottles with the parts. They will serve as coil blanks; perhaps you've used the same type of bottles for coils also.

Working together, Steve and I will attempt twin designs using



Project Boards and Parts

email, texting, phone calls, smoke signals and maybe even video to access each other's thoughts and ideas as we assemble this "we're coming from behind 50 years" project.

Stay tuned as to what we end up with.

On The Road Again...

I have experienced some highly exciting times in ham radio. When I received my first license as knØhsd in April 1961, I had no idea what lay ahead. At a still tender age of 15, I really was quite naïve as to what the possibilities would be once I launched my interest to fol-

low radio.

I had already found old radio sets, some to be used, some to be disassembled, and my interest was growing in what I considered at the time to be a hobby with magical aspects. Radio would always be, in my mind at least, a thrill; how much more a thrill could it possibly be than to be able to use it to communicate with. When I would tune my parents' Zenith AM table radio with a 78 rpm record player on top playing Gene Autry's "Back in the Saddle Again" song or tuning the radio in to Arthur Godfrey's talk show, I was certainly fascinated.

I'm sorry to say that early on, many military radio sets passed me by without my even knowing what was passing me by. Not all of them, of course, did I miss out on but some. Old radio magazines were digested, and out of the pages of very early 1940s issues of QST and 73 magazines, I would be privy to pictures of Hallicrafters radios that had been designed from the casters up by top notch radio design people.

I remember getting a few sets from Jim Fred on several visits to his home. The military units were receivers and transmitters; where he had gotten them, I don't remember, that is if I even knew where they had come from.

One of these to come out of Hallicrafters was the HT-4 or its military designated brother, the BC-610



The BC-610i

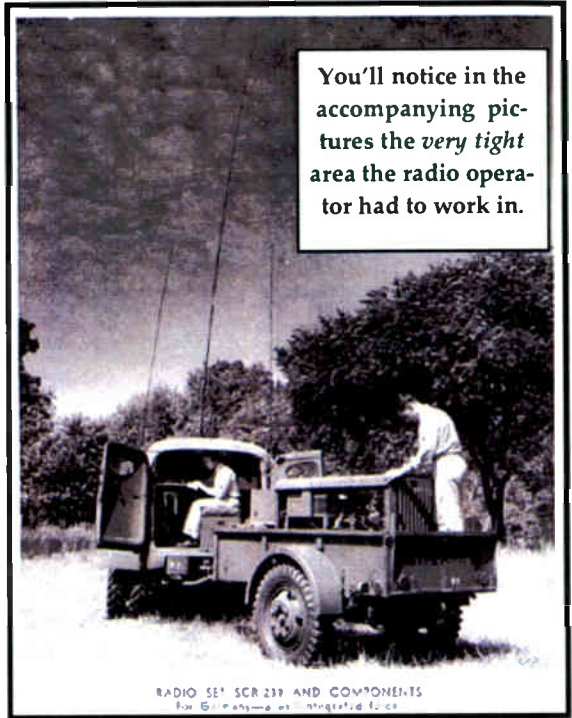
transmitter. The military required a high-powered radio transmitter that would be capable of voice communications that was tough, able to transmit over a range of a minimum of 100 miles and work from either a fixed location or in the back of a truck. There were several other manufacturers, but Hallicrafters was the main one. At a cost of \$700.00 (near the price of a car) for the civilian unit, it was a real work horse delivering 325 watts of voice and 425 watts for Morse code operation.

The BC-610, with letter designations of A through I, became an integral part of the military's SCR-299 mobile communications unit with production starting in 1942. The Signal Corps listed their required specifications, and the Hal-

President's Keyboard continued

licrafters engineers worked closely with the United States Army technicians. It was so successful that General Dwight D. Eisenhower credited the SCR-299 in the reorganization of US forces. The SCR-299's credits are impressive – it aided in the Invasion of Sicily and Italy and helped in the victory against the Nazis at Kasserine Pass. 25,000 transmitters were produced.

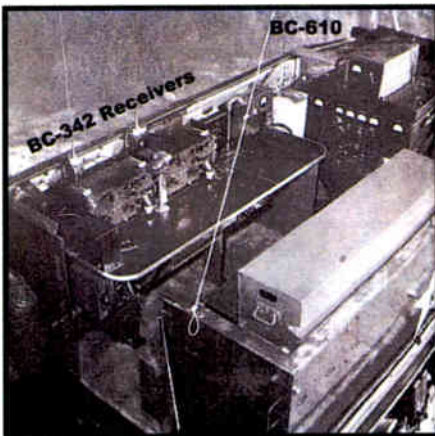
You'll notice in the accompanying pictures the *very tight* area that the radio operator had to work in. With the heat that's generated with the BC-610 and the other units, it's no mystery why many of the radio operators worked shirtless. Also, the picture of the '610i



on the previous page is not the one we're getting – I lifted the photo from the internet for illustration only.

A sad side note to the BC-610 transmitters. WW II ended so abruptly that radio communication gear and even vehicles, helicopters and planes were deep-sixed as they were being transported back home. That is a bit of history that really hurts.

Merrjoy and I are leaving the 3rd week of June to go to Manassas, Virginia to pick up this brute and its accompanying parts. Herman – it's heavier than my old table. So, since I know what you think of my





at a de-tuned level so as to not get the attention of the neighbors with interference. If any of you in IHRS have details, information, parts (?), pictures or even associated equipment for the '610i transmitter or know of anyone who has anything '610, please get in contact with me.

Its stable mate is a Hammarlund HQ-145x. The BC-610i will complete my vintage set-up and it'll be one that I hope will be fun to see and operate. I'll report to you updates – stay tuned.

old table, and this old transmitter weighs 400 pounds, I surmise it's out of the question that you'd want to help unload it, eh? HiHi

My plans are to keep the '610i as near its original configuration as possible but in operating condition. Because it's a transmitter capable of fairly high power, I'll be running it

Well, time to close. I wish each of you a very pleasant summer. See you at Cool Creek on Saturday, August 15; until then be safe and be a positive influence on someone.

Dave



SCR-299

Saturday, August 15 - the Indiana Historical Radio Society 2015 Summer Meet. Cool Creek Park, 2000 East 151st Street, Carmel, Indiana.

There is space for indoor and outdoor Swap N Sell setup. Tables are available indoors. General admission is free. A table for Swap N Sell is \$10 for IHRS members, \$15 for non-members.

Schedule of activity:

7:00am—set up for Swap N Sell

8:00 AM the IHRS Summer meet begins. Set up entries for the contest.

The "Popular Vote Contest categories are:

- 1. 1920—1929 Radio**
- 2. 1930—1942 Radio**

10:00 AM Vote for your favorite radio in each of the contest categories.

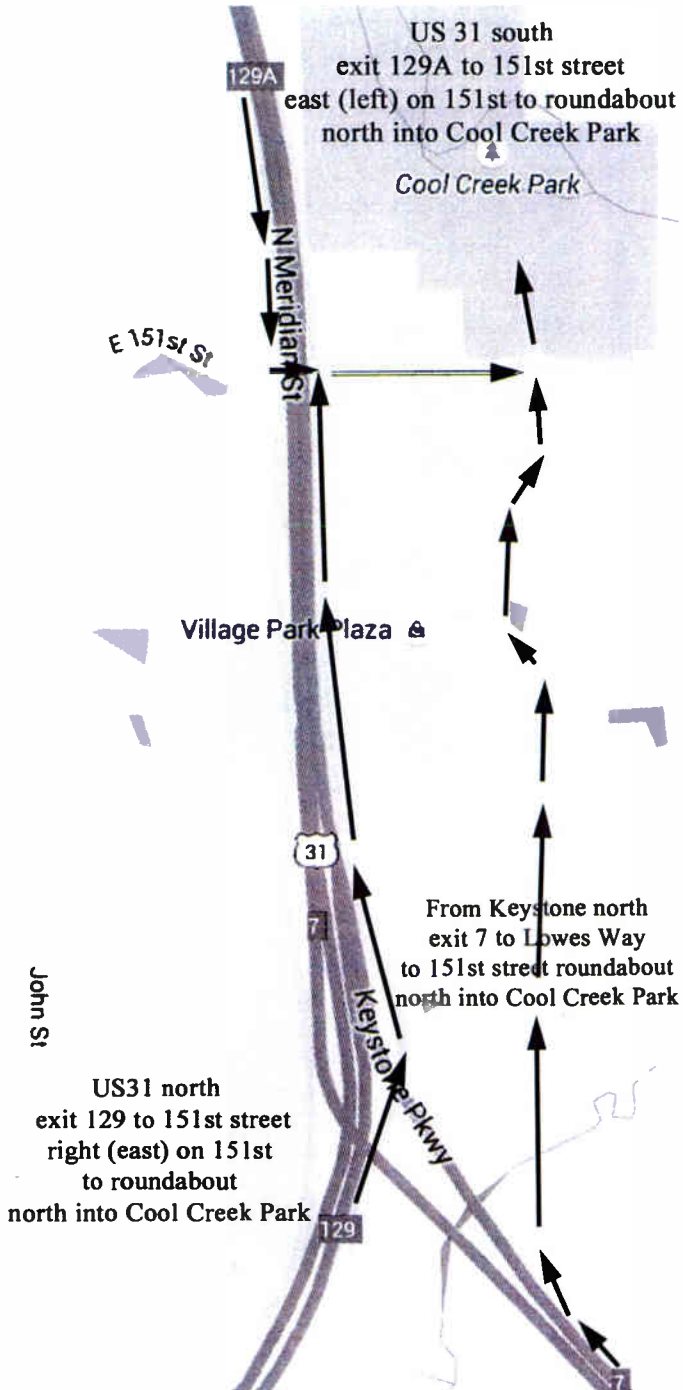
10:15 AM contest results and announcements.

Directions to the Cool Creek Nature Center:

Heading south on highway 31 you get off on the 129A exit which is the 151st Street exit. Stay on the left side of the exit and turn left at the first stoplight. Head east on the left side of the double lane street for about a quarter of a mile, until you come to a roundabout. Stay on the left side while turning north on the roundabout. The park's entrance is on the north side of the roundabout. Once in the park, head straight north until you have to curve to the left.

Heading north on Keystone Parkway, get off on the exit 7 ramp which is on the east side of the highway. Head north on what will be Lowes Way and later Grayhound Pass. After you pass the third stoplight, the road starts curving from due north to due west. On the outskirts of the curve is a stoplight intersection for Cool Creek Park Road. Turn right and head north on Cool Creek Park Road until you reach a roundabout. Stay on the inner lane of the roundabout as you pass around until you reach the north side. The park's entrance is on the north side of the roundabout. Once in the park, head straight north until you have to curve to the left.

Heading north on highway 31, get off on the 129 exit which will be on the right hand side of the highway. Stay on the road until you reach the 151st Street intersection. Turn right onto 151st Street and head east. Stay on the on the left side of the double lane street, for about a quarter of a mile, until you come to a roundabout. Stay on the left side while turning north on the roundabout. The park's entrance is on the north side of the roundabout. Once in the park head straight north until you have to curve to the left.



JOIN US FOR AN END OF SUMMER SWAP MEET SATURDAY, AUGUST 15, 2015

8:00 AM to 11 AM

At the Cool Creek Park Nature Center,
2000 East 151st Street, Carmel, Indiana

This year, the Indiana Historical Radio Society decided to have it's summer swap meet, not at a hotel or at a meeting lodge, but at a nature preserve and recreation park located between Carmel and Westfield. This park features a large nature center which features a large, carpeted, conference room and various displays of animal life in aquariums, terrariums, and a large bird observatory room. Should there be any rain, on the day of the meet, venders can back up their vehicles right up to the side service door and unload their wares directly into the building. The facility has plenty of tables and chairs for everyone. There will be free coffee, doughnuts, and pop for the early birds. Tables will be set up, inside the conference room, for two contest categories.



- 2015 Regional Vintage Radio -

Mid-South Antique Radio Club

MSARC Meet information contact: layvinrad@twc.com

Antique Radio Club of Illinois www.antique-radios.org

October 4—Swap Meet, Carol Stream

December 6—Indoor Swap Meet, Carol Stream

Michigan Antique Radio Club www.michiganantiqueradio.org

CARS—Cincinnati Antique Radio Society

Info. at oltubes@roadrunner.com or Bob Sands 513-858-1755

Dayton Antique Radio Club (SPARK)

Contacts Ed App 937-865-0982

Central Ohio Antique Radio Association—COARA

Info. at <http://coara.org> for event schedule.

AWA-Antique Wireless Association www.antiquewireless.org

AWA Annual Convention - August 11—August 15

Henrietta, New York

What (Literary) Digest Readers Dislike on Radio

December 16, 1933

A sample of results from a 1933 Literary Digest readers survey. In a review of the survey results the Digest noted "these ballots were received from Digest readers . . . not from the general public."

A random selection of Dislikes in the Radio Test:

Jazz dislike=10,867 like=513

Sob songs dislike=2,442 like=58

Torch singers dislike=892 like=8

Excessive, too long, cheap advertising dislike=7974 like=0

Trashy, coy, patronizing, wise-cracking announcers dislike=488 like=0

Comedians who are not funny, cheap humor, . . . dislike =5010 like=0

Political speeches and propaganda dislike=1002 like=838

Beauty talks dislike=22 like=2

Mystery stories dislike=488 like=336

Children's hours dislike=640 like=426

The Literary Digest, December 16, 1933, page 9

Plant "A" Radio Restoration by Jeremy Schotter



My radio as purchased in 2011

Introduction

These oval shaped radios show up on eBay a few times a year and are often branded Silver, Climax, or Clinton to name a few. The same dial has been used on some radios branded Sonora as well. They usually consist of an Art Deco styled cabinet that contains an attractive dial with meager 4 or 5 tube superheterodyne circuit. Some of the circuits use a resistance line cord while others rely on a ballast tube to drop the line voltage. Manufactured by the mysterious "Plant "A" in Chicago, Illinois, this particular model often commands a decent price in good original condition (\$200+).

I came into possession of my first Plant "A" radio on a chilly morning in September 2011. I was attending the annual Greater Louisville Ham Fest when I spotted this radio in the outdoor flea market. It

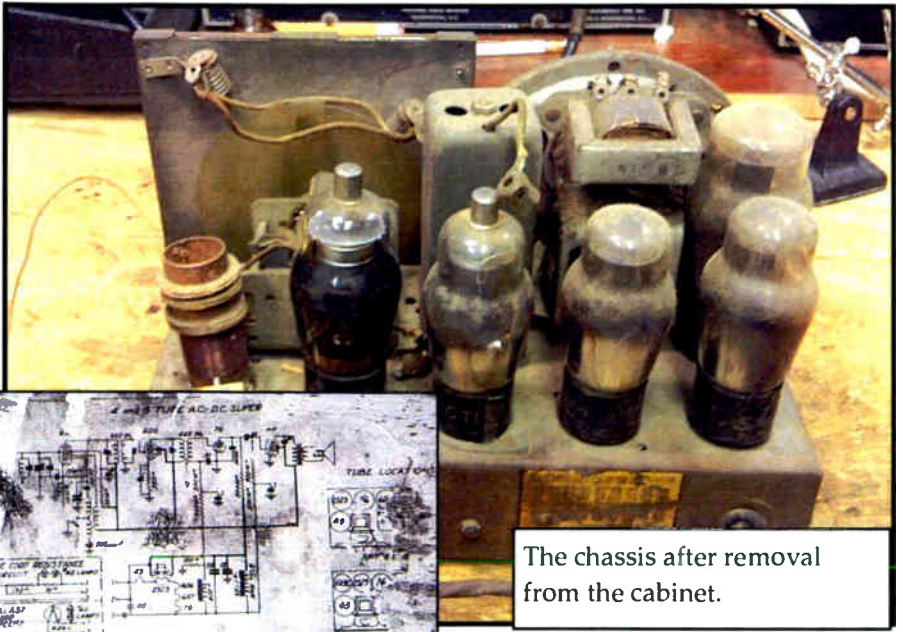
was sitting on the ground amongst a variety of other radios and test equipment that obviously had seen better days. \$20 later and it was mine!

Restoration

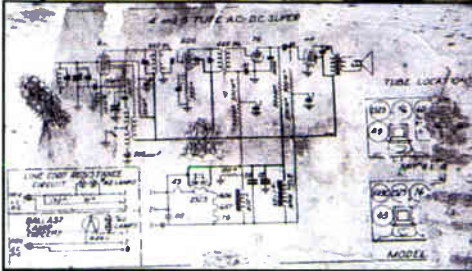
This radio sat in storage until early 2013 when I finally had time to work on it. From the outside there were several obvious flaws:

- The knobs were missing or incorrect.
- The cabinet had some wood joints that were separated
- The back was missing
- The original finish was not salvageable.

Once the chassis was removed it was apparent that this project would require a complete rebuild from scratch.- The chassis had been partially gutted and someone had begun rewiring it for a different circuit and had never finished. So the fun begins!



The chassis after removal from the cabinet.



The schematic for my Clinton radio.

Electronics

The first step to repairing a radio, let alone rebuilding one from scratch in this case, is to acquire a schematic of the original circuit. For most radios that I repair this simply requires me to locate the schematic in my collection of Riders Perpetual Troubleshooters manuals. Unfortunately, servicing documentation for radios from this manufacturer can be difficult to obtain. Typically a small schematic diagram was glued to the cabinet on most Plant "A" radios but the diagram on my radio was long gone.

Jon Stanley (<http://www.electronicxandmore.com/>) owns an identical radio which was branded Clinton with a model number of 612SP. Jon's radio still

had the schematic diagram glued to the cabinet and he gladly emailed me some photos of it so that I would have something to work with. After some editing in Photoshop, I had a useable schematic from the photos that Jon had generously provided to me.

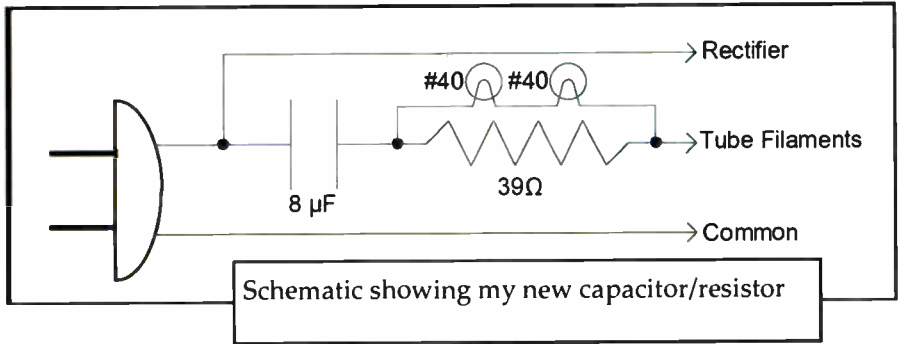


The chassis on my radio was covered with a layer of dust on top of a layer of black grime and would require some extensive cleaning. The speaker and output transformer were removed (taping a

piece of cardboard over the face of the speaker cone for protection) along with the IF transformer and the tuning capacitor. The dial and tuning assembly were very carefully removed and the glass dial was stored in a safe place for the duration of the rebuild.

The dismantled chassis was cleaned in small sections using GOOP hand cleaner (cream type **without** Pumice) and by using a small nylon bristled brush. A brass bristled brush was used for a few

an AC motor capacitor to replace the resistive line cord that was originally installed. The benefit to using a capacitor is that it consumes no energy, thus does not produce any heat, and acts as a resistor when passing AC voltage. The capacitor had to be non-polarized and properly rated for the line voltage. For this radio I would use a metalized polypropylene film motor run capacitor rated at 50/60Hz and 450 VAC. My radio originally used a line cord of



areas with stubborn corrosion. Care was taken to protect the two labels still present on the chassis. One label being the infamous orange colored Plant "A" sticker and the other being an advertisement that reads "Bills Auto Supplies, Toys, Radios, Electric Refrigerators".

When the chassis was clean and most components were removed, it was time to begin planning the electronic rebuild. I decided to use

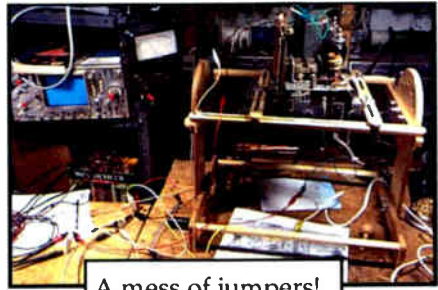
roughly 160 ohms, with a tap of 30 ohms for the pilot lamps (two #40 lamps wired in series, each lamp 6.3V @ 150mA). The reactance of the capacitor to be used would need to be calculated (reactance is AC resistance at a given frequency). Since the filament current draw is around 300 mA at 120VAC, the reactance of my capacitor would need to be roughly 400Ω (120V / 0.3A). The capacitor size in microfarads

$$|X_C = \frac{1}{2\pi f C}, \text{ Thus, } C = \frac{1}{2\pi f X_C} = \frac{1}{2\pi 60 \text{ Hz} (400\Omega)} = 0.00000663 \text{ F or } 6.63 \mu\text{F}$$

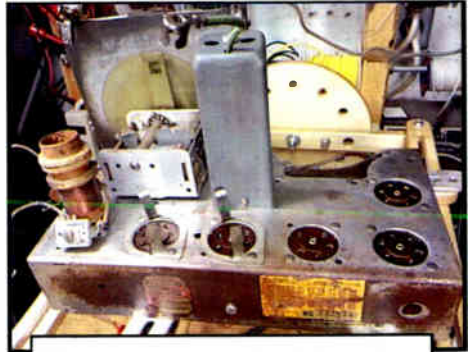
(μF) was calculated using the formula at the bottom of this page.

With a general idea of the capacitance that was needed rewiring of the radio could begin, starting with the tube filaments and pilot lamps. Wiring the tube filaments and pilot lamps first would allow me do some testing and verify that my capacitor and dropping resistor for the pilot lamps would work. With the use of a variac and many test leads with alligator clips, the AC capacitor and a high wattage (20W) resistor were wired in series with the tube filaments. Voltage was slowly brought up on the variac while simultaneously monitoring filament voltages across each tube. I experimented with several capacitors until I determined at an 8 μF capacitor would give me the exact voltages that I needed (within 10% of the values listed in the RCA tube manual, my goal was to be within 5%, or slightly less than the rated voltage). A 39 Ω resistor in series with the capacitor provided a roughly 12VAC drop across it, so the pilot lamps (in series with each other) were wired parallel to the dropping resistor.

With the power supply of the radio working the tedious rebuild process could continue. Every wire, capacitor, and resistor would have to be replaced. The PM type speaker and audio output transformer were remarkably still good,



A mess of jumpers!



The chassis going back together.

along with all of the tubes. The volume potentiometer was frozen, had a damaged shaft, and was of the wrong value so it was replaced (2M Ω was installed, schematic calls for 10k Ω). The tube shields that shield the 6A7 detector/oscillator and the 6D6 I.F. tube were missing and are essential for the correct operation of the receiver. Two 'Goat' brand tubes shields from my parts supply were cleaned up and worked perfectly for this application. A reproduction cloth covered power cord with an antique style round plug were installed.

The first power-up of the rebuilt radio chassis was promising yet disappointing at the same time. The

25Z5 Rectifier

Pin	Function	Expected	Actual
1	Heater	25VAC	24.5V
2	Plate 2	115VAC	114V
3	Cathode 2	115VDC	108VDC
4	Cathode 1	115VDC	108VDC
5	Plate 1	115VAC	114V
6	Heater	25VAC	24.5V

An example of my tube voltage table.

only sound from the radio was a low hum. The first step I usually take when powering-up or troubleshooting a radio is to obtain voltage measurements at each tube pin. Most manufacturers include expected voltages with their service information, but no such information exists for this radio. Using an RCA tube manual and referencing similar radio circuits from other manufacturers I was able to create a table in Microsoft Excel to record voltage measurements at each tube pin and compare them to my pre-determined expected values.

The first problem found was the output of the rectifier tube (25Z5) was very low. Testing the rectifier indicated a heater/cathode short. Once the rectifier was replaced the B+ voltage was closer to expected values, but the radio was still not functional.

Once voltages were all measured I did not immediately notice any problems. A signal was injected

into the grid of each tube, listening for a tone in the speaker until the problem was narrowed down to the non-functional section. In my case, the signal was not making it past the 6D6 tube in the I.F. section. The tube was retested and my wiring in this section was doubled checked.

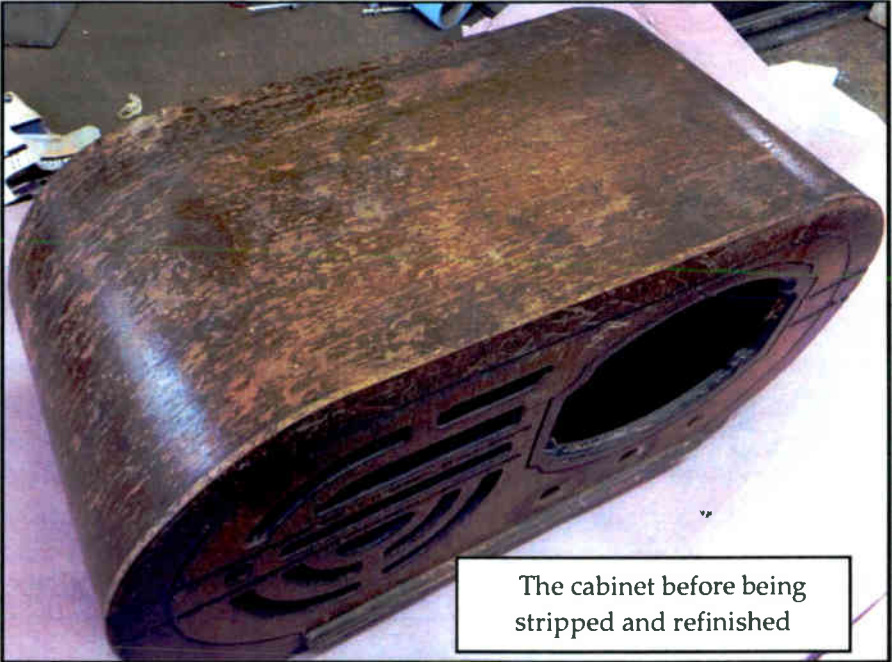
I was close to locating the problem but other life events began to take priority. All radio work came to a halt while I undertook the laboring task of dismantling, packing, and moving my radio shop of the past 14 years from my parent's basement to my new house 20 minutes away.

In early 2014 after a long break with time to rethink my troubleshooting results I finally had time to revisit this project. I consulted with my friend Darrell (WA4USO) who is an expert radio builder and repairman. Upon reviewing my voltage measurements he instantly took notice that the suppressor grid/cathode voltage on the 6D6

tube was too high. I was expecting 0VDC or less, but was measuring 31.4VDC. The grid and cathode are tied together at the socket, and connected to ground through a 330Ω and 0.1μF capacitor (wired in parallel). I began probing and poking in

Cabinet

I tend to avoid radios with cabinets that require a large amount of work, especially if they have extensive veneer damage or the original finish cannot be salvaged. On this radio, a rear support was missing



this area when the resistor lead at the ground connection broke loose. The lead had broken right at the solder joint and was not making contact, thus not lowering the grid/cathode voltage and causing the tube to shut down. Reconnecting the resistor and reheating the solder at the joint brought my radio to life. An alignment and a few more minor repairs had the radio working satisfactorily.

which compromised the structural integrity on one side of the cabinet. If any weight had been placed on the top of the cabinet, the veneer on the curved sides would have most certainly cracked. Despite the odds, the cabinet survived unscathed and would only require minor repairs and a new finish.

The first task was to fabricate a new support for the back of the cabinet. The support on the left side



The cabinet with a base coat of clear lacquer and the black lacquer

is simply a mirror of the missing support on the right side, so the left side was used as a template to fabricate a replacement. With the new support in place the base of the cabinet could be re-glued which greatly improved the structural stability. The next step was the removal of the old finish which was accomplished using Citristrip. After a light sanding and cleaning, the grain was filled using Behlen medium brown walnut grain filler. After the filler had dried the cabinet was once again sanded.

Black lacquer was used to tone the area inside of the grille, around the dial, and in the grooves on the face of the cabinet. Watco semi-gloss lacquer had favorable reviews online and among my antique radio friends so it would be used for the

base and final coats on this project. During the process of restoring this radio several identical models were listed on eBay. While I was interested in seeing what a rough market value was, I was even more interested in viewing some cabinets with a decent original finish. The other cabinets that I observed on eBay showed that a much darker toner was used around the perimeter on the face of the cabinet (between the groove and the outer edge of the cabinet) and in-between the groove and the recessed black lacquered area around the dial. Mo-hawk brand toner was used to duplicate the darker tones areas.

The cabinet was wet sanded in between coats and a tack cloth along with compressed air was used to remove dust and other de-

bris. The final coats of lacquer brought the finish to a semi-gloss sheen. The old grille cloth was laid on a flat piece of glass and carefully cleaned and rinsed with water. To help restore the color vibrancy of the cloth it was dyed gold and allowed to dry flat on the glass. Letting this dry flat on the glass allowed this fragile cloth to be reinstalled without having to be ironed. The last step was to replace the missing knobs which were purchased from Julie and Marty McCall (radiopup@bellsouth.net).

Project Completion

"When I acquired this radio I was just beginning my senior year of Purdue and was in the midst of a multi-year hiatus of any radio projects. It was a very influential, and

at times turbulent, period of my life that that included finishing school, beginning a career, moving, and purchasing my first home. Despite so many changes I still found myself drawn to one thing; the mystery and challenge of fixing old radios.

This radio served as a good project to "get my feet wet" and test out the new skills and knowledge that I had gained in the previous years' time. Only one task remains, which is to construct a replacement back cover. Otherwise I find this project completed." *Jeremy Schotter*

(Jeremy is a System Design Engineer at Siemens' Rail Automation)



The completed Clinton.

The “Apexed” Recycled Crystal Radio by Edward Dupart



A DIY Crystal Receiver

The IHRS had a contest in 2015 for a home made crystal radio and I thought about building a modern version and then I thought about building a replica of the 1920's and I decided on building a replica. I mentioned to Fred Prohl that I was looking for some old 3 dialers for capacitors and coils and he said he had some, so at the next business meeting he brought up four parts sets. I took them home and tore them apart. None of them had cabinets, but the Apex had a nice panel, decent capacitors, coils with pretty green wire, binding posts and wire. So I decided to make something out of the Apex.

I had some goals for this radio. It had to be relatively simple to use, so multiple switches with gobs of contacts were out. Two tuning dials were the maximum. It had to be symmetrical in design, the knobs the same distance from the sides as well as the binding posts and have a professional look. This could be accomplished with the Apex panel.

The Apex was very dirty and the mice had been in it, so there was a lot of corrosion, but fortunately the variable capacitors didn't have much corrosion and were easy to clean up. The coils were OK but were dirty on the top. The binding posts needed a good cleaning and

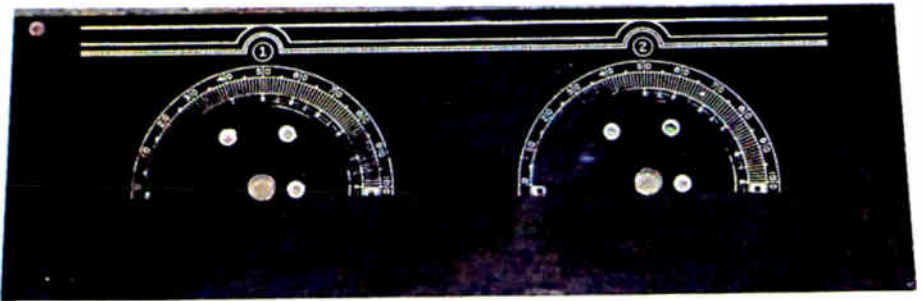


The Apex 3 dial panel

they came out looking good. 409 did a great job cleaning the panel. I reused the square wire and had to use steel wool on them to get the corrosion off. The plating did come off in places and went down to bare copper, but not enough to be a visual detraction. So now the parts I would be reusing are clean.

would not chip the Bakelite on the side of the panel that would be discarded. The higher setting worked best.

I decided to save some of the print on the panel and the labeling determined which end to cut off. The tuning knobs were labeled 1, 2, and 3, so it was pretty obvious that



The "New" 2 dial panel

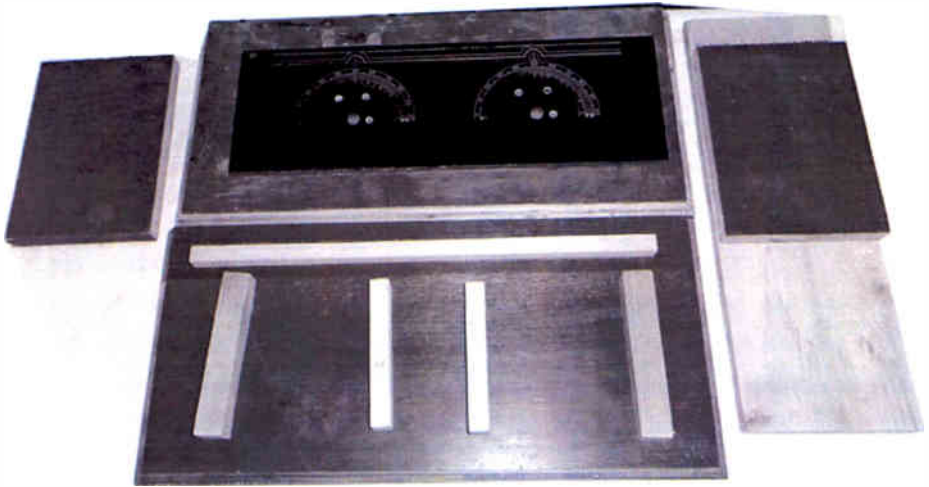
The next thing to do was cut the panel down to size and I used the table saw for this. Bakelite is prone to chipping when cutting it so I set the blade relatively high and I made my cut slowly. I made a couple of sample cuts at different heights to find the best setting that

I would cut off the side with the number 3 on it. In doing so, I made sure the distance was the same from each edge to the dial hole. After cutting the right side of the panel and part of the bottom off, it became necessary to remove some of the painted trim, which I did

The "Apex" Recycled Crystal Radio—continued

with fine steel wool. Now that the panel is down to the size I wanted and some of the unwanted painted trim has been removed, it was now time to take rubbing compound

and other small pieces came from other old radios. Now it was a matter of cutting all of them down to the right size and using the router for the top and bottom pieces. Most



The cabinet ready for assembly

and then white polishing compound to get the steel wool marks off the panel. The panel now looks great and is balanced and symmetrical.

Making the cabinet was next on the list. I reused the Apex bottom board and it had to be cut down to size. I had some wood I saved from another old radio that was about the right size for the sides. The top came from another old radio and was solid walnut and I had been saving it for the right project and being about the right size made it destined for this radio. The back

of the wood I used came from old floor model radios, so I can say my crystal radio was made from vintage wood.

Now for the staining and top-coats and before I did any staining or finishing, I determined where all the holes were going to be and used the drill press to drill the holes. Now it's ready for the staining and lacquer. The sides had a nice original finish, so I left the sides alone and the top had a nice original finish, so all I did was steel wool them and put a lacquer top coat on them. The rest of the pieces I stained with

directly to the second variable capacitor and would be equivalent to a very simple crystal radio and this would result in a real loss in selectivity, but an increase in volume. It only takes a few picofarads to couple the two resonant circuits together, so my capacitor consists of two parallel #14 gauge wires that go to the "hot" side of the variable capacitors and are adjustable. I can swing the one wire closer or farther apart from the other wire. This really controls the volume and se-

lectivity of the radio. Closer coupling equals greater volume, but less selectivity and vice versa. There is no interference between WLAC 1510 Nashville, Tennessee and WBET 1230 Sturgis, Michigan, which is my strong local station. I'm pleased with its performance and no switches to mess with.

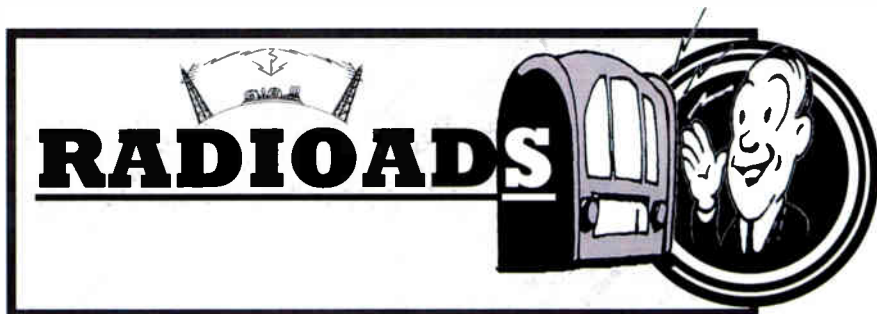
Unless I told you I built this, odds are you would think it was built around 1924-25. There will be a note inside the radio telling of its history. *Edward Dupart April 27, 2015*



The Completed "Recycled Apex" as a Crystal Receiver

Ed Dupart, busy at what enjoys—sharing his knowledge of radio. In addition to radio and traveling with family, Ed teaches in the Sturgis, Michigan schools.





Submit your "FREE TO CURRENT MEMBER" RadioAd by the 15th of February, May, August, or November in time for the Bulletin issue that follows.

Wanted: I'm looking for any information, history details, advertisements, parts, complete or partial units, photographs and/or manuals on the BC-610i military transmitter used by the United Forces in WWII. Please contact me at dmj.mantor@gmail.com or 765-618-8342 (before 7 p.m.). Many thanks, Dave Mantor

For Sale: WD-11 tubes with good filaments. Two rare brass-base, tipped with loose bases, easy restoration \$70; Two Cunningham \$57. Three Radiotron and one unmarked, all four \$96. Very nice. Price includes tracked, insured USPS priority mail. Nick Pendergrass, 5950 Grand Pavilion Way #410, Alexandria, VA 22303. (812) 720-0667. Paypal is ok at Email npendergrass@me.com. 03/15

For Sale: REPRODUCTION RADIO BATTERIES: I've developed replica battery solutions for most tube and transistor radios--batteries that have not been available for nearly thirty years. They look, they feel and they work--just like the originals! Plus, they are a reusable resource. Inside are holders for AA, C, D and 9-volt batteries. When the batteries wear out, simply remove them and install new ones. Contact Bill Morris at batterymaker@gmail.com or at 317-895-1334. 12/14

**Indiana Historical Radio Society
2015 Meeting Schedule**

Summer Meet, August 15 —Cool Creek Nature Center, Carmel

Fall Meet, October 10—Riley Park Shelter, Greenfield

Details at indianahistoricalradio.org



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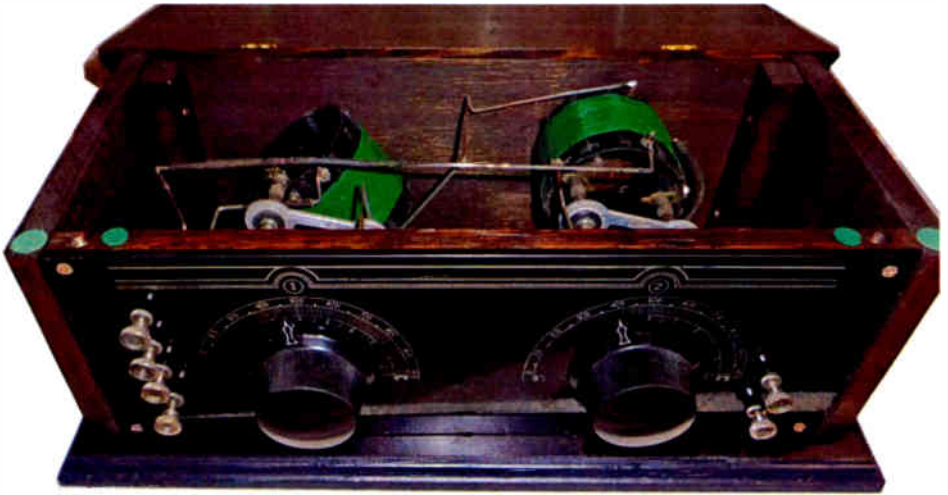
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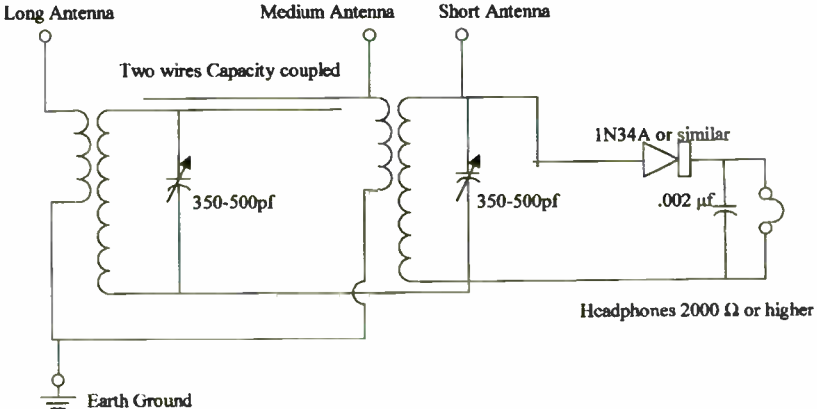
The BULLETIN
A publication of the Indiana Historical Radio Society
Forty-four years of documenting early radio.



The "DIY" Crystal Receiver uses a 1N34A as the Detector

The circuitry is fairly standard with two parallel resonant circuits, capacity coupled using the primary coil, that was the plate coil in the RF stage of the TRF radio, as the antenna – ground input. There are three antenna inputs. The long antenna goes to the first resonant cir-

cuit, giving maximum selectivity, but a possible decrease in volume, which I didn't experience with this radio. The medium length antenna can go to the second resonant circuit which effectively bypasses the first resonant with a loss of selectivity. Finally, the short antenna goes



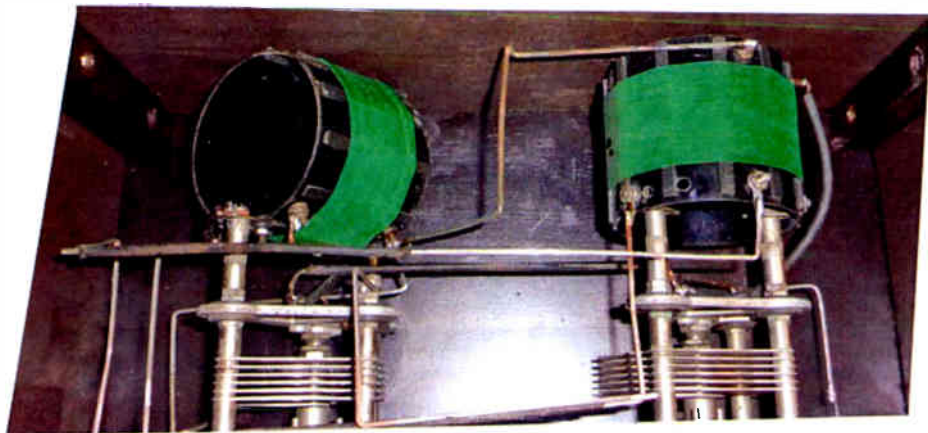
Apex Recycled Crystal Radio built by Edward Dupart April 25,2015
 Built from a junk 1924/25 Apex 3 dial TRF radio

a very dark stain and top coated them with lacquer. I decided to use new brass plated screws and hinges and they are the only new parts used in this radio. I couldn't believe it but this radio took 40 screws! But it is solid and looks great!

Putting the electrical part of the radio together was a bit of a challenge. Using square #14 gauge solid wire that was used and had to be straightened and re-bent was harder than I thought, but using it definitely gave it an authentic early

radio, but it certainly looks like a 1920's radio.

The only other modern part I had to use was the diode, a 1N34A equivalent and you are wondering why? I have two vintage cat whisker crystal detectors and they were sitting right by this computer I'm typing on right now, but a few months ago I decided to store them in a nice secure spot. The only problem is I can't find that nice secure spot, but when I do, I will put a vintage cat whisker detector on



The assembled circuit using the original square bus wire.

1920's look. I removed the green coils from the variable capacitors and flipped them over so when you looked inside the radio only the nice pretty green side was visible, so in essence, I hid the dirt that wouldn't come off the green wire. It probably took me about three hours to build the electrical part of the

the front panel. In the meantime, the front panel looks nice and clean and uncluttered without it.

How well does it perform? It outperforms my Heathkit CR-1, which I use as a standard to judge crystal sets by. It is louder and picked up one more station than the Heathkit.