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Canadian Vintage Radios

The Publication of the Canadian Vintage Radio Society Incorporating the CVRS Newsletter

# Spring 2023 Issue

THIS ISSUE 22 PAGES

## Notice of the CVRS 2023 AGM —CVRS Executive

The 2023 Annual General Meeting (AGM) of the Canadian Vintage Radio Society (CVRS) will be held online via Zoom on Sunday, May 7, 2023 at 11:00AM Pacific, 12:00PM Mountain and Central, 2:00PM Eastern 3:00PM Atlantic, 3:30PM Newfoundland. All CVRS Members in good standing are invited to attend the AGM and access details the Zoom call will be sent to Members by email.

The agenda for the AGM is included in this issue of Canadian Vintage Radios, along with a slate of confirmed nominees for the 2023/24 CVRS Board of Directors. CVRS Members may submit any additional nominations for the CVRS Board of Directors to President@canadianvintageradios.com by May 5, 2023.

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## A 'Brace' of Scott Allwave's... and Some Radio TLC - Part 4- Kevin Christopher and Gerry O'Hara

*Parts 1—3 of this article series dealt with the restoration of the cabinet of a Scott Allwave 12 Deluxe, authored by Kevin Christopher. The remainder of the series cover the restoration of a Scott Allwave 15 chassis by Gerry O'Hara—this receiver having no cabinet—but hey, who needs a cabinet when you have a pre-WWII Scott chassis?.....(!).*

I (Gerry) was contacted in late-Summer/Fall of 2021 by someone asking if I was willing to 'check out' two E.H. Scott radios he owned: a Scott 'Allwave 15' (AW15) chassis - photo, right, and a 'Scott Sixteen' (photo on Page 2). Subsequent email correspondence and phone calls enlightened me to the fact that the owner of these radios was actually E.H. Scott's nephew. He had bought the AW15 set back in the 1960's, but the Scott Sixteen's provenance is very interesting as illustrated by the following extracts from our email correspondence:

*"...the Scott Sixteen is in fine original condition. It was given by my Uncle, E.H.Scott, in October 1937 to a cousin [*of his*] who very kindly left it to me...* [I want] *the Scott Sixteen... be kept in its original condition and not used or serviced... I have the letter that Uncle Earnest* [the founder of Scott Radio Laboratories] *wrote to his cousin [*located in New Zealand] *on October 16th, 1937 when he arranged for "a small model radio receiver- the smallest set I have made for years" to be shipped*

Cont. on Page 2

**HEALTH and SAFETY:** The Canadian Vintage Radio Society (CVRS) draws the attention of all readers of 'Canadian Vintage Radios' to the Warning and Disclaimer statement on the rear cover page of this document—please read and heed the contents of that statement as health and safety is our priority—thank you.

# Editorial — Gerry O'Hara

As Spring brings new life and the long days of Summer to look forward to, if your thinking of buying a new Ford vehicle for those Summer road trips, then beware…

Buyers of new Ford vehicles in the future will not be able to listen to their favourite AM stations while on journeys—the radios fitted will not have an AM band! (see article here), quote "*Ford To Discontinue AM Radio In Most New And Updated Models*". What? – shock, horror, OMG, where is the world going?

The solution? – easy, take along one of your vintage AM radios and an inverter of course! – it would look good on the dashboard, be a 'head turner', and so much fun to boot...

Gerry

# Local Representatives


**Alberta Chapter** — Rick Williams

**Atlantic Network** — Kevin Christopher

**BC Lower Mainland Chapter —** Ken Patenaude

**Manitoba Network**—Grant Sesak

**Ontario Golden Horseshoe Network**—Dave Chamberlain

**Saskatchewan Network**– Doug Parker

**Vancouver Island (VI) Network**—Gerry O'Hara

Local groups or chapters of the CVRS can represent a small group, whether geographically-based or otherwise, and Networks can cover small or large geographic areas. Thus we can have the Alberta Chapter, Vancouver Island Network or even the Northern Electric Special Interest Group—as long as a member of the CVRS wishes to run it and wants it to be represented within the CVRS. Why not step-up folks – we want to hear from you!

Cont. from Page 1

*to New Zealand…*

*The Allwave 15 I bought years ago with no cabinet but I have all the components, including the speaker…* [the Allwave 15] *was in my study In Victoria…* [and] *I would like to use it again…"*

I informed the owner that I was confident the AW15 could be made to work again providing it was complete, unless it had suffered some catastrophic fault that caused a problem in one (or more) of the transformers, chokes or speaker field coil. And, even if that had happened, that they could be re-wound or suitable replacement parts sought if cost was not an issue.

The two radios were located some distance from my location in Victoria, BC, Canada, on another island offshore of Vancouver Island, and this, COVID19, plus many other commitments I had at the time, meant it was several months before the AW15 would be on my workbench. In the meantime, however, the speaker for the AW15 was with the owner's daughter who lives close to me. The speaker cone had been damaged (photo, left), and the owner arranged to have the speaker re-coned in Vancouver – a process that took five months. The upshot was that the speaker, with its cone repaired, and the AW15 chassis, arrived at my house around the same time, over six months after the first enquiry, ie. in May 2022.

### The Scott Allwave 15

The AW15 was produced for about fifteen months in 1934-35. It is regarded as an interim model between the Allwave 12 (AW12) and the Allwave 23 (AW23), with its circuit under constant development and revision during its production cycle. Some comments on this are presented below from personal correspondence with a noted Scott radio collector and historian Kent King, founder of the EH Scott Enthusiasts Website and author of an excellent article on E.H. Scott in the 1997 issue of the AWA Review, while trying to establish which version of the chassis I had on my workbench:

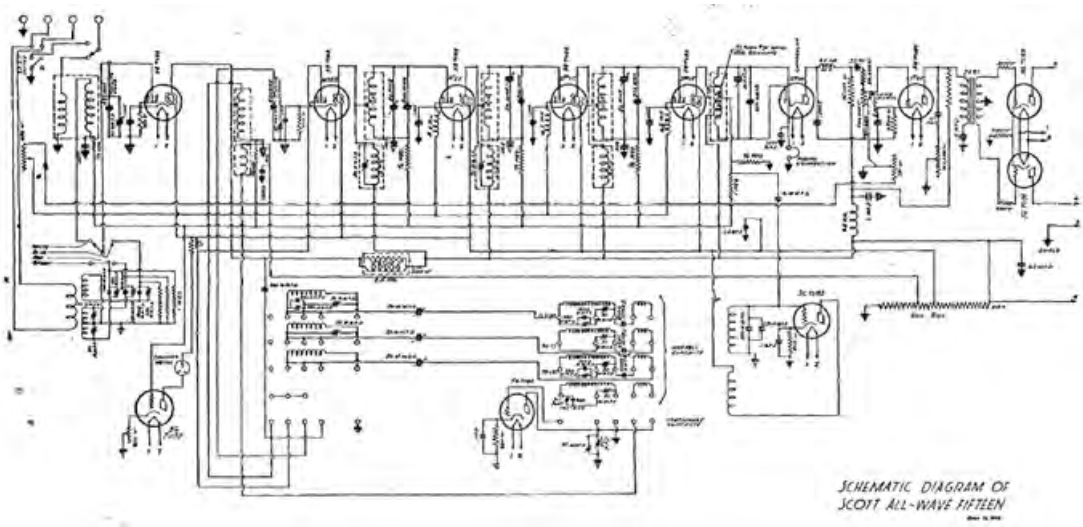
*"...The Riders diagrams* [dated] *11/19/34 and 1/12/35 are the only diagrams with the #55 tube diodes strapped together for half wave detection...* [these] *were the only two diagrams available until 3 older diagrams turned up in recent years and [these] are now added to the Scott Enthusiasts website. There are 3 other diagrams not in Riders, but available in the Allwave 15 set folder in Scott Archives* [on the Scott Enthusiasts website]. *For these 3 diagrams - the secondary of the last IF transformer is center-tapped for AVC and each secondary end is wired separately to the 2nd detector for push-pull detection:*

*- '4/10/34' dated diagram* [below] *uses the Wunderlich tube 2nd detector. The 2 grids are not strapped together, #58 mixer, 4 antenna posts;*

*- '5/7/34' dated diagram uses the Wunderlich tube 2nd detector. The 2 grids are not strapped together, #58 mixer, 4 antenna posts; and*

*- an undated [*diagram], *believed to be early-Fall 1934, using a #55 tube, 2 diodes... wired to the separate ends of the last IF secondary for push-pull detection, 2A7 mixer, 2 antenna posts.*

*In those 3 early diagrams, the last IF transformer secondary is center-tapped. However, that first non-Wunderlich diagram shows the #55 tube is wired for full wave detection from the 4th IF tapped secondary, not half wave* [like the chassis on my workbench]. *Your #55 tube wired for half wave detection, like the last two dated diagrams, is not consistent time wise with a chassis punched with 4 antenna posts.*


*Incidentally, although we* [now] *have 5 diagrams, comparison among several collectors produced 7 versions based on small control and feature variations* [and in] *the Miscellaneous set folder on the Scott Enthusiasts website* [there is a] *Wunderlich replacement circuit* [prepared by Scott]... *Some #55 tube conversions* [from the Wunderlich detector tube] *were done by the Scott Lab, or one of the several Scott service centers established by 1940. To further complicate matters, sets returned to the factory for service were sometimes updated a bit to later production design.*

*...Scott was a Custom Radio builder, and the AW-15 evolved considerable during its 15 months of production 1934-5... so, someone other than Scott Labs would have had a challenge trying to service an early production Scott model 15...*

*Scott was a small manufacturer, and likely [could] not afford to scrap perfectly good parts and chassis blanks...* [so] *it is possible Scott would use up stock of Wunderlich set parts and any remaining chassis blanks already punched for 4 antenna posts for the first of the sets using the #55 tube.*

[All this] *strongly suggests...* [the chassis on my workbench] *was built as one of the designs*

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# Local Chapters

## BC Lower Mainland Chapter – Ken Patenaude

The BC Lower Mainland (BCLM) Chapter held its Spring 2023 meeting on Sunday, March 19. Meetings are held at the Charles Rummel centre in Burnaby (3630 Lozells Ave.) and are coordinated by Ken Patenaude (Tel: 604-856-0253). Our next meeting will be on Sunday, June 4—this will include a fleamarket from Noon to 1pm. There is no admission fee, but a $5 table charge. Please contact Ken for information on joining the BCLM Chapter, to arrange for a Show-and-Tell, to submit suggestions for future meeting topics, or for any other details about BCLM activities.

## Alberta Chapter – Murray Dickerson

The Alberta Chapter of the CVRS met on March 19 to hear the presentation called '*Dealing with Grief in the I.F. Domain'*. Rick Williams started the discussion with a demo on using a signal generator and scope to find the peak resonant frequency of an IF transformer. Of course , this test can also be used to check for a good IF transformers in a radio. Greg Bilodeau then picked up the discussion about the makeup of different IF transformers from the older types with separate tunable trim capacitors to the fixed trim caps on the newer slug tuned IFs found in 5 tube AC/DC radios. The problem with the newer types is that they frequently used silver coated mica strips to approximate the 100pF caps used with each of the two coils (input and output) windings inside the transformer. The silver coating tends to migrate around the mica strip and then shorts out on the sides. He then showed a simple replacement with 100pF ceramic caps to replace the defective mica strips with "silver mica disease'. Murray Dickerson took the last segment by doing a full set of diagnostic conditions on a typical 5 tube Crosley radio for the IF strip. This presentation was video recorded to be placed on YouTube (notice to be supplied later). Murray suggested that he would write up the notes and pictures into an article for the next CVRS Newsletter.

The next presentation will be on April 16 and will include the second part of the 'Power On Box' that was first presented on February 26. That content of the presentation is included in an article in this issue of Canadian Vintage Radios (page 10).

# Regional Networks

## Atlantic Network — Kevin Christopher

Interest in vintage radios has increased considerably here in the East so far this spring. Prices at auctions are high and the local demand is increasing rapidly. This is especially heartening after

# Non-CVRS Organization News

News and events from other (non-CVRS) vintage radio groups and organizations.

**Prairie Vintage Radio Society —** Nothing reported from the boys on the Prairies for this issue.

**Puget Sound** — the CVRS always receives a copy of 'Horn of Plenty', the newsletter of the Puget Sound Antique Radio Association. This is a great publication with many interesting article in every issue.

**Ontario Vintage Radio Association** — for information visit their website, here

**Ottawa Vintage Radio Club**—we went 'virtual' starting early in the pandemic, with 'Zoom'-based meetings, and email-based online auctions. The zoom meetings have allowed remote club members to join-in. Now, we are experimenting with 'hybrid' meetings, where members can join either on-line or in-person. For information contact Gord Rabjohn, President, at gord.rabjohn@sympatico.ca or visit us online at http://www.ovrc.org/

**Quebec** — The SQCRA has 115 members mostly from Quebec but also in eastern Ontario, United-States and France. The SQCRA organizes local radio restoration contests, auctions, workshops and social events for its members and publishes the magazine "Radiophilie" 10 times a year. Visit their web site at www.sqcra.org.

**Victoria Radio Group**— Free to join! Meets monthly 12 times a year on 3rd Wed. at 6:00pm - Quality Foods. View Royal (opposite VGH) - meet outside the Exit door (a large covered area) where we will have a couple of display tables with radios and test equip. Please bring something for display or sale or giveaway. At 6:30 or a little later we will move inside to the upstairs meeting room. Ask at customer setvice if you cant find us Contact: Lee Allder atlelee@gmail.com for more information.

**SPARC Radio Museum, Coquitlam** — Vintage radio museum based in Coquitlam, BC. Check out the SPARC website and this presentation.

the past year or more of poor interest. I am getting enquiries almost daily from people needing the old family radio restored and from others wishing to buy one or more because they like the colour, or the wood of these old beauties.

The demand seems fairly even for all cabinet styles, especially the large consoles. Even Bakelite cabinets are in demand now after a long period of being out of favour. One could say the level of radio activity is high and increasing!

## Ontario Golden Horseshoe Network — Dave Chamberlain

Earlier this Spring I had been contacted by two families who wish for some assistance to liquidate a family member's radio/parts collections. One is the Lafleur family (contact Kimberley by email at Kim_Lafleur@outlook.com, or by cell at 905-903-9218), and the Peter Picken collection, containing some 500 or more radios, is still active as far as I know. Contact: staceypicken@hotmail.com or phone 1-705-392-9119 (evenings and weekends only). See photos of some of the collection on page 11.

Locally there has been no known activity within the Network. I was however made aware of an upcoming Central Ontario Amateur Radio Flea Market and HamFest on Sunday June 4th 2023. 9am - 12pm. Cambridge Ontario. General Admission is $8.00 plus Free PKG. For more information contact: info@hamfeston.ca

## Manitoba Network— Grant Sesak

Nothing to report from the Manitoba Network for this issue. If you are interested in learning more and/or becoming a member of the network, please contact Grant Sesak: gsesak@gmail.com.

## Saskatchewan Network - Doug Parker

Here are the updates from our group here in Saskatchewan: Les finished the Deforest Crosley that he started about a year ago and a Stromberg Carlson and completed pair of Philco "Hippo" radios and started on a Viking cabinet radio with phono and a RCA tabletop model. Ken hasn't been repairing any antique radios but he has been busy building a controller for his wind turbine. Gary kept himself busy working on a Musaphonic and a Philco Transitone 166 and a Zenith "owl eyes" and a Stromberg 561 and wishes to get started on a "Phantom" radio table.

And as for myself, I worked on a number of Bluetooth modules and the power supplies that would enable the tube radio's 6 volt filament supply provide the power and restored some of my old antique test equipment and got the chassis work done on a Marconi 217SW with the cabinet still needing attention and a 6 volt tractor battery powered Phonola 40V52P. Also repaired a solid state home theatre 4 channel amp. The antique radio repair for most of us here in Saskatchewan will be put on hold as we can now start our outdoor activities.

## Vancouver Island (VI) Network - Gerry O'Hara

Not a lot happening with the VI Regional Network—its probably about time we arranged a Zoom call before we become distracted with vacations and 'summer pursuits'...

Several CVRS members attended the Victoria Radio Group meetings held at the new venue of 'Quality Foods', View Royal (opposite Victoria General Hospital) on February 15 and March 15—with all the usual 'radio chatter', fleamarket/swaps and 'give-aways', with the bonus of a warm meeting room for a presentation, chat and a coffee afterwards. The next meeting is on April 19. If you are a CVRS member residing on the Island who is not yet a member and would like to join, please contact: Gerry O'Hara at vinetwork@canadianvintageradio.com.

Cont. from Page 3 *using the Wunderlich tube, and later modified* [so] *you have a transitional example using a #55 tube* [as the detector], *but using* [a] *left-over chassis punched for a Wunderlich version - hence the empty toggle switch hole by the set cable and the unused holes previously used for the two red antenna posts. … your chassis does have a* [detector tube] *socket with no tube number, so perhaps Scott had not yet a supply of sockets embossed with '55'.*

*Conclusion, you may need to refer to a combination of diagrams working on your receiver. For now, I would recap 'as is' and not attempt to restore back to original condition."*

This was all quite fascinating, and so reflective of the speed of radio technology advancement during the early-mid 1930's. Given all the above, I agreed that it would be best to refurbish the chassis 'as is', ie. as a hybrid or transition design - rather than trying to make any changes such that it 'fit' any one particular schematic. Close examination of the chassis did confirm that the wiring around the #55 detector tube matched the Wunderlich replacement circuit issued by Scott, so the chassis on my workbench likely did represents a transition design produced shortly after discontinuing use of the Wunderlich tube, that used a chassis blank punched prior to that change, and that also included some elements of the mid-production run circuit changes, such as the last IF stage cathode bias circuit omitting the RF choke (though the choke is still present on the chassis), and that may have had some factory and/or dealer re-work after production. Detailed discussion of the above as it relates to the chassis being worked on here is presented later in this article.

Interestingly, two videos of the AW15 chassis manufacturing process, filmed by E.H. Scott himself, can be viewed here and here.

As with other Scott models and in common with other 'custom set' manufacturers of the period, such as McMurdo Silver, the purchaser could opt for a variety of cabinet styles, however, this particular chassis did not come with a cabinet.

**Allwave 15 Circuit and Features**

The AW15 covers the Broadcast band and three shortwave bands, thus:

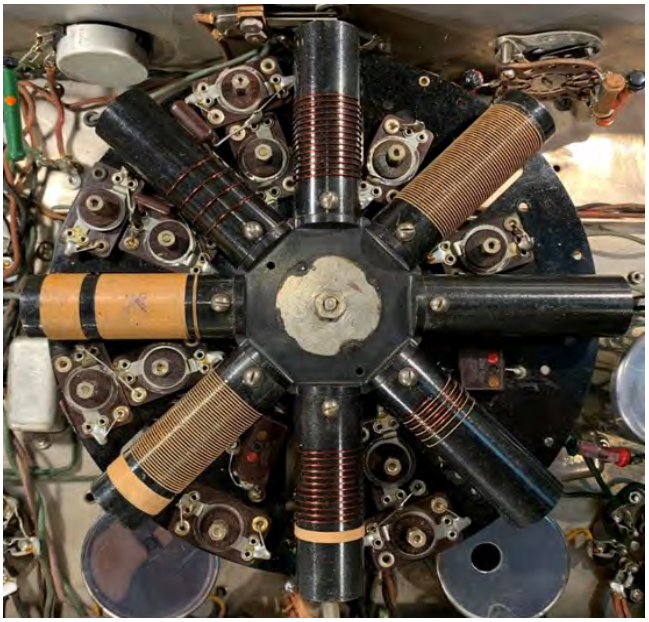
Broadcast Band ('White Band'—photo, right): 540KHz - 1500KHz

SW-1 Band ('Blue Band'): 1.5MHz - 4MHz

SW-2 Band ('Red Band'): 4MHz - 10MHz

SW-3 Band ('Green Band'): 10MHz - 23MHz

Its circuit topology is a fairly standard superheterodyne, comprising a single RF preselector (amplifier) stage (#58), mixer (2A7, or #58 in early versions), local oscillator (#56), three stages of IF amplification at 465KHz (3 x #58), detector (#55, or 'Wunderlich' detector tube in early versions ), 1st AF amplifier stage (#56), push-pull AF driver stage (2 x #56), push-pull AF output stage (2 x 2A3) and rectifier (5Z3), with the addition of a BFO (#56) and tuning meter amplifier (#56). The focus of the design is more on performance, quality and reliability rather than gimmicks or leading-edge innovation, though arguably, the use of a full-wave rectifier detector circuit in some of the circuit configurations was innovative.



Perhaps the most striking feature of the circuit implementation is the use of a turret to change the RF coils (photo, left). The mixer and local oscillator coils and their associated trimmer capacitors are mounted on a carousel with contacts that connect with two sets of multiple fixed contacts and a single fixed contact mounted on the underside of the chassis. Such an arrangement greatly sim- Cont. on Page 14

Cont. from Page 1

The 2023 AGM agenda, including the slate of Director nominees, is presented below:

## AGENDA: 2023 Annual General Meeting (AGM)

1. Call to Order (Gerry O'Hara)
2. Determination of a Quorum Present (Gerry O'Hara)
3. Welcome (Gerry O'Hara)
4. Acceptance of Agenda (Gerry O'Hara)
5. Approval of Minutes of the Previous AGM (Gerry O'Hara)
6. Business Arising from Minutes of the Previous AGM (Gerry O'Hara)
7. President's Report for Previous Year (Gerry O'Hara)
8. Treasurer's Report (Bruce Winter)
    a. Approval of 2022 Financial Statements
    b. Confirmation of Preparer of 2023 Financial Statements
9. Special Resolution (Bruce Winter): In order to streamline the CVRS AGM process and provide enhanced continuity of leadership within the CVRS, a SPECIAL RESOLUTION for amendment of the CVRS Bylaw 4.2 is tabled to extend the Directors Term of Office from one year to two years as follows:

    *"The TERM OF APPOINTMENT of DIRECTORS OF THE CVRS shall be TWO YEARS from the date of their appointment. Election of said Directors will occur every two years at the AGM unless replacement or additional Directors are deemed to be required from time to time by the CVRS Executive, for example, due to resignation of a Director."*

    If the SPECIAL RESOLUTION is passed, the CVRS bylaws will be amended accordingly and submitted to the BC registry of Societies
10. Election of 2023 Board of Directors (Doug Parker): Since the last AGM, Nori Irwin has resigned her Directorship, and Gerry Shand has advised the CVRS Executive that he will not be standing for re-election as a Director. The current slate of candidates comprises Les Dickson, Gerry O'Hara, Doug Parker, and Bruce Winter (all incumbents). Call for additional nominations, and voting.
11. Report on Local Chapters/Regional Networks:
    a. Vancouver Island Regional Network (Gerry O'Hara)
    b. BC Lower Mainland Chapter (Ken Patenaude)
    c. Alberta Chapter (Rick Williams)
    d. Saskatchewan Regional Network (Doug Parker)
    e. Manitoba Regional Network (Grant Sesak)
    f. Ontario Golden Horseshoe Regional Network (Dave Chamberlain)
    g. Atlantic Regional Network (Kevin Christopher)
11. Report on National Membership (Les Dickson)
12. Other Business (Gerry O'Hara)
13. Next Meeting
14. Adjournment

# My Worst 'Oops' of 2022! - Alain Dufour

Following a request regarding our "Ooops's" here is a short one from me… [*Send me more please! - Ed.]*


I had just bought a bunch of 'not working' transistor radios for a few bucks.

Among them there was a nice Sony TR-84. I cleaned the battery contacts, changed some capacitors and there it was, singing again!

So I started cleaning the plastic cabinet, which was quite dirty from years of use with dirty fingers and all that (photo, above right). Of course I used gentle dish soap and a soft brush to clean it well.

Then, to make sure it would dry out completely before reassembling it, I put the case on an electric baseboard [heater].

It was a cold January day and I was glad I could simply use an electric baseboard as a dryer. In the meantime, I started to fix the other radios.


But I completely forgot about the plastic case that was drying out on the electric baseboard...

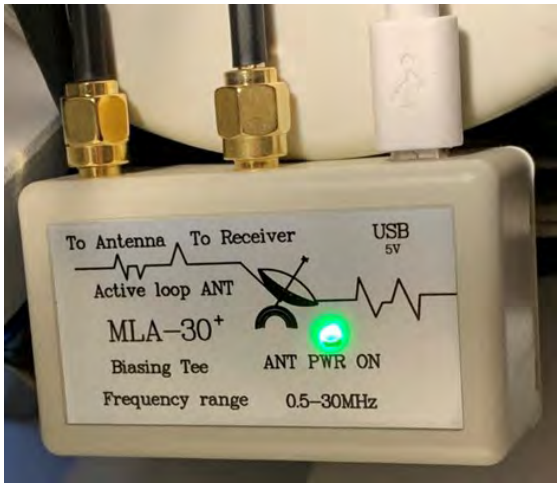
When I picked it up, it was melting away, like that clock painted by Salvador Dali (below). So now I have a 'Transistor Dali!' - photo, left.

# Active 'MagLoop' Antenna - Maxwell Hertz


My house location, my house, and, in particular, my workshop, is full of radio frequency noise. The noise is generated by many sources, from the cable box amplifiers, power pole transformers and 'smart' electricity meter outside, to computers, power supplies, LED lights, dimmers, monitors and TV's inside – far from ideal for a checking out receiver performance!. I have tried many antennas, including a 'long wire', vertical, 'MiniWhip passive tuned loops on the Broadcast band, and a passive 'Magloop' on the 20M ham band. The best performing of these were the loops, however, they were limited to a specific bands.

While checking other options for receive-only loops, I found an active (amplified) loop antenna claimed to cover 100KHz through 30MHz (even though its marked as covering 500KHz to 30MHz!). I had read several good reports about this unit working where others failed, especially in high-noise environments. After trying several other antennas out previously, with little success, I thought this may work, as tuned (passive) loop antennas, eg. a 20M band 'magloop' and a tuned loop on the Broadcast band, had effected an improvement over a simple 'long wire'.

The unit I bought was an 'MLA-30+' – available on Amazon and eBay, and comprises a stainless steel loop, a waterproof amplifier box to which the loop connects directly, the output of which feeds around 10m of thin coax to a 'bias-T' box (photo, below), that provides power to the amplifier box and splits out the amplified signal to be sent to the receiver. A bit overpriced for what it is, but if it works, I thought, 'bite the bullet' and give it a try for Christmas!




Well, so far, I have been pleasantly surprised – I tried it out on my Eddystone 940 and Radio Shack DX-394 receivers, and it definitely improved reception on the Broadcast band on both, with several weaker stations that are normally battling against the cacophony of interference in my workshop clearly audible and at improved strength, especially when the loop is oriented for optimal reception (like all loops, it is directional). It also works reasonably well on the shortwaves, with WWV and several broadcast stations being received well.

A semi-qualitative review of the earlier 'MLA_30' version of this unit can be viewed here, where it is compared to 'Wellbrook' magnetic loop and a 'groundloop' antennas. The conclusion was that the MLA-30 performed well on the Broadcast band, where it appeared to be optimized, but less so on the HF bands due to a higher noise floor. Short reviews of the newer '+' version posted on sites such as amazon purport much better performance over the earlier version, however, these are unqualified by any results, however, a couple of comparative reviews of the '+' unit operating on the shortwave bands on eHam.net and the New Zealand DX League are favourable.

Did You Know?

Heinrich Hertz's research proved the existence of electromagnetic waves, including radio waves, but he believed that his harnessing of "wireless waves" had no practical application and said: "It's of no use whatsoever… this is just an experiment that proves Maestro Maxwell was right—we just have these mysterious electromagnetic waves that we cannot see with the naked eye. But they are there."

# The Power Up Box – Murray Dickerson


If you are a 'Newbie' (new to the art of vintage radio restoration), you will want to make use of the following information and construction ideas. Even if you are more practiced, you may want to consider some of the ideas in the following article. Perhaps you already make use of your own version of a 'Power Up Box', but this article will explain how you can get more use and benefit from it than what you are currently using.

So what is a 'Power Up Box'? – It is a very useful piece of equipment for the initial application of AC power to any radio you are wanting to work on. It will allow you to slowly apply power to an old radio or piece of electronic equipment to determine if serious problems exist in its circuits, before applying full power and then watching serious damage occur before you can stop a catastrophe from taking place (i.e. parts going up in smoke, fuses blowing, and other serious meltdowns). Also, the 'Power up Box' (Box) may allow you to work safely by reducing the risk of electrical shock. Lastly, some simple add-ons to the Box will extend its usefulness in ways that will make you believe that you just cannot work effectively without it.

The photos, right, show the outside and inside views of a [typical] Box. This one is currently in use with the CVRS (Alberta Chapter) workshop in Edmonton. At first glance, it looks a little strange because of the incandescent light bulb on top, but it also has a Variac (voltage variable auto transformer), an isolation transformer, an AC meter and a few other components that will be explained later. You can make your own version of a unit like this by employing all or just some of the circuits it has, depending on what you decide to use.

Before we get into the details and especially if you are a Newbie, I want you to make sure that you know the following basics of AC (Alternating Current), since you will be using it in almost all of your radio restoration work. Take a look at the figure on page 12, called 'AC Power Facts'. The drawing on the top left of this figure shows a typical DC (Direct Current) graph of current flow of a given voltage over time, such as you would experience from a battery or electronic power supply. When turned on, the voltage rises almost instantly from 0 Volts to 70.7 Volts and stays like that, supplying current (Amps) along the time axis 't' untill it is turned off. I chose the value of 70.7 Volts on purpose to illustrate its relationship to an AC source depicted in the next drawing on its right. Power, measured in Watts, provided by such a source is simply Volts x Amps.

Now, compare that with the equivalent power supplied by an AC source which is given as 70.7 Volts RMS (Root Mean Square). RMS values are used since they directly relate to the equivalent power of a DC source. Notice however, that the peak voltage of the AC waveform reaches a high positive value of 100 Volts and a low (or reverse) value of 100 Volts, when the current reverses and flows in the opposite direction. Most of the meters you will learn to use with electrical work are calibrated in RMS AC Volts, **because that value is equivalent to a DC source in terms of the useful power it provides.** This is very im-

Cont. on Page 12

# Joining the CVRS

**Member Benefits:** These are many, but here are some of the obvious ones:

**Networking:** Opportunity to network with like-minded folks—radio restorers, collectors, repairers, historians etc.—by joining local chapters, attending member-organized swap-meets and local meetings to chin-wag about radio-related topics.
**Schematic Service:** The CVRS offers a free copy service for Radio College of Canada (RCC) schematics to members currently in good standing. A pdf file of an RCC schematic can be obtained by emailing schematics@canadianvintageradio.com with the manufacturer and model number of a radio made in Canada between 1927 and 1980. If possible, please provide an estimated year of manufacture or the latest year of patent registration (usually given on the model tag). Members wishing a printed copy of a schematic should send a SASE (self-addressed, stamped envelope, Canadian postage) to the CVRS Membership address given below. If you wish to make sure that an RCC schematic for your radio exists before sending a SASE, send an email to the above email address.
**Website:** The CVRS website provides updated meeting information, membership and contact information, as well as access to radio-related information and links of interest to Members.
**Forum:** An active forum is available to members and non-members, however, enhanced functionality is being considered for members.
**Newsletters:** For prior calendar years, electronic copies of 'Canadian Vintage Radios' (the Newsletter) can be accessed (where available) and downloaded by current members in good standing. Passwords to access this section will be sent annually to those members taking out membership in the current year.

**Payment of Dues:** Members will receive five 'pdf' copies of 'Canadian Vintage Radios' per year of their paid-up subscription. Members will be notified when the latest copy of the Newsletter is available for download from the CVRS website.

**Paying by Cheque or Money Order:** If you pay by cheque or money order, the annual dues are $20. **Subscriptions for printed copies of the Newsletter are no longer available.** Please send a cheque or money order for the appropriate amount ($20) to: **CVRS Membership, 4757 London Green, Delta, BC, V4K 4X1, Canada.** If you are a new member, please include the following information for our member database: name, address, phone number(s), email address, occupation, any special areas of interest in vintage radio or related topics.

**Paying Online**: Two options exist for you to submit dues electronically:

**PayPal**
1. You may submit your dues by using the SEND MONEY tab. Select the "Personal" and "Other" transfer options since you are not purchasing a commodity or service. Enter the CVRS membership email address (membership@canadianvintageradio.com) as the address for PayPal to send the transfer notification.
2. If you are a new member, fill out and email the information requested above.

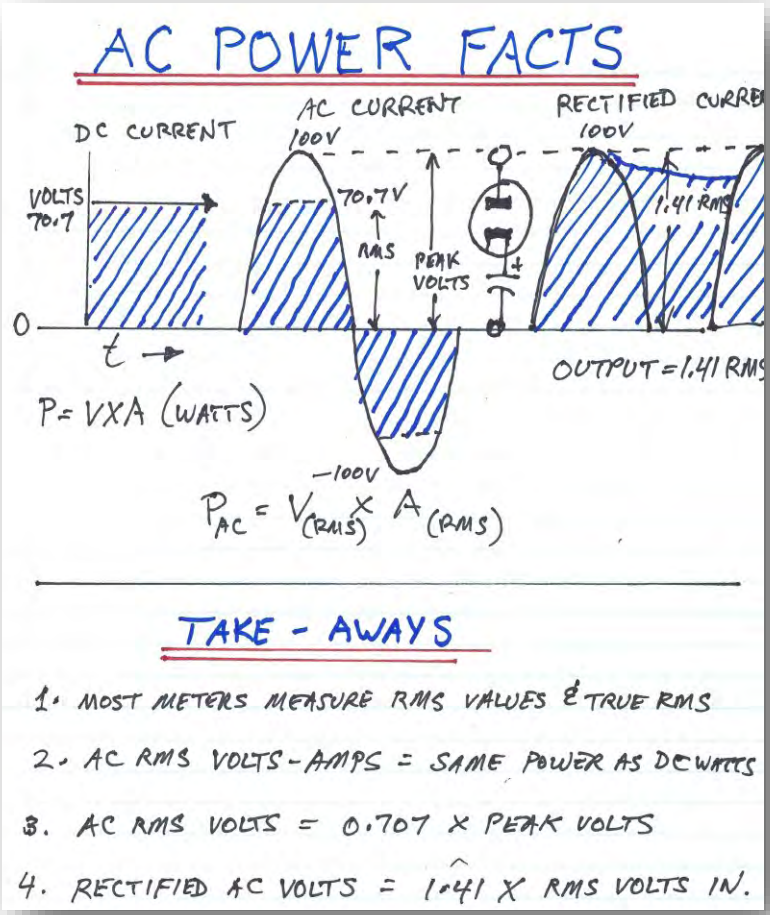
**Interac Email Transfer:**
1. Log on to your online bank account, go to pay bills and transfer funds, select Interac Email transfer, enter the amount and email to membership@canadianvintageradio.com.
2. When you enter the amount and email address, it will ask you to suggest a question and answer. Just make a question up and submit it and the answer,
3. After you have completed the transaction, email the question and answer by separate email to membership@canadianvintageradio.com. If you are a new member include the member information requested above.

# For Sale/Free/Wanted

**Free to a good home!:** An Electrohome 'Provincial' radio/gramophone unit in good condition (photo, below, left, free to person that collects—Vancouver area). Contact Janice on 604-537-8179

**For Sale:** Picken collection, ON. Contact staceypicken@hotmail.com or phone 1-705-392-9119 evenings and weekends only. Example photos below—many more!

Cont. from Page 10 portant to understand and it allows for AC power to be given as Volts (rms) x Amps (rms). Sometimes, the power label on the chassis of a radio refers to the power intake in Volt-Amps (VA), not Watts, but that figure is approximately equal to DC Watts (it is not necessarily totally equal because of reactive and phase differences in AC circuits, but is close enough for what we need to know). Also, be aware that an AC RMS source of voltage has almost a third more shock value than the equivalent DC voltage (due to the AC peak voltage).




Finally, look at the right-hand drawing in the figure, right: this shows what happens to an AC current when it is changed to a DC current in your radio's rectifier circuit. A vacuum tube half wave rectifier is depicted with a filter capacitor at the cathode. The rectifier allows current to pass in only one direction and the output voltage is taken from the top of the capacitor and it will peak at 100 Volts (pulsing DC) with the capacitor smoothing out the ripples to allow for a more uniform (close to DC) current to supply the radio's circuits for successful operation. **Its value is actually given as 1.41 x the input RMS AC value. (1.41 x 70.7 Volts - close enough).** Finally, look at the 'Take-Aways' at the bottom of the figure and remember these four facts.

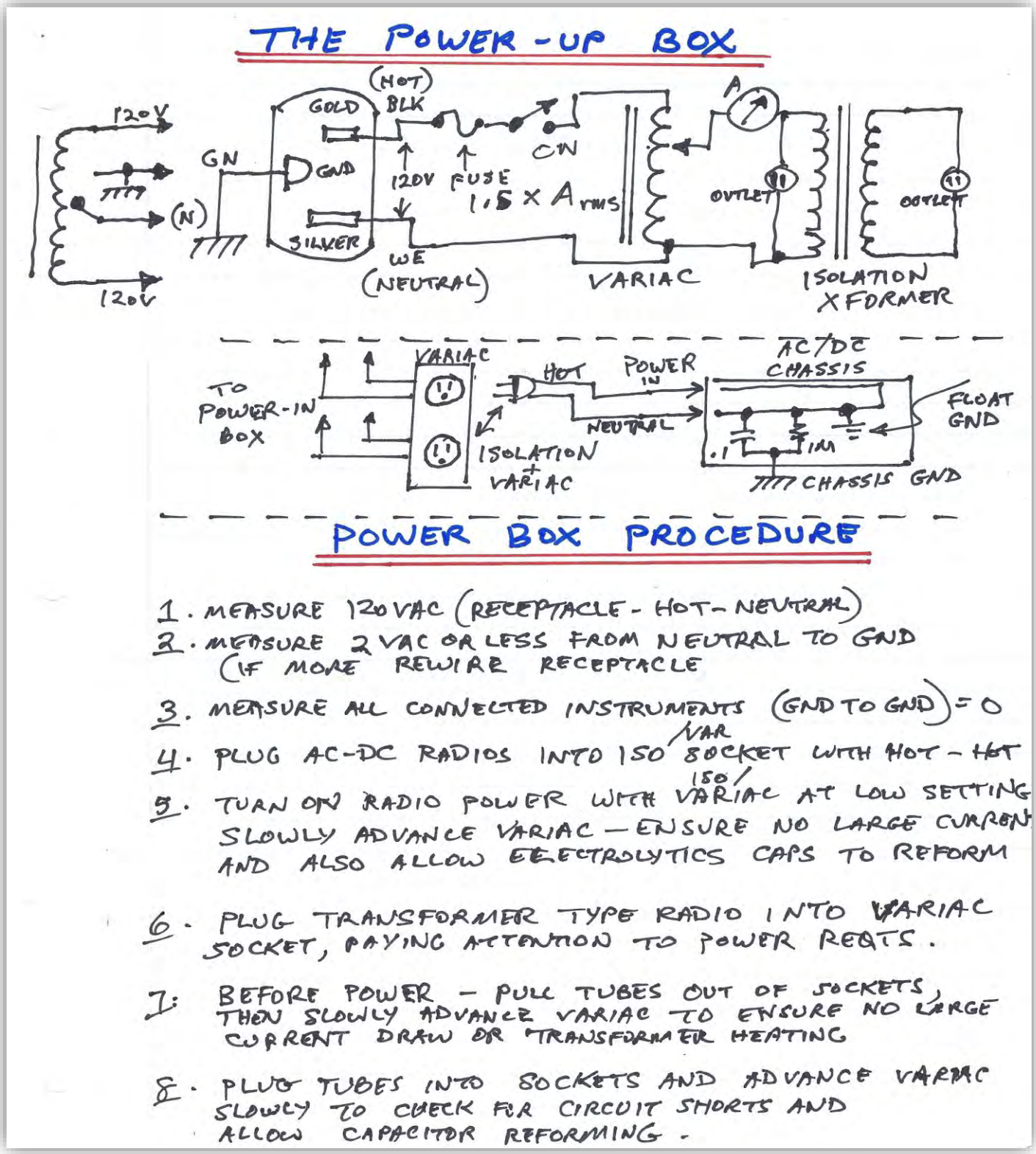
We are now ready for the Power Up Box (refer to the figure on page 13). First, we are going to be using the domestic AC supply available in a typical three prong outlet, rated at (approximately) 120 Volts RMS. The small left-hand drawing in this figure depicts the input electrical supply to your house, which comes from a street-side pole transformer with a primary of around 13 Kilovolts. The secondary is 240 Volts with a center-tap that is supplied to you household power panel. The center-tap allows for two parallel 120 volt circuits to hook up all the electrical outlets in your house and the full 240 Volts to be applied to your heavy power appliances, such as your electrical range and oven, your clothes dryer and your central air conditioner, etc.

The input power wiring allows for the center tap to be grounded, and it is subsequently referred to as the Neutral wire, which is grounded to earth with 6' grounding rods. To ensure greater safety, there is also a ground wire that is strap-connected to the Neutral line and grounded utility box. Should either the Neutral or ground wire become disconnected, there is a safety backup by using this dual grounding configuration, otherwise a full 240 Volts would be available at any point in the wiring if you were to accidentally touch a live circuit (twice as deadly).

Now look at the drawing in the top center of the figure on page 13. It shows a correctly wired house power outlet where the green wire goes to the center ground, the 'hot' (or 'Live') 120 Volt black wire goes to the shorter prong (usually gold coloured under the socket), and the Neutral white wire (silver prong underneath) goes to the longer prong - remember that the Neutral and ground wires are connected together back at the main panel. When you check out the voltages from pin to pin, you might find that there is a small voltage difference between the Neutral and ground of 2 Volts or less - which is normal due to some amount of induced voltage over the long lines where the power lines are run physically close together. If it's more, something is wrong.

Also, make sure that the hot and Neutral lines have been correctly wired to the correct prongs (sometimes they could have been incorrectly wired). Make sure all of these conditions are correct before trusting this power outlet to run your radio and instruments without stray or incorrect voltages being present, to ensure safety and correct voltage readings when doing your work.

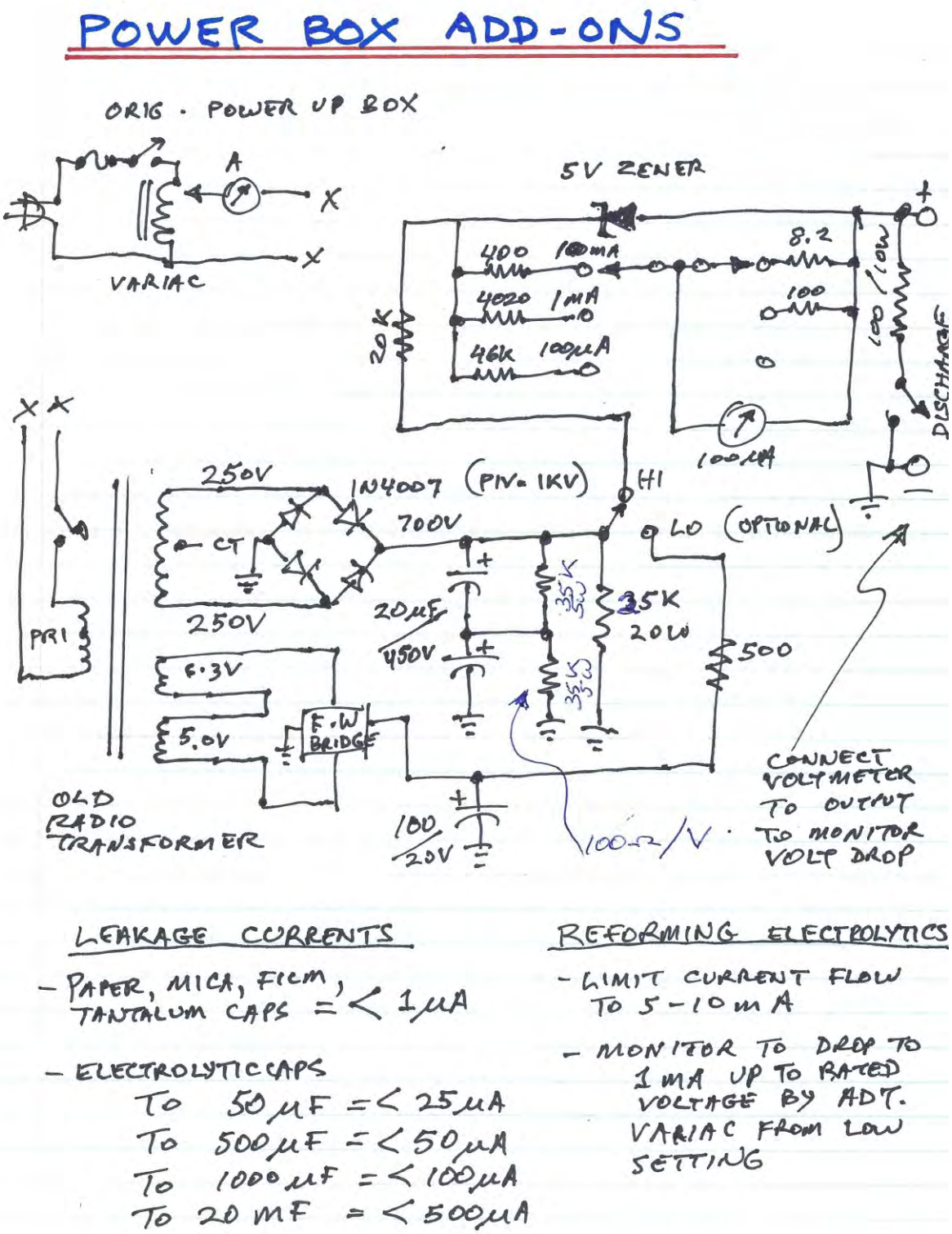
The diagram for the basic Power Up Box in the figure on page 13 shows the power going first to the Variac and




then through an AC ammeter and then finally through an isolation transformer and output sockets to plug your radio into. The ammeter could be salvaged from an old analog multimeter and could be anything that allows up to an Amp or two full-scale. The Variac should be rated correspondingly and would be best if it was capable of at least 2 Amps AC at full voltage out. The same current capability is needed for the isolation transformer. You

can make up your own isolation transformer by putting two large filament current transformers back to back, with each transformer having ratings of 100 VA (Volts x Amps) or so. Most five tube superhets are rated around 35 VAs and transformer driven sets could be rated at 100 to 200 VAs, so your power up box should be able to meet these current requirements.

Now if you are wondering about the 60 Watt lamp on top of the CVRS power box in the photo on page 10, it is actually a separate 120 Volt power circuit that puts your radio in series with the lamp. It is a quick and simple indicator of whether your radio is shorted or drawing too much current when turned on. Say that you plug the lamp in series with a 35 VA superhet radio and the lamp turns on bright; then your radio is shorted in its power circuit. Otherwise, if it is drawing a normal amount of current it will allow the lamp to shine at about 2/3 of its normal brightness. Of course, if the lamp doesn't light up at all, then your radio must have an open circuit.




The Power on Box Procedure in the lower half of the figure on page 13 takes you step by step through testing both AC/DC radios and transformer powered types. The advantage of having the AC ammeter in the power up box is that it allows you to read the exact amount of current your radio is using when powered on and that should correspond to the radio's VA rating. If it is more, this tells you that your radio is shorted or that some power driven circuits are leaky or drawing more current than they should. This could happen with leaky capacitors, tubes or transformers.

The middle drawing on the figure on page 13 shows the problem

LEAKAGE CURRENTS

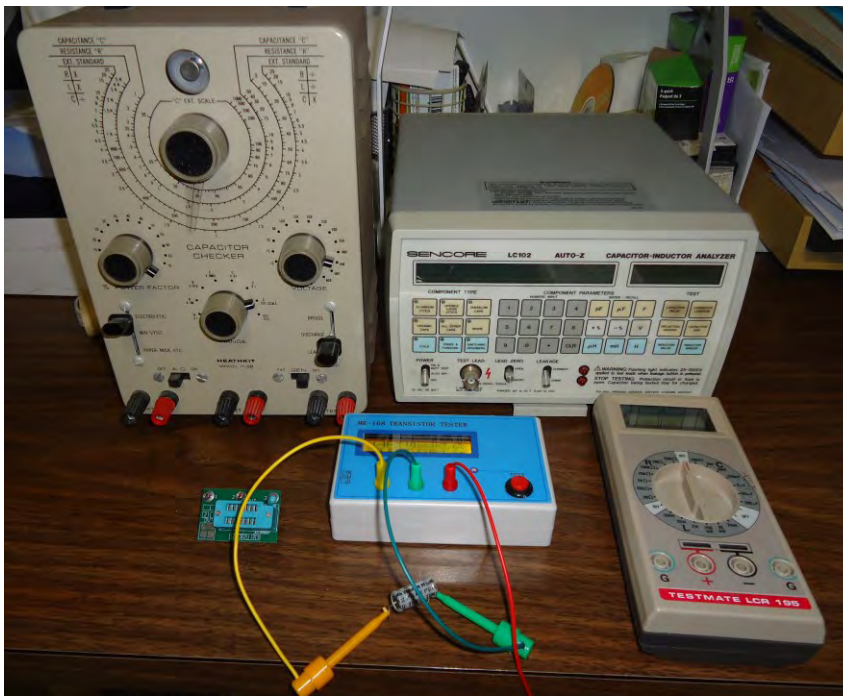
- PAPER, MICA, FILM, TANTALUM CAPS = < 1µA
- ELECTROLYTIC CAPS
  - TO 50µF = < 25µA
  - TO 500µF = < 50µA
  - TO 1000µF = < 100µA
  - TO 20 mF = < 500µA

REFORMING ELECTROLYTICS

- LIMIT CURRENT FLOW TO 5-10mA
- MONITOR TO DROP TO 1mA UP TO RATED VOLTAGE BY ADJ. VARIAC FROM LOW SETTING

with an ordinary AC/DC tube radio which has a two prong power plug that could actually put the hot wire of the power cable to the chassis, which you will want to avoid. The circuit in the rectangle shows only the grounding within the radio where the chassis ground is isolated from the floating power ground by a resistor and capacitor. Notice the difference in the ground symbols which will likely be shown on the schematic for your radio. Here is where safety is ensured by using the isolation transformer. Of course, transformer powered radios don't need a separate isolation transformer.

If you get really ambitious, you might want to build the add-on circuits shown in the figure on page 14. This circuit includes a salvaged radio transformer to allow up to 700 Volts to be used as a capacitor leakage tester and an electrolytic capacitor restorer. Why is this add-on so useful? Because testing capacitors properly takes more than just a simple capacitance meter. The photo, below, shows various cap testers starting with the old Heathkit Model IT-28 (upper left) that tested caps with a bridge type circuit, but also allowed leakage tests adjustable up to 600 Volts. These are very hard to find now. A Sencor Model LC102 (top right) full function tester provides many capacitor tests, including precise values and full leakage testing, but is high priced at $1,500 dependent on where you buy it. Lower right is a low priced handheld capacitor tester with no leakage testing and finally, there is a MK-168 component tester (lower left), that probably offers the best 'bang for the buck'.




You can obtain an inexpensive MK-168 component tester from eBay for about $30, which is perfectly good for most capacitor tests, but only the most expensive capacitor testers will also provide leakage testing. Ordinary capacitor testers use a microprocessor to charge a capacitor up by time and translate the reading into microfarads, but if the capacitor is leaky the reading could show too high. Besides, a capacitor could work at a lower voltage and still break down (fail) under higher operating voltages. This add-on tester allows you to test the capacitor at the rated voltage it is supposed to operate at. Usual expected values are indicated for various capacitors on the right lower side of the figure on page 14.

The voltage varying aspect of the Variac in the power on box allows for the capacitor operating voltage to be varied right up to its maximum required rating. The output of the transformer is a rectified DC voltage and the leakage reading is read off a 100uA DC meter with a set of range selected resistors. A 20Kohm current limiting resistor sets the allowable current flow to lower amounts to not exceed 10mA and the 5V Zener diode sets a 5V limit around the meter to protect it from over-voltage.

A 'Hi-Lo' switch sets a much lower range of voltages to be used to test low voltage transistor type capacitors. The full wave bridge rectifier for this circuit is the same configuration as the unit above and lower voltage diodes can be used if wanted. Note that the two filter capacitors in a series connection are paralleled with voltage equalizing resistors, each of 5 Watts rating. They are both 35Kohms, but if your secondary transformer voltage is different than 700V, calculate these resistors at 100ohms per volt across each.

The output circuit marked '+' and '-' is to connect the capacitor to be tested and should be discharged by the switch and resistor before testing takes place. A push button contact switch can be used and it should be held in contact for a few seconds for discharging larger valued capacitors.

This same circuit can be used for reforming old leaky electrolytic capacitors using the directions on the lower right side of the figure on page 14. This being said, some experienced radio restorers say that reforming caps is usually a waste of time, but you can experiment for yourself and form your own opinion.

If you wish to ask any questions on this circuit or its operation, you are welcome to send me an email at mdickers@telus.net or phone me at 780-457-3715.

Cont. from Page 6 plifies the band switch wiring, and its rigidity results in enhanced stability and is less prone to unwanted (spurious) oscillations, especially at higher frequencies. All coils and transformers are very well made and much larger in form than found in most other radios, and those not mounted on the carousel are all well-screened. The associated trimmer capacitors are also of high quality.

As noted above, the circuit of the AW15 changed over its production cycle, though most changes related to replacing the Wunderlich detector tube, which was becoming obsolete, with a #55 (dual-diode/triode) tube. The two Wunderlich tube schematics show full wave detection using a centre-tapped fourth IF transformer secondary, whereas the schematics that include the #55 tube show both full wave and half wave detection circuit configurations. Other changes, more minor in nature, included to the bias circuits of the IF tubes, the 'Static'/'Sensitivity' Control, the AVC circuit, and to the antenna connection arrangement.

**Chassis Construction**

The AW15 comprises two chassis: a large tuner chassis, measuring 22.5" wide x 13" deep (including knobs) x 8.5" high, and a power supply/power amplifier chassis measuring 11.5" wide x 6.5" deep x 8.25" high. Both chassis are constructed from heavy gauge chrome-plated steel, with the tuner chassis having some L-section cross bracing underneath to reduce flexing, as well as a steel cover plate over the coil carousel, and a heavy-gauge steel base plate. The speaker is a 12" diameter cone electrodynamic unit with a large rear casting housing the dual field coil assembly, a cast basket, and a pressed steel pedestal housing the output transformer.

**Power supply/power amplifier:** the large chrome-plated power transformer and choke dominate the upper side of the power supply/power amplifier chassis (photo, right of chassis on arrival), and a large rectangular audio driver transformer on the underside. The line cord and a 'flying lead' for the on-off switch enter through a grommet on one end of the chassis, and there is a 110/120vAC switch, a keyed 6 pin 'Jones' ('Cinch') style socket that provides power to the tuner chassis, and a 6 pin speaker socket on the other end.

**Tuner chassis:** most coils, chokes and transformers on the tuner chassis are enclosed in large chrome-plated cans, these being push-on (friction-fit) over the lip of the can bases, which are fixed to the chassis (photo, below of chassis on arrival). The shortwave antenna coil and tuning gang are enclosed in rectangular heavy-gauge chrome-plated steel shields, the one for the tuning gang being lined with a lead sheet, with a sheet of lead also located under the tuning gang. I have no definite explanation for the presence of the lead lining (and neither did Kent King) – its possibly for additional RF screening and/or to add mechanical resilience to the tuning gang assembly. Several of the paper capacitors under the tuner chassis are of so-called 'bathtub' construction, ie. are encapsulated in metal cans, these being riveted to the underside or rear apron/sides of the chassis, though capacitors inside the coil/transformer shield cans (above the chassis), and a couple located under the chassis are tubular paper types. As noted above, the tuning mechanism is a form of 'turret', where the RF coils and trimmer capacitors are mounted on a horizontal rotating carousel. The front panel band change switch shaft has a bevel

gear mounted on a horizontal shaft that engages with a second bevel gear, mounted on a vertical shaft, that rotates the carousel. Detents located in a metal insert at the centre of the carousel, visible in the photo, right, engage with spring-loaded pins mounted in a pot metal casting housing the bevel gears, to stop and hold the carousel at each of the four band change positions. Two end stops are cast into the section of the pot metal that prevent over-rotation of the carousel (see discussion on this in the tuner refurbishment section of this article). The use of sealed 'bathtub' style paper capacitors is interesting for a 1934 domestic radio - these look like high quality parts similar to those used in military and communications sets of the mid-late thirties onwards, these usually having a paper-in-oil dielectric (I suspect in this case the dielectric to be plain paper dielectric capacitors sealed in tar. The parts list notes that three of these cans, located on the rear apron of the tuner chassis, contain a 'choke and condenser assembly'.

I suspect in this case the dielectric to be plain paper dielectric capacitors sealed in tar. They were all found to be electrically leaky with DC resistances in the 100K - 250Kohm range

**Speaker:** the AW15 12" electrodynamic speaker includes two separate field coils - one in the bias circuit of the 2A3 output tubes (DC resistance of 750ohms), and one in the HT supply to the tuner chassis (DC resistance of 2175ohms). The push-pull output transformer is located in the speaker pedestal.

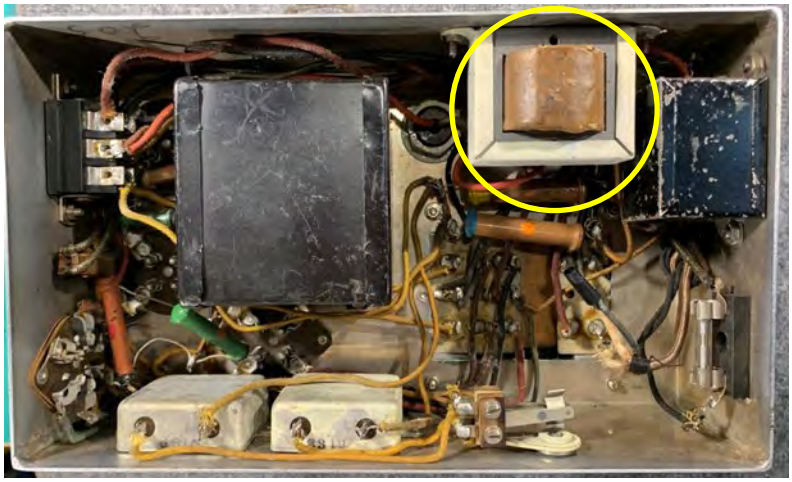
**Preliminary Inspection and Assessment**

A preliminary visual inspection of both the tuner and power supply/power amplifier chassis indicated that they were generally 'unmolested', sporting most of the original components, though some signs of rework was evident, especially on the power supply/power amplifier chassis.

Following removal of the steel base cover of the tuner chassis, the knobs and front panel have to be removed to allow access to some of the screws to allow removal of the internal steel cover over the band change mechanism. However, following that there is very good access to all parts of the under- chassis. There are several resistors and capacitors located inside the coil and transformer shielding cans above the chassis. Access to these parts is also easy as the cans simply pull off their bases.

One tube, the #55 dual-diode/triode, had a detached top cap which I repaired. All tubes were then tested for emission, and all were ok apart from one of the #56 tubes and the 2A7 tube which were low emission at 34% and 48% (amplifier)/54% (oscillator) respectively. The owner also provided three spare tubes, a 5Z3, a #58 and a 2A3, all which also tested good for emission.

**Power Supply/Power Amplifier Chassis**



Further inspection of the power supply/power amplifier chassis confirmed that it had several modifications and faults:

- There was a (non-original) Canadian-manufactured 'Hammond' centre-tapped choke (circled yellow in the photo, left), which I suspect is actually a push-pull output transformer with the connections to the secondary winding cut away, the stubs of which could be observed when the unit is examined closely, mounted under the chassis associated with some wiring mods that, after tracing out, had been undertaken to replace the interstage (driver) transformer wired between the push-pull #56 audio driver tubes on the tuner chassis and the 2A3 power

output tubes on the power supply/power amplifier chassis. The primary of the original interstage transformer likely failed (open circuit) due to a short or an 'old age' failure, such as corrosion of the windings. This transformer was still present under the chassis, albeit with its primary windings cut away, but with its secondary windings still connected to the 2A3 audio output tube grids. The centre-tapped Hammond choke had been wired into the circuit to provide plate voltage to the two #56 audio driver tubes in the tuner chassis (in place of the driver transformer primary winding), and the grids of the 2A3 tubes connected to the #56 plate circuits via the two 0.5uF coupling capacitors that are part of the phone jack circuit;

- A couple of the resistors had been replaced with different values to those on the schematic as part of the modifications - one of these resistors was very frazzled (photo, at bottom of page 17);

- The 110/120v switch was intermittent in operation; and

- Some of the resistors present were oriented differently than shown on the available under-chassis diagrams. I also noted that these, and others resistors/paper capacitors were not present on the Rider's schematic (either the 'Early' or 'Late' versions), though a schematic on the EH Scott Enthusiasts website showed these components.

Options provided to the owner regarding the driver transformer modifications were to:

- Re-wind the original transformer: not feasible unless the original specs were known;

- Find an exact Scott AW15 replacement part, eg. from an AW15 'parts set';

- Leave the arrangement as-is and evaluate the circuit once operational; and/or

- Find a suitable (non-Scott) replacement driver transformer and revert the circuit as per the schematic.

I suggested proceeding with the last two options, and the owner agreed.

**Speaker**

With the power supply-amplifier chassis on the bench, I thought it would be a good opportunity to plug in the speaker (photo, right) and test the field coil and audio output transformer. As noted above, the AW15 speaker has two field coils: one in the plate circuit feeding high voltage to the tuner chassis and one in the cathode circuit of the 2A3 output tubes. The cathode circuit field coil tested ok, with a DC resistance of 750ohms, as per the schematic, but the plate supply field coil was open-circuit - it should measure 2175ohms. With this field coil open circuit, no plate voltage would be supplied to the tuner chassis, so the tuner would be inoperative, and the speaker electromagnet would not be fully-functional, ie. the magnetic field would be weaker than designed, reducing the efficiency of the unit.


Options proposed to the owner on this issue were to:

- explore the connections to the field coil - one of the connections between the coil windings and the wires to the umbilical to the power supply/audio amplifier may have detached, however, preliminary investigations indicated that the open circuit (break) in the windings was likely inside the cast housing or buried within the field coil;

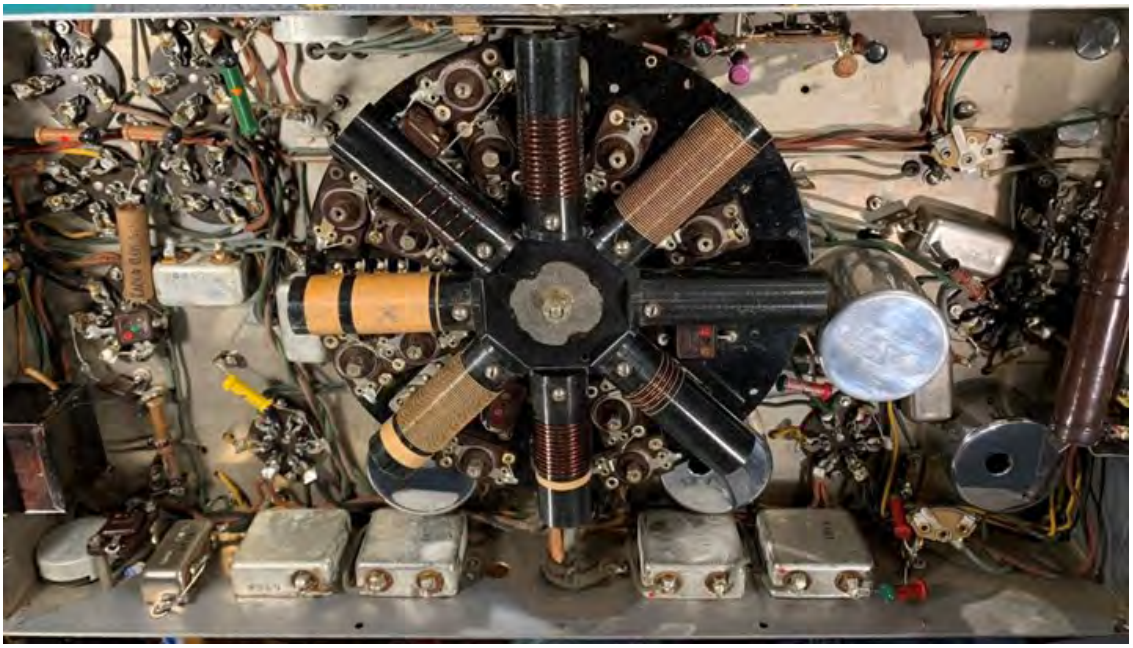
- have the speaker field coil repaired. This would entail complete disassembly of the speaker and re-winding the field coil;

- buy another AW15 speaker in working condition (if one could be located); or

- replace the field coil with a resistor and/or choke to simulate the power supply purpose of the field coil and thus allow the correct plate voltage to be fed to the tuner chassis, hoping that the remaining good field coil, ie. the one in the cathode circuit of the 2A3 tubes, was sufficient to magnetize the speaker such that it produced adequate volume/audio quality.

I recommended the last option to the set's owner as a starting point, and this approach was accepted by the owner as being appropriate.

**Tuner Chassis**

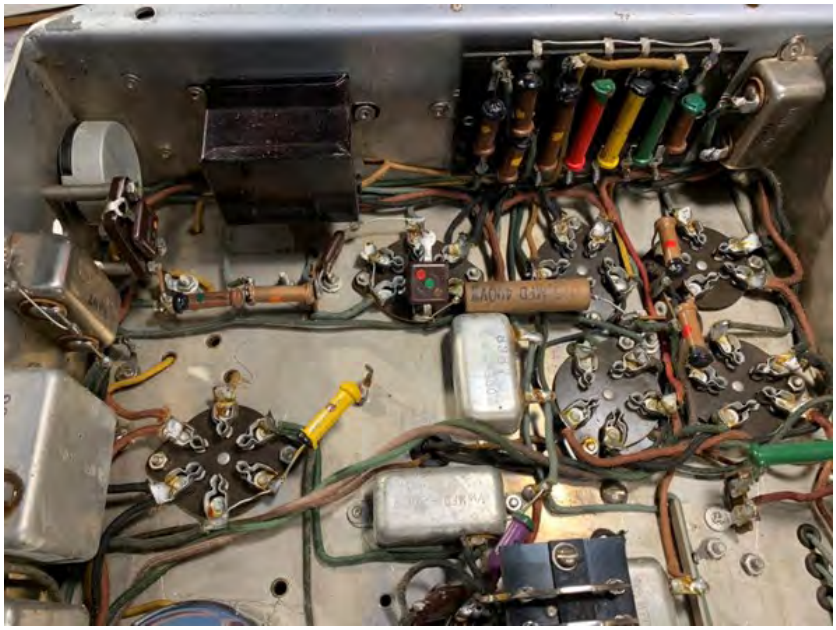


A closer look at the underside of the tuner chassis (photo, right) revealed that in addition to the circuit differences noted above, there was a large number of differences in the layout in this example compared with either of the two chassis layout drawings I had found for the set. For example, this chassis has several capacitors and resistors in different locations than shown on the layout diagrams, the '215v HT Filter' had been omitted, and two above-chassis can electrolytics were absent, with blanking caps present in the holes in the chassis the electrolytic capacitors would have occupied.

The coil carousel was removed (photo, left) to facilitate closer inspection and component replacement work. This revealed that the housing for the bevel gears was made from chrome-plated pot metal that had started to fail due to 'pot metal cancer', with one piece chipped off and several minor cracks developing through the casting. This a known issue with pot metal, and I have encountered many bad cases of pot metal decay in other sets of the 1920's through the 1930's. However, this casting still had good structural integrity and did not show any signs of swelling or warping, which often happens.

**Some Scott Sleuthing**...

Before undertaking any refurbishment work on either chassis or speaker, correspondence was struck with some E.H. Scott restoration experts on the speaker and the tuner chassis. Regarding the tuner chassis, I noted that none



of the schematics I could find matched the chassis on my workbench. Per the email texts presented earlier, the response was a strong suspicion that the chassis here is one originally made for the 'Wunderlich' detector tube, ie. an early model of the AW15, that has been modified, likely at the Scott factory, to use a #55 detector tube instead. So, I traced the wiring and components around the #55 detector tube (photo, right), and found that they indeed matched the (Scott factory) 'Replacement of a Wunderlich with a Type 55…' schematic as found on the EH Scott Enthusiasts website, but with the following differences:

- The 500ohm resistor shown between the #55 cathode and ground is connected to one half of the 3 position 'Static' switch. This switch selects either a short to ground, or a 770ohm or 2.5Kohm cathode resistor into the circuit;

- The 0.1uF coupling capacitor to the volume control is actually a 0.025uf tubular paper part; and

- A 50Kohm resistor is wired between the 0.025uF coupling capacitor and the 'hot' end of the (500Kohm) volume control.

The correspondence also noted that if this modification to the detector had been undertaken, then:

*"- The detector tube socket would have no tube number embossed on it, ie. '55', and instead a 'dark red center button' would be present* [I found that no '55' was embossed in the tube base, but no red centre button was present either]*;*

*- A hole would have been drilled later for the #55 tube grid cap wire (as the Wunderlich tube has no grid cap connection), with the hole lacking the brass sleeve to protect the grid cap wire* [I noted that the hole on this chassis does have a brass sleeve (eyelet) present]*;*

*- Holes would be present on this chassis where two middle (red) antenna posts and the toggle switch to connect them would have been removed (these were only present on chassis punched for the early Wunderlich detector circuit chassis)* [this chassis matches that description, ie. these holes are present]*;*

*- The last IF coil on the Wunderlich detector tube chassis is center tapped, later (Scott) modified wiring changed to strap the #55 tube diodes together, becoming a half wave detector - affecting the sensitivity and maybe the AVC action"* [the last IF transformer secondary on this chassis was centre-tapped (connection lug circled yellow in photo, right), but there is no connection to the centre-tap tag on the coil former and the #55 tube is wired as a half wave detector]; and

*"- Other changes to accommodate the change to the #55 tube would have been made per the 'Replacement of a Wunderlich with a Type 55…' schematic"* [these all checked out apart from the differences noted above].

If the above was not confusing enough, as noted earlier, there are three other schematics not found in Riders (Riders contains two schematics – 'Early and 'Late'). For these three schematics, the secondary of the last IF transformer is center-tapped for AVC and each secondary end is wired separately to the detector diodes for push-pull detection. The schematic dated 4/10/34 uses the Wunderlich detector tube, though the two grids are not strapped together, and this version has a

#58 mixer tube and 4 antenna posts. Another schematic, dated 5/7/34, uses the Wunderlich tube detector, again with its grids not strapped together, a #58 mixer tube and 4 antenna posts. The third schematic (undated, though believed to be early-Fall 1934), uses a #55 tube with its two diodes wired to the each end of the last IF transformer secondary for push-pull detection, a 2A7 mixer, and 2 antenna posts. The two Riders schematics (dated 11/19/34 and 1/12/35) are the only schematics with the #55 tube diodes strapped together for half wave detection. However, the chassis I was working on had a 2A7 mixer and a #55 detector with the diodes strapped together, and a centre-tapped last IF transformer, with no connection to the centre tap.

It was also noted in the correspondence that to further complicate matters, sets returned to the factory for service were sometimes partly updated to a later production design. Scott was a 'Custom Radio' builder, and the AW-15 design evolved considerable during its 15 months of production 1934-5, with some #55 tube conversions done by the Scott Lab, or one of the several Scott service centers established by 1940: the changes made to the tuner chassis on my workbench definitely appeared to be 'factory', and not undertaken by a Scott dealer/aftermarket workshop.

Given the above, I was convinced that this particular chassis was built as one of the designs for the Wunderlich tube, and later modified (likely at the factory) for a #55 detector tube: it is very plausible that Scott would use up stock of Wunderlich detector set parts and any remaining chassis blanks already punched for 4 antenna posts for the first of the sets using the #55 tube, as Scott was a small manufacturer, and likely could not afford to scrap perfectly good parts and chassis blanks.

The conclusion of all the above is that reference to a combination of the various schematics would be needed while working on the tuner chassis, replacing capacitors and resistors in it 'as is', and not attempting to revert it to any one schematic.

**Approach to Refurbishment**

Part 5 of this article series will cover the refurbishment of the Scott AW15 chassis. However, before that commenced, I had a discussion with the owner about what he wanted to achieve from the refurbishment work on his AW15. I explained how I define 'repair', 'refurbishment', 'sympathetic restoration' and 'restoration', and what level of effort was connected with each (for more discussion on this topic, refer to the article on Page 14 of the December 2020 issue of Canadian Vintage Radios). I explained that to render the under-chassis appearance of the tuner 'factory fresh' after replacing paper and electrolytic capacitors would entail significant effort to disassemble/reassemble the chassis as most of the paper capacitors are sealed 'bathtub' metal-encapsulated types, riveted to the chassis, with the heads of most of the rivets (above the chassis) inaccessible without removing the bases of the coil shielding cans. Also, replacement resistors would need to be encased in reproduction bodies fabricated to match the originals.


Following this discussion, the owner decided that he wanted only the above-chassis appearance to look as original as possible, and the existing cosmetics improved upon, though the under-chassis appearance was not a concern to him, his primary concern being that the circuit be functional and reliable. Given that the set is a 'Scott', and is therefore a collector's item, I suggested that a compromise be reached for the under-chassis work in that the original 'bathtub' capacitors (examples shown in the photo, right) be left in place and the new parts installed in such a manner as to allow further work on the chassis to be undertaken in the future should a subsequent owner wish to expend the time and effort needed to render the under-chassis appearance 'factory fresh'. For any replacement resistors and for tubular paper capacitors, these would be removed and retained with the chassis so the capacitors could be restuffed and reproduction resistor bodies fabricated. This suggestion was agreed to by the owner and this was therefore the refurbishment approach adopted for this AW15 tuner chassis.

The approach agreed for refurbishment of the power supply/tuner chassis was similar, however, this chassis had been subject to considerable re-work due to the failed driver transformer. As such, the centre-tapped Hammond choke that had been installed along with the associated wiring changes to allow the power amplifier to function with the failed driver transformer primary winding would be left in place until (or if) a suitable driver transformer was available. The replacement driver transformer would then be installed in place of the Hammond choke, with the original driver transformer being left in place so it could be either re-wound or restuffed (with the replacement driver transformer) in the future if so desired.

# Radio—Caption Competition— Eamonn Tork

Another version of our 'Radio Caption' competition, this time with an early British TV production theme — if you would like to enter, please send suggestions here. Some examples so you know how to 'tune in your ideas'…:

- 'Interloper Jack' had managed to sit in the middle again—but this time Betty had rigged up her 'secret weapon': a handy phone so she could still have a natter with Doris during the boring bits of the show…
- Doris had drawn the 'short straw' boring job yet again—watching the test cards. The last time she did this, she nodded off and the Producer thought the sound effects guy had started playing on his washboard with a drumstick while playing maracas.
- The three controllers in the rear of the control room dreaded Saturday morning work after the video technicians Sid and Stan had spent Friday night in the 'Elephant and Castle' pub—famous for its pie and pea suppers, jellied eels and pickled eggs, washed down with copious amounts of Guinness – so they were all wearing their coats ready for a quick emergency dash to the exit should the atmosphere up there become unbearable…

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## And finally…..

We encourage all CVRS members to submit articles or letters that relate to vintage radios or associated items. Please send any editorial mail to:

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