Sept/Oct 2009

Fall 2009 Issue

CANADIAN VINTAGE RADIO SOCIETY

Canadian Vintage Radios

"Its All Finished But The Wiring!"

- Bob Murray

The annual AWA Conference took place in September, 2009. Bob Murray attended this event as usual and provides a report in this Newsletter (page 5). One of his snaps taken at the conference is shown below—the name of this excellent kit radio reminded me of a few of my own projects... and, of course, it is ever-optimistic!

ROGERS TYPE 28 "TEN-55" SACRILEGE!

- Bill West-Sells

One of the local people who hails from Saskatchewan keeps bringing me strange old radios (I wonder why Bill? — Ed.). This one was in a foreign cabinet, evidently a floor model. The legs were sawn off and this 10-55 Tombstone model chassis had the speaker mounted on one side with holes drilled for "HiFi" reproduction. The curved glass and hexagonal dial hole are nice but I suspect for another brand, possibly Stromberg Carlson. The control shafts didn't line-up with the original holes and they had been filled, and new ones drilled. Only the tuning hole was in the correct place.

There were a couple of things to check out first, before deciding whether to put it in the parts radio pile or trying to make something useful out of it. There was a considerable amount of tar that had leaked out of the power transformer, but a quick check of the HV secondary winding indicated that it was still OK. It was something like 360-0-360, and not something like 355-0-328 which would indicate a shorted group of windings. The second thing was the speaker which was ripped. After gluing the cone with vinyl cement it seemed Cont. on Page 4

From the Editor

What do we want or expect from the CVRS? The name of our organization implies an integrated, Canada-wide society with a common interest in vintage radios—but is this what we have? Well, sort of, though there is much that could be done to make it more so, and to facilitate what we all really want from such a society—better networking and resources to help with our hobby. In this spirit, we have taken the first step towards having those who actively participate in the society more fully reflect the organization's national nature. The CVRS is pleased to announce that John Bray of Kilbride, NL, has volunteered to serve as Membership Coordinator—more about this in the next issue, including John's plan to assemble a membership directory for distribution. In the meantime, contact us if there is something you can offer to the CVRS its members. Do you have experience in developing/maintaining websites? Other areas? If so, we would like to hear from you—contact Gerry, Don, or Phil @canadianvintageradio.com.

73 Gerry & Don

Provincial Representatives

Alberta
Rick Williams
rick@canadianvintageradios.com

British Columbia
Volunteer needed

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Stan Marlin
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Manitoba
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New Brunswick
Bill Gentleman
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Newfoundland
John Bray
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Yukon & NWT
Volunteer needed

The CVRS is looking for representatives for several regions across Canada. If this position is unfilled in your area and you are willing to take it on, please contact us. Don't worry, the duties are light! - acting as a regional contact for the society in your area, perhaps forwarding news or technical interest items for the newsletter. Of course, if you want to expand the role, we'd also love to have you form a local chapter! What you make of the position is up to you, but we hope to see your name added to the above roster!

Stark Model 9-66 Tube Testers and Optimization Ideas - Part Four — Murray Dickerson

Refer to Figure 4 (right). This represents the usual simplified circuit for a tube tester with the tube under test shown, whether it is a mutual conductance or emission tester. The tube under test has a meter in the cathode circuit to indicate level of emission while the plate is supplied by a transformer secondary B+ voltage through a plate resistor. It doesn't matter if the meter is connected somehow through the plate circuit. The grid circuit is not important for this discussion. To test for microphonics or any type of noise generated by the tube, you must find the wire that connects to the plate of any tested tube and attach a 0.0005 uF (500 pF at 400V or higher) capacitor to it. The other end, as well as a lead coming from the cathode of the tube, must be provided to the jacks that will allow you to connect your noise test radio through its antenna coil. Don't leave the radio connected when doing other tests. To test for noise, you will push the test button and tap the tube at the same time. This is required since most tube testers connect the B+ to the tube's plate circuit through the "push to test" button after all the set-up is completed. Testing for noise at RF frequencies allows you to eliminate all the low frequency garbage like 60 Hz and other stray interference.

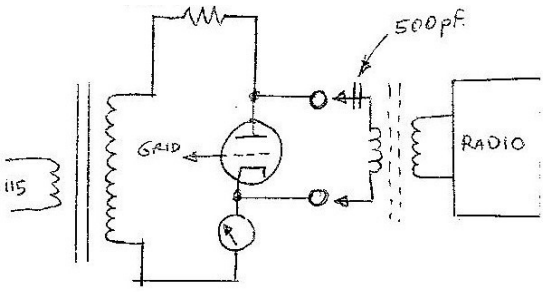


FIGURE 4 : GENERAL NOISE TEST

This setup is also used for testing other forms of noise in a tube as well and here is where we have to discuss other considerations. If we use an ordinary AM radio to pick up the other types of tube noise we'll likely not find much. This is because most AM radios have low front-end sensitivity (about 100 microvolts) due to the strength of local

AM broadcasters. If tube noise is just a few microvolts, you'll readily see that a normal AM radio is just not able to detect anything other than microphonics. You'll hear noise between stations, but that's just the noise of the radio itself and the atmospheric noise combined together.

The solution is to use a more sensitive receiver, but how many people want to cannibalize a more desirable communications receiver just to get a tester for tubes? Of course you could plug a high sensitivity, low noise receiver into a test jack on the Mod Box just to carry out the noise test, but what if you want to have a dedicated noise test radio as part of your Mod Box? One solution is to pull out a good quality FM tuner out of a modular HiFi component that are selling for a few bucks in yard sales these days and convert it into an AM radio by changing the FM detector into an AM detector at the last I.F. stage. These better-quality solid-state FM receivers have sensitivities of a microvolt or two. You also could make use of the signal strength meter many older high quality sets had as a noise output meter. You would then simply deduct the background noise reading from the tube noise reading to get a relative tube noise value reading.

I haven't tried this as yet and maybe some enterprising experimenter out there will test-out this idea or come up with a better one. If so, let me know and I will pass it on to all the readers of this series. My email was given earlier in this article. The radio noise test I was previously referring to was with an AM radio tuned to somewhere quiet on the AM band. That would hold true for an FM radio converted over for AM detection as well. However, there is the concern about using 90MHz reception for this test, rather than the much more conservative 600 - 1,000Khz band in an AM radio. Noise occurs across all bands and there shouldn't be a problem finding it at higher frequencies. What we don't know is whether background interference will be a problem using a converted FM receiver.

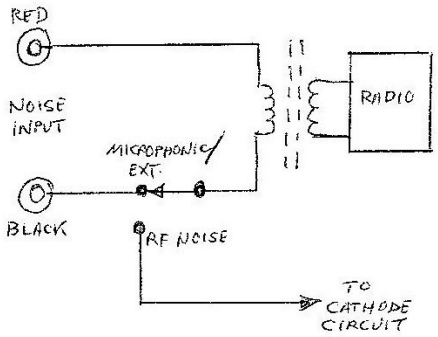
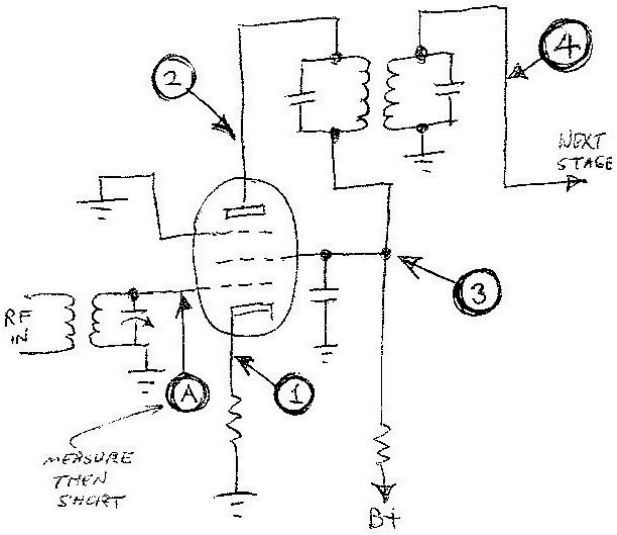


FIGURE 5: FINAL MOD BOX NOISE

But now let's assume that you have a sensitive (< 5 micovolts), low noise radio that can be used for our noise tests. Figure 5 (right) shows how to provide for a couple of banana jacks on your Mod Box to allow noise testing. The top jack could be red and the bottom could be black in colour. The reason for the colour difference is that you should always connect the red jack to the 9-66 noise test jack on the left side. You might want to put a little black enamel or hobby paint on the right side jack to remind you that it should be connected through a test lead to your black Mod Box banana jack. This is because the left jack connects to the plate of a tested tube through a capacitor and that is the connection you want to do other noise tests with, other than the microphonics test. Notice that in the figure a switch allows you to choose between the microphonics test from the 9-66 and a RF noise test on any tube you are testing in the 9-66 or Mod Box. If you are testing for RF Noise in a tube the switch allows you to connect to the cathode wire within your Mod Box (remember the circuit provided in the first part of this series). You will then have the equivalent circuit shown in Figure 4, which is more ideal for this type of testing.



Alright, so why the reference to an Ext. in the same switch setting as microphonics? This allows you to use the test leads to explore radio noise in real circuits you are working on. This is a valuable troubleshooting tool and Figure 6 (left) shows some typical test points in an RF circuit starting at point A, which picks up noise coming from the previous stage. Thereafter, short out A to ground and move through the other numbered points with the red test lead while the black lead connects to the ground of the circuit under test. You will be able to find any noisy components this way as well as pick up the noise level of the tube itself. Since the input antenna coil of the noise test radio is a balance line, you might get by with standard test leads or a twin lead in wire. If background noise levels and interference are objectionable you might have a standby coaxial or shielded cable ready to use instead.

Chapter News

British Columbia Chapter - Gerry O'Hara

The BC Chapter met in the community hall in Charles Rummel Park in Burnaby on September 20, 2009. The meeting was well-attended and provided a good opportunity to 'catch-up' after a busy summer. Ted brought freebies as well as some excellent bargain receivers. Elmer will be providing an 'Oscilloscope Basics' presentation at the noon, November 15, 2009 meeting at the same venue.

Saskatchewan Chapter - Stan Marlin

The Saskatchewan chapter of the CVRS convened at Pense on Sunday, Sept. 20th. for our third annual Fall social gathering.

Mike Scales hosted the event and being ever thankful for his foresight, two canopies provided shelter from the intermittent showers that day (photo, below).

Rather than converging on the local tavern for lunch as we had done in the past, this year's event featured a potluck, noon-hour barbeque. It truly was a majestic feast (no pun intended).

The dozen or so members that attended did bring a few show and tell items but the event is basically set up as one more means of unifying our Saskatchewan chapter. Our major swap meet will be the next SK. chapter gathering and we also have our own newsletter which is published four times a year; ie. one issue per season. We do seem to have a very interested, cohesive bunch of vintage radio addicts here on the Prairies and our close associations have produced many true friendships.

Alberta Chapter - Rick Williams

Nothing to report this issue

New Brunswick Chapter - Bill Gentleman

Nothing to report this issue.

Cont. from Page 1 to be ok.

One thing I keep finding is that people don't understand what a star washer is for on a control shaft, and put it on the wrong side-as this one was (photo, below) - this is wrong! While it will hold the nut tight once it is cranked up, it won't hold the control in the position you want it to stay in while you are wrenching it. In fact it may annoyingly go round and round until you twist the wires off! Put the star washer between the chassis and the body of the control, and nothing behind the nut. Now you can tighten the nut and the control will not twist.

Typical of jobs like this one is shoddy workmanship with incorrect parts and materials. This set sported a house wiring electrician's approach to a plug repair, using those little plastic 'wire nuts'. I threw the plug into a box and the wire nuts in their place, and substituted a more homey little rubber plug for the job.

Typical of radios of this brand and age is the circuit board. It's a strip of insulating material about 2" by 7" with a lineup of resistors and capacitors, all connected to the chassis with once rubber-coated coloured wires that now crumble if you touch them. Have fun, and be careful to do a meticulous detailed drawing of which wires come from exactly where, and where they go! Doubtless there are leaky caps and a bad resistor

Ontario Chapter - Paul Martin

Hi from Ontario. Between our son's wedding and trying to keep the grass cut between storms there was not much time for radios this summer. I did buy a couple over the summer and they are in my shop waiting for me. Has anyone heard of a Hermac radio? (made in Quebec) - a very small 5 tube radio in a nice wooden cabinet (works too!). The other is a Marconi console. I don't hear much from anyone else in Ontario but hoping that will change this winter.

Nova Scotia Chapter - Brian McKeigan

Nothing to report this issue.

Manitoba Chapter - Brad Larson

in that group. In this one (photo, below) there was just a couple of faulty resistors and all the caps.

As is to be expected, the electrolytic capacitors needed to be replaced too. This set had the little cardboard box type (8 uF), which with a little heat from the woodstove, opened up and I was able to fit a new electrolytic and a parallel paper cap together and fold it up again—looks original. Paper caps have a very low power factor, which means their series resistance is very low compared to their capacitive reactance. But it is not so with an electrolytic. You can put in an enormous value electrolytic and get high frequency feedback on the B+ line, but a small paper cap will kill the signal by virtue of its low series resistance. After all, at radio frequency, say 1 MHz, a 0.1 uF cap has a reactance of 1.6 ohms. If there is 10 ohms of series resistance in that electrolytic, you can see why the little paper cap mysteriously does the trick. And that's why you find them across an electrolytic a hundred times its size.

Onto the cabinet. I did what any amateur might, given the mismatched chassis and aborted piece of furniture. I figure I might sell it to some sucker who wants his chainsaw fixed but sees this old thing, and always wanted one. I strengthened the box with screws, glue, and Pacific Yew - something you won't find in your local hardware store, and put 4 rubber feet on the bottom, blackened a few spots and finished it with lacquer. I made a big wooden knob for the tuning, and used 4 generic ones.

Antique Wireless Association News - Bob Murray

Another great Annual Conference was held in Rochester, NY, from August 20 to 23. This year's conference organizers had made some changes, including moving events to land more on the week-end days, and providing a large tent in the flea market area to protect against the possibility of rain. There was some grumbling among those who aren't fond of change, but the reported attendance was 415, up from 195 last year. The AWA conference has a really big flea market. This year 144 spaces were sold.

Attendees included some new faces, and some long term attendees were absent. I met a few new Canadian collectors, and many from previous years. The conference theme this year was kit radio, and in the exhibits were radios from Heathkit, Allied Radio's Knight Kits, and others. There were presentations about Heathkit and Knight Kits. Bart Lee gave a lively presentation of his experiences with a Knight 'Ocean Hopper' kit (photo, below)when he was still in high school, and of his correspondence with Radio Moscow and other such stations. Bart also mentioned that the US government invited foreign immigrants who were not registered to come in and register themselves as aliens. Bart and some of his high school friends thought that was a cool idea, so they went in and registered themselves as aliens!

The conference provided another opportunity for members to look at the progress being made on the new museum buildings. In another two or three years time, the AWA Museum will be located entirely in modern display space. All in all, it was a satisfying conference to attend.

On another US note, check out http://picasaweb.google.com/WVRadioMuseum/MuseumOfRadioAndTechnology#slideshow/5359999311731081282 for a great slide show presentation of the excellent range of exhibits at the Museum of Radio and Technology in Huntington, West Virginia—truly amazing (thanks to Gary Schneider and John Terrey for the link).

Alignment Equipment and Tools (continued)

- Signal Generator(s): Whilst some crude re-tuning (not really alignment) can be undertaken using received signals, especially when stations of known frequency can be heard (only if the receiver is not too far out of alignment), the lack of known signals across all bands and at all times of the day/night when you may be doing the alignment work, fading and other 'on-air' effects make this far from ideal and therefore a good signal generator ('genny') covering the IF and RF range of frequencies of interest is really a 'must have': standard 'service-quality' signal generators can be bought for a few tens of dollars on EBay or new ones for not much more. I use a typical valve-based 1950's service-grade 'genny' manufactured by Triplett, Model 3432-A, bought on EBay for around $80. It covers 160kHz through 220MHz (plus more on harmonics), has variable AM modulation, a fairly basic output attenuator and is remarkably stable after 30 minutes or so. I also have a Superior Inst. Model 660-A that is not as nice to use (or as stable), but extends down to just below100kHz. For lower frequencies (eg the 85kHz second IF found in some communications receivers), I use a Heathkit 'audio' generator (Model IG-5218) that covers all frequencies up to 100kHz. Also needed is an appropriate cable, with croc clips at the receiver end, and a few isolating capacitors - 0.1uF for IF stages and 0.01uf (or lower) for RF stage injection.

- Output Meter: Many novices think that they can tune a signal peak by 'ear', well yes, you can, but it is surprising what an improvement can be made using a visual aid. I use a Triplett multimeter (Model 630-NA) that has an 'output meter' input – (it simply has an internal 0.1uf capacitor that is connected in series with the AC voltage ranges). If your multimeter does not have this facility, just connect a capacitor externally. While the receiver S-meter (if fitted) can be used for peaking receiver tuned circuits, it has the disadvantage that it is not sensitive to signal level changes at very low levels (due to delayed-AGC action in the circuit) and it may be connected into the circuit ahead of the final IF transformer, eg. the S-meter is often located in a bridge circuit connected to the screen grid of the final IF stage, thus adjusting the cores of the final IF transformer will have little or no effect on the S-meter reading.

The above essential instruments can be supplemented with:

- A crystal-controlled 'marker' oscillator (photo, left): this instrument is very useful when the receiver local oscillator alignment is 'way out'. I use a homebrew unit I made when I was 16 (I think it was in 'Practical Wireless') that has switchable 1MHz, 100kHz, 12.5kHz and 10kHz output markers set up using one of the standard frequency transmissions on 10MHz or 15MHz ('WWV'). I also used to use to use a 'Class-D' Wavemeter and a BC221, but these still reside in my mother-in-law's garage in Burton (I don't miss them, though the BC 221 is beautifully made and nice to use).

- Digital frequency meter ('DFM'): modern signal generators have these as standard, but I use a stand-alone BK Precision Model 1803 that I picked up on EBay for a few dollars – checked against my crystal calibrator it is 'spot on' right up to 100MHz, even though it is 25 years old. It gives a bit more confidence than using just the signal genny scale;

- VTVM: as these have an extremely high input resistance, they can be attached to the AGC line to act as an S-meter to provide a visual indication of tuning peaks (though note that the AGC voltage in some sets is derived from a diode connected to the primary of the last IF transformer, negating its usefulness for adjustment of the final IF transformer cores). I own several VTVM's – a few Heathkit ones, including a V-7A dating from the 1950's (works well) and two IM11s from the early 1960's (I have found that the printed circuit construction in these later models can result in problems), an early-1950's EICO Model 221 that works very well, but my favourite is a Triplett Model 850 (it has a nice big, easy-to read scale);

- A dummy aerial: not essential but can make a difference in aligning the RF input . For the SW bands I use a resistor of the specified input impedance connected across the aerial connections, applying the signal genny signal through a 220pf or smaller capacitor;

- Another receiver of known accuracy: a modern digital-readout receiver (eg. Radio Shack DX-394 or Eton E100) and/or scanner can be very useful in checking local oscillator operation and frequency – though not for the 'purist' I guess...

Classified Ads

Free to members in good standing

For Sale: Capacitor Kits for Tube Radios. These kits contain the most often needed capacitor sizes and offer saving over buying capacitors individually. Free shipping. Available are Orange Dip, Tubular Axial Film, Electrolytic, Dipped Silver Mica, Mylar, Polystyrene and Safety cap kits. For price list and kit descriptions, please contact Dave Cantelon, 6 Ferncrest Gate, Scarborough, Ontario, Canada, M1W 1C2 ; phone 416-502-9128; Email: justradios@yahoo.com or visit WebSite: www.justradios.com

For Sale: I have a Sparton 270 Junior radio for sale in Edmonton (photo, right). I really have no idea what price to ask for it so I'm asking $50.00 or best offer. It isn't in great shape so I'll take what I can for it but it does have the tubes etc. Photo, upper right. mamacat60@shaw.ca

For Sale: I have Grundig Musicschrank 7062 W/30 in good condition with manual and schematic. Located in Stouffville, Toronto area, Tel: 905 642 8998. Photo, lower right.

Joining the CVRS

Two types of membership are available in the CVRS based on whether you wish to receive a hard copy of the CVRS newsletter sent via Canada Post or an electronic version as a PDF file sent via e-mail (in colour—recommended). A full year's dues for the printed-mailed newsletter is $25, and $15 for the emailed version. International membership is available at the equivalent rate, although a postage surcharge will be added depending on the destination.

Membership runs on the calendar year and annual dues are payable each January. Those who join the Society in September or after have the option of paying a part year and receiving only the Sept-Oct and Nov-Dec issues of the newsletter. This option is available for $15 or $10, again depending on whether you wish a mailed or emailed version. Members joining in September or after may also pay for the full year and receive back issues of the three spring newsletters at no charge.

Dues may be paid by sending a cheque payable to the CVRS to:

CVRS Membership,
10271 Algonquin Drive,
Richmond, BC,
V7A 3A5

CANADA

Dues may also be paid via the Internet using one of several options. If you have a 'HyperWallet' account, you may send funds directly to don@canadianvintageradio.com . If you wish to make an electronic payment to the CVRS from your online bank account, contact don@canadianvintageradio.com for the necessary details.

However you choose to remit your dues, please provide the following information by email or with your cheque so we can update our membership database:

Name:
Mailing Address:
Email Address:
Telephone Number:
Your special interests connected to vintage radios:

Schematic Services from the CVRS

The CVRS offers a free copy service for Radio College of Canada (RCC) schematics (only) to members currently in good standing. A pdf file of an RCC schematic can be obtained by emailing Don White, don@canadianvintageradio.com with the manufacturer and model number of a radio made in Canada between 1927 and 1980. Members wishing a printed copy of a schematic should send a SASE (self-addressed, stamped envelope, Canadian postage) to the CVRS Membership address shown above.

If you wish to make sure that an RCC schematic for your radio exists before sending a SASE, email Don at the above address.

New to the CVRS

The Society welcomes the following new member who have just joined/re-joined the ranks:

- Gary Graham, Devon, AB
- Jeff Wilson, Varna, ON
- Tony Turkiewicz, Edmonton, AB
- Garry Martin, Delta, BC

A Technical Short - Eddy Stone

Basic Fault– Finding Techniques (Part 9) - Combined Fault-Finding Procedure (continued)

If voltage is reporting to the mains transformer primary, check the AC voltages on the transformer secondary: the centre-tapped HT windings should be in the 250v-0-250v to 350v-0-350v AC range in most valve receivers, and the LT voltages should be as specified by the manufacturer (eg. 6.3v AC and 5v AC (rectifier)). If neither of these voltages are present, this could be bad news, indicating that there is most-likely a problem in the mains transformer - probably an open-circuit primary winding if neither secondary voltage is present. If the LT voltages only are present, the HT secondary may be open circuit and vice-verse. If the LT windings are not working, and there is not a spare winding available on the transformer, a suitably-rated low-voltage transformer can be purchased and fitted to supply the heaters (eg. 6v transformers are widely available from many suppliers). Alternatively, a replacement power transformer can be sourced from suppliers of 'vintage' radio spares, eg. http://www.tubesandmore.com, Radio Daze (http://www.radiodaze.com/) or direct from manufacturers (eg. Hammond).

'Dead' Stage

Often the easiest fault condition to diagnose and repair: first check the voltages around the tube(s) in the faulty stage identified by the signal-tracing/injection methodology described earlier and/or by referring to the set's schematic. However, if this information is not available for the particular set you are working on, the table, right, provides some 'typical' voltages for a range of circuit nodes in AC-only supply tube receivers.

Circuit Node	Typical Voltage	Comments
Mains transformer HT second-	300-0-	AC
Standard HT line	250	May be higher - up to 350v
Stabilized HT line (if present, eg. to LO in communications sets)	150	Check type of stabilizer tube for specified voltage
AF Output stage cathode	12	
AF Output stage screen	225	
AF Output stage plate	230	
First AF stage cathode	12	May change with mode setting on some communications sets
First AF stage plate	100	Can be as low as 30v
IF stage plate	230	
IF stage screen	95	
IF stage cathode	1.5 – 2.5	May depend on IF (or IF/RF) gain control setting – up to 45v
LO plate	120	As low as 50, as high as 200
LO cathode	0 – 1.5	Depends on LO design
Mixer plate	200	
Mixer cathode	3	May depend on IF (or IF/RF) gain control setting
Pentode RF stage plate	230	
Pentode RF stage screen	100	
Pentode RF stage cathode	1.5	May depend on IF (or IF/RF) gain control setting – up to 45v
Cascode RF stage 2nd plate	170	
Cascode RF stage 1st plate/2nd cathode	90	
Cascode RF stage 1st cathode	1.5	May depend on IF (or IF/RF) gain control setting – up to 45v
BFO plate	140	
AGC bus	0 to -10	AGC on, depends on strength of applied signal. Measure with VTVM, DVM or 'scope
Heater supply	6.3	AC. Many rectifier tubes have 5v heaters. Many pre-WWII have lower-voltage heaters. AC/DC sets often have varying heater voltages for different tubesin the heater string

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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