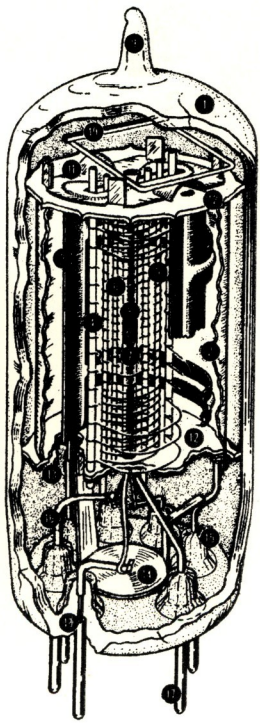
The FLASH!!

An Official Journal Published For Radio/TV Collectors

Dedicated to the Preservation and Documentation of Wireless, Radio, Television and Associated Equipment

Volume 8 November ☺ December 1997 Issue 6



1—Glass Envelope
2—Internal Shield
3—Plate
4—Grid No. 3 (Suppressor Grid)
5—Grid No. 2 (Screen Grid)
6—Grid No. 1 (Control Grid)
7—Cathode
8—Heater
9—Exhaust Tip
10—Getter
11—Spacer Shield Header
12—Insulating Spacer
13—Spacer Shield
14—Inter-Pin Shield
15—Glass Button-Stem Seal
16—Lead Wire
17—Base Pin
18—Glass-to-Metal Seal

In This Issue...

The Colorado Radio Collectors would like to extend their condolences and deepest sympathies to Dick Hagrman, his daughter Sherie, his sons Kirk and Bill and to all of their family in the passing of Dick's wife Ann.

Those of us who knew Ann will not forget a loving mother, wife and friend.

6 Nov 97

Official Journal of the

Mountians N' Plains Radio Collector's Association

Dedicated to the preservation and understanding of wireless, through the united efforts of organizations throughout the Rocky Mountain region and the Great Plains.

Volume 8, Issue 6 **November/December 1997**

TABLE OF CONTENTS

ABOUT THE COVER

Tu-be or not tu-be. This is a question? Well, the awful pun aside, I don't think any of us would question that it's the tubes that are the core and main-stay of the technology that we're all "ga ga" over. The except from a '59 RCA tube manual on this month's cover hearlds the theme of this issue. So, enjoy a collection of articles on helping you wend your way through a number of issues and problems that you may encounter as you collect and replace some of these old but *certainly* not forgotten artifacts of the past.

FLASH!! PUBLISHING DEADLINE NOTES

It's the intention of this Editor to mail our journal bi-monthly just prior to the 2nd Sunday of the issue month. Articles about, and pictures of your treasures, are welcomed as are **Want/4-Sale** ads and any letters or comments about our hobby. All material used are the copyrighted (C) property of the **Colorado Radio Collectors**.

The article submission deadline dates are set to allow timely mailing in the following month. These dates are the 1st of Feb., Apr., Aug., Oct. and Dec.

** ADS ARE FREE TO CRC & NARCC MEMBERS **
** NONMEMBERS - 20 CENTS A WORD **

Thanks to the *Pressworks* for printing the FLASH!!
(303) 934-8600

Kudos to this month's Flash contributors!

Dave Gonshor, Robert Rosengarten, Larry Weide, Barney Wooters

Colorado Radio Collectors Antique Radio Club

Founded October 1988

Dedicated to the Preservation and Documentation of Wireless, Radio, Television and Associated equipment

MEETING LOCATION

Unless otherwise noted in this Journal, regular meetings are held on the second Sunday of every other month starting in January (except: 3rd Sunday in May) at 1:00PM at the **VectraBank Bank Building,** Community Room, 1380 South Federal Bl. A swapmeet follows the meeting in the parking area.

Calendar of 1997 CRC Events

Nov. 9th - Regular Meeting

Calendar of 1998 CRC Events

Jan. 11th - Regular Meeting

C.R.C. OFFICERS

President:
Neil Gallensky
Westminster (303) 466-0976

Vice President:
Tom Kelly
Boulder (303) 444-1837

Treasurer:
Dick Hagrman
Littleton (303) 794-6674

Flash Publisher:
Larry Weide
Englewood (303) 758-8382

CRC Archives:
Charles Brett
Colorado Springs (719) 495-8660

ALL DUES $12.00 ANNUALLY

(Joining dues prorated to June 1)
• Contact club for foreign rates •

Dick Hagrman
3429 W. Berry Pl.
Littleton, CO 80123
rhagrman@aol.com

WANT ADS and ARTICLES

Should be directed to;
Larry Weide
5270 E. Nassau Cir.
Englewood, CO 80110
lweide@ibm.net

ON THE AIR

Participation & Enthusiasm

by Dave Boyle, President - CRC

For those members and guests who were able to attend our annual auction I say "thanks". Thanks for all joining together to make this event another exciting and memorable occasion. I was particularly pleased on how everyone was apparently self-empowered to pitch in and help organize and carry off the whole experience. Over $4000 worth of radio and related item were sold. The proceeds will enhance our treasury by over $400. The operative words for this year's auction were *definitely* participation and enthusiasm.

Speaking of participation and enthusiasm; that's the juice or "electron flow" that continues to make our club thrive and move forward.

As my final message (do I hear applause?) special recognition and kudos to Larry Weide for his unending and creative work in the organizing, editing, and publishing of our "Flash!". This local journal is keeping us informed, educated and entertained to say nothing about earning the CRC some national attention.

I also extend my appreciation and thanks to all of you who helped us realize another successful radio club year. Now let's give Neil and Tom some of that same traditional "participation and enthusiasm" for the coming year. We all benefit in so many ways.

Dave Boyle

The CRC 1997 Auction Results

This way to the complete listing of items and prices ☞

The Colorado Radio Collectors Annual Auction - 1997 Results

by

Larry Weide, CRC Member

Well, that's more like it! Thanks to all of you out there, this year's auction was one of our all time best. I want to give particular thanks to, Dan Busetti, Dave Gonshor and Henry Lamb for the donation of the proceeds of the sale of their items to the CRC. And, I also want to thank all of those that worked so hard during the auction (Lord forgive me if I forgot someone!): Ken Kapelke, Bob Cofer, Jerry Tynan, David Boyle, Bob Stutzman, Barney Wooters, Mike McCutcheon and of course our auctioneer Jim Burleson.

Lot Description	Final Bid
Admiral 1938	70.00
Admiral 4220-D5	5.00
Admiral 5022	35.00
Admiral 5X11N	20.00
Admiral 6C229	15.00
Airline - bakelite, white	10.00
Airline 52-336	6.00
Airline 94HA-1562	15.00
Airline BR15421A	20.00
Airline, table radio	2.00
Atwater Kent 42 Pooley	150.00
Atwater Kent 30 and spkr	90.00
Atwater Kent 33	30.00
Atwater Kent 427	200.00
Atwater Kent 70	80.00
Atwater Kent F4 Speaker	75.00
Blabber Mouth novelty	12.50
Books	5.00
Box, Misc material	35.00
Box, Scanners	20.00
Burt 'n Ernie novelty	20.00
Cannon novelty	22.50
Cap Checker & Tubes	105.00
Cheese Burger novelty	12.50
Continental portable	7.50
Coronado 05RA2	12.50
Crosley, table radio	1.00
Day-Fan battery set	160.00
Delco 6010	3.00
Eico Grid Dip Meter	35.00
Emerson 695	20.00
Fischer AM/FM 8 track	20.00
French Fries novelty	25.00
Gas Pump novelty	37.50
GE 400	15.00
GE CLock 535	12.50
GE E91	135.00
GE table radio, wood	20.00
Globe novelty	35.00
Gloritone cathedral	210.00
Hallicrafter S-38, black	40.00
Hallicrafter S-38, grey	15.00
Hallicrafter S-53	40.00
Hickock Meter 209A	35.00
Hickock tube tester	15.00
Knight tube tester	12.50
Magnavox clock radio	15.00
Midwest chassis	1.00
Midwest chassis & speaker	6.00
Military BC348, ANFRR22	20.00
Misc.	15.00
Motorola 47D1	80.00
Motorola 5A74	12.50
Motorola 68X12	15.00
O'scope & Tubes	80.00

Orange novelty	5.00
Packard Bell 5R1	12.50
Philco 37-1505	180.00
Philco 40-95	2.00
Philco 42-842	15.00
Philco 46-1201	15.00
Philco 46-131	20.00
Philco 51-629	7.00
Philco AM/FM	10.00
Phonograph novelty	20.00
Precision power supply	45.00
Radiola 16 and Speaker	130.00
Radio Shack novelty	5.00
RCA 2XF92 & 66X11	30.00
RCA 65U radio/phono	22.50
RCA 6BX6	10.00
RCA Nipper work mat	30.00
RCA Radiola 18	100.00
RCA Radiola 33	17.50
RCA Radiola AR-812	20.00
RCA Tube Caddy	45.00
RCA WR59C sweep gen.	2.00
Realistic 150 SW	55.00
Realistic PR-01	5.00
Receiver/Spkr RME-45	65.00
Regency MRC33	5.00
RF Gen. URM25	40.00
Rider Manuals - qty 7	15.00
Scott chassis qty 2	50.00
Sentinal 338	20.00
Silvertone 101-609-74	35.00
Silvertone 7106	1.00
Silvertone portable	5.00
Silvertone wood qty 2	10.00
Skysox novelty	10.00
Staco 501 variac	45.00
Stewart Warner A6	50.00
Stewart Warner R-136A	120.00
Stewart Warner R-180A	40.00
Sylvania 541B clock radio	2.00
Table cabinet with spkr	50.00
Table radio	13.00
Tube Tester	12.50
TV Convert. & Schematics	15.00
TV Test Equipment - qty 4	17.50
UHF Converters - qty 2	5.00
Westinghouse H-165	2.00
Xtr Portables, qty 3	7.50
Zenith 3000	200.00
Zenith 7S634R	60.00
Zenith 808	5.00
Zenith R519R	5.00
Zenith R723	27.50
Zentih 8GP05YT	30.00
Zentih H724Z	20.00
Zentih H725	20.00

Collector Books for Sale

CRC and NARCC Members get specially reduced prices on popular collector books. ONLY NARCC and non-Front Range by mail.

**** This listing has been updated. Please discard previous Flash listings ****

	Retail	Club
ANTIQUE RADIOS, COLLECTOR'S GUIDE - 4th EDITION **Bunis, 1997 values, revised & updated, new photos, 248 pgs**	**$18.95**	**$14.00**
GUIDE TO OLD RADIOS, POINTERS... - 2rd EDITION **Johnson, 277 pages, 1995-96 prices**	**$19.95**	**$14.00**
ANTIQUE RADIO RESTORATION GUIDE - 2rd EDITION **Johnson, 144 pages, repairing, refinishing, cleaning**	**$14.95**	**$11.00**
RADIO & TELEVISION PRICE GUIDE - 2nd EDITION **Harry Poster, 1994 values, 195 pages, Years 1920 - 1990**	**$17.95**	**$13.00**
RADIO, EVOLUTION OF THE - VOLUME ONE **227 pages, 118 in color, More than 800 radios pictured and priced for 1992, picture from the collections of CRC members Jim Berg and Johnny Johnson**	**$22.95**	**$16.00**
RADIO, EVOLUTION OF THE - VOLUME TWO **All different from Volume One, 226 pages, Color, Radios of the 1920s - 1960s, with 93-94 values, pix from CRC member Jim Berg**	**$24.95**	**$17.00**
TRANSISTOR RADIOS, COLLECTOR'S GUIDE VOL II **Bunis, 1996 prices, Full Color**	**$16.95**	**$12.00**
TRANSISTOR RADIOS, COLLECTOR'S ENCYCLOPEDIA **Lane & Lane, 1994-95 prices, 168 pages, Photos, 2200 listings**	**$19.95**	**$14.00**
ZENITH TRANS-OCEANIC, ROYALITY OF RADIOS Bryant, **1995 Price Guide, 160 pages, History/Restoration, 100 Photos**	**$24.95**	**$17.00**
RADIOS BY HALLICRAFTERS **Dachis, 1996 values, 220 pages, 1000+ pics, id's, history**	**$29.95**	**$20.00**
CLASSIC TV'S, PRE-WAR THRU 1950'S **86 pages, color & b/w pics, descriptions, etc.**	**$18.95**	**$14.00**
Machine Age to Jet Age, Radiomania's Table Radio Guide I, '33-'59 **Stein, 255 pages, 100's photos**	**$24.95**	**$17.00**
Machine Age to Jet Age, Radiomania's Table Radio Guide 'II, 30-'59 **Stein, 358 pages, 100's photos**	**$28.95**	**$20.00**

NEBRASKA ANTIQUE RADIO COLLECTORS CLUB

N.A.R.C.C. OFFICERS

President:
Randy Buss
Kearney (308) 234-9483
Vice-President:
Vern Killion
Lexington (308) 324-2502
Secretary/Treasurer:
Steve Morton
North Platte (308) 534-4778

ALL DUES
$12.00
ANNUALLY
Mail to:
Steve Morton
905 West First
North Platte NE 69101

WANT ADS
and
ARTICLES

Should be directed to;

Steve Morton
905 West First
North Platte NE 69101

Nebraska Antique Radio Collectors Club

President's Column

by Vern Killion, NARCC Vice President

Hi club members,

Our auction was super! We even had several folks fly in for it. An engineer from HP flew in and bought the S-line twins. In all, the Collins stuff brought about 2/3 of current fair market value - not too bad for an auction in the boondocks.

This year's auction was held at the National Guard Armory. It worked out better then it would have had it been held at the KC hall as originally planned. We even had a covered drive-in loading area. This year's auction was the best ever. About 20% was NARCC items and 80% was HARA ham stuff. As usual, I sold some good stuff and bought some junk I don't need - Hi Hi!

All the NARCC members voted at the auction on what to do concerning a newsletter for the next year since dues for 1998 are now due. The members unanimously decided to go back to our own monthly news letter, and those that are interested will make their own arrangements (i.e. subscribe to the CRC) to get the "Flash". Most felt that this would result in higher attendance at our monthly meetings since notice of the next meeting would arrive a week before the next scheduled meeting. No one had any bad feelings about the "Flash", it was just felt we have a need for a pre-meeting notice to get everyone off their "duff" to attend the next meeting.

Or next meeting is scheduled (Wx permitting) at the KRVN 880 xmtr site, 5 miles NW of Holdrege, Neb. at 1300 on 10/28/97. Everyone is encouraged to bring a crystal set to demonstrate operation with NO antenna.

Vern

The One-Liner Contest Results

And the envelope please! The winner in the category of the best hint or tip contained in one syntactically correct statement, by simple majority vote, is....

Dave Boyle

#14

When buying old radios and paying by check keep your wife out of your face by simply entering 10% of the actual cost into the checkbook column – but just remember you did this!!

As you know, Dave will receive a free one year's membership in the CRC.

Congratulations Dave!

Hi fellow collectors!

How many of you are aware that the Web has a "ton" of information and material available on old time radio (OTR) broadcasts? Of course, this is the stuff that those Grande olde Dames of radio technology were designed to reproduce in the first place.

Rather than bore you with the URL's for more sites than you can shake a stick at, I'll give you a couple of pointers and that will lead you to scads of information.

Use your favorite search engine and look for "Old Time Radio".

If I would recommend one specific home page to look at it would be Lou Genco's site at; **http://www.old-time.com**

Here you'll find;

- Lend libraries and clubs for OTR programs, including Denver's own **Radio Historical Association of Colorado** with 15,000 titles. If you can handle a .dbf file you can even down-load their catalog.
- FAQ's for OTR
- Commercial tapes and other programming material for sale.
- On-line music and sound bites of famous radio themes - and references for loading the correct plug-ins if you need them.
- Shareware and freeware (catalogers, labelers, etc.)
- Links to various www and ftp sites
- Radio photographs and drawings

Enjoy!

The Right Tools For The Job

by Barney Wooters, CRC Member

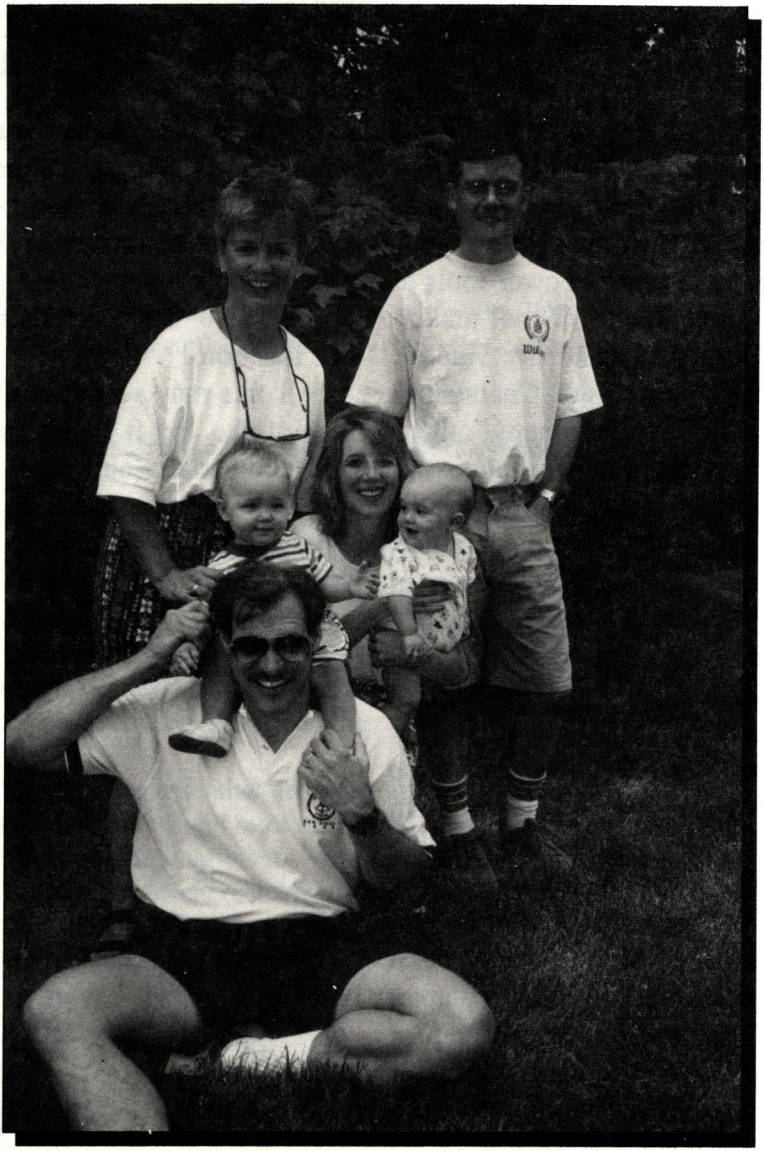
Having the right tools for any job is half the effort. I enjoy using a variety of hand tools almost every day in the work that I do. Just as owning a nice old radio can be a source of pleasure and pride, so does owning and using good quality hand tools - power tools as well. Some names of tool makers which come to mind are Xcelite, Kraeuter, Klein, Vaco, Channelock and Hunter among many others. Also, it is in your best interest to stay away from shoddy, low quality tools. With very little experience, you can tell by just looking at cheap pliers, screwdrivers, wrenches, etc. that quality was the last consideration. Remember that you usually get what you pay for.

Now that you have all these great tools, learn to use them properly. Don't use your adjustable wrench as a hammer and don't use your good screwdriver as a pry bar. Misuse of tools can even be a safety hazard. Trying to pry apart something with a screwdriver or striking some part with a hammer could result in eye injury from flying metal fragments.

Even good quality tools need periodic cleaning, re-shaping, wire-brushing and lubricating. Learn the right way to re-shape the blade tip of flat-blade screwdrivers, for example. Keep all adjustable tools such as wrenches, pliers and calipers free of dirt, grease and metal filings. You also might consider keeping all you tools together in a suitable tool box so that everything is in one location.

All this may seem simplistic to many folks, but it stands to reason that good tools (and other things) given proper care will last much longer than you might think. While you're at it, clean up that work bench too.

America's first couple (Bill and Hillary) are growing fast!



Some of the "big eaters" at the '97 CRC picnic; l. to r. - **Hillary** with Matt and Karen Lutkis, and **Bill** with Bill and Carolyn Hinkley

WD11 Tube Substitutions

by

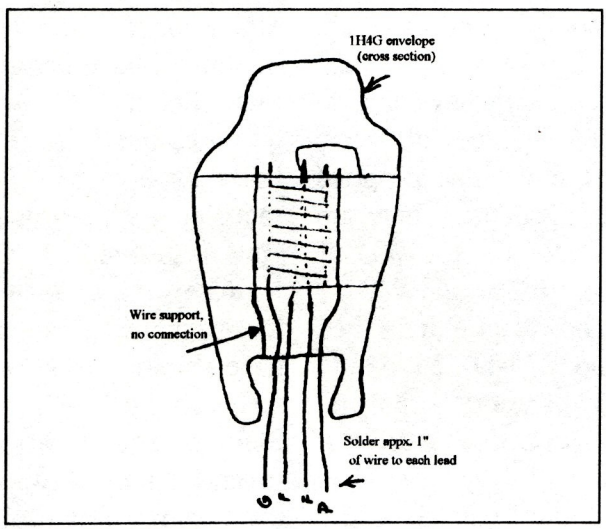
Bob Rosengarten - brose@erinet.com, Guest Author

After purchasing a very clean, but tubeless RCA Radiola III I eagerly dug into it hoping to hear it play. I have never been content to buy any radio without making it work. I realized I would need 2 WD-11 tubes to get music and news from my new acquisition. It did not take long to find these are not cheap tubes. No local collectors seemed to have any to part with. I learned of some through the internet but the price was too high. I learned there are several substitutes for the WD-11 but the problem is the odd WD-11 base with its one large pin. I then went after dud WD-11s and could not find any of those. Several collectors mentioned a source of WD-11 adapters, that being Mr. Jim Fred of Cutler, Indiana. There is an adapter he offers at a very good price that converts a WD-11 base to accept a 4-pin tubes such as an #864, #30 or an 01A.. I have had good results using #30 tubes powered by flashlight batteries in place of 01As in several older radios. The #30 looked like a good candidate for the Radiola III. The Radiola III uses two tubes that plug into sockets in a sort of well. The original WD 11s will protrude out of the top.

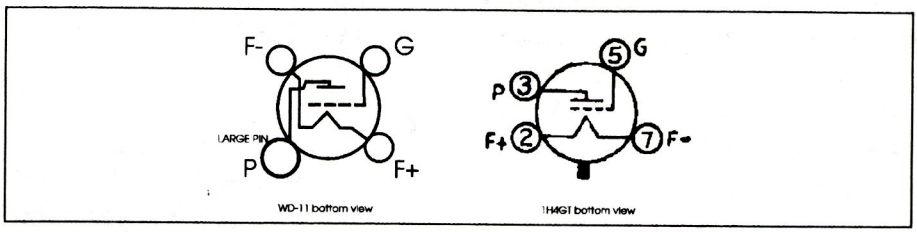
After checking on the adapters, I found Mr. Fred offers a plain WD-11 base (reproduction). I thought with this I could actually "make" a direct WD-11 replacement. I looked at the options. I have heard of collectors that altered #199 tubes for this purpose, but I found them to be fairly expensive. The thought of sacrificing a working #199 did not appeal to me. I thought about taking apart a #30 but I hated again to dismantle a working tube. I have used #30s in place of series-strung 199s in a 1927 Steinite and have powered up several battery Atwater Kent sets I own, using a few flashlight cells to light the tubes. (Atwater Kent did make a dry-cell type of set called the Model 21). I had happened to purchase a handful of 1H4G tubes at a good price from another collector. This is the octal equivalent of the #30 and can generally be found a bit cheaper than its predecessor #30. I decided

to see if I could dismantle a 1H4G and graft it to a WD-11 base.

The first thing to do is break the cement bond between the base and the envelope. I grasped the base in one hand and the envelope in the other and very gently twisted. The cement "gave" with little effort. Then I heated the prongs (2,3,5,7 on the 1H4G) with a soldering gun to dislodge the tube leads. As you do this continuing to twist the tube envelope will eventually dislodge the wires. Soldering wick may help suck the solder out, but I did not try it. Once the envelope pulled free of the base I arranged the appropriate leads on the 1H4G to correspond with the WD-11 base prongs. I found the 1H4G leads are a tad short and will not bottom out in the WD-11 base. I was warned by Mr. Fred that the reproduction base is made of Delrin plastic and has a low melting point. It will not take the heat of soldering like a production tube base. He said it is necessary to solder with a 40 watt or less iron and to use a large (2") alligator clip as a heat sink. To alleviate the short lead problem, I soldered extra wire on to the 1H4G leads. I carefully scraped the leads bright to make sure they took solder and would make a reliable connection. With this done I test-fitted the 1H4G in the WD-11 base. The taper of the "ST" envelope seemed to fit like the original 1H4G base. I next checked the continuity of the tube with a VOM to make sure I did not have any of the leads shorted. You should see roughly 10 ohms across the filament and of course no continuity between filament and plate or grid. If you do see continuity from the plate or grid to anything your wires may have touched and you will be in trouble if you try to fire it up. As an afterthought, insulating "spaghetti" would prevent this. Once I got the leads in place I cemented the envelopes into the bases. On one I used a craft-type



glue called "Tacky Glue". On the other I tried household cement. I held the base in place with 2 crossed rubber bands wound around the bottom of the base and over the top of the tube. I have been told you can resurrect the old cement with denatured alcohol, but I didn't try it, mainly because I did not have any. I soldered the prongs after the cement had dried, again checking the prongs with a VOM before soldering. I used a 25 watt iron and found even it would quickly soften the WD-11 base using the prescribed heat sink. The trick is to quit just as soon as you have a decent joint. When it cools, snip off the left over wire coming out of the prongs.



I am guilty of keeping a messy bench with too many projects and too many wires. Due to carelessness I promptly smoked one of my "new" tubes by bumping the filament with 27 volts and had to make another. Glad it wasn't an original!! Since I only had the one tube, I went ahead and ran the radio with just the detector circuit. It came to life right away. The performance was similar to other regenerative sets I'd experienced. The Radiola III tunes and controls regeneration with two varicouplers, and fixed capacitance. With some practice I could tune in all the local stations and even some of the weaker ones a TRF might miss. At night it was able to pick up about anything on the air. Once I competed the other tube and was able to use the audio amp, it made quite a difference in volume. It powered headphones well but didn't do much with a speaker. I don't think the Radiola III was used with a speaker that much. Possibly a higher "B" voltage for the audio amp and substituting a #31 tube for the output may help, but running the output of the Radiola III through a separate audio amp. will drive a speaker if you want to demonstrate the radio to your friends.

The only thing that does not seem to work as the original setup is the rheostat. This is because of the current drain differences between WD-11s and #30s. I do not get any volume control with

my arrangement. Possibly a resistor in series would afford more control.

I play the radio on flashlight batteries for the filament supply and 9 volt transistor radio batteries strung in series as the "B" supply. For "B" voltages I have been running the detector on 27 volts and the audio amp. on 45 volts.

One thing that was broken on the original radio were the tube socket supports. The originals seemed to be rubber straps woven through the socket platform and clamped under metal clamps. I believe these were shock mounts to suppress microphonic characteristics of the tubes. I tried replacing the straps with leather shoe lacing I had laying around. They seem to work well.

I would be pleased to hear from anybody that had tried similar experiments. I like to find the "fixer-upper" kinds of sets not only for their obvious "fixer-upper" prices, but for the fun and challenge of bringing them back to life. I have this radio at my workbench in the basement and can't seem to help firing it up every time I pass by!

Bob Rosengarten
1448 Lebanon Road
Clarksville OH 45113-9711

Those Nasty Philcos

by Dave Gonshor, CRC Member

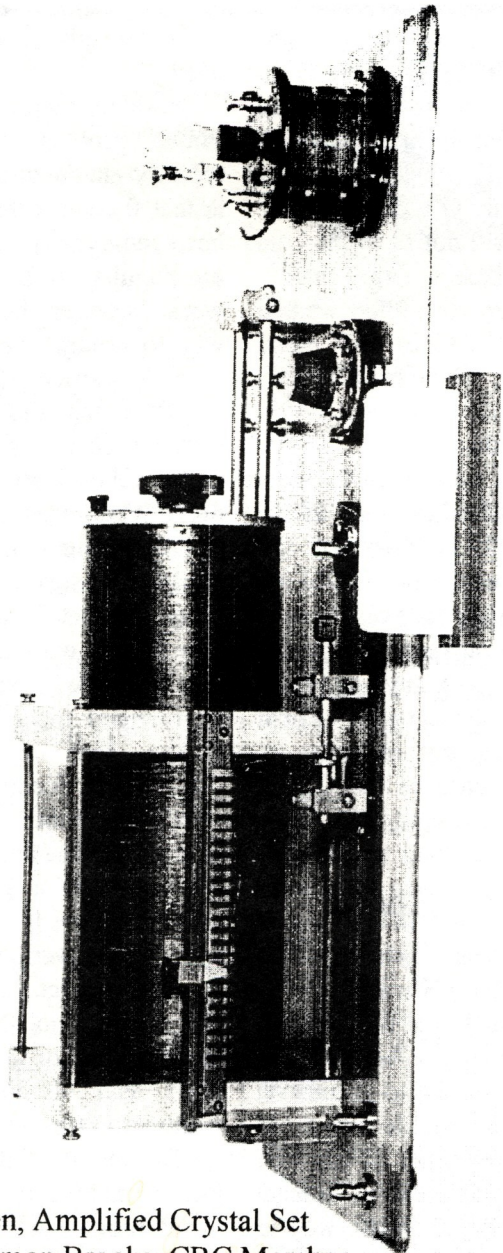
Late 1930's Philco radios have tube shield bases with an inner hole to allow the tube base to engage the socket, and an outer lip to engage with the tube shield. The inner hole was sized to accept only G type tubes. GT and metal tubes will not fit in the hole because the tube base is larger than G type tubes. Apparently Philco wanted to standardize glass tubes over metal tubes. However, when smaller glass GT tubes came out they wouldn't fit into the sockets either.

The trouble is tube manufacturers stopped making G tubes, such as the 6K7G and 6A8G, in favor of GT tubes. So replacement tubes would not fit in late 30's Philco radios. These G tubes continue to be scarce and more expensive today. Many of these Philcos have the tube shield receptacles hogged out in order to accept the larger base of the GT or metal tubes. This is usually OK when using a GT tube, as long as the tube shield is still used. It also may work (but not always - see below) for a metal tube. The reason why a shield must still be used for a metal tube is that the metal shell of the tube is connected to pin 1, which was intended to be connected to ground on the tube socket. The trouble with those nasty Philcos is that pin 1 of the tube socket had no receptacle to engage with the pin, and there was no way to ground the shell of the tube. Hence, the outer tube shield still had to be used.

Another attempted remedy for this Philco problem, which the author recently encountered in a model 38-7, is that the entire tube shield base had been removed, presumably to allow a metal tube to be used. This didn't work, however, because there was no way to ground the shell of the metal tube. In particular, a 6K7 (metal) IF amplifier stage did not work at all. The author used an oscilloscope to find a high level oscillation at the plate of the 6K7. When a jumper cable was used to ground pin 1 of the tube, the stage worked! However, placing a grounded metal shield over the metal tube did not work. My guess is that the interelectrode capacitance of an ungrounded metal tube are so much greater than a glass tube that regenerative feedback was occurring within the tube, and grounding the tube shell is the only way to stop it. As it turns out, a glass tube (6K7G) inserted in the IF tube socket worked just fine, even without a shield! Another problem is that the grid leads are usually too short to engage the shorter metal or GT tubes. These grid leads can usually be lengthened without too much trouble.

The moral of the story is: If your Philco has been modified to use GT or metal tubes, look out for problems! Also, save those G tubes for your Philcos.

Radio of the Month



1916 Klitzen, Amplified Crystal Set
Owned by Leamon Brooks, CRC Member

Care And Feeding Of Old Tubes

by

Larry Weide, CRC Member

In keeping with the theme of this month's Flash, I thought it might be useful to re-publish an article that we did about four years ago concerning what can be done to rescue some of your old tubes. Let's say you've managed to acquire a really great old radio or two, or perhaps you've picked up some old tubes at a swap-meet. In any case, it's a good bet some of these tubes are going to have problems (which may be the reason why the old radio was put on the shelf and forgotten - until you came along!!). However, it's also a good bet that with a little patience and work, some of these problems can be overcome.

Filament Rejuvenation:

Although many things can go wrong with an electron tube, the most typical failure is an open filament or the filament's electron emission has weakened beyond usefulness. In the early days the filament was used as the actual electron source, whereas most modern tubes use the cathode element for the electron source and the filament is used as a "heater" - a common filament synonym. Of course an open filament means you've just became the proud owner of a new oddly shaped fishing float. However, with certain older tubes there is hope for a "weak" filament.

Fairly early in the tube design process it was discovered that the oxides of certain rare-earth elements were efficient producers of electrons when heated. Unfortunately these compounds are neither good conductors of electricity nor particularly strong physically. Consequently they were used as coatings on Tungsten filaments. This coating practice is also used on modern cathode equipped tubes. However, it turns out there were a few tube types that used filaments that had the electron producing material, Thorium, actually imbedded in the Tungsten as well as being used as a coating. Impregnated Tungsten was known as Thorated Tungsten. It's this type of tube filament that has a chance to be rejuvenated by a technique known as "Flashing". Fortunately, this group of tubes include the ubiquitous 01A.

The flashing process consists of two steps. First there is a relatively high "flash" voltage application to the filament, then a lower "aging" voltage is applied - each for a specific voltage and time duration depending on the tube type. Fig. 1 is a chart showing the voltage and duration values for each tube capable of using this process. Be VERY careful to note the tube types that CANNOT use the flashing process and, in fact, may be damaged by it's use.

You might be interested to know this technique was worked out many years ago in the labs of RCA.

Before you get "flash happy", you're going to want to make sure the tube you're about to flash REALLY needs it. Flashing a good tube will materially reduce it's remaining useful life. So, run your suspect tube through it's paces on a tube tester first. In this case we're only interested in filament emission values. Figure 2 is emission test data to provide minimum guidelines for determining if a tube has impaired filament emission. Although you could use this information in lieu of access to a tube tester, note that Fig. 2 is unfortunately not as complete as Fig. 1. If you use the Fig. 2 data in a simple hook-up, remember to tie the grid to the plate first as if the tube were a diode.

O.K.., now it's time to flash! It's unimportant if the flash voltage is AC or DC. Perhaps the easiest source of an adjustable voltage would be your tube tester. Just make sure that if you do use a tube tester DO NOT press any test buttons, as flashing must be done without any plate current flowing. Other voltage sources might be a Variac (a continuously adjustable transformer), or a variable DC power supply. In any case, your voltage supply should be capable of 2 - 3 times the normal filament current draw for the tube being flashed. Using Fig. 1, simply apply the flashing voltage, then apply the aging voltage. The object of this process is to drive whatever Thorium is left in the Tungsten to the surface as a replenishing oxide. Be aware that the actual results you get will be dependent on the individual tube and it's condition prior to flashing.

TUBE REACTIVATION CHART - FIG. 1

Tube Type	Flashing Voltage (Volts)	Flashing Time (Seconds)	Aging Voltage (Volts)	Aging Time (Minutes)
'99	12	10	4	30
'20	12	10	4	30
'22	12	10	4	30
'01A	16	10	7	30
'00A	16	10	7	30
'40	16	10	7	30
'71	16	10	7	30
'10	16	10	9	30

NOTE: TUBES THAT CANNOT BE FLASHED:
'11, '12, '00, '26, '27, '45, '50, '80, '81, '71A

EMISSION TEST DATA - FIG 2

Tube Type	Filament Voltage (Volts)	Plate Voltage (Volts)	Minimum Current (Ma)
'99	1.1	50	6
'20	2.2	50	15
'01A	5	50	20
'00A	5	50	14
'40	5	50	14

Loose Tube Wires:

Another problem with many an old tube types is that a lead wire becomes disconnected from it's base pin. The most probable reason for this is poor or incomplete solder tinning of a lead wire and/or it's pin. After time, corrosion, arcing or thermal stress can cause the lead wire to separate Sometimes the relatively heavy current draw of the filament will fracture a poor solder connection and, as it turns out, this is the most common failure mode.

A tube that tests as totally dead, or there's no control when the test grid bias is changed, is the clue for a loose wire. However, an open filament is really the most likely cause of a dead tube. You could start with a conservative repair approach by placing the tube in a clamp of some sort, with the pins pointed downward, and try to re-sweat (re-solder) the wires to the pins - starting with and testing the filament pins first. The problem here is that the wire or pin may be corroded, the wire is too short or the wire is actually broken. If you still suspect a loose wire you'll need to remove the Bakelite base of the tube in order to inspect and repair it.

First you will need to disconnect all the wires from the pins by heating each pin with your soldering iron and sucking or wicking out the solder with an appropriate tool. Next, the tube base is removed by softening the base cement with Iso-propyl alcohol. Brush the alcohol liberally around the base of the tube, held in an upright position, keeping the cement wet until gentle twisting and pulling will allow the base to pull away from the tube.

Now you can make a final check on the filament with an ohmmeter. If you've found the problem was a loose wire then begin reassembly by making sure each wire is tinned and straight. If a wire is broken or too short then solder on an extension. Make the splice close to the tube to allow for as much distance as possible between the solder splice and the re-soldered wire/pin joint. Also, do your best to see that the inside tips of the pins are as clean and tinnable as possible. You can use the old cement, while it's still soft and tacky, to re-attach

the base after you've made the repair. After you've made sure that the old cement is very soft and in position to "squish" against the tube glass, slide the base back onto the wires and press the base back into place against the tube. Be careful not to disturb the glued base as you begin to re-solder the wires.

When re-soldering the wires, try to get some of the solder to tin around the outside bottom of the pins - just enough to "catch" the pin were you know it's clean, but not so much that it would obstruct the pin from entering the tube socket. One of our members told me that there was a tool available, at one time, that would neatly cut out a small section of the bottom of a tube pin so that you could more efficiently make such a repair.

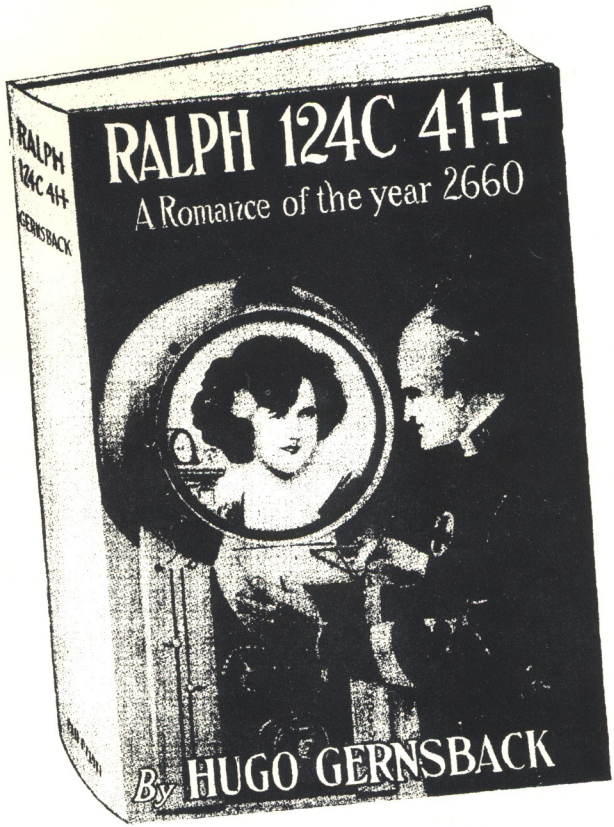
Miscellaneous Problems:

I've had some luck with tubes that have had the grid cap wire break off by "nipping" away a little of the glass around the stub of wire left at the top of the tube - just enough to solder on an extension wire, but not so much that the glass fractures. Make this extension wire flexible and have it be long enough to solder into the grid cap and still have room to work on the stub. After soldering you can use the old cap cement as above, or you can use a little epoxy to replace the cap.

An old timer, that one of our members knew, use to re-align the element stacks that had gotten out of line inside some older tubes by carefully nesting the tube within the grasp of his hand and hitting the heel of his hand against his thigh (ouch!).

You might have run into hum problems that any tube can have, but were particularly troublesome in quite a few 6xx tubes of the 1930's (6F6, 6D6, etc.). This is usually caused by inter-element high resistance shorts - most often between the filament and cathode. This type of short is usually at it's worst when the tube is cold, and can be measured with an ohmmeter. Using a tube base diagram, measure from each element to all the others. Typical shorts, that cause hum, measure from around 500K to about 2M. If you find one don't throw the tube away just yet - particularly if you don't have a replacement. Sometimes the short gets "better" after the tube warms up, and/or it may work suitably in another radio.

Maybe this is old news, but a good way to identify a tube, whose number has faded away, is to fog it with your breath as you would when cleaning your eye glasses. Then, hold the tube up to the light to catch the faint image in the moisture. The glass needs to be as clean as possible for this technique to work well, BUT you don't want to use anything but a very gentle DRY wiping to clean the surface. One collector I know puts his tubes in the freezer as method of invoking the moisture. Once you've found the tube type mark it on the base with a scribe. Good luck in saving another one!



Against an amazing background of mechanical electrical and chemically altered life of mankind there is set a brilliant and colorful romance in the life of the greatest living scientist of that age.

Ralph's love for the beautiful stranger, his conquest of his rival and the worsting of the great saturnine Martian, culminating in a running fight in space with tragedy and terror conquered by almost unbelievable and incredible weapons, make one of the most interesting and gripping stories ever told.

700 YEARS HENCE

Radio News - December, 1925

The Open Trunk

4 Sale:

- Reproduction Philco Cathedral cabinet parts. Front panels, rear arches, bottom moulding. Grandfather clock finials, colonial clock top trim and finials. Reproduction 90 cabinets. Other needs such as other style mouldings from your sample. Inquire.

  Dick Oliver, Antique Radio Svc.
  28604 Schwalm Dr.
  Elkhart IN 46517
  (219)522-4516

- Reproduction lid tags with warranty card for the Crosley 51, 51P 51E and 51SD... $4.00 each. When requesting one, please send the serial number of the set.

  Bob Jensen
  420 Grand Avenue
  Alliance, NE 69301
  (308)762-7391

- Copper rod, save $$$$$$, several diameters available to make your own soldering iron tips. (or I can for you).

  Radio repair and restoration service.

  David Boyle
  1058 Colt Cir.
  Castle Rock CO 80104
  (303)681-3258

Wanted:

- Cabinet for an Atwater Kent 36

  Doug McDowell
  (303)794-9047
  dmcdmail@concentric.net

Mts. 'N' Plains Radio Collector's Association
CRC/NARCC
5270 E. Nassau Clr.
Englewood CO 80110

FIRST CLASS