NZVRS BULLETIN

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Competition Winner AGM 2016
Peter Lankshear's Simple Set

NEW ZEALAND VINTAGE RADIO SOCIETY INC.

A non-profit organisation devoted to the preservation of early radio equipment and associated historical information.

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NZVRS LIBRARY
The NZVRS librarian is Bruce Churcher. Requests may be sent to the NZVRS Library, PO Box 13873, Onehunga, AK 1643
or Email: library@nzvrs.pl.net

THE NZVRS BULLETIN is a membership magazine for members only, published approximately quarterly. Contributions are always welcome. Any opinions expressed by writers are theirs and not necessarily those of the Society. Any feedback, contributions, letters, suggestions etc can be sent to:

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ASB Bank account 12 3067 0168223 00

A Calendar of Events is listed on our website at **www.nzvrs.pl.net/aaa/calendar The AGM is usually in July.**

AUCKLAND MEETINGS are held at the Horticultural Society Hall, **990 Great North Road** (opposite Motions Road.) Western Springs, on the **third Monday** of each month from 7.30pm.
Dec: Monday 19 – Last Auction Nite.
Jan: Monday 16 – HMV Radio
Feb: Monday 20 – Auction Nite.
Mar: Monday 20 – Telephones!

TARANAKI AREA MEETINGS are held on the second Sunday in even months. Visitors most welcome; contact either Bill Campbell, Phone 06-753 2475 or Graeme Lea, Phone 06-758 5344

WELLINGTON MEETINGS are held typically from 1.30pm the second Sunday of every month at the Petone Community House, 6 Britannia Street, Petone. Contact: Tony Humphris Phone (04) 298 1550. Email: zl2amz@nzart.org.nz

CHRISTCHURCH MEETINGS are held on the first Thursday of odd months (not January) 7.30pm at the NZART Branch 05 Clubrooms, 5 Idris Rd, Fendalton.
For further details contact John Dodgshun, 12 Natalie Place, Christchurch 8051. Phone: (03) 355 5308
Email: dodgshun@ihug.co.nz

SUBSCRIPTIONS:
The subscription year is a calendar year (1 January - 31 Dec). Subscription renewals are sent in the year end Bulletin. The NZ Rate is $30, with an early-bird renewal reduction. An email E-version bulletin is available at the world-wide rate of NZ $20. An email is sent with a link to the latest issue. Please note that these files are usually about 20 Megs to download.

EDITORIAL

This bulletin seems to have had the gestation period of two larger elephants; however with the help of some excellent contributions I hope you will enjoy the read. The editor of course is always appreciative of printable items, offerings of material and suggestions of subject themes etc. As you may notice this is a double issue and I hope you appreciate its thickness! It almost seems worth considering an annual bulletin by the rate they seem to be churned out! Even at best I do not see quarterly bulletins continuing to be the norm unless we can find another editor, three issues per subscription year may be do-able with considerable help from you. Radio Bygones I notice has already gone this way.

As a small inducement for you to dub up with dues again for this coming year we have included a calendar and of course offer the renewal rate rebate if paid subscriptions are paid before 15 March 2017.

It has been a bit tough for editors this year with the noted departures from this world of Geoff Arnold (former editor of Practical Wireless, Television, Everyday Electronics and founder of Radio Bygones) and Hank Tarfman (editor of the Southern California Antique Radio Society magazine The SCARS Gazette). Hank was a real nice guy and requested a number of reprints of NZVRS bulletin items – after generous complements of course! Hank became a personal member of the NZVRS after receiving an exchange copy (SCARS reciprocal copy) for some years.

On a similar note we have lost our committee member and librarian Ross Paton – a tribute appears within. Also, we note with concern that former treasurer Bryan Marsh is now in a private hospital after health issues. His wife Betty has died and their former home on Rimu Rd has been sold. Paul Woodcock our hardworking secretary has been under the knife recently and begins a recovery process at home. The July AGM saw no changes to the committee but two Life Memberships were awarded – one to Gerry Billman and the other posthumously to Ross Paton who had died the week before. These awards had been nominated and agreed upon at the previous November committee meeting and it was a little unfortunate that Ross could not accept his in person - however it was presented to his family after the funeral. They seemed very appreciative in their card sent a few weeks later. A late note is the generous donation of an Edison phonograph to the Society, on the condition it is not onward sold on e-auction sites. This will appear on the Dec 19 Auckland Final Auction Night, along with a wide selection of NOS valves. See the item near the end of the bulletin.

Season's felicitations to all and take care.

Cheers, David

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Obituary: Ross Graham Paton 1942 ~ 14 July 2016

Ross was the Paton family first born in Orakei, Auckland, in 1942. He attended Kohimarama Primary School and was later a founding pupil of Selwyn College. A non-sporting child but with frequent trips to the local tip and roadsides scavenging for "recovery activities". An avid collector of valves and other stuff, and a motorcyclist in his youth.

Work history:

- First job was with Waldo Hunter Auckland
- Went to the UK in mid 1960's – Liberty Fabric House of London
- 1968 George Courts K Road – inventory & stores person
- With Bruce Churcher at Philips Hobson Street
- Philips 1975 + 25 years and redundant in 2000

Ross had a legendary memory for recalling the 12 digit parts numbers of the Philips catalogued items. Ross contributed to several UK magazines with comments on valves, substitutions and general design comments. These included the Radiophile and the Eddystone Users Group publications. Ross was a Foundation member of the NZVRS with 37 years continuous membership and a current committee member. Ironically he was nominated for life membership but died just a week before the AGM where it was posthumously ratified by the attendees. His life membership certificate was given to his family.

Time was irrelevant to Ross, he looked old before his time commented his sister – perhaps because of this facial hair and beard, but also because Ross was notorious for never being ready on time, no matter what had been prearranged.

Philips reunion 2005. Ross with Sheryl Green (Now F & P) was Customer Service Manager, Spares, under her control. Photo from Graham Street

I was with Philips 15 years and first met Ross when we moved into 2 Wagener Place, St Lukes and even after I transferred to head office in Wellington, enjoyed catching up with him during my regular visits back north. I retired at the end of 2007 and since 2009 have been a regular contributor to Wares Magazine, the appliance industry 'Bible'. Another colleague from those days, Tony Chandler has also died and I'm putting together a few paragraphs to mark the passing of both men…. Merv Robertson

What sad news. I had known Ross through the society for many years, he was always generous with his time and help and a fount of knowledge on all the Philips and Mullard gear in particular. I found some old side contact valves while I was having a clear out just last week and remembered how Ross had found me some for an early Philips I had to restore. We have all lost a bastion of the society and a good friend. He really will be missed. Unfortunately I won't be able to attend his funeral but I will offer some Mead in his memory. Farewell Ross! Regards Clifford Wright, Helensville.

Doug Edgar & I caught up with this very sad news from Gerry, at his place yesterday, when I presented Gerry with a rare Jackson Bell "Swan" Cathedral for his kindness, time and expertise in 'all things Transformer and Coil' on behalf of Doug and I.
Ross was a part of all of us David, and personally, a man who I got to know and respect from the time I first met him - which was my 1st NZVRS meeting on the floor of Johns shop, sitting on cushions—May 1980. I will miss him. Sadly, I cannot make the funeral. Kind Regards, Mark Thomson

Ross on the occasion of receiving his 15 years service award at Philips

At Ross's funeral NZVRS Committee Member and Librarian Bruce Churcher had these words to say:

"Ross was a foundation member of the Vintage Radio Society and a stalwart supporter of the Society. He was a member of the library team. In other words, vintage radio was a large part of Ross's life – but this does not convey the man he was, so I will talk a little about my experiences with him.

I trained as a Radio/TV serviceman in the Philips consumer products workshop, starting at Hobson Street, Auckland. I knew Ross as a storeman, serving on the parts counter, attending to public and trade customers, as well as we technicians. He was knowledgeable and astonished everyone with his ability to remember part numbers – these became 12 digit codes with computerisation.

I left after 11 years but again made contact 18 years ago when I became interested in vintage radio and joined the Society. With my background it was natural all things Philips related would become my special area of interest and of course I shared this with Ross. While I was familiar with post WWII sets and techniques, Ross was the font of knowledge of early radios – the then new, mysterious world of P-based valves and Superinductance. We also shared an interest in communications receivers, both having started short-wave listening on domestic radios with all their limitations. He was especially keen on the British Eddystone sets, but also had Murphy, Hallicrafters, Hammarlund, Trio, Racal, Philips and many more varieties.

I gradually learned more about Ross. He usually had a couple of library books on the go at any one time. He subscribed to the Listener and daily newspaper. These must have all contributed to his extensive general knowledge and made him opinionated on many matters. He sometimes contributed to Max Cryer's Saturday morning program on Radio NZ National.

His technical knowledge also came mainly from his extensive reading. The Society Library received periodicals from America, England, Australia and Holland – all fuel to his enquiring mind. Self taught he became competent in repairing valve radios. There was a story of a Collins communications receiver that had never quite worked as expected and Ross traced the elusive bias fault to a capacitor fitted in reverse – at the factory. Well done Ross!

From time to time we would catch up with a phone call, talking of recent repairs, ask about each other's cats and enjoying some Goon Show humour. I recall speaking about working on a ham transceiver; "What was the RF stage used in that?" He asked. "A 6BZ6" I replied. "Not a bad bottle" he commented, "but a popular mod is to fit a frame-grid valve" I replied. So we discussed the pros and cons of this modification. He was quite capable of speaking of the nuances of such technicalities. Ross seemed to have a vast knowledge of radio valves – not only their function but also their manufacture and possible re-branding that occurred in the trade.

Since we were in adjacent suburbs, it was easy for me to collect him on the times I attended ham radio market days. Hamilton, Cambridge and Whangarei we regularly attended. These were the pre-TradeMe days when a lot of gear changed hands. He liked to stay until the end and get boxes of miscellaneous items cheaply. He said he always found something useful in them. His Babani Valve Equivalents Manual was tucked in his pocket to help identify valves for his stock. Sometimes on these days Ross was approached by people who remembered him from his time at Philips and I still find library material with a label "Supplied with the complements of Philips, from Ross Paton.

He was never concerned with the appearances of his radios – this was a mere cosmetic detail. It was how well they worked that mattered. This extended to his cars where rust or large areas of paint primer were OK. He liked to wear things out and recycle items. He was in his element when an inorganic rubbish collection was in progress. There were stories of dismantling parts from TV sets and radiograms at the kerbside. In conversation he would often mention this or that set was found in these collections.

When Ernie, our Society Librarian, passed away David suggested Ross could take over "Library Duties" with my help. We needed to provide email service so I became the internet connection, although I was (and still am) a novice at computing. The library hard copy collection was not really accessible and Ian loaned some circuit files (ex John Stokes) while Ross had his own collection of data. So we searched and supplied what we could to fulfil requests for service data and circuits. When I came to a dead end, Ross was the one to consult. He instantly knew that the HMV 471 was a British made export model for the NZ market.
Sometimes he phoned people in the North or South Island to clarify some point or get more information (especially if they had done a bulletin item) such was his curiosity.
When I first came across the English magazine called "The Radiophile" I was surprised to find it contained a regular column from Ross – their NZ contributor. In his own rambling conversational style he wrote of his experiences with sets other authors had restored and his own work bench issues. *[Similarly The Eddystone Users Group newsletter. Ed]*
After a fall and hospital stay, a small team set about a tidy-up to give better access in his home unit. Our next meeting was an auction night and as often happens, a couple of unwanted donated items were left and David dropped then into the rubbish bin prior to locking up at the end of the evening. Ross meanwhile scavenged in the bin and extracted an English Kolster-Brandes chassis. I was thinking "Please Ross you don't need that!" when to my relief he dropped it back into the bin. He turned to say "I just wanted to check on the tuning capacitor they used – it's cheap fibre board insulation, not high quality ceramic!" Such was his attention to detail.
When we last spoke on the phone, 3-4 weeks ago, he raised the subject of the first Philips radio to use a ferrite rod aerial. He had yet to get one going and was curious how well they worked. So there was still unfinished business with Ross.
Sadly, he aged quickly and with a Parkinson's diagnosis, health issues dominated his life and things were only going to get worse. In his own way, he had a full life.
So finally I will say "Goodbye Ross". I will miss your knowledge and friendship."

Our Ross in woolly hat (slightly obscured by boxes), assisted by our President in sorting our Library material on its relocation to storage.

1996 NZVRS Conference. Ernie Hakanson, Ross Paton, Grahame Lyndsey, Bob Cook (rear view) and Reg Motion.

Finally a shot of Ross at a Philip's Social function – bygones, like when brown liquor in larger bottles was still permitted to be served to employees!

SOME TIPS ON RESTORING PHILIPS RADIOS

By Ross Paton reprinted from NZVRS Bulletin Volume 6 number 4 February 1986.

Some people, I'm led to believe, upon removing the back cover from a Philips radio of the mid to late 1930s and upon seeing the rat's nest of yellow rubber covered wires - mentally cringe. Well, you need not do so if you work on the chassis methodically:

Firstly, to deal with the rubber covered wire. The only practicable way is to do each wire one at a time, either putting in a new piece or by unsoldering one end, removing the insulation and slipping a piece of spaghetti sleeving over it. In cases where wires with spiral metal shielding are encountered the spiral strip can be unwound after unsoldering one end and then rewound on to the new length of wire. This is easier to do than it looks, though it is rather time consuming. Do not be tempted to use unshielded wire, even where it is used between output valve and output transformer, as instability will result.

I have found that it generally pays to replace all the tubular black pitch encased bypass and coupling capacitors if any of the originals remain. Most screen bypasses are 0.1 uF and AVC bypasses 0.05 uF. Coupling capacitors vary in size and it pays to have the schematic diagram for the particular model on hand.

Always check the filter capacitors before applying any power to the set. Most of the Philips sets of this era used electros of only 320-volts working, which doesn't leave much safety margin. The old cans can be emptied out and new capacitors put inside, or the old ones left on the chassis and disconnected underneath with new wired in separately. It is also essential to replace the 0.02 uF capacitor wired across one half of the high voltage secondary of the power transformer. The replacement must be able to handle 250 Volts RMS and should have a DC rating of 1500 volts or higher.

It also pays to replace the original power cord on these sets if it hasn't already been done, as the rubber insulation under the black cotton covering is usually badly perished.

Often the volume control potentiometer is badly worn and consequently very scratchy. As the original controls are no longer available a replacement will entail adapting a standard pot and fitting a new mounting bracket where necessary. There is also the differences in shaft diameters to contend with.

Poor contacts between valve and socket is, regrettably, a common problem with the side contact series of valves. About all that can be done is to ensure that both the valve contacts and the socket contacts are clean and that there is adequate tension on the latter. It is also important that the connection between coating of any metal sprayed valves and the connecting wire is good, especially with valves in the IF stage.

Another thing to check is resistors used for voltage dropping purposes, e.g. in screen feed circuits.

If you own a “Theatrette” and the dial cord breaks don't despair. The cord can fairly easily be replaced if you remove the screws that hold the bottom plate of the cabinet and then unsolder the wire strut that goes between power inlet plug bracket and the dial pointer bracket. The complete assembly should come away a few inches, though you may have to unsolder the odd wire or two. Then the celluloid light diffuser plate underneath the dial scale is removed by slackening off the two screws that secure it which will leave the dial cord path quite accessible. There has been some speculation recently about how the Theatrette was put together. Well, in my opinion, all of the components and wiring were assembled in the form of a loom, just like the wiring for a car, and then dropped into the cabinet, joined up and fastened down. When one inspects a Theatrette closely there doesn't appear to be any other way of doing the job efficiently and easily, other than the method just described.

Correspondence, feedback etc.

Dear David, Thanks for the recent bulletin. This has prompted me to write the following letter: After reading the pages by Trade-me-Triode I remembered that the triode is supposed to be a low noise tube. Unfortunately this one has a rather high level of extraneous noise and I would ask our editor if he could connect some sort of filter circuit at the input in order to improve the signal to noise ratio, or in other words that the noise level be reduced so that we can hear (or see) more of the actual signal with less interference (QRM). One solution might be to fit a new tube, but the exiting one appears to be working OK provided that the noise level can be reduced. I have had a few comments to the effect that the noise level is a bit too high for a publication that is representing our society overseas.
Signed *Phil the Philterer*

Ed responds: Phil, what sort of filter would you be thinking of; a high cut perhaps works best with hiss or thermal type noise but my ears cut off on anything over 7 kHz anyway so I don't really hear it. A low cut could perhaps be applied to cut out the rumble but then if I applied it to one item perhaps it should be applied overall?

Other reader feedback: Hi Ed, Great to get a new bulletin. Great range of "stuff"; interesting Butement item and of course another entertaining missive from Trade Me Triode. Keep up the good work. BC

Trade Me Triode replies:
Dear Ed, "The Triode" was delighted to receive Feedback from our readers. "BC" Thank you for your complimentary letter to the Editor — he does do a superb job doesn't he! *[Some say a little sluggish! Ed.]* I'm glad you were entertained by Mr Triode's report last Bulletin, that is absolutely our aim! "Phil", thank you for your letter also. You are of course, quite correct, regarding the "extraneous" noise and the need to connect "some sort of filter at the input stage, in order to improve the signal to noise ratio". Please understand that it is only because of the marvellous "Long Path Propagation" into the realms of; the random, the righteous, the radical, the reserved and the outright "reincarnated" — that such a reporting window on the medium of "Trade Me" exists at all! In short - "The seeds we sow are the crops we grow". However, be assured that a series of measures has now been applied to achieve a higher quality of signal - that without undue (ahem) distortion and we will drop the over- modulation and perhaps 60dB over strength 9 signal to ensure future missives are more (ahhhh) palatable on the end – fed dipole at your QTH. Low (and High) Pass Filters have been installed, new coupling (and especially By-Pass) condensers are now in circuit as is a "Mountain-sized" Filter Condenser block. I'm calling the latter "Hector" (a type of "Selective, Phil – ector Detector" in your honour "Phil") which has been suitably filled with pitch to ensure QRM (from the other side) doesn't cause "splatter".
The Triode Transmission "Phil" is spasmodic (as some may be thankful for) and I will, if you so wish, consult our editor (who I must add has been very happy with "Mr Triodes" schedule thus far) endeavouring to lengthen the frequency, reduce the RF output and disconnect the Linear Amplifier, so you don't get altogether 'blown away' by it all.
"Phil", seriously though, the aim of this missive is primarily to add another 'flavour' to our Bulletin, to lighten what could otherwise be in danger of becoming an "ionic bombardment of self –important stuffiness, lost in endless waves of high powered (and high browed) technicality". *[Not to forget the parade of excellent restorations. Ed]*
Your point however is well made and be assured, "Mr Triode" takes no umbrage rather, he is most grateful for your feedback!
Regards, "Trade-Me-Triode". *Trade Me Triode will be taking a short break, Ed*

Radio Development Laboratory (RDL) Mutual Conductance Valve Tester Type 1 Manufactured for the DSIR (NZ)

From Wayne Squires & John McIlwaine

I have something you may wish to put in the mag. It's of local interest and a few questions exist that you or readers may be able to answer. About 30 years ago I managed to obtain a valve tester - from memory it came from Auckland Technical Institute but its history prior to that I do not know, which raises a question. I've used it for years to test my valves, using the Avo Valve Tester data book as the means of pin connection and base data. I still have that book and it has been an essential tool for using the tester. The enclosed photos show the external and internal views. I don' t know what the original case was because my unit is obviously in a somewhat home made box, there was a lid but I left it in NZ as it was full of living borer. There was a circuit diagram, copy attached (very difficult to scan and then reassemble the images) but it shows the basic circuitry. It shows the unit was designed and built by the RDL of the DSIR around 1943. New types of valve bases have been added as has a new external connection eg grid 1 wire. Cheers, Wayne

[We have subsequently been very sorry to learn that Wayne died suddenly this year Ed.]

N.Z. Valve Tester

Doing a bit of restoration on an old Mutual Conductance valve tester which I can not find a testing list for various valve types. It has Radio(1936)Ltd. Auckland on the two power transformers and a 6A3 rectifier. I do have a circuit for a RDL DSIR VALVE TESTER TYPE 1 and a drawing D901 dated 1943 signed by J.D.Stevenson. It certainly looks like a factory made unit. Would you know the beast and how I might find a copy of the settings for the various valve types? Any assistance would be appreciated if you get the chance.

Kind Regards John McIlwaine jajdmac1@bigpond.com

Wayne appears to have the answer for the selector settings using the AVO booklet John.

The history behind RDL is interesting reading – along with NZ involvement of Radar Development. Briefly:

John Hearnshaw University of Canterbury, Christchurch says:

RDL (Radio Development Laboratory) DSIR

• Established in 1937. RDL's Operational Research Section led by Elizabeth Alexander.

• Supported radar work in WW II, and 5 radar sites (4 in Northland, 1 on Norfolk Island)

• Disbanded abruptly in 1946 by Sir Ernest Marsden, Director-General of DSIR.

• The demise of RDL in New Zealand meant NZ lost its first chance to establish research in radio-astronomy.

Other snippets from DSIR Narrative WW2 No. 3: Radar, include;

1939 Feb 25 High Commissioner for New Zealand in London conveys request of Secretary of State for Air that a skilled physicist go to Britain for instructions in new defence device.

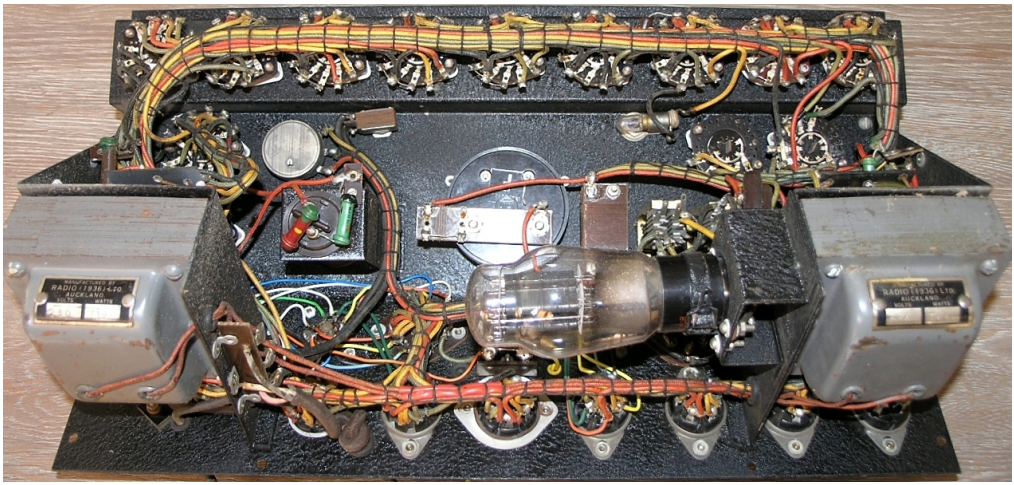
1939 Apr 29 Dr E. Marsden, Secretary, DSIR, New Zealand arrives in Britain for training. He visited the RAF radar site at Bawdsey and went on sea trials of radar on HMS Rodney

When Marsden returned to NZ in October 1939 with much information and some hardware he set up two secret radar development laboratories;

1) Radio section at Wellington East Post Office (headed by Charles Watson-Munro)

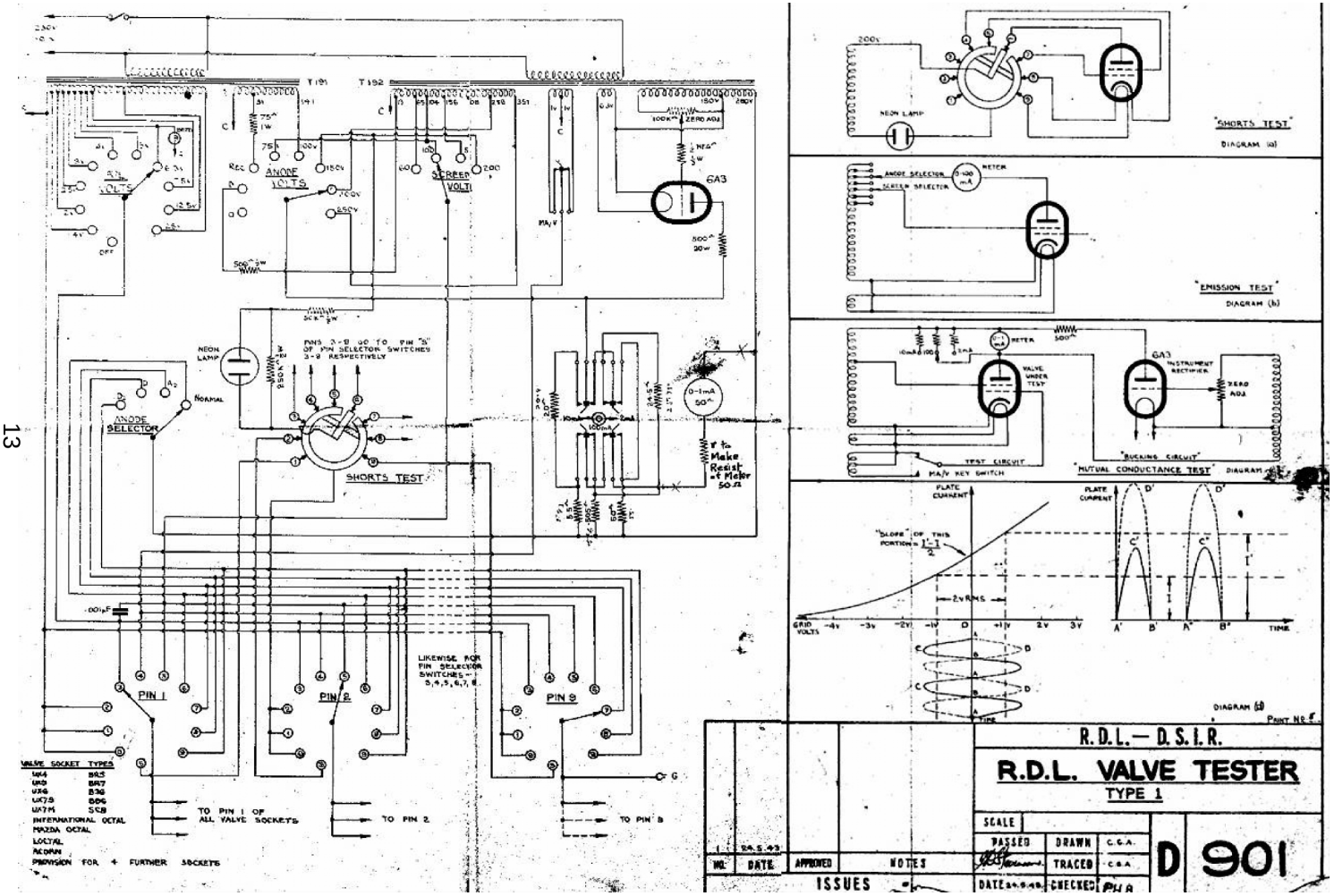
2) Physics Department at Canterbury University College (headed by Fred White)

In November 1941 these two were combined as the DSIR Radio Development Laboratory, with a related laboratory in Auckland. "A development, production, testing and training programme was carried out at a time when there were very few radar components available in NZ, test and training equipment was practically nil. Immense time and effort was spent in scrounging and adapting materials and components."



VALVE	SELECTOR SWITCH No.	T.C.	Vf	DATA FOR VALVE CHARACTERISTIC METER & VALVE TESTER TYPE 160					DATA FOR AVO VALVE TESTER			BASE	TYPE
				Neg. Grid Volts	Anode Volts	Screen Volts	Ia mA	mA/V	Anode Volts	Screen Volts	mA/V		
4H07	642 300 000		4		150		3	1·1	100		1·0	B4	T
4H03	642 300 000		4		150		5	1·2	100		1·0	B4	T
4H80	642 310 000		4		200		6	2	100		0·2	B5	T
4K30	642 300 000		4	10	150		20	3·6	100		3·0	B4	T
4K32	642 300 000		4	15	200		30	3·6	100		3·0	B4	T

Top; RDL Valve tester, internals middle and the AVO book 9 digit selector settings


T191
T192
ANODE VOLTS
SCREEN VOLTS
6A3
NEON LAMP
ANODE SELECTOR
SHORTS TEST
PIN 1
PIN 2
PIN 3
TO PIN 1 OF ALL VALVE SOCKETS
TO PIN 2
TO PIN 3
VALVE SOCKET TYPES
INTERNATIONAL OCTAL
MAZDA OCTAL
LOCTAL
ACORN
PROVISION FOR 4 FURTHER SOCKETS
"SHORTS TEST"
DIAGRAM (a)
"EMISSION TEST"
DIAGRAM (b)
"MUTUAL CONDUCTANCE TEST"
DIAGRAM (c)
R.D.L. — D.S.I.R.
R.D.L. VALVE TESTER
TYPE 1
D 901
SCALE
DRAWN
TRACED
CHECKED
PASSED
ISSUES
NOTES
APPROVED
DATE

Southern Soundings 2nd August 2016 by David Fahy

Meeting for the first time in the bright and cheerful BR 05 Clubrooms, our winter meeting of 15 members got underway to a great start with John Walker reporting on the merits of the "Mega Transistor Tester" advertised at various prices on Trade Me. These testers seem to be able to do everything electronic – they'll even de – flea the dog and make your toast in the morning. John has modified his with the addition of pin jacks and a better switch. Those members who have purchased them report themselves well satisfied with them.

Steve Dunford showed us his 1936 Airline, an American made set with affiliations to Gulbransen. Unusual in having a separate 6C5 oscillator and using a 6K7 as mixer, the oscillator signal modulates the 6K7 suppressor grid. Products used in this restoration included the following: Kiwi shoe polish, Autosol chrome cleaner, red mahogany Bri-wax, isopropyl alcohol, oxalic acid and a vinegar to water 9 to 1 chassis rinse. Steve had devised a very natty LED strip light to light the dial more evenly than the original bulb.

Next John Dodgshun showed us his 1930 Clarion AC5, a TRF featuring 2 45s in push pull, driven by a 27. A 27 also serves as detector and 3 24As as R.F.amplifiers. Those who check the model on the Radio Museum website will see the original had an ornate fleur-de-lys pattern on the grille cloth and John's radio needed a new grille cloth so ingenious solutions were called for, finally resolving in the cutting of a complex mask and screen printing. Similar attention to detail is apparent in John's revival of the key hole celluloid which had the usual 'distortion with age' problem. This was restored to its proper arcuate bevel with judicious use of the heat gun. Brasso provided the final clean up. A resourceful feature of John's restoration was the use of a black bootlace (sans crimped ends) as a very acceptable wiring loom 'encaser'.

Murray Clark rounded off the meeting with a discussion of non-motorcar vibrator powered sets previewing the display of his early Columbus vibrator set at our next meeting. Murray reminded us that the D.C. appears at the transformer centre tap in synchronous vibrator setups. There was some wary endorsement by the meeting of the merits of vibrator contact filing as a 'get you home' strategy – 1200 wet and dry paper or a diacrom file seem to be recommended.

It was good to have Jim Lovell join us again after his illness. Albie Smith reminded us that our subs are due and also provided an excellent supper to conclude the meeting.

September 2016

"Is the man here this year with his radios?" This inquiry of the ticket seller at this year's Christchurch Antique Bottle and Collectors Show gives an idea of the interest our hobby can produce. So congratulations are in order for Albie Smith, a regular exhibitor at this show and winner of the People's Choice award for 2016. "I can't see the point in putting all that effort in restoring a radio just to have it sit on a shelf at home," says Albie who has done much to show the flag in Christchurch for vintage radio. Perhaps it is time for other clubs in New Zealand to go similarly public. A crystal set, a Hikers One, a Bell Colt and a couple of wooden sets, console and mantel perhaps fed period music via a local oscillator in turn fed by a stack of 45s or 78s in a corner of your local library may do a lot to foster heritage interest and recollection for passers-by.

Albie showed us his most recent restoration, an Atwater Kent Model 708, at the September meeting of the Christchurch Vintage Radio Society. Had it done much work before its restoration? Well, the knurling on the wooden volume and tuning knobs was just about worn

off! A special challenge for Albie has been to find five 58s of equal merit in the spares box for the front end.

John Dodgshun showed us a Philips 540, a 1947 NZ made plastic bodied mantel radio not AC/DC, so very tightly packed 5, octal GT & metal valves round a substantial power transformer. Can anyone supply the correct brown knobs? The cabinet was designed apparently in an Argentinean Philips factory - Eindhoven at the time being occupied by the Germans. John also displayed a handy own-design variable power supply – 150 milliamps up to 300 volts using a Beacon R11, a 6SJ7, an EL34 and, because he could – an 83 (yes, the mercury one) rectifier. The circuit is very straightforward and eminently "home-buildable". Is that a word? *[No but the meaning seems clear. Ed.]*

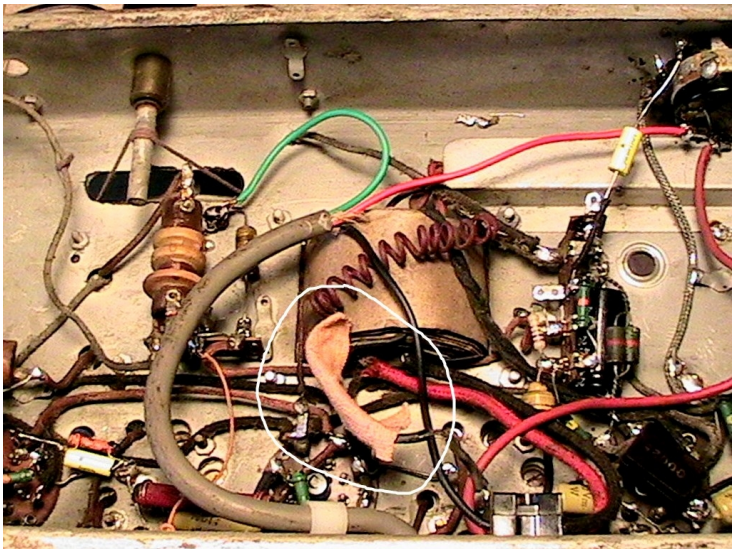
Ever tried to find a 1K5 in an RCA valve book? That might be because it is a valve unique to Australia. Murray Clark's Columbus Model 70R features two-as RF and IF amplifiers in this "farm set "designed to run on 6 volt batteries. So it has an in–cabinet synchronous vibrator unit, a pm speaker and a handy 3 position on off switch; off, on with dial light on (to tune in), on with dial light off to save battery. Battery consumption is a meagre 1.3 amps (8 watts).

Kelvin Barnsdale showed us an interesting reflexed home built valve set, the tickler coil inserted inside the tuning coil on this 30 equipped receiver. He also showed us how he builds Eveready 762 (45 volt) batteries using colour photocopied wrappers on Coke or Sprite cardboard boxes.

The meeting concluded with your scribe tottering out the door under the weight of a give-away Philips Model 541, Terry Collins helpfully holding the door open while telling all "It's important to be kind to the afflicted".

Incidentally, what is the rhyme and reason to the Philips model numbering system prior to 1947? Your scribe's just mentioned wooden cabinet battery farm set is Model 541 using side contact valves. John Dodgshun's plastic bodied octal valve set is Model 540. Anyone know how come?

Horrors From the Workshop of Albert Cross



Again Albert has come across a sticky job – sticking plaster used to "insulate" the power lead to the transformer! I think there a few other problems in there too – crumbling insulation? Perhaps a fuse would be a good idea?

A Nostalgic Project By Peter Lankshear

Cover Story – the 2016 AGM "Simple Set" Construction Project Winner.

Before the mid 1950's, home radio construction was a popular hobby. Radio magazines were plentiful and most published details and instructions for projects ranging from beginners' crystal sets to quite elaborate multi band receivers. Accompanying these articles would be advertisements from suppliers of parts and kit sets. Many of the most enthusiastic readers were technically inclined lads who salvaged, scrounged, recycled and traded parts and saved pocket money, often earned by jobs out of school hours. I was one of these and it led eventually to my making electronics my life's work. To be able to make a career from a hobby is an enviable situation.

A Competition

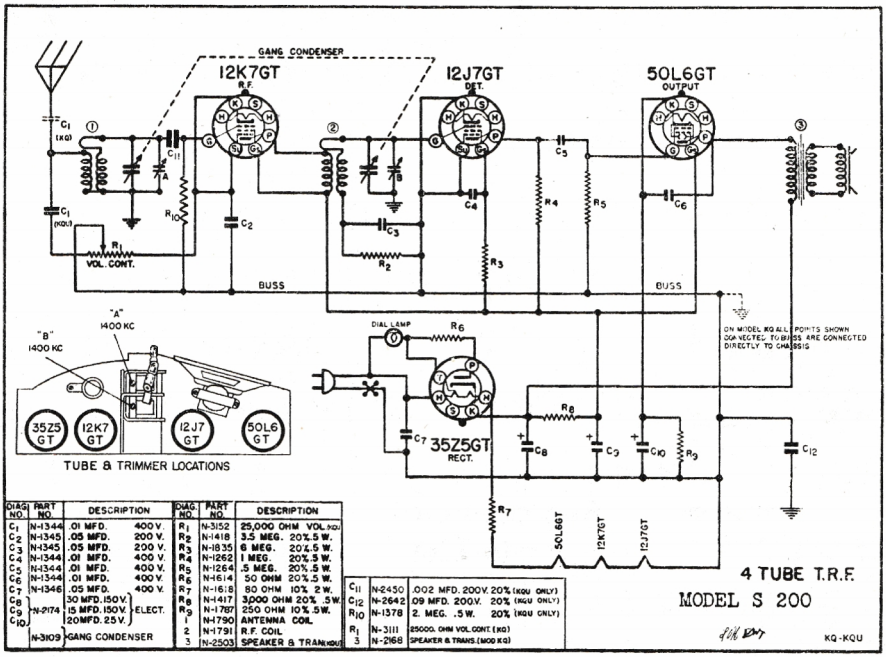
There was a special satisfaction in building a radio that worked and I was interested when recently the NZ Vintage Radio Society announced a project with which I could indulge in some nostalgia. They planned a competition for a project that could have come out of an old radio magazine. It was for the design and construction of a simple receiver, to be capable of receiving signals in the M.F. band. Novelty would earn points and the number of active devices in the signal path was limited to four. There were few other specific requirements, but one was for the addition of a headphone output suitable for supplying a test signal into a 1000 ohms termination. A clarification stated that diodes would not be classed as active devices. Arguably the "Golden Age" of valve radios was the period immediately prior to World-War II. The major developments in A.M. receiver evolution were in place and the International Octal based valves used widely were reliable with good performances and available from many manufacturers. The outbreak of war in 1939 had brought most domestic receiver development to a halt, and in the immediate recovery period after 1945, manufacturers understandably took over from where they had left off. This appeared to be a good period to base a receiver on. Although a standard four valve plus rectifier superhet might fit in the competition of maximum of four active devices, one of these would have little novelty, and being one of by far the most common class of valve receiver, would likely not excite the judges and might not strictly meet the requirement of simplicity. Better to make something less common and preferably less complex.

Three Stage Receivers

Other than sets with regenerative detectors, which were obsolete by the early 1930's, the simplest valve receivers capable of serious work had three stages. Popular in America especially were inexpensive TRF receivers with an R.F. stage, a detector and a loudspeaker amplifier stage and a fourth valve, a rectifier. Intended for urban locations these radios were limited in sensitivity and selectivity. A circuit of a typical receiver is attached. Suitable for receiving local stations only, they were commonly found in apartments or in use as "second sets" for kitchens, bed rooms, dens, children's radios and the like. Whereas even a basic superhet would have four or five tuned circuits, a three stage TRF would have only two tuned circuits and therefore limited selectivity. There were also a few simple sets that had a frequency converter connected to the detector without the benefit of an I.F. amplifier. Although they had lightly better selectivity than the simple TRF's they were still very basic receivers.

Little known outside Europe and Britain, were the far better performing "Short Superhets"- fully functional superheterodynes, also using only three valves plus a rectifier. Many British manufacturers made them, some well-known examples being the pre-war Philco "Peoples Sets", the Wartime, Government sponsored, "Civilian Receiver" and the very collectable circular A22 Ekco.

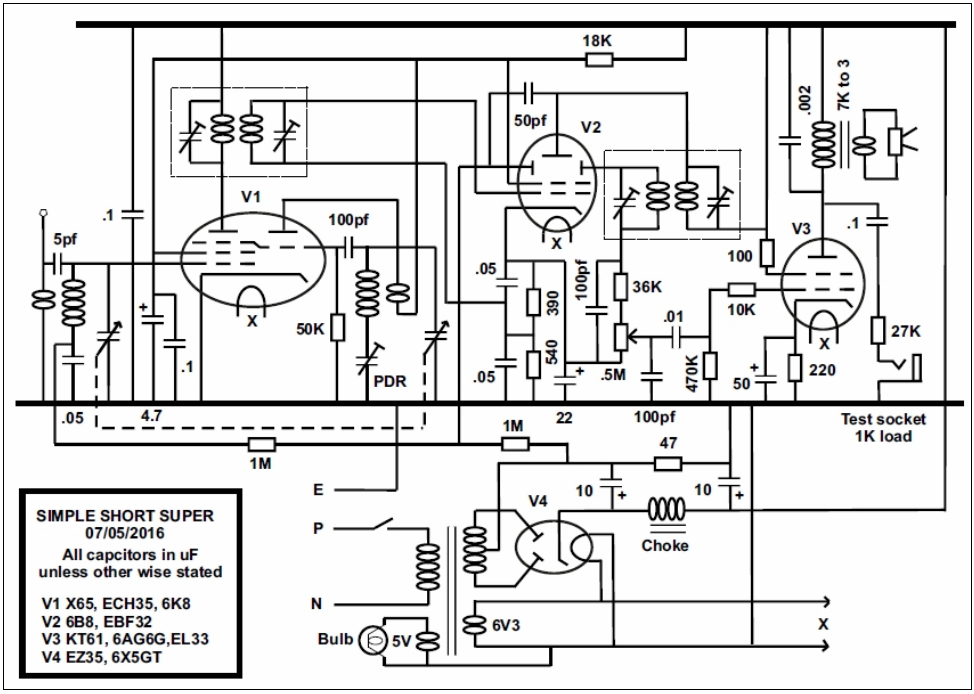
The standard superhet with its two audio stages had a surplus of audio gain that could be useful for weak signals and shortwave reception, but otherwise was largely wasted. The short superhet was simplified in having the detector directly driving a single audio stage without an intermediate voltage amplifier. In these receivers, the use of high gain output pentodes went some way to compensate for the reduced audio gain.
It seemed that a short superhet could meet the requirements of the contest and be a practical and useful receiver after the competition.



4 Tube TRF Example – a Gamble-Skogmo 1942 Circuit

The Circuit Design.
A search through the many years' accumulation of useful bits and pieces in my "used but too good to be thrown away" box revealed a small square dial unit and associated tuning capacitor. They had been supplied by the long deceased Auckland firm of Johns Limited who made "Companion" receivers and components. Although used in various projects since their purchase in 1947, they were in reasonable condition, from the right era and were suitable to base a receiver round. Suitable aerial and oscillator coils were located and a pair of Inductance Specialists' excellent New Zealand made iron cored I.F. transformers was also found.
The first valve would be the frequency converter, with several interchangeable types of octal triode/hexode readily available. There would be nothing other than standard about its circuit other than the use of "back" bias for the control grid, whereby a capacitor was saved by returning the AGC line to a 47 ohm resistor in the power supply negative lead.
In a short superhet especially, the I.F. amplifier valve provides a significant proportion of the receiver gain. As semi conductor diodes were not in common use for detection and AGC before 1950, either the I.F. amplifier or the output valve would need a pair of diodes included in its envelope. The Philips EBL1 diode/power pentode had been intended for this type of service. However, I had none so chose a metal 6B8 diode/R.F pentode; a rugged and reliable performer, for the I.F. stage and detector. A simplification of the circuit was to use a common

single resistor and bypass capacitor for the voltage supply to the IF screen, the mixer screen and the oscillator anode supply.
Diode detectors often also provided the automatic gain control voltage. Although simple and trouble free, this basic method has shortcomings in a short superhet. One problem is that even a weak signal will commence to reduce the gain of controlled valves. The remedy is to delay the onset of AGC so that only stronger signals will generate a control voltage. This entails the unavoidable complication of a second diode. Delayed AGC has also the advantage of creating a flatter control so that when it is operating; stations are more alike in received strength. It was common practice to use the cathode voltage of the valve containing the diodes to provide the delay. As the cathode voltage of the 6B8 is only three volts, an extra cathode resistor was added to provide sufficient AGC delay to enable the detector to have adequate signal level to fully drive the output stage. As the 6B8 does not have a fully remote control grid cut-off, AGC was not applied to the I.F. stage.



High Gain Output Valve
With a rated mutual conductance of about 10ma/v, the high sensitivity 6AG6G output pentode and its equivalents have twice the gain of many of their contemporary output pentodes. For high gain valves, cathode bias is recommended and to insure against parasitic oscillations, both the control and screen grids should have series connected suppressor resistors. The simple resistor/capacitor feed to the test socket was fitted to comply with the judging rules. The output stage is otherwise quite conventional.
The power supply has a conventional full wave rectifier and choke filter. As noted previously, the 47 ohm resistor in the negative lead supplies 3 volts bias for the frequency converter control grid.

Aluminium Chassis

For this type of project aluminium, being corrosion proof and easily worked, is a very satisfactory chassis material. A piece of 1.00 mm aluminium sheet made a very acceptable chassis. Its only shortcoming is that it can't be soldered but provided star washers are used with solder lugs, earthing is not a problem.

With the receiver operational, there remained the decision as to what to do about a cabinet. Cabinets for many receivers of this type were made of a moulded plastic - hardly a practical material in a home workshop. Wood is the usual standby, but to produce anything more complex than a plain box requires tools and skills I don't possess. Leatherette covered wood seemed promising, so I marked out a sheet of 10 mm plywood and a friend's jig saw was used to cut out the dial and speaker openings. After the cabinet's assembly, I approached an obliging car trimmer and upholsterer about obtaining some suitable leatherette. He was quite intrigued by the idea of using it to cover a cabinet and suggested brown head lining, which he offered to fit for me. This he did very promptly and at a very reasonable cost, and we were both very pleased with the result.

Some projects come together nicely with few problems. This was a good example, and the set works and sounds well. In an urban location and connected to a couple of metres of aerial, it receives all the local stations with sufficient audio gain to fully drive the output stage. It is now more or less permanently installed for service in my living room.

Neglected Collectibles

The question may arise as to what is the relevance of this exercise to vintage radio. Although home made and kitset radios were a significant part of radio history they are rarely are seen in collections. They may not always have the finish and eye appeal of the commercial product but perhaps we should consider rescuing more of them to preserve alongside the more photogenic commercial products.

Acknowledgement

My thanks to Gary Tempest for using his computer skills to draught the circuit.

While the AGM Competition does not permit "Judges Correspondence", the following comments by the Judges are perhaps fitting to reinforce the careful design features that were appreciated:

1) The receiver picked up 14 stations in ample volume for normal use.
2) The 5 inch speaker gave good quality sound in a medium sized cabinet.
3) The Leatherette covered case was stylish, unique and distinctive.
4) Of the circuit the following points were noted;
   a) Proper use of both diodes in the 6B8 – one for detector, one for AVC.
   b) 0.1 uF bypass capacitor on the HT being efficient at RF and not relying on the electrolytic smooth capacitor.
   c) 0.002 uF "Tone Correction" capacitor wired across the Output Transformer primary, not from the OP plate to ground, where it must have a higher voltage rating.
   d) Spare 5 volt winding on the transformer gives the (6 Volt rated) dial lamp a longer life with still adequate brightness.

   Overall this entry was awarded 96 points out of a possible 100!

A 1940's Type Basic Short Superhet.

Description of Receiver.

This receiver is a simple short superhet, patterned on the technology of the 1940's. It has three active stages.

The first valve is a triode hexode, with A.V.C. applied to its control grid.

The second stage is an I.F. amplifier using a pentode tube. In the same envelope are two diodes. One is a diode detector. The second diode acts as a delayed voltage A.V.C. generator. To permit the detector to develop sufficient voltage to comfortably drive the output stage, the I.F. amplifier operates without A.V.C. and there is a delay voltage on the A.V.C. diode of about 10 volts .

The third stage is conventional, using a high gain output pentode.

There is an integral power supply with a hum filtering choke

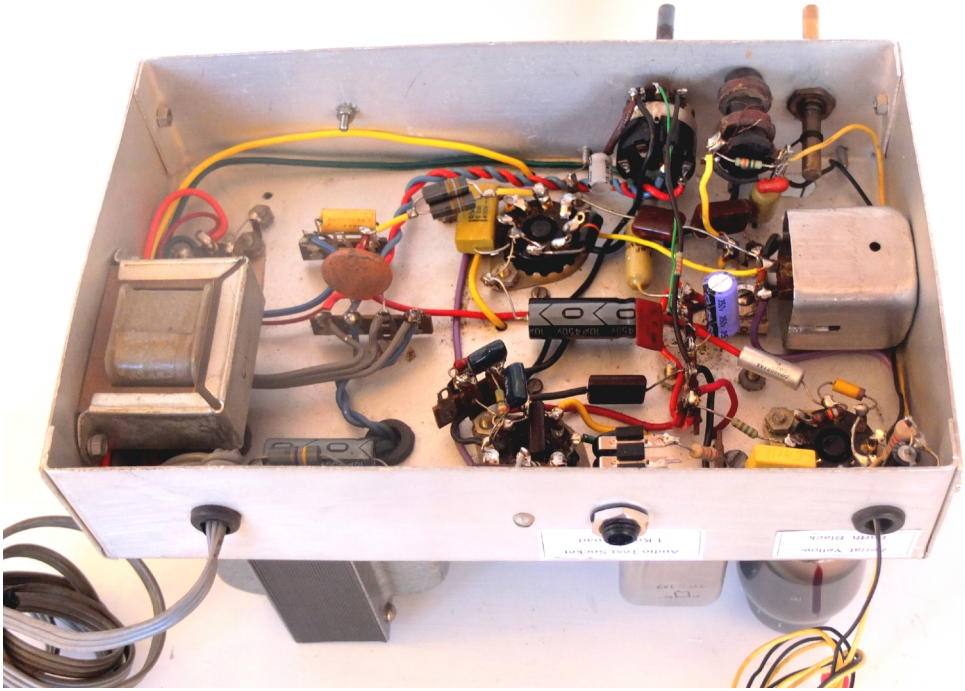
Background notes (from a BVWS "Bulletin" article)

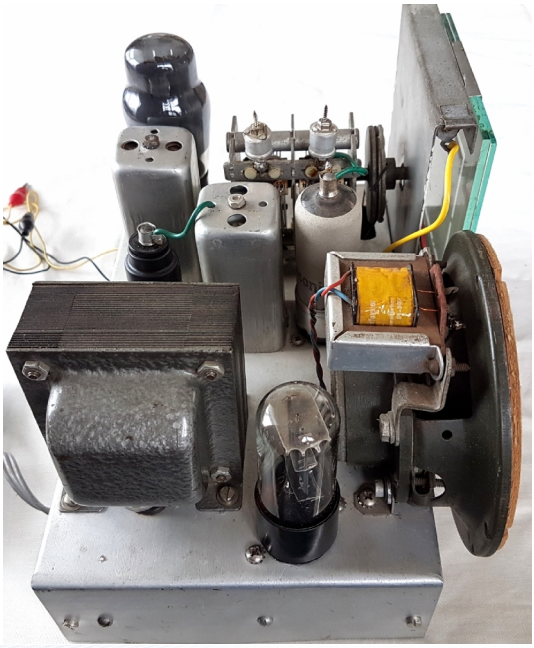
"Other than sets with regenerative detectors, which were obsolete by the early 1930's, the simplest conventional valve receivers capable of serious work have three stages. Popular in America especially was an inexpensive TRF with an R.F. stage, a detector and an audio amplifier stage, and models suitable for mains operation included a rectifier. Intended for urban locations these were capable of receiving local stations and were commonly found in apartments or in use as "second sets" for kitchens, children's radios etc.

However, in Europe and Britain, a popular and more effective type was the "Short Superhet", a fully functional superheterodyne also using only three valves and a rectifier. Two well known examples of short superhets are the pre war Philco 644 "Peoples Set" and the Wartime, Government sponsored, "Civilian Receiver".

A standard small superhet with two audio stages, tends to have surplus of audio gain. The short version is simplified by having only a single audio stage. The use of output pentodes with at least twice the sensitivity of a standard American output valves goes some way to compensate for the reduced audio gain of the short superhet."


"Q"
TYPE 142
MADE IN U.S.A.
Aerial Yellow
Earth Black
Audio Test Socket
1 Kohm Load



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1ZB

Storefront Challenge

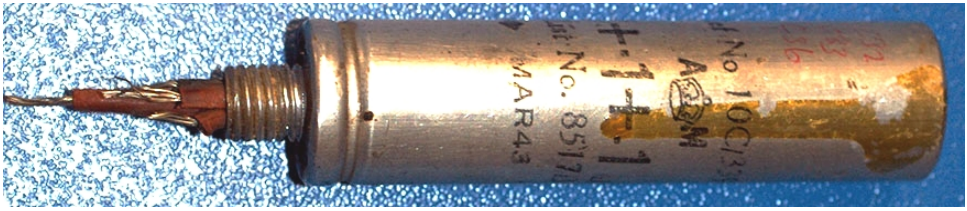
OK here is a different challenge – Where might the R N Hills furniture stores have operated (approx 1940s - 50's)? Also I wonder how many "stores" could get away with a display of disassembled radio apparatus today – see slight enlargement! There seem to be a range of components, partially completed apparatus and test instruments in the left-hand window. The street number of the shop is 149 and the telephone number 28550. The store window reflections are interesting too. The best background info I have is the photo fell out of a box of stuff from the estate of someone who may have worked in South Africa / Kenya before arriving in NZ in about the 1960's.

New Capacitors for Old Condensers by Allan Isaacs

www.radiomuseum.co.uk/triple%20cap.html

The most frequent problem met when restoring old radio equipment is the old condensers. Usually the small-value varieties such as moulded or silver mica fail much less often than the tubular wax-covered paper-foil type used for decoupling or coupling in valve circuits which I'll deal with here. To diagnose a faulty condenser, often end is clipped and its resistance is measured. A really poor condenser will have a low resistance ie anything under one megohm. Unfortunately a simple measurement like this will not reveal most problem condensers which will only fail when a high voltage is connected across them. Connect a couple of hundred volts across an old 350v condenser and after a few moments the thing can exhibit leakage which often increases dramatically with time. To confuse matters, once the thing has been disconnected from a high voltage its resistance may rise again. However if left connected it may well eventually become too hot to touch.

A restorer can easily replace an old condenser with a new capacitor, however the view under an old chassis is then marred by lots of shiny and brightly coloured new parts. One solution is to completely detach the old condenser, remove its innards and fill it with a modern capacitor, a process known as "stuffing". Usually a smaller tubular capacitor will be fitted inside an old case; however I've adopted a different approach now that sub-miniature high voltage capacitors are available at prices much lower than standard types. I'll demonstrate how to restore a tubular aluminium condenser (as used in the R1155 receiver for an example pictured below) and follow that with an example of a second method.



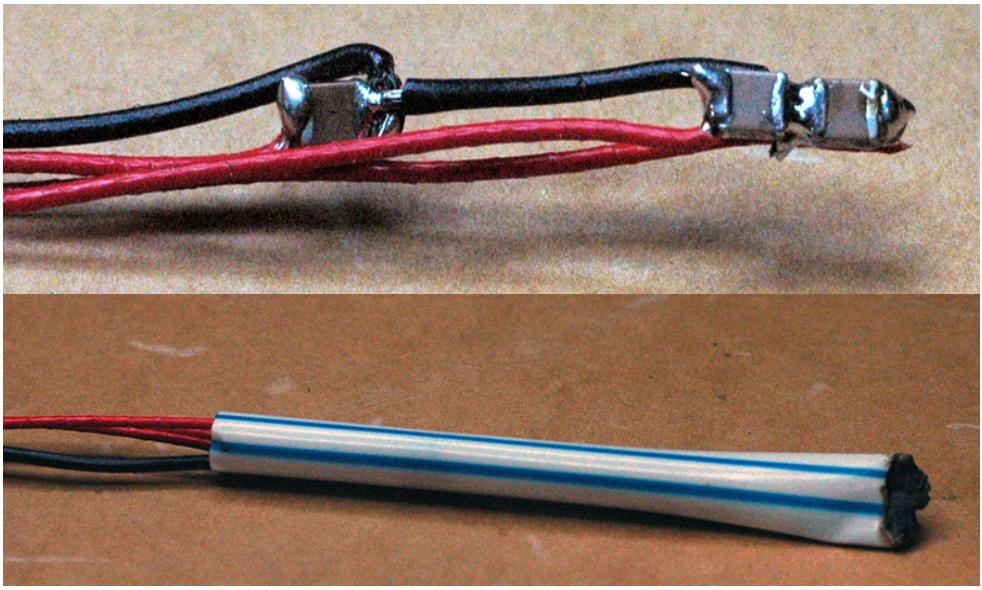
Above the R1155 3 capacitor assembly.

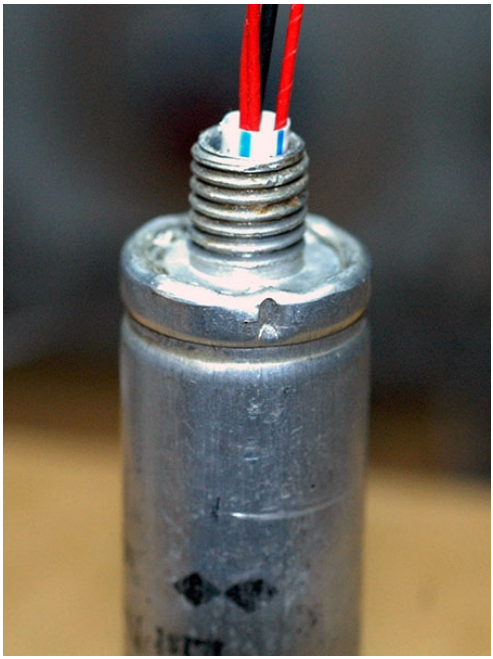
Below the raw materials: A roll of 0.1uF x 500v surface mount capacitors left and with one shown on a 25mm diameter 2p piece on right.

In the R1155 example, I'm going to restore a 3 x 0.1uF condenser (which is about 85mm long and 18mm diameter, rated at something like 350V and made in 1943) using three chip capacitors each with a "1210" type case whose maximum dimensions are 3.3mm x 2.6mm x 2.1mm.
The first step is to drill out the old leads and about 50mm of the internal condensers using a 5mm drill. The new insulation material is a length of drinking straw about 5mm in diameter into which will be inserted the new capacitor assembly.

Because the old condenser has a common ground wire to the three 0.1uF sections I've used a new black wire connected as shown above. To solder the wire some sort of clamp will make things easier otherwise the lightweight capacitor chips will just stick to your soldering iron.

Below, I've connected a red wire for each 0.1uF capacitor and then checked that the assembly slides into a length of drinking straw which has its end sealed with wax to prevent ingress of old condenser particles.





The straw tube is inserted into the 5mm hole drilled into the condenser.

At this stage the new capacitor assembly can easily be pulled out of the tube, so to secure and seal this assembly in place I've melted some wax from another old condenser into the gap.

Left is pictured the finished triple 0.1uF capacitor refurbished 73 years after manufacture and ready for fitting back to the R1155 chassis.

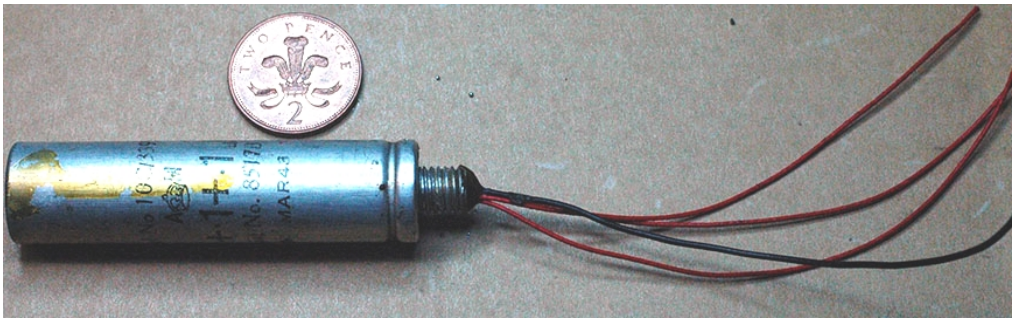
I checked the capacitance of each section and found all were identical at 0.122uF.

When selecting the red and black wires for connection to the capacitors do ensure that they are tolerant to heating when soldering and their insulation is suitable for the voltage used in the equipment in which the refurbished capacitor is to be fitted.

Parts cost was under 16p which is pretty good for three 0.1uF x 500V capacitors.

[NZ costs are about 24 cents per capacitor on small orders. Ed]

I used fairly thin wires on my refurbishment so suitable sleeving could be pushed over them to make the set look original.

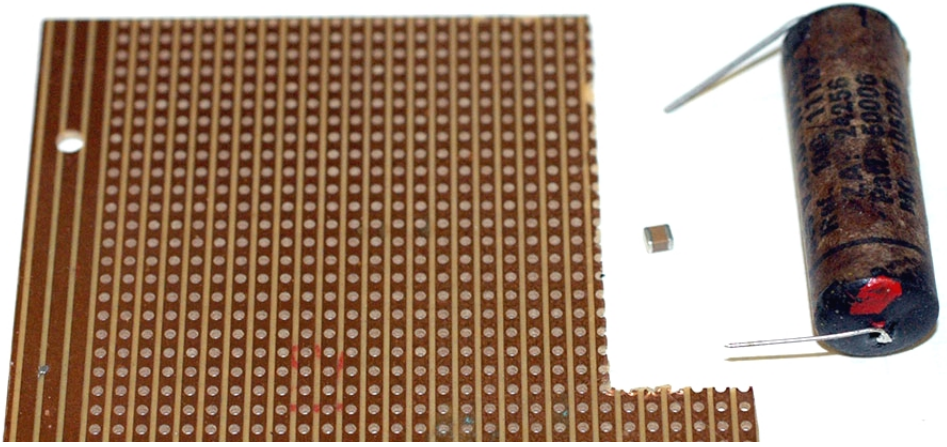


Above the completed assembly ready for placing back in the set.

Second Stuffing Method:

I recently stripped out all the 0.1uF and 0.05uF condensers from an R206 receiver I was restoring and carried out measurements to see how they had aged. Not one was in perfect condition because of the degradation of materials used in their manufacture. The key issue was DC resistance. In valve circuitry impedances are often extremely high and if an old condenser has a DC resistance within the range up to 5 or 10M ohms it will affect operation when used in certain circuits, for example between the anode of an LF amplifier and the grid of an output valve. Being more specific, a leaky condenser will make the output valve control grid more positive than the designer intended. This will make the output valve draw more current than was intended and if this is especially high it may damage the output valve, output transformer, the rectifier and maybe even ruin the output transformer. *[In any case excess heat will be generated and in an old set this is not good. Ed.]*

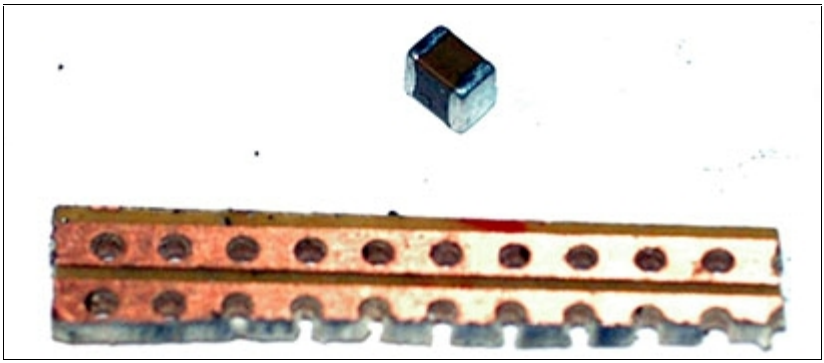
Here I describe my second method of stuffing an old 0.1uF 350 volt working condenser to produce a new 0.1uF 500 volt working capacitor in the same physical space.



Above Vero-board left, smd capacitor middle and old capacitor right.

Above the removed foil and paper contents of the old capacitor

Below chip capacitor, Kemet 1210 Arcshield HV 100nF Ceramic Multilayer Capacitor, 500 V dc X7R Dielectric ±10%; 3.2mm x 2.5mm x 2.1mm plus small piece of Veroboard.



Above, the circuit board carrying the chip capacitor and leads.
Below the completed item, the ends sealed with cardboard disks and pitch.

Speaker Reconing Expert Visits Christchurch VRS Group.

A slightly chilly evening, bearing witness to the winter to come, saw a good turnout of 20 members and one teenager for the May meeting of the Christchurch Vintage Radio Society.
Proceedings began with Michael Wise presenting his replica Paraset – a transceiver used during World War 2, especially by the Resistance in Occupied France. Authentic down to the B.A. nuts and bolts, Michael had sourced components on 4 continents to build this set which fitted very neatly into its fibreboard suitcase. John Dodgshun and Steve Dunford presented new restorations. John of an Atwater Kent and Steve of an Airline 62-316. We look forward to their more detailed descriptions of their restorations at a later meeting.
Electromagnetic speakers, particularly of the smaller sizes are becoming rare. Rebuilding rather than replacing has become necessary for many Christchurch restorers. In light of this, the Christchurch VRS Group invited Sam Lowe an NZVRS member from Taranaki (who has developed several techniques for rebuilding E.M. speakers) down to Christchurch to show us what he does. Sam is a 'hands on' man when it comes to speaker reconing and he came fully prepared with aluminium sheet, donor speakers, cones, glue, voice coils, old stockings, boiled eggs (!), tea bags, bias binding and so on. He also demonstrated other repair techniques e.g. for cracked and broken bakelite cabinets. His demonstrations were very well received and the meeting concluded with supper and a natter.
Incidentally, David Chapple, keen to pursue further this theme of reconing speakers has discovered an online calculator for working out the shape of flat cardboard to be cut out for a new speaker cone at http://craig-russell.co.uk/demos/cone_calculator/

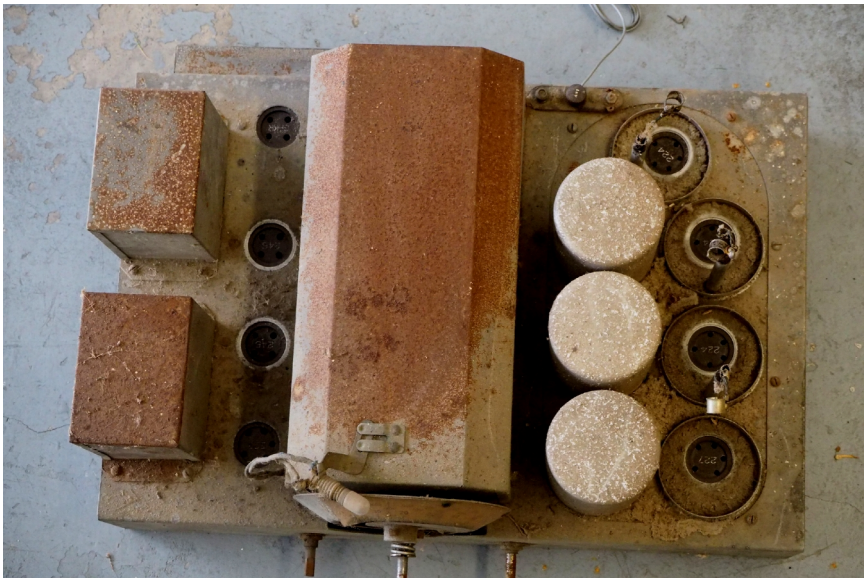
Some Other Speaker Cone Repair Ideas;

- If there is a hole or tear to be patched one can use tea bag paper and brush on contact cement from a spray can. Just spray a bit into a small container. Using small bits of tea bag paper a quite good repair can be made to missing suspension areas
- Selley's Quik Grip is a petroleum based contact adhesive which remains supple and flexible for years. This is an advantage in cases where the cone needs to continually flex, as in the area of the cone adjacent to the speaker frame (suspension). If the damage is extensive (holes or large rips), repair it in stages over a few days in order to allow the adhesive to reach full strength before the next layer. When the repair is complete, mask the speaker's annular gap and frame and then spray the cone lightly with black or dark grey paint. This has the effect of tidying up the job and can make the repair almost invisible. The trick is not to use too much adhesive because it will lose its elasticity somewhat if applied too thickly and change the audio characteristics of the speaker.
- Silicon sealants maintain their flexibility indefinitely when cured and this is their main virtue for speaker cone repairs. Nevertheless they are quite viscous and thus difficult to work into the often fragile speaker cone. A means of thinning is necessary and his can be achieved by squeezing as much sealant as needed for the repair into a small glass jar, add a little acetone and mix thoroughly. Keep adding acetone until the sealant is just mobile. Now add mineral turpentine until the sealant is thin enough to be applied by a brush. It is especially good for strengthening threadbare speaker cone suspension corrugations. It also makes a good primer where the extra strength of unthinned sealant is required eg at the centre where the cone attaches to the driver coil former. Considering that in the long term, paper deteriorates in the presence of acid, a neutral cure sealant should be used.
- If you can find it try Selley's carpet glue. It is flexible and not water-based.
- PVA for repairs to the stiff cone areas, silicone sealant for the flexible surround. It is important to use as little as possible, so as not to add too much to the cone mass. For holes, I use one layers of paper towel as a patch, saturated with the glue. A guy on YouTube, Bandersentv, uses coffee filter paper for this.

Restoration of a 1930 Clarion Model AC-51 by John Dodgshun

I purchased this radio from Trademe simply because it looked a bit different. The photos of it showed the dire state it was in. John Stokes in M.G.R. says: "*Clarion radios were sold in New Zealand right from the inception of their manufacture in 1930, two of the earliest being the 6 valve model AC-40 Clarion Jr. and the AC-51, an 8 valve console. Because of the short length of time the company was in business, coupled with the comparatively small quantity of sets made, there are few remaining Clarions to be found in this country."* Well, I now have one of them.

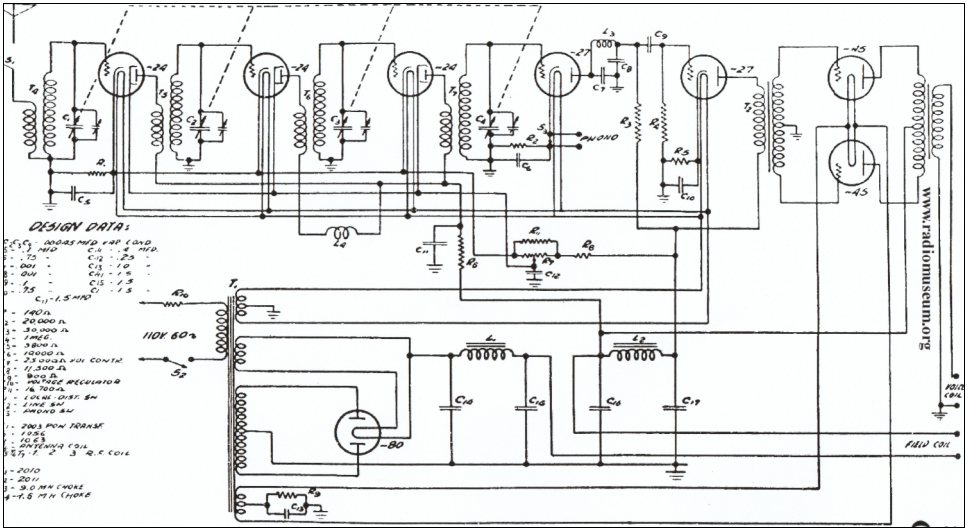
Much of the cabinet's veneer was lifting or lifted - fortunately none was missing. Two legs were damaged, the varnish was crumbling, the knobs and grille cloth were missing and the chasses were badly corroded. It was very sad indeed. Miraculously, the speaker cone was pristine.

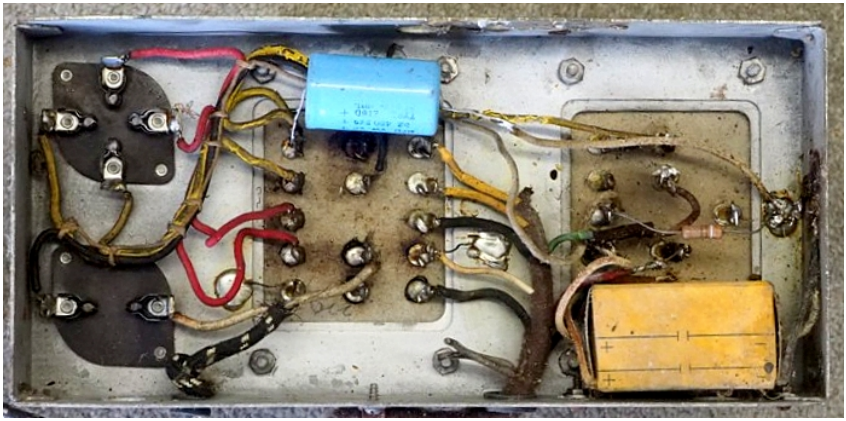


The set is a triple TRF with three 24As, a 27 anode bend detector – a horrible thing, a 27 first audio and push-pull 45s in the output. The power supply is on a separate chassis on the speaker level. The rectifier is a trusty 80 and it has a device called a *voltage regulator*. Phase inversion for the output valves is by means of a transformer in the plate circuit of the 27 audio amp and bias for the 45s is derived from a bypassed resistor in the centre tap of the separate filament winding ie Cathode bias.

It sat in the corner of the garage for some time while I pondered the best way to proceed. As is my wont, I started with the works. This time, *Nostalgia Air* was not forthcoming but I found a lot of information on *Radio Museum* including a circuit and full frontal photograph albeit a not very good one.

On the power supply chassis are two large & heavy cans. One contains the power transformer, the other, two filter chokes, four electrolytic filter capacitors and the output stage cathode bypass capacitor. The power transformer tested good and it was at this point that I discovered that the voltage regulator, (which is simply a nichrome resistor wound on a mica former enclosed in a perforated metal container and connected in series with the primary,) drops the primary voltage to187 volts. It is actually a very satisfactory heater! In the other can both chokes were open circuit and the four filter caps were very leaky. As both cans needed to be replated, I had to remove their contents which were encapsulated in pitch. The curing oven at work provided the perfect solution.

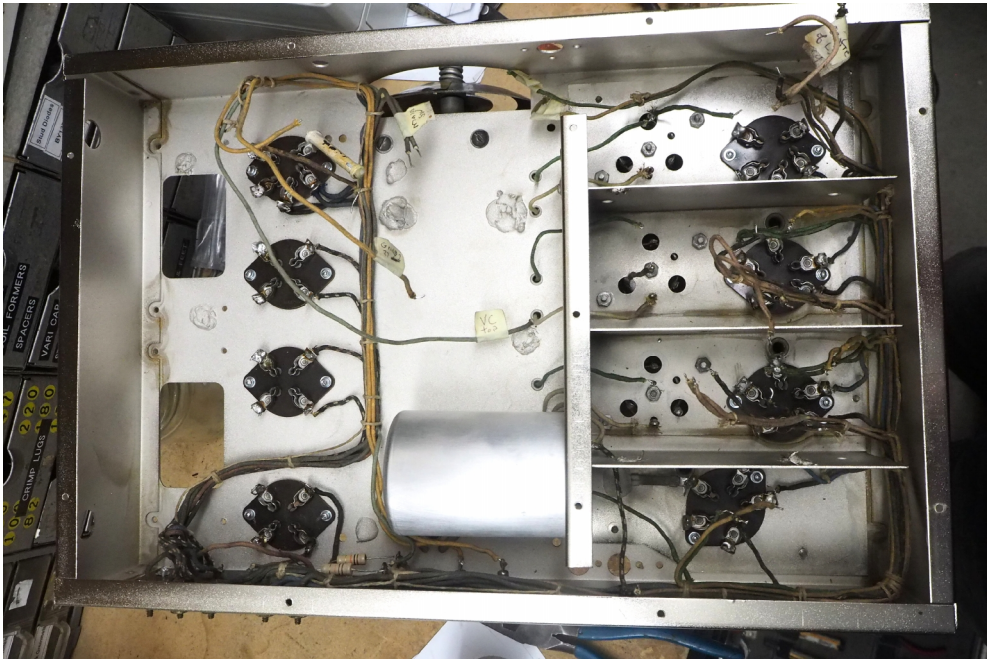




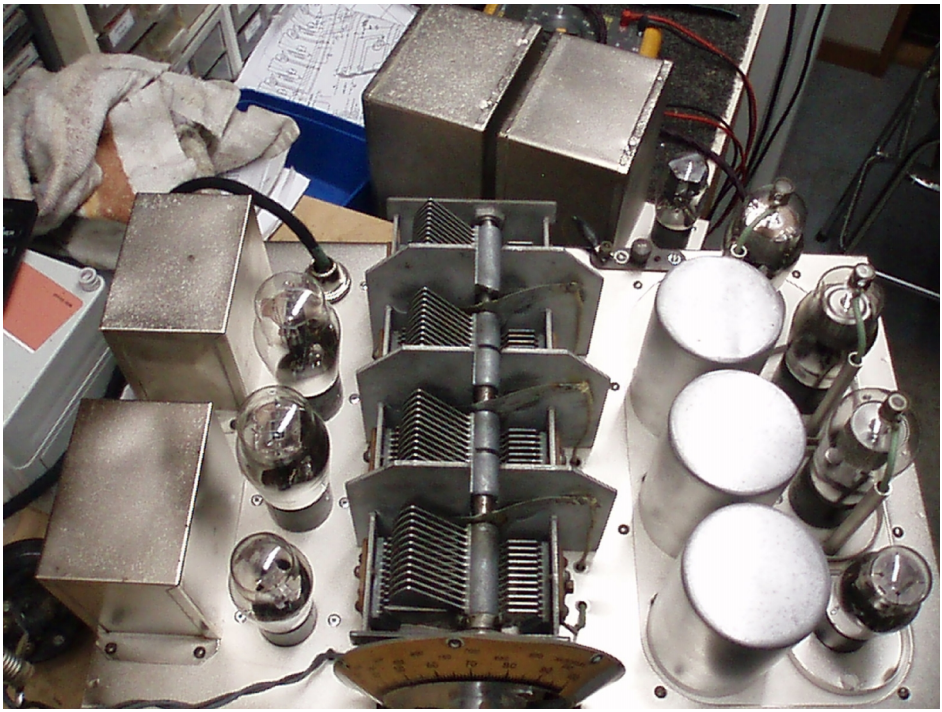
The circuit of the main chassis is very simple and it took no time to document and dismantle. The driver and output transformers, both on the main chassis were good both continuity and insulation wise. All the metal bits were sent off to be blasted and re-plated in nickel. At this stage I should have tackled the cabinet but was still a bit doubtful as to how best to proceed, so I left it.

Reassembly, along with the replacement of faulty components didn't take long. The power transformer can was easily re-assembled but I had to wind two new chokes and fit new electrolytic caps in the other can. I shied away from replacing the pitch opting instead for wax. I have refitted the restored voltage regulator but electrically replaced it with an auto transformer – much more efficient! All the power supply wiring, including the multi-core cable (10 cores) connecting to the main chassis, was rubber insulated. As it all had perished it needed to be replaced. I used a black woven shoe lace, whipped at both ends, as the casing for the new inter-chassis cable and another one to recover the speaker cable. The speaker frame was quite badly rusted so, rather than dismantle it, I very carefully cleaned it up, masked the cone, terminals etc and re-sprayed it silver. Fortunately the magnet coil was intact. It looks good doesn't it!

Next, to the main chassis. All the original wiring here was cloth covered and in good order so I didn't even have to disassemble the wiring loom. The RF section and detector is on a sub-chassis and there is extensive shielding between the stages, including metal tubes for the grid leads of each 24A, to prevent oscillation. As well, each 24A and the 27 detector is shielded. All the RF coils were continuous so all that was required was to dip them in wax to ensure they were adequately sealed.
The rest was just time and the set leapt into life on first switch-on. Being TRF the alignment was simple and the performance and selectivity are remarkable. Not so the distortion created by the anode bend detector!



I later found two balloon 27s to replace the two ST shaped ones and am still looking for a pair of balloon 45s.- Just to make it look a bit more authentic. An original feature is the switch in the aerial line which reduces, or increases, the radio's sensitivity. It is a slide switch on the right hand side of the cabinet.
A question arose about the switching for the mains power and pickup as when received, the pickup wiring and the mains switching wiring had been disconnected. In place of the switch a pot had been fitted but it wasn't connected at all. Presumably it was intended as a tone control. I have fitted a three position switch, Off/Radio/Pickup and reconnected the wiring. It is interesting to note that the volume control which controls the screen grid voltage of the three RF stages, will not work for the pickup. Investigation has suggested that early pickup heads were magnetic and had their own volume control.



Now to the cabinet. I had to turn a new bottom section for one of the broken legs. The other was able to be repaired by gluing. The old varnish was scraped off to reveal some beautifully grained veneers. All of the veneer that had lifted or fallen off was carefully removed and, bit by bit, re-glued on. The decorative beadings were all removed and cleaned up. After a thorough sand, parts were re-stained and the whole re-assembled ready for polish. Yes, it took a long time. At this point I bowed to my significant polishing inadequacy and took the cabinet to a local spray painter whom I have used on several occasions. He sprayed three coats of a two-pot epoxy satin and the result is superb. Well worth the $50 he charged me!
Last but definitely not least was the grille cloth. The cabinet photo I retrieved from *Radio Museum* showed an ornate pattern on the cloth. After some thought and a couple of phone calls, I traced the outline of the speaker opening onto a piece of paper, actual scale. Then with a pencil, a much used rubber and even more time, I drew one half of the pattern. I scanned it into Photoshop and spent, yes, more time tidying it up. I then took the file and a couple of pieces of cloth to a local screen printer whom I had used before. He was able to produce a mirror image of my half, marry the two halves together and print the whole onto the cloth. The result has exceeded my wildest expectations. When I sent him a photo of the completed job he was most impressed. It was with great trepidation that I attached the cloth to the backing board but it went smoothly.
So, another “old dunger” to quote Gerry Brownlee, is restored rather than destroyed. It has pride of place in our drawing room.

A Sharp Restoration By Gerry Billman and Doug Edgar

This is one chapter in the life of one very rare radio.

Some months ago a friend emailed me asking if I had seen this very decrepit radio on the auction site TradeMe. He also added a note stating that it was a Sharp radio made in Japan about 1933. Always on the lookout for any old and rare valve radios to restore I checked out the listing and immediately realised that this was indeed a Sharp cathedral radio and was a very sad looking radio indeed. It was obvious from the picture that it had been stored away unused and neglected for many years.

For some time I have known that there was simply no room for any more radios in my collection no matter how rare and desirable they were. I phoned my collector friend Doug and said "you have to find the space to add this set to your collection". I know of only one other working wooden Sharp cathedral radio in NZ, so restored this could possibly be the rarest cathedral shaped radio in your collection. Doug agreed, so I went ahead and bid on it on his behalf and as this was the only bid, we won the auction.

The radio was in Christchurch so Doug arranged for his brother who lives nearby to collect the set, pack it and courier it to Auckland for us. The couriers did their best to totally wreck this radio despite it being superbly packed and prominently labelled "fragile". *[I fear this only identifies targets for some couriers! Ed.]* The radio had been in a reasonable condition when purchased. However when it arrived in Auckland the very heavy plastic packing case was cracked on two sides and there was damage underneath, where one of the control shafts had almost pierced the packing cabinet. The power transformer had been torn off two of its mounting brackets, some of the tuning gang rotor plates had been crushed almost flat and every joint in the cabinet had cracked open.

Doug now continues:

My first job was to dismantle everything and thoroughly inspect every part so that repairs could commence. Overall the radio seemed to have been stored in a dry place during its life of retirement. There was no rot, rust was minimal, delamination was average for a radio of that age and there were just a few nuisance borer holes.

On top of the poor radio's misfortunes, sometime during its life, someone had carried out redecorating with a thick coat of oil based paint. This was over everything including the speaker grill cloth. About the only way to get back to the original wood via stripping and sanding, was to completely dismantle every glued joint of the cabinet body. Normally this is not too much of a problem for a radio of that age but this factory had used a lot of nails in their cabinet construction. That just made deconstruction a little bit harder.

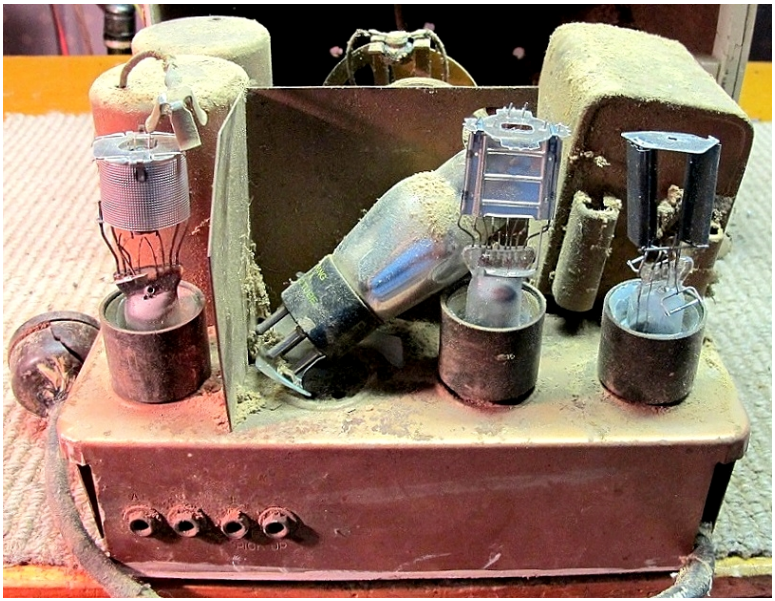
Missing were parts of the frame-work that held the cathedral shaped ply together. Fortunately I was able to replicate these from the parts that were still intact. Missing also was the rear cover tail gate panel. A borrowed back panel came in useful and another perfect duplicate was laser cut for the job.
The stripping and cleaning process revealed a couple of interesting details: The front panel was not made from the usual wood veneer, but manufactured in its present shape and design from a solid piece of timber. The production number (# 20) of this radio was clearly punched into the woodwork in the back of the cabinet. It seems this radio was one of the first off the block from the factory so to speak.
With a pile of clean parts, cabinet assembly was simple but very slow. A week or so of piecemeal gluing and it was starting to look like a cathedral radio again. Normally one would start with the base and build up around that, but for all the right reasons for this one I had to start with the arch and fit all the parts to it - finishing with the base. Now a totally glued cabinet and no nails in this one. The cabinet in its naked state was given to Gerry to do the specialist finishing job.
Doug on chassis repairs:
The transformer mounts were first replaced and then the damaged tuning gang was removed. The tuning gang rotor plates were straightened and given a light bead blasting to clean out some residual oxide. It scrubbed up very nicely. Other items of transit damage were the two tuning capacitors on the front of the radio. With light re-engineering and parts replacement I was able to get these back to good working condition. The chassis in its assembled static condition was taken back to Gerry to try and get it working. I was keen to see that the chassis remained as original as possible.
No schematic was available, so understanding the circuit with so many of the components buried in pitch inside cans was put on hold until I had sorted out a set of four working globe valves to replace the rather gassy ones that came with the radio. The replacement valves were 224, 227, UX112 and a 280.
A new power cord replaced the original cord and broken plug. The speaker tested good, so with the speaker and valves in place a Variac was used to gradually increase the supply voltage while keeping an eye on the amp meter. All seemed to be in order except for a very loud hum from the speaker.
I suspected that the filter caps, buried in pitch in a can with other caps, had long since reached their use by date. By tracing out that section of the circuit I could locate the two wires entering the can that came from either side of the filter choke. I disconnected these at the can and connected them to two new filter caps. The hum disappeared and with an outside aerial plugged into the antenna input, stations could be heard right across the dial.

Gerry continues: The rebuilt cabinet was returned to me for the polishing and final assembly. Doug had done a superb job rebuilding the cabinet so that only a final light sanding had it ready for the stain etc. Some experimenting was necessary with oak and walnut stains to achieve a finish that I felt suitably matched the original.
I applied a coat of shellac as a sealer then next day a careful buff with ultra fine wire wool to remove any possible nibs. Over several days the finishing coats were applied. A final coat of good quality furniture polish had the cabinet looking factory fresh.
As usual finding a suitable replacement grill cloth meant a visit to several fabric shops then finally at a furniture upholsterer's shop, I found some fabric that was very similar to the original. This was carefully installed using a glue gun.
The chassis and speaker were installed and the Sharp radio was ready to join Doug's collection.

Pictures

Above: Before and after

Below: As received

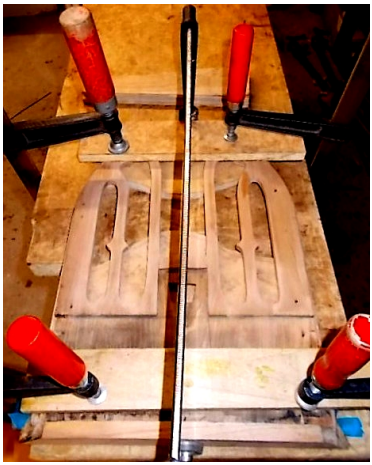


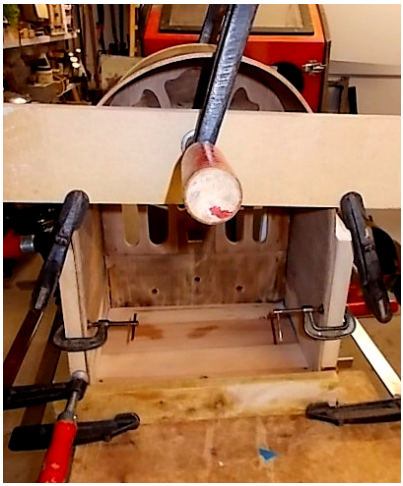
Before above and below a bit after.

Above Repaired Set Rear View, Others are before

Below mangled capacitor.

Step by Step Cabinet Repair by Doug Edgar:

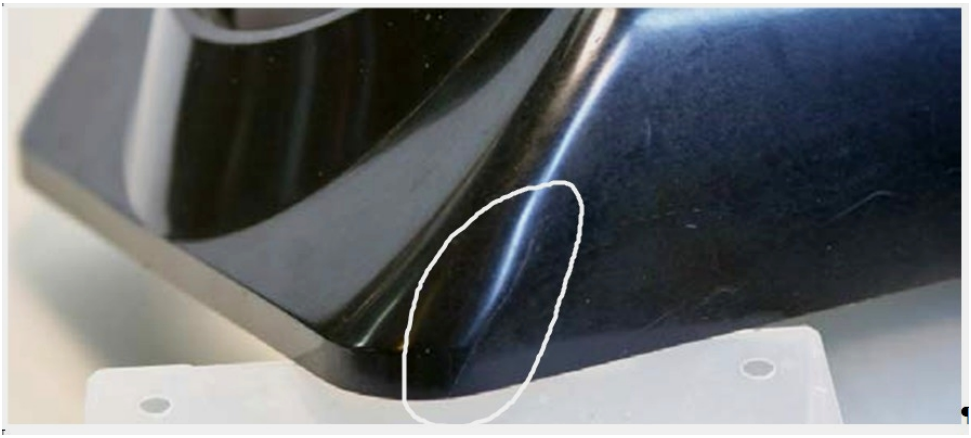




One method of repairing a small crack in bakelite

From Arwin Schaddelee (Netherlands)

An often irritating problem is a small crack in a bakelite telephone (or other bakelite object). Bakelite is, after all, brittle and this kind of damage can easily occur. In this article I will show how to do a relatively easy repair. It does however take some practice, so please try it out on a test subject first. Please do mind that it works best on black (really black) bakelite. It works on other plastics too, although other plastics may better be repaired with another type of glue. The blacker the material, the less visible the repair will be. We are using super glue, as it is translucent when dry it will take up the colour of the surrounding material. There is no need to colour the glue before applying.



In this case I am repairing the front corner of a Heemaf 1955 telephone. A crack in this position is a common occurrence. It is at a dangerous position, because here at the business end of the telephone there is a risk of cracking further, so a repair is needed.

Do I really need to repair this?

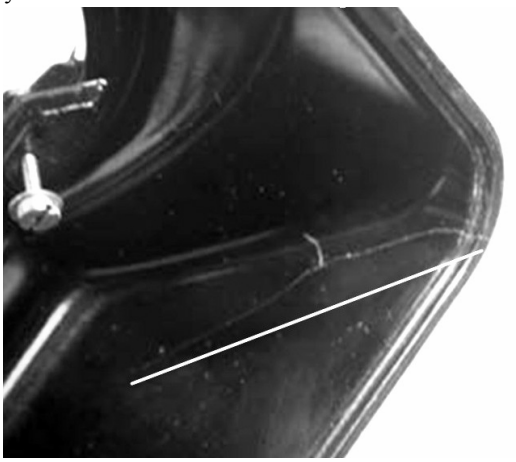
That is always the question, why should you repair it? Repairing it with this method is irreversible, resulting in the object being worse off if the process is botched up. So there are several aspects you may want to consider before you start:

1) Do you have the skill? Have you practiced this method? Were you happy with the results?

2) How valuable is the object you are going to repair? How does this relate to the first point, your skill to perform this method?

3) Is it safe to leave it as it is? In the case of the telephone in this article, the crack ran for quite some distance along the inside of the case. There was a risk of the crack getting bigger, because this telephone will actually be used and handled normally.

4) After the repair the crack may still be visible, albeit faintly.



Right: Inside view with white line indicating the length of the crack.

In this example the telephone in question was going to be used on a daily basis and not just a static display. Leaving the crack as it was would risk further cracking and possible breaking off. Also of note was that the crack was much bigger on the inside than visible on the outside.

What do we need?

- Super glue, the slow setting kind.

It will need to stay liquid for a few minutes. Some products dry really quick. Test it first. Perhaps Super glue gel?

- Sandpaper, 800, 1500 and 2000 grit.
- Toothpicks
- Scratch remover, polishing agent, Brasso, Displex etc
- Dremel tool with polishing wheel and grinding implement

Clean, clean, clean!

First, wash the object and make sure the crack is clean and there is no dirt around it. Also make sure there is no dirt in the crack itself. Brush along the crack with a stiff brush and soapy water. Make sure it is dry for the next phase.

Does it fit?

We are going to put glue in the crack later, so it is important to see if the crack closes properly. Both sides of the crack need to be as flush as possible. When you go across it with your fingernail, you must not feel a ridge. Please mind to go across it both ways! Do you feel a ridge? Make sure the crack is clean and nothing is stuck in it. Also try pressing it closed and see if it fits better that way. If you cannot get it to close properly, you may want to reconsider repairing it.

Wiggle it!

When we put on the glue later on in the process, we are going to wiggle the edges of the crack. This moving the edges of the crack will cause the glue to permeate fully through the crack. That is also the reason why we need slow setting super glue. Otherwise it will harden before the glue has fully penetrated the whole crack. Do mind that you do not put too much force on the crack, otherwise it may crack even further or you may even break off a piece of bakelite. You only have to wiggle it a little bit.

So do a test wiggle, before gluing it for real.

Sometimes it is not possible to wiggle. Then proceed to gluing, without wiggling.

Put it to the grind stone

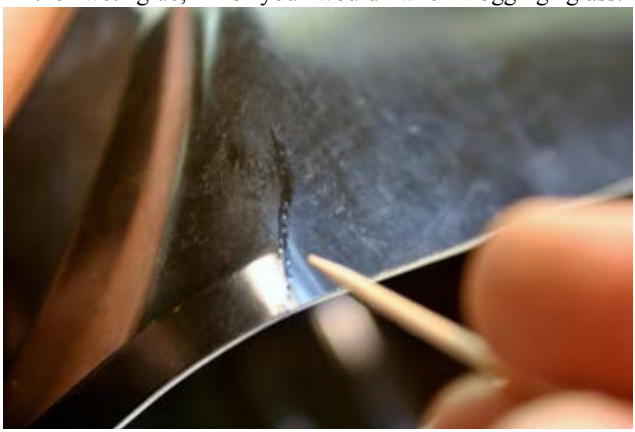
Sometimes I grind out the crack on the inside of the piece I am repairing. There are a number of reasons why this may be advisable to do so. Firstly, we are going to put the glue on the inside of the housing, squeezing a small line over the crack. Grinding it out makes the gluing a lot easier. The glue can be put in the ground out trench easily.
In this case the crack was longer on the inside than on the outside. I wanted to make sure I reached the very end of the crack with the glue, making sure the whole crack was glued. The crack in this case is in an area that is exposed and we do not want the crack to reappear. Also the position of this crack made it possible to grind it out.
There may be reasons not to grind it out; for example when the grind area is visible or in a hard to reach area.

Glue and wiggle and glue again

So, now we are ready to glue. We are going to start on the inside of the housing. In this case I have put a steady line of glue along the ground out trench. If you have not ground out the crack, just put a nice bead of glue over the crack itself.
After applying the glue, start wiggling the edges of the crack. By the motion of each side of the crack, the glue will permeate through the whole crack. After a while the glue will start to appear on the other side, in this case the outside of the telephone. Please do not stop at the appearance of the first small drop. Continue wiggling until all along the outside of the crack, drops of glue start to appear. You may want to apply some more glue on the inside and start wiggling again.

Please make sure there are no accidents with the glue, so hold everything carefully, preferably the glued part facing upward and the crack facing down as much as possible. Also beware of glue running through the inside of the housing and do not get any on your fingers!
When the first glue is well distributed, leave to set. Make sure the crack is closed properly and the 2 sides are flush. This is a critical moment. The more flush the two sides are, the less visible the crack

will be when finished. Hold the crack in place until the glue has set. You may speed up the setting process by breathing on the wet glue, like you would when fogging glass. Cyanoacrylate (superglue) sets quicker, when it comes into contact with moisture.



When the glue is set, take a toothpick and put a line of glue over the crack on the outside of the housing along the whole crack. You may want to repeat that 1 or 2 times. The glue will decrease in volume when setting. This forms a slight trench along the crack. It needs to be completely filled before we can start sanding.

Sand, sand, sand

Now we are going to carefully sand away the excess glue with 800 grit sandpaper carefully bent into a U-shape. With this bent piece of sandpaper I take great care to sand just over the glued part and try to avoid sanding the surrounding area as much as possible. Sand it down until all the excess glue has gone and the surface is totally smooth. Then carefully sand it again with finer and finer sandpaper.

Polish, polish, polish

First I polish the sanded area with Autosol car scratch remover a couple of times, using a felt polishing wheel on my Dremel tool. Afterwards I polish it by hand with an agent called Displex. {Displex is a compound for removing scratches from telephone touch screens. It works really well on plastics too.}

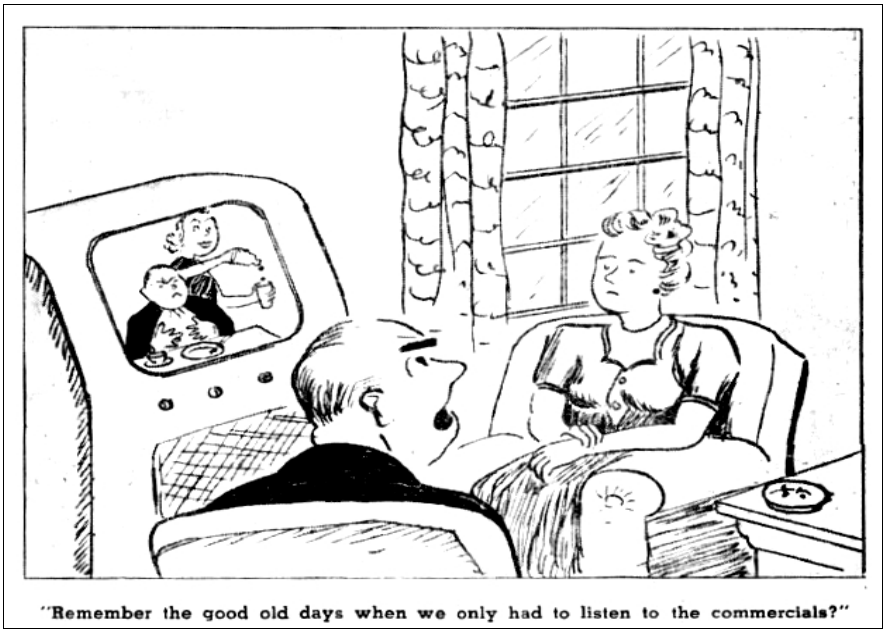
[Brasso, followed by Autosol car scratch remover and possibly Red Rouge may work here. Ed]

Show it off to your friends

If all goes well, the crack will be invisible. And you end up with this result, see last picture. Please mind that when the bakelite has faded a bit, the crack will show up black.
But in this case I am very happy with the result.

Arwin Schaddelee, The Netherlands. WWW.MATILO.EU

Editor's comment: Arwin's method seems to provide pleasing results and the polishing afterwards an important part – especially if adhesive "bloom" has appeared on the object's surface after using the Cyanoacrylate. Also there is sometimes a small part of the crack missing and a filler of some sort is needed. Here the fine dust of filled material from an inconspicuous part of the object (or ground material from another Bakelite object kept for such an occasion) can be used by sprinkling this dust over a glued section and built up inlayers to be slightly higher than the surrounding surface – to be smoothed off after the adhesive has set.



"Remember the good old days when we only had to listen to the commercials?"

Automatic Netting in Wireless Set No. 19 from Don Beswick

In Ray Robinson's professional presentation he mentioned the method used by Alan Butement to ensure that a transmitter and receiver were automatically on the same frequency. His method was used initially in Wireless sets No.9, No. 11, and later the No. 19 set.

The block diagram shows the receiver which is a conventional superhet with a 465kHz IF, and a BFO generating 465 + 3kHz to give an audio beat note.

Let's assume that it is tuned to an RF carrier of 5MHz. The local oscillator will be generating 5.465MHz and these signals are fed to the mixer (6K8 valve). The difference frequency is selected which is the IF of 465 KHz. The BFO generates a frequency of 465 + 3kHz, determined by the pitch control, and the IF and BFO signals are mixed in the detector, and again the difference frequency is selected to give an audio note between 0 and 3kHz.

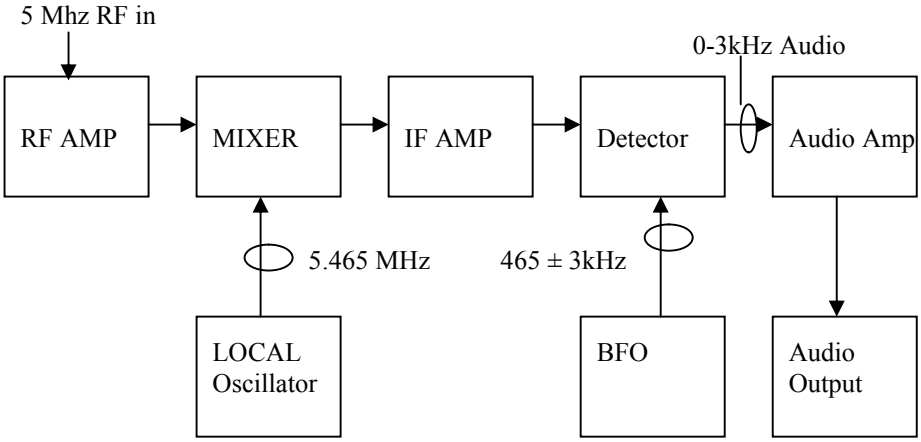
The clever part of the system is in the transmitter. The block diagram shows that the local oscillator signal of 5.465MHz is mixed with the output of the BFO which is 465 + 3kHz, and the tuned buffer selects the difference frequency which is 5MHz + 3KHz, or between 4.997 and 5.003 MHz, depending on the setting of the pitch control. This is the output frequency of the transmitter, and the 0 - 3KHz variation above or below 5MHz is well within the pass-band of a similar receiver, so for practical purposes the transmitter frequency is locked to the frequency of the incoming signal at all times.

The No. 19 set has two 6K8-G valves. One is used as the oscillator-mixer for the receiver, in which the triode section is the local oscillator and the hexode section is the mixer, which produces the IF output of 465 KHz. In the other 6K8-G the triode section generates the BFO signal, used when receiving and transmitting, and the hexode section is used only when transmitting. When transmitting, the hexode section is used to mix the local oscillator signal with the output of the BFO (both are from the triode section of each valve) and the difference frequency is what the receiver is tuned to. The tuned buffer is a high gain EF50 valve, and the input and output (at signal frequency) are tuned by two gangs on the four-gang variable capacitor in conjunction with coils for each range. This leaves only two gangs for the receiver, whereas a receiver with an RF stage should have three gangs. The aerial is connected to a separate tuned circuit which, when receiving, tunes the grid of the RF amplifier (6K7-G), and when transmitting it becomes the final tank circuit for the 807 output valve.

The operating procedure is more involved than that of the ZC1.

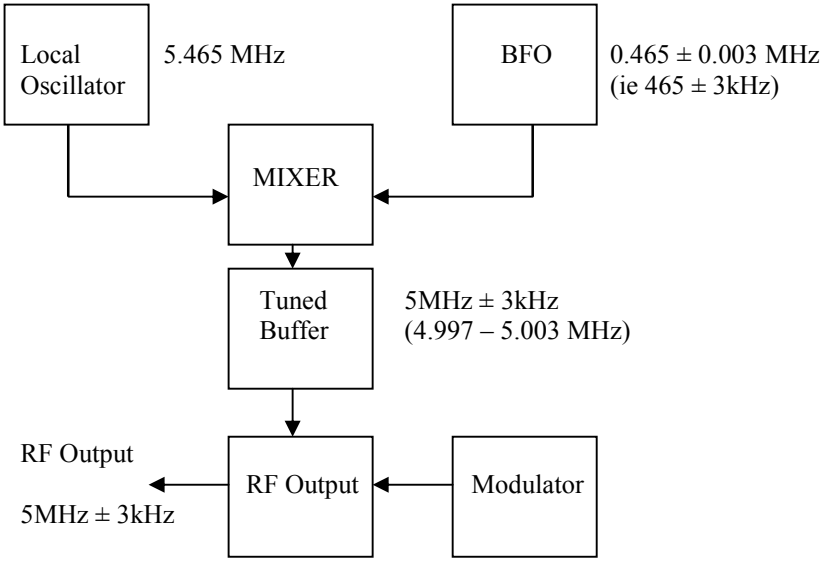
Block Diagram of the No. 19 Set Receiver

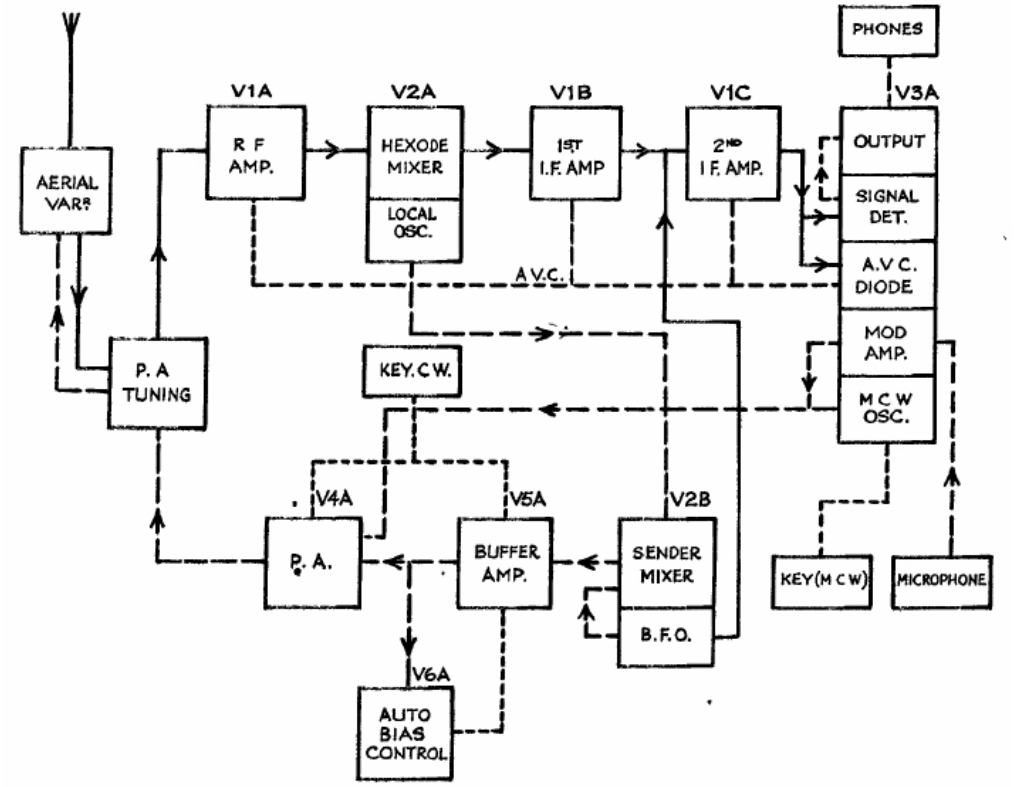
This is a standard superhet receiver with a BFO



Block Diagram of the Transmitter

The BFO is within a few kHz of 465kHz and when subtracted from the local oscillator frequency the difference is within a few kHz of the received frequency and within the pass-band of a similar receiver.





The overall combined block diagram of the number 19 set.

Milestones:

Collier and Beale began their partnership in 1926 – 90 years ago!

Radio Hauraki set to sea on Labour weekend in 1966 – 50 years ago!

Oxford University has a battery operated bell that has been "working" for over 176 years. The "dry cells" are made of 2 piles of 1000 discs each of alternating zinc and silvered paper, sealed with wax. It still generates about 2000 volts and drives an electrostatic bell.

See: //en.wikipedia.org/wiki/Oxford_Electric_Bell

Help requested for a Pacific 6 Valve Chassis

Hi David, I'm hoping you can help, or you know someone who can help... or as a last resort if you could put something in the next bulletin for me. I have this 1934/5 (I'm pretty sure) Pacific 6-Valve Dual Wave set which I am going to restore.

From what I can tell it was made by RCNZ for Pacific Radio and the chassis was used in both this cabinet, the awesome 'Elite', shown opposite and possibly the other standard-design console shown below (the owner of that one has a 7-valve chassis which is quite different).

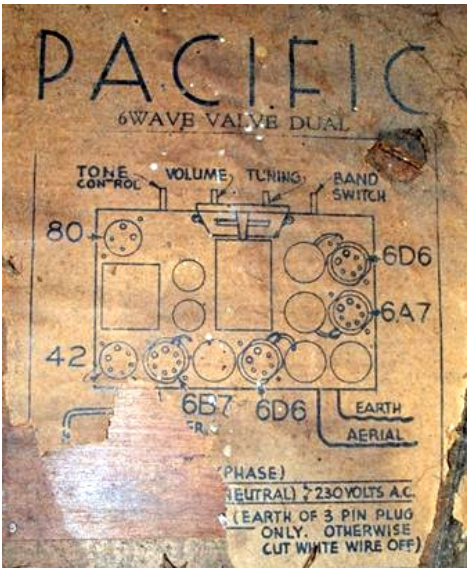
I want to restore mine, but the chassis has been changed to the wrong one, and mangled, and retrofitted with late-40's circuitry, which means I need to scratch build something. The RCNZ model 18 chassis is similar (same valve lineup, also dual-wave, but subtly different layout of coils, valves and controls - although the controls have the same spacing) so I am using a parts model 18 chassis as a base, but I don't have the schematic for the Pacific 6-valve and the library doesn't either. What I'm hoping is that someone out there does - and/or maybe someone out there has the Pacific 6-valve chassis in one of their radios that I could take some detailed photos of and reverse engineer something to suit my cabinet.

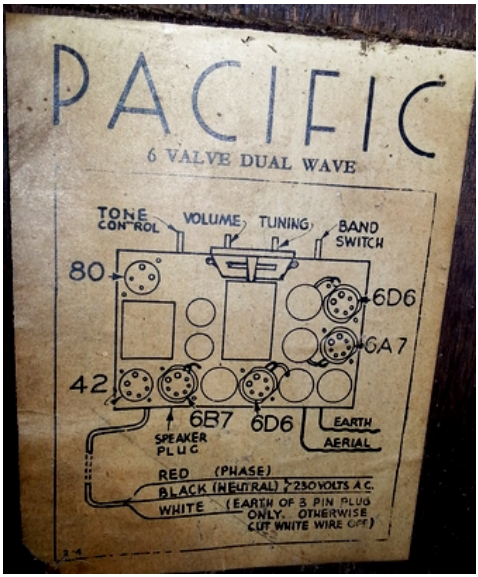
Above: Similar dial and controls but 7 valve chassis

Left: The Elite chassis, dial and controls all appear to be the same.

Below Left: Elite cabinet paper below.

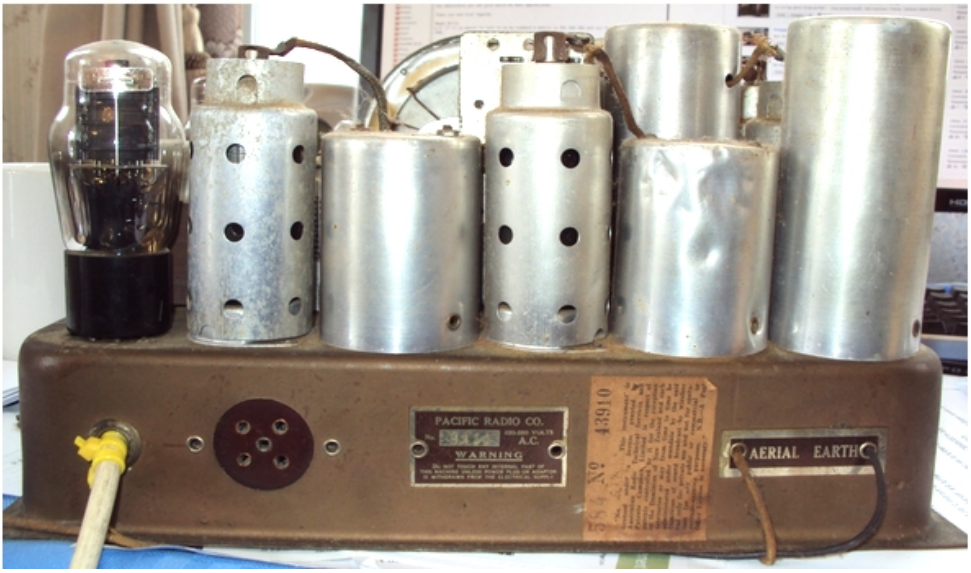
Below Right: Steve's back paper.





Above & below: Elite chassis – 6 valves

I also need to track down IF and coil cans that look like the ones below, someone that can screen-print metal to help manufacture the badges for the back of the chassis, and someone who can print transfers to rebadge an RCNZ speaker, but those are side-issues at present. This won't be a 5-minute repair :)

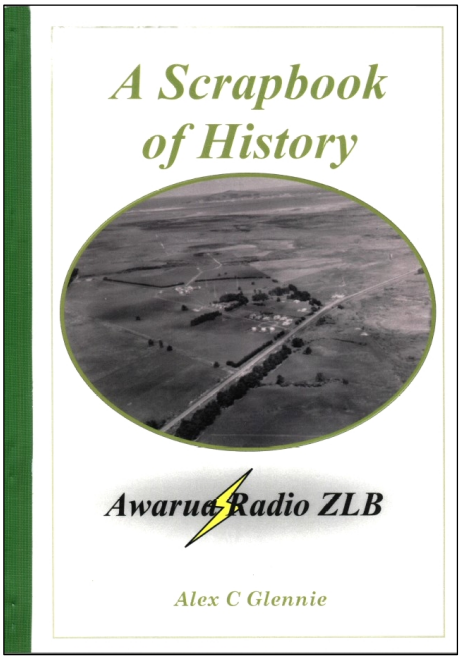


Above: Wanted Chassis RCNZ 6 vlave

Right: Back of chassis "Pacific Radio" badge

Anyway, if you can help or point me in the right direction I'd really, really love it.
Thanks, Steve Dunford, Christchurch. steve@essentialtech.co.nz

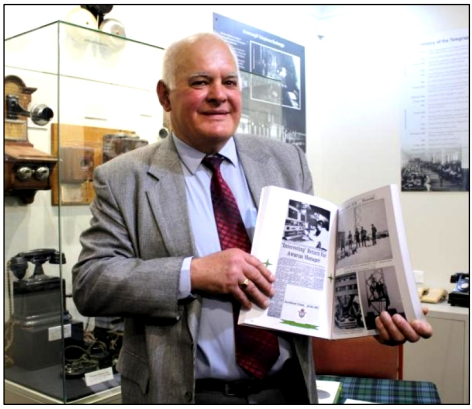
A Scrapbook of History Awarua Radio ZLB collated by Alex Glennie



"This detailed reference book records the history of Awarua Radio Station and is published by the Awarua Communications Museum to raise funds.
The 282 page A4 sized book contains photographs, maps, documents and stories of Awarua Radio from inception in 1913 until closure in 1991. It covers 19 station masters, the period of World War 2 as well as present day auroral research with the Unwin Radar and the Awarua Space Tracking Station. The book includes hundreds of photographs, newspaper clippings and reproductions of official documents as well as anecdotes and biographies.
Alex Glennie's father worked at the station for 30 years until his retirement in 1976, and the family lived in one of the cottages at the station for 15 years."

Books can be ordered for $60 plus $8 track and trace postage within New Zealand.
Inquires to the Awarua Communications Museum at info@awaruamuseum.co.nz or
Awarua Communications Museum, PO Box 722, Invercargill 9840
Payment by cheque or direct credit to Awarua Communications Museum
Westpac account 03 1745 0077525 00 with your name as a reference.

While this book contains a wealth of clipped material (hence the title "Scrapbook of History") my slight disappointment was that the reproduction quality of some of the scanned items means they are relatively hard to read. Included in this category is a direct reprint of the George Newlands excellent NZVRS bulletin (Feb 2002) item on high powered spark transmitters. Other material is of excellent quality and the typed text easy to read. The oral recollections are a treat – almost from another world, but a reminder of how things actually were, here in the past. It is a collection of items of interest and not quite the sort of book to read from cover to cover in one sitting – rather a pick up and read from selected items. The A4 format is good for a serious "lap" read but not like a novel to be read in bed!
Buying this book of course also supports the Awarua Communications Museum and that is a recommendation in itself. Ed.



Alex Glennie at the Awarua Communications Museum book launch (ODT web pix)

Eddystone 670 Marine Receiver conversion to 230 AC from Don Beswick

These sets were designed to operate from 230V or 110V AC or DC as found on ships. The basic circuitry (valve heaters and HT supply) were designed to operate on 110 volts, and when used on 230 volts the extra 120 volts was dropped by a large wirewound resistor (about 12cm long and 3cm wide) mounted inside the case near the speaker. The heaters of the U-series Rimlock valves were wired in series parallel and fed through a thermistor so that the voltages added up to 110 volts. The thermistor protected the valve heaters from the initial current surge, although it delayed considerably the heating up of the valves. A selenium rectifier was mounted on the chassis and supplied the HT voltage by a half-wave circuit. One side of the mains (preferably the neutral!) was connected to the internal chassis, but if the mains plug / lead connection was reversed then the internal chassis would become live. For safety, the internal chassis had to be insulated from the outer metal case and front panel. The metal case should be earthed unless the set is supplied from an isolating transformer.

When purchased as a restoration project, a few components had been replaced but the set was not working. Other resistors and capacitors were replaced, the output transformer was OK, but the main dropping resistor (500Ω @ 50W) was open circuited, and a suitable replacement was fitted. Selenium rectifiers generally show their age by developing a high forward resistance, and less HT voltage, so it was replaced by a silicon diode with 22Ω in series. The filter choke was not original so a more suitable one was fitted. The mains polarity was confirmed (neutral to chassis), and when tested it worked on broadcast but clearly needed alignment. After a few minutes it was found that the large dropping resistor generated a lot of heat which would have heated up the outer case. What was more important was the condition of the insulation between the internal chassis and the outer metal case and the diecast front panel. There are Paxolin strips separating the internal chassis from the outer metal straps that wrap around the chassis, and there are Paxolin tubes and washers to insulate the front panel from the coil box which was part of the internal chassis. An initial test with an ohmmeter showed good insulation, but a megger test with a higher voltage showed that there was leakage of a few thousand ohms, which was unacceptable. It was not a practical proposition to remove the faceplate and the screws holding the front panel to the chassis and replace the Paxolin tubing and washers, so it was decided to remove the large voltage dropping resistor and run the set from a 110 volt isolating transformer. The set worked on the lower bands, but an external transformer is a nuisance. There was still the inconvenience of a long warm up time because of the thermistor (carbon rod type) in the series heater string.

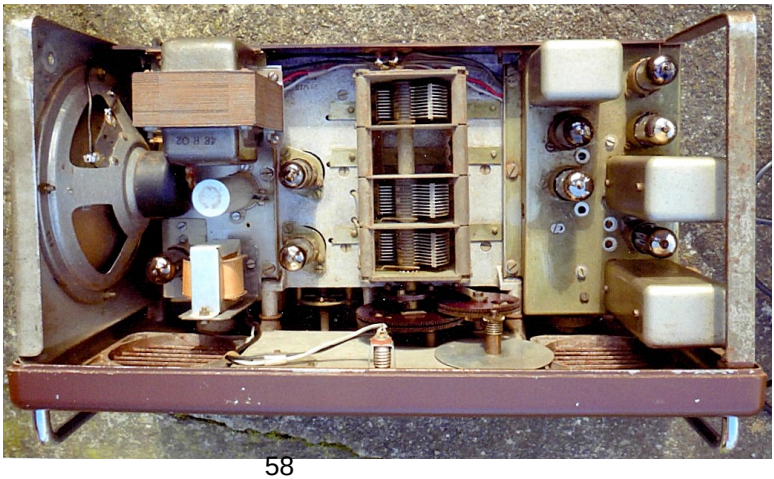
Finally I decided to fit a mains transformer and fit the E-series Rimlock valves (with 6V heaters) and wire the heaters in parallel. A Beacon R02 transformer was fitted, and it was necessary to fit a speaker with a smaller magnet to allow room for the transformer to be mounted where the selenium rectifier had originally been.

This transformer is 280V aside at 60 mA and should provide an HT of about 230 volts. There was an oblong hole in the power supply chassis where an oil-filled capacitor had been fitted, and the centre part of the hole was widened slightly and a patch fitted to accommodate a socket for an EZ40 rectifier valve. The HT line under the chassis was an airborne bare copper wire

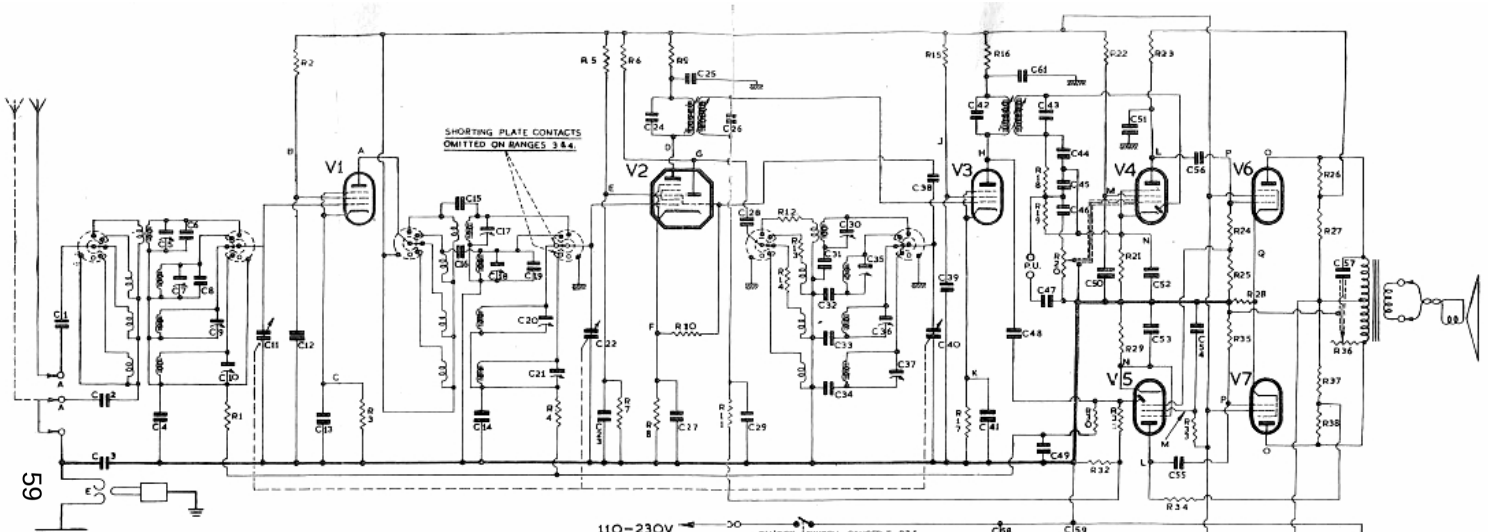
which made access to other components somewhat difficult, so two small tag strips were fitted on the chassis for the HT wiring. The thermistor was no longer required, and the valves heated up more quickly. In the course of rewiring the heaters from series to parallel, about two metres of surplus heater wiring was removed. The push-pull UL41's were replaced by two EL42's as used in car radios and they worked well and drew less current than push-pull EL41's. The HT voltage was about 230 volts and it brought the top short wave band back to life. At the same time R12 and R13 in the oscillator circuits of V2 were deleted and R14 was reduced from 560 to 56 ohms. The audio driver valves which were originally UAF42's were replaced by EAF42's and both types gave more audio gain than needed. If two EBC41's were used, with the diode units tied together, there should still be sufficient audio gain, and the circuit would be simplified with the removal of two screen resistors and two bypass capacitors. In this circuit the grid voltage for the second driver is obtained by tapping off the output voltage of the first driver, and with the lower gain of triodes the value of R25 would have to be increased to tap off a larger proportion of the voltage. The model 670 has a push-pull output (originally UL41's) driven by the push-pull driver stage of UAF42's. The circuit is sometimes called a paraphase circuit, and the audio output of the first driver is tapped off to feed the grid of the second driver with the correct voltage level (which equals the grid voltage of the first driver). For example, if one volt of signal at the first driver produces an output of 20 volts, then 1/20th of this output is tapped off to feed the grid of the second driver. This gives one volt of AC signal for the second driver so that its output will also be 20 volts (with the required phase relationship) so that the output valves will give a balanced output.

Remember that the first driver gives a phase inversion and the second driver gives another phase inversion so that their outputs are of opposite phase to drive the push-pull output valves.

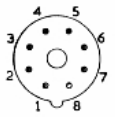
In the 670 circuit the voltage divider consists of R24 and R25 and the proportion of voltage tapped off is R25/(R24 + R25) and the gain of the driver stage is the inverse of this ratio. In the original circuit R24 was 1 Megohm (1,000kΩ) and R25 was 13kΩ, so the gain of the driver stage was 1013/13 which equals 78. When those resistance values were used with EBC41's an audio voltage of 0.8 volts on the grid of the first driver produced 0.5 volts on the grid of the second driver, so R25 was increased to 18K and finally to 22K, which gave 0.8 volts on the grid of the second driver. Waveforms were checked with an oscilloscope and it confirmed the same grid voltage on each triode driver valve, hence the driver voltage was balanced to give a balanced output from the output valves. (This is one of the situations where an oscilloscope is needed). In this circuit the gain of the triodes was 1022/22 which equals 46, and there was still plenty of audio gain to drive the EL42's. The set has its own speaker and is now self-contained, except that it is now suitable only for 230V AC. However the wiring is simpler and, more importantly, the internal case and chassis can be earthed.



Right, New PSU squeezed in below new speaker.



VALVES		1	2	3	4	5	6	7	8
V1, 3, 4, 5.	UAF41.	H	A	D	G3	G2	G1	K.S.	H
V2.	UCH41.	H	AH	AT	G3	G2 G4	G1	K	H
V6.7.	UL41.	H	A	K G3	_	G2	G1	K G3	H



UAF42 and UCH42 valves are equally suitable.

COMPONENT VALUES

RESISTORS.

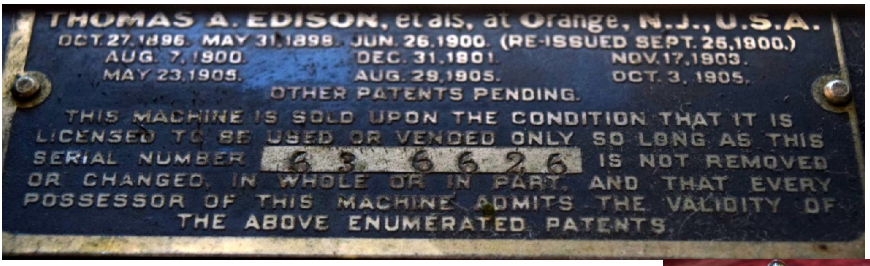
R1	470,000 ohms.	½ W.	
R2	47,000 ohms.	"	
R3	330 ohms.	"	
R4	470,000 ohms.	"	
R5	20,000 ohms.	"	
R6	10,000 ohms.	"	
R7	47,000 ohms.	"	
R8	200 ohms.	"	
R9	1,000 ohms.	"	
R10	22,000 ohms.	"	
R11	1 Megohm.	"	
R12	12 ohms.	"	
R13	47 or 50 ohms.	"	
R14	560 or 500 ohms.	"	
R15	47,000 ohms.	"	
R16	1,000 ohms.	"	
R17	330 ohms.	"	
R18	22,000 ohms.	"	
R19	100,000 ohms.	"	
R20	500,000 ohms.	Pot. (No. 3136P).	
R21	2,700 ohms.	½ W.	
R22	1 Megohm.	½ W	
R23	270,000 ohms.	"	
R24	1 Megohm.	" 5% Tolerance	
R25	13,000 ohms.	" 5% "	
R26	100,000 ohms.	"	
R27	2,700 ohms.	"	
R28	120 ohms.	"	
R29	2,700 ohms.	"	
R30	470,000 ohms.	"	
R31	220,000 ohms.	"	
R32	470,000 ohms.	"	
R33	1 Megohm.	"	
R34	270,000 ohms.	"	
R35	1 Megohm.	"	
R36	50,000 ohms.	Pot. with D/P. Switch (No. 3757P).	
R37	2,700 ohms.	½ W.	
R38	100,000 ohms.	"	
R39	500 ohms.	3A. with 3 Variable Taps.	
R40	140 ohms.	1½ W. Wire Wound.	
R41	Thermistor.		

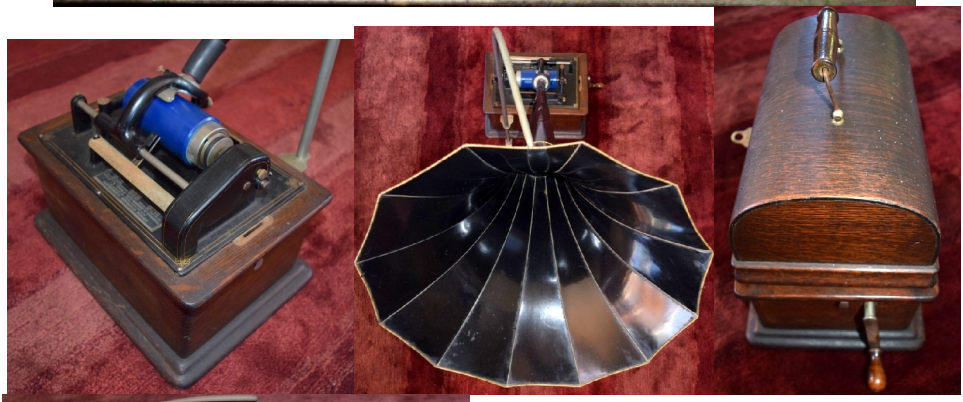
CONDENSERS.

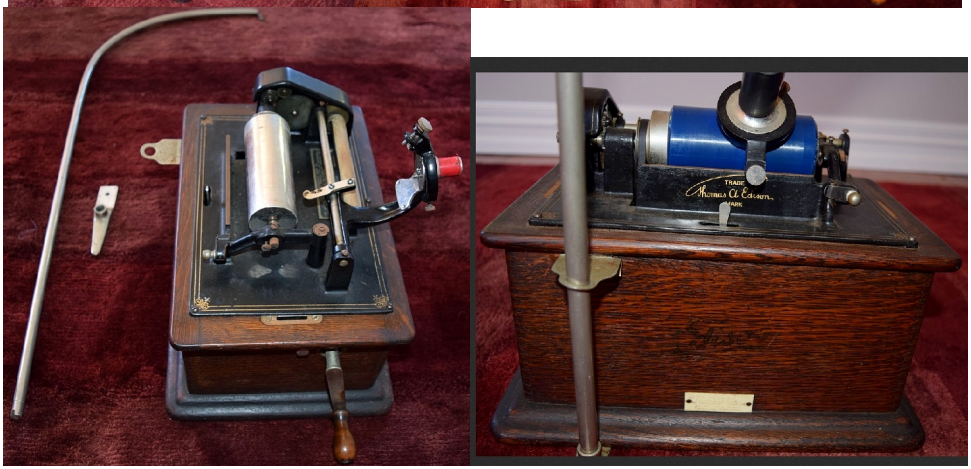
C1	·01 mfd.	Moulded Mica.	
C2	·01 mfd.	Moulded Mica.	
C3	·01 mfd.	Tub. Paper (AC type)	
C4	·01 mfd.	Tub. Paper.	
C5	3–10 pf.	Air Trimmer.	
C6	10 pf.	Ceramic.	
C7	3–10 pf.	Air Trimmer.	
C8	10 pf.	Ceramic.	
C9	3–20 pf.	Air Trimmer.	
C10	3–20 pf.	Air Trimmer.	
C11	11·5–210·6 mmfd.	3 Gang.	
C12	·1 mfd.	Tub. Paper.	
C13	·1 mfd.	Tub. Paper.	
C14	·01 mfd.	Tub. Paper.	
C15	30 pf.	Ceramic.	
C16	6 pf.	Ceramic.	
C17	3–20 pf.	Air Trimmer.	
C18	3–20 pf.	Air Trimmer.	
C19	8 pf.	Ceramic.	
C20	3–20 pf.	Air Trimmer.	
C21	3–20 pf.	Air Trimmer.	
C22	11·5–210·6 mmfd.	3 Gang.	
C23	·1 mfd.	Tub. Paper.	
C24	100 pf.	Silvered Mica.	
C25	·1 mfd.	Tub. Paper.	
C26	100 pf.	Silvered Mica.	
C27	·1 mfd.	Tub. Paper.	
C28	100 pf.	Silvered Mica.	
C29	·01 mfd.	Tub. Paper.	
C30	3·5–20 pf.	Ceramic Trimmer.	
C31	3000 pf.	Silvered Mica.	
C32	2000 pf.	Silvered Mica.	
C33	640 pf.	Silvered Mica.	
C34	280 pf.	Silvered Mica.	
C35	3·5–20 pf.	Ceramic Trimmer.	
C36	3·5–20 pf.	Ceramic Trimmer.	
C37	3·5–20 pf.	Ceramic Trimmer.	
C38	100 pf.	Silvered Mica.	
C39	·1 mfd.	Tub. Paper.	
C40	11·5–210·6 mmfd.	3 Gang.	
C41	·1 mfd.	Tub. Paper.	
C42	100 pf.	Silvered Mica.	
C43	100 pf.	Silvered Mica.	
C44	100 pf.	Ceramic.	
C45	100 pf.	Ceramic.	
C46	·01 mfd.	Tub. Paper.	
C47	·05 mfd.	Tub. Paper.	
C48	10 pf.	Silvered Mica.	
C49	·01 mfd.	Tub. Paper.	
C50	·1 mfd.	Tub. Paper.	
C51	40 pf.	Ceramic.	
C52	30 mfd.	15v. Tub. Elect.	
C53	30 mfd.	15v. Tub. Elect.	
C54	·1 mfd.	Tub. Paper.	
C55	·01 mfd.	Moulded Mica.	
C56	·01 mfd.	Moulded Mica.	
C57	·05 mfd.	Tub. Paper (AC type)	
C58	50 mfd.	450v. Wkg. Tub. Elect.	
C59	50 mfd.	450v. Wkg. Tub. Elect.	
C60	·01 mfd.	Tub. Paper (AC type)	
C61	·1 mfd.	Tub. Paper.	

Phonograph Auction item 19 December Auckland Meeting

The Auckland meeting on the 19th December will be mainly valve sales of new old stock from the collections of Ross Paton and Bryan Marsh. However there has been a generous donation from a non member who would like to see the items go direct to members rather than to be seen for resale on any internet auction – eg TradeMe, eBay etc. One of the items is a rather nice (presumed to be) Edison Standard Model B from December 1905, with a Morning Glory Horn; photos below. The machine works but is stiff and has slight surface rust in some places on the bare metal – some simple TLC eg clean and lubrication would see a nice working unit. Members are welcome to place absentee bids in writing for this auction item via the treasurer or secretary email: nzvrs@pl.net Collection will be the responsibility of the successful bidder on the evening of the auction. See nzvrs.pl.net/aaa/gram.pdf for better pictures







MARKETPLACE

Advertisements should be neatly hand printed, typed or printed onto a separate page, posted to the NZVRS or emailed to *nzvrs@pl.net*

Often a picture will help members understand your item. No verbal or telephoned adverts thank you, and don't forget to include some contact details; eg postal, telephone & email. There is no charge for members' adverts but the NZVRS is not responsible for the outcome of any transactions between members.

AVAILABLE

Valve Cartons Final Run on these - no more to be made by Paul: – plain white flat packs

- Small size $15 per 100
- GT size $15 per 100
- Medium size $18 per 100
- Large size $25 per 100

NZ & OZ supplied, contact Paul for post and package charges per order.

Contact: Paul Burt, 44 Hastings St West, Christchurch 8023.
Tel: 03 - 960 7158, Mob: 021 0236 1748
Email: **paulburt444@gmail.com**

Society Sales:

NZVRS supplied CAPACITORS for sale to NZVRS NZ members only please. Order via Bryan Powell, 279 Spur Road, RD3, Silverdale 0993. Tel: 09 - 44 22 514 or mob: 029 415 5119
Email: **bapowell@xtra.co.nz**

Metal polyester film, axial leads, (µF):

0.001	630 Volts	**60** cents each
0.002	630 volts	**60** cents each
0.005	630 volts	**60** cents each
0.01	630 Volts	**60** cents each
0.022	630 Volts	**60** cents each
0.033	630 Volts	**60** cents each
0.05	630 Volts	**60** cents each
0.068	630 volts	**60** cents each
0.1	630 Volts	**60** cents each
0.22	630 Volts	**60** cents each
0.33	630 Volts	60 cents each
1 µF	400 Volts	$1.00 each

Electrolytic capacitors, polarized, axial

10 µF	450 Volts	$1.50 each
10 µF	**600 Volts**	**$3.00 each**
20 µF	450 Volts	$2.00 each
40 µF	450 Volts	$3.00 each
47 µF	450 Volts	$3.50 each
100 µF	450 Volts	$5.00 each

Lamps 6.3 volts 150 mA (low wattage)
MES & Bayonet 50c each

Extra specials while stocks last:
Box of 10, globular 12volt, 250mA MES lamps at $2 per box. Limited supply – only one box per order please.

For all orders please add $3.50 for P&P.

Power plugs (Tilley white plastic type with unprotected brass pins as pictured above) available at 50 cents each plus $4 post and package per set of 4 (ie $6 for set of 4, posted to an NZ address).

KTW62 valves (actually VR100 10E/278 or 6U7 GT, CV1100) NOS $1 each collected club nights or $15 for packs of 5 P&P inclusive. Quantity limited and may be rationed per member.
Contact the NZVRS Secretary Paul Woodcock, 2 Levy Road, Glen Eden, Auckland 0602.
Email: **paul.woodcock@opus.co.nz**

All Society Sales cheques to be made out to the "NZVRS" and crossed "Not Transferable" please.
Direct banking options are available to the NZVRS ASB bank account – see bottom of page 2.

AVAILABLE:

Hewlett Packard Journal 1962 – 1965 – it is a technical magazine produced by this company. I have bound copies of this publication free to a good home. Contact David Fahy via Email **amanda.david@clear.net.nz**

I have a Philips Hi Z Chassis & Speakers for sale, model F7Z96A, going order though the volume pot is noisy, the speakers are still on the baffles from the cabinet (now holding drinks).
I am open to offers around $20.
Thanks, Bill Campbell. Tel: 06 753 2475
Email: **billcampbell@clear.net.nz**

Wanted

Marquis Tuning Knob (as per photo below) 32 mm Dia. Grub Screw type, with or without small pointer. For a 1933 Ultimate Model 514, shown in 'More Golden Age of Radio', by John W. Stokes, page 130, it's also on the Dust Cover. Please Contact Alan Colman,
Tel: 09- 476 2092
or Email: **colmana@paradise.net.nz**

Wanted

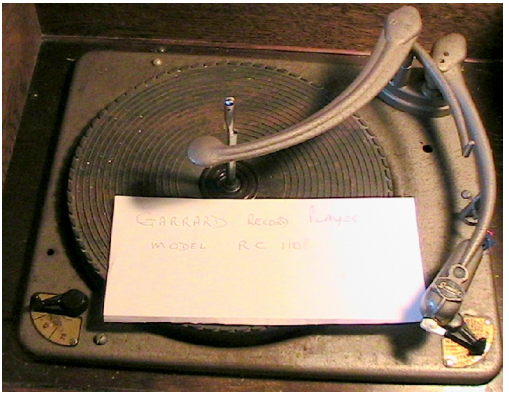
1) I am after 2 or 3 RCNZ (Columbus/ Courtenay) EM loudspeakers 8" or 10". I would prefer the speakers to have cones that are beyond reasonable repair, as it's the field coils (and in one case) the hum bucking coils that I'm needing to repair other RCNZ speakers I have that have open field coils. I would like one to be of 1000 Ohms, if at all possible please? If available, I will also buy speakers that are in good order too.

2) I now find that I am in need of one or two **RCNZ (Columbus or Courtenay) power transformers**. The ones I am wanting are vertical mounting, 385-0-385 Volt (at 80mA), a 5 Volt and a tapped 6.3 Volt secondary windings. It seems that most RCNZ power transformers are similar (as far as size and ratings go) for radios that have RF valves, so it won't matter what model chassis these transformers come from.

3) I am also after **dial glasses (in great order please) for both Courtenay and Columbus models 90 and 91**. Or, if anyone knows how to replicate these in 'Photoshop' (or other graphics program), I would be very happy. I have recently acquired a Courtenay 91 that has a dial glass in poor condition. I also have a Columbus 90 and 91 with poor dial glasses. I can be contacted by email: **ptr_walsham@yahoo.com.au** or phone: (09) 238 4520 (Pukekohe). Thank you, Peter Walsham

Wanted.

Garrard record player RC110 as pictured below. Thanks, Albert Cross
Email: albert.cross@ihug.co.nz

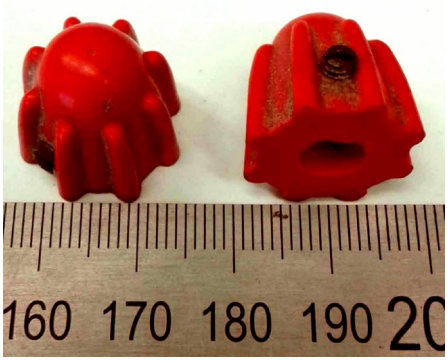


Club Sale by Tender:

John F Rider's Perpetual Troubleshooters Manual 1931 (Volume 1 covering US sets from 1919 ~ 1931) and 1932 (Volume 2 covering US sets from 1931 ~ 1932) for sale to members via tender. These volumes are in very reasonable condition but surplus to the Library's requirements and are offered to members only, by way of tender. Tenders must be in writing - posted or emailed to the society email address **nzvrs@pl.net** or **PO Box 13873, Onehunga**, indicating the price offered for the individual volume and include the name of the bidder. Sorry **no** telephone bids. The highest bidder (above a modest reserve price) will be awarded the volume(s) at the offered price - plus any additional costs for postage or courier where applicable. Failure of bids to reach the reserve will probably see these in the December Auction. Tenders close at **noon, Friday 16 December 2016.**

Wanted

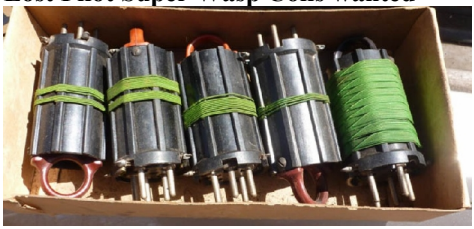
4 knobs for a Philette model 540/540E radio as per photo (approx 20 mm diameter). Colour is **not** important. Please contact John Dodgshun
Email: **dodgshun@es.co.nz**
Mob: 021 139 6155



Wanted

Photographs or information on a 1924 **Gecophone BC2010 4 Valve Deluxe Cabinet Receiving Set**. I believe one may have belonged to Dieter Bardenheir some years ago. **Evan-alex@aanet.com.au**
HRSA member number 2740.
Regards and thanks,
Evan Murfett
6 Tennyson Street
WOODEND VIC 3442
(+61) 03 5427 3663

Lost Pilot Super Wasp Coils wanted



A box of coils similar to these were misplaced at a mid-year club auction night. John Akersten would very much like to be reunited with them. Contact John on 027 450 3051 or email: **jm.nthaiz@xtra.co.nz**

I'm **travelling to USA in May 2017** intending to visit various events including; Kutztown PA, Antique Radio Meet and Dayton OH Hamvention plus other attractions such as The Smithsonian in Washington DC and whatever else is possible. See:

http://www.dvhrc.com/ May 12-13 2017
http://hamvention.org/ May 19-21 2017

I did a similar trip last year for a month; car and motel costs are cheap. If anyone would like to discuss possible joint travel plans please contact Peter Noonan Whangarei, tel: 09-432 8441 evenings or email **peter.noonan@xtra.co.nz**

Philips / Belgium MBLE knobs: Desperately seeking the following: 6 of the larger knobs, 2 of the smaller or a Full Stereo 4 Plus amplifier, Manufacturered 1959
Link to radiomuseum
http://www.radiomuseum.org/r/mble_full_stereo_amplifier_4_4.html

Perhaps all should have gold centres? Ed.

Contact: David Kemp email: **me@kempy.com**
Mobile: 027 274 7244

Stuff is the junk you keep -- Junk is the stuff you throw away!

RADIO DIRECTORY

What to Buy and Where

CITIES

AERIAL MASTS	Domestic Radio Co., Ltd., Strand Arcde, Auckland.
ALTONA & HAMMARLUND-ROBERTS SETS.	Johns, Ltd. Chancery Street, Auckland.
ATWATER-KENT RADIO	Frank Wiseman, Ltd. 170-172 Queen Street, Auckland.
BREMER-TULLY RADIO	Superadio, Ltd., 147 Queen Street, Auckland.
BURGESS RADIO BATTERIES,	All Radio Dealers.
CROSLEY RADIO	Abel, Smeeton, Ltd., 27-29 Customs St. E., Auckland.
FERRANTI RADIO COMPONENTS	A. D. Riley & Co., Ltd., Anzac Avenue, Auckland, and all leading Dealers
CROSLEY SETS	Lewis Eady, Ltd., Queen Street, Auckland.
LOUDSPEAKER AND TRANSFORMER REPAIRS	A. E. Strange, 404 Worcester Street, Christchurch.
MULLARD VALVES	All Radio Dealers.
RADIOLA RECEIVERS	Chas. Bennett, Ltd., 619 Colombo Street, Christchurch.
RADIOLA RECEIVERS and Expert Radiola Service.	Farmers' Trading Co., Ltd., Hobson Street, Auckland.
RADIO REPAIRS AND SERVICE	E. G. Shipley, 185 Manchester Street, Christchurch.
DIAMOND DRY BATTERIES	Royds-Howard Co., 553 Colombo Street, Christchurch.
T.C.C. CONDENSERS	A. D. Riley and Co., Ltd. Anzac Ave. Auckland, and all leading dealers.

COUNTRY TOWNS

CROSLEY RADIO	J. C. Davidson, Main Street, Pahiatua
CROSLEY SETS	F. H. Jellyman, Ltd., Devon Street, New Plymouth.
CROSLEY RADIO	D. A. Morrison & Co., Victoria Avenue, Wanganui.
MAJESTIC, ATWATER-KENT AND APEX ELECTRICAL SETS. Also Bremer-Tully, Radiola and Browning-Drake	Radio House, Hamilton. G. S. Anchor, Manager.
PHILIPS VALVES AND APPARATUS	All Good Radio Dealers.