AVAILABLE (CONT.)

I have been asked by one of our veteran collectors, who is moving to a retirement home, to help dispose of his collection which consists of approximately 150 radios mainly from the 40's and 50's. He wishes to sell the collection as one lot for $2000. I have photos of most of his collection which I can send to any interested member, or would be pleased to answer any phone queries. Rod Osborne, PO Box 2098, Tauranga. Phone 07/5442887.

WANTED

Chassis for an Atwater Kent model 75 or any other Atwater chassis which would fit the model 75 cabinet which I have. Also I require an Atwater turntable or any 78 rpm turntable and pickup. Sam Lowe, 23 Hurdon St, New Plymouth. Ph 06/7536693

Dial glass for a Philips "Westminster Hall" model F8Z96A Hi Z stereo. Please write to E.Herbert, 13A Didsbury Drive, Waihi Beach.

Old time servicing instruments (whether serviceable or suitable for parts only) and manuals, circuits or other data. Multimeters or W.H.Y. to quality gear. Interested in particular in Rimco Dynalyzer (USA tuned signal tracer) and audiolyser, Denradio JB7 tuned signal tracer (Australian), Supreme (USA) 582-A pushbutton RF Signal Generator (data, instructions only), Early Radiocraft, Service, Radio & Hobbies, Practical Wireless, Australasian Radio World mags of 30s-50s or W.H.Y. Radio servicing test equipment books. B F Baker, 2 Queen St.,Russell 0255. Ph/Fax 09/4037718 evenings if possible.

Tuning gang for Pacemaker G828. Richard Webb. Ph 09/2756381.

Car radio, early 30's, earlier the better, Atwater Kent, Philco, RCA, Scott etc or UK set, any condition, complete or not. Peter Noonan, 52 Ruakaka Beach Rd, Ruakaka. Ph/Fax 09/4328441.

Meter for AVO Valve Characteristic Meter Mk IV. also information on Paton Electrical Valve Tester Model VCT, serial no 166:69. Contact Ray on 03/6849089 or email rdever@timaru.com

Cabinet for Zenith model 55127 upright or mantel (MGAR p180). Also cabinet for Philco model 37-610 upright. Buy or may swap for these items. Kevin Horn, 26 Roycroft St., Waihi. Ph 07/8636865. email hornfam@xtra.co.nz

Following valves, KBC1, KL2, KL4 or KL5, AL1, AL2X., AL3 and AL4. Also would like to know valve lineup for Philips models 715 and 518. Bill Edwards 211 Dickson Rd, Papamoa, Tauranga.

Power transformer for Atwater Kent model 85. Sec 320-5-2.5 volts or similar. Bill Lambie, 12 Foster St, Avalon, Lower Hutt. Ph 04/5678840.

I need the following parts to complete my Columbus 27. One power transformer, four knobs, one 8" EM speaker. Damien Jurgens, 105A Matapihi Rd, Mount Maunganui, Tauranga. Ph, 07/5725977 (wk 07/5756119)

Trio 9R59 Communications receiver, slide rule dial model Operadio speakers, 8" electrodynamic types, both front and rear spider types required. Gordon Baker, 101 Hinewa Rd, Otumoetai, Tauranga 3001. Ph. 07/5767889. Fax 07/5782899.

EZ40, EL41, EBC41, EF41, ECH41, valves, must have 80% emission test. New 10uF 350V electrolytics. Army ZC1 whip aerial with base. Mike Edwards, 47 Martyn St, Waiuku 1850. Ph 09/2356903.

Own copy

N.Z.V.R.S. Bulletin

NEW ZEALAND VINTAGE RADIO SOCIETY

Vol. 20 No.1 May 1999

A Prize -
RCA Brunswick radio/phonograph combination of 1924 (see page 4).

NEW ZEALAND VINTAGE RADIO SOCIETY INC.

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

PRESIDENT: Ian Sangster, 75 Anawata Rd, Piha Rural Delivery, New Lynn, 1250. Ph 09-8149597, email: Ian.Sangster@airnz.co.nz

SECRETARY: Grahame Lindsey, 13 Rosalind Road, Glenfield, North Shore, Auckland. Ph 09-4432033 or 021446292. General correspondence as well as requests for purchase of books, badges and power cable are handled by the Secretary.

TREASURER: David Crozier, 154 Grey St, Onehunga. Ph 09-6365954 or 0800-187161. email- dckh@ak.planet.gen.nz. Financial and membership matters are handled by the Treasurer. A list of members is available on application to the Treasurer with a self-addressed, stamped envelope.

NZVRS BULLETIN is published quarterly in the months of February, May, August and November. Opinions expressed by writers are not necessarily those of the society. Contributions should be sent to the **EDITOR** , Reg Motion, 2A Hazel Terrace, Tauranga. Ph 07-5768733, email - regmotion@xtra.co.nz.. Bulletin distribution is arranged by Chris Hollis, 13A Princes St, Cambridge. Back numbers of most issues are still available from the **FOUNDING EDITOR**, John Stokes, 281C Hillsborough Rd, Mt Roskill, Auckland. Price is $1.50 each for numbers up to volume 10 and $2 for issues from Volume 10 onwards. Cheques to be made out to NZVRS.

NZVRS LIBRARY Requests for circuit diagrams, books and magazines from our library should be made to the **LIBRARIAN**, Ernie Hakanson, 17 Williamson Ave, Grey Lynn, Auckland. A small charge will be made for copies of items supplied.

AUCKLAND MEETINGS are held on the third Monday of each month at 7.30pm in the Horticultural Society Hall, upstairs in the old Chamberlain Park Golf Clubhouse, 990 Great North Rd., (opposite Motions Rd.). Sales of vintage items are held at these meetings in the months of March, June, September and December.

WAIKATO AREA. Next meeting will be held at Kevin Horn's place, 26 Roycroft St. Waihi on 30th May at 1.30pm.

WELLINGTON MEETINGS are held typically from 1pm on the second Sunday of every month at Tireti Hall, Te Pene Ave, Titahi Bay. For further details contact Bob Hatton, 40 Rose St, Wadestown. Ph 04-4728788.

CHRISTCHURCH AREA. Contact Jim Lovell, 41 Yardley St, Avonhead,Christchurch 8004, for details. Ph 03-3427760.

CONTENTS	Page

FROM THE EDITOR

My thanks to those members who rallied to my plea for more articles. I am now in the rare position of having a few good stories to carry over. The next issue will include an article by John Stokes on the worldwide use of the name Radiola and one by Rodney Champness of Victoria, Australia on the fabled Flying Doctor Service as well as a note by George Newlands on capacitors in valve filament supplies. However, keep those articles coming - they will be needed.

The Society Annual General Meeting, held on 15th March, was well attended. There has obviously been general satisfaction with the Officers and Executive as a vote of thanks for their efforts was passed by acclamation. Ian Sangster was re-elected President, Grahame Lindsey, Secretary and David Crozier, Treasurer. The committee comprises Phil McGechie, Doug McDonald, Clarry Schollum, Bob Cook, John Hutchinson and Gerry Billman.

While it is early days yet in that not all of our members have returned their subscriptions this year, it appears that the membership might have declined a little. Maybe you have a friend who has expressed interest but has not yet joined and this may be the time to press the point with him or her. A nomination form is included with this issue just in case you may need it.

Please note my new email address - regmotion@xtra.co.nz

NOTICES

(ex Des Wright)

1. The next auction (June 21st) will include a set of Riders (Vols 1~9) in good condition. Postal bidding for the set only, in one lot, is being made available to all NZ financial members. and closes with the Treasurer on his last post received Friday 18 June. Postal bids will be against the "in person" bidders at the venue on auction night. A successful postal bidder will need to subsequently cover the cost of collection or courier which may be arranged through the Treasurer.

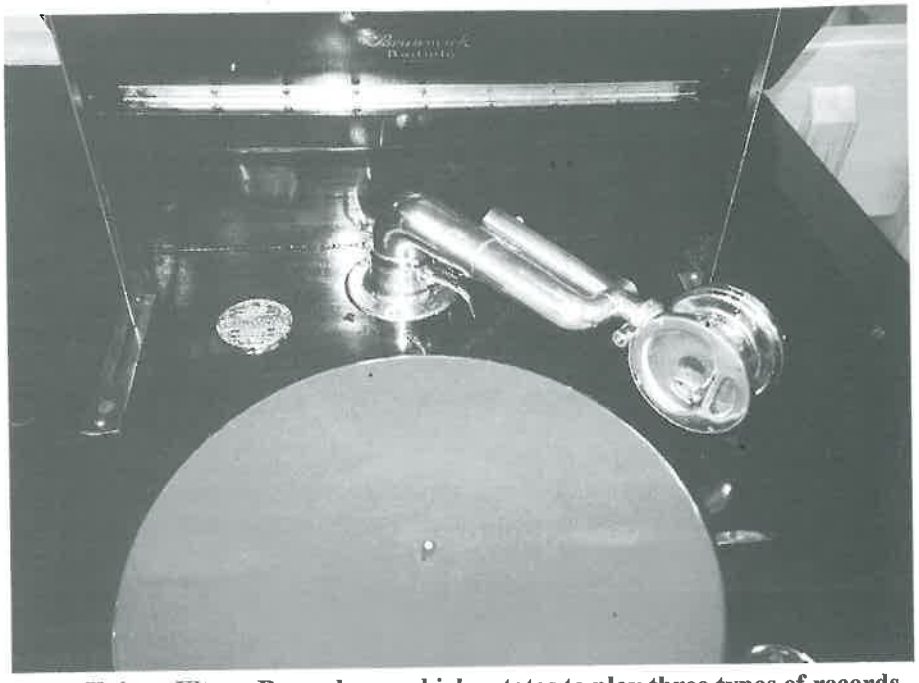
2. A capacitance measuring service is available from the Treasurer at no cost except return postage which should be included with the item sent for measurement.

AUCKLAND MEETING CALENDAR

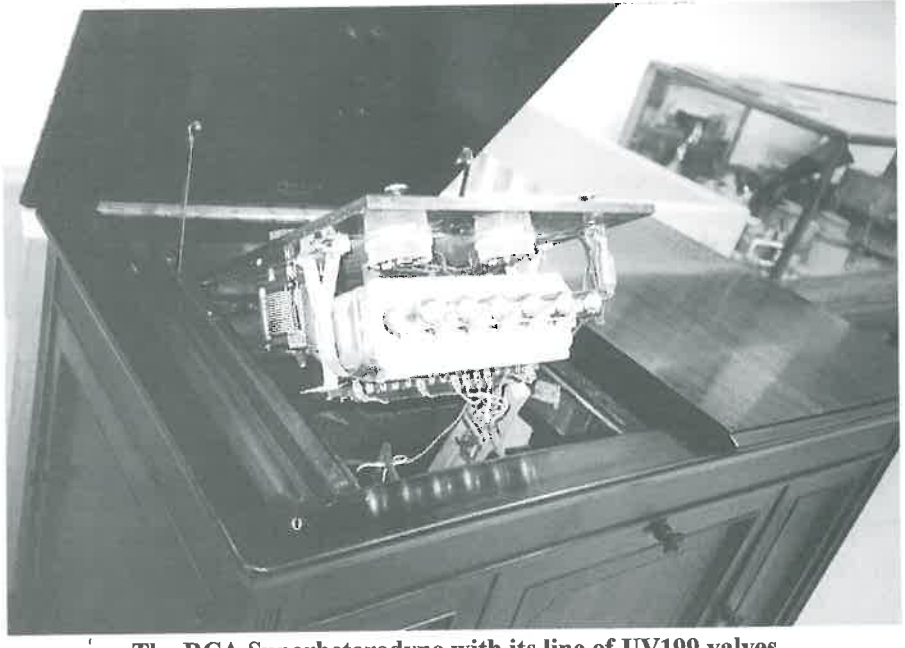
May 17th; Winter reading - clearance of duplicate magazines from the library.
June 21st; Auction Sale.
July 19th; National HRO and clones.

NEW MEMBERS

Andrew Parsons	Hamilton	Ray Chow	Auckland
Tony Lightfoot	Victoria, Aust.	Roger Iversen	Auckland
Milton Cornick	Marton	Andrew Leavers	Australia



The Unique Ultona Reproducer which rotates to play three types of records



The RCA Superheterodyne with its line of UV199 valves.

Write "Catacombs" ?

A MARRIAGE OF CONVENIENCE

by Rod Osborne

In 1925 the two biggest American phonograph companies were the Victor Talking Machine Co and Brunswick (Brunswick-Balke-Collender Co). Edison had a relatively small piece of the market at that time.

One of the largest radio companies was RCA, who wielded great power because of the number of patents and licences they held.

In 1924 RCA and Brunswick officials had a meeting and agreed to combine forces to make a radio/phono combination. RCA allowed Brunswick to use their very advanced Super-heterodyne radio in conjunction with a Brunswick phonograph.(see cover page)

An interesting feature of the Brunswick phonograph was the Ultona Reproducer.

The Ultona was no ordinary reproducer. Patented by Louis Taxon in 1917 it was designed to play the three main types of records sold at that time. They were the normal lateral shellac (Victor and Columbia), vertical cut shellac (Pathe) and vertical cut Diamond Disks (Edison). The reproducer had four moveable parts which could be adjusted to play any record. Steel needles were used for standard records, twist the reproducer and its permanent diamond stylus, with its own independent diaphragm, plays Edison records, twist again and a separate ball shaped sapphire stylus plays Pathes. A sliding weight allows for proper pressure. (see picture)

The RCA Super-heterodyne radio was also no ordinary radio.

At a time when nearly all radios were regenerative or TRF, this one was a superhet. It was designed and patented in 1918 by Edwin H Armstrong, and was a 6 valve model using all UV199 tubes. It was a very innovative design at the time and it was many years before others adopted the superhet principle.

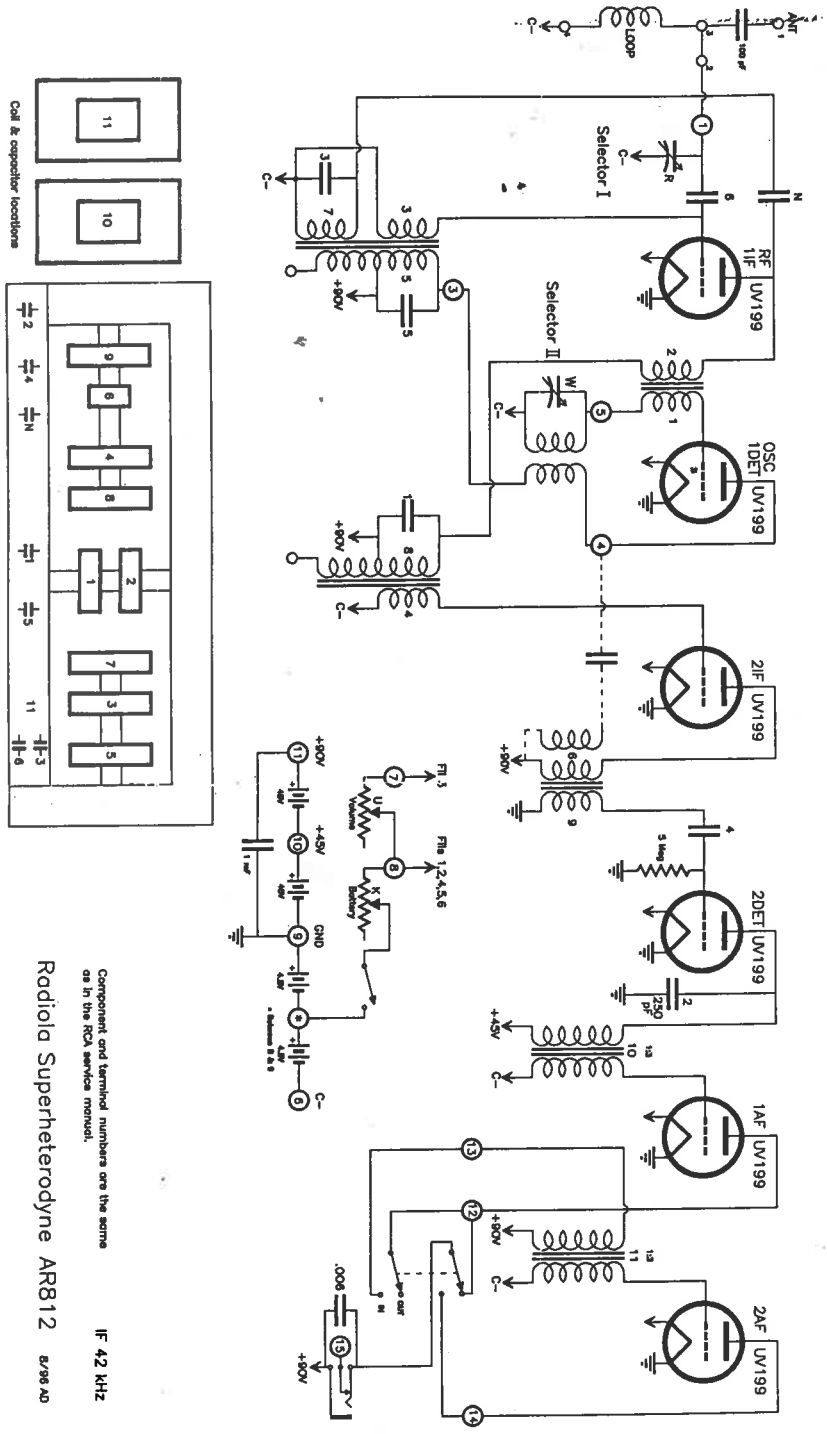
An unusual feature by today's standards was the IF frequency of only 42Khz.

Alan Douglas provided me with a circuit which shows the tube line-up and function (page 6).

An interesting innovation was the horn speaker. As well as providing the acoustical amplification for the phonograph, it had a connection for the radio speaker pressure unit to connect to the throat of the horn so it could also serve as the radio horn. An acoustical valve joins the horn to either the radio or the phonograph.

I found this one at about 5AM one dark morning at a swap meet in Elgin. We were all out in the carpark with our torches waiting for the sellers to unload their trucks when I saw this one being taken out of a large truck and was able to be the first one to it. Later that morning I was offered double what I had paid for it, but realised I would never find another so reluctantly turned the offer down.

Q: were the commas omitted by the author or were they not picked up by Pop's scanner?



ELECTRONIC MULTIMETERS

Reg Motion

During and after World War Two electronic equipment increased greatly in its complexity and diversity of use and with this came a call for instruments to accurately measure DC and AC voltages within very high resistance networks as well as extremely small currents.

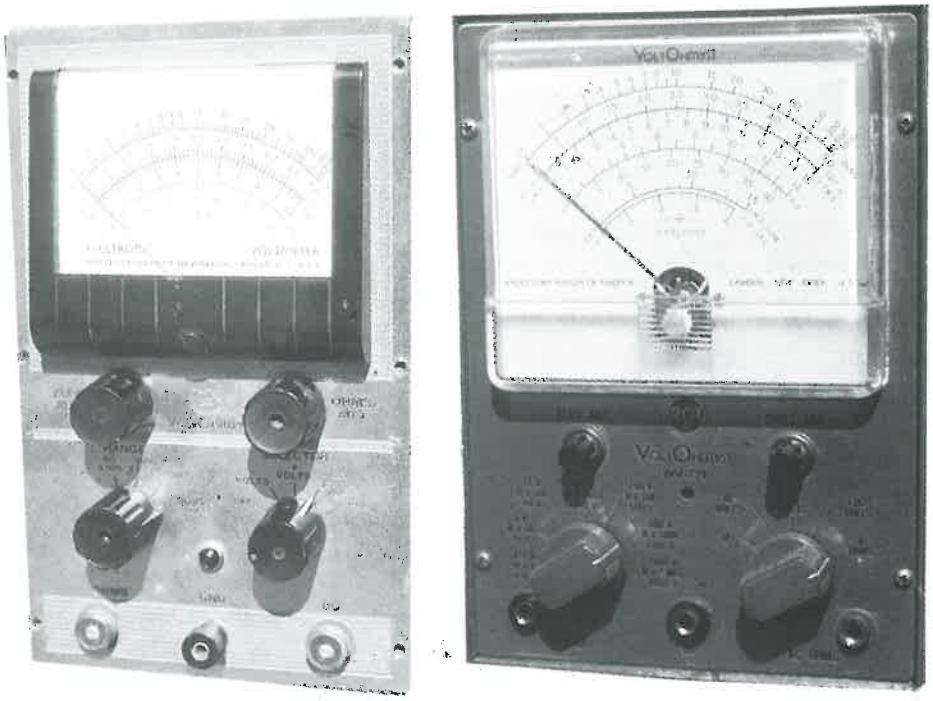
By the 1940s the moving coil meter had been developed to read full scale with as little as 10 microamps but at this sensitivity it was expensive, quite delicate and easily damaged by overload. Most commercially available radio multimeters were designed around meters requiring 50 microamps or more for full scale deflection. The current taken by these meters was still too high for accurate measurement of voltages in networks which commonly used resistances of one hundred thousand ohms or more; typical examples being the plate voltage of a resistance coupled audio amplifier or the bias voltage in an automatic volume control circuit.

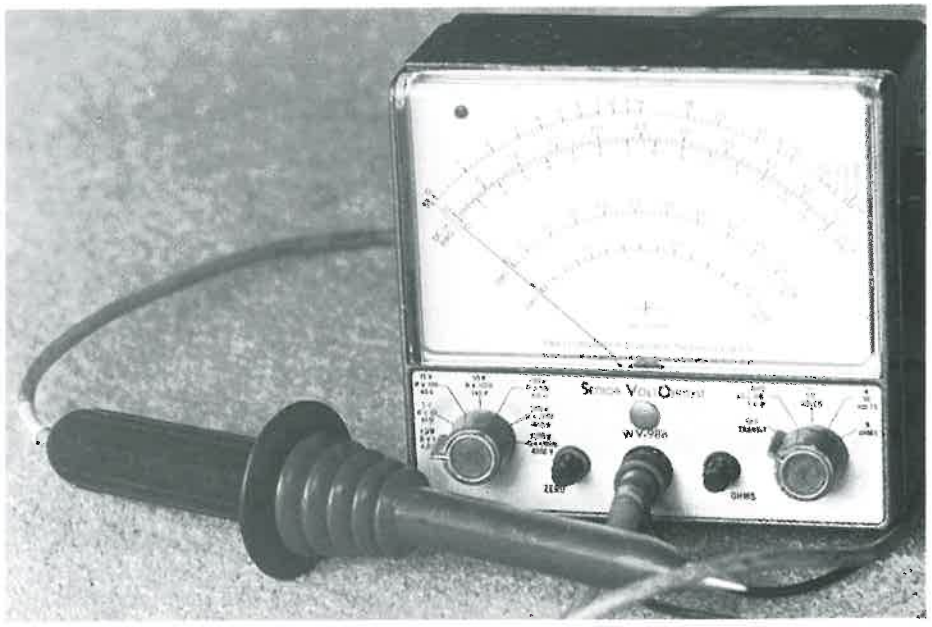
Electronics came to the rescue and a number of interesting designs were developed. DC voltages were by far the most difficult to measure using electronic instruments since the accuracy of measurement depended on factors such as the long term stability of valve characteristics, power supplies and resistors, all of which were notoriously poor. As a result frequent recalibration was required.

One method which gained some acceptance was the "slideback" voltmeter. This revived a very old measuring method in which a balancing voltage, usually produced within the measuring equipment, was adjusted to exactly oppose the voltage under measurement at which point no current was taken from the source being measured and simple robust instruments could be used to measure the balancing voltage. The point of balance could be very exactly determined by electronically amplifying the current flowing between the instrument and the source under measurement. These amplifiers were then only required to indicate when this current reached zero thus drift in their amplification was not important.

While the "Slideback" voltmeter could be very accurate it had two major disadvantages - it was cumbersome to use and could not readily follow changing DC voltages. Something better was required and a circuit known as the "long tailed pair" came into use. In this circuit short term drift in valves was minimised by using two identical valves in a balanced arrangement so that drift in one valve was cancelled by the usually identical drift in the second valve, while DC negative feedback made the circuit performance practically independent of long term changes in the valve characteristics. This circuit coupled with the development of highly stable composition resistors allowed very high impedance electronic multimeters to be provided at a reasonable price. Alternating voltages could be measured by first rectifying same then applying the output of the rectifier to the DC voltmeter input. While this rectifier is often built into the instrument it can be put into a separate probe allowing measurement of high frequencies without circuit disturbance which would otherwise be caused by the capacitance of the connecting leads.

Triplett 100,000 OPV available in NZ in 1950s





ies

Instrument manufacturers throughout the world produced variants of this electronic multimeter with guaranteed accuracy's which generally varied directly with the price. One instrument which gained considerable favour among radio service personnel was the RCA Voltohmyst. It was small, thus highly portable, had a large easily read dial and covered a wide measurement range with reasonable accuracy. This RCA design went through a number of developments and the photos opposite show representative models.

A circuit diagram of an RCA Senior Voltohmyst is shown overleaf. Note that the probe has a switch which on DC measurement introduces a one megohm resistor into circuit right at the probe tip. The purpose of this resistor is to isolate the circuit under measurement from effects which otherwise might be caused by the probe cable and to ensure that any high frequency energy at the point of measurement is not transferred into the meter where it might upset the DC measurement circuitry. When measuring AC or Ohms the one megohm resistor is shorted out by the switch. The frequency limit on AC is about 3 MHz unless an optional crystal rectifier adaptor is added to the probe.

Typical performance specifications of the RCA Voltohmyst are as follows:-

DC voltage - 0 to 1500 volts in seven ranges with a constant input resistance of 11 megohms and an accuracy of 3% (up to 50,000 volts with a special high voltage probe at an input resistance of 11,000 megohms). * [for measuring TV EHT voltage]
RMS voltage of a sine wave- 0 to 1500 volts RMS in seven ranges with an accuracy of 3%. Input impedance approximately one megohm shunted by 70 pF.
Peak to Peak value of any alternating voltage - 0 to 4200 volts in seven ranges.
Resistance - 0.2 ohms to 1000 megohms in seven ranges.

The RCA Voltohmyst did not measure direct or alternating current but other manufacturer's designs often did so by measuring the voltage drop across a small resistance.

A major advantage of this type of electronic voltmeter was that it could be easily designed to limit the maximum value of current through the indicating meter to a safe figure thus eliminating damage to the movement through range overload.

ILLUSTRATIONS OPPOSITE

TOP - Two early models of the RCA Voltohmyst (type WV-77E on right)

LOWER - The RCA Senior Voltyohmyst type WV-98B with the special high voltage probe for measurement of the extra high tensions (EHT) used in TV sets, oscilloscopes etc.

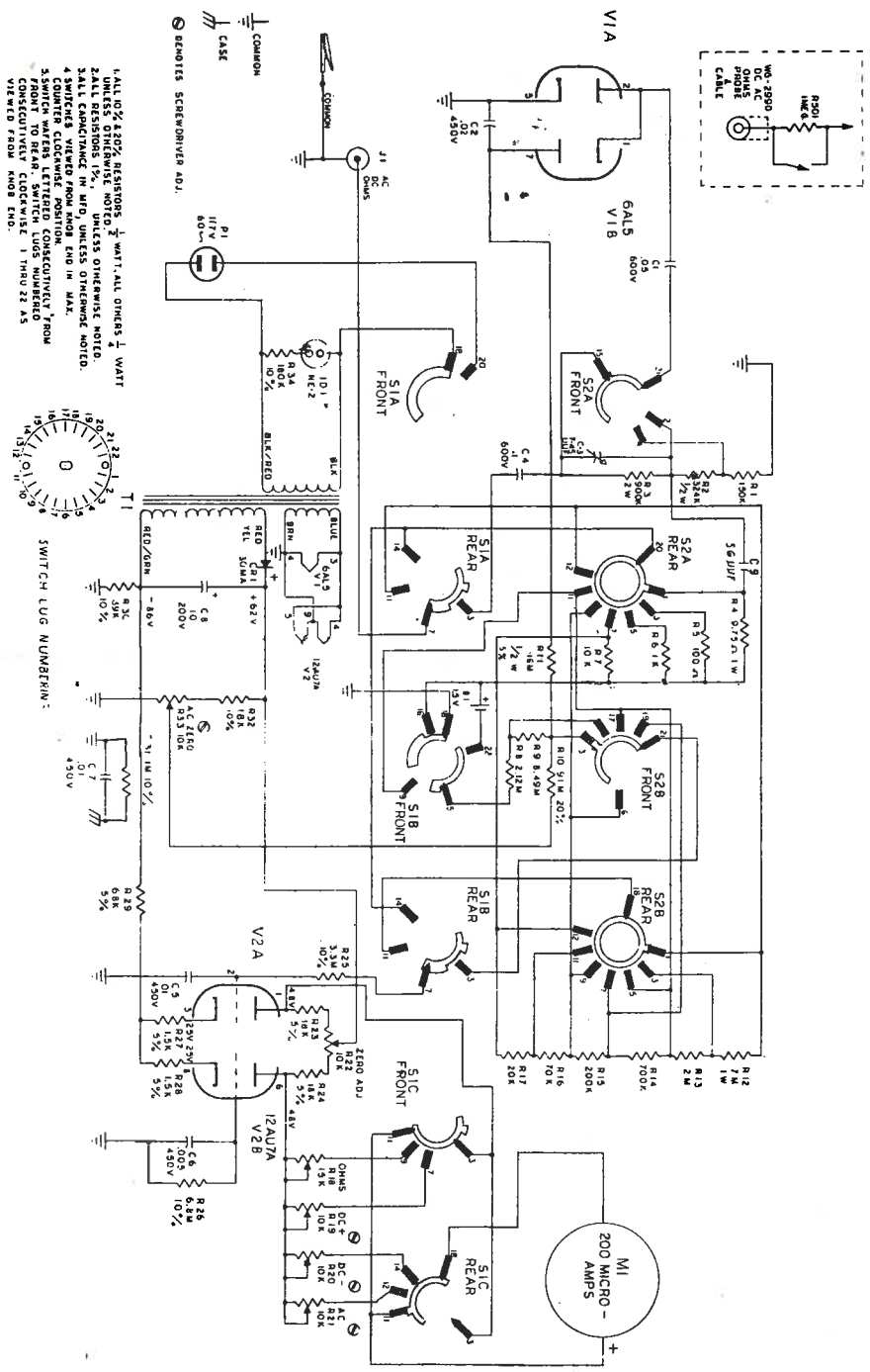


Figure 5. Schematic diagram of the WV-98B

COLUMBUS RECEIVER SERVICING NOTES.

Peter Lankshear

The Radio Corporation of New Zealand was a major local manufacturer, especially from the mid 1930's into the 1950's and there can be few established New Zealand collections without some examples, and they can be found even in Australia. Distributed nationally, the RCNZ own brand name was Columbus, but large numbers of their receivers were sold by Turnbull & Jones as Courtenay. Less common were the CQ and Pacific labels, and sometimes an "Ensign" kitset receiver using RCNZ parts will surface

not kitset

With their good electrical design, Radio Corporation receivers perform well, but now, 50 years on, sets unearthed from storage are likely to need some TLC as many were "run into the ground" before being relegated to a garage or cupboard. This article is intended to assist collectors in understanding their operation when bringing sets back to life. It is impossible to deal with all models individually, but their basic designs did not change much. In any event circuits for most models are readily available and provide adequate information, including the correct voltages around each valve. Before starting work, get a copy and make yourself familiar with the set and its operation.

Avoid the temptation to switch on the receiver to "see if it goes". It is not reasonable to expect a set that has been out of use for years to be in good working order, and you may do some serious damage if some things are not checked first. As with any make of receiver, it is wise to first check the condition of the power cord and its connections. It is not unknown for an experimenter to have left a receiver in a lethal condition, with the phase connected to the chassis.

Unfortunately, Radio Corporation power transformers were not well constructed and failure was common. It is quite likely that a Beacon or similar replacement will have been fitted, but if the transformer is original, inspect it very closely. Look out for charred paper or "burnt" smells. These are danger signs that there may have been a burn out. If it is O.K. the next step is to inspect the insulation of the transformer leads. Frequently this will have been rubber, and as it is likely to have perished, renewal is essential. The best way to get access to the leads is to first remove the transformer from the chassis. This brings us to a minor difficulty in repair of Radio Corporation receivers. Before soldering, leads were threaded through tags and tightly clinched, to the extent that it is not an exaggeration to say that a freshly wired Columbus receiver could have operated without solder on the joints. This creates a restoration problem. There is little chance of separating a lead from a tag by heating the solder and tugging with a pair of pliers. Invariably the tag will break first. Many repairers simply just cut the offending lead off and "blobbed" extra solder on to secure the replacement. This not only looks rough and ready, but can be unreliable. Remember always that ideal restoration work should be indistinguishable from the original workmanship. To preserve tags and appearance the best way is to first remove the solder with a desoldering tool or "Solderwick" and then undo the leads with a sharp pointed scriber or soldering aid set as stocked by Dick Smith. A small sharp pair of diagonal cutters is very useful too. The replacement lead can then be threaded through the lug to provide a better looking joint and as a bonus it will not need a third hand to hold it in position while soldering.

terminal posts mounted on P.T. mounting bolts

The transformer can now be separated from the chassis. If it is a vertical type, remove the end covers, and after removing the crumbling insulation, slip new sleeving on to the leads. If you have any doubts about the condition of the transformer, after the lead insulation has been replaced, run the receiver for an hour or two with all valves unplugged. The transformer should only get slightly warm. IMPORTANT: Do not do this until you are certain that the insulation of the transformer leads is in good condition..

Incidentally you may discover some Columbus sets built in the late 1940's with unusual rectifier octal socket wiring, with most pins connected. This appears to have been a response to post war valve shortages so that either a 5Y3 or a 6X5 could be used. The difference in filament voltages was more or less compensated for by the poor regulation of the power transformer winding which produced around 6.0 volts with a 6X5, but the much heavier drain of a 5Y3 pulled the voltage down to nearer 5.0.

Radio Corp. was enterprising in that they made a lot of their own components, with varying degrees of success. For a proper restoration project, ALL paper capacitors should be tested for leakage. Any that test lower than 100 megohms should be replaced. This applies also to the early receivers that used TCC capacitors. Modern plastic dielectric capacitors of appropriate voltage rating make excellent replacements for paper types.

Columbus also made mica capacitors, recognisable by their plain black cases and marked only by the value. Although dielectric breakdowns are rare, these capacitors can cause some very puzzling problems by intermittently losing capacitance. I have conducted post mortems on some of these and found connections to the electrodes to have been clamped with what appear to be pieces of tin plate, not always rust free!

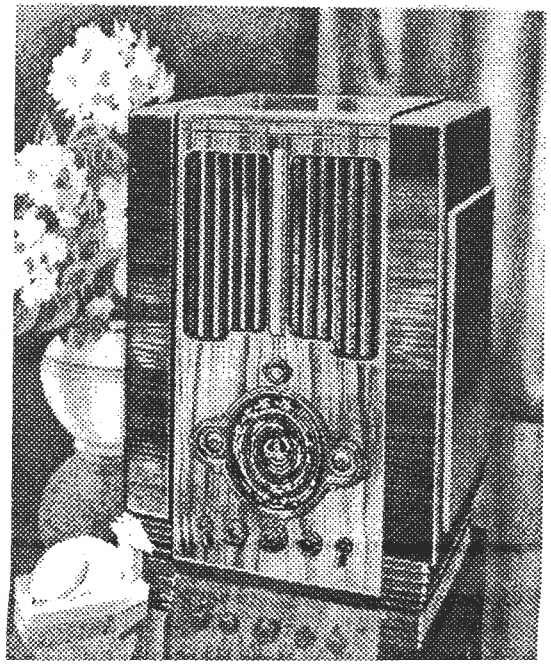
Resistors should be checked for value. Two that often will have been found to be high are the audio amplifier anode load, often .25 megohms, and the associated screen grid resistor, typically 2.0 megohms. The screen grid voltage divider to the mixer, R.F. and I.F. stages frequently comprised a 15Kohm and a 25Kohm old style carbon stick resistors. These are likely to have gone high and should be replaced. The 25K can have a 1 watt rating, but the 15K should be replaced by a parallel pair of 30K 1 watt resistors (or 2 x 7.5K in series).

For many years, Radio Corporation made their own very good loudspeakers .They are easily dismantled, about the only tricky bit being the terminal strip which is part of the output transformer. The most likely problem will be an open circuited output transformer primary, but sometimes the field may be open. It is worthwhile attempting to repair the field as the problem is often a corroded lead out wire where it contacts the bobbin. Even if the break is in the winding, with a bit of care and patience, removing the wire and then rewinding is quite straightforward. It is useful to have access to a lathe for this purpose.

I.F transformers sometimes will have an open circuited winding. Suitable replacements can usually be located, and often the internals can be transferred to the original can. As with most I.F. transformers, it is important to get the connections correct. A reversed connection will result in a considerable loss of receiver gain.

In the larger sets with an R.F. stage, the R.F. coil can have two faults. One is easy to find. There is no voltage on the anode of the R.F. amplifier valve, indicating a green spotted primary (the larger winding by the way). Another problem can be not very obvious, but has a serious effect on performance. R.F. coils have a single turn of wire from the primary wound round the outside of the tuned winding. If there is leakage between these two, high tension voltage can leak via the tuned winding to the Automatic Gain Control line. This can be hard to find because control grids of the AGC controlled valves conduct as diodes and clamp the voltage practically at zero. This problem is not peculiar to Radio Corp. receivers and can in sets with valves with top cap grid connections be checked by lifting the grid caps of the A.G.C. controlled valves and noting if any POSITIVE voltage between one of the grid clips and chassis. (There may of course be a small negative voltage. This is the normal grid bias).

Another frequently found coil problem can be a burnt out aerial coil winding. This again was not peculiar to Radio Corp. receivers, but was common in the days of large aerials. It does not need a direct lightning strike to induce a large amount of energy into an aerial, and if there was no operative lightning arrestor the receiver input winding suffered. Look for signs of charring , and if the resistance between aerial and earth is not somewhere between 10 and 50 ohms, chances are that there has been a burn out. By the way, Radio Corp. receivers often had a resistor of a few thousand ohms connected across the aerial winding. This was to prevent "birdies", or heterodyne whistles resulting from the aerial coil resonating close to the receiver's I.F. frequency. Many of the problems outlined are not peculiar to Columbus products, but in the writer's experience have been regularly encountered in RCNZ receivers. These sets are an important part of New Zealand's radio heritage, and a worthy component of any general interest collection.



Columbus Model 43
The louvre effect on this cabinet was said to give an even distribution of tone volume

(With acknowledgement to "More Golden Age of Radio" by John W Stokes)

History of GEC and the Marconi Valve by Fin Stewart

Book review by John Stokes

This two-part volume is in effect, two books in one. In producing the first part the author has accomplished something which, to this reviewer's knowledge, is most unusual -- he has both written and published privately a company history without having had any connection with the company concerned. And this is not his first effort, for although he has had no background experience in industry, Fin Stewart has previously produced another book dealing with the valves of a single manufacturer.

Part 1 consists of some 36 pages, of which twelve are actual text, the remainder being made up of illustrations of various GEC products plus advertisements and reproductions of company literature listing commercial activities, mainly of the pre1935 era. Within the limitations of space, the author has done a remarkable job of including much detailed information on the early history of the formation of this giant among British companies and the way in which it developed over the years. Details of the lives of various individuals concerned make fascinating reading and it is obvious that the author has done his homework thoroughly.

Part two consists of some 92 pages in all and features many illustrations of valves, including twelve pages of recent photographs. These photos are large enough to clearly illustrate each valve's internal construction and physical appearance, the very things valve collectors and historians are likely to be interested in. Apart from photographs, there are also other illustrations taken from catalogues, as well as numerous old ads from magazines, mostly of the pre-1930 era,

There is a 14-page text by the author describing many different types of Marconi-Osram valves and tracing their development right up to more recent types made up to the 1970s by GEC. In addition to the text the author has prepared a number of separate tables which include all sorts of relevant information which is likely to be very helpful to readers who do not own or have access to valve manuals or other printed information. A feature of the several pages of valve equivalents tables is that they have been presented in a way which makes it easy to discover directly if there is an M-O V equivalent of any particular valve, whether it be commercial, military or whatever All in all, there are some 35 pages of tables arranged in 14 groups, surely enough to satisfy any seeker of information on M-O V and GEC valves

Because the bulk of Part 2 consists of tables, any form of index would difficult to arrange, but even so an index to just the actual text would be helpful; this applies equally to Part 1 as well.

Altogether an amazing amount of information has been packed into this book and Fin Stewart must be congratulated on its production.

Copies are available only by ordering directly from the author:
Fin Stewart, "Cockerdale", 380 Bulga Road Wingham N.S.W. 2429
Australia. The price is $20 Australian currency, plus $5 P&P.

REVALVING A PHILIPS V7A.

George Newlands

Those involved in collecting or servicing the Philips V7A, or Theatrette as it is commonly known, will be well aware of the scarcity of the valves used in this set. English types with 4 volt heaters were never very common in New Zealand and workable ones for this set are now very thin on the ground. With the exception of the rectifier, workable equivalents are also hard to come by.

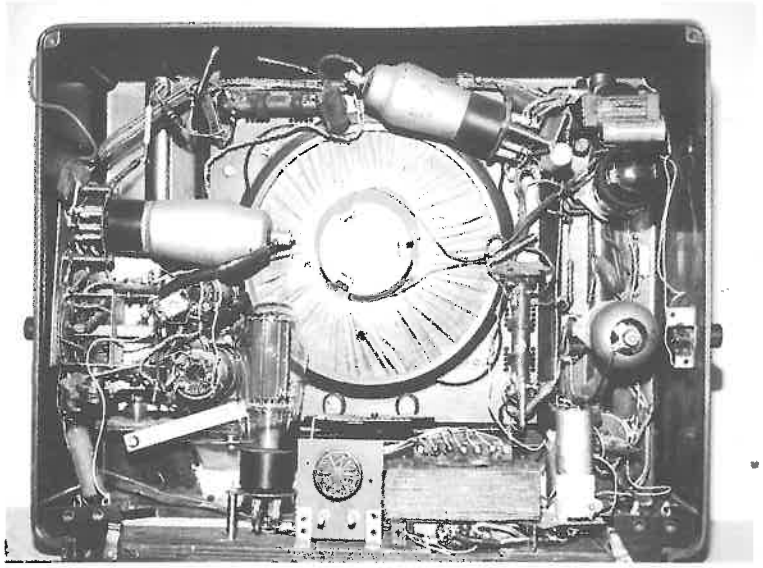
It was with all this in mind that the experiment to be described was attempted. Would it be possible to make one of these sets work using commonly available valves? The immediate answer is, of course, a qualified yes, but with how much modification? Anything that involved irreversible changes would spoil the set and it would then no longer be a Theatrette.

Before modifying something it always pays to have the device, whatever it is, in full working order. This is more important than many people realise because, if a modification fails to work, you can then be sure that the fault is the modification and not something that was there before you started. Thus, this operation was commenced with a fully working Theatrette and a set of good original type valves.

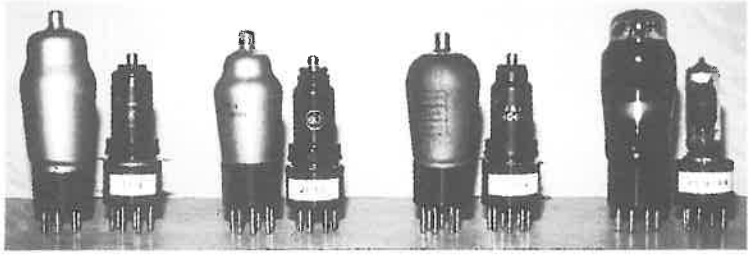
Ground rules had to be set. Firstly, no alteration was to be made such as would change the external appearance of the set and nothing was to be irreversible. Secondly, valves chosen as replacements had to be readily available types. Thirdly, if at all possible, the replacement valves had to be such types that the set would not notice the change. This would mean that circuit alterations would not be necessary. A hunt for suitable valves was now on. Local rarity dictated that anything 4 volt or with a B7 base was out of the question as was replacing the sockets in the set. Whatever was used would involve making up adaptors and four old B7 bases were found for the job. Replacement of the rectifier was deemed unnecessary.

The Theatrette audio setup uses a TDD4 and a PENA4 in a system that has most of the gain in the output stage and the first exercise was to find a valve which would work in place of the PENA4 without modification to the circuitry. The most likely candidate was the EL33 but it was much too large. The height of this valve plus a socket adaptor would make the valve protrude from the back of the set and the back cover could not be fitted. A miniature or noval type was obviously called for and the EL41 and EL82l looked most likely. Local availability dictated the EL82l (6CH6) and an adaptor was built up to suit. The next question was how well would it work on the 4 volt heater supply. Surprisingly well as it turned out considering how drastically underrun the cathode is in that condition. A valve tester check showed a somewhat reduced anode current but nothing else changed very much. Installation of the unit in the set brought everything to life with no noticeable difference to the good PENA4. So far so good.

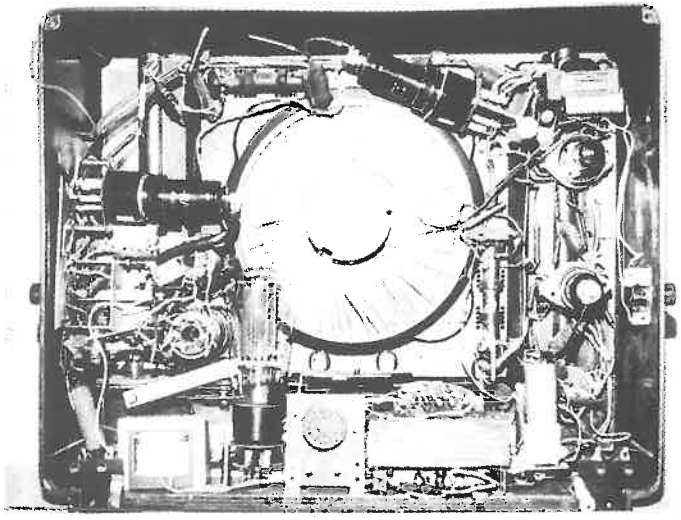
Next came the TDD4 audio driver and detector, A check of the likely candidates here brought up the 6R7, a valve not all that similar but probably workable in the position. An adaptor was built, the unit placed in the set, and again everything worked.



**Left -
Set before
modification**



**Centre-
Valves with
their built-up
replacements**



**Right-
Set after
modification.
Note small
transformer at
bottom left.**

It was all was starting to look too easy and the suspected need for a small booster transformer to bring the heater supply up to 5.3 volts was receding, but the more critical stages of the set were still to be modified. The IF and mixer stages would probably need to be more precise, particularly as regards interelectrode capacities and the like if the set was not to have to be completely re-aligned.

The IF valve is a VP4B and it seems to have no readily available equivalents. The 6K7 seemed to be the way to go, even if the gain is a little low by comparison, so one was installed and tested with no problems. This situation is probably helped by the fact that the Theatrette uses a l28 kHz IF and a minor change in valve capacitance would have a negligible effect on the tuning. A higher IF would be more seriously affected and require the transformers to be retuned.

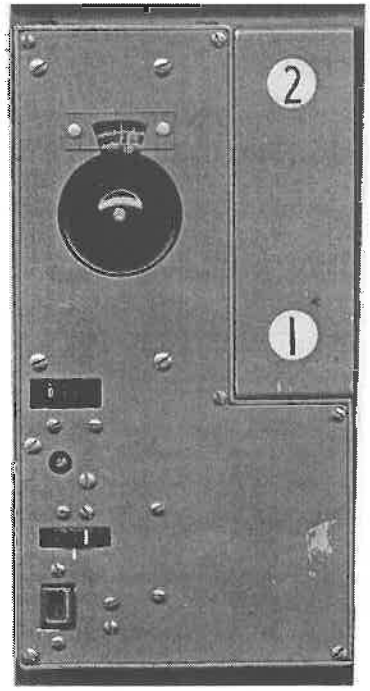
Then came the tricky bit. The mixer stage uses an FC4, an Octode, and the equivalents are all obscure. A check of the EK range in a valve manual showed nothing suitable and readily available except the EK9O which is actually a Heptode and, being a miniature, would be an open invitation to trouble when replacing something the size of an FC4. With no Octode available a Pentagrid seemed to be the way to go so the 6A8 was chosen. With an adaptor built the valve was installed and a test produced - silence.

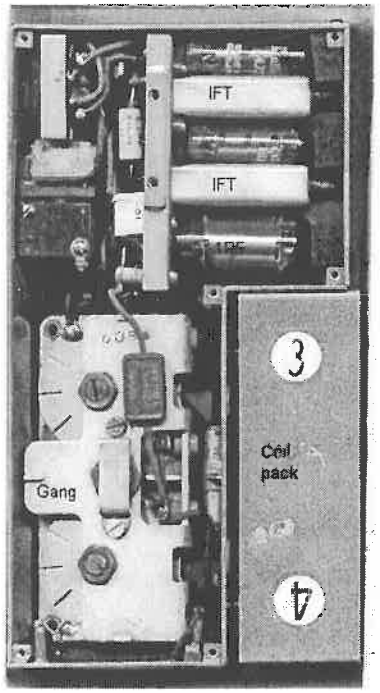
The mixer oscillator was refusing to work so the heater supply line was disconnected from the power transformer and 5.3 volts applied. Still nothing. A 6K8 was then tried directly in place of the 6A8; the set burst into life and stayed that way with 4 volts back on the heaters. Most sets which use the 6A8 or 6K8 as a mixer will work with either so why this one will not is a bit of a mystery.

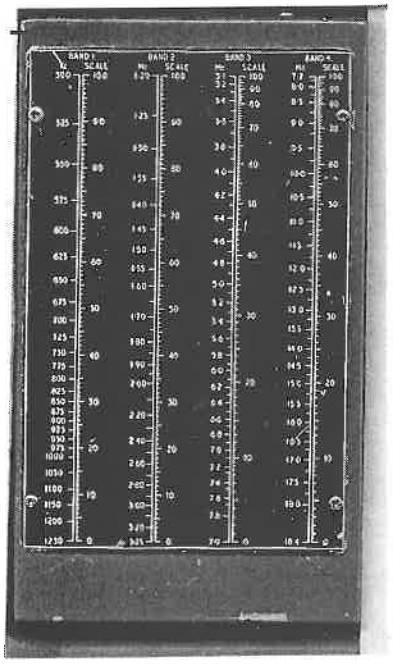
So there it is. A Theatrette revalved with 6.3 volt valves and all that is required is three octal sockets, one noval socket, four old B7 bases and three grid clips. Most importantly, no alterations to the construction of the set are required and everything is readily restorable. Performance is quite acceptable with the heaters on 4 volts and is probably the equivalent of a worn set of valves but to underrun valve cathodes as much as 30% is not a good idea. Valve life may be severely reduced due to cathode poisoning. A small transformer which will give the necessary 2 volt boost can be made quite easily and will fit in the space on the set bottom board below the tuning capacitor. With the secondary correctly phased and in series with the 4 volts this will bring the supply up to 6 volts. The dial light can either be replaced with a 6 volt unit or left across the 4 volt supply.

The necessary interconnections between the original valve base and the substitute valve socket are as follows. The first number of each pair is the pin number of the original valve base and the second number is that of the valve base which carries the substitute valve.

PENA4 > EL821	2>2 3>8 4>4 5>5 6>3&9 7>7
VP4B>6K7	1>1 2>3 3>5 4>2 5>7 6>8 7>4
TDD4>6R7	1>5 2>1 3>4 4>2 5>7 6>8 7>3
FC4>6K8	1>6 2>5 3>4 4>2 5>7 6>8 7>3







Top left
Front of receiver showing main dial top left and plug-in coil box at right Socket at lower left takes the phone plug.

Top right
rear of receiver with cover removed to expose interior components.

At left
Rear of battery box showing scale for converting frequency to dial reading. A short cord and plug (not shown)connect this box to the receiver

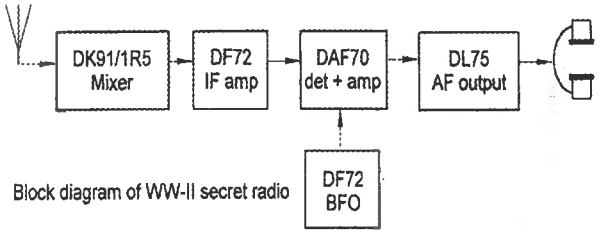
A WW-II Mystery Miniature Radio

by John R L Walker

My interest in vintage radio is chiefly concerned with communications-type receivers so I was highly delighted when a fellow NZVRS member presented me with the strange little set described below. It was of obvious military origin and obviously British made but that was all that was known about it. In its day it would have been the ultimate in miniaturisation and my guess is that it was designed to be dropped to wartime resistance groups or similar clandestine operations.

The externals. The set comprises two grey steel boxes, each about 170 x 90 x 35 mm and weighing just over 1 kg. One is the main receiver whilst the other houses the 'A' and 'B' batteries, plus it also has the dial calibration scales its upper side. The receiver is a five valve superhet covering from 500kHz through to 18.4 MHz in four bands and band changing is achieved by plugging in the coil box (the small rectangular box at one corner) in one of four positions, which is quite a clever way of avoiding a cumbersome wave-change switch. As may be seen from the photographs the front panel controls include the main tuning knob which has a dual scale, volume control, BFO pitch control and a socket for a hearing-aid type earphone. On/off switching is done by removal of the 4 pin power plug on the side.

The internals. The most remarkable feature of the interior is the two-gang tuning capacitor which is arranged in a side-by-side configuration to keep it shallow; I have never seen this type of tuning gang anywhere else! Apart from the DK91/1R5 pentagrid mixer all the valves are Mullard sub-miniature types with B8D bases. These valves draw only 25 mA of filament current each. The IF transformers look like Philips types whilst the rest of the components are obviously of British manufacture. Everything is held together with 6 or 8BA screws; more evidence for its British origin.



Block diagram of WW-II secret radio

The battery box was designed to hold a 1½V D-cell for the filament supply and a rectangular 45V battery for the HT supply. Since such 45 V batteries are no longer readily available I made up a substitute from five 9V #915 batteries in series so as to be able to test the set. Making a 2 pin plug for the earphone socket was more of a challenge. However, to my great delight when I connected an antenna and fired it up stations came through loud and clear and I found I could hear them quite well on a small 45 ohm speaker salvaged from a junked transistor radio.

Unfortunately I do not have the circuit or any other information on this unusual little set so if any member can help I'd be most grateful. One thing I do know is that it is not a Type MCR-1 receiver which is both larger and different in appearance. I can be reached at 19 Athol Terrace, Christchurch 4. Phone +64 (3)348 9084, Fax +64(3)348 9480. email: walker@botn.canterbury.ac.nz

VINTAGE RADIO INTERNET WEB SITES

Listed by Ralph Boshier

Antique Radios: http//edge.net/~jim/antiquerad. htm Private collection of antique radios.

100 years of Radio Web: www.alpcom.it/hamradio/ Includes information about Marconi.

Antique Wireless Association: www.ggw.org/freenet/a/awa/
Electronic Communication Museum, Bloomfield, NY. USA

Phils Old Radios (not Phil McGechie!): http//antiqueradio.org/
Information on restoration, prices, books, magazines etc.

Old Radios: www.tmt.it/oldradio/links.html
Extensive list of world wide antique and old-time radio web sites.

Mississippi Historical Radio Society: http//home.cybertron. com/~comcents/mhr/mhrlp.html
Museum site with wide range of information.

Museum of Radio and Technology: http//oak.cats.ohiou/edu/~postr/MRT/
Antique Radio Museum, site includes photos and information

Edwin H. Armstrong Site: www.erols. com/oldradio/highligh. htm
Historical information on Armstrong, de Forest etc.

Radio History on the Web: www.oldradio.com/ Broadcast Radio history archive.

How RADAR works: http//windows.ivv.nasa.gov/earth/Atmosphere/tornado/radar.html

NZART NZ Amateur Radio Transmitters): www.nzart.org.nz/nzart/
Click on "Other Radio Pages" this will lead to a wide range of radio related sites.

Sphere Research Canadian Test Equipment Site: www.sphere.bc.ca/test/
Lists a wide range of test instruments and vintage radio equipment for sale.

Mike's Electric Stuff www.netcomuk.co.uk/~wwl/electric. html
Lots of photos and information on vintage valves/tubes and components.

EB5AGV/EC5AAU Vintage Radio Site: www.geocities.com/SiliconValley/6992/
Info on a wide range of communications equipment.

Boatanchor Pix: http//oak.cats.ohiou. edu/~postr/bapix/
Wide range of equipment including "Heathkit". Includes circuits and manuals.

Vintage Radio repair and restoration: www.vintage-radio.com/

"Electronics Australia" magazine www.electronicsaustralia.com.au
"Silicon Chip" magazine: www.siliconchip.com.au
"Dick Smith Electronics": www.dse.co.nz

(cousin of Manny Stevenson who spent many years in England

SOME UNUSUAL VALVES

R (Dick) Stevenson

This is not a history of thermionic valves but merely a description of some unusual types I have come across or read about. Among Lee de Forest's many experiments was a "tubeless valve" ie a bunsen burner! Flames were known to be sensitive to spark discharges so he thought that a varying flame might change the hot resistance of a platinum wire. This was unsuccessful but in fact it may have been possible to show some rectifying effects with electrodes in the flame although the presence of so many hot ions and electrons would have overwhelmed any signal by thermal noise.

In order to improve the detecting ability of Fleming's diode, De Forest tried to control the current through the valve by means of external electromagnets and a second plate inside. However, it was the introduction of a grid that did produce a better detector and the Audion or triode inaugurated the whole new science of electronics. As often happens with inventions, in the same year that the Audion was patented, an Austrian, Von Lieben achieved amplification using a strange-looking valve that resembled the electron-gun of present day TV tubes. The aim was to amplify or "act as a relay" for telephone signals. By the use of an external electromagnet and a narrow, long tube he modulated the electrons and obtained useful amplification of A.F. signals.

Although electrons had been named and measured by the end of the 19th century, it was still thought that ions were necessary for correct valve action. It had been found that valves containing a little gas (soft valves) were quite sensitive detectors and this idea lingered on in the 200A valve, used in the early 20's. Nevertheless there were strong warnings about exceeding 45 volts on the plate of the 200A as ionisation was apt to occur suddenly with possible destruction of the valve.

Von Lieben and Reisz adopted de Forest's grid (in the form of a perforated disc) and produced a rather ungainly soft valve (seen illustrated in many early wireless books). This featured a filament coated with oxides. but bombardment by heavy positive ions gave it a short life. In England the ingenious H.J.Round also produced soft valves with however a *variable* vacuum. This was achieved by equipping each valve with a small tube on top containing asbestos. In use the vacuum "hardened" and the valve became less sensitive. By the application of a match to the tube containing the asbestos, some gases were driven off and optimum conditions were again realised. World War I saw considerable developments and it was recognised that for reliability, the valve vacuum should be as perfect as possible. The electron was accepted as the current carrier and our very own Lord Rutherford devised a structure for the atom with a positive centre surrounded by a mobile cloud of electrons.

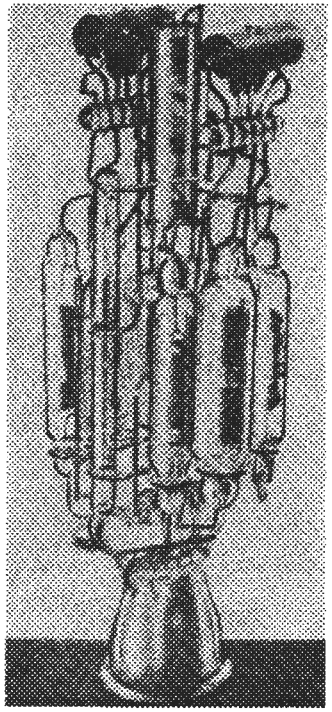
The "so-called" French valve, (called the "R" valve in Britain) was produced with a high vacuum and was the ancestor of most valves that continued up to transistor times. Gas-filled valves lingered on mostly as thyratrons or power rectifiers, first as the filamentless type BH and then the mercury filled type 83. The gas triode type 884 had a brief moment of glory as a generator of a sawtooth waveform in early TV scanning circuits.

Once the structure of a thermionic valve had been established, with a filament or cathode, a number of grids and a positive anode or plate, there was not much more to invent. Improvements were mainly in more accurate methods of construction. The great proliferation of valve types led to the "All-purpose valve" designed by J.H.Harries and manufactured by Hivac. This, the type AIS, had five grids which could be connected in various ways to serve any function in a receiver. Another construction was the Wunderlich valve invented by Norman E Wunderlich who sold his patent to the Arcturus Tube Company. These valves had two grids at the same distance from the filament and were largely used as full wave detectors - Scott used the Wunderlich A in two of his 15 tube models. *Terman* states that they could improve gridleak detectors.

What were possibly the first integrated circuits were produced by Loewe Radio who put up to three valves in one glass envelope. Some coupling components were also included so a complete receiver could be built up using only one valve. I once examined such a valve which seemed the size of a milk bottle and very fragile. I could make out the electrodes of three valves but did not handle it too long as the owner was beginning to look very apprehensive. *Stranger* states that "the snag with such multielectrode valves, is that if one filament goes, the whole valve goes. The makers however, undertake repair of their valves and give a twelve months' guarantee". A comforting thought as long as you lived in Germany where the guarantee applied.

On the rather lurid cover of an American radio magazine of the 1930's, I read "At last, the Filamentless Tube!". The article on it was rather cagey about details, but I gathered that the stream of electrons was generated by a high voltage discharge instead of the usual cathode. To have a high positive voltage, on both "cathode" and plate made me wonder if the electrons knew which way to go! Biasing of such a valve would have been a nightmare and the need for a gas to produce the discharge brings us back to the noisy unpredictability of soft valves. Not surprisingly it sank without trace.

As broadcasting became more widespread, transmitting valves had to dissipate more watts and cooling became a problem. In Britain the "CAT" (Cooled Anode Transmitting) valves were successful with an easily cooled external copper shell that was actually the anode. Someone had the bright idea that the same construction could be scaled down to make a metal receiving valve and so the "catkin" was born. The internal electrodes were fused into a glass foot joined to a short glass tube A fairly narrow cylindrical copper anode was sealed to the glass



Element assembly of the Loewe type 3NF valve.
Note the vertical glass tubes containing the interstage components - sealed to prevent contamination of the vacuum by outgassing from these components

From "Wireless Mag., Dec. 1927

tube but lead-out wires were still quite long and went to a typical base, usually a British four or five pin. With a high voltage on the exposed plate, the valve had to be enclosed by a rather ugly aluminium shield. In the event, the seal between metal and glass proved to be leaky in *50%* of the valves so after much expense and effort their production was abandoned.

The construction of the subsequent American metal valves is very well known, and it may be mentioned that the glass to metal seal problems were solved by the used of a new alloy, Fernico, the actual amount of glass being reduced to small beads around the lead-out wires. At the same time the new octal base with a locating spigot was introduced and in my opinion was one of the most useful inventions in the history of valves. Anyone who has tried to plug in a later all-glass 9-pin valve first time will understand.

The less-distorted output of large power triodes in Class "A" was appreciated especially in Europe, but in America, a few valves were developed which contained two triodes directly coupled, the cathode of the first being joined to the control grid of the second. These included the types 2B6, 6B5 and 6N6 and were often found in push-pull giving a useful 20 watts. In the late 1940s at Mt.Albert Grammar we were asked, as members of the radio club to look at the PA system and trace a fault The amplifier had push-pull *6B5s* but I think the trouble was actually a short in the microphone shielded cable which had been rather casually treated.

In the late 1930s with television and radar needing valves that could operate up to 60 MHz, the old-fashioned arrangement of glass pinch, evacuatmg tube and long lead-out wires was a disadvantage. One of the earliest of the all-glass construction was the B9G base, being a disc of glass with nine pins passing through and then through a metal shield without touching it. In the centre was a metal locating spigot to aid insertion, and a metal shield encased the whole valve. The famous EF5O pentode, usually painted red and much used by the RAF is a well-known example of this construction. as was also the EE50. In order to increase transconductance this valve had a secondary cathode which, when struck by the electron flow, produced many more electrons by secondary emission. Possibly it was hard to make as it was soon discontinued.

What was probably the craziest construction was an American valve described by *Stranger* as having a grid in the form of a slotted cylinder with vanes. When the electrons hit the grid, it rotated, "but its practical application is problematical". We can but agree.

References:

A Righi "Wireless Telegraphy" (1909)
R Stranger "The Outline of Wireless" (1941)
K Thrower "History of British Radio Valves to 1940" (1 992)
F.Terman "Radio Engineers' Handbook" (1943).

Ed.- While on the subject of valves (tubes) it seemed to me appropriate to follow Dick's very interesting article with an excerpt from a Service Shop conversation reported in an overseas vintage radio journal (continued overleaf).

It is coffee break in the service shop and "Mary" is talking to the shop's experienced serviceman "Clem":

Mary starts by asking the following question of Clem." I have noticed tubes come in different shapes and I have also noticed the letters on the end of the type seem to have something to do with the shape. Some have no letters on the end like a 6L6 and some are G and some are GT like *50L6GT* and 6K6G. So I expect you could tell me about the shapes and letters -- what is the significance?"

"I think I can." came Clem's reply. "When tube manufacturers started they borrowed the vacuum technology of the day. They used the same envelope as lamp bulbs of the day. So the very earliest tubes had a baseball sized round globe with a vacuum seal off tip just like the lamp bulbs of the day. As the technology progressed lamp bulbs evolved to the shape of bulbs used in electric signs or the so called "S" or "sign" shape bulbs. These are the ones you see on the marquee of the Strand Theater. These bulbs have a smooth top and the evacuation tube is hidden in the base. Tube manufacturers adopted these "S" envelopes and they became the standard for a number of years. The lamp makers also created a series of lamps for show cases like we have in the front of the shop. These are long and tubular and are called, not surprisingly, tubular lamps. Also not surprising they are noted as "T". By the way, the lamp manufacturers designate the diameter as well. A lamp is called T8 or T12 or T6 depending on the diameter of the bulb. In this case a "T" is equal to an eighth of an inch so a T8 is one inch in diameter, a T12 is an inch and a half and so forth.

As vacuum tubes became more complex, the tube makers decided it would be necessary to support the internal structure at the top as well as the bottom. To provide the support, a top mica disk was used which required a tubular section to hold it. Thus tubes became the now familiar S-T shape. This shape is a mixture of "Sign" and "Tubular". The sign shaped part is large enough to accommodate the elements and the tubular section on the top, the "hat" if you wish, holds the supporting mica washer. This style was quite popular all through the 30s."

Clem stopped and took a sip of coffee. "In the midthirties GE introduced the metal tube. This was quite a revolution and provided a new series of tubes like the 6K7 and, later the single ended 6SK7. The other tube builders wanted to provide the same types, but GE had the patent and they didn't want to pay royalties. So they put the "innards" in the familiar S-T envelope and added a G to the number. So the 6K7 became a 6K7G as a glass tube. Zenith even put a coating on them and called them Metalglass to try to recover some of the marketing edge.

Just before the war, the set designers were able to make quite small sets by using the then new GT or Glass-Tubular tubes. So the 6K7G became the 6K7GT and the S shape was gone. The new glass GT tubes were nearly the same size as the metal tubes. Some of the GT tubes also offer increased performance so a GT will replace a G and, almost always, the other way round, but, sometimes a G will not replace a GT. When the 7 and 9 pin miniature tubes were introduced, after the war, they were all glass so the designation at the end to signify shape is not required. Now, the letters at the end indicate improvements and revisions of design. The 6AU6A is an improved version of the 6AU6." *and here endeth the lesson.*

A GREAT HOBBY

Kevin Horn

In 1993, while on holiday at Whangamata, my wife and I strolled into an appliance shop which had a display of Vintage Radios in various parts of the shop. When we enquired as to whether these radios were for sale we were told they were on display and they belonged to the Service Technician who worked there.

I was totally fascinated by these old radios, which had been beautifully restored. I had a brief conversation with the owner of the radios and then we continued on our merry way. But the fascination of these radios never left me and, as a consequence, six years later I have a collection of my own and have enjoyed restoring cabinets and spending time learning how to fix the radios themselves. It truly has been a discovery of a great hobby and, by the way, the young man who owned the radios in Whangamata is now a good friend.

My interest in radios goes back a long way. As a small boy I remember being fascinated with radios and record players. When I got to college I went along to the school radio club to become a member, but unfortunately I did not fit the criteria, I just wasn't considered bright enough and I probably mixed with the wrong crowd so my future in radio was broken at that point. My first set was a Bell radio my grandmother owned, which was given to me when I left school at fifteen to become a farm boy. I had a local serviceman connect a turntable to it, and this became my very first radio gram. I got many hours of pleasure from listening to it in my room and have maintained a soft spot for the humble Bell ever since.

It was in July 1993 that I purchased my first set, a Columbus model 90 (which I paid far too much for). An uncle of mine owned one when I was a young boy. Since then I have taken an interest in collecting Columbus radios and now have some forty Columbus and Courtenay radios. I also collect others as well and have tried to find early Akrad sets because I live in Waihi where Akrad radios were made by Keith Wrigley in the 1920's.

Vintage radio is for me an attractive hobby. I enjoy doing restoration work on cabinets, exploring how the set works and repairing it where necessary. Along with that comes the privilege of meeting new people and making some new friends along the way, many of whom are keen to help and pass on their expertise and knowledge. One of the things I like is that you don't have to be a technical Guru to enjoy this hobby.

So, those of you out there who really know your stuff, remember us new-comer's when you talk "technical". I might be standing there nodding my head but I probably haven't got a clue as to what you are talking about. Then there's the buzz of going to a club auction or some other auction hoping to find that exclusive model which I don't have as yet.

My friend Andrew McTurk and I spent Easter Monday in Auckland visiting a few collectors there and talking with them. We enjoyed and appreciated the sets others have collected, from the common Bell to the top of the line Atwater Kents, they all have there place in a collection. There is nothing a collector likes more than to have a visit from another collector. I have found it doesn't matter what you've got, it's how much you appreciate it.

I hope this small article will prompt others to write in and give us a profile of themselves or any other interesting comments. This article is especially for those of you who are new to radio collecting and may only have a few sets on your shelves, exotic or not, it doesn't matter as long as you enjoy what I believe is a great hobby.

I could not end this article without mentioning my wife and children, especially their patient endurance when we go away on trips; Dad always has to check out the second hand shops. My wife Suzanne likes older collectables and has a corner in the house for the other bits and pieces we have. As well she has hosted the odd Club meeting at our place.

The next get together for the Waikato region in on SUNDAY 30th of MAY, so maybe we will see you there.

If you would like to contact me in response to this article feel free to do so. I am keen to get my hand's on any early Akrad Radio's. My address is Kevin Horn, 26 Roycroft St., Waihi. phone 07/8636865. email, hornfam@xtra.co.nz

FROM THE SECRETARY

The following items are available from the secretary, Grahame Lindsey, 13 Rosalind Rd, Glenfield, North Shore, Auckland. Ph 09-4432033 or 021/446292. Please make cheques out to the NZVRS.

BOOKS

"**Philco Radio 1928-1942**" by Ron Ramirez with Michael Prosise; $36 plus $5 p&p.

"**The Zenith Transoceanic**" by John Bryant $ Harold Cones; $31 plus $5 p&p.

"**Book of Hallicrafters**" (fully illustrated); $36 plus $5 p&p.

NZVRS lapel badges. $5 each.

POWER CABLE

2 metre lengths, braided cover, 3 core plastic insulation with molded plug at $2 each plus $4 p&p.

10 metre lengths only (no plugs) at $8 each plus $4.50 p&p

FROM THE TREASURER

A limited number of the following items are available from the treasurer, David Crozier, 154 Grey St., Onehunga. Ph 09/6365954 or 0800/187161.

email, dckh@ak.planet.gen.nz

Make cheques out to NZVRS please.

POWER GUARDS

Residual Current Detectors for 240V AC power point protection against electric shock. At cost $20 plus $5 p&p.

BOOKS

"**Shortwave Receivers Past and Present, 1942~97**" 3rd Edn. by Fred Osterman at cost; $55 plus $5 p&p.

"**Zenith Radio The Early Years**" by Harold Cone, John Bryant at cost; $45 plus $5 p&p

If you cannot get people to listen to you tell them it's confidential.
You know you're getting old when your broad mind and slim waist change places

RIDER'S MANUALS ON CD-ROM

Review by Peter Lankshear.

For vintage radio students and restorers, arguably the most important material inherited from the past is John Rider's well known and monumental set of "Perpetual Troubleshooter's Manuals". Containing details of upwards of 90% of American made radios, these were published annually for more than 20 years from 1931 and for New Zealanders, the first 10 volumes especially are invaluable for reference and restoration.

Rider's Manuals present two problems. First the limited number in existence means that there are few complete sets. Secondly, as anyone fortunate enough to posses them will agree, with well over 1000 pages each, they are bulky and heavy. At a rough check, a set of 12 volumes weighs about 50 kilos and occupies the best part of a metre of shelf space!

It was therefore with interest that I noted in the catalogue of the Antique Electronic Supply Co. of Arizona that 23 volumes of Riders manuals have been transferred to compact disks for reproduction on Windows 95 or 98 equipped computers. Each of the 6 disks except the last holds four volumes of Rider, and each disk is a "stand alone".

I obtained the first three disks, (Volumes I to XII) and duly explored them with considerable interest, successfully using both a 100MHz 486 with an 8 speed CD player and a K6 Pentium 200 with a 32 speed player. Each page has been been scanned as a separate TIF file and when displayed on the screen can be rotated or zoomed to magnify a specific part of the diagram. There appears to be little loss of detail in the scanning and when printed on a H-P Laser6L the quality is equal to that of a photocopy. There is a small reduction in size.

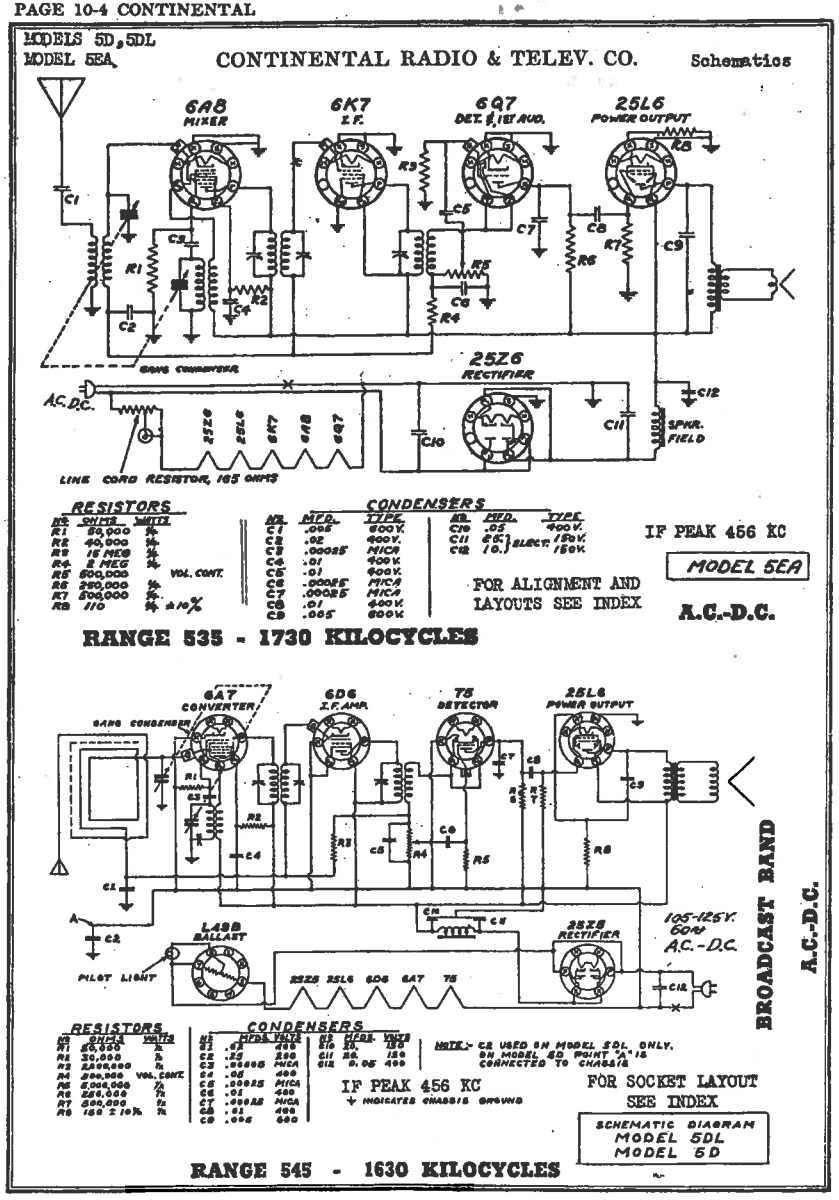
Each page of Riders is stored on its CD as a separate numbered but unnamed file, and is accessed from a database installed in the computer. The program that has been used is Imaging for Windows by Wang and for the first 12 volumes occupies nearly 23 mHz of hard disk. I estimate that the full set of 23 volumes would need about 50 mHz. Operation is a bit quirky and a little reminiscent of the DOS dBase programs of a decade ago. Instructions are minimal and discovering how to operate the system properly required some trial and error. All of Rider's material appears to have been entered. In fact, I found some Scott material that is not part of original Rider! To enter the estimated 35,000 entries for the full database must have taken some patience!

Once the operation is mastered, finding the data for a specific model is straight forward and rapid and all references are listed. This last feature is important because data for a given model is often found in two or more volumes. Browsing, is not as easy as thumbing through the manuals and I found that the quickest method for this is to access the CD files directly, finding my way around with the aid of the published Rider indexes which I have. These are also convenient for use with the manuals themselves and are now available from Antique Radio.

At US$85 (approximately NZ$165) each, the disks are not cheap, although in my experience, four individual manuals would be traded at more than $200. Do they warrant this sort of money? If you need Rider for research or whatever, and do not have a set, the disks are well worth having and have the advantage of considerable space saving. Also printing circuits

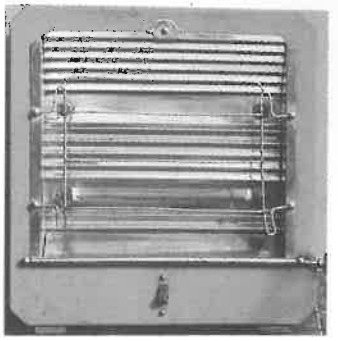
directly from disks is preferable to the hassles and wear and tear of dismantling manuals for photocopying. However, for convenience and flexibility of use, given the choice I would, in balance, prefer to use the manuals.
Below is a direct reproduction of a schematic printed from the CD ROM.

PAGE 10-4 CONTINENTAL



Wartime Economy Measures

John Stokes



Further to Ian Sangster's article on Radio Ltd's use of nails in their 1941 models, it may be of interest to mention another "wartime economy measure" adopted by this firm. Their Ultimate 2-bar electric heater, model 302 produced in 1941 made use of the piece of waste metal punched out to produce valve sockets holes as a both functional and decorative retaining device at the top of the reflector (see photo).
Incidentally, Ian's mention of "large six inch nails threaded as chassis hold down bolts", a statement attributed to me, was not quite correct. The bolts were four inch in length, and were used by the Auckland firm of Westonhouse Radio Ltd.

Back in the Saddle Again

(With apologies to Gene Autry)

Australian member Darryl Kasch, disc jockey, writer, historian and book producer returns to radio.
He is now wearing a new hat at 92.3 Country FM, Marlborough, Queensland.

OBITUARIES

Dennis Burrage, passed away at Auckland on January 27, 1999. Denny served in the Royal Navy in WWII before moving to New Zealand where he settled in Auckland.. He was particularly active in obtaining and restoring military radios for his large collection..

Eric Arthur Caley passed away March 1st, 1999 at North Shore Hospital, Auckland.. Eric was a Radio Officer in the Merchant Navy during WWII

Lyall Laurent passed away on the 17th January 1999 at Auckland. As well as being a member of the Vintage Radio Society Lyall was a DX operator, radio amateur and a strong supporter of other blind radio personnel in New Zealand.

We extend our deepest sympathy to relatives and friends.

FROM THE LIBRARY

The following are extracts of articles from vintage radio magazines received by the NZVRS library. Photocopies of these articles are available at $1 each plus postage from the librarian - Ernie Hakanson, 17 Williamson Ave, Grey Lynn, Auckland. Phone 09/3766059

211. The Paragon Regenerative Receiver. photo, circuit, description. Antique Radio Classified,Vol 15/1, Jan.1998, p7.

212. The 300B Tube Lives Again. Cetron and Svetlana copies, photos, drawing, description test results. Antique Radio Classified,Vol 15/1, Jan.1998, p8.

213. The Tuning Eye Tube in 1930s Radio Sets (part 1). photos, descriptions, history of 6E5 and others. SCARS Gazette,Vol 23/1, Feb.1998, P5.

214. Simple Home Built Radios of the 1920s. Cigar box models. photos, descriptions, circuits. SCARS Gazette,Vol 23/1, Feb.1998, P21.

215. The Hypresco 4 Revisited. photos description, trademark. HRSA Radio Waves, No 63, Jan 1998, P4.

216. Tunafone Wirelesses. Model R5, photos, history of Company. HRSA Radio Waves, No 63, Jan 1998, P8.

217.The Eclipse Univox 5 Valve direct-coupled TRF of 1930(?). Photos, restoration, circuit. HRSA Radio Waves, No 63, Jan 1998, P13.

218. Early British Valves. Photos, descriptions, history. HRSA Radio Waves, No 63, Jan 1998, P22.

219 One Valve Radios - The One-valve Superhet. photos, circuits. HRSA Radio Waves, No 63, Jan 1998, P28.

220. Testing Older Battery tubes on the Hickock Models 530, 600 and 6000. Old Timers Bulletin, Vol39/1, Feb 1998, P14.

221.A WW2 Vintage Japanese Military Airborne Receiver. photos, description. Old Timers Bulletin, Vol39/1, Feb 1998, P24.

222. The Collins 4A Transmitter. Photos, description, history. Old Timers Bulletin, Vol39/1, Feb 1998, P32.

223. Remembering Bruce: Tributes to Bruce R Kelley - founding editor. Old Timers Bulletin, Vol39/1, Feb 1998, P34.

224. Headsets - New Brandes Finds. Navy type and Superior Matched Tone, photos, history. Old Timers Bulletin, Vol39/1, Feb 1998, P40.

225 Restoring a Vintage Mains Superhet. 1928 RCA Radiola 60, photos, description, circuits, problems. Radio Bygones No 51, Feb/Mar 1998, P5.

226 The Hellschreiber. Feldenschreiber operation. photos, descriptions, circuit diagram. Radio Bygones No 51, Feb/Mar 1998, P12.

227. The Domestic Tape Recorder. Recordon, Grundig TK20, Simonsound, Collaro Elizabethan Major, Ferrograph, Binatone, Fuji Cherry, Philips 2202, Revox G36, Tandberg 15SL. Photos, descriptions, History. Radio Bygones No 51, Feb/Mar 1998, P16.

228. Radio Identification Systems IFF (USA).types, descriptions, history. Radio Bygones No 51, Feb/Mar 1998, P21.

229.Measuring capacitor Equivalent Series Resistance. test setup using audio generator and DVM. Antique Radio Classified vol 15/5, May 1998, P17

230 Collectors Guide to Antique Radios - CD ROM edition. description, installation. Antique Radio Classified vol 15/5, May 1998, P18

231 The Master-Baldwin Clarophone. unusual horn speaker, description, photos. Antique Radio Classified vol 15/4, April 1998, P8

232 General Electric Model K-52. description, photos. Antique Radio Classified vol 15/4, April 1998, P9

233 Capacitance Measurement. measuring small capacitors with a bridge. Antique Radio Classified vol 15/4, April 1998, P12

234 Restoring the R1116. Military aircraft receiver. photos description, history. Radio Bygones Issue No 52, April/May 1998, P5

235 Origins of Radar. Description with circuit of a novel method invented by Dr Lowry in 1926. Radio Bygones Issue No 52, April/May 1998, P18

236 A home-brew Valve tester. description, circuit, photos. Radio Bygones Issue No 52, April/May 1998, P19

237 Wireless Set Canadian No 58 Mk.1/T .photos, description, circuit. Radio Bygones Issue No 52, April/May 1998, P26

238 Lord Haw Haw. photos, history. Californian Historical Radio Society Vol 21/3&4, Winter 1997, P8

239 Kadette Tunemaster. description, photos, circuit. Californian Historical Radio Society Vol 21/3&4, Winter 1997, P12

MARKETPLACE

Advertisements for the next issue must reach the editor by the 17th July. 1999. Ads should be either hand printed, typed on a separate page or emailed. Note that no verbal or phone ads will be accepted. Remember to include your name, address and phone number. There is no charge for ads but the NZVRS is not responsible for transactions between members. Address ads to: Reg Motion, 2A Hazel Terrace, Tauranga, New Zealand. email regmotion@xtra.co.nz

AVAILABLE

Signal Generator, US made early 30s "Supreme", 100 kHz to 30 MHz, CW and MCW output, High and Low output sockets with attenuation controls, Valve lineup 2 x 37 triodes and a 37 tetrode. Suitable for a collection. For fuller details write J Riddle, East Takaka, Takaka RD1, Nelson.

Marine AM sets including Lincoln Commodore, some ex-Auckland ferries; (deceased estate) to sell or swap. Richard Webb. Ph 09/2756381

Various back issues of QST magazine. Contact Ray on 03/6849089 or email rdever@timaru.com.

Two EKCO car radios, (1) type CR61/A, 8 valve allwave, bandswitch selects broadcast plus 4 s/w bands and 4 preset stations (one on longwave, 6 Volt, bowden cable operated, c1950, (2) type CR32, 5 valve BC., tuning switch selects 6 pretuned stations. 12 volt, a compact single box, c1948?. $100 the pair as is where is. American Bosch car radio model 802, 6 volt, receiver and speaker in 9.5" dia. metal box, missing remote tuner. Peter Noonan, 52 Ruakaka Beach Rd, Ruakaka. Ph/Fax 09/4328441.