NZVRS BULLETIN

Vol 42 **2021 Annual**

100 years of broadcasting in NZ

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

THE NZVRS EDITOR
NZVRS Editor, P.O. Box 13873, Onehunga, Auckland 1643. Or Email: nzvrs@pl.net

ASB Bank account 12 3067 0168223 00

A Calendar of Events is listed on our website at **nzvrs.com/calendar**

AUCKLAND MEETINGS are held on the **third Monday** of each month, from 7.30pm. Generally, even months are auction nights, odd months are themed – see the calendar on the website or forum for more details.

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: Neville Grubner Phone 04-905 6084,
Email: ngrubner.ng@gmail.com

CHRISTCHURCH MEETINGS are held on the first Thursday of every month except 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: jandjdodgshun@gmail.com

SUBSCRIPTIONS:
The subscription year is a calendar year ie 1 January - 31 Dec. Subscription renewals are sent with the year-end Bulletin. The NZ Rate is $30, with early-bird renewal reductions as applicable. The colour email E-version bulletin is available at the world-wide rate of NZ $20 where an email is sent with a link to the latest issue. Note these files may be 25 Megs to download.

EDITORIAL

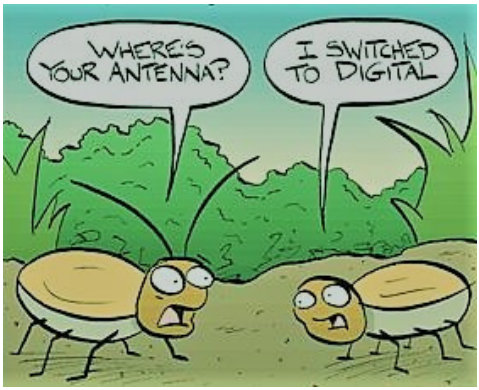
As I write this, we are still undecided on the prospects of an exhibition in 2022, the original theme to celebrate the 100th anniversary of broadcasting in NZ for a 2021 convention has passed due to our Auckland Covid lockdowns. A 2022 event is uncertain but still possible and will be notified via email and our website should it firm up.

The 100th anniversary should not go unmarked however and we have a bulletin item relating to this event and era, within.

Also, we have an exceptional AVO VCM restoration item from Terry Collins, overall winner of the AGM competition. His extensive documentation far exceeds the bulletin capacity so there is a link to his information included for further study.

Auckland meetings, while still erratic, are looking for an ideal home. We will continue to trial a number of venues to come up with the best solution to our homelessness. Meetings dates and locations will continue to be posted on our webpage nzvrs.com calendar.

Take care, stay well and best wishes for 2022.
Cheers, David



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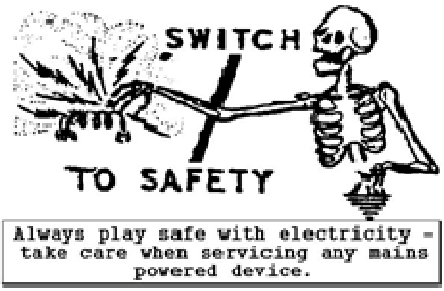
Cover Picture – Professor Jack's original transmitter of 1921 on display in Toitū Otago Settlers Museum.



Notes, Queries, Passings & Obituaries:

Passings:

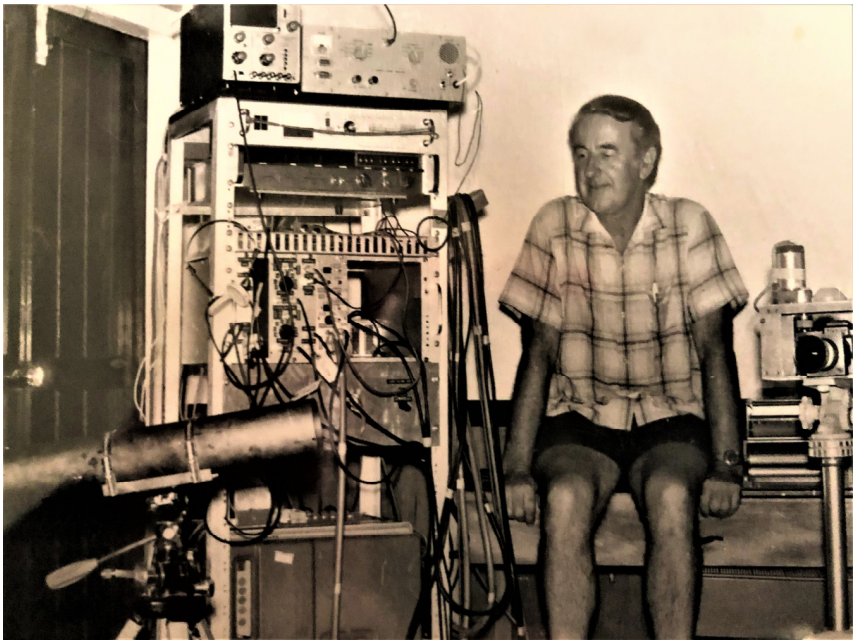
Robert James (Jim) Clegg 20 Aug 1922 – 11 Aug 2020

Jim grew up in the suburbs of Kingsland and Sandringham. He left school at 13 to contribute to the family coffers (his rate of truancy rendered staying at school pointless!) Later, Jim took night classes in Electricity and Trade Drawing following a promise to his mother to compensate for his lack of schooling. Then followed a variety of jobs including radio assembler, telegram boy, postman and Morse telegraphist.

Called up for full service on his 18th birthday, Jim was assigned to the Army Signals Corp and stationed in the Bay of Islands – Japan's most likely target.

After a year, Jim transferred to the Airforce and was posted to Harewood in Christchurch, then Ardmore, and finally the New Hebrides as a radio mechanic with the Catalina Flying Boat Squadron in the Pacific.

After the war there followed a spell at Newmarket Post Office as a Morse telegraphist, a technician at radio station 1YA, a certificate in Radio Broadcasting Technology, and finally; enrolment at Auckland University in Science – a late starter at the age of 24! During the university years, he also worked full time as a technician at the NZBC, and then as a scientist at Fisher & Paykel's lab. Tramping in the Waitakeres with the University Tramping Club was his escape.

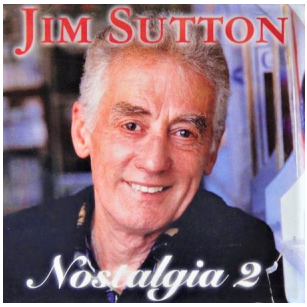


Jim Clegg at the Physics Department, Auckland University.

After graduating with an M.Sc. (Hons) degree in Physics, Jim was off to London to a job in the research labs of the British General Electric Company. In 1954, it was Canada and 3 years with Westinghouse, followed by RCA in Montreal. Notes in his CV during this period mention computer solutions for air-to-air missiles, with a note that specifics were not to be divulged as they were under the Official Secrets Act. Yes, it really was rocket science! On his return to NZ Jim lectured in Physics at Auckland University until his retirement, researching wind energy and electrical storms.

He had a house built in Murrays Bay, where he lived the rest of his days with his family. He could do anything, fix anything, make anything. Memories include him building our TV (didn't everyone's dad do that?!). We had to kick it in the bottom right corner to get the picture to come right! Dementia finally robbed him of his wonderful brain but, thankfully, that was very late in life. *From his daughter Suzanne*

James Arnold (Jim) Sutton



On 26th April 2020 peacefully at Wanaka in his 80th year, formerly of Point Chevalier, Auckland.

Jim Sutton had just the right skills to become one of New Zealand's most beloved radio hosts. It wasn't his voice, which was unadorned and mercifully lacked macho rumble and attitude, it was his background. Sutton was in his mid-40s before he got involved in radio in his spare time, and by then had already tried several careers.

These past lives accidentally created the perfect CV: he had been a plumber, a policeman and a publican. He had dealt with real lives at their most basic and vulnerable, and this made for a crucial difference when Sutton got behind the microphone. He was a listener, not a talker.

His radio career almost didn't happen. In the late 1980s, after a short period behind the scenes as a producer at Radio Pacific, he had an audition at Radio New Zealand to see if he was suitable as a host at Newstalk ZB. "I got the letter back saying I'd never be a commercial broadcaster," Sutton said in 2013. Unsaid are the words, "… and the rest is history." For his programme 'Nostalgia with Jim Sutton' made history, not only for lasting nearly 25 years on ZB, but for the New Zealand social and musical history that was discussed each week. Sutton's talkback show wasn't about airing gripes, but a place to share memories. All Sutton had to do was suggest a topic on growing up and the listeners would take over. "Department stores, rural life, holidays, pubs, trains, boats, planes, trams – people love trams, throughout New Zealand – the great stories would roll on and on."

And there was music, with songs chosen to generate more memories, in particular New Zealand songs. Again, almost by accident, stories of New Zealand music and entertainers became a central part of the programme. Week after week, for over two decades, he welcomed a New Zealand musician from an era when playing a supper waltz was required, and the listeners responded with reminiscences of their own.

These chats with veteran musicians from the 1940s, '50s and '60s became a substantial oral history of New Zealand entertainment. Many of Sutton's guests were once drawcards in New Zealand dance halls, and have now passed away. His chats with veteran musicians became a substantial oral history of New Zealand night life.

Sutton grew up in Point Chevalier, in Auckland. He came of age in the mid-1950s when rock'n'roll arrived. "The music I played; from the 1930s on, as a kid it was on the radio and I heard it and enjoyed it. I always enjoyed all styles of music. My grandmother took

me to see Mina Foley's farewell concert, in Auckland, also Patrick O'Hagan, the Irish tenor. She also took me to the movies, The Great Caruso. Her tastes were very catholic, all kinds of music."

After high school, as an apprentice plumber, Sutton played rugby for Suburbs. "A group of us knocked around together. On Saturday nights, it was down to the Avondale College dance, there was a pretty good rock'n'roll band there – the place used to pulse with people.

It is largely thanks to Sutton that NZ's first independent record label, Tanza, had much of its catalogue reissued. In the early 1990s, he visited Vida Peach, the widow of Tanza engineer Noel Peach. She liked his style and clean shoes. She took him to her garage, which had Tanza master tapes and 78s in pristine condition. She said, 'If you'd like to help yourself, you're more than welcome.' Sutton took the "treasure trove" home in his car boot, and found an unexpected surprise: tapes of many commercials and jingles recorded for 1ZB in the 1950s. They became a popular part of his programme that celebrated an earlier era of radio. "We'd have a night of commercials and people would call up, singing them. You'd get four hours out of that. Then we'd play a night of serials and soap operas – Portia Faces Life, Dr Paul, Life with Dexter, Night Beat – and a night talking about renowned radio hosts such as Phil Shone and Merv Smith.

On 13 April 2013, ZB changed its format and the Saturday night Nostalgia show was replaced. On his final show, Sutton told his listeners that the first song he had aired in the show in 1988, nearly 25 years earlier, was Merle Haggard's 'Are the Good Times Really Over?'. His final guest, guitarist Gray Bartlett, stayed on to "help me make it through the night". "I had a good run, and every one of those Saturday nights was fantastic."

Sutton and his wife Anne left Auckland to be near family in Wanaka, where he died in April 2020, in his 80th year.

Abbreviated contribution from Chris Bourke April 2020

Oddities etc

72 minute audio - "The Radio Hauraki Story" - documentary with Paddy ODonnell, soliciting support for Radio Hauraki to get a land-based licence. From the Internet Archive. Audio: https://tiny.one/nzvrs603

Switzerland delays FM shutdown for cars

Switzerland had planned to shut down all FM broadcasters in 2022/23 but has now decided to delay until 31 December 2024. At this time, all VHF radio licences will expire. This delay will now allow consumers to have more time to change technology. Switzerland had determined to switch off FM broadcasting by the end of 2024 at the very latest. By the end of 2019 with almost three quarters of radio usage digital, a staggered shutdown of FM stations by August 2022 (government run SRG) and by January 2023 (private radios) looked reasonable. This had been agreed by 42 out of 44 radio broadcasters and the SRG. However, while in German and Italian-speaking Switzerland the vast majority of radio broadcasters are still in favour of the 2022/23 shutdown of FM, in French-speaking Switzerland it was not popular. Since a nationwide solution is needed, it has been decided to delay closure until 31 December 2024. Also, marketing figures indicate more time is needed for the changeover, especially those who drive a car. In Switzerland, while all new cars since 2019 have DAB+ capability, there is still a need for retrofitting in older models.

World Radio and Television Handbook to cease production. After 24 years the WRTH 2022 will be the final edition of World Radio TV Handbook produced and published by WRTH Publications.

Handy Hints

New Sight for Old Eyes

Magic eye tubes such as 6U5, 6G5, 6E5 etc that use the electron excitation of a phosphor screen seem to lose their brightness over time and use – perhaps due to screen "poisoning"? One method to improve their display that has been found effective in some cases is to apply ample heat to the screen area and allowing to cool in a gentle manner. The heat can be gently applied from a candle (avoid soot deposits on the glass if possible) through to gas flames for durations of at least 5 minutes or until unable to hold. Allow to cool slowly without draft (in a shoe box has been found effective).

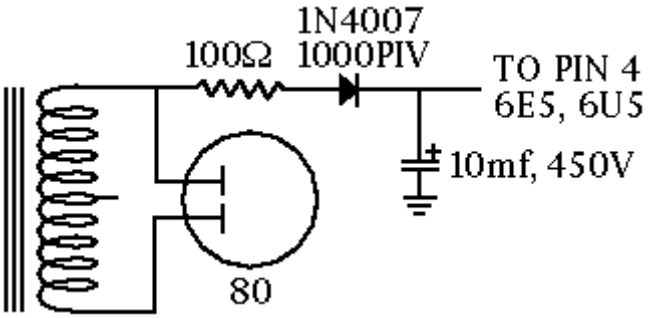
The resultant improved brightness is not as good as new but some good improvements have been observed.

From 1960's Radio Craft

"Eye" Tube Hints

Good eye tubes such as 6E5 and 6U5 are getting harder to find. Many of the old ones still have filaments but have lost most of their green glow. You can increase the green by a slight modification of the circuit. These tubes were originally specified for operation on 250 volts. By increasing the voltage on the target, pin 4, dim eye tubes may again be useable. I have tested some weak "eye" tubes to 1000 volts and have not had a problem.

To increase the brightness pin 4 should be connected to a higher voltage in the radio. If the radio doesn't have a higher voltage, the addition of a diode, capacitor and resistor should add around 100 volts. Most radios use an 80 type rectifier. This tube has a high voltage drop and in addition, the rest of the radio circuit load reduces the high tension supply voltage. Circuit:



Connect a 100 ohm resistor (used for protection) to one of the 80 tube plates. The other end of the resistor to the anode of a diode (1000 piv). The cathode of the diode should go to the positive end of a 10 mfd 450 volt cap. The negative end of the cap goes to ground in the radio. Now remove the wire which connects pin 4 of the eye to B+ and connect pin 4 to the junction of the diode and 10 mfd cap. *[You might like to add a bleed resistor of about 100kΩ to ground across the capacitor to discharge it after set switch off. Ed.]*

The actual voltage on the eye will be slightly less than 1•4 times the AC plate voltage on the 80. The higher the voltage on the eye tube, the larger the AVC voltage needed to close the eye. The 6E5 tube is more sensitive than the 6U5 or 6G5 and will have more movement when tuning in a station.

From Norman R. Leal CHRS

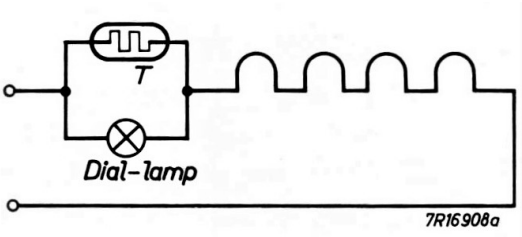
Restuffing Bathtub Capacitors

I did a half dozen of these bathtubs for an SP600 rebuild just a little while ago. For the tar packed ones I gave them a quick burst of heat with a propane flame to the bottom cover and they came apart with hardly any smoke. The trick is hanging on to them. The technique I found that worked well was to securely thread a long wood screw into the bottom plate of the capacitor and clamp the head of this in a vice. Then to hold the body of the bathtub, I threaded long 1/4" standoffs onto its ears, then threaded a bar across the two standoffs to act as a handle. Keep a constant wiggling pull on the handle while heating, and in less than a minute or two they're separated, with no damage to the tub at all.
For the oil filled tubs I did not heat them at all. I drilled 1/4" holes in each corner of the bottom cover then with sturdy long nose pliers slowly nibbled out strips around the perimeter. Didn't take long at all and turned out fairly clean. There isn't much oil in them so it can be adsorbed with paper towel then disposed of appropriately. A rinse with alcohol and after cutting the leads for the new capacitor inserts, it's ready for fresh innards to be soldered in. I didn't bother trying to replace the bottom covers as they get bolted against the chassis anyway. A bonus to that is you can easily play with the capacitor values later if needed.
I think it's good to at least retain the bathtubs otherwise it spoils the vintage character look of the set. Perhaps no one else will look under the chassis but I do, and that's all I need to warrant the extra effort.

From dan.vessey@usask.ca

Using NTC resistors to provide bulb failure protection in ac/dc portables.

Dial lamps in ac/dc portables are often connected in series with the valve filament chain. Should the bulb fail, the radio stops because the chain is broken.



One simple protection for this is to wire an NTC across the lamp. Under normal conditions, with an intact filament, the NTC remains cool and inoperative (the high resistance state). However, should the bulb fail, increased current through the NTC will cause it to heat up and decrease in resistance value, allowing current through the remaining filament heater chain and the set to work.

Philips recommends the following NTC types:

83922	for 100mA (R at 25°C: 3k – 7kΩ)
100.026	for 100mA (R at 25°C: 2k – 3kΩ)
100.092	for 100mA (R at 25°C: 7k – 12kΩ)
VA 1006	for 200mA (R at 25°C: 1k – 1.5kΩ)
100.102	for 300mA (R at 25°C: 3k – 6kΩ)

NZVRS President's Report AGM 2020

Welcome to the 2021 New Zealand Vintage Radio Society Annual General meeting, it has been a year of change in venues, where we hold our meetings. Where we are today is our third meeting location tried since we lost use of the old Chamberlin Park golf clubrooms at 990 Great North Road.

We initially tried the replacement, round shaped buildings next to 990 Great North Road, where the Horticultural Society was relocated to, against its wishes. Next, we used the North Shore Vintage Car Club rooms at Albany and have held several meetings there, thanks to Neville and Paul. And now we are trying this location at 83 Selwyn Street Onehunga.

Meeting attendance has fallen, but we have been through a huge upset with the Covid lockdowns, and the experts predict we are not in the clear yet!!

Our long serving committee member Owen Young was tragically killed whilst out enjoying one of his other passions, road cycling. A good number of NZVRS and Audio Society members attended Owen's funeral in Ponsonby. Our condolences are extended to Owen's family.

We are about to relinquish our rental of the Storage King facility where our library is stored, today you will see a quantity of our library material here, the rarer items will be put up for auction and other items will be free for removal and members will be encouraged to take as many as they can, we cannot leave anything at this venue. Thanks to our member Ralph Kearton, a section of our library is now stored on the Hibiscus Coast.

All the best for the coming year, stay safe and clear of the virus.

Regards Ian Sangster.

NZVRS 2020 AGM Competition Results

There were 3 entries this year for the AGM competition:

Roy Arbman entered a very nicely restored Atwater Kent model 708 that had needed major cabinet work and won Radio – Restoration and Performance certificates.

John Dodgshun entered a clever scratch-built signal tracer using 2 valves plus a magic eye and won Test Instrument – Design and Construction certificates.

Terry Collins entered a complex restoration of an AVO VCM tube tester that had suffered heat and water damage.

A tip for similar cleaning jobs; cooking oil, backing soda, detergent and toothpaste were all used.

Looking like new, and with comprehensive electronics replacement Terry's entry won Test Instrument – Complex Restoration certificate and **Overall Winner** certificate.

Many thanks to the entrants for participating in the competition.

Details of each entry are further on in this Bulletin.

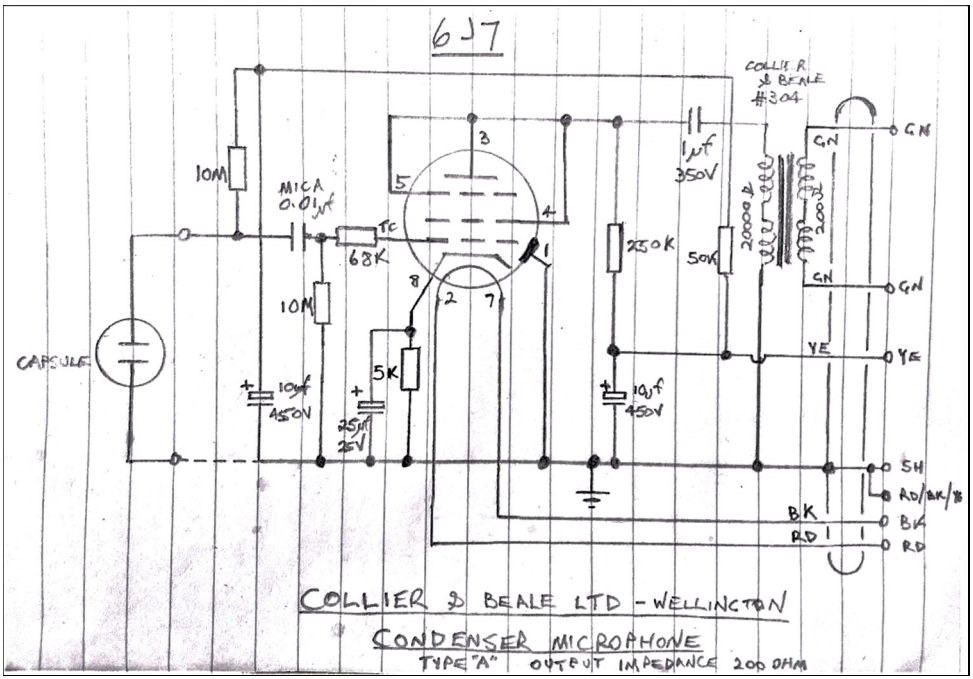
Treasurers Report

The Treasurer's annual summary of account is included as a stuffer for this bulletin.

Collier and Beale Condenser Microphone from Bruce Churcher

Here are the photos of the microphone I mentioned at the AGM. The owner, a former broadcast technician, purchased this from someone in Brisbane via internet auction. He wondered what the supply voltage would have been. He drew out and provided the circuit.


CONDENSER MICROPHONE
TYPE A. OUTPUT IMPEDANCE 200 OHMS.
MANUFACTURED BY
COLLIER & BEALE LTD.
WELLINGTON.


6J7
COLLIER & BEALE #304
10M
MICA 0.01µf
TC
68K
10M
CAPSULE
10µf 450V
5K
25µf 25V
1µf 350V
250K
50K
10µf 450V
GN
GN
GN
YE
YE
SH
RD/BK/B
BK
RD
COLLIER & BEALE LTD - WELLINGTON
CONDENSER MICROPHONE
TYPE "A" OUTPUT IMPEDANCE 200 OHM

EM to PM speaker conversion from Bruce Churcher

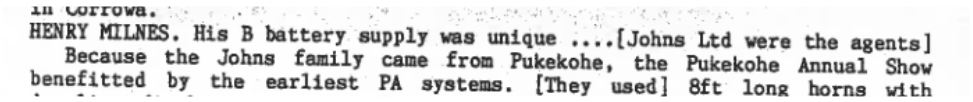
It is always interesting to see how others tackle the problems of repairs and restorations. This neat idea for a EM-to-PM conversion appeared in a carton of assorted items from a club auction.
The repairer seems to have been faced with the common problem of an EM speaker with open circuit field coil. Perhaps the cone was also badly damaged since he has started with a modern speaker. Two tag strips have been added (secured with self-tapping screws) to support a 20 watt, 1500 ohm wire-wound resistor as field-coil replacement. A clamp around the magnet provides mountings for a piece of expanded aluminium bent to give protection from the high voltage at the resistor terminals.
Note, in this example, there is insufficient protection from prying fingers but perhaps the set had a back cover for further security.
Since the field coil also functions as a filter choke, a choke may be required to be installed in series with the resistor if hum is a problem.
Alternatively, a new, higher value of filter capacitor may give adequate filtering.

Henry Milnes – The UK Gas Radio inventor who retired to NZ

A query from Alan Cattell <alan.cattell@hotmail.co.uk> a UK historian about a John Stokes item some 30 years ago has added to the picture of Henry Miles. *[John's original item was in bulletin 12-3, November 1991. Ed.]* From Alan we learnt that Henry was born in Frizinghall, Bradford, UK in1897. His father was a machine tool maker and manufacturer. The 1911 Census shows Henry as a pupil at Woodhouse Grove School, Apperley Bridge, Rawdon. In 1924 he married Nellie Suddards and his occupation is shown on the marriage certificate as Machine Tool maker. He and Nellie moved to Bingley and the Electoral Rolls has them living at Southlands Grove, Bingley

Initially operating as the Milnes Radio Company, Henry patented (UK Ptn no. 311849) and manufactured 120 volt HT batteries in Cottingley, before moving to Victoria Works, Church Street, Bingley in 1932. These **rechargeable batteries** were exhibited successfully at the Olympia and Manchester Wireless Exhibitions of 1933 and 1934, and were eventually patented in the USA. They were sold in India, Australia and New Zealand.

[Johns Radio Limited were the agents. see Bulletin 12-4 letters from Alan Douglas? below. Ed.]



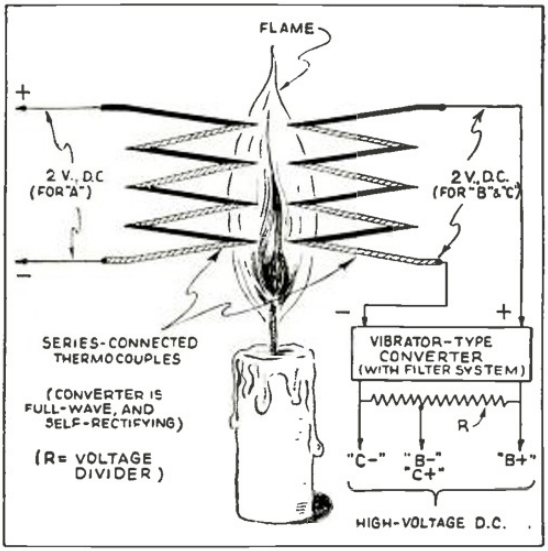
in Corrowa.
HENRY MILNES. His B battery supply was unique ....[Johns Ltd were the agents]
Because the Johns family came from Pukekohe, the Pukekohe Annual Show benefitted by the earliest PA systems. [They used] 8ft long horns with

They were marketed as being : ' *Always fully charged. The Milnes Unit recharges itself from the LT accumulator merely by turning a switch'. They form an economical source of High Tension current'.* Advertising claimed 80% savings on the cost of other forms of HT supply.

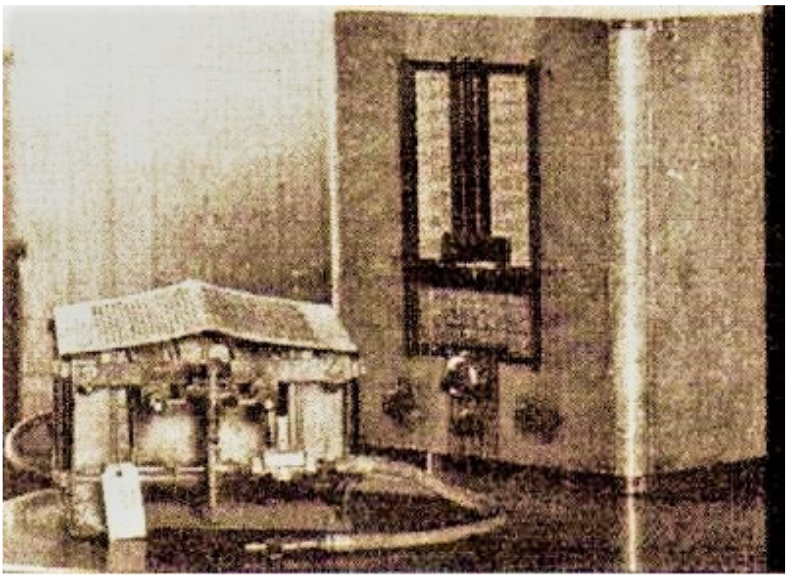
Battery operated radios became popular in the 1930s particularly in remote areas where there was no electricity supply. As Milnes already made batteries, in 1936 and 1937 he saw an additional market and diversified into building radio sets. He sold a range of 7 battery operated models and one a/c mains model. These 1936 models included the Milnes Saphire (3 tubes), Amythst (4 tubes), Emerald (6 tubes), Diamond (7 tubes), Pearl (6 tubes) and Ruby (7 tubes). While in 1937 the Milnes Onyx (5 tubes) and Venus (6 tubes ac mains) models were produced.

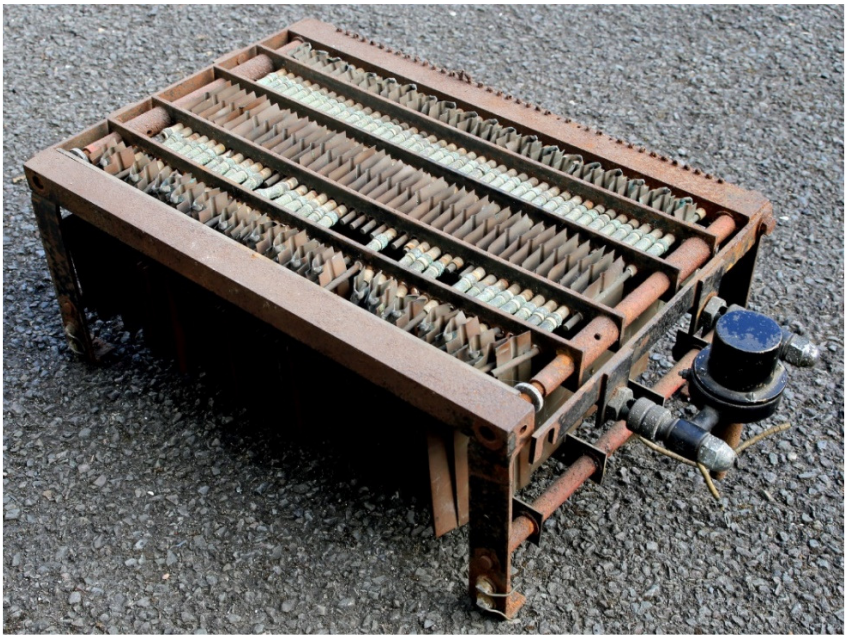
While being moderately successful, his efforts were put in jeopardy by a major fire which destroyed thousands of radio parts in September 1937. His Bingley

business never really recovered from this and in May 1938 the company went into voluntary liquidation.
Newspaper sources suggest that Milnes spent those two years researching the possibilities of a gas-powered radio and that in August 1938 he launched the concept.
Marketing material for the newly named Milnes Electrical Engineering Company, announced: *"Milnes Thermo Electric Generator enables you to run your battery set from your domestic gas supply, without the need for LT or HT batteries and produces all current from heat."*
As such, the radio was linked to the thermo electric generator which created an electrical charge when heated by gas. The charge was then stored in an accumulator. The burners on the generator were ignited by flash device operated by the volume control knob on the radio set.



Theory of operation.
A series of dissimilar metal connections are heated to produce a low voltage and current *[known as the thermoelectric effect discovered by Seebeck in 1821 – a series being a thermopile where one junction is warmed the other cooled.]* Two supplies or chains are used in the Milnes generator one to supply the filaments (LT) and another to supply a vibrator type inverter for the HT as indicated in the sketch on left.





Public demonstrations showed that the radio set reproduction was excellent, with no interference. Milnes claimed that the running costs were half that of rechargeable accumulators. It was also claimed that the radio would also help warm the house!

Any further development of the gas radio was interrupted by the start of the Second World War and never fully realised its full potential. Milnes was however successful in securing an Air Ministry contract for the supply of accumulators in 1939.

Electoral Rolls show him living in Bingley until 1946, and this same year he developed the Milnes alkaline storage battery.

Henry moved to Fife, Scotland in the late 1940s. Newspaper records in 1949 show the family announcing the engagement of their son John Charles (born 1927) to Noeline Monks from Auckland, New Zealand from their address on Tayside.

An article in the Dundee Courier on 17/10/1950 announced that the Milnes Electrical Engineering Co (Bingley Ltd), Tayport, had supplied two of their "everlasting" HT batteries to the Norwegian, British and Swedish Antarctic Expedition.

In September 1951 the same newspaper carried an article stating *"Small batteries made by Milnes Electrical Engineering Co, Tayport, play an important part in forecasting weather. Attached to balloons they are carried 12 miles into the air and record barometric pressure and humidity. The firm also manufacture car and radio batteries."*

In November 1951 the Dundee Courier published a brief statement that the first public performance of Radiosond high-fidelity reproducers manufactured by Milnes Electrical Engineering, had taken place at a Tayport music recital.

The Dundee Courier later advertised the sale of machinery and other equipment from the Milnes Electrical Engineering Company in October 1953. Milnes asserted that his reasons for doing so were that "government bureaucracy was interfering with the potential of his business."

The family begins its move to New Zealand in the 1950's. Henry, his wife Nellie plus daughters Helen M (born 1938), Sylvia J (born 1941) and Jennifer A (born 1944) and their grandmother Josephine Suddards sailed to New Zealand in June 1953.

His son John Charles and Noeline had previously sailed to New Zealand in March 1950.

- 1957 NZ Electoral rolls
  Henry and Nellie Milnes at 26 Queens Street, Northcote, Auckland and listed as "grocers"
  Noeline Ailsa Milnes is living at 14a Vermont Street, Ponsonby, Auckland (Catholic Church, Sacred Heart Parish accommodation) and listed as "married"
  John Charles Milnes is living at the same address and listed as "cargo worker"
- 1963 NZ Electoral rolls
  Henry and Nellie Milnes at 325 Glenfield Road, Glenfield, Auckland and Henry is listed as "engineer"
  Helen Margaret Milnes also at the same address and listed as "spinster"
- 1969 NZ Electoral rolls
  Henry and Nellie Milnes at 325 Glenfield Road, Glenfield, Auckland and listed as "retired"
  Henry died 26 April 1970 and was cremated 30 April 1970 at Purewa, St Johns, Auckland (ashes "returned") [age 73] [see: https://www.purewa.co.nz/view/?id=64904]
- 1978 NZ Electoral rolls
  Nellie Milnes at 9 Gladstone Road, Glenfield, Auckland and listed as "widow"
- 1981 NZ Electoral rolls
  Nellie Milnes at Selwyn Village (a retirement facility), Target Road, Point Chevalier, Auckland.

There is no mention of Henry in the directory of NZ Engineers so it is very unlikely he continued any of this original interests in thermo generation, batteries or radio after his arrival in NZ.

The grocers shop building at 26 Queen Street Northcote is still there but now a residence. There is an attached house behind the shop. This part of the city was by-passed by the Auckland Harbour Bridge when it opened in 1959. There is a private access to the beach below via a right of way behind the shop on the left-hand side.

Queen Street, Northcote (Point) was one of the major access-ways to the North Shore and further north from the centre of Auckland, and ferries ran across the harbour until the bridge opened in 1959. The ferry landing being at the lower end of Queen Street would have provided a regular flow of traffic past the shop until the bridge opened.

Ian's Starlink Story - So Far **by Ian Sangster**

I live in a bush area some 45 km from Auckland Central, internet has not been on at my house since dial up days. My neighbours have internet, via Wireless Nation or similar providers, from a transmitter at Piha or Waiatarua, but I do not have line-of-sight access to either. Thus, when Elon Musk's Starlink internet service came along I watched its progress with interest.

Eventually when it became available in my area, I paid the required deposit online. After a short wait they asked for the full payment and shipped the kit to me, via DHL from Hawthorne California.

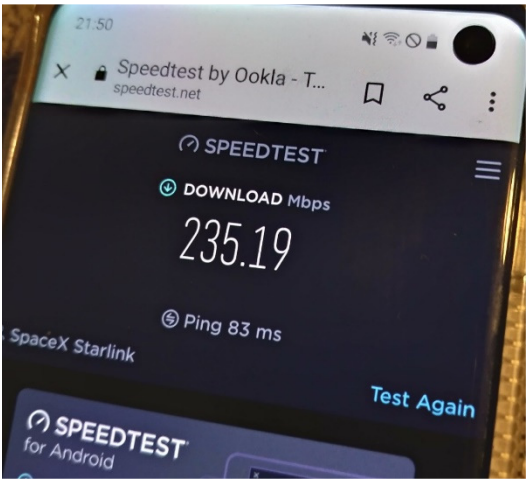
They have an app which you download for your phone, this contains installation tools plus speed checking measurements and a control to park your dish if you need to move it. The dish is actually a servo driven fractal antenna called "Dishy". Fractal antennas can be researched via the internet.

I made a wooden frame to mount the antenna on a suitable level plane on the roof. This was designed to be moveable in case the position I had chosen was not the best for reception. I mounted the tripod base on the wooden frame and placed it in what I determined to be a good spot on the roof using the obstacle detecting app on my phone. I carried the dishy antenna up onto the roof and inserted it into the tripod mount. The antenna is terminated with a cable looking like multicore of 100 ft length. I ran the cable down into the house through a vent and plugged it into the power supply /modem unit.

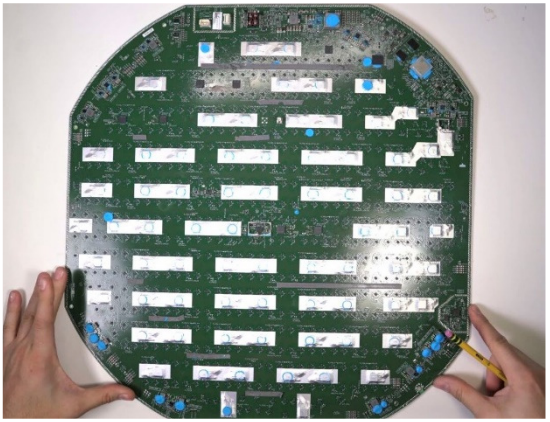
I nervously plugged in the power supply and the wi-fi modem, and powered it up. It got on with it

while I watched its progress on the Starlink app on my phone. I did not need to wait long before it had completed setup and internet was available. The dish initially ran from stowed position to point straight up into the sky, but since that time it has tilted more to face south.

I am very pleased with the internet speed achieved and have unlimited data available. Interesting that the Dishy assembly is made in the USA, the modem and 56v dual power supply is made in the Philippines and the wi-fi modem is made in Taiwan. I have been able to stream video with little or no pause or buffering. My 200+Mbps speed result may of course, not be forever as more users take up the system. However, it is relatively costly, so maybe not many will.



Starlink



Left inside Dishy McFlatface.

Recently the Starlink website was updated to advertise download speeds between 100Mbps and 200Mbps with latency as low as 20ms now available in most locations. However, with chip shortages, freight delays and half a million pending customers service delivery times have been pushed to late 2022 or early 2023. Unit production is only in the order of 5k units per week.

The chip shortage is not the reason that some areas have later coverage times than others, that variance is explained by satellite capacity and demand in each region. Starlink is primarily intended for rural areas without good Internet access and Starlink has said that it won't be able to serve everyone in densely populated areas. Wait times can be pushed out if signups in any given area exceed the number of open “slots” available.

"If you place your order where we have coverage and capacity, you will receive a confirmation email with your order number, service and shipping address, and can view your shipping details on your Account page. We typically ship Starlink Kits out within 2 weeks of payment.

We will be able to accommodate more users per area over time as we increase the number of satellites in orbit."

RF earthing problem with Eddystone receivers by V Jenkins

The purpose of this short note is to report what I found when investigating the strange loss of performance of my 940 encountered recently, to describe the work I did to resolve the issue and to recommend measures that other Eddystone users may wish to take.

I have two Eddystone receivers – a Model 730/4 and a Model 940 – that are in daily use at my location because they appear to cope better with local interference than more modern receivers – probably because their combination of valves and multiple tuned circuits in front of the mixer. The 940 is my first choice for SSB reception, especially now that I have modified the AGC system *[See article on 940 AGC modification in the Restoration section of the Eddystone website http://eddystoneusergroup.org.uk/]*

When I had modified the 940 and was drafting the article, I set out to retest the receiver thoroughly only to discover that it was not working properly on Range 1 and Range 4. On Range 1 there was a loss of sensitivity and a significant tracking error. On Range 4 there was an excess of sensitivity and the front end was prone to oscillation. I had to investigate.

The first thing I did was to remove all trace of the AGC modifications and returned the receiver to its original form. I did this to prove that it was not the modification causing the problem and to demonstrate to myself that the modification could be removed in only a matter of a few minutes. The second thing I did was to check carefully that the receiver was working correctly on Ranges 2, 3 and 5; it was. I studied the circuit diagram; starting with Range 1 because that appeared to have the lesser problem. I concluded that the problem was likely associated with L16, C49 and C54; most likely C54 – the padding capacitor which is virtually impossible to extract and re-place on its own.

Therefore, I removed the complete coil assembly from the coil box. This is quite easy because it only requires three joints to be un-soldered and one bolt to be removed. I tested all the component parts and could find nothing wrong. I tested the complete assembly and confirmed that it was working as it should. I then cleaned the three connecting posts ready for re-soldering, cleaned the brass fixing pad at the bottom of the coil and installed the coil assembly in the coil box. On applying power to the receiver, I discovered that Range 1 was now working again and the tracking issue had gone. Then the penny dropped!

The brass foot on the bottom of the coils serves two purposes: it provides a strong and rigid means of mounting the coil in the coil box **and** it provides the earth return for RF currents in the amplifier, mixer and oscillator circuits. If one or more of these earth returns is less than perfect then strange things can happen. For example, a two-stage RF amplifier can turn into a tuned RF oscillator.

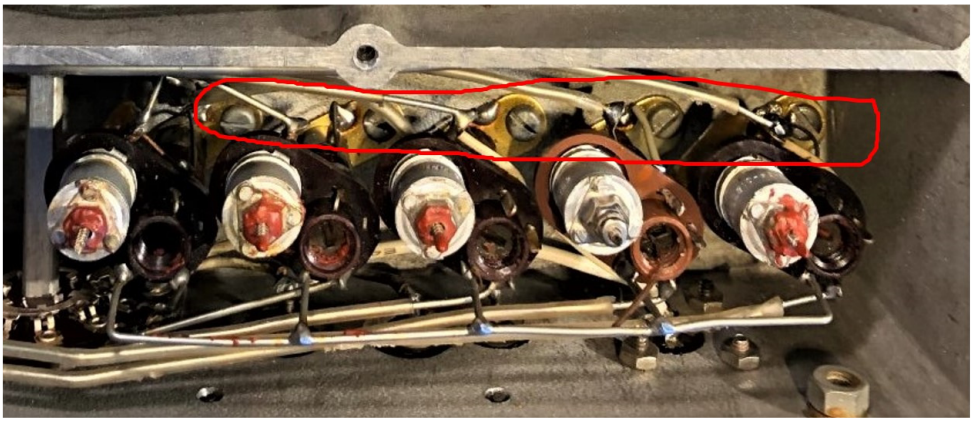
In order to prove that I had correctly identified the problem, I extracted the four Range 4 coils assemblies, cleaned their brass fixing pads, along with the bolts, washers and the coil box underneath them and re-installed them in the coil box. Having done that, the receiver worked well on Range 4 without any sign of the excess sensitivity or oscillation that there had been an hour earlier.

There is no sign that my 940 has ever been stored in a damp environment. There is no sign of corrosion anywhere; let alone inside the coil box. Nonetheless, it was clear that sufficient oxidation had occurred to disrupt some of the earth connections between the coil assemblies and the inside of the coil box.

The full solution to the problem is to remove all the coil assemblies, clean all the mountings and re-assemble everything. That is what I did on my 940. It is a lot of work that has to be done very carefully to avoid causing damage. I think it was worth it because apart from fixing the faults the set now works better. It is easier to align; the tracking is more accurate; it is a bit more sensitive; it feels 'newer'. However, there is a much simpler solution. The coil assemblies are held in place with a bolt and a shake-proof washer which has sharp edges. If you undo the bolt sufficient for the washer to be able to move about and then re-tighten the bolt, the sharp edges of the wash-er will cut through any oxidation and make a new connection.
In order to prove this simpler solution, I subjected my 730 to it.
Firstly, I tested the set to ensure that it was working and within specification. Secondly, I did the 'undo, wiggle and re-tighten' procedure to each of the 20 coil assemblies. Thirdly, I worked carefully through the alignment and tracking procedure. As expected, no adjustment was required but some of the tuning peaks felt a bit sharper. Finally, I put the receiver back into service and again, like my 940, the 730 appeared to perform a bit better and felt a bit 'newer'.

Based on my findings above, I would suggest the following:

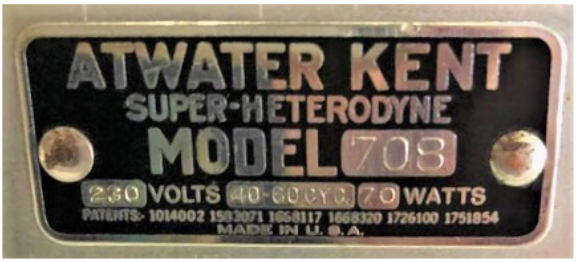
1. Do not forget that those bolted connections at the bottom of the coil assemblies are critical RF connections
2. If you do have problems on only one tuning range, check the coil fixings; just as you would the other components unique to that range
3. When refurbishing a receiver, consider employing the simpler of the two solutions as a preventative measure; just as you would change other components that are showing their age.
4. These measures are applicable to most Eddystone valved HF receivers.

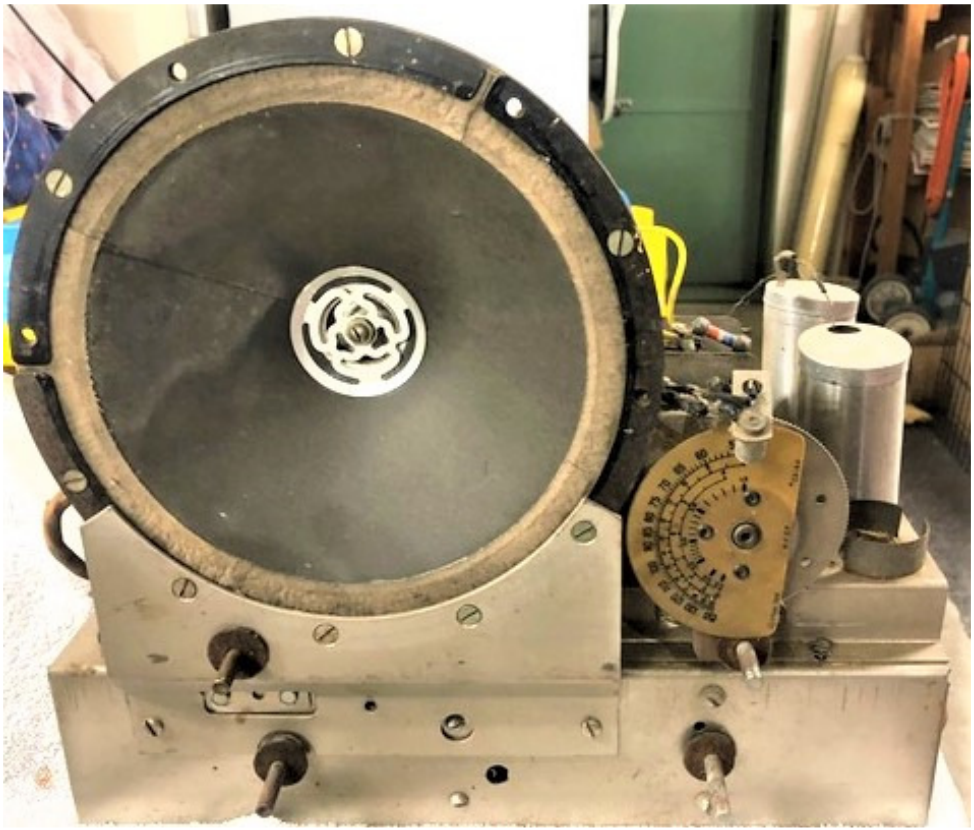


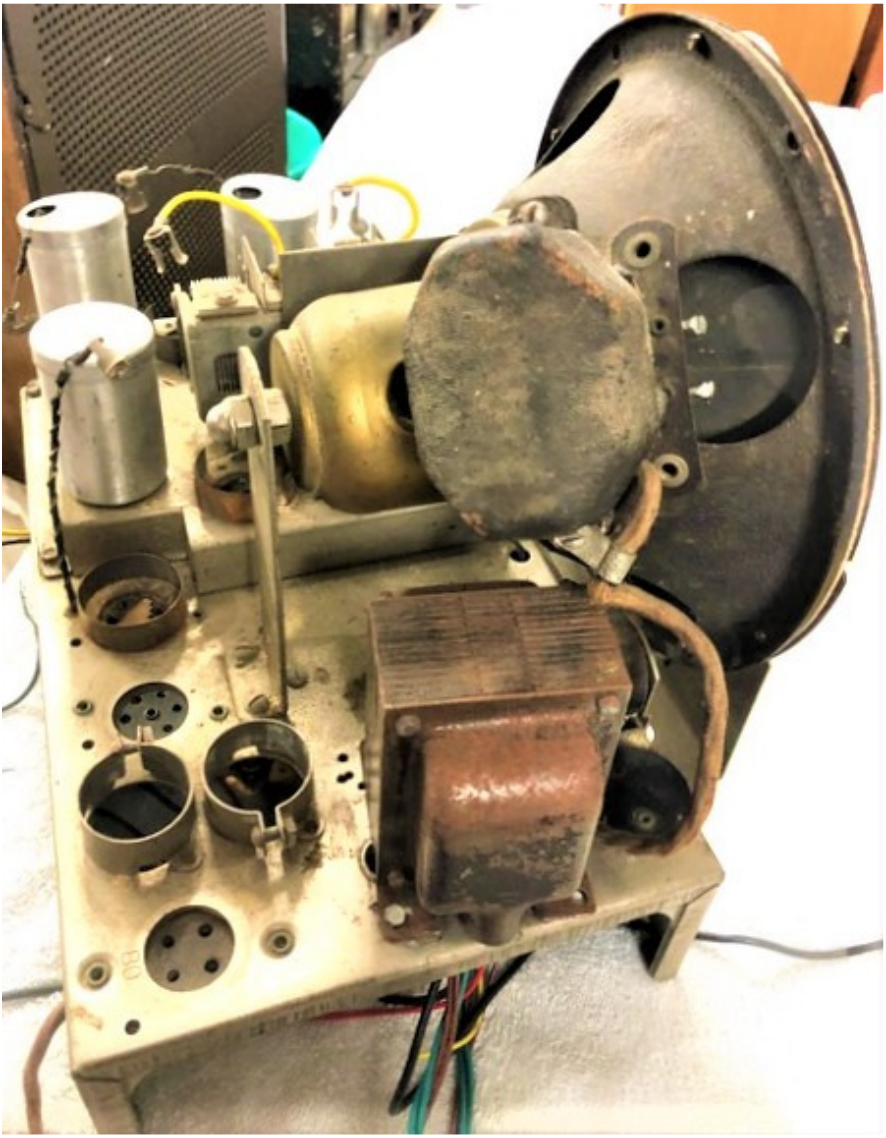
Coil "box" section – the errant bolt and brass foot connections can be seen just above the beehive capacitors circled in red.

Restoration of an Atwater Kent 708 by Roy Arbman

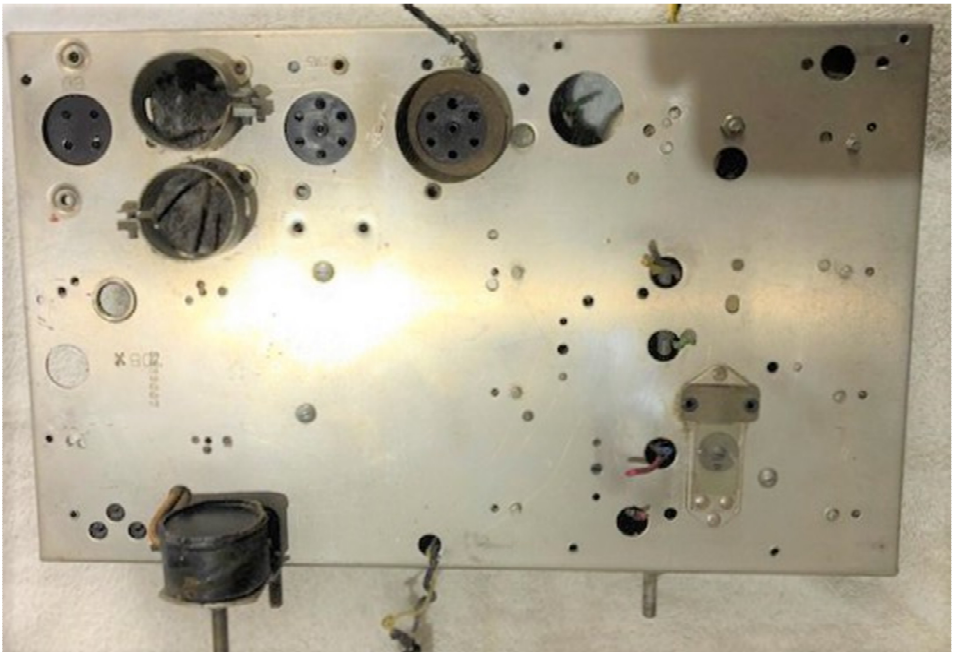
This Atwater Kent radio was obtained in average condition. There was no borer present in the cabinet but the fine fret work was delaminating. The chassis was all complete except for the can type electrolytics. The radio was not operational.







Removed the chassis and noticed the disintegrating rubber wiring. This would all have to be replaced. Stripped the chassis down completely, under the mains transformer the model number is stamped “708X” this was an export model and hence had the mains transformer with 230 volt primary.

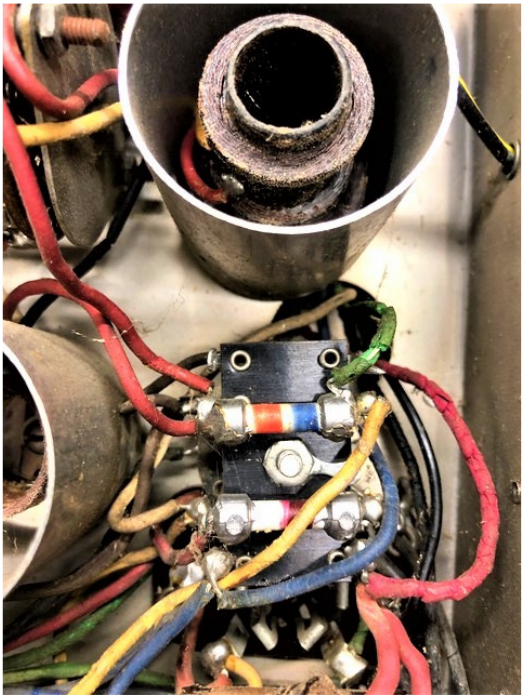


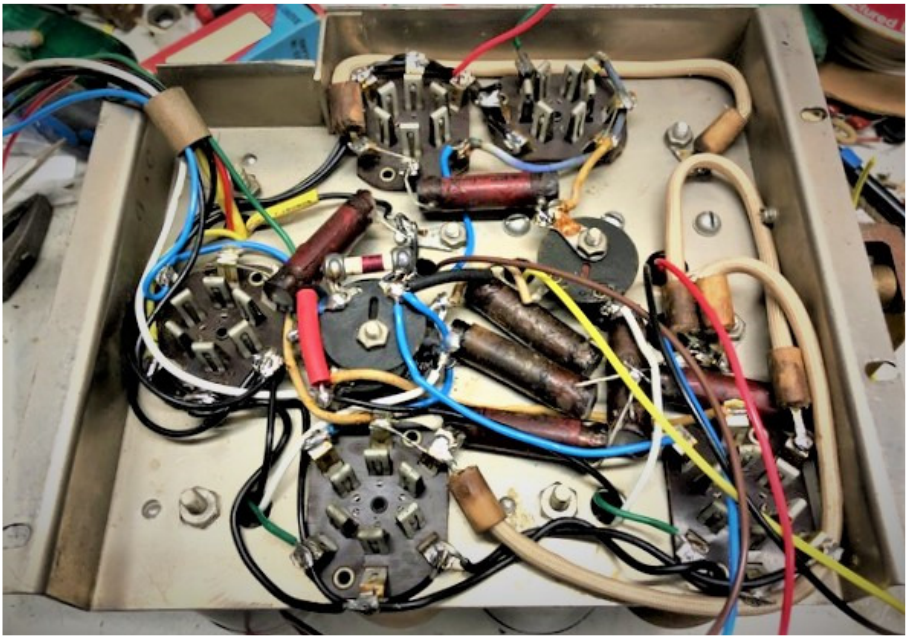
A thorough clean was done to remove years of built-up dirt and grime, the chassis was in remarkably good condition and did not need any further work to to it.

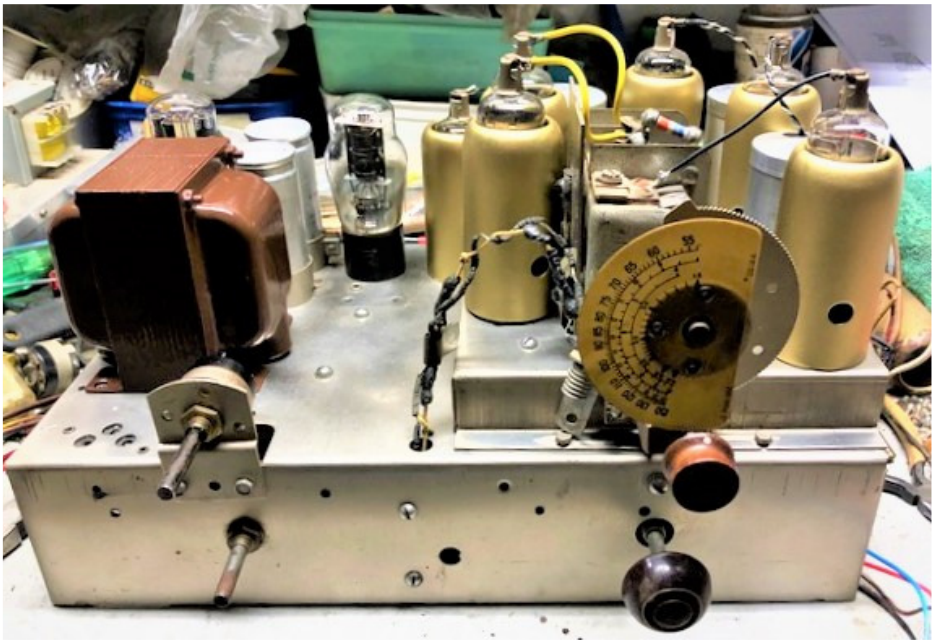
The hardest part of this restoration was the sub-chassis which comprises of the RF, 1st detector, Oscillator and IF stages. Photographed and carefully noted where each wire is terminated from the sub-chassis to the main chassis.

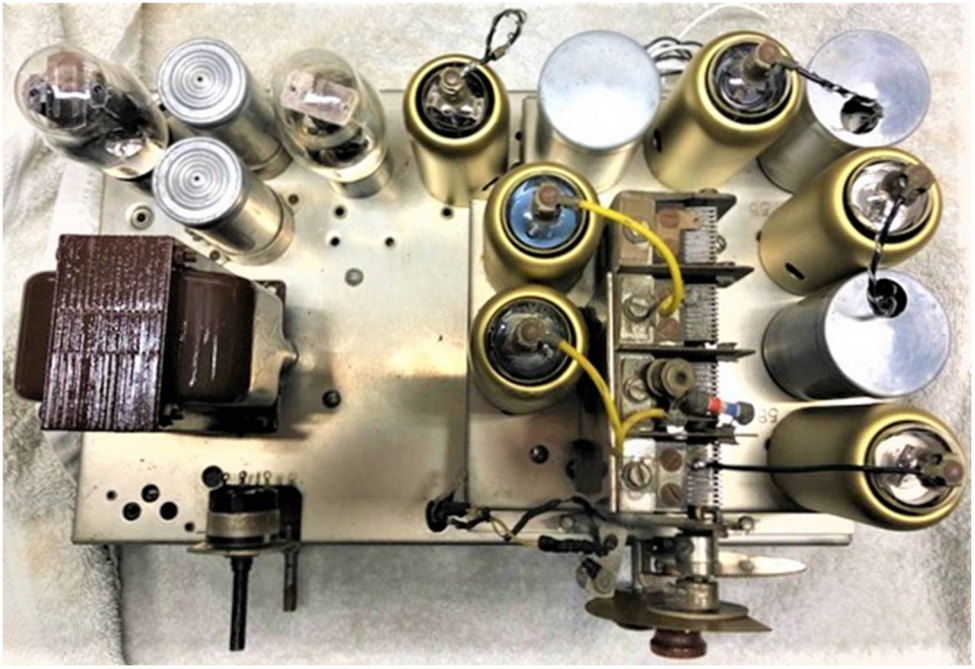
Once the sub-chassis was removed, all the capacitors were re-stuffed, retaining the original look.
There are a number of flexible resistors in this sub-chassis which were all open-circuit. I used normal resistors to replace these but made them look original by encasing them in a flexible tube of woven fibre (white in colour). The other resistors were checked and found to be within 20% of correct value and were left alone. All the rubber wiring was replaced.
Coils were checked for continuity and found to be okay. The tuning capacitor were cleaned and oiled. All wires from the coils including the IF's were replaced as these had perished as well.
The wiring to the top caps of the valves were shielded as Atwater Kent had originally done, simply a twisted wire rap around the grid lead, earthed at one end only.

The main chassis was checked, some resistors were o/c and were replaced. Flexible resistors replaced and capacitors re-stuffed.
The volume control and mains switch were faulty and replaced.
There is a block capacitor assemble which contained most of the bypass and coupling capacitors, this was sweated open and the contents replaced with modern equivalents, then sealed with wax to make it look authentic. The electrolytic (replacements) capacitors were cut open and new 10mfd capacitors inserted. Rubber wiring was also replaced.
Mains power cable replaced.









Re-assembly with the sub-chassis was then completed, valves inserted, the speaker re-attached to the chassis and testing done. Slight re-alignment of the IF's was only needed.
The AK708 was working perfectly.

The cabinet was stripped down, the fret work carefully glued back together, lightly sanded with 600 grit sandpaper, then spayed with several coats of polyurethane.

The grill cloth was retained as it was not damaged.

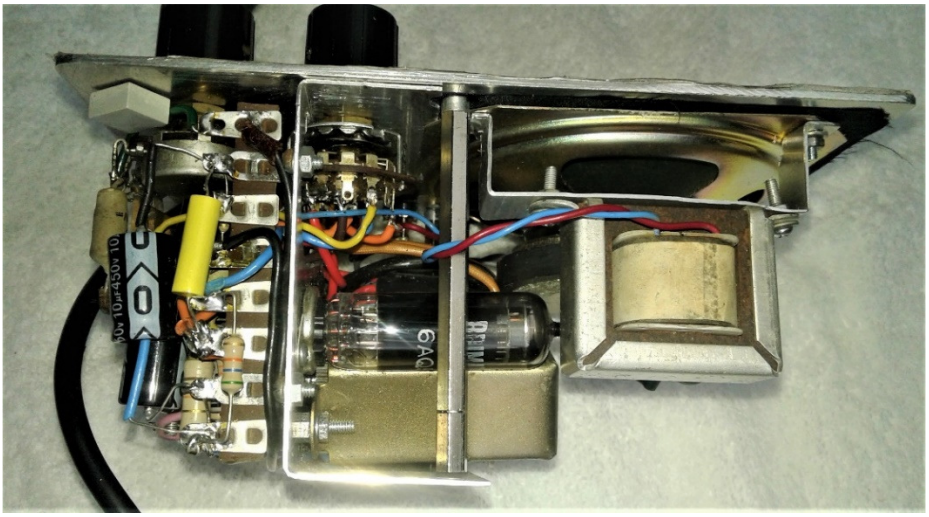
A Signal Tracer by John Dodgshun

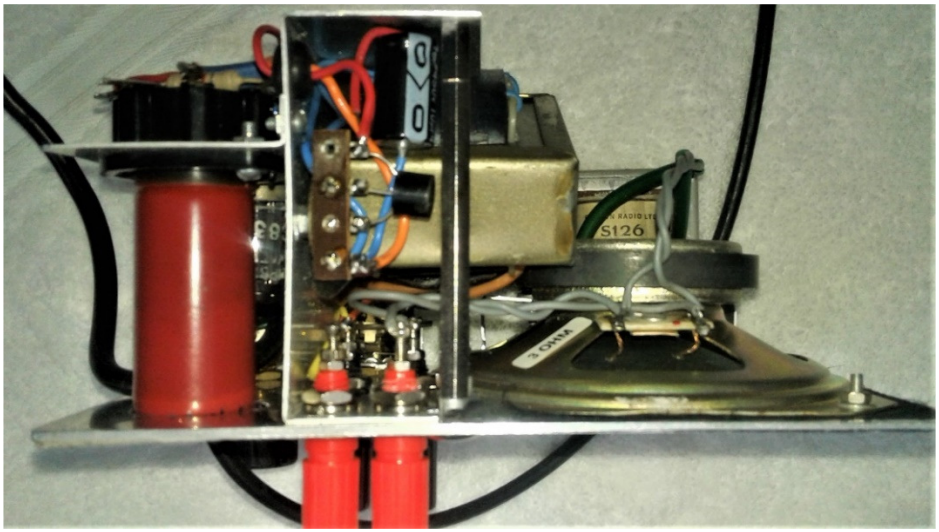
This project began after I bowed out of a TradeMe auction for a Heathkit type T4 signal tracer. *[Pictured left. Ed]* I had often thought that one of these pieces of test equipment would be a useful addition to my stable but the TradeMe item was much in demand and sold for considerably more than I was willing to pay for it.

So, after finding the circuit of the Heathkit model, I set about building one. The output valve used in the T4 is a 12CA5. I had to look that one up and decided that a 6AQ5 would be just as suitable. - Conveniently I had one. The 1629 magic eye requires -8V to close the shadow, the same as a 6E5 which I also had one of. The 12AX7 was no problem as were the speaker, speaker transformer and components. So far so good.

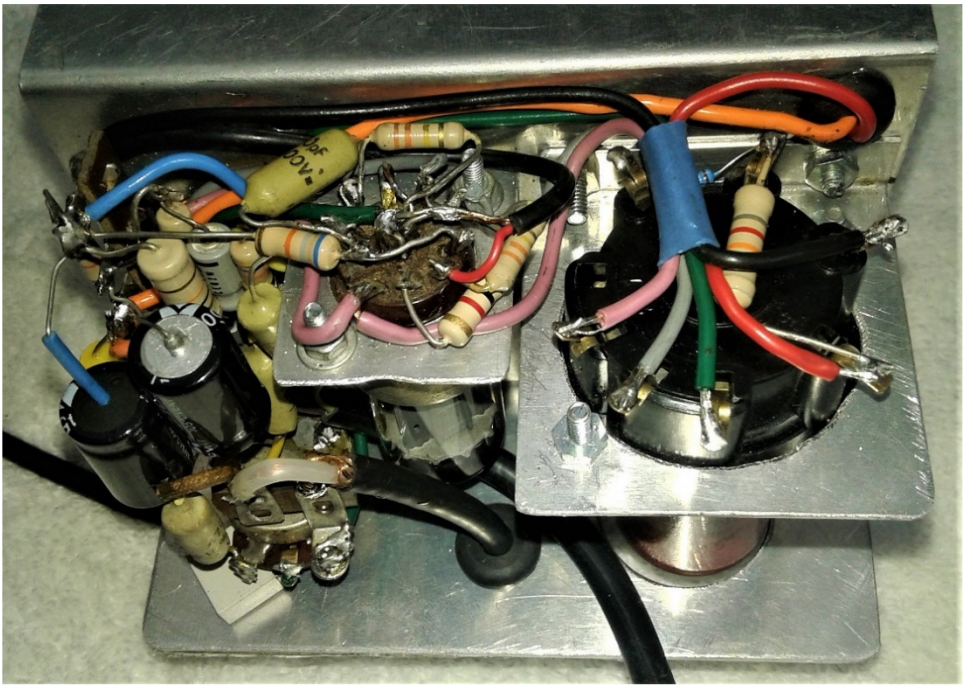
For the power transformer, I dug out a suitable core and wound a new coil with a 6.3V heater winding and the 115V winding for the HT.

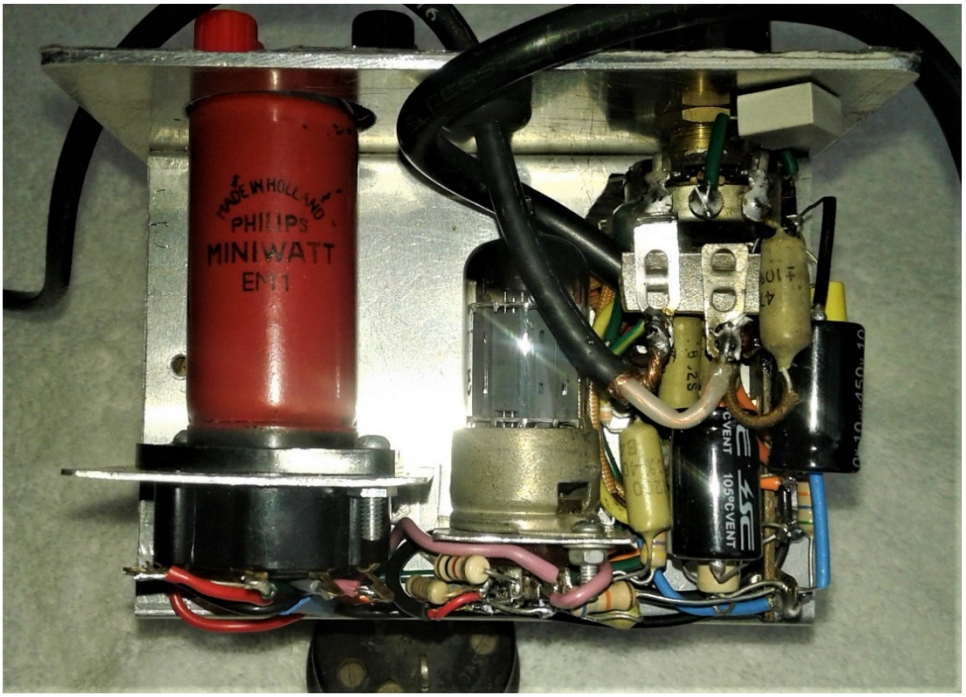
What to build it in? I found, tucked away in a corner that I hadn't looked in for quite a while, an old FET VOM. It had been my main multimeter but had long since given up the ghost. Mmmmm. It is quite a small cabinet but maybe with some thoughtful layout everything would fit? I found that I could make it all fit with the exception of the 6E5 which was several centimetres too long.





I had to sleep on that before I came up with the possibility of using an EM1. I had a NOS one of these so I searched it out and yes, it would just fit. As well it has the beautiful 4 leaf clover shadow pattern. Win, win!
It was a bit of a problem to mount as the side contact socket requires a 38mm diameter hole and takes up quite a lot of space!
After examining the Heathkit circuit carefully, I decided to simplify the front panel clutter, and give me much needed space, by combining the Noise and Power switches in a three position rotary switch. The T4 had a slide switch which disconnected the speaker from the output transformer and I decided this wasn't necessary so removed that also. For the probe, I dug out an old multimeter one with a switch and fitted the diode and capacitor into it. I designed a front panel label on the computer & printed that and repainted the case.

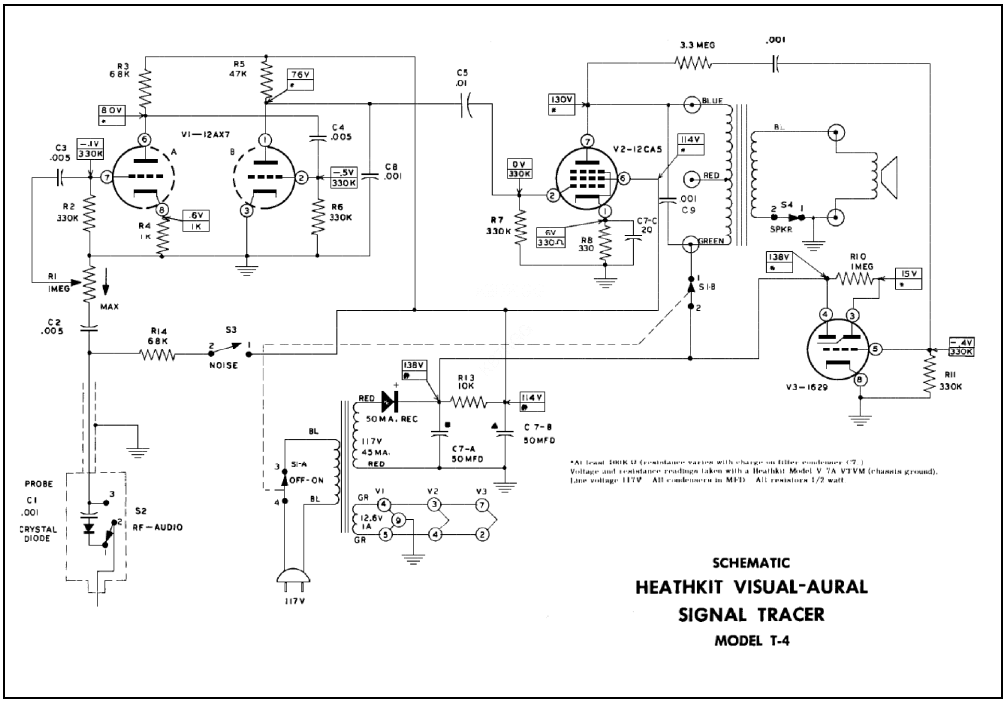


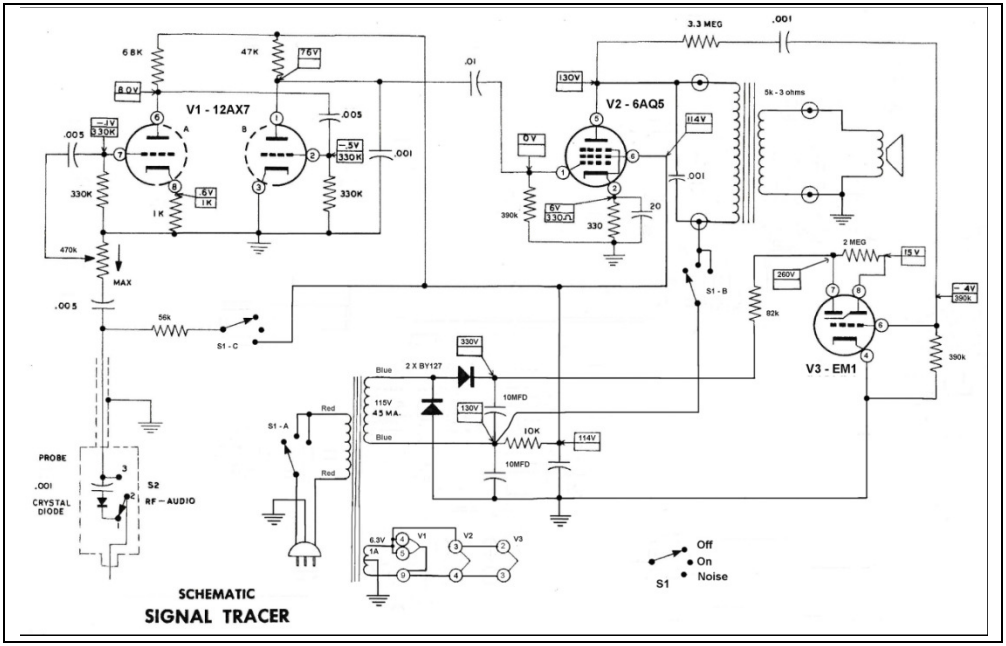

MADE IN HOLLAND
PHILIPS
MINIWATT
EM11
105°C VENT

All very satisfactory! After some metalwork and assembly, the unit was ready for testing. It all worked well except for the magic eye which was dim & unresponsive. It transpired that the target voltage on the EM1 was around 140V, okay for the 1625, when it should have been 260V. How to fix this as the power transformer was a tight fit and the bobbin was already full?

A full wave voltage doubler came to the rescue and the problem was solved albeit with an 82k series resistor to bring the new HT voltage of 330V back to 260V. The centre of the doubler conveniently provided the rest of the HT at 165V. I have reused the knobs from the FET VOM, even the one with a small piece missing, and, as an acknowledgement to the Heathkit unit, I have fitted an English GEC 3 pin plug.

At 190mm high, 130mm wide and 95mm deep I now have a very compact signal tracer which has proved to be very useful.





Original Heathkit circuit top, Dodgshun Signal Tracer lower.

jandjdodgshun@gmail.com

“Phoenix from the Ashes” an AVO Repair from Terry Collins

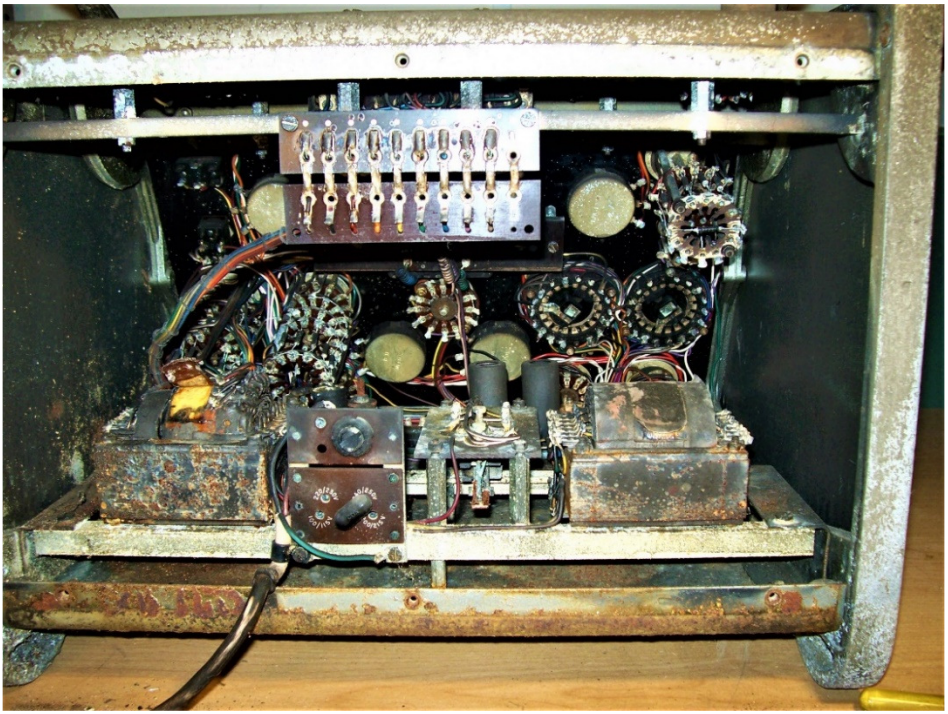
The first prize winner for the 2021 AGM Competition.

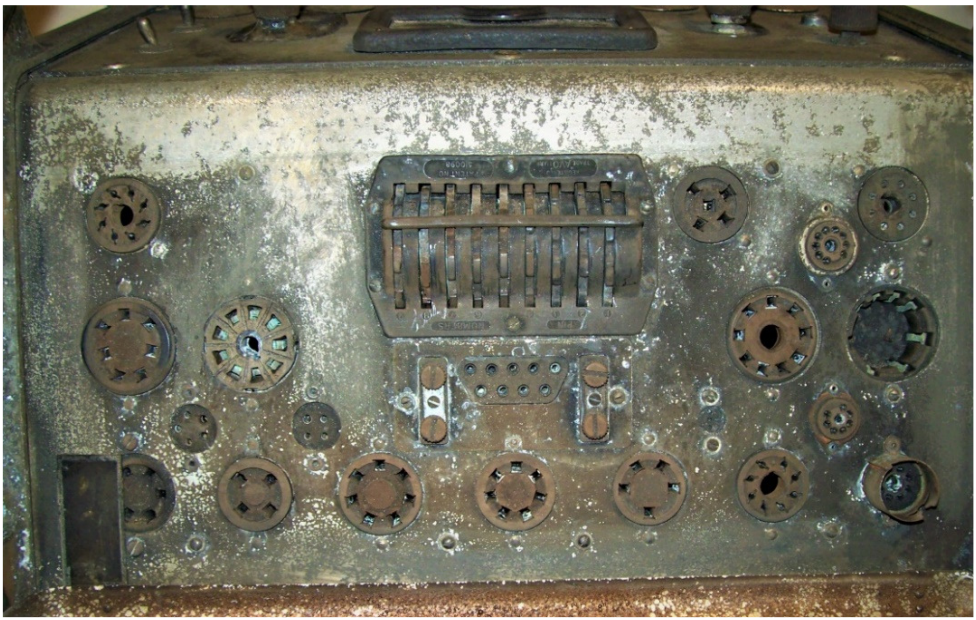
I received this unit in early January 2019. It had been stored in a garage that was involved in a fire. While the tester itself was not burned, it had sustained extensive damage from heat and water. A quick inspection of the front panel by cleaning a small section indicated that the instrument might not be a complete write off so further investigation was carried out.

The front of the instrument had faced the main heat source and as will be seen the meter movement, Vg and Gm control knobs were destroyed. All the black control actuators (the material is, I think, Bakelite) had “bubbled” in the heat as had the electrode selector "roller" switch on the socket deck on top of the instrument. This was less damaged however probably due to the cover being in place at the time. The rear and underside panels were heavily rusted from efforts to extinguish the fire.

Internally there was heat, smoke and water damage. The insulation on some of the wire looms had fused and it wasn't possible to remove a wire without damage. All surfaces were coated with soot and the overload relay parts were badly corroded.

It was clear from this brief physical inspection that there was little point in trying to repair the unit as found. After removing most of the soot the transformers were checked and found to be probably usable. The switches on the front panel were given a brief test in situ, all exhibited considerable leakage (typ. < 10K between adjacent tags).





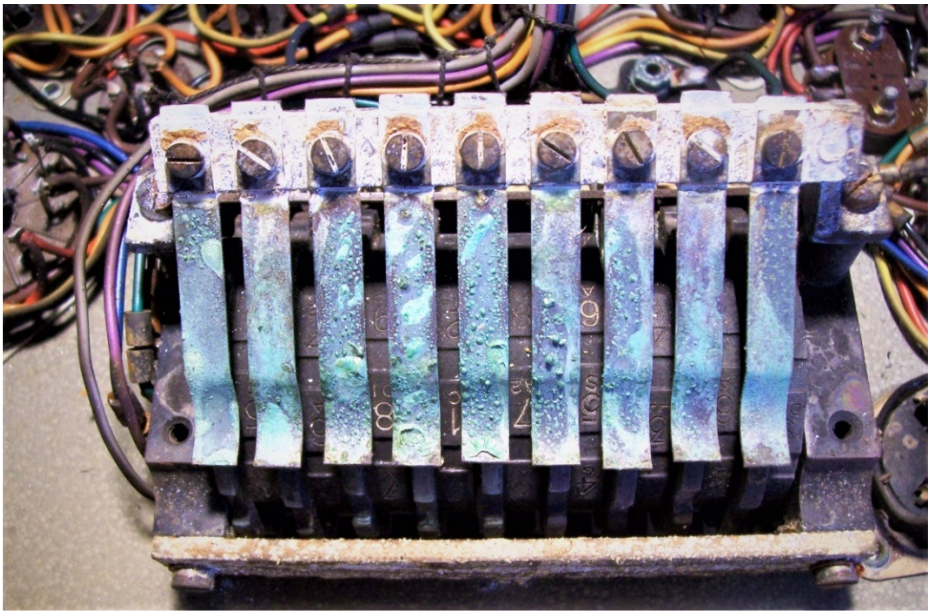
The original point-to-point wiring, having no means of allowing separation of sub-assemblies, makes working on these instruments difficult. It was decided to make any replacement sub-assemblies "plugable", this would entail additional work but considering the chances of getting all wiring "right first time" this was (I thought) a prudent approach.

On close inspection of the rectifier panel mounted in the center of the base plate it was evident it was not worth repairing. The functions provided by this sub-assembly could, with more modern technology, be housed elsewhere and not having parts mounted here would make working on the rest of the instrument easier.

The power supply sub-assembly did not seem to be badly damaged but as noted above the overload relay was corroded and probably would not function reliably after any repair. It was decided not to attempt a repair of this critical protection device, therefore it was necessary to design a suitable replacement of some sort. After removing and cleaning the soot from the terminal strips of the power transformers they were re-examined thoroughly, tested and found to be undamaged and within specification. The power supply was then dismantled, the mains voltage adjustment panel cleaned and retained and all metalwork cleaned. The transformers and mains adjustment panel were remounted in their original positions, all other parts were discarded.

This was the end of the investigation; the work of repair/restoration was now commenced.

The instrument was completely dismantled, and all switches and sub-assemblies stripped to parts. The remains of the meter mounting and over load alarm lamp parts were removed and discarded. All external metalwork was sand blasted in preparation for painting. Holes were added to the socket deck to accommodate B9D, NV5 and Acorn sockets. All external metal parts were then painted with grey Hammerite paint and left to harden.



The remains of the meter were removed from the front panel and discarded; the panel was cleaned, in the first instance, with a combination of cooking oil and baking soda. This removed the soot and the panel was then washed using detergent, after polishing with toothpaste and one more rinse the panel was usable.

The front panel pots were measured and the tracks found to be within tolerance. The external surfaces were cleaned and the parts opened, cleaned internally, again with a non-residue cleaning product, tested then re-assembled.

The rectifier panel was written off, however the three 8W wire wound resistors on this panel were retained as these were custom values and still within tolerance. In view of the heat exposure and age (about 65 years) of the remaining resistors in the instrument it was decided to replace all these parts.

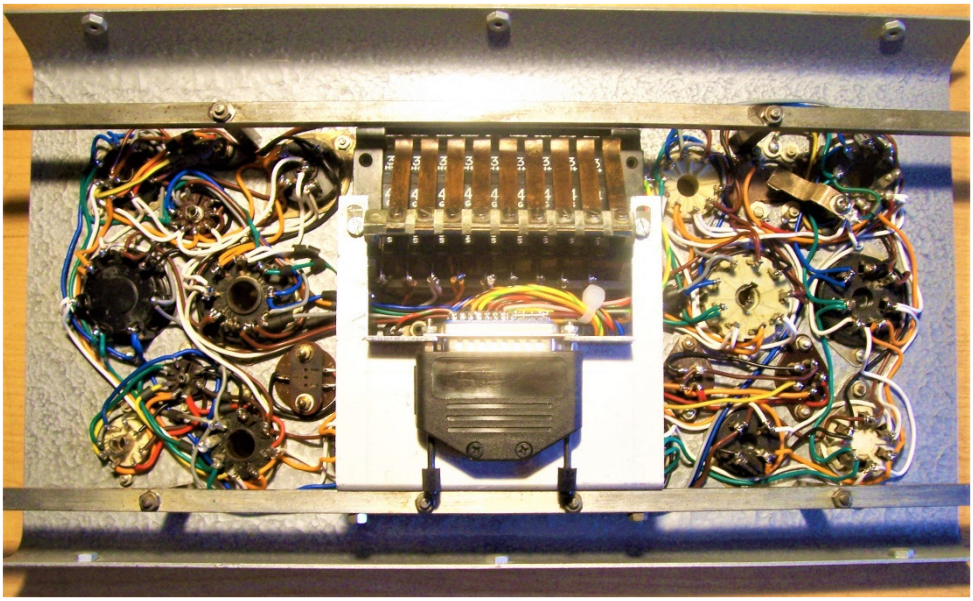
All wafer switches were removed, disassembled and the solder lugs cleared of wires, the wafers were then cleaned. The cleaning consisted of scrubbing in a boiling sugar-soap solution to removed grease and soot, washing in a detergent and finally rinsing twice in hot water. When the wafers were thoroughly dry, measurements were made between each terminal lug to all others on the wafer with a 400v DC current limited supply to ensure the insulation was adequate. The contacts were treated with a non-residue switch-cleaning product. The metal parts were cleaned with boiling sugar-soap, dried and the detent mechanism lubricated with light grease. Finally, the entire switch was re-assembled and put to one side.

The first items repaired were the control actuators. As described above these had "bubbled" in the heat, in order to make these presentable it would be necessary to repair this damage. A dummy shaft was made to allow the actuator to be mounted in the chuck of a lathe. The actuator was then turned and a file applied to remove this surface damage. The resulting holes were filled with automotive "bog" and, when fully cured, the actuator was again mounted in the lathe and the surfaces polished, finally they were painted with black paint and given a light polish.

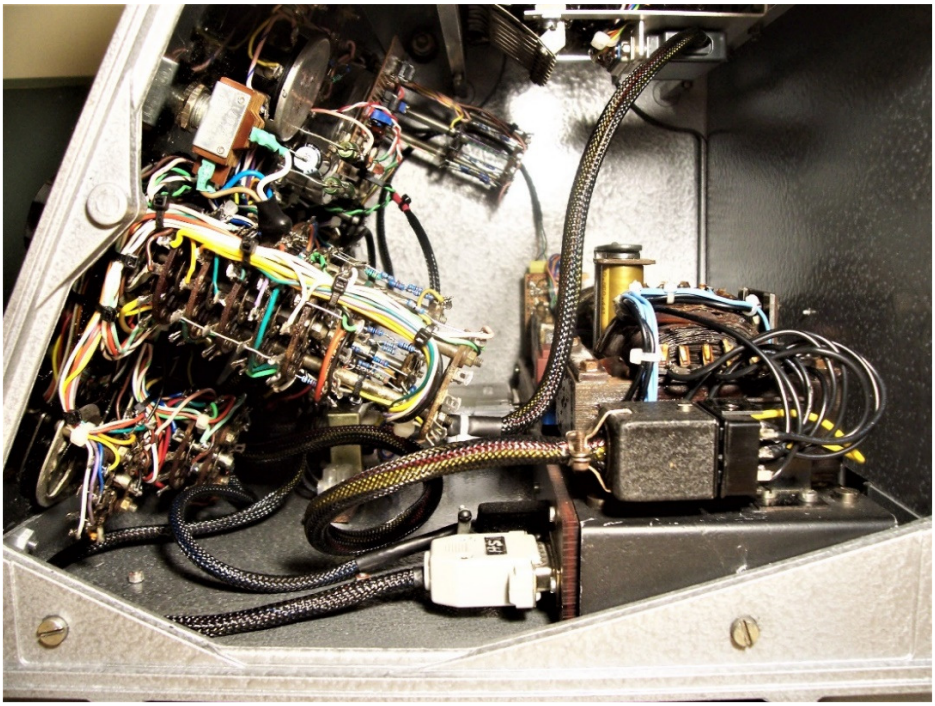
The fine "Grid Volts" and "Gm" control flanges needed to be fabricated, to this end a forming jig was designed and made from dowel and particle board. Some 2mm thick acrylic sheet was

obtained and cut into squares about 150mm on a side. A hole was drilled in the center of the square to locate the piece on the forming jig. The jig and material square were then slowly heated in an oven until the acrylic was observed to soften and deform. The jig was then removed from the heat and pressure applied so that the plastic formed a raised central dome. The acrylic was allowed to cool. When fully cooled it was setup in a lathe and the outside cut off to provide a clear, circular flange that could be fitted to the actuator, before fitting the actuator a line was scribed on the underside of the flange.

To make the power supply "pluggable" it was necessary to add a panel along the back of the sub-chassis, this panel was made from a piece of 4mm thick Paxolin. The sockets were mounted on this panel; a deliberate effort was made to use a different socket for each sub-circuit so as to eliminate the possibility of mis-connection. The low voltage heater supply connector was not mounted to this panel; it was wider than the other sockets and would have required that the metal rail at the rear the chassis be cut thus reducing the overall strength of the chassis. This heater output was connected via a 12-way miniature "Jones" socket. This was used due to the greater current requirements of this output. It was mounted at the end of the power supply chassis on a small bracket near the low voltage transformer.



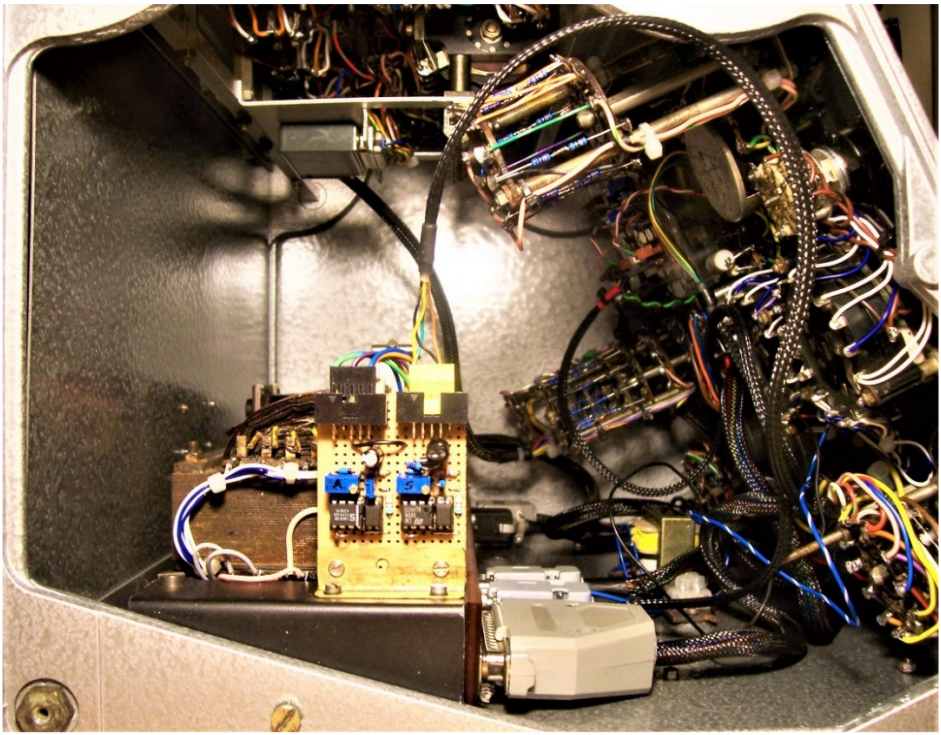
A six-amp IEC plug was mounted on the other side of the chassis for the mains input and a second small panel was fixed at the other end of the chassis to carry the two internal calibration pots and service link that were formally mounted on the, now discarded, rectifier panel. The rear cover and base plate were modified to allow access to these parts



A 3000 type post office relay was modified to operate a 5 amp micro-switch along with a single original N.O. contact, this was to be the overload mains switch and was mounted on a paxolin panel next to the low voltage transformer. The original overload detector used a multi coil relay arrangement to provide its function, this allows simultaneous monitoring of both anode and screen currents. The approach adopted with the replacement system was to monitor these currents as before but independently. This was necessary as there could/would be significant voltage differences between these two circuits when in operation or under fault conditions.

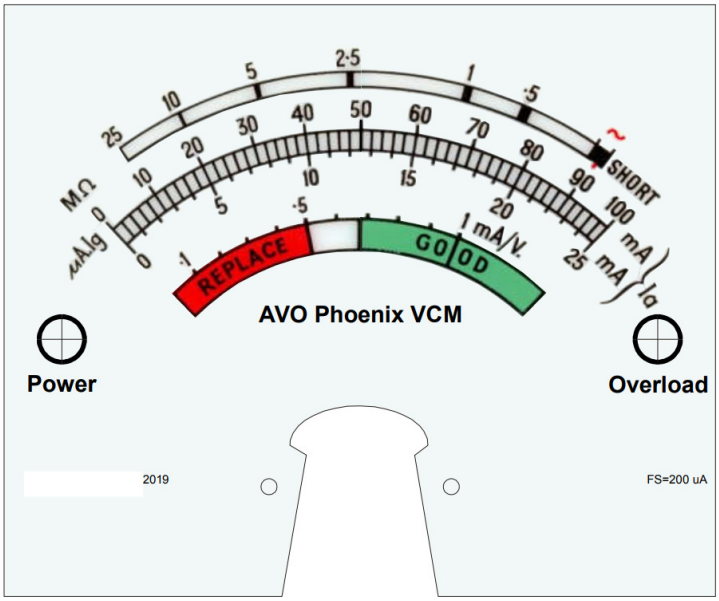
Two small independent, isolated auxiliary power supplies were constructed to feed the overload current detectors, the output of the detectors are optically isolated and "ORed" together to drive a small relay via an amplifier. This relay gives isolation from the mains potential present on the 3000 type relay. The 3000 type relay after operating is held operated via its own (original) contact, thus the system latches preventing any further operations until the mains power to the instrument is removed, this may be accomplished by cycling the main power switch on the front panel. A third auxiliary power supply was constructed to provide power for the meter amplifier and the isolation relay driver. The overload supplies were powered from a PCB mounted transformer, the meter amp power supply was powered from a (now redundant) 6.3v secondary originally used to supply the pair of 6AL5 valves on the rectifier panel. These three supplies and the relay driver were constructed on a piece of home made fibreglass Vero board mounted in the space formally occupied by the overload relay.

The overload current detectors were constructed on a piece of Vero board mounted at the end of the power supply chassis close to the high voltage transformer. This allowed easy adjustment of the detector thresholds without the need to get hands close to any voltages.

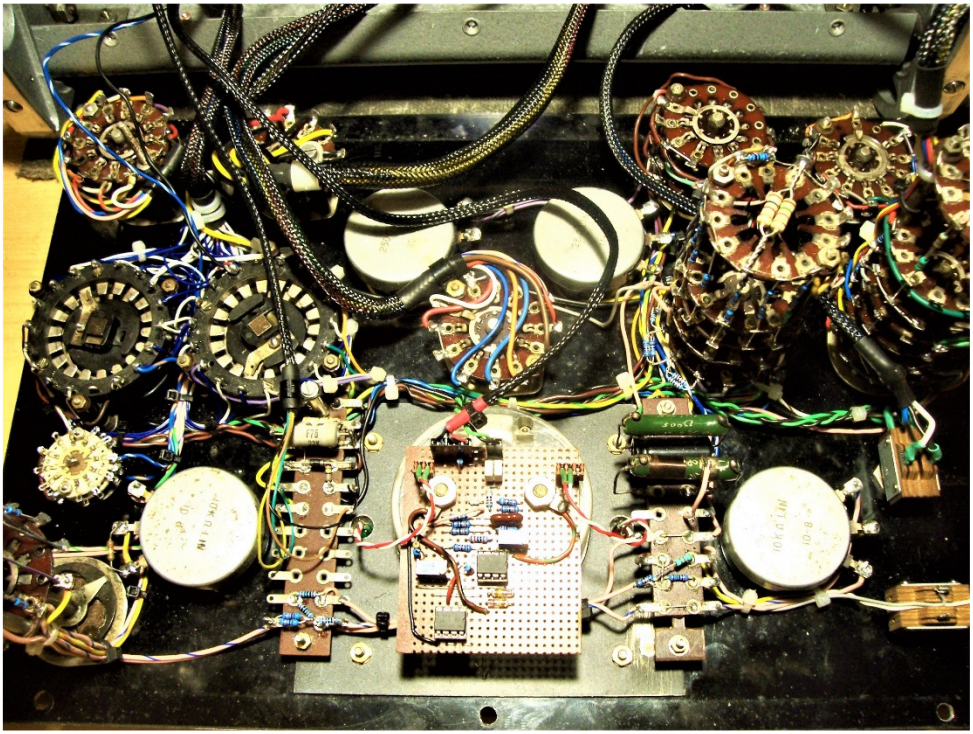


The socket deck was reconstructed with as many new sockets as were available but some of the original parts had to be cleaned and reused, these were the two "Hivac" miniature sockets, the British B7 and B9 and the large UX7 sockets. As noted above the B9D, Acorn and NV5 sockets were added along with seven and nine pin, pin straighteners. The original ferrite beads were recovered and reused with additional beads added as insurance. A DB-25 plug was mounted to the deck so that it could be removed easily for any future maintenance; several pins were paralleled to carry the (sometimes) considerable heater current. The "roller" electrode selector switch assembly and electrode/link panel were dismantled and cleaned in a similar manner to the switch wafers described above. (Cleaning and repair of the "roller" switch required about 40 hours work over a two-week period). The engraving on the roller switch sections was restored with a white wax pencil; a heat gun was used to ensure an even wax filling. Two top cap leads had to be made as the electrode panel did not use a standard size socket.

A meter movement was purchased from the local amateur radio club; this was from a Heathkit VTVM. It was slightly smaller than the original so a panel was made to carry the meter; this was then mounted to the front panel with four screws. The replacement movement FSD was 200uA so a simple amplifier was built and tested using the original meter specifications. The amplifier allowed an electrical zero and a small gain adjustment to compensate for variations in component values. The amplifier was designed to offer the same loading to the external circuit as the original moving coil 30uA movement. A new scale was generated from images available on the web, after modification this was printed and fitted. Two holes were cut in the rear of the movement and scale to allow the mounting of a pair of LEDs. The green LED is a power indicator; the red LED is used as an "overload trip" indication. The meter amplifier assembly mounts directly to the meter movement and is secured by the meter terminals.



On each side of the meter assembly a pair of tag strips were mounted to allow fitting some of the parts formally located on the rectifier panel and also to give convenient "break points" in the wiring for testing, measurement and fault tracing.



The course "Grid Volts" and "Meter" switches were populated with the required resistors. Since most of the values specified are not available as single items, series and parallel combinations were sometimes needed. Fortunately, it is now possible to obtain 1% metal film wire ended resistors at very low prices making it reasonably easy to meet these requirements. Some parts were selected on test simply because I had them available.

The 6AL5 valve rectifiers were replaced with silicon diodes, a silicon diode was also added to the anode supply as in the MkIV VCM. The front panel switches were wired to the power supply connectors, all wires allocated to a particular connector were protected within a length of woven PPS tubing, this is a very strong material and offers good mechanical protection. A "tail" was taken from the meter switch to the socket deck, this terminated in a DB-25 socket.

The three sub-assemblies (power supply, front panel and socket deck) were connected together and any wiring errors found and rectified. The meter mechanical zero, electrical zero and gain adjustments were carried out and then a slightly modified calibration of the VCM was attempted. Some difficulty was experienced initially as the phase of the "grid volts" supply was incorrect. I could find no reference to this requirement in any documentation but from observation of the original wiring it seemed clear that provision had been made for changing the phase of this

supply. I reversed the grid supply at the power transformer and it was then possible to calibrate the instrument as described in the AVO documentation.

Attempts to use the instrument to test valves indicated that the anode current trip was too fast. A surface mount 10uF tantalum capacitor was added to this detector on the rear of the overload detector PCB to "slug" the response. It was also necessary to add a small capacitor (2.2uF) at the relay driver input to prevent "chatter". At this point I considered the project completed, the instrument was calibrated, operational and a useful addition to my workshop. Some time was spent documenting for future reference.

About six weeks after I thought the job completed, I became aware of two minor innovations available on the MkVI VCM that could be added to my MkIII, these were (1) a limited anode current capability used when testing multi-section valves such as the ECH35 and (2) a 12v anode/screen test voltage for low voltage valves such as the E??83 series valves used in car radios

Since the power indicator was now part of the meter assembly there was a "spare" hole in the front panel (formerly occupied by the pilot lamp). A small, two pole, four position switch was obtained and fitted in this position. The value of R38 in the MkIII was 8K but in the MkIV this has been increased to 24K, a suitable part was obtained and wired so that it could be switched in (limited) or out (unlimited) by the new switch.

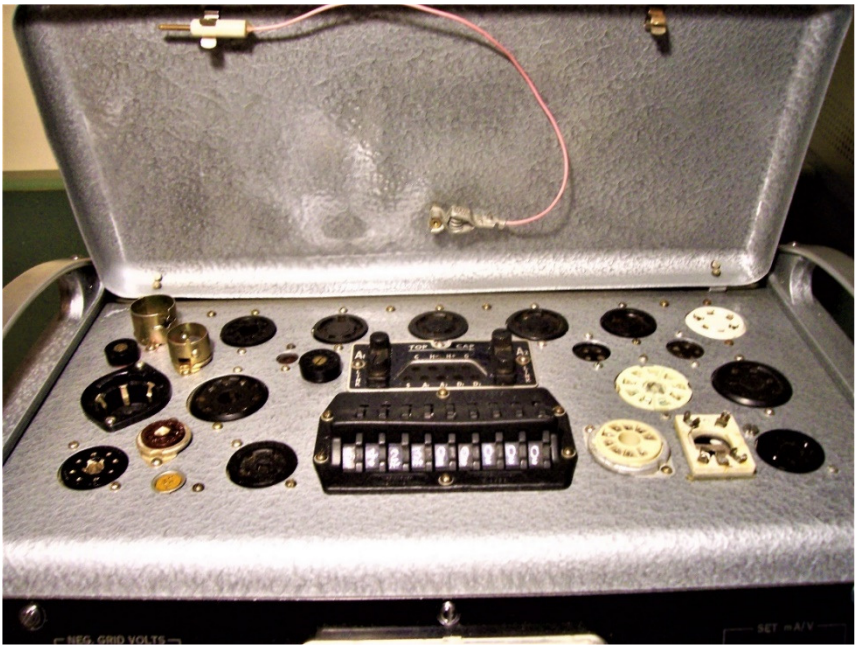
I found a small mains transformer suitable for testing 12v valves. It was necessary to remove some turns from the secondary to obtain the required voltage. There was no room available for this transformer on the power supply chassis so it was mounted to a small strip of Paxolin and this was fixed to the base plate in the area formally occupied by the rectifier panel. The mains live and neutral were brought out of the “Mains Set” connector and terminated at a “chocolate block” mounted on the Paxolin strip. The low voltage output was similarly terminated at the other end of the strip, the output wires were then taken to the front panel switch. When the Anode/Screen voltage switch is at the 20v position the additional switch may be used to switch between 20v and 12v.

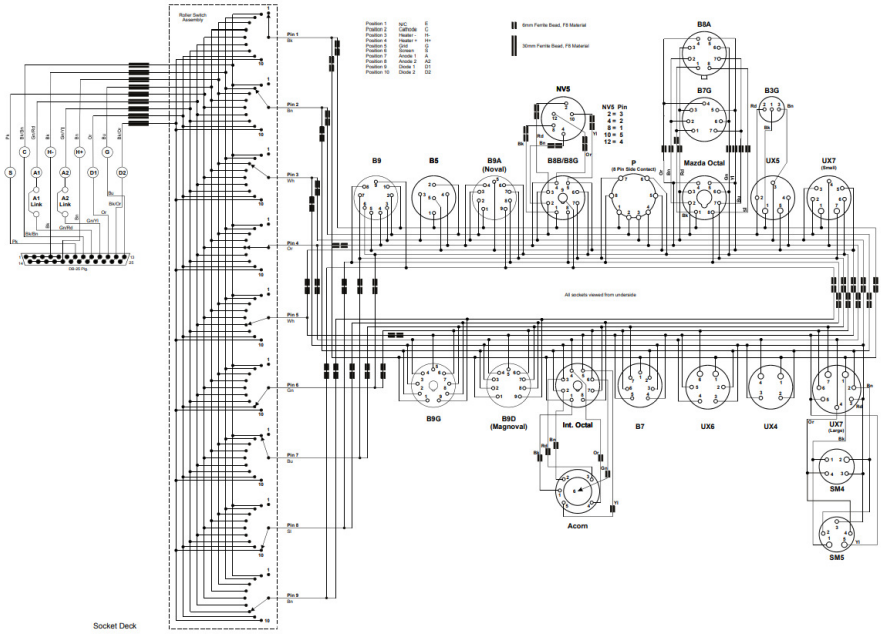
The documentation was updated to reflect these changes and any errors found were corrected. I think this is the end of the project (again!).
I would like to acknowledge and thank the following NZVRS members for their assistance, advise and support with this project: Angus Bromley, Murray Clark, John Dodgshun, John McKim and Paul Willmott-Dalton.

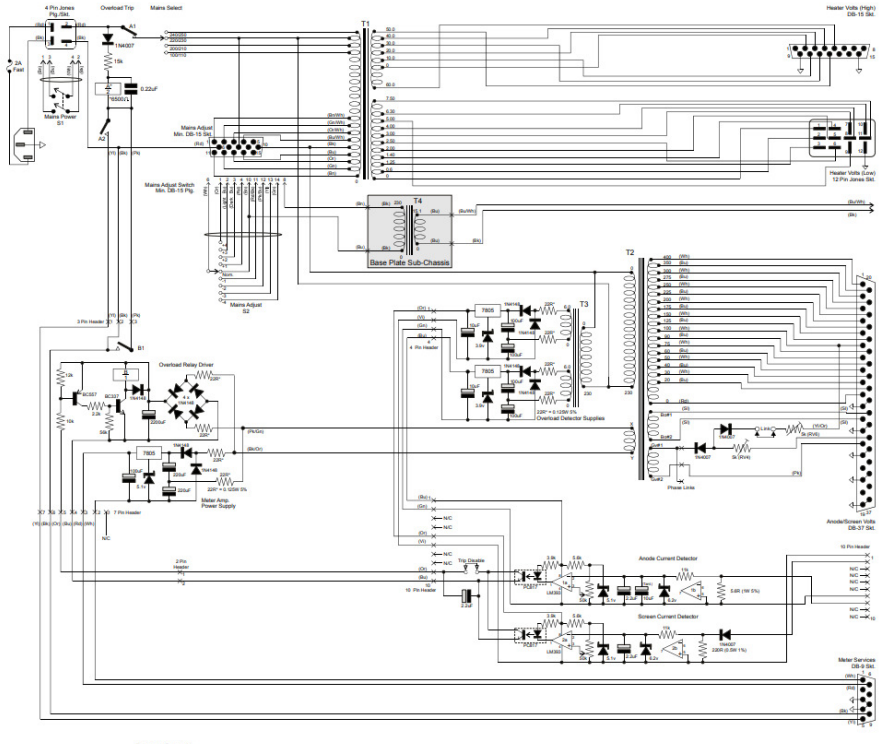
Note: - The above document was generated from notes made during the project, this was some eight months in duration, two years ago. Inevitably I will have omitted some details and thoughts occurring at the time, also some of the photographs are poor (most were taken as memory joggers) for these shortcomings I apologies.
[Also please note that this bulletin entry is an abridged version of Terry’s entry documentation. The complete version, including circuits, more pictures, component list etc, can be seen at http://www.nzvrs.pl.net/AVO Ed.]

Terry Collins terry295@opie.no-ip.org

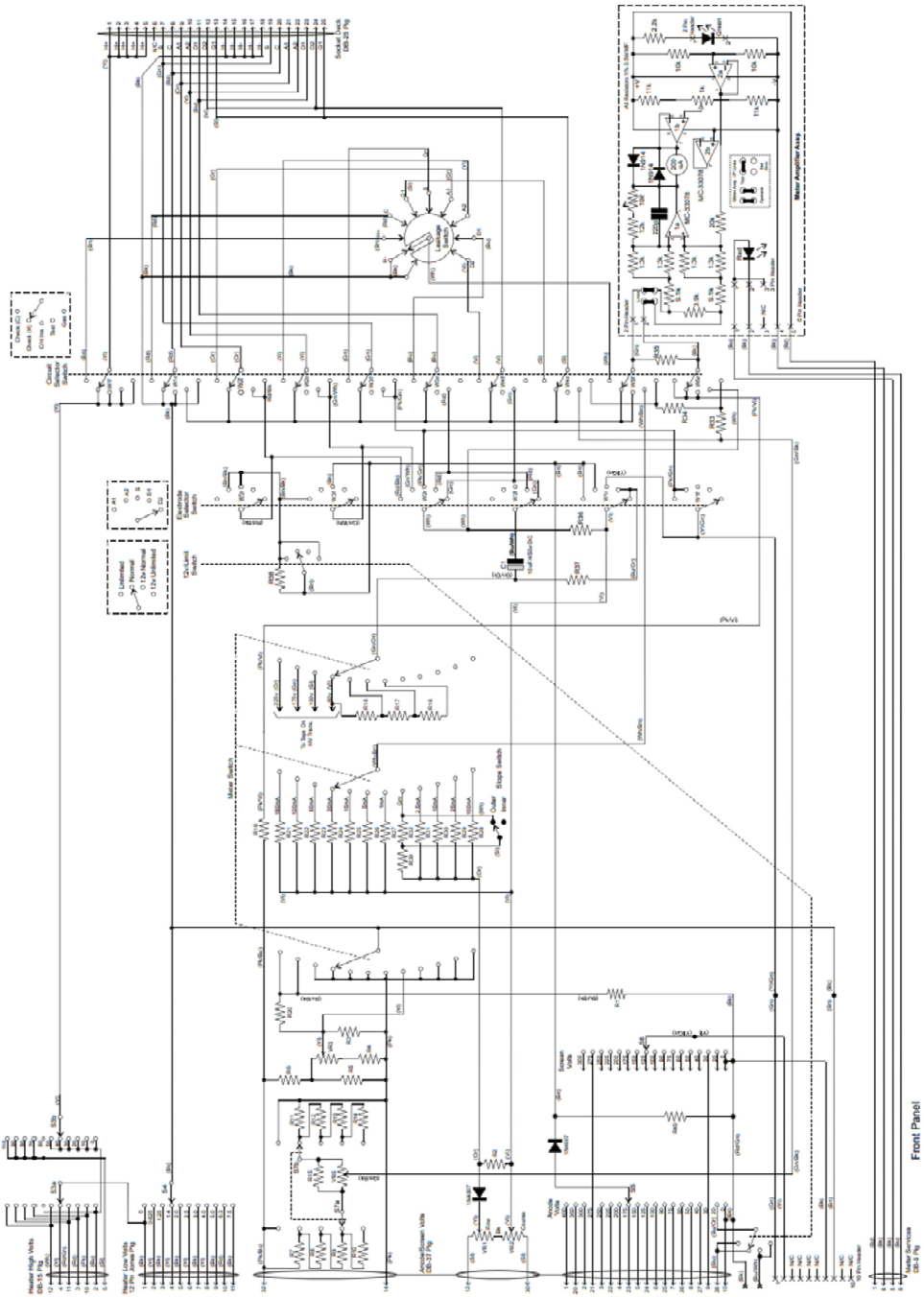
Completed project.







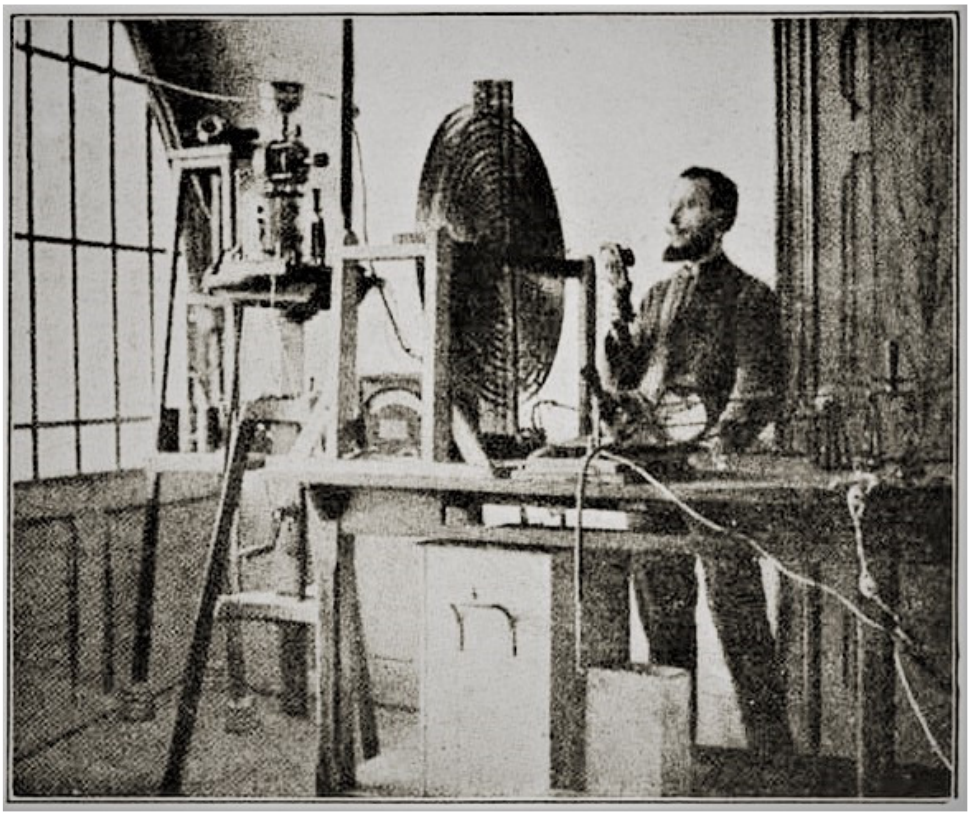
Power Supply


Front Panel

100 years of broadcast radio in New Zealand

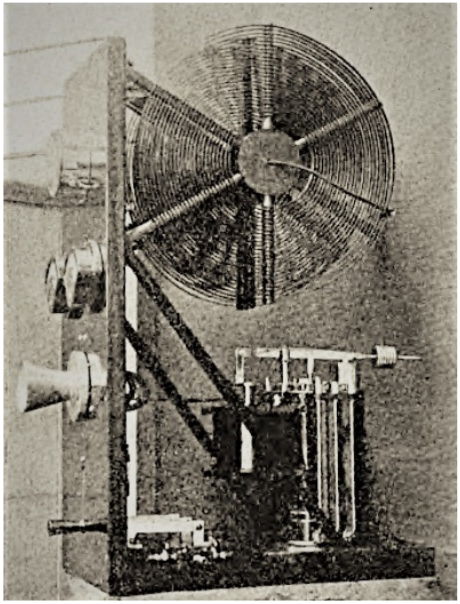
Musical broadcasting to radio listeners in New Zealand has been around for over 100 years. Prior to this radio telegraphy in Morse code or similar was the norm, reception of the human voice and even music was a significant milestone yet to come, although some northern hemisphere experiments had proven the capability but with limited success. For example, Fessenden in 1906 (and others) had demonstrated the modulation of arc transmissions by a carbon microphone. Fessenden had used fine cuts in a gramophone cylinder to provide a 10kHz interrupter effectively a subcarrier for the arc.

These and other methods could be used to provide carrier wave “telephony” ie voice transmission rather than the usual “telegraphy” ie (Morse) code transmission. Voice transmissions were seen as an improvement on code, as relatively unskilled operators could get their message across rather than being skilled in the sending and receiving of code. But these experimental developments, especially in Europe, were suddenly curtailed by the 1918 Great War. For example, Goldschmidt of Belgium had developed voice communication for use in the Belgium Congo in 1914 but his apparatus and transmission facilities were destroyed to prevent them falling into enemy hands, on the German invasion of Belgium in August 1914. {He went on to develop the microfiche as a microfilm standard instead.}



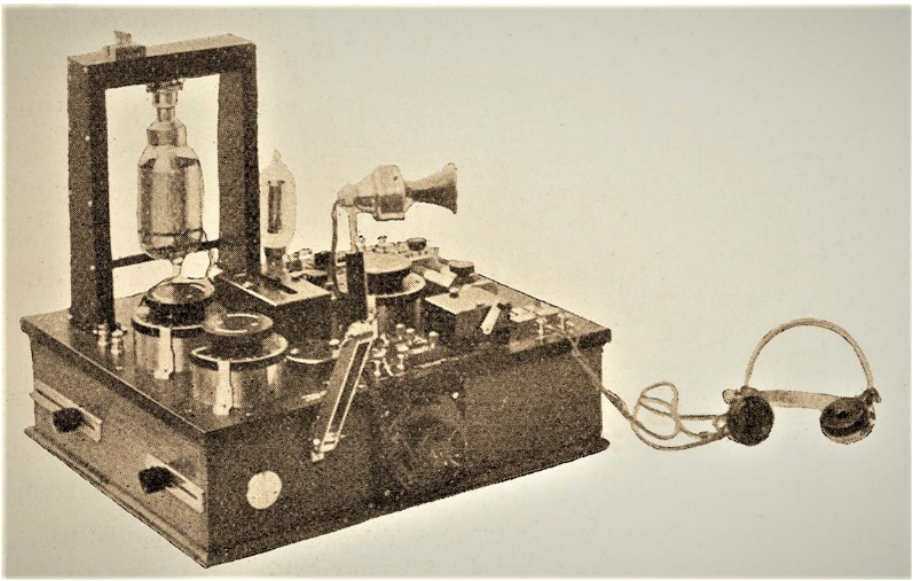
Goldschmidt holding his carbon-based microphone in Belgium early 1914.

Primitive Hanscom (USA) modulated arc transmitter. (Below right)

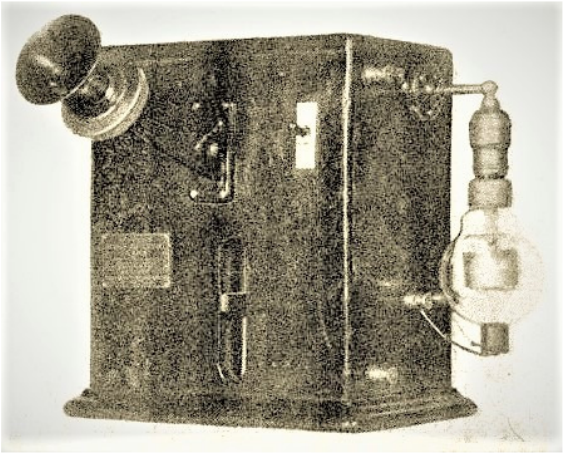


Early experimental arc radiotelephone (AM or voice) transmitter designed by W. W. Hanscom sometime before 1917. This was one of many variations on the arc converter transmitter invented in 1903 by William Duddell and Valdamar Poulsen, the first crude voice transmitters that were used before vacuum tube AM transmitters took over in the 1920s. It generated sinusoidal waves with a 100 VDC electric arc connected to a series LC circuit. The arc, submerged in a container of alcohol (bottom right) has a servo feedback system with a weight and electromagnet that controls the electrode spacing. The carbon microphone (front panel) connected in series with the transmitter's antenna lead, had to handle the full 2.5 A RF output current and so was water-cooled. Transmitting on 300 to 2700 m (110 to 1000 kHz), it could be received at distances of 100 - 260 mi (160 - 400 km).

The Great War saw radio work focused on the various war efforts and especially “portable” communication devices now possible with the development of the thermionic valve, from the original 1904 works of Fleming and De Forest in 1908.



A 1914 Marconi short range radio telephone using a Round type C valve.

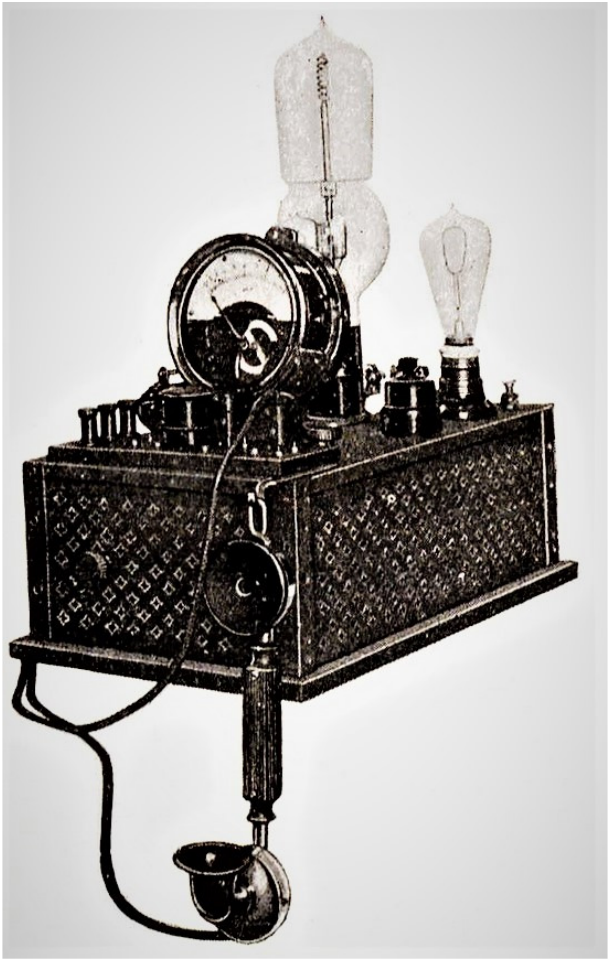


De Forest 1914 Radio Telephone (with Audion valve inverted to prevent the filament sagging onto the gid).

This combined radio telephony and telegraphy transmitter consists of microphone and key with internal Round valve.

This type of equipment was installed on spotting aircraft during the later stages of the first world war. There was considerable advantage in using this type of radio equipment for air to ground communication where the pilot may well be preoccupied with survival.

On right, One of the earliest vacuum tube radiotelephone transmitters, built by German scientist Alexander Meissner in 1913.



In a historic test in June 1913, Meissner used it to transmit voice 36 km (24 mi) from Berlin to Nauen, Germany. It used a mercury vapor triode vacuum tube (large tube visible) developed beginning in 1906 (approximately at the same time as De Forest's Audion tube) by Austrian engineers Robert von Lieben and Eugen Riesz. The large Lieben-Riesz tube (right) was used in the Meissner oscillator transmitter circuit which he had developed earlier that year, while the receiving circuit used a smaller Fleming valve (left). It transmitted on a wavelength of 600 m (500 kHz) with an output power of 12 W with 440 V on the plate, modulated with a carbon microphone in the antenna lead. H. J. Round noted that when the Leiben tube was used at such power levels, the tube lasted only 10 minutes before the filament burned out due to the bombardment by mercury ions.

New Zealand

Meanwhile back home in post war NZ there was not an “easy win” for radio experimenters. The 1903 Wireless Telegraph Act protected the rights of the crown to be sole communicator in New Zealand and it wasn’t until after WW1 that the 1920 Post Office Amendment Act allowed provision for (amateur) licenced receivers and transmitters.

Prior to 1920 even the reception of radio signals was the prerogative of the Government and illegal for others. However, this did not stop enthusiastic amateurs and especially the educated youth of the day experimenting with some of the documented means of radio detection. Generally, they were receiving Morse code telegraphy signals – but a few went a little further and included transmission in their activities.

There was varying interpretation of the law at the stages before and after WW1. For example, the “3 Boys” Cyril Brandon, Rawson Stark and Stanton Hicks, in September 1908 sent Morse

signals across Dunedin Harbour. They received the encouragement and support of the local mayor, who with the help of the local P&T Telegraphist transmitted goodwill wishes message over their apparatus and received a suitable reply. However, a special permit had been allocated by the Post Master General (Ward) for this event. Perhaps moderated because the first public demonstration of radio in New Zealand was given by the Marconi Company at the 1906 Christchurch International Exhibition.

Prior to this the activities of amateurs were lower key and less publicised. Two Dunedin trainee teachers; Strachan and Scott, were sending signals to ring a bell 100 yards away using simple spark and cohere apparatus in 1901. Similarly, Dunedin's 16-year-old, Jimmy Passmore in 1902 built his own transmitter and used it to signal 10km in 1903.

However, by 1909 things were becoming less congenial with the authorities and when young Bill Sexton in Auckland signals were received by the HMS Challenger in the Huraki Gulf he was asked for his station name, later in a similar occurrence with the HMS Pioneer, a newspaper advert was placed for the radio enthusiast to identify himself to the authorities.

More strongly the "Timaru bad boys" Hathaway, Courtis and Mayo had their station closed down after their transmissions "interfered" with communication between the Pioneer in Timaru Harbour and the Challenger in Wellington in 1909. Hathaway had a licence to operate a telegraph station but this did not matter – their signals had been "heard".

Other "experimenters" were reprimanded with closure or an "enforced period of inactivity" for similar actions.

This increased sensitivity in radio matters may have been due to the government of the day wishing to establishing wireless stations for secure ship to shore communications. In 1912 the P&T Parliamentary report mentions interference to official messages and recommended all amateur aerials be taken down.

Still, it did not stop some – notably Arthur McClay, B Robinson and G Tinney, who picked up the distress signal of a ship in trouble off Barretts Reef at the entrance to Wellington Harbour. They passed the message on, but the government station was out of action due to the storm and could not verify the message. The ship was rescued but the three were reprimanded and Tinney (a P&T employee) was suspended, however parliamentary pressure later saw the three thanked, reinstated and a consent to operate a receiving station (albeit with and internal aerial). But generally, such radio activities were seem as eavesdropping and meddling, by the authorities of the day.

The 1903 legislation had prohibited "receiving or transmitting communications by wireless without consent". This had provided the perceived provision for consent for experimental research.

The 1913 amendment to the act took away this consent clause, and made all sending or receiving apparatus illegal. One transgressor of 1913 was Eric Battershill (Hawkes Bay) who was prosecuted in Hastings for building his own receiving apparatus (see item this bulletin).

However, in April 1914 Canterbury College was allowed to operate a private wireless receiving station for research work with the British Association. But when war was declared 15 August 1914 all such stations were closed down. Any transgressions discovered were treated firmly with fines and threats of imprisonment.

After WW1 there was a new world to be discovered.

As indicated at the start of this item the first world war brought advances in radio voice communication. Some of the first music broadcasts here came from visiting ships in NZ

waters. These (especially those from the USA) had the latest equipment to allow "audio broadcasts" – now using thermionic valve technology developed during the war.
A number of technical magazines and publications of the day included designs for home made sets along with the latest advances eg "Wireless World" UK and great volumes such as Goldsmith's "Radio Telephony" & "Wireless Press" USA of 1917.
Later shipboard broadcasts included music for "dance parties". For example this edited extract;
"THROUGH THE AIR A WIRELESS CONCERT. *[Christchurch Star, Mon Aug 22, 1921]*
wireless concert was enjoyed by Mr R. J. Orbell and some friends at Merivale on Saturday night. **The concert originated aboard the United States steamer Eastern Planet** which left Lyttelton on Saturday evening for Timaru, and was reproduced in Mr Orbell's wireless receiving room by means of a loud-talking telephone receiver attached to his wireless receiving set. To listen to the world, Mr Orbell has merely to open the doors of a cupboard, put in a plug, turn a dial, and listen. The cupboard contains several handsome instruments, made by Mr Orbell himself, who is an engineering student at Canterbury University College. Actual speech is reproduced through the telephone receiver, and messages from practically all over the world can be received in Morse code over the ordinary wireless apparatus. One of the first wireless telephone apparatus fitted to a vessel's wireless installation was that of the Eastern Planet, which left Lyttelton on Saturday evening for Timaru. …… Mr Orbell's apparatus is subject to a Government permit for amateur operators, which imposes a pledge of secrecy concerning certain matters, and lays down certain rules to be observed. The apparatus is comparatively cheap, and it is easy to realise that its use is a fascinating hobby. The Government's regulations forbid the sending out of messages from the set."

You could pick up radio stations from America and from Europe in New Zealand quite easily, because there was very little interference, especially after the electric trams stopped running each night. *[Electric trams were running in most NZ major cities from 1900 Ed.]*

Off shore, one of the first regular broadcasts in Europe was from PCGG in Holland run by Idzerda in 1919 (see another item this bulletin). In the USA KDKA had started as an amateur university station in 1916, stopping for the war then resuming its regular music broadcasts on 2 November 1920.

Enter Professor Robert Jack (physicist) of Otago University.

"Why should the people of New Zealand not be allowed to hear the best things going?" – Professor Robert Jack (1921)

Robert Jack (4 November 1877 – 1 May 1957) was a Scottish-born physicist, professor and Dean of the Faculty of Arts and Science, University of Otago, and a pioneer of radio broadcasting in New Zealand.
Robert was born in the village of Quarter, near Hamilton, Lanarkshire, Scotland, son of a school master and was educated at Hamilton Academy and the University of Glasgow, graduating MA with first class Honours in mathematics and natural philosophy. After he attended the University of Paris and the University of

Göttingen for postgraduate study and as a result of this research, which included the effect of magnetic fields on atoms (the Zeeman effect), Jack was awarded a Doctorate in Science from Glasgow.

For the following four years he was a lecturer in physics at Queen's University, Belfast until 1914 when he took up the post of professor of physics at the University of Otago, Dunedin, NZ. Beyond the university he introduced the people of Dunedin to many aspects of physics through popular 'open' lectures.

From his arrival at Otago University, assisted by his technicians Jack Sutherland and others in the university's physics department, Robert Jack undertook research and experiments in wireless radio transmission.

1920–21 saw Jack back in the United Kingdom where he researched developments in naval radio communications and equipment with his brother, Hugh Jack, a respected electrical engineer.

He returned to New Zealand with equipment (including high voltage dynamos and two Round ES4 valves) that was to form the basis of his radio broadcasting apparatus and on 21 May 1921 was able to transmit voice and music across the university laboratory.

After this initial success, his permission for "experimentation" took a while to be granted from the Post and Telegraph Department, and then each test needed approval.

Further developments led to the broadcasting on Saturday 17 November 1921 (from the university's physics department located in the bell tower) of New Zealand's first radio programme. The transmission included a rendition of the song "Hello my dearie", and was documented by Frank and Brenda Bell of Shag Valley (95kms away) in her log-dairy as being received on her brother's receiver.

Further transmissions were permitted for two hours, two nights a week, Wednesday and Saturday with programmes consisting announcements and live and pre-recorded music; Isabella Finlay Manson (the Scottish-born matron of Knox College, University of Otago who was to become Robert Jack's wife on 22 May 1922) contributing musical content. She was also known to have telephoned the laboratory to give the technicians Jack Sutherland and Tan Hughes, prior warning of unexpected or out of hours visits by Professor Jack.

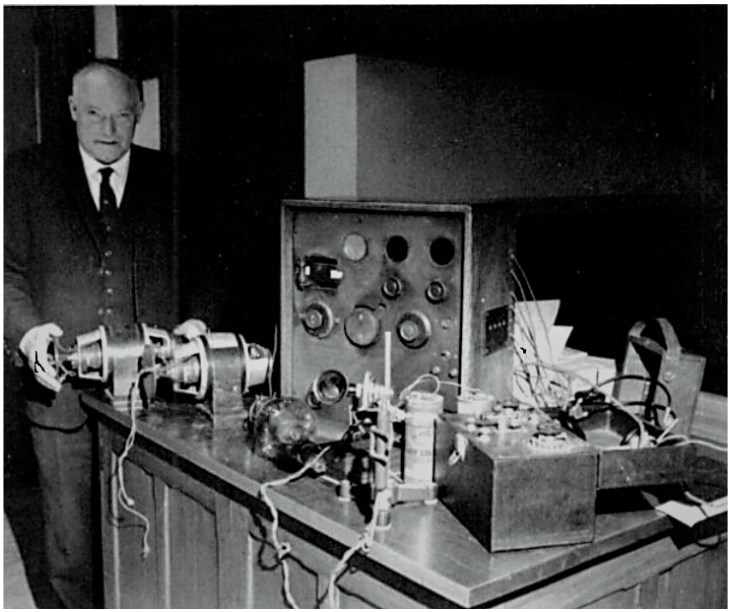
Each transmission began with five minutes of a buzzer, to allow listeners to tune their receivers. In December 1921 Jack received a telegram from Wellington reporting that his Christmas broadcast of the tune "Bells of St. Mary" had been heard in Wellington by P&T Telegraphist Clive Drummond. The gramophone records for transmission were supplied by the local record shop of Charles Beggs Limited.

Jack continued making his experimental broadcasts twice a week until Christmas of 1921, after gaining permission from the Post and Telegraph Department.

On 11 November 1921, the Otago Radio Association had been formed by a group of enthusiasts, and Robert Jack was elected Association patron. From 15 November 1922 the Association began making regular broadcasts and through the changes in 'call signs' and ownership over the succeeding decades the station, once known as Radio Dunedin, is the oldest outside North America and the fifth oldest in the world.

From 1924 Robert Jack had experimented with television transmission and in 1928, using equipment similar to that developed by John Logie Baird, he successfully transmitted a picture across his laboratory. It was, though, to be another 30 years before the first non-experimental television broadcasts in New Zealand.

Following research for the government into infra-red radiation during World War II, Robert Jack retired in 1947. His wife having predeceased him in 1941, he died at Dunedin in 1957.

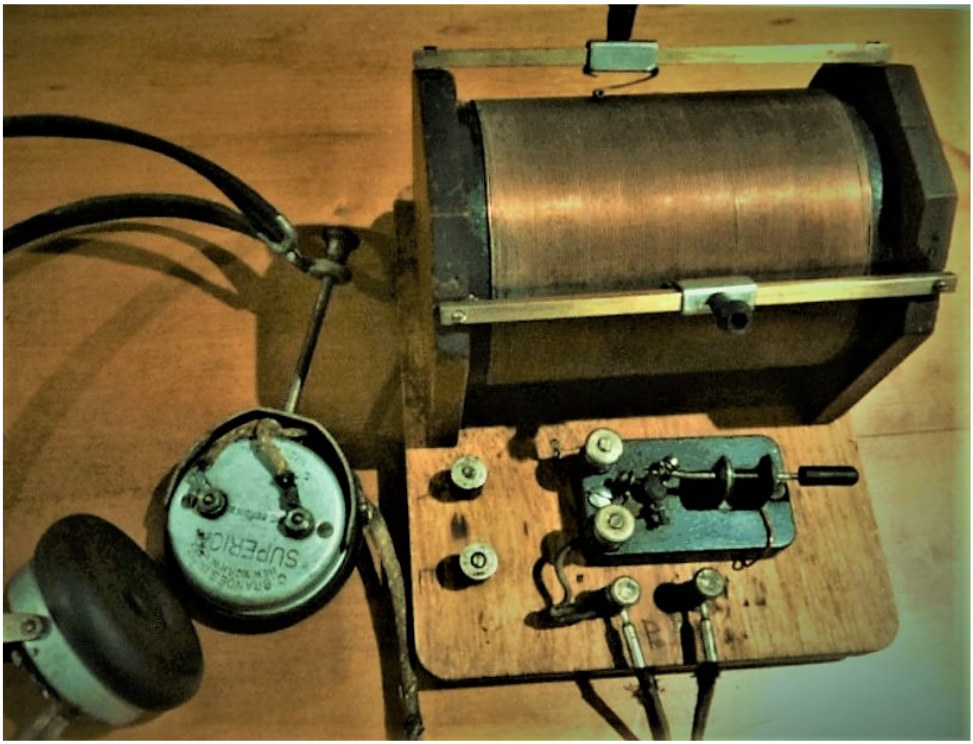


The Otago University transmitting equipment of Robert Jack with technician Stan Hughes holding the dynamotor HT generator, also visible are the type D cells to drive the carbon microphone (on small stand). A more modern Round valve is in the front of the original transmitter 'box". *[The bulletin cover picture provides a better representation I feel. Ed.]*

His radio transmitter is still owned by the University of Otago and has found a long-term home at the Otago Settlers Museum after the 2010 attempt by the University to sell off over 200

items from its collection – including the Professor Jack transmitter and associated devices, from their Physics Department.

Crystal receiver of the day:



Bruce Barnett of Taieri Beach, Otago, says this receiver was probably there on the day. The person I obtained it from many years ago assured me that it was built at the Physics Dept of Otago University for Prof Jack back in the early twenties. It certainly has all the components of the time and the headphones are 1918 vintage. Regards BB

In 1921 a Wellington businessman, Charles Forrest, began transmitting gramophone recordings from a room in the Hope Gibbons building. Forest was the owner of the International Electric Company – selling radio parts and was assisted by the manager of the music department at Charles Begg and Co. Although he had no formal permit or licence to do so, he did have a verbal understanding with the Chief Telegraph Engineer such that whenever his transmissions were causing reception problems at the nearby marine radio station, he would cease until the ship-to-shore communication had concluded.

“If you're selling the parts to make a wireless set it would make sense to give people something to listen to.”

ES4 Valve (pictured right) 1920

Base: Europe 4-Pin B4 (Eu A, E, 4A) 1914

Filament: 4 Volts / If 0.75 Ampere / Direct / Battery

First made in 1920, this tube was designed by John Scott-Taggart and was similar in appearance and characteristics to the R tube. While working for a year from 1919 to 1920, as head of the tube department of Edison-Swan, He designed the ES2 and ES4 tubes. He left to further his radio interests elsewhere. Over the next few years, he designed other tubes and some of these were made for him by Mullard. He was a well-known author during (and after) World War One and he was in various signals units of the British Army. He was also a technical officer involved in radar training and maintenance in World War Two.

With 1 amp at 6 v to the filament and up to 1000 volts at the plate it could be used as a transmitter up to about 30 watts. *[1920 : History of the British Radio Valve to 1940 p. 155]*

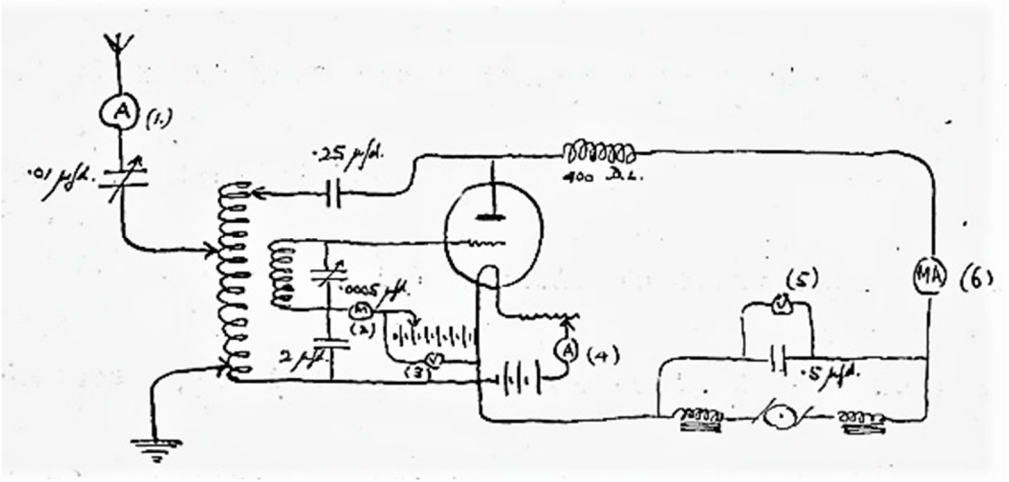
Thesis on distortion in Professor Jack's transmitter by Miles Barnett - Otago University physicist (1901 – 1979)

Miles was the talented son of a Dunedin surgeon. At Otago University he produced his thesis entitled Analysis of Modulation in a Wireless Telephone Transmitter, in 1923. The equipment he utilised was some used by Professor Robert Jack in his experimental radio broadcasts of 1921 / 1922 including his transmitter.

He completed his doctorate at Cambridge University UK, where he studied in the Cavendish Laboratory. He was assigned by Sir Ernest Rutherford to investigate the propagation of radio waves under the supervision of the English physicist EV Appleton, investigating the radio reflective layers in the upper atmosphere. Their initial findings were published in Nature in 1925. In 1926 Miles was the wireless expert in JM Wordie's Cambridge Expedition to East Greenland. On his return to NZ, Miles worked as a physicist for the newly-established DSIR in

Wellington. In 1935 he was appointed to the New Zealand Meteorological Office becoming Director in 1939, and awarded an OBE in 1945. During the war he served as a Wing Commander for NZ forces from the equator to sub-Antarctic.
The pdf version of his thesis is available at: https://tiny.one/nzvrs375

From this we can see that Professor Jack's transmitter design probably used grid modulation with the cardon microphone at "M" (2) in the circuit.



Recollections indicate that an anode voltage of 1000 volts provided an aerial current of about 0.5 amps and approximate output of about 5 watts although the specs for an ES4 indicate that it is capable of 30 watts at 1000 volts.
Various anode voltages 800, 1000 and 1600 were experimented with. The P&T telephone type carbon microphone was regularly overhauled by Tom Scott of the local Dunedin P&T Department.

Other broadcasts (more modern) celebrating the 100 years of radio broadcasting in New Zealand;

RNZ Sarah Johnson web tract;
Voices in the air programme https://tiny.one/nzvrs372
Audio track https://tiny.one/nzvrs373

The Museum of Sound & Vision have a recording of the RNZ 1971 Aspect programme that includes reference and recollections of early radio characters. The recording marking the 50th anniversary of Professor Jacks transmission. Link; https://tiny.one/nzvrs374

Aspect. 1971 precis:
A documentary tribute to Professor Robert Jack of Otago University and early radio broadcasting in New Zealand. Produced by Alwyn Owen to mark the 50th anniversary of radio broadcasting.

- A re-creation of Professor Robert Jack's first broadcast is heard. He back-announces "Hello My Dearie" (the first song played on radio in New Zealand) and then introduces

"In the Combat" from Il Trovatore, sung by Madame Violetta and Ernest Pike. (An excerpt is played from a 78rpm disc.)

- Several characters and Brenda Bell give their recollections of hearing Professor Jack's early broadcasts.
- Professor Jack was head of the Physics Department at Otago University. Stan Hughes who was a mechanic in the department, recalls Professor Jack's personality.
- Reading from Professor Jack's unpublished "Notes for History' about his early experiments with radio broadcasts.
- Jack Sutherland also worked at the university as a mechanic. With Prof. Jack he designed and built a transmitter using a P&T carbon microphone. Noel Ellison. technical superintendent at Broadcasting House explains the technical problems they first had to overcome.
- In Shag Valley in North Otago, radio amateurs Frank and Brenda Bell, were listening. Brenda recalls monitoring the university's test transmissions and getting in touch with Dunedin via the local doctor's telephone, as the telegraph office was closed. She tells a story about relaying the message that the song "Hello My Dearie" was heard.
- There was little public reaction as only dedicated enthusiasts could hear the broadcasts using home-built receivers.
- Mr L.S. Spackman of Auckland outlines the difficulties in getting a radio licence. He used to monitor Morse signals and was unaware of Prof. Jack's experiments, so was surprised to hear music one evening.
- Clive Drummond of Wellington explains that he was also listening, after becoming interested in radio during his World War I service as a telegraphist.
- Mr B.S. Jones was a ship's radio operator in 1921 and describes picking up the transmission while off the coast of Otago, which he says was very exciting.
- Further reading from Jack's radio log: The wife of Governor-General Lord Jellicoe and her daughter heard broadcasts while on board the H.M.S. Melbourne.
- Dr Miles Barnett, a student of Prof. Jack's and recalls hearing a broadcast while visiting the Bells in Shag Valley. They rang Jack and he announced it over the air with 'almost boyish excitement.'
- A re-creation of the quality of the early music broadcasts is played using equipment of the era. The popular song "Whispering" is played.
- It is still in working condition and a recording made via Jack's original microphone is heard.
- By early 1922 broadcasting became more mainstream, with accounts in the press and other stations being set up. Lionel Slade recalls running displays of radio reception at church bazaars, with the public being invited to try and find the "hidden gramophone" where the radio music was coming from.

HELLO MY DEARIE
Hello my dearie, I'm lonesome for you,
I want you near me, Oh honest I do;
Come over, I'm all alone
That's why I called you by phone;
Loving like this is some people admire,
But cuddles and kisses you can't send by wire;
I have the blues, don't refuse, or you'll lose me,
On honey hurry, or I shall worry,
I love you so, goodbye.

1922 was to see the beginnings of many local radio stations.

In February 1922 a Wellington businessman, Charles Forrest and his brother George, began transmitting gramophone records from the roof or the Ford Motor building on Courtney Place, assisted by the manager of the music department at Charles Begg and Co next door. The Forest brothers were the founders of the International Electric Company – [later to be registered as the International Radio Co Ltd] selling radio parts [an agent for De Forest Radio & Telegraph Coy and others.] See bulletin 9-2 August 1988.

Another Wellington station started in August 1922 by the enthusiasts Arthur McClay, Robert Apperley, Eric Simpson, Clive Drummond and Ray Haggett after hearing the delights of Professor Jacks broadcasts, they requested his design specifications and "began for the fun of it". *[Clive Drummond, born 1891, was a WW1 returnee who had served as a signalman and early radio operator in the South Atlantic convoy (battle of the Falklands) and Mesopotamia. Drummond later heard Professor Jack's Christmas 1921 broadcast on his Wellington receiver - a distance of 400kms and wrote to Jack confirming this. He later went on to be Wellington's 2YA iconic announcer from 1925 – 1955.]*

Broadcasting most evenings except Sunday and utilising the excellent diction of Clive Drummond as their announcer – he was also the postmaster next door. They first operated as the Federal Telephone Company but later moved to the fifth floor of the Dominion Building on Plimmer's steps and became the Dominion Radio Company.

Auckland's first station began in April 1922 operated by Douglas Shiperd and Robert Burrell from the top floor of the Strand Arcade on Saturday afternoons – becoming the birthplace of Radio Limited. The transmitter was a De Forest provided from Charlie Forest.

NZ Herald 17 August 1922 item right:

The Christchurch Radio Society began their broadcasts in 1922.

By the end of 1922 there were seven established radio stations nationwide and 572 radio receiver licenses issued.

AUCKLAND INNOVATION.

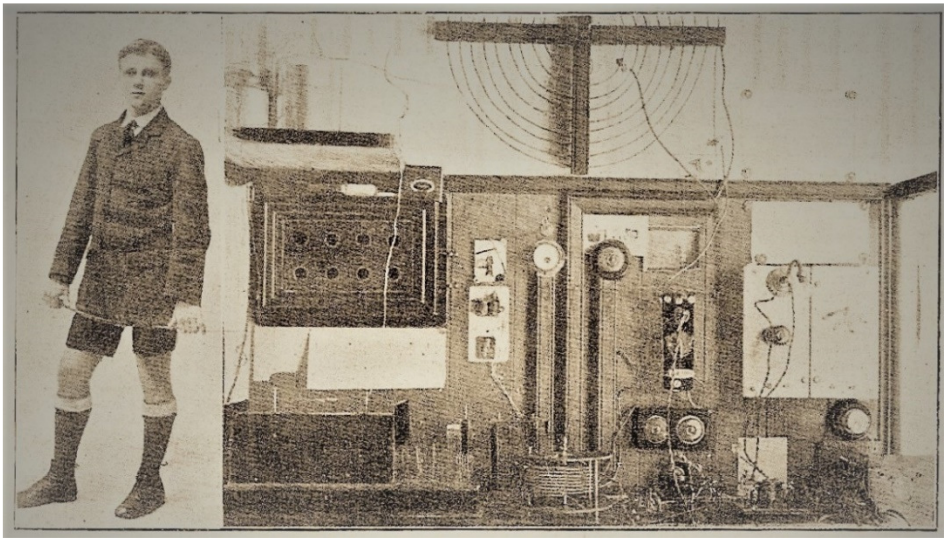
PROGRAMMES "BROADCASTED."

The distinction of being the first firm in New Zealand to go in for "broadcasting" with wireless telephones on a systematic scale is held by Radio, Limited, an Auckland company which has taken up quarters in the top floor of the Strand Arcade. It is the intention of the company to "broadcast" programmes of music at mid-day and in the evening from the Strand Arcade or the Scots Hall, where it has a studio.

A test was made on Tuesday evening with gramaphone music, which was heard on a ship 220 miles from Auckland, as well as by the Auckand radio station and amateurs in all parts of the city and suburbs. Mr. R. E. Grainger, of Ponsonby Terrace, whose aerial had been taken down for repairs, fastened a lead to the wire-mattress of his bed and connected it to the aerial terminal of his set, which is a single valve receiver. He reports that he was able to hear ships quite well, also the Wellington time signals at 8.30 p.m., and then he "tuned down" and got the gramaphone music loudly enough to hear with the 'phones held a foot away from his head.

Further tests were made yesterday with equal success, and to-day the public will have an opportunity of hearing vocal and instrumental items "broadcasted" from the Strand Arcade in Messrs. Lewis R. Eady and Son's, Ltd., premises in Queen Street. The demonstrations will be given between noon and 2 p.m.

Eric Battershill



Picture of Eric and his apparatus as appeared in the Summer 1913 issue of Wireless World.

Napier's Lew Willoughby spoke of Eric Henry Battershill, whom he described as a gifted and courageous young man. Born in Hastings in 1897, he attended Napier Boys' High School where he was awarded the Vigor Brown Challenge Shield for lifesaving.
"However, his most notable achievement came when he was prosecuted by a heavy-handed official in the telegraph department in Napier for illegally operating a home-built wireless apparatus of his own making.
The case actually went to court with plenty of publicity. Lawyers from round the district attended the trial which in the words of one reporter 'closely approximated a Gilbert and Sullivan comic opera';
Timaru Herald, Volume XCVIII, Issue 15121, 15 August 1913, Page 5
WIRELESS. SCHOOLBOY'S EXPERIMENTS. MUST BE DISCONTINUED.
Per Press Association. HASTINGS, Aug. 13, 1913.
A case of considerable interest was heard at the Court this morning, when Eric H. Battershill was charged with that on June 1st he did establish a plant for the purpose of receiving communication by wireless telegraphy without having obtained the consent of the Postmaster-General. Defendant, who was represented by Mr D. Scannell, pleaded guilty. Mr H. A. Cornford, who prosecuted on behalf of the Crown, said that in June a fault was detected, on the telegraph wires at Hastings, and a linesman investigating said he found that wireless apparatus had been installed by the defendant, who was a High School boy, for the prosecution of his study in the apparatus, for receiving wireless messages from places within a thirty miles radius, not so arranged as to reply, but for the purposes of receiving, was perfect. The defendant was liable to a penalty of £500, and it was a matter of great importance, insomuch as what the boy was doing for his own instruction might be done by a person of great intelligence for reasons serious to the country and the Empire, such as the interception of a wireless message from overseas. The danger was that they might produce results of the upmost gravity, and it would

be advisable for the State to make public the penalty. Scannell said defendant was a Napier High School boy, and part of his ordinary education had to do with electricity. A mountain was being made out of a molehill. In Australia, permission was given, and it rather difficult to understand why it was not given in New Zealand. The statute only served to stultify the boys' talents. The lad would hove to the decision of the authorities, and have the plant dismantled. The Magistrate said there was something to be said in favour of the statute — for instance, in a case where a message of a vital character was being transmitted, not only between one Department of State and another, but containing private information. If this was intercepted, harm could be done. Defendant would be convicted and ordered to come up for sentencing when called upon. The lad had been encouraged by his teachers, and no order for costs would be made.

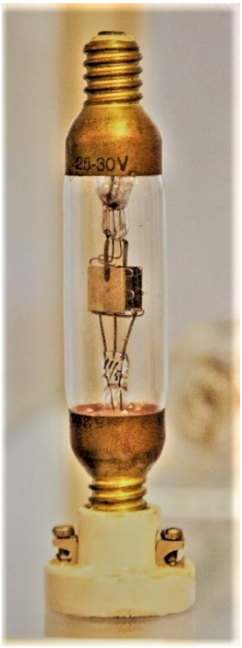
He subsequently tried to enlist for World War I in New Zealand but was told he was too young and that his conviction was held against him. He left New Zealand on the steamer Maheno and swam ashore at Albany in West Australia and made his way to Sydney where he was working as a motor mechanic until he enlisted in the Australian Forces, which makes him a true Anzac. He served as driver and in many other capacities including wireless operator, despatch rider, intelligence officer and later as a pilot."

6 cylinder Mitchell, 1914 Driver **Eric Battershill** (aged 17 years) on the East Coast run from Herbertville (Cape Turnagain) to Dannevirke (about 55km), established by AWS Longley.

One of the first regular radio broadcasters in Europe 1919: Hanso Idzerda

Hanso (Hans) Henricus Schotanus à Steringa Idzerda (1885 to 1944) was born in Friesland, The Netherlands. He was the son of a country general practitioner. Although all his paternal ancestors were medical doctors, he decided to study electrical engineering. He graduated from the Rheinisches Technikum of Bingen am Rhein in 1908 as an electrical engineer and started work for Siemens in the Hague. In 1913 he established himself in Scheveningen (The Hague) as an independent consulting engineer "for the application of electricity in every field". However, his passion was radio. He started the “Technisch Bureau Wireless” manufacturing radio parts for the Dutch Army and Navy and later specializing in direction finding; locating German zeppelins for the Dutch Army during the Great War (1914-1918). This gave him an entrance into the War Department and the higher circles of government.

Scheerman, a technician at the Philips lamp factory (and possibly after some encouragement and persuasion from Hanso) used lamp parts of two grids and two flat anodes parallel to the filament to manufacture a triode valve. Due to their relatively poor vacuum, they had high gain. Philips and Idzerda entered into a contract to manufacture the “radio lamp” for Idzerda’s exclusive right to sell. The Philips Eindhoven plant started a trial production in March 1918 using the identification PH-IDZ (an abbreviation for Philips Ideezet) and the initial run of 180 were sold by Idzerda. By the end of 1918, 1200 Ideezets had been sold.



In late 1918 Hanso staged a demonstration in a Zoo building at the Hague of his valve amplifier receiver that allowed telegraph transmissions (Morse) to be heard over the entire hall.

Idzerda continued to work with Philips to develop a more powerful version of the Ideezet thermionic valve. After a progression of improvements, he successfully demonstrated radiotelephonic transmissions over a distance of 1200 meters at the Utrecht National Fair, in February 1919. The public were enthusiastic about it and Queen Wilhelmina came to listen.

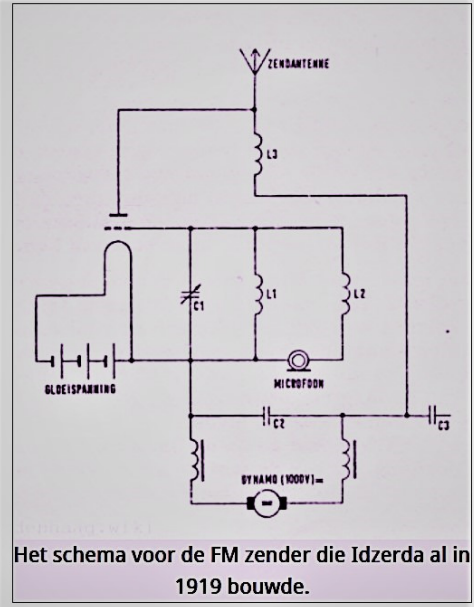
By the end of July 1919 an experimental 100W transmitting triode was being produced by Philips of Eindhoven, engineered and patented by Philips, but based on the Ideezet design.

Hanso Idzerda then asked for an official license to transmit "audio over radio" aiming to broadcast this to anyone. This license was granted in August 1919 with the call sign PCGG. It is likely his government connections favoured him in this as normally no one was being granted licenses at this time, not even to listen to radio.

On the 6th of November 1919, from his new "studio" in his commercial building at Beukstraat The Hague, his newly established station broadcast between 8-11 pm, a "Radio Soireé-Musicale". This intention to broadcast a regular evening musical program every Thursday had been announced in the local newspaper NRC (Nieuwe Rotterdamse Courant) the day before.

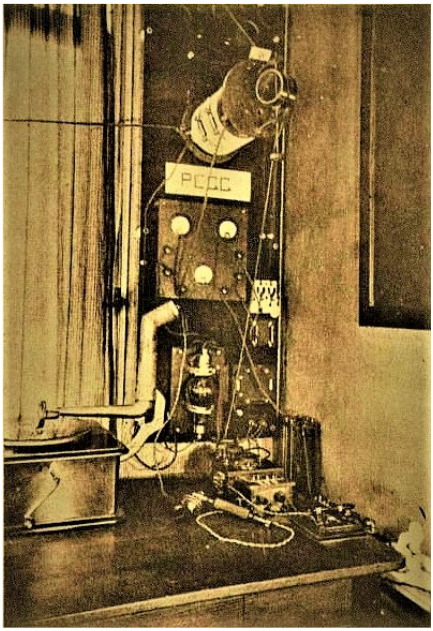
The Canadian Reginald Fessenden, on Christmas Eve 1906 may probably have been the first to transmit speech and music and there were others eg the Belgian engineer ***Robert Goldschmidt*** *[perhaps better known for his development of the standard microfilm or microfiche] transmitted from the Royal Palace in Laken, Belgium from March till July 1914. [see item on Goldsmith elsewhere in this bulletin. Ed]*

How did Hanso Idzerda manage his transmissions from a technical point of view? Well, he used Frequency Modulation, a very crude form of FM (1919 style). This saved him the use of a second TA4/125 valve had he modulated in AM as neither Class-C amplification nor the constant current AM modulation devised by Raymond Heising were in general use at this time.



Het schema voor de FM zender die Idzerda al in 1919 bouwde.

The simple transmitter, circuit right, was modulated by the carbon microphone connected in series with a small winding (L2) across the oscillator tank circuit (L1 & C1). With varying microphone current (speech or music) the frequency of the transmitter was "pulled" either side from the "normal" frequency. As PCGG was one of the few stations transmitting at this time, on this frequency, the wide bandwidth of the FM transmission was not a major source of interference for other broadcasting stations (ie there weren't any others!) This allowed slope detection on a simple receiver of the day at two possible points – just above or just below the central transmission frequency.



A replica of Idzerda's first transmitter 1919. The carbon microphone in the horn speaker arm of the "Pathefoon". The transmitting triode in the lower centre.

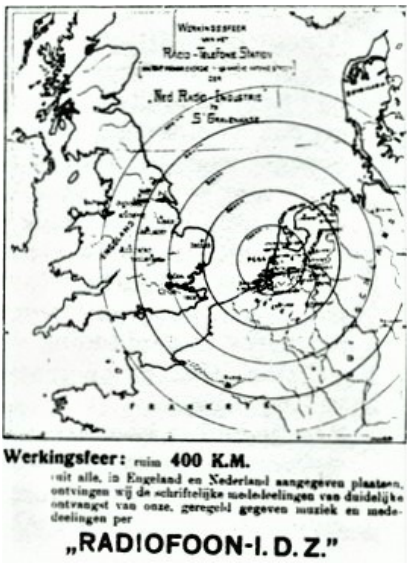
Hanso kept publishing announcements in daily newspapers about the content of his transmissions a few days ahead of the actual transmission date, informing the public well beforehand of what would be on air. He was the announcer and played records on his "Pathefoon" gramophone which had the horn cut off and a carbon microphone installed in the abbreviated venturi-tube. He soon became dissatisfied with this broadcasting style, as he considered record playing far too dull, so to delved into live radio transmissions.

Idzerda now had a clearer idea of how to earn money - by producing radio receivers *[about 66 various models and variations from 1914 – 1926 are recorded. Ed]* to listen to the regular broadcasts.

Small chamber orchestra. Idzerda is standing behind the piano.

The next steps were even far more challenging: the live broadcast of an orchestra. Here is a small chamber orchestra. Idzerda is standing behind the piano.

The range of PCGG was greatly increased when the frequency was changed from 670m to 1050m and 1070m long wave. Reports from all over Europe kept coming in. The station could be reliably heard in a 500 km radius. This included the Thames estuary, London and eastern UK, where reception was remarkably good. Newspapers began to report about the "Dutch Radio Concerts". People flocked to public houses and other places with a radio to experience this new phenomenon, helped by former military WWI radio operators who were able to build receivers.



The BBC did not begin broadcasting until 14 November 1922, when Arthur Burrows, Director of the British Broadcasting Cooperation speaking clearly, with authoritative intonation that would become iconic, opened the transmission at 6pm with: "This is 2LO, Marconi House, London calling". But this was to happen in the future.

Late in 1919, the “Daily Mail” began to pay a comfortable monthly grant to Hanso for the publishing rights and exclusive promotion of PCGG in the UK.

Once the BBC was solidly set up and the UK had its own broadcasting entity for the British Empire, there was no longer the need for a foreign station like PCGG to provide information, entertainment, education and culture and in 1924, the Daily Mail terminated the agreement with Idzerda.

In an attempt to continue local interest in radio and his receivers, Hanso decides to broadcast concerts from Kurhaus. He rents a quality line from the PTT for this purpose, and one to his transmitter in The Hague. At this time another broadcasting station (later to become the national radio service in Holland) is set up in conjunction with Philips and is highly successful.

Hanso was a brilliant engineer but not so much of a businessman, having lost his major income source, he now lost his PCGG broadcasting license due to “lack of financial stability” becoming bankrupt in November 1924.

Hanso was a Frisian and of strong character, he tried again with a new entity “Idzerda Radio plc” and got involved in a year long legal battle with Philips over patent rights. He eventually won, but his patent falls void when he failed to keep up with the annual payments. Meanwhile Philips, through their subsidiary NSF (Dutch Signal Equipment Factory), acquired his broadcasting license and produced radio receivers for a fraction of his retail price.

Beautiful handcrafted and machined Idzerda 3-valve receiver 1920/21; Courtesy by Piet Blaas NVHR

Hanso continued to produce his receivers and transmit via “Idzerda-Radio” but he was not legally permitted to announce his programs. He also built a transmitter for the Royal Meteorological Institute. However, in 1932 Idzarda was totally banned from broadcasting.

Eventually, Idzerda realized he could not continue and sold all his movable assets in an auction on May 8th 1935.

Having been supported and financed by his uncle Arnoldus over the years, he fortunately inherits his guesthouse in Scheveningen (The Hague) which was close to the dunes and the sea. His final enterprise was “Guesthouse Idzerda” - a private hotel managed by his wife.

However, his curiosity for technical matters remained strong, although it cost him his life: On November 2nd 1944, a German V2 rocket malfunctions and crash-lands in the dunes not too far from the house, leaving a huge crater. Naturally curious, he went to examine it but was intercepted by a German patrol and told to leave the area. The next day he returned to look through the scattered wreckage but is again caught by the patrol. This time there is no mercy, he is shot near the crater and buried in a shallow grave. It was not until the following year that his wife and four children became aware of his fate. In March 1946 his body was found and reburied at 'Nieuw Eyk en Duynen' (The Hauge) where his grave is now maintained by the War Graves Foundation.

This item was triggered with our librarian providing a copy of an item by Paul Aerts, South Africa Radio Society with approval and subsequently added to with publicly available collective commons information (internet).

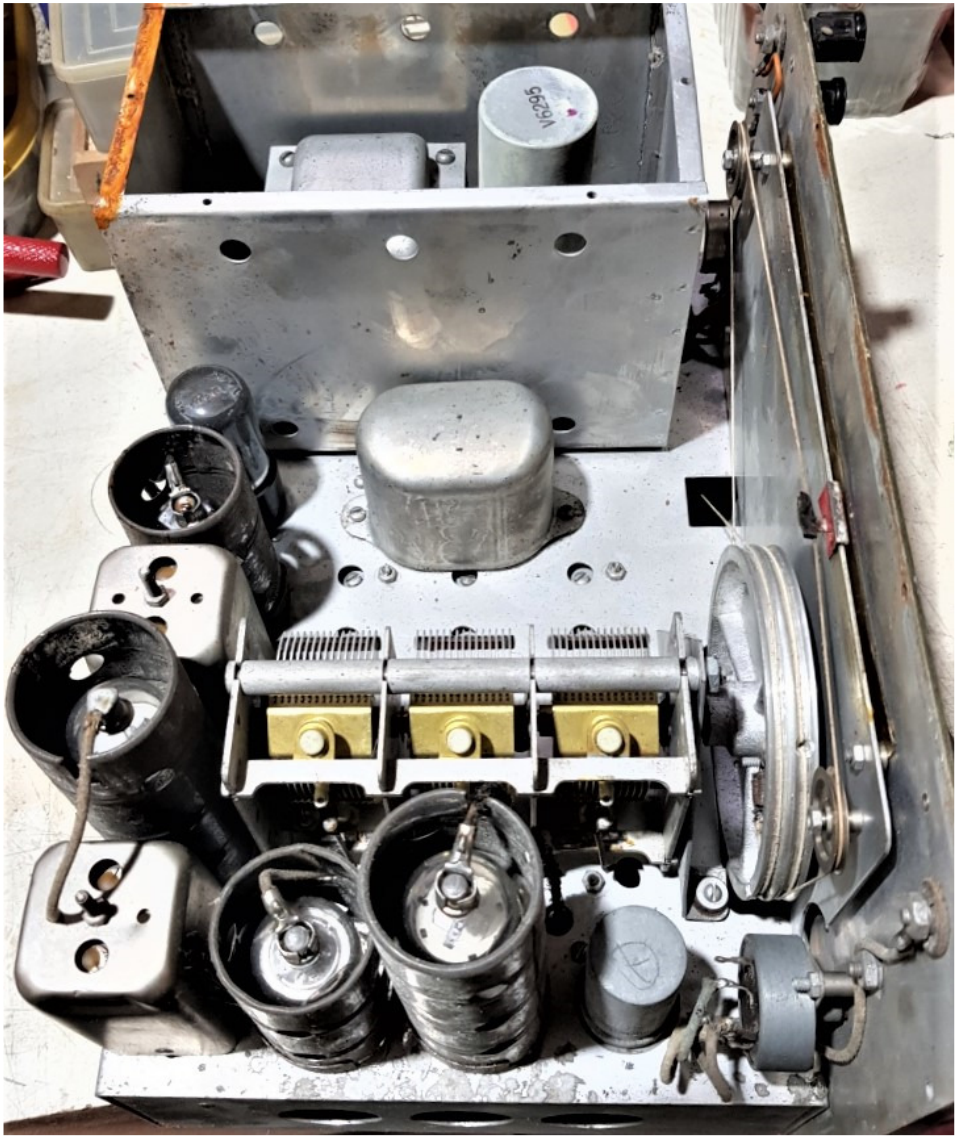
A.E.W.1 Amenities Receiver by Ray Robinson

The Reception St A.E.W.1 (N.Z.) is an amenities receiver, designed for the entertainment of the troops, when off duty. It is a standard superheterodyne receiver, with one IF stage (455 Kcs), one RF stage and a vibrator power supply. It will operate from 6 volts DC current at about 2 amps. It was made in New Zealand. It was intended for front line operations, as it has no mains AC input and is in a sturdy steel box. It covers shortwave as well as the broadcast band. There are 4 bands: 550-1600 Kcs (broadcast band), 6-12 Mcs, 12-17 Mcs, 16-24 Mcs. It is different from some amenities receivers, in that it does not have a phono nor a microphone input.

Picture: Front

Mechanical Design: The case is a heavy gauge steel box, with an enclosing lid. The DC supply cable fits inside a pocket in the lid. On this lid pocket is a diagram showing how to connect the speaker and aerial. There is available externally; an aerial wire, ground wire with spike and a speaker. Two speakers can be connected if required. The radio itself has a plated steel chassis, the vibrator power supply in an enclosed rubber mounted steel box.

The front panel is painted in green wrinkle paint and there are metal plates fitted to explain the control knobs operation. In the centre is a large rectangular dial with a slight bulge. To the left of this are 2 terminals, AERIAL and GROUND, with the VOLUME control beneath them. To the right of the dial are 3 terminals for the speaker, showing connections for one or two speakers. The tone control is beneath them.
Below the dial is the band change switch, an on/off switch labeled Battery, and the Tuning knob. There is a Plessey name on the dial, but hidden from view.

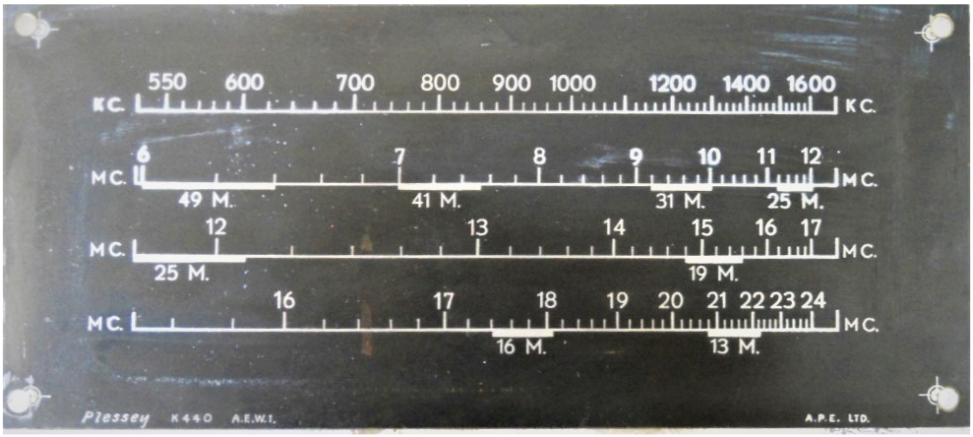


Picture: Inside

Electrical Design: All the valves are 6 volt AC heater types. The audio output valve is a 6V6GT using cathode bias, which drives a speaker transformer whose output has a tapped secondary to allow connection of one or two speakers of 500 ohms impedance. There is a Tone control connected to the anode circuit. The Service Bulletin mentions that this control may be fitted to the PA grid circuit on some radios. The audio comes from a 6Q7GT triode amplifier. It has a diode rectifier to demodulate the audio. The other diode rectifies the IF signal and generates an AVC voltage, for the IF and RF amplifiers. There is no AVC delay, as the cathode is connected to ground. The IF amplifier valve is a 6U7G, and has a double tuned IF transformer on the input and output. The screens of the IF, RF, and Mixer are connected together. The Mixer valve is a 6K8GT, with the triode connected as the local oscillator. The hexode section is the mixer. The RF amplifier uses a 6U7G valve. There is a 3-gang tuning capacitor to tune the RF amplifier input, RF output coils and the local oscillator coil. The coils are switched by the band change switch. Note that there is only a trimmer for the RF amplifier coils for the high frequency end and there is no slug for the lower frequency end of the bands. The two lower frequency oscillator coils do have an extra padder trimmer. The vibrator supply has a 6 volt DC input and uses a synchronous vibrator. The Service Bulletin mentions that the vibrator is a 12 volt type with "especially adjusted" contacts.

Restoration: The radio was in good condition and very clean inside. The only noticeable problems were some rust on the chassis. There is also some rust on the front panel screws. The rust cleaned off easily and the case was sanded and repainted in the affected areas. The carry strap was missing, having rotted away, so a new one was fitted. The volume control was very stiff but this freed up with the application of some WD40. The dial was in good condition except for a small mark where the dial pointer had been touching. The dial string was in good condition and the radio mechanically tuned from one end of the dial to the other. The valves were all GT sized except for two; the RF and IF amplifiers.

The dial was dismantled and the metal scale cleaned. The Red mark from the dial pointer came off by using soap. The screws were cleaned and it was re-assembled although restringing the dial cord was a little tricky. The scale was marked Plessey.

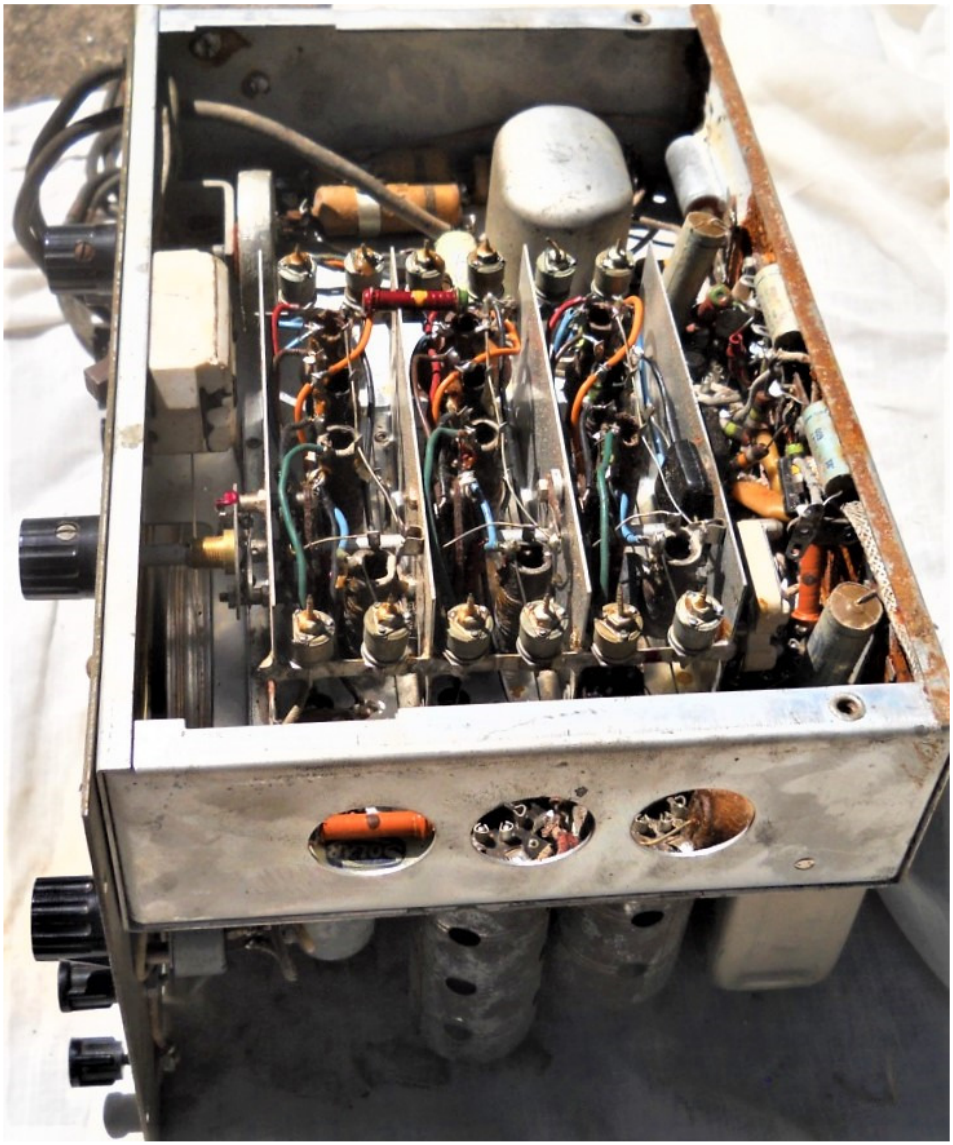


Picture: Dial Scale

The vibrator supply was removed and placed aside. 6 volts DC was applied from a bench supply and the current peaked at 2 amps and then slowly reduced to 1.6 amps. This was assumed to be normal. A speaker was wired to the audio output terminals. Another bench supply was connected and 150 volts DC was applied to the vibrator output terminal strip. Surprisingly, some noise was heard in the speaker so an aerial was attached. Several stations were tuned in on the broadcast band. The grid of the audio output valve was checked and there was plus 4 volts DC present indicating a leaking coupling capacitor. The circuit was referred to and it was decided to replace all the paper capacitors with new ones. The original capacitors were made in the USA and appeared to be in good physical condition. The electrolytic cathode capacitor on the audio stage was replaced. Also replaced, but left in place, were the main HT capacitors which are can mounted. All the resistors were checked but none were replaced, despite two being slightly high in value. Some resistors were of the Body/Tip/Dot style and others were more modern tubular types.

Picture: Vibrator

The vibrator supply was dismantled and the 3 paper capacitors were replaced. The vibrator did not run so it was taken out of its can and the points cleaned. When working correctly the vibrator package was reassembled and wired back into the radio. The rubber mounting grommets were replaced as they were hard and brittle.



Picture: Underneath

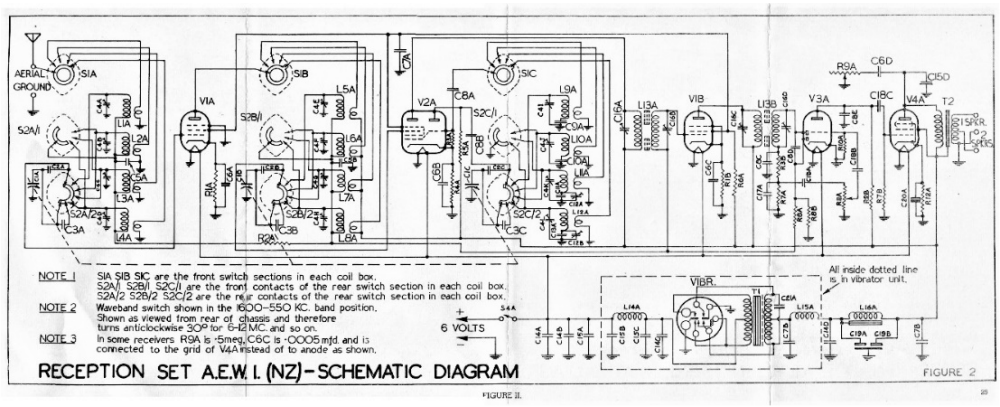
The radio was realigned for the IF frequency as it was a little low. It measured 100 micro-volts for a 10db signal to noise ratio at 455 Kcs.

The broadcast band and the first short-wave band aligned easily with the Philips beehive trimmers. The two higher scales were hard to align and the aerial trimmers had little effect. The top scale would not peak at all. A Grid Dip Oscillator (GDO) was used to check the coil resonances and the dial alignment. The top band was way too high but the next band was fine

but it would not tune the lower end of the band. Two paper capacitors were found beneath the coil assembly and these were replaced with difficulty. But there was still no change in the alignment. A careful study of the circuit showed that all the bands were tuned with a 500 pF variable capacitor (C1A). When the first short wave band is selected a series capacitor is added (C3A) to reduce the tuning capacitance. The top two bands have another capacitor switched in (C2A) to further reduce the tuning capacitance. This was marked 100 pF on the circuit diagram but when measured on an LCR bridge was actually only 2 pF. This was replaced. The GDO now confirmed that all the coils tuned correctly. With the top two bands now tuned properly, the sensitivity also improved markedly. The sensitivity for the four bands varies from 3 to 10 uV, for a 10 dB Signal to Noise ratio.

Band 1:	550 – 1600 Kcs	(8 -10 uV)
Band 2:	6 - 12 Mcs	(7 – 3 uV)
Band 3:	12 – 17 Mcs	(6 – 4 uV)
Band 4:	16 – 24 Mcs	(10 – 3 uV)

Conclusions:
The radio receives local broadcast stations easily and the three short wave bands have a good sensitivity. The tuning is a little quick especially with the small tuning knob. This is despite the two top bands being expanded and having a flywheel on the tuning knob. When the case is shut up it is a very rugged little radio.



Picture: Circuit

References
A.E.W.1 Working Instructions and Service Bulletin, Z1/ZA 3006
Also Steve Dunfield has a collation of info on his website at www.vintageradio.co.nz

AEW1 a 5-valve plus vibrator supply (6-valve equivalent) Army Canteen Radio Receiver.

One of two different sets released by the Army Education Welfare Service for 'education and entertainment' (as noted in the AEW1 manual).

This set is understood to have been designed by the Radio Corporation of New Zealand, and manufactured by at least Radio Corp NZ in Wellington and Radio (1936) Ltd in Auckland. There is evidence in a section of a letter from Alex Marks in the Radio Corp factory (Alex was the son of William Marks, the RCNZ founder) to Fred Green (who was their factory rep / buyer in England at the time) in 1946 that they were producing spares packages for the AEW1 and had formerly produced the AEW1's themselves:

Inter-call Dept. This is the new Department with Jack McCormack, in the room where we built all our instrument stands and artillery boards and packed all the A.E.W.I's. We call it the Intercall Dept., although at present most of its work consists in packing A.E.W.I. spares. Of the 400 cases we have to pack and send we have despatched 50, with a hope of sending another 100 cases before May the 25th (they are required for a boat on that date). The balance of 250 will take say some six weeks to complete. Jack McCormack is also handling a lot of other jobs at the same time, and for that purpose from next week we are giving him Noel Jenkins' old room in addition to the A.E.W.I spares.

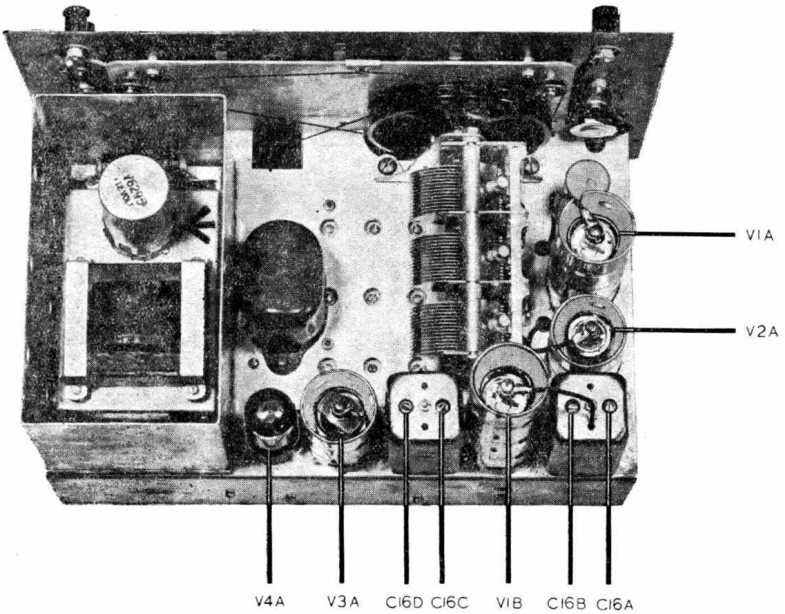
The AEWS (Army Education Welfare Service) offered training for post-war life to NZ soldiers, and this included radio technician training - it is believed that the AEW1 & 2 radios were both to be listened to, and to be experimented with as part of the training in radio.

Technical Information

Valves (5 + vibrator): 6U7G, 6K8GT, 6U7G, 6Q7GT, 6V6GT
Intermediate Frequency: 455kc/s
Frequency Bands: 4 covering Band 1: 550 Kcs to 24 Mcs

Service information AEW1_Service_Doc.pdf

The AEW1 contains a 12V vibrator, which has been modified to operate on 6V. Even though the set is designed to operate on 6V, a 6V vibrator cannot be used.



Replacing Burnt Out Push-Pull Driver Transformers

The radio restorer often finds that half of the driver transformer secondary is open in transformer-coupled P-P output stages, causing one of the tubes to get no signal. Triode tubes require a lot of driving voltage. The rule of thumb is that maximum output occurs when the driving voltage equals the grid bias. Grid bias in the typical P-P type 45 output stage runs 50-65 Volts. For adequate volume, the driver transformer often needs a step-up ratio as high as 10:1

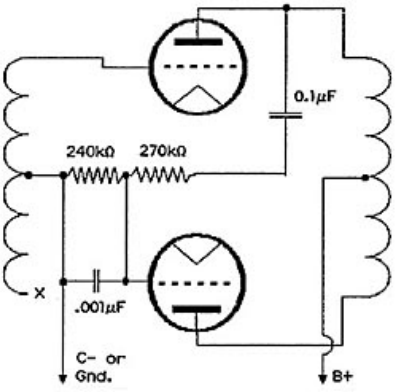
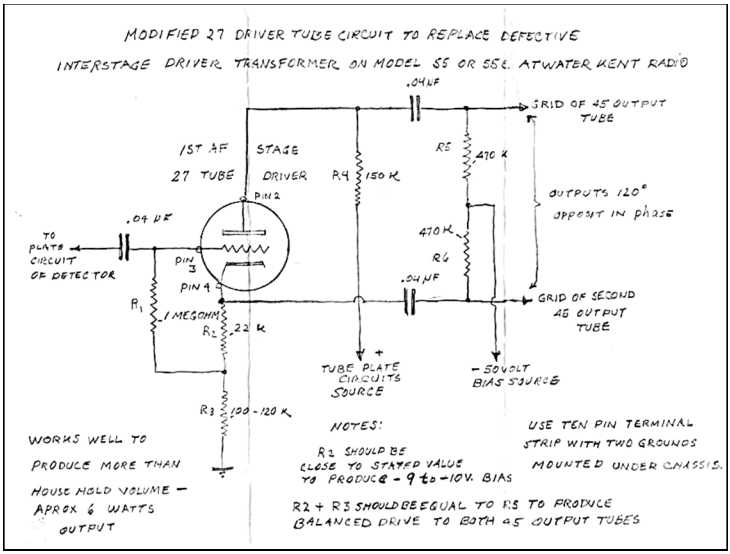


Fig. 1 Circuit for temporary replacement of a push-pull output driver transformer with half of its secondary open.

Such transformers are not easy to find, nor are they easy to replace in sets like the Atwater Kent Models 55 and 60 where everything is potted in tar. Langford-Smith in *Radiotron Designer's Handbook, (4th Ed.)* gives a circuit for P-P pentode tubes where signal for the lower tube is taken from the unbypassed screen of the upper tube. Philco used this circuit in their Model 40-180 and Echophone used it with triodes in their 1931 Model F.

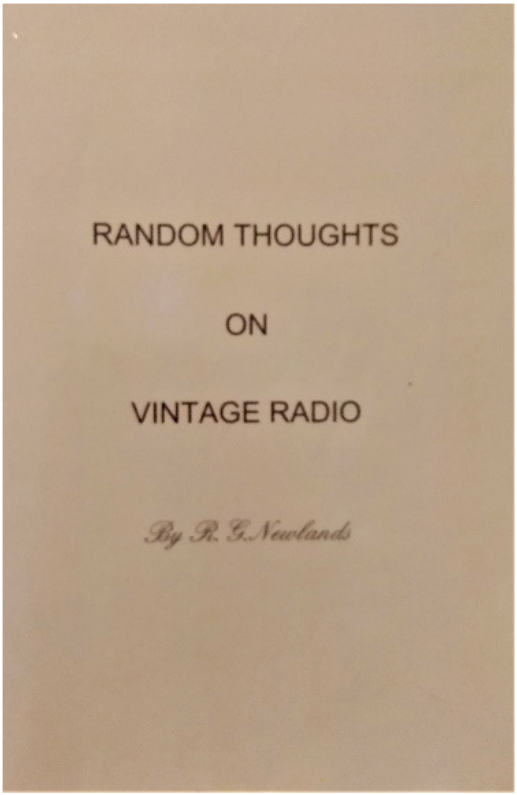
The signal on the screen (or plate) of the upper tube is 180° out of phase with the grid signal. If some of this signal is used to drive the grid of the lower tube, phase inversion is built-in. Distortion is higher because the inverted signal is taken off before cancellation in the P-P output transformer. However, it works and doesn't sound too bad. The 0.001uF is needed to supress any oscillatory tendencies especially at higher output levels. This simple fix will get your set working while awaiting a replacement.

Similarly, this circuit popped out of some JWS material – a solution to the same problem;



Book reviews

Random Thoughts on Vintage Radio. A book by R G Newlands.



This book is a selection of the previously published magazine articles contributed by George for the NZVRS Bulletin and the Wellington Group newsletter. These have been brought up to date, reset and minor editorial improvements have been made in some instances. George's writings have also been published worldwide and in the NZART Break-In magazine.

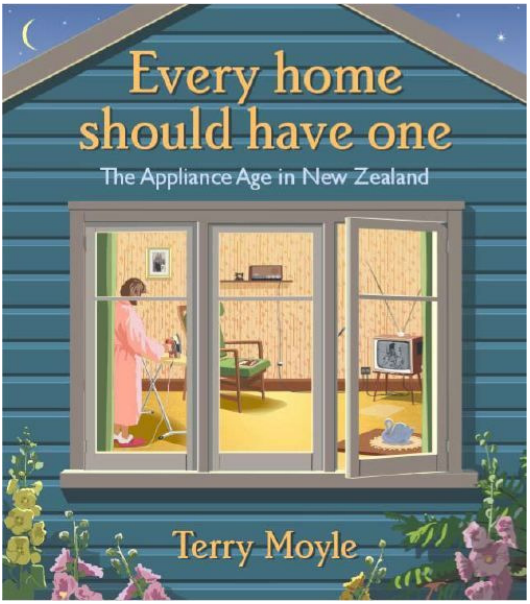
George was brought up in Wellington and began his technical career in the NZPO as a mechanician in the Khandalah telephone exchange. His NZPO career progressed through to being curator of the NZPO Museum in the 1990s *[sadly this collection was never generally opened to the public. Ed]* Random Thoughts on Vintage Radio reflects his life-long fascination with investigating, building, servicing and restoring vintage radio receivers.

This simple book consists of 38 unique chapters of a particular theme (240 pages) and includes a diverse range of thoughts such as "Collecting – the disease we all share", "Valve life and reliability", "Servicing a Valve Chassis" and "Disposal of a collection". I have always found George a great writer and this is an excellent read. It comes in a fractionally larger than A5 sized, soft cover book of a largeish font size that makes it a pleasure for senior reading. It is great to take anywhere that time filling may be required and each chapter is a complete item. There is satisfaction in re-reading these timeless topics.

Cost $25.00 including packing and post.

Order through the Wellington NZART Group Branch 50
51 Tilbury St, Fairfield, Lower Hutt 5011.
Bank: ANZ 06-0541-0859045-00
E-mail: secretary@zl2wb.com
Website: http://zl2wb.com/wp/

Every Home Should Have One - The Appliance Age in NZ
by Terry Moyle



New Zealand's homes were filled with appliances, and behind every refrigerator, television and kitchen appliance there is an interesting story that tells of the growth of consumerism in New Zealand. Do you remember your Grandmother's lounge (on the brown floral carpet) - a small black and white TV in an ornate wooden frame took pride of place, perhaps supplanting the wireless for the first time?

After World War II, New Zealand became a consumer society where every family wanted the latest appliance. It was the perfect way of 'showing off' to the neighbours and say (subliminally) that things were going well. Remember the introduction of the TV or did you go to and watch it at the neighbours? Who was the first on your street to get a colour TV? From heaters, vacuum cleaners, wireless radios, refrigerators, toasters, irons, kettles, ovens, televisions & microwave ovens — we liked to show off these latest 'gizmo's to our friends and neighbours. Packed with colourful photography and humorous (by today's standards) magazine advertisements of the day, Terry will transport you to a time when having a Microwave was a BIG deal (even though most people just boiled water in them initially)! Names like Fisher & Paykel, Kelvinator and Shacklock are the heart of our homes and this book tells the story of all the local companies and how they 'stretched the truth' in trying to get Kiwis to get their product in the home.

A hardcover book (slightly wider than A4 at 240 x 270 mm) of early 300 pages, 80,000 words and over 350 photographs, newspaper advertisements and detailed and extensively researched history of local manufacturers throughout New Zealand makes this book an insight into the way we grew up and how our homes evolved to what they are today. An excellent comment on social history. Many of the pages have an 'I remember that' moment!

Check out your local library or for purchase payment details contact the author Terry Moyle contourcreative@xtra.co.nz This book is available from Terry directly for $60 plus $10 courier.

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.

Metal polyester film, axial leads, (µF):

0.001	630 Volts	70 cents each
0.002	630 volts	70 cents each
0.005	630 volts	70 cents each
0.01	630 Volts	70 cents each
0.022	630 Volts	70 cents each
0.033	630 Volts	70 cents each
0.05	630 Volts	70 cents each
0.068	630 volts	70 cents each
0.1	630 Volts	70 cents each
0.22	630 Volts	70 cents each
0.33	630 Volts	70 cents each
1 µF	400 Volts	$1.00 each

Electrolytic capacitors, polarized, axial

10 µF	450 Volts	$2.00 each
10 µF	600 Volts	$3.00 each
20 µF	450 Volts	$2.50 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

We have procured a limited quantity of 500K ohm log taper, switched pots available to members for $5.00 each

Order any of the above via Bryan Powell, 279 Spur Road, RD3, Silverdale 0993.
Tel: 09 - 44 22 514 or mob: 029 415 5119
Email: **bapowell@xtra.co.nz**

P&P: For all orders please add $5.50 for urban and $8.00 for rural delivery.

All Society Sales payments can be made via direct banking deposit to the NZVRS ASB bank account 12 3067 0168223 00 or credit card via PayPal to : nzvrs@pl.net

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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@wsp.com**

The society has been donated an AVO 8 mark 5 multimeter, in excellent condition, complete with travelling case and leads etc as pictured below. It is available to members for tender ie the best offer received before the 1st of February 2022. E mail: nzvrs@pl.net

Wanted: to complete a refurbishment
i) any coils for a National Company FB7 or AGS receiver. Range unimportant. Photo(s) attached. The labels indicate the function and the band covered. These coils are engraved "Osc B" and "Det B"; There are coil sets "osc" and "det" for each band; A, B, C, D, E, F, AB-20, AB-40, AB-80, AB-160, as well as plain coil formers not labelled at all. I shall be happy to obtain any of these, matched or unmatched.

ii) a National "Doghouse" power supply. Any model, condition or voltage. As photo below.
Contact: John Reid e: john.reid@ojifs.com
Tel: 07 543 9138 Mob: 027 246 3648

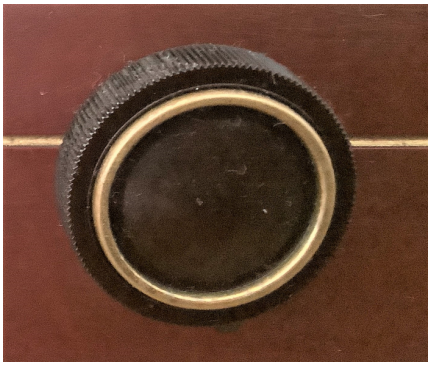
The FB& set

"Dog House" PSU required.

Base pin arrangement for the plug-in coils.

Top view with finger pull loop

Wanted two more Philips knobs for a BX645A. The knobs are 35 mm overall diameter and standard quarter inch spindle. Two more knobs would be excellent and would complete the restoration, the back lever controlled is not required.
Contact Lawrence Carter
e: **lawrencecarter2@gmail.com**>



Lawrence Carter is trying to identify and date this 17 inch Philips TV – if anyone can help . Contact Lawrence
e: **lawrencecarter2@gmail.com**

I am trying to dispose of my extensive collection of radio and associated equipment. Of immediate concern is disposal of my Marconi MKIV black & white broadcast cameras. They are of late 1950's vintage and were imported by TVNZ of the new AKTV2 station when Auckland got its first public TV station. They were relegated to DNTV2 when Dunedin got its station about 1963 and then they were relegated to the Dunedin Outside Broadcast Unit where they were used until it went to colour tv. Two of the 5 cameras were redeployed to Dunedin Teachers College for college productions. The other one was retained by TVNZ and is now in private hands in Dunedin, another in Ashburton and the fifth in the Toitū museum in Dunedin. I worked for 8 years as the TV tech at Dunedin Teachers College and worked with these cameras. I was successful in tendering for the equipment when it was sold. I feel that they should be preserved for suitable display preferably in Auckland. While I would like to recover some money for my costs it is more important that they be suitable preserved. The whole package is probably a couple of TONS
Included are; 2 Marconi MKIV Broadcast cameras, two camera control unit and control panels, a Genlock unit to sync the cameras, two power supply units, one communications unit, two long range telephoto lenses, a control desk, 2 line monitors with waveform scopes [Camera 1, Camera 2], 3 line monitors; preview and line out, two camera tripods and dollies, plus various spare parts.
I could include some of the valves. The cameras were in working condition when I purchased them over 40 years ago. I have the service manuals and a range of other Marconi manuals. The camera cables have gone missing.
Contact Kevin Weatherall
e: Kevinwea4@gmail.com
t: 03 467 9300 or m: 021 158 9385

Looks a bit like one of these: