Founded 1979 Incorporation No A6677 P.O. Box 692, Shepparton 3632

Shepparton & District Amateur Radio Club and Electronics Club

March 2025 Newsletter

Next Meeting, Saturday April 5th, at club rooms

SADARC COMMITTEE

President – Graeme Martin, - VK3VSM
Vice-President: - Peter Rentsch – VK3AXI
Secretary: - Rob Hose - VK3BLD plus Adam Cleary - VK3UU as scribe
Treasurer and Membership – Ian Saunders – VK3YYY
Webmasters - Graeme Martin - VK3VSM and Ray Gardiner – VK3YNV
Hamfest Co-ordinator: - Peter Rentsch - VK3AXI
Newsletter editor and Publicity - Peter Simpson – VK3ASK
Technical Committee: Geoff VK3ZNA, Ray VK3YNV, Denys VK3ZYZ, Josh Gardiner, also power to co-opt.

To contact any member of the committee above, email committee@sadarc.org and specify who you wish to communicate with and the subject.
If you have items for the newsletter, forward to: newsletter@sadarc.org
Communications Manager (External Events): Darren Glasson (VK3HEN) – subject to confirmation.

Meetings the first Saturday of the month from 10 am for Arduino training, plus informal chats and technical talks. A BBQ follows (a gold coin donation). Main meeting 1 pm (except January when no meeting occurs) at 360 Health Centre, 18 Channel Road (250 metres from Archer Street), Shepparton.
Variations in these times, days and location are normally notified in the preceding newsletter.

DISCLAIMER: - No guarantee is given as to the accuracy of information in this newsletter. E. & O.E.
WARNING: - There is a danger of electrocution or injury when working on electrical/radio gear or working **at** heights doing antenna work. You do so at your own risk.
25/08/2022

VK3RGV repeaters and transmitter operating frequencies from Mt Wombat

53.725MHz (-1 MHz), In Service 146.65MHz (-600 kHz), In Service
438.2MHz (-7 MHz -D-Star), In Service 438.650MHz (-7 MHz 91.5 Hz tone), In Service
438.9MHz (-7 MHz - DMR), In Service 439.775MHz (-5 MHz), Now back in service, IRLP (node #6990)
476.475 MHz (+750 kHz) CB Repeater WBT03 Channels 3- 33, In Service
VK3RDS, 438.7625 MHz (-7 MHz DMR) Shepparton on test @ VK3YNV QTH
The three following repeaters are not the clubs but are allied to the club in one way or another. Mt Major VK3RDU, 146.850 MHz, 439.875MHz. Mt Bruno VK3RWC 147.325 MHz (-1.6 MHz 123Hz)
Access to most analogue repeaters is by sub-audible 123 Hz tone or noise/carrier mute (less sensitive). Your TX offset is shown in brackets

Club informal on air get togethers, all welcome. Club call sign VK3SOL:

Wednesday- 2mx repeater 146.65 MHz 8.00pm.
3.63 MHz SSB ± interference 8.30pm,
Sunday – 2 mx repeater 146.65 MHz 2 pm & 8 pm
The Vintage Radio Club – 2 mx repeater 11 am, Sunday.
A number of semi-private HF skeds take place either daily or weekly, locally or further afield.

Website – www.sadarc.org or www.sadarc.org.au Face book Page – Shepparton and District Amateur Radio Club Direct Link: https://www.facebook.com/groups/481867453084459

In this Issue

Next Meeting

The next SADARC meeting will be held on Saturday March 1st, at our regular club rooms, 18 Channel Road Shepparton.

The format for the day is as follows;

10am Arduino class with Denys, Ray and Josh.

12pm Our regular BBQ, with gold coin donation.

1pm Regular club meeting, plus displays of current projects.

Diary Dates

April 5th, Regular club meeting.

May 3rd, Regular club meeting.

September 14, 2025 Hamfest

November 23rd, Bunnings fund raising day.

Editors Comments

As well as our regular reports, this Month we have a really interesting article from Colin Jones VK3DGS titled All About All Star. As many would know, at our

last meeting Colin and Jason gave a really interesting talk on this topic and it is great that they contributed some details for this newsletter.
Also in this issue a couple of vintage radio topics and a reminder about the WIA and Bendigo Radio club AGM and Technical Festival being held in Bendigo.
In closing, congratulations to our new member Peter Roberts, who has passed his foundation licence exam and is now VK3PTR, well done Peter.
Well, that's it from me, see you all at the next meeting.
73's Peter VK3ASK

Presidents Report – March 2025

Yikes—another month has flown by! February seemed to disappear in a blink. I have to say, it still feels a little surreal sitting on this side of the desk, looking out at all of you! Stepping into the President's role has given me a whole new appreciation for what it takes to keep things running smoothly. I'll admit, I had a bit of a shaky start, but as the meeting went on, the support from all of you really helped put me at ease—so thank you, we truelly do have a great cohort!

I'm excited for what 2025 has in store for the club. We recently had a great discussion about our early days of CB radio—where many hams first got their start. It was a great reminder of how important it is to keep building an active and welcoming ham community. Helping new operators get involved in this amazing hobby is something we can all contribute to, and I really do think the purchase of the WIA –Your Entry Into Amateur Radio manual will help with fostering new operators .

Think back to your own early days in radio—sometimes, all it takes is a word of encouragement or a shared story to spark that lifelong passion in a new ham. For me it was sitting around listening to my father (silent key) talking to some far off distant station on the other side of the world , I was fascinated at how a metal pole outside was able to talk to Japan or America or into space. Those are the moments that stick with you. Let's keep that spirit alive and continue

inspiring the next generation of operators! (Though I have to laugh at myself for saying "next generation" when I'm still a young one myself!)

One of the big events coming up is the **John Moyle Memorial Field Day Contest**. This is always a highlight on the amateur radio calendar, giving us a chance to test our skills, experiment with portable setups, and most importantly, enjoy the hobby together.

I'd really love to see **SADARC getting more involved in contests and field days throughout the year**. While I know these events may not appeal to everyone, they're a fantastic opportunity to practice operating skills, test equipment, and strengthen teamwork within the club. Plus, they help promote amateur radio and SADARC to the wider community.

Even if contesting isn't your thing, field days are a great excuse to get outside, try different radio setups, and just enjoy the company of fellow members. Whether you're operating, logging, setting up equipment, or simply coming along for the social side of things, there's a role for everyone.

I'd also like to explore opportunities to collaborate and build stronger connections with other clubs in this part of Victoria. At the end of the day, we should be working together—learning, sharing, and growing this hobby as a community. There's so much knowledge and experience out there, and by connecting with other clubs, we can all benefit.

Let's have a discussion about how we can get more involved and make the most of these opportunities. And if you haven't already, I encourage you to jump onto the forums and check out some of the great projects being discussed!

Looking forward to another great month ahead—73!

Graeme Martin VK3VSM

President

March 2025 Minutes

SADARC Meeting Saturday March 1st 2025

1. Meeting opened 13:00
2. President Graeme 3VSM welcomed group. Congratulations to Peter 3GCR for obtaining his Foundation licence on his first attempt. Thanks also to Geoff 3GSR for the assistance and support for Peter. (Also thanks to the President Graeme for running the examination).
3. Newsletter. A few members reported not receiving the newsletter. A check of email addresses should solve this problem. A reminder to all to check their spam folder just in case... A motion to accept was proposed by Kevin 3KPH and seconded by Ian 3YYY. Carried
4. Correspondence in. From the ACMA the CB repeater licence renewal.
   A letter from BAREC for the upcoming WIA AGM on May 3rd. [The meeting will be held at The Shamrock Hotel cnr Pall Mall and Williamson st Bendigo and will commence at 3pm. A dinner will be held after the event and bookings are not necessary. A live cross to the ISS during dinner is slated].
   The Winter 2025 issue of the Canadian Vintage Radio club was received. This is available to read on our forum.
5. Correspondence out. To the Shepparton Council re a request for potential location for Clubrooms.
   A letter to BAREC to offer support for the upcoming WIA AGM.
6. Presidents report. This was provided in the last newsletter. A motion to accept was raised by Ian 3YYY and seconded by Adam 3UU. Carried
7. Financials. This report was dated February 29th. Outgoings for equipment for Mt Wombat, Hall hire for the displaced meeting in February due to fumigation, and the CB licence. Noted were CAV fees due next month. Moved by Ian 3YYY seconded by Jason 3NQS
8. Technical report. Ray 3YNV on behalf of the Tech Committee delivered another comprehensive technical report with a lot of work being completed or in progress. Specifically, work on D-Star with the needed USB

serial device having being received. Ray will work to convert USB sound cards for the service. Adam has donated a 1.5kW off grid / on grid inverter (1.5kW) for potential use at Mt Wombat as a UPS and or mains filtering solution. Ray to evaluate.

9. Reports.

   Bunnings. Graeme and Ray attended the Bunnings meeting re BBQ fundraising. We have been allocated November 23rd 2025 as a firm date and are on the short notice turn around for opportunistic BBQs when others drop out. This is expected to be very short notice (24-48hrs) and it would be great to be able to assist so please make yourselves available if we are offered an extra day.
   SWL report. Stevo indicated several upcoming events, Ship to Shore inc 27MHZ end of March and new NZ SW frequency list is available.
   3UG books. Rodneys book is still available. A great read for those interested. Several have been donated and a Letter of Appreciation to Lyn to be penned.
   Peter reported that our Hamfest has been calendared and added to the Facebook page. Bank interest. Peter 3ASK will investigate the possibility of finding a better account at Bendigo to earn interest from our accounts Reports moved by Peter and seconded by Kevin 3F.

10. General Business. A discussion around the ongoing CB repeater misuse was had. Peter 3VDL brought this up asking for thoughts on how to manage the situation. Various ideas were tabled. A letter will be part of this solution to ACMA. Moved Peter 3AXI seconded Ian 3YYY.

    Forum discussions. It was noted we have received a large number of requests to join the forum. While ostensibly the forum is restricted to club members discussions around gaining new members, possibly forum only members, was had. Additionally a separate section accommodating the Vintage Radio club was suggested. To facilitate increasing the forum activity for potential new members a Q&A capture of information and an associate style membership (at a rate to be discussed) was considered, committee to discuss further.

All Star talk. Thanks to Colin and Jason for the talk around All Star which included historical setting and current discussions an informative update, thanks guys.
The club ‘patch’ is getting closer. Josh indicated it should be available next meeting, stay tuned.
John Moyle Field day. A group from the club are going to compete 15th 16th March and a discussion re the use of the club call VK3SOL was made. Jason moved the acceptance of General business with Ian 3YYY seconded can carried.

11. Meeting closed 14:25

BAREC hosts the WIA Annual Meeting & Technology Festival.

Below some more details from: Neil Patton VK3ZVX, President of the Bendigo Amateur Radio & Electronics Club (BAREC).
Note that some of our members are planning to attend this festival.
Over to Neil.

Attentions to **All Victorian Amateur Radio Clubs:**

The bookings page for the Bendigo Technology Festival is now up and running ...!!!

Radio Clubs, Radio Societies, individual Amateurs, specialist and novelty AR vendors, commercial operators, and any organisation wishing to display, demonstrate, or sell equipment or merchandise are invited to make Victoria's first public Hamfest a great success.

Do your part to promote Amateur Radio.

Please register by 30th April 2025.

Go to:
www.barec.net.au and click on the Festival bookings page.

All tables provided: $25- per table including 2 free entries
Individual entry: $7-

Note that visitors to Bendigo may also benefit from the WIA Visitors page.

Set-up from 6:00AM Sunday 4th May 2025.
Gates open 10:00 AM.

We'll see you there - 73 !!

Neil A Patton
VK3ZVX
President BAREC

All About Allstar Linking by Colin VK3DQS

Further to our very interesting talk given by Jason and Colin Jones at our last meeting, Below is a detailed article covering this topic.
Over to Colin

All About "AllStar" Linking by VK3DQS -Colin

Allstar Linking: An Overview

Allstar linking is a system used in amateur radio to connect repeaters, nodes, and users over the internet using Voice over IP (VoIP). It is based on the **AllStarLink (ASL) network**, which runs on the **Asterisk PBX system**, a software-based private branch exchange (PBX) originally designed for telephone systems.

Chinese "Shari" Node
About $80 AUD

Homemade Allstar link node "in a box"
About $80 AUD

How AllStar Linking Works

1. **Nodes & Connections:**
    - Each AllStarLink station (a repeater, simplex node, or hotspot) is called a **node**.

    - Each node has a **unique node number** assigned by AllStarLink.
    - Nodes can connect to each other directly or via **hubs (conference servers)**, allowing multiple nodes to be linked together.
2. **VoIP Technology:**
    - Uses **Asterisk PBX**, an open-source telephony engine, to handle voice communications over the internet.
3. **Linking Methods:**
    - **Direct Node-to-Node Linking:** One node connects directly to another.
    - **Hub/Conference Linking:** Multiple nodes connect to a central hub, allowing broader communications.
    - **Repeater Linking:** AllStarLink can link repeaters together over the internet, extending coverage beyond RF limits.
    - **Bridging with EchoLink & IRLP:** Some nodes can bridge with EchoLink or the Internet Radio Linking Project (IRLP).
4. **Hardware Requirements:**
    - A radio connected to a Linux-based computer or Raspberry Pi running the **AllStarLink software**.
5. A radio interface (such as a **CM-108 Board,URI, RIM-Lite, or homebrew USB interface**) to connect the radio to the computer.
6. An internet connection to transmit data between linked nodes.

Key Features of AllStarLink

Full-Duplex & Half-Duplex Modes: Can work with both repeaters (full-duplex) and simplex nodes (half-duplex).

Customizable Linking: Users can program custom linking scenarios using **DTMF tones** or command-line scripts.

High-Quality Audio: Uses **codec2, G.711 (ulaw), and GSM codecs** to provide clear voice transmission.

- **Remote Control & Monitoring:** Nodes can be managed remotely using SSH, a web dashboard, or DTMF commands.
- **Multiple Connections:** Unlike EchoLink or IRLP, which have limitations on the number of connections, AllStarLink can handle multiple simultaneous links.

Key Features of AllStarLink

AllStarLink Node Numbers & Network

- Each node on the AllStar network is assigned a **unique node number**, much like a telephone extension.
- The **AllStarLink website (www.allstarlink.org)** allows users to register, obtain a node number, and manage their node settings.
- Popular public hubs act as **"gathering places"** where many nodes connect to form large worldwide networks.

How to Link Nodes in AllStar

Using DTMF Commands

- **Connect to a Node:**
  *3 <node number> (e.g., *3 2000 connects to node 2000)
- **Disconnect from a Node:**
  *1 <node number> (e.g., *1 2000 disconnects from node 2000)
- **Disconnect from All Nodes:**
  *76
- **Check Connection Status:**
  *70 (Lists active connections)

Using Asterisk CLI

- Advanced users can use the **Asterisk command line** (asterisk -r) to manage connections manually.

Benefits of AllStar Linking

✅ **Global Connectivity:** Link repeaters and radios worldwide over the internet.
✅ **Better Audio Quality:** Compared to IRLP and EchoLink, AllStar provides **superior voice clarity**.
✅ **Scalability:** Supports multiple simultaneous connections, unlike other VoIP ham radio systems.
✅ **Flexible Linking Options:** Nodes can be linked permanently, temporarily, or dynamically based on needs.
✅ **Open-Source & Customizable:** Users can modify configurations and scripts to fit their use case.

AllStarLink vs. EchoLink vs. IRLP

Feature	AllStarLink	EchoLink	IRLP
Audio Quality	High	Medium	Medium
Multi-Node Linking	Yes	Limited	No
Supports Repeaters	Yes	No (officially)	Yes
DTMF Control	Yes	Yes	Yes
Bridging Capabilities	Yes (with EchoLink, IRLP, etc.)	Limited	No
Open Source	Yes	No	No

Basic AllStarLink Node (Simplex)

For a personal **simplex node** (a small radio hotspot, similar to an EchoLink node):

Raspberry Pi 4 (4GB)

MicroSD Card (16GB+)

For a personal **simplex node** (a small radio hotspot, similar to an EchoLink node):

USB Sound Interface (DMK URI, RIM-Lite, or CM-108 board)

Baofeng UV-5R or similar radio

Cables & Connectors

Power Supply

Getting Started with AllStarLink

1. **Sign up at www.allstarlink.org** and request a node number.
2. **Set up a Raspberry Pi or Linux machine** with AllStarLink software.
3. **Connect a radio to the computer** using a USB radio interface.
4. **Configure Asterisk & node settings**, including network and linking preferences.
5. **Test connections** and start linking with other AllStar nodes.

Conclusion

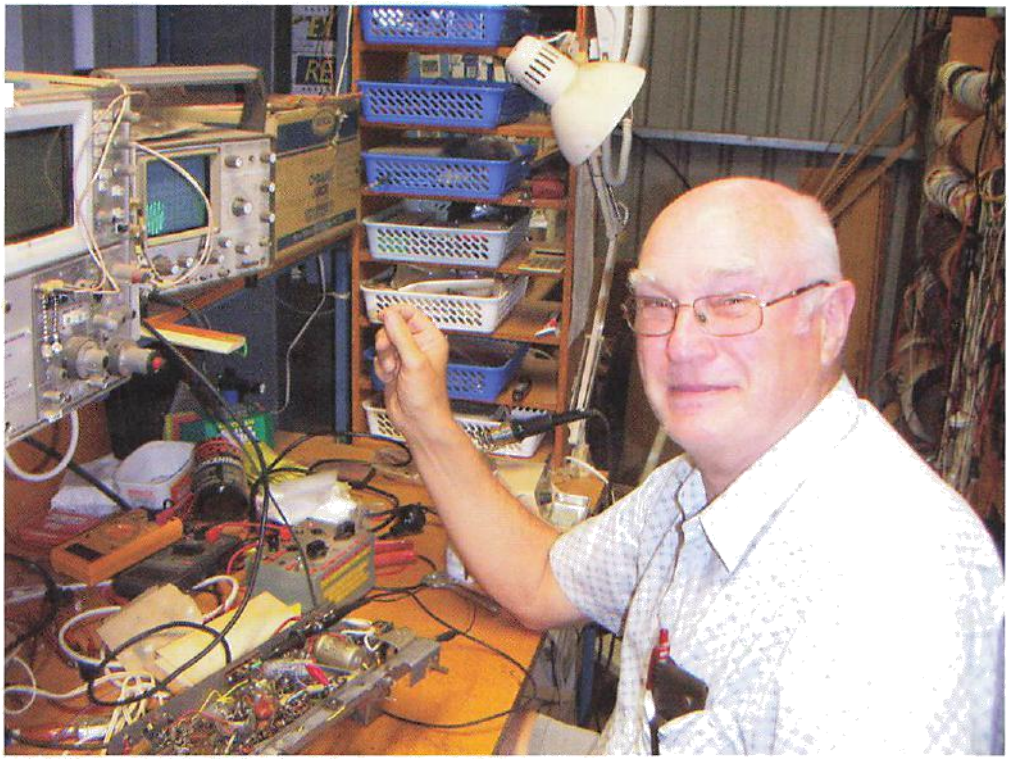
AllStarLink is a powerful and flexible system for amateur radio operators to link repeaters, simplex nodes, and users worldwide. It offers **high-quality audio, multi-node linking, and open-source flexibility**, making it a preferred choice over traditional VoIP linking methods like EchoLink and IRLP.

Colin VK3DQS

Below an article submitted by our Vice President, Peter VK3AXI

RADIO MEN AND THEIR SHEDS

by TONY MAHER



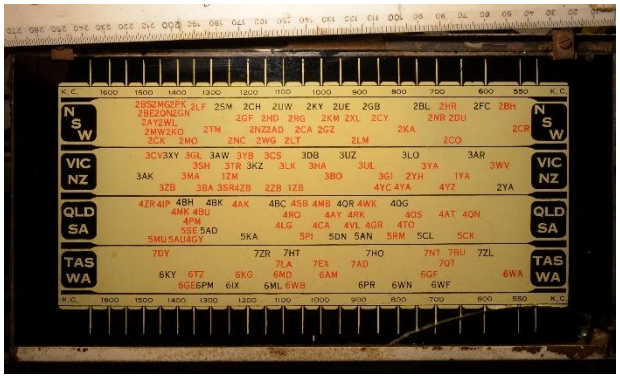
Rodney Champness's tin shed is a shed with a no nonsense feel to it. Work is done here quickly and efficiently. A simple steel framed timber topped bench with above it a similarly constructed equipment shelf. On the bench are numerous multimeters, hand tools, regulated power supply, variac with built-in voltmeter, cleaning materials and assorted adaptors. Above on the equipment shelf are two oscilloscopes, a Hewlett Packard signal generator, power supplies and a home-built signal tracer unit. To the right of the bench is a large stand holding dozens of reels of wire and cable. Nearby is a Traeger 'flying doctor' transceiver and shelves containing dozens of neatly labelled plastic bins of components.

In the photo Rodney is fitting a switch to a Kriesler chassis so that it can be used in a talk to demonstrate the performance of a receiver with and without reflexing.

Rodney lives near Shepparton in country Victoria and is well known to many readers of *Radio Waves* as the long-time writer of the popular Vintage Radio column in *Silicon Chip* magazine. He is the award-winning author of the book *Outback Radio*.

Restoration of the Howard Vintage Radio by Marc Chick “Vintage Radio Club”

Marc Chick carried out the repair of this Howard Radio for Jacek VK3JTS. Below the details of the radio and restoration.



1936 Howard 329- 619 Sussex	Marcus Chick

Another that turned out to be, “The yearly set from Hell”.

After some searching, I found out that the Howard chassis presented to me to attempt to fix was in fact manufactured by “Regent Radio Pty Ltd. According to the 1937 “Trade Annual” they were in Burke Road Camberwell. They were manufacturers of all types of radio receivers, public address amplifiers and transmitters. While that was all wonderful. It made no real contribution to sorting it out.

With the initial assessment, fortunately it looked like it had only two cathode electrolytics replaced and the originals, left under the tag board (tatty) and one resistor. Otherwise, a broken dial string and the dial glass itself cracked. The Pentagrid was missing along with the terminal of the fly lead for the 6G8 and a critical valve shield. All of the sockets were Octal: During the war there was a tendency to revert to the previous generations of old stock six pin types which I would suggest stopped “WϖD” scarpering off with them. Initially those sockets did help date it. Until I found the real info: But no circuit.

Amusing was, that when rolled on its back to inspect the underside, the inertia wheel of the tuning fell off. Its die cast like most and will eventually disintegrate. I did paint & glue it to slow the process. It was interesting to note that the Pentagrid was recessed in the chassis and it became clear that the set used to have an antenna post? That antenna area was a bit of a shemozzle.

It actually came with two speakers. The cone of the original electrodynamic was destroyed and a permanent magnet one was connected to the voice coil of the transformer. That made use of the field coil of the original electro-dynamic (Field coil) speaker. I was later to realise that the output transformer had an open primary and the valve tester did not like the 6V6 output tube, nor the 5Y3 rectifier. The 6G8 (second detector / first audio) fared little better. That meant a few new valves were in order. First IF was the forever cantankerous, 6U7. Leave one of them unshielded, at your peril.

One bad habit, poorly executed, was to place a link in the speaker plug to cut off B+ to the output valve Plate; should the speaker be left out. On some models without field coil speakers, that left the screen of any valve with one (Tetrodes, Beam Pentodes (Renodes archaic)), with a live screen. That meant that the screen became the plate, as it was not designed to handle plate current and it failed. In covering that likelihood; by cutting off all B+, the first cap is a 600v one, to resist the surge voltage, which will happen on startup anyway.

Irrespective of no circuit, I proceeded anyway. As normal the grid resistors of the 6V6 were way out of spec. They have an attrition rate, rather than a fail rate. Its cathode resistor also found the bin. So, three resistors went to the bin there. I was surprised as they all were types with a metal cap on their ends: I expected more failures. Being 50K, as expected the one on the Pentagrid and another resistor on the screens went. V1, assumed 6A8G; V2, 6U7G; V3, 6G8; V4, 6V6: V5,5Y3G

For some reason the original filter caps were still in circuit? Bad policy that can wreck the rectifier & probably did. They should have been replaced when the cathode bypass ones (2) were?

I ended up dismantling the field coil speaker and salvaging the coil. This was then mounted on the chassis and mods made to the speaker plug & socket to allow for that. The new output transformer was able to be mounted on the Permanent Magnet" speaker that came with it.

The dial globes were a 6V 5Watt automotive type. While these are gettable the damage to the dial glass did suggest that they were too hot. As both were blown

and the grommets, they were in had started to break up, I decided to change these to a lower wattage conventional type at closer to 2watts. But saved the old sockets, in case that did not work out. The glass was removed, mainly to get the grot out.

Knobs were missing; however, I do have some from a closed factory that only needed drilling & tapping for lock screws. They will do until something better, or original turn up, or are made: Maybe?

Otherwise, getting it going was more an exercise in time. The paper caps were all leaking like a sieve as expected and were replaced; Along with all electrolytics. 6G8 cathode bypass cap was wrong, as it did not comply with the value of the old one still under the board.

Those I fished out, as there were paper ones under it, which needed replacing,it also looked less rushed & tatty. The 6V6 needed attention as it, and its grid resistors &cathode resistor were defective, as was the output transformer. This actually has a switched tone control. But otherwise, is relatively conventional for that run of valves, which wiring wise, tend to electrically follow the same, or similar plot. It was not powered as that was not considered safe, nor practical.

It did fire up with the usual corrosive issues with the pentagrid I used (6A8). This I guessed, by the fact it was Broadcast only and the pentagrids with their integrated triode exciter, did not appear till around 1938, mainly in muti-band sets thereafter: It was likely the rather unstable, 6A8: Any way it works. The RCA description of 2A7, 6A7 & 6A8 is not particularly flattering. The difference in those valves is the heaters and bases only. But it failed the “burn test”.

The NOS 6U7 was faulty with an unsoldered pin, on replacing with another tested one, I realised the socket was also broken, so out I came. Next came the realisation the First IF transformer had a make and break fault. That was a broken 100pF cap so I changed both. Now for the Pentagrid.

This particular valve 6A8 formerly several others mentioned in “RCA Handbook 1944”, is quoted as having good sensitivity on the broadcast band and on the SW bands down to 25 metres its sensitivity drops, rapidly falling off below 20

metres. It does not like AGC / AVC on short wave as it causes frequency shift. Which is largely why it was superseded by valves like 6J8, with separate triode oscillators built in, on SW. Voltage was another problem, as their oscillation is not very stable with variations in voltage.

Its socket also turned out to be faulty. Naturally the socket pins on the new, did not line up with the old socket, requiring some rewiring. Then one moved to the antenna & oscillator coils,

Initially I had noted that the Monkey had been at the front end. As noted, the aerial terminal had gone & was replaced by wire in a great tangle under the chassis. The oscillator was weak & playing up the 50Kgrid resistor inside the oscillators can had developed a loose cap and tested 100k, so out it went. I was hoping the fault was not a coil wire. Fortunately, it was a dry joint causing a "make & break". The solder joint to chassis should have never been attempted, where it was: I moved it to a more effective point. Not surprisingly, the oscillator was much happier after that sort out. Modulation was much better.

That area needed a tidy up as the oscillator trimmer was a sky joint & it should have been bolted down? The holes were already in the side plate for both trimmers; so, I put it near the antenna one where it should have been. The trimmer was a bolt down type anyway? So why was it where it was? You could not turn the set on its side to adjust it, as that risked wiping out the 5Y3(see tube data)? It also impeded the tuning slug's adjustment.

I did run it sideways while working on it, but used a Russian 5Y3, as its ruggedised & built more like a "6x.." rectifier series and has to have a cathode sleeve, by the way it behaves.

As it was a transformer set with a shielded transformer, which puts a charge on the chassis, it got a new cable which earthed / grounded its chassis. Much safer all round, & it did pass "Tag & Test" (Earth effective & no earth leakage).

Set is rather typical of the evolution from "Autodyne's (Screen Grid Radios)" One of the first really successful super heterodyne radios, to ones using "Pentagrid" frequency changers, where mixing and oscillation were more predictable and

superior. Unusual for the era, the highest BC frequency was 1600KHz which locally became 3NE around 1954. It's now 1566KHz. IF I believe was 460KHz. I ended up tuning by the voltage method.

So, it did finally get to the point where it did not malfunction when "burn tested' for a minimum of three hours. I did not have the cabinet. It was considered, by Sony, that three hours had the highest probability of failures.