Newsletter
The Antique Wireless Association of Southern Africa
18th Anniversary

185 December 2021

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DEVOTED ENTIRELY TO

AMATEUR RADIO

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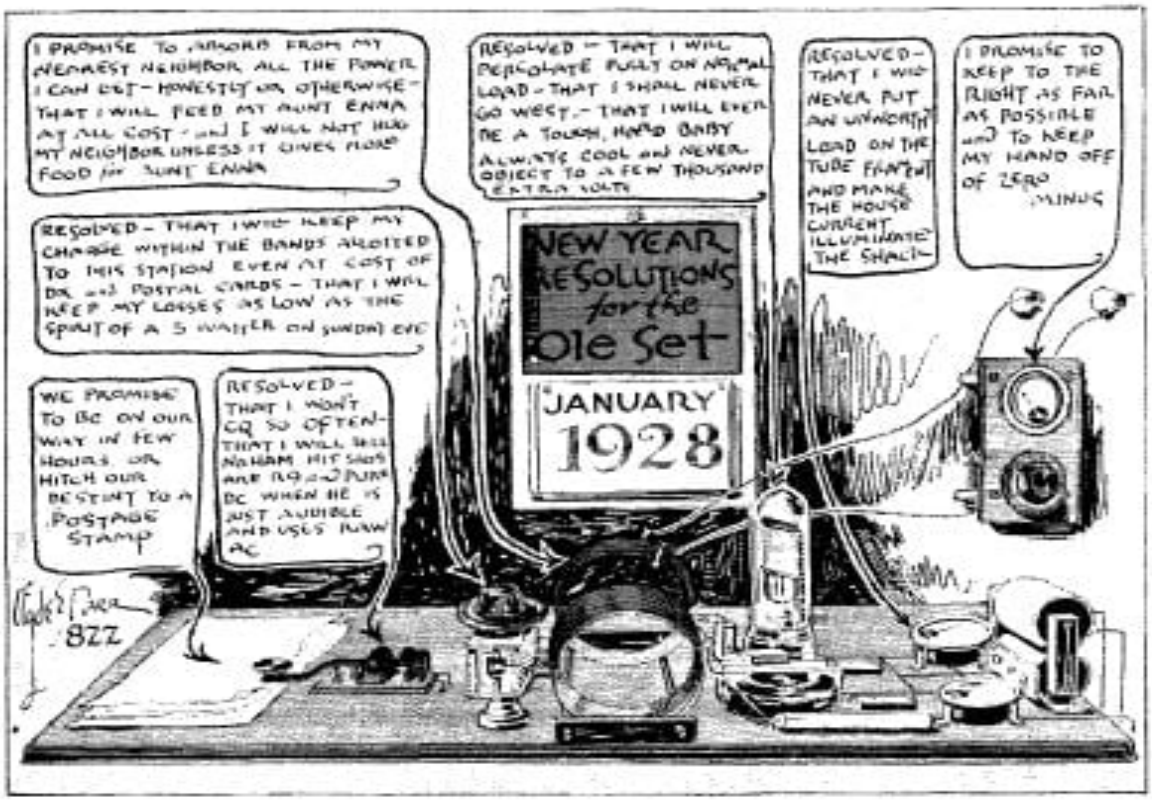

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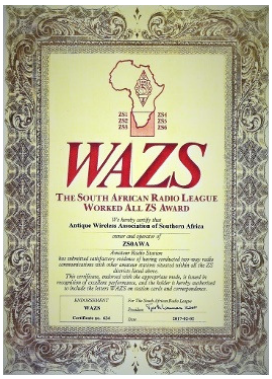


Inside this issue:

AWA Committee:

* President—Renato ZS6REN
* Acting VicePresident—John ZS1WJ
* Technical Advisor—Rad ZS6RAD
* Secretary/PRO—Andy ZS6ADY
* KZN—Don ZS5DR
* WC—John ZS1WJ
* Historian—Oliver ZS6OG
* Member—Wally ZS6WLY

Visit our website:

www.awasa.org.za

Reflections:

With the AGM behind us and a "fairly new" committee in place for the new year, we can now settle down and get back to the business of "Finding, fixing and using" again. It was good to see so many who took the time to join us at the SAIEE and I assure you, we did have a good time.

For those of you who could not make it, we look forward to seeing you next year.

One of the worrying things was the lack of people wanting to be President, or Vice President. I would have thought that people would be lining up, being disappointed that they were not considered for the post, but it seems we are not that popular.

Of course I am being sarcastic. People tell me at my age I'm not being sarcastic, I'm being truthful.

Whatever it is, it is disconcerting that we have great difficulty in electing a President and Vice.

In the early days, we were all lining up for our turn to see what we could do to make things better and solicit more members. Maybe now we think we have enough. (Almost 400 at the last count).

Of course we welcome Jacques ZS6JPS as Vice President, which means that next year Jacques will again serve a period as President (Renato has volunteered to stay on for half a period – 1year) and Wally who comes on board as a member to the committee.

As usual, there were more items for disposal at the boot sale than there were people attending, but there was still a good few articles that exchanged hands and found new homes.

The braai took a bit longer than expected due to a lack of firelighters, and no smokers being there. After borrowing some matches from the caretaker at the SAIEE and the ingenuity of a few members, the fire was lit and soon enough the meat was on the grid with happy faces all around.

After some lengthy discussions and the usual braai banter, it was time again to pack up and another fine meeting came to an end.

We can only echo the thanks of Renato to the SAIEE for once again providing us with such an excellent venue. We are truly blessed to be able to use their facilities.

Unfortunately we are to end this short piece with sad news of the passing of Max Clark who was the Chairman of the Historical Section at the SAIEE and worked closely with a few of the AWA members. He was also very much in favour of the AWA and often would pop in at our AGMs to keep in touch with those of us who never really saw him.

There is a tribute to Max further on in this issue of the Newsletter.

Until next year.

Best 73

DE Andy ZS6ADY

Wikipedia

Solar cycle:

Sunspots were first systematically observed by Galileo Galilei, Christoph Scheiner and contemporaries from around 1609. The solar cycle was discovered in 1843 by Samuel Heinrich Schwabe, who after 17 years of observations noticed a periodic variation in the average number of sunspots. Schwabe was however preceded by Christian Horrebow who in 1775 wrote: "it appears that after the course of a certain number of years, the appearance of the Sun repeats itself with respect to the number and size of the spots" based on his observations of the sun from 1761 and onwards from the observatory Rundetaarn in Copenhagen. Rudolf Wolf compiled and studied these and other observations, reconstructing the cycle back to 1745, eventually pushing these reconstructions to the earliest observations of sunspots by Galileo and contemporaries in the early seventeenth century.

Following Wolf's numbering scheme, the 1755–1766 cycle is traditionally numbered "1". Wolf created a standard sunspot number index, the Wolf index, which continues to be used today.

The period between 1645 and 1715, a time of few sunspots is known as the Maunder minimum, after Edward Walter Maunder, who extensively researched this peculiar event, first noted by Gustav Spörer. In the second half of the nineteenth century Richard Carrington and Spörer independently noted the phenomena of sunspots appearing at different solar latitudes at different parts of the cycle.

Collins KWM-2 versus Drake TR-4

By Paul ZS6PMS

What is the best valve transceiver from the mid-sixties of the last century? Galaxy, Swan, National, Collins, Drake, Hallicrafters ? This list goes on for a while. The Japanese “rice boxes” did not even exist in the international market by then. The market was dominated by the Americans. However, in the UK some sort of a Collins clone at least by appearance and color scheme also existed being the KW-2000 by K.W. Electronics Ltd of Dartford.

These sets were very expensive. Top of the range pricewise was Collins. Take the Collins KWM-2 ($ 1350) with its power supply the 516F-2 ($ 230), speaker 312B-2 ($ 105) and microphone SM-3 ($ 65). So, you got all of these for $ 1750. In today’s US dollars $15,147.00 . This in Rand would be R 231,750.00 now.

If you wished to go portable from your holiday home or elsewhere you could erect a simple antenna and Collins provided a solution. The ensemble you needed for this was: KWM-2 ($ 1350), hand microphone MM-1 ($ 25) and slide-on power supply with internal speaker PM-2 ($ 150) you even got a nice Samsonite suitcase CC-2 ($ 55) with it for only the total of $ 1,580.00. By the way, the last Rockwell-Collins KWM-2A that left the production line in 1977 would have cost you $ 3,533.00 US.

Very few hams in those days knew about noise floors, IMD, dynamic range and so on. VSWR-meters and tuners like the famous J.F. Johnson Matchbox were available but one mostly trusted to match the transceiver to the antenna with the π-filter in the plate output of the PA also called a Collins-filter. This filter matches a VSWR up to 3:1. The antenna usually a dipole for the “poor hams” was cut at 468/f [MHz] ft close enough to give a good match. A few turns in the coax cable at the feed point to avoid common mode currents in the feed line and job done. Though just a few turns do not work at all.

Commercial Yagi beams existed. Mosley of the USA was leading in this field. Cubical Quads were mostly home brew with bamboo sticks used as spreaders. I used to log crowds of ham’s using Lazy Henry’s to give them some directivity and gain on the high bands.

So let’s have a look at both transceivers born in that era.

THE COLLINS KWM-2

Figure 1: The Collins KWM-2

After launching the famous S-line in 1958 Art Collins came to the market with the KWM-2 in 1959 and the KWM-2A in 1961. The architecture was similar to the S-line. Double conversion and the use of his world-famous Collins mechanical filter on 455 kHz. The set lacked the rejection tuning of the S-line receivers

of

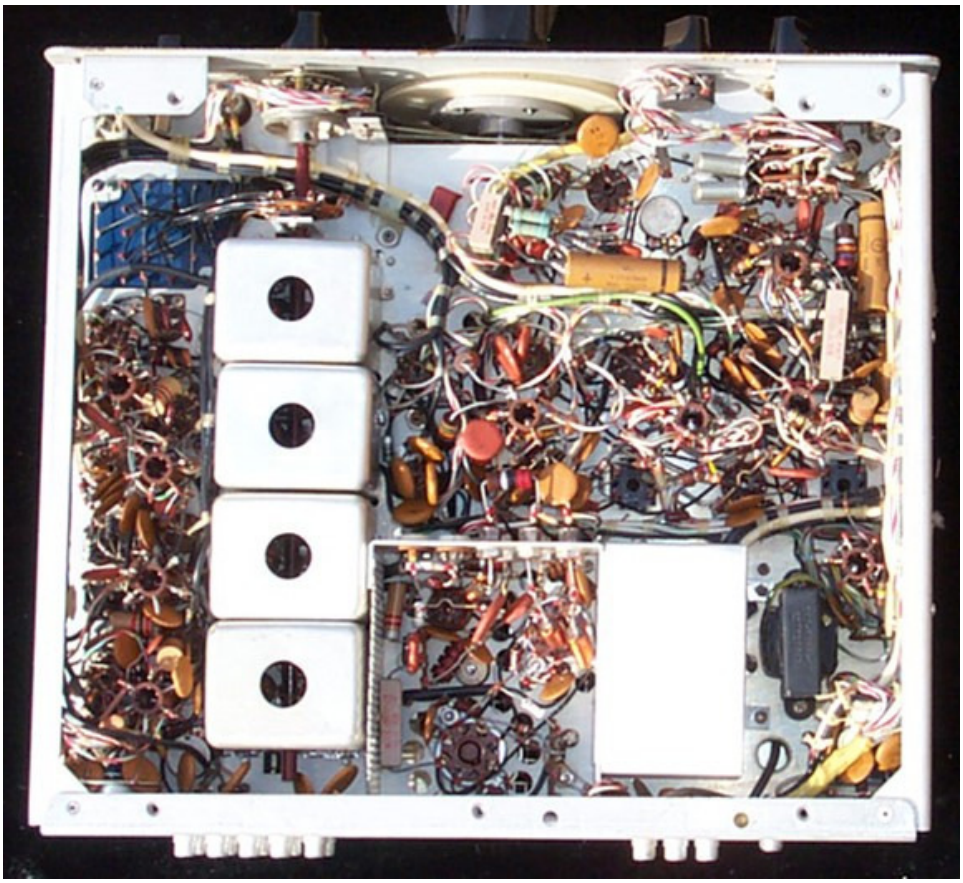


Figure 2: The underbelly side a Collins KWM-2

The sideband crystals of the mechanical filter are hanging sorrowfully in the upper right hand corner of figure 2. I do not like to work into this mess, unless I am really forced to do so.

THE DRAKE TR-4

At lot happened in 1963 almost simultaneously. Galaxy (A division of Hy-Gain) came up first with a single conversion transceiver design using a 9 MHz IF. Soon followed by Drake with the TR-3. It was Drake's first product that included a transmitter section. The famous "Drake Twins" only would hit the market in 1966. With the TR-3 Drake he had to leave his reliable 50 kHz pass band tuner to be found in all his receivers since the introduction of the 1A ("slim black letterbox") in 1957. Selectivity now had to be reached with crystal filters for the 9 MHz IF. The TR-3 was a great success, but had some flaws. Among these it had no side tone and full break-in CW. Therefore by the end of 1964 the TR-4 was born to overcome these. The set was produced until it was replaced by the TR-4c in January 1972.

Figure 3: The Drake TR-4

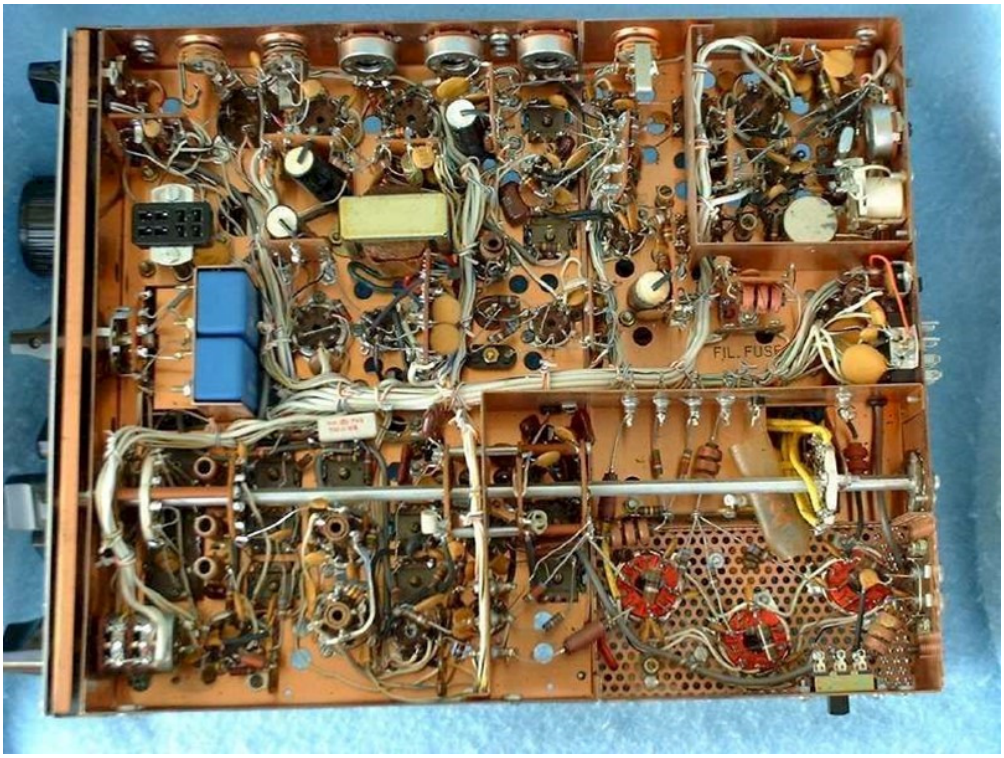
This 9MHz IF single conversion design uses a 4.9-5.5MHz VFO (Drake used a PTO: Permeability Tuned Oscillator, like Collins). It is best to mix the incoming signal higher than the 9MHz IF to avoid spurious, but this also means that you get the 20m band for free by down mixing without an added crystal oscillator in the premixing stage. Only the down and upside of the 20m band get reversed.

The controls of a TR-4 are a bit strange with its "X-CW", "X-AM", "Sideband X" and "Upper", "Down lights.

Figure 4: The magnificent copper clad TR-4 chassis

Figure 5: The underbelly side of a Drake TR-4

Figure 5 shows there is plenty of room to work. The PA-valves get very hot indeed even when you tune-up and being on air. Pick up a 12.6V filament point rectify and filter with a small low voltage capacitor. Install a 12V computer fan on the outside against the PA cage with cable ties.



CONCLUSIONS

The documentation of the Collins is by far superior to the Drake, however Drake tries to accommodate the DIY ham by giving more information as of how to solve problems with his equipment.

The parts of both transceivers are of the same high quality. Drake uses 6JB6 television line sweep valves instead of decent transmitting valves like the 6146's in the Collins. These TV valves were used all over in those years even the first "hybrid" the Yeasu FT-101 uses 6JS6's. The problem with these valves is their low plate dissipation and therefore they cannot really handle the output power relative to this.

The Collins has twelve 200 kHz wide bands to cover 80-10m. The Drake has seven 600 kHz wide bands. In the TR-4 the upper 3 cover the 10 m band. Sometimes this is to one's advantage or disadvantage. Using the Collins needs more tuning and re-tuning when the split is within the band one is working on.

Collins specifies 0.5µV receiver sensitivity for 10dB signal to noise ratio as well as Drake does. The specs for selectivity, carrier suppression, distortion, audio response etc. are all the same. It is just how the user feels acquainted with the set giving him a happy feeling to use it.

Both are quite useless on CW. This is if you wish to use this mode on a crowded band. Drake tried to overcome this flaw by introducing the TR-4cw in 1976 by adding a 500Hz CW filter.

The Drake AC4 power supply and the TR-4 is an unhappy marriage not even a marriage of convenience I would say. The AC4 is switched on/off remotely by the little switch on the audio pot in the TR-4. The AC4 is unsafe if not dangerous in itself. The mains cord has just two wires. It has to be replaced by a 3-wire cord. The mains earth has to be grounded to the chassis. The AC4 is protected by a 3A slow blow fuse for 230V operation. Make sure yours is not the 5A one meant for 120V operation. I have the suspicion the 3A fuse does not protect at all and therefore is specified as slow blow. Recently I looked into this. The AC4 is prone to a huge inrush current it seems. Another flaw is that you cannot get the AC4 out of its MS4 cabinet unless you chisel away the two back stands over the screws.

Both transceivers stood firm against the tsunami of “Rice Boxes” in the seventies and early eighties. These came with far more gadgets one could ever dream of in those days and with a very competitive pricing. Now they are just relics of the past. We have to cherish them and look after them. Do not leave them on a shelf for years on end. The filter electrolytic’s will perish and without giving a sign they will pass away while you lovingly look at your jewels on your shelf.

MY RUNNER UP

Figure 6 : The Hallicrafters SR-150

This is a jewel as well. Double conversion and a very sensitive quiet receiver.

Farewell Max

by past AWA President Richard F4WCD/ZS6TF

From my title you can gather that the news is sad. Max Clarke, aged 95, passed away peacefully at his home in Garden Village Randburg on Thursday November 18th in the care and presence of Maureen, one of his daughters. His wife Eileen suffering from a long indisposition and cared for by Max, passed away earlier in the year.

This picture was taken on 16th November 2013 on the occasion of the first of the AWA AGM's in the SAIEE council chamber. Max was accepting a donation to the SAIEE Museum of an early true RMS electronic VA meter from the AWA. It was a thank you gift for the use of the facilities organised by Max and the beginning of a fruitful collaboration between the organisations.

Max was a "big person" in a slim, trim package, a type A personality with fast walking pace which some younger men found hard to match. Add to that an amazing sense of humour, and incredible powers of organisation and acquisition, it was a privilege to serve under him as Chairman of The SAIEE Historical Section, his post retirement passion. Max obtained his BSc (Eng) Electrical degree from Wits in 1947, and did his pupillage for 3 years with E.S.C. Border Undertaking, East London area. He then did 2 years as a graduate apprentice with the BTH company, Rugby, England.

What followed was a career in various regional and municipal electrical undertakings, retiring as Town Electrical Engineer of Randburg. Max had an encyclopaedic memory concerning players in the industry and had a prolific reservoir of anecdotes about them. This fed through to his editorship of the AMEU (Association of Municipal Electrical Utilities) newsletter of which he was both editor and contributor, running to over 100 editions in 33 years.

However, the SAIEE was Max's second home. He first joined in 1946 and by 2007 had become a fellow, council member , and HS section chairman. He wrote up the history of the section, formerly the Historic Interest Group, which was published in the February 2015 of the SAIEE Wattnow magazine. Under his determined leadership Innes House was annexed for the museum, and "creative" budgeting financed the population of its artefacts in illuminated display cabinets, the work of his hard working HS committee members.

I was grateful for the team of AWA members who helped me achieve our side of the bargain, the radio room, amateur radio station ZS6IEE, and making the displays, preparing the exhibits, and acquiring equipment. ZS6JPS,ZS1WJ, ZS6IN, ZS6KAT,ZS6MC, and ZS6OG but there were many others.

Our birthdays were 2 days apart and that meant really decent cake for the 11 o'clock Thursday tea meeting in the SAIEE basement for 2 weeks of each month of February. One of his repeatable sayings, a favourite of mine is "Without our electrons, all other disciplines are stuffed" (He used another word at the end!), highly appropriate in days of load shedding.

We say farewell to the "Gentleman Engineer" Max Clarke, Doyen of the SAIEE, family man, friend of the AWA, with condolences to his family and add the thought that they don't make them like that anymore.

On my bench – Rad's Icom IC-271

Renato Bordin November 2021

If you own one of the Icom radio's that feature the ram board with lithium 3V battery and are worried about losing vital radio configuration stored in ram then this story is for you. There is plenty documentation available on how to keep the ram contents alive whist replacing the battery on the ram board, this is available from many sources. Just Google "Icom ram board" and you will be guided to a number of sites featuring ram board programming, battery replacement and 3rd party memory modules available for purchase. I could not however find a site that explained in detail how the radio would react to a complete loss of ram contents, as if the battery died and lost all its memory. How would the radio behave? What are the symptoms of memory loss? Most sites recommend shipping the radio off to Icom or purchase one of many replacement ram boards featuring non-volatile ram at significant cost. I wasn't happy with these choices.

This is exactly what happened to Rad's radio, a glitch, a slip, a who knows what caused the ram to malfunction rendering the radio inoperable. Loss of memory contents on the IC-271, IC-471, R71 and other models featuring the ram module with 3V battery backup cell will NOT kill the radio as reported on many web sites. Having no ram memory cannot kill a circuit featuring a cpu with address and data bus. Sure, the radio cannot be used since it needs to read ram contents to initialise the synthesizer with the correct frequency band depending on radio model. An IC-271 needs to know it's a VHF 144.000 to 146.000MHz radio etc when switched on, the memory content provides this data. We just need to reload the memory contents or firmware and the radio will be just fine. The ram is also used to store the programmable memories with frequency and mode, you will need to reprogram these memories after this repair. So, if one day you turn on your much loved IC-271 and all you see is 666.66 on the display, relax and continue reading.

Fig1 Corrupt ram contents

For Fig1, I loaded the entire contents of the ram module with zeros, as if there was no memory module plugged in or the battery lost power hence killing the memory contents. The uPD444 1K X4 bit static ram chip used for memory must have power on the Vcc pin to keep memory contents intact when the radio is powered down.

Rad's radio had corrupt memory contents and displayed the sixes, the display was erratic and although did update with VFO adjustment it simply would not get to the desired frequency. The VCO output was completely off frequency as the synthesizer has not been updated with correct PLL data. The memory is organised to write display info and PLL data keeping the VCO at the desired mixer frequency.

There are two web sites that feature programming software and details for the programmer hardware. I choose Andrew Gerald N2CBU attempt since the programming utility is comprehensive and the programmer hardware itself is very easy to make. You will need an older PC with a parallel port and DOS operating system to run the programming utility. The programmer is simply elegant and makes use of a single CD4040 counter to address the uPD444 ram and just 4 data lines for memory content, a 5V regulator and a few supporting components is all you need. You will also need a parallel port DB25 cable used on those old dot matrix printers you probably threw out years agoJ or you could just make up a cable with a couple of DB25 female connectors. Only 8 wires are needed from the parallel port to the programmer as seen in Fig2. I used a small piece of Vero board to assemble the programmer using pins from a header connector to mate the ram board to the programmer board, fig3 should be clear enough with my intentions.

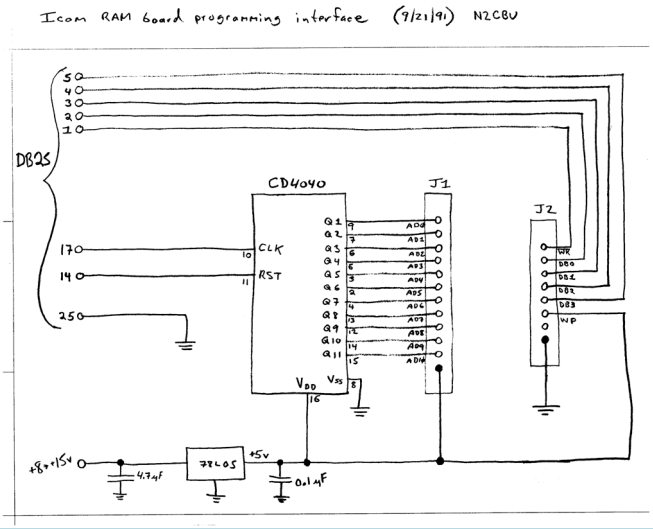
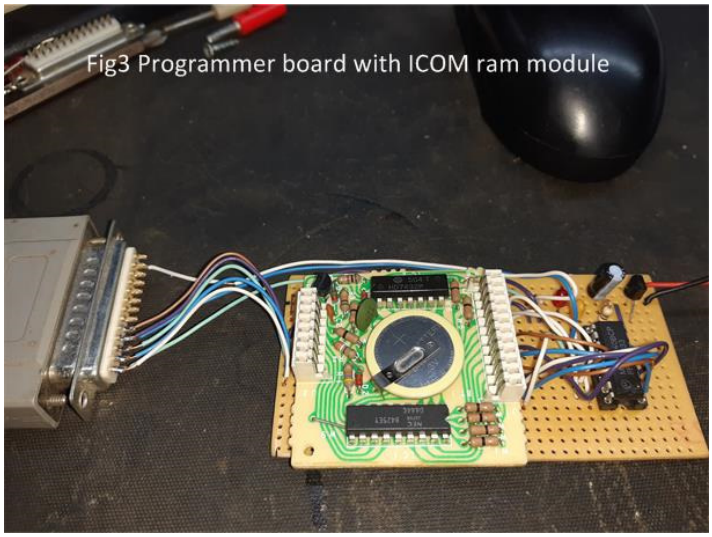


Fig2 N2CBU programmer schematic.

You're almost done. Unplug the ram board from the radio and sort out the battery first. If it does not read 3V then find a cell and make good the board. Don't worry about trying to keep the memory contents alive as described in the many on-line battery replacement procedure documents available. You only need to follow those procedures if your radio is fine and the battery voltage reads 2.99V – Do it soon!

Although the links to all files are listed at the end of this article I recommend you send me a mail on zs6ren@gmail.com and I will forward you the necessary files. There are other sites that have the firmware file for the various Icom radio's but did not work and I have not investigate this any further. Only the file



Pressing “P” will select one of three possible printer ports or LPT ports. Selecting base port 378 will link the programming to LPT1. This is most likely a DB25 port on your computers motherboard. Don’t try any of the USB to parallel adaptors or PCI add on cards with parallel ports on them, it will *not* work. Only motherboards that feature an on board parallel printer port printer will work. (L) load the firmware file from your directory called IC271.bin, the programmers hex display will present you with a bunch of numbers, Fig4, this is the memory content. Power up your programmer and press (W) write, the counter on the top left will indicate that the file is getting to the ram module. Once verified, that’s it! Power down, unplug the module and return to radio. The entire 2m band and more is now available.

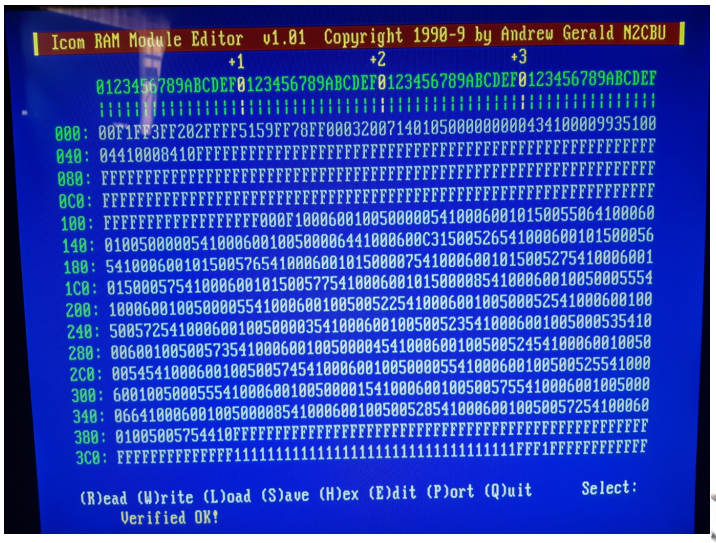


Fig4 Programming software with IC271.bin file loaded

Internet resources used for this project – http://n2cbu.n2cbu.com/ Download the “Ram Module Programming Utility” and make a copy of the ICOM-RAM.exe file. This is the programming software. Schematic and other info available in this zipped file. https://www.mods.dk/view.php?ArticleKey=cede2d63a7c04ebd4cb55a2228c7141a&i=1-icom-IC-271-Binaries-for-IC271-and-IC471 Here you will find the binary firmware file for the Icom IC271 , IC471 and R71. You must first register before you can download.

I would appreciate any feedback on this repair, please let me know if you have experienced this problem.

IC271.bin will work. This file was found on the mods.dk web site and will require registration before download is possible. I have used mods-DK many times in the past so please consider giving them a small donation if you get your radio working. It takes a lot of effort to keep these web sites running that we take for granted, buy the chap a beer! Download all the files and place them in a directory on drive C.

Plug the ram module on your programmer and run the program ICOM-RAM.exe you should see fig3.

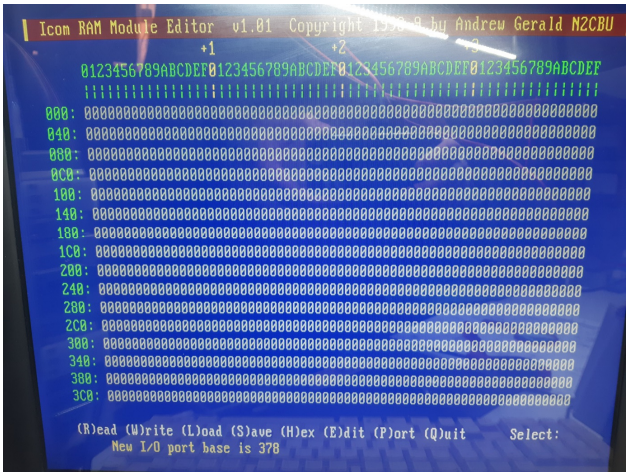


Fig3 Screen shot of the programming software

Here is a happy Rad with his working 271

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Antique Wireless Association of Southern Africa

Mission Statement

Our aim is to facilitate, generate and maintain an interest in the location, acquisition, repair and use of yesterdays radio's and associated equipment. To encourage all like minded amateurs to do the same thus ensuring the maintenance and preservation of our amateur heritage.

Membership of this group is free and by association. Join by logging in to our website.

Notices:

Net Times and Frequencies (SAST):
Saturday 07:00 (05:00 UTC) —Western Cape SSB Net— 3.640
Saturday 08:30 (06:30 UTC)— National SSB Net— 7.125; Sandton repeater 145.700
Echolink—ZS0AWA-L; ZS6STN-R
Relay on 10.133; 5.380 and 14.135
Saturday 14:00 (12:00 UTC)— CW Net—7025

AWASA Telegram group:

Should you want to get on the AWA Telegram group where a lot of technical discussion takes place, send a message to Andy ZS6ADY asking to be placed on the group. This is a no-Nonsense group, only for AWA business.
+27824484368

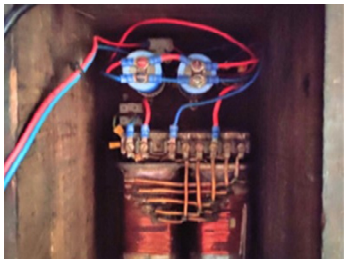
FOR SALE EX S.K. ESTATE:

B25 Green Army Radio Installation including Handset and folding whip antenna.

1. 1 PA Module , faulty, for spares
2. 2 Power supply modules for spares
3. 10 Misc modules for B25 ? Condition unknown
4. 4 photocopied Manuals
5. 1 Homebrew power supply complete with 4 pin power connector

All the above are in untested condition, however it is believed the radio receives. It belonged to a listener member. Transmit functions unknown.

Please submit bids to John ZS5JX, phone 0824865280 or
johnnormanzs5jx@gmail.com



Radiogram for sale, Edenvale.
Contact Johan: 083 506 4290

COLLINS Amateur Radio Equipment

75A-3 Receiver — The 75A-3 is a double conversion superhetrodyne designed for top performance in the 160, 80, 40, 20, 15, 11, and 10 meter amateur bands. A crystal controlled high frequency oscillator and highly stable low frequency VFO permit accurate calibration of two kilocycles per dial division on 10 and 11 meters and one kilocycle per dial division on all other bands. The Collins mechanical filter gives the 75A-3 the most nearly optimum selectivity ever achieved in a communications receiver.

32V-3 Transmitter — A completely self-contained VFO-controlled, gang-tuned, bandswitching, amateu transmitter rated at 160 watts input on CW and 14(watts on phone. The excellent audio in this little receiver-size rig is engineered to punch through the QRM. It covers the 80, 40, 20, 15, 11, and 10 meter amateur bands and is thoroughly filtered and shielded to reduce spurious radiation to a minimum.