



Volume 31 No. 5
April 2022

S.A. Group Newsletter

This is the most ingenious valve ever developed – but what is it?
Why was it developed, and what does it do?



Inside: Find out a little more about this amazing valve.

Historical Radio Society of Australia Inc. – S.A. Group

Web Site: www.hrsasa.asn.au

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Committee for 2021-22

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Committee Member:	Peter Howard	0424 563 732	peterhoward2012@gmail.com
Committee Member:	Tony Bell	8269 4092	antony.k.bell@gmail.com

Planned Meetings for the Remainder of the Year (all are tentative due to Covid-19)

Sunday 24 April 2022 (NOTE: This is Sunday of Anzac Day long-weekend)

1:00pm to 3:30pm

Book and Magazine Sale Day

Magazines, reference books, journals, textbooks, including lots of sets of collectable items, and 12 unsold radios are all available.

Go to the SPECIAL SALE DAY page of our website and see the Catalogue of items on sale. You can even download your own copy.

- St. Cyprian Church Hall - 70 Melbourne Street, North Adelaide, SA, 5006

Wednesday 11th May

12:00 noon (for a 12:30 start)

MEMBER'S LUNCHEON

Formerly known as the "Retirees" Luncheon, it is open to non-retirees and partners of members

- The Reeppham Hotel, 273 Churchill Road, Prospect, SA, 5082

Sunday 29 May 2022

12noon to 3:30pm (NOTE: The earlier start time)

BBQ Lunch and Home Visit

We will be visiting Phil Flaherty's "radio shack" adjacent to Goolwa Airport. Phil has a fabulous collection of military radios, receivers, and transceivers, plus an amazing workshop. Visit the Goolwa markets in the morning and/or arrive at noon to enjoy a BBQ lunch. We hope to also see a farm working dog display.

Sunday 26th June

1:00pm to 3:30pm

WOODEN RADIO RESTORATION (Part 2)

Our Member, Peter Howard will lead us through his professional methods of stripping, sanding, repairing veneers and French polishing techniques

- St Cyprian Church Hall, 70, Melbourne Street, North Adelaide, SA, 5007

Wednesday 13th July

12 Noon (for a 12:30 start)

MEMBER'S LUNCHEON

Formerly known as the "Retirees" Luncheon, it is open to non-retirees and partners of members

- The Reeppham Hotel, 273 Churchill Road, Prospect, SA, 5082

Sunday 31st July

1:00pm to 4:00pm

AGM and AUCTION

AGM and election of Office bearers for 2022-23 followed by a regular club Auction

- St Cyprian Church Hall, 70, Melbourne Street, North Adelaide, SA, 5007

Sunday 28th August

1:00pm to 3:30pm

EDDYSTONE TRANSCEIVERS - "SHOW & TELL" - PLUS A BOOK SALE

Members who have any model of Eddystone are invited to bring them along and talk about their

history, restoration and performance.

- *St Cyprian Church Hall, 70, Melbourne Street,
North Adelaide, SA, 5007*

Wednesday 14 September

12noon (for 12:30pm start)

MEMBER'S LUNCHEON

Formerly known as the "Retirees" Luncheon, it is open to non-retirees and partners of members

- *The Earl of Leicester Hotel, 85 Leicester Street,
Parkside, SA, 5063*

Sunday 25th September

1:00pm to 3:30pm

AUDIOPHILES DAY - HOME VISIT

This meeting is the re-scheduled visit to Warren Lane's home that was postponed from last year -

It will feature Warren's collection of valve HiFi Amplifiers and his collection of broadcast radios

- *The address will be given directly to members closer to the date.*

Sunday 30th October

1:00pm to 4:00pm

CLUB AUCTION

This will be a regular auction - Members wishing to book a table (max. 20 items) please contact the Secretary in advance.

- *St Cyprian Church Hall, 70, Melbourne Street,*

North Adelaide, SA, 5007

Wednesday 12th November

12 Noon (for a 12:30 start)

MEMBER'S LUNCHEON

Formerly known as the "Retirees" Luncheon, it is open to non-retirees and partners of members

- *The Reeppham Hotel, 273 Churchill Road,
Prospect, SA, 5082*

Sunday 27th November

1:00pm to 3:30pm

**"ASTOR" BRAND RADIOS - "SHOW & TELL" -
PLUS A BOOK SALE**

Members who have any model of ASTOR Radio are invited to bring them along and talk about their history, restoration and performance

- *St Cyprian Church Hall, 70, Melbourne Street,
North Adelaide, SA, 5007*

Saturday 10th December

12 noon (for a 12:30 start)

CHRISTMAS LUNCH

Our annual Christmas Luncheon - Wives and partners are very welcome to attend

- *The "Maid of Auckland" Hotel, 926, South Road,
Edwardstown, SA, 5039*



"It's a new reality program. The screen goes blank for an hour so you can go out and experience real reality."

President's "Banter"!

"Don't lean on the meter bridge....."

From our President, Graham Dicker.



This month's topic is **"Don't lean on the Meter Bridge"** (NOT an April Fool's joke!)

This may sound like a strange heading, but it has a whole lot of useful thought behind it.

Back in April 2009 I undertook one of those tasks that at the time looked straight forward, restore a 20-year-old ABC "Outside Broadcast" van its Harrison 24 track console. A month's work tops for a semi-retired broadcast engineer. Now there is a lesson in this story (many actually.) While most HRSA members spend weekends working on restoring a single radio chassis, an entire OB van is a whole other project. As it turns out apart from stripping out all the old wiring removing old gear installing new patch bays, rewiring faulty snakes, there was the job of restoring the 24 Channel Harrison MR4 console.



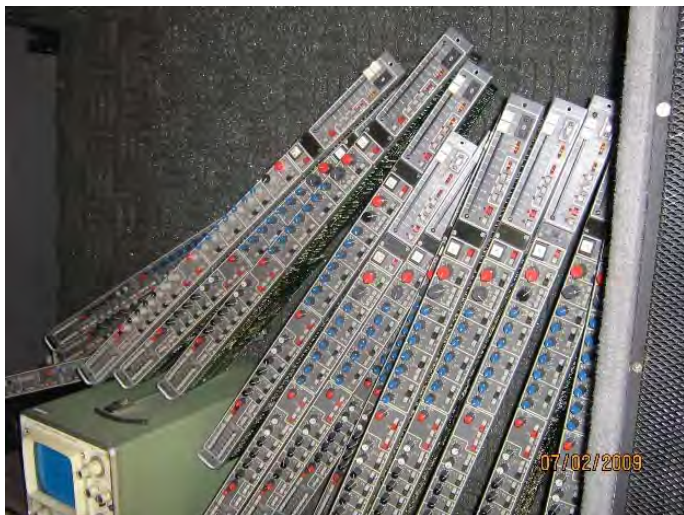
The Harrison is the most used console for sound engineering at major movie studios and soundstages in the world. Sonically it outperforms everything including Neve consoles.

When my mate Sandy Matheson purchased the OB van at auction no-one in the world would have thought that someone would actually try to

restore a 40-year-old console as well. The previous music producers and technical staff at the ABC who used to maintain the Harrison were in disbelief when they heard what we were about to do, in short, they thought we were nuts. It turned out the ABC had two of these Harrisons and one was used as spare parts to keep the other going. Even then the ABC could not fix all the faults and decided it was end of life both for the van the console, and the 3 permanent ABC maintenance engineers immediately retired once the van had gone.



The Harrison was originally a 24-channel console with a card frame and chassis to support up to 40 channels. When Sandy took possession of the console every module and the power supply were faulty. Some had come from the donor console some were original, different versions of boards, some sub-modules were missing but every single board was faulty. When the van arrived, the chassis was empty and there were some 50 modules just chucked in the OB van, not all were complete. (See photo below)



In a moment of entire insanity, we collectively decided that I would fix every module and make the console the only 40-channel one in the Southern hemisphere.



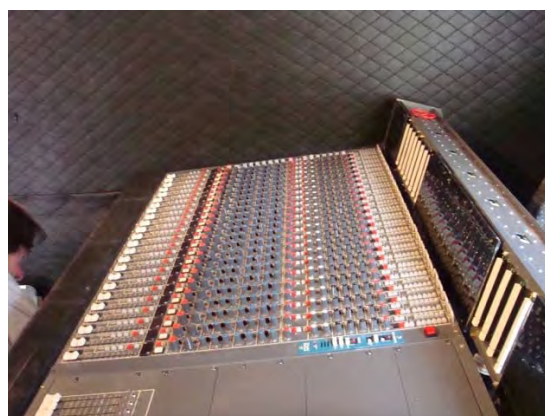
After contacting Harrisons in the USA, they intimated that it could NOT be done outside of their factory and were seriously concerned about our mental health, as every Harrison console in the world always had at least 2 maintenance engineers, just to keep them going on a daily basis! These are **very** complex beasts that practically every time you power them up (or down) another fault would occur.

Some 6 months later, working full time on the project 7 days a week, I had repaired and re-capped every module - some 10,000 capacitors all up. But reliability was still an issue and the amount of heat generated by the console was significant. We tried all the modifications we knew... adding extra cooling fans and ducting to get the heat away until I had a moment of genius when I worked out that every IC in the console had exceeded its MTBF by a factor of 10, every chip has lasted 10 lifetimes.

On that basis I removed 3500 IC's from the PCB's and installed milled pin sockets and new NE5532 and NE5534 IC's. The PSU current draw went down from some 35 amps at +/-24V to a more reasonable 18 amps and the heat generated also lowered considerably to about half.

This takes me to the title of this article *"Don't lean on the meter bridge"*. This may sound like a strange title, but in fact we ended up making up a computer printed sign which was placed on both sides of the console for people to read. As you can see in the photo below, the meter bridge is part of the console with its own backplanes which contained some 60 or so separate LED VU meters, each one with many chips, LED's and other parts, plus some European connectors into which every module plugged into the backplane. None were interchangeable and every single VU meter had to be calibrated on extender boards in situ, due to the active earth power supply system used.

As seen in the second photo, when plugging up channel cables etc. at the rear of the console it was common to steady oneself by holding onto the meter bridge. The problem was that everything was so cramped with the electronics that the slightest pressure anywhere on the bridge would result in either, or both 24-volt supply rails shorting to the virtual earth buss. When it did short it was spectacular! Cables would melt and the PSU crowbars with over-current would trip all the breakers and the 3 phase OB Van breakers would trip leaving you in complete darkness!!



After a lot of fault-finding hours, a design flaw was found. With the metal covers removed there was NFF (no fault found) but put the covers back on and the slightest pressure anywhere would bring on the fault! Without any screws in place there was no fault, but the VU meters would not operate properly due to noise from a lack of screening. The backplane has thousands of wires and busbars by

way of ribbon cables and connectors and just wiggling them around would not bring on a fault. Doing a binary search (i.e., removing half the modules, test again then remove half again etc. the fault was still not evident. It was more than 2 modules and less than 38 that would cause the failure.

In the end the sign reading "*Don't lean on the meter bridge*", ended up not being a temporary fix but a permanent one.

All up the restoration was 48,000-man hours plus parts, and took over 2 years to complete, my son Brenton in the photo above personally changed about 1800 IC's. The net revenue worked out at 25 cents per hour for the labor cost and about \$8000 in parts. The cost of a new console from Harrison

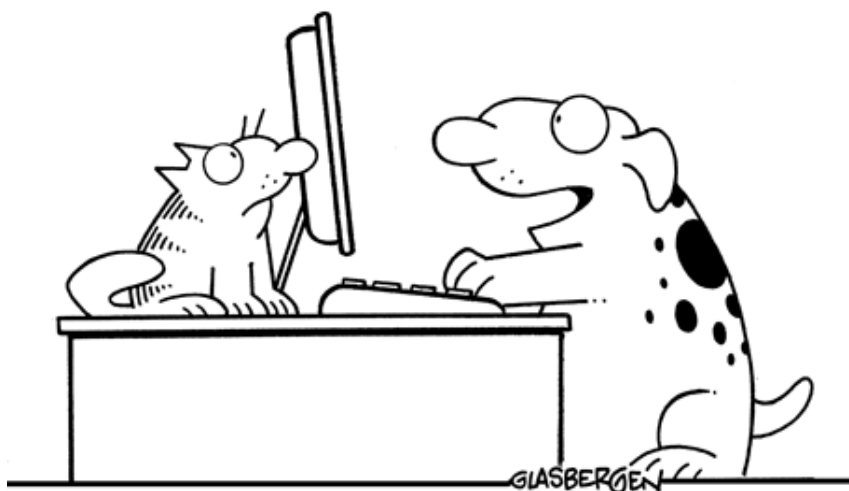
\$250,000 USD or landed with GST and freight about \$400,000AUD.



The fully restored, 40 track Harrison MR4 mixing console

Wanted to Buy, Sell or Exchange

Are you looking for a hard-to-get part? A strange knob, or a replacement coil? Have an item that you'd like to sell? Why not place a free, classified advertisement on our website? Go to the TRADING POST page of our website at: <https://hrsasa.asn.au/page-16/> and have a look at what's on offer right now and help a fellow member. It changes frequently. *Why not make use of this resource yourself?*



**"I'm starting my own Internet radio station.
Nothing but fire, police and ambulance
sirens, 24 hours a day!"**

Component Corner

Many new members are probably wondering where to obtain components and valves. The following is a list in order of preference:

- ☐ **HRSA-SA Group Shop** (See the Directory above). We are working towards a publishable catalogue.
- ☐ **AZTRONICS**, 170 Sturt Street, Adelaide. Houses the HRSA-SA Group valve bank and modern components. Will source components for members. Great supporters of the HRSASA.

- ❑ **HRSA** Melbourne (see *Radio Waves*) Houses the HRSA valve bank and odd passive components and kits, plus resource books written especially for members.
- ❑ **WES Components**, Sydney. The catalogue is viewable on-line and orders through the Shop Keeper or Secretary, as the SA Group has an account.

Photo Gallery: Recent HRSA-SA activities



Above: Wednesday 9th March – Member's Luncheon at the Earl of Leicester Hotel, Parkside



Above and next page: Sunday 27th February – “Fault Finding” Workshop



Above: Warren Lane working with Rob Doran



Above: Alan Taylor working on Peter Howard's radio



Above: Christopher Ratcliff working with Stephen Parker and Murray George



Above: Duncan, Norm and Mark working on identifying the "Mystery Object"

Below: HRSASA "Sale Day" on Sunday 27 March at the Church Hall



Feature Article – The Loewe 3NF Multi Valve

Transistors and integrated circuits (I.C's.) are so commonplace in the world of modern electronics. Most people assume that "integrated circuits" were developed to save space and cost as technology developed. "Miniaturisation" would seem to be a logical motivation for sequential development from large, glass envelopes of the 1910's to today's tiny, very sophisticated, low-voltage, low-current components. But this is NOT the case!

The Loewe 3NF is one of the most ingenious of radio/wireless inventions which hit the UK market in 1926. This valve, which is really three valves in one, contains within its glass bulb, all the components necessary for a detector and two-stages of resistance-coupled low frequency amplification, namely, three valves, three anode resistances, two grid-leak resistors and two coupling capacitors! The valve itself was seen as a miracle of ingenuity when fitted with the necessary tuning apparatus. The result? A a loudspeaker radio receiver compressed into a minimum of space!

But why did this happen? Was it for miniaturisation, or something else? No – It was for taxation purposes!!

In the UK, the government realised by the mid 1920's that radio was taking off, so a tax was put on the number of valves in a radio device, payable by manufacturers. Radios were becoming more sophisticated in design and performance. More valves meant greater revenue for the government, so the manufacturers had to find a way to push back against this imposition, hence the development of the Integrated Circuit or multi-valve.



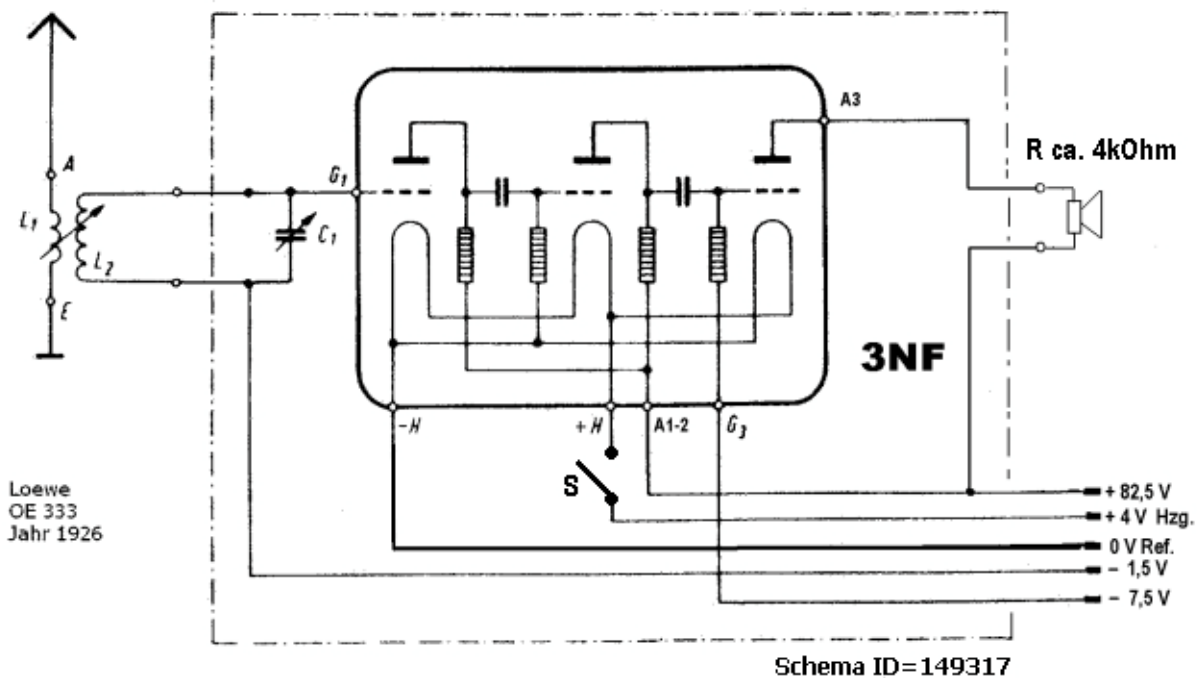
Above: Two Resistors and one Capacitor inside each tube – Repeated on the reverse side.



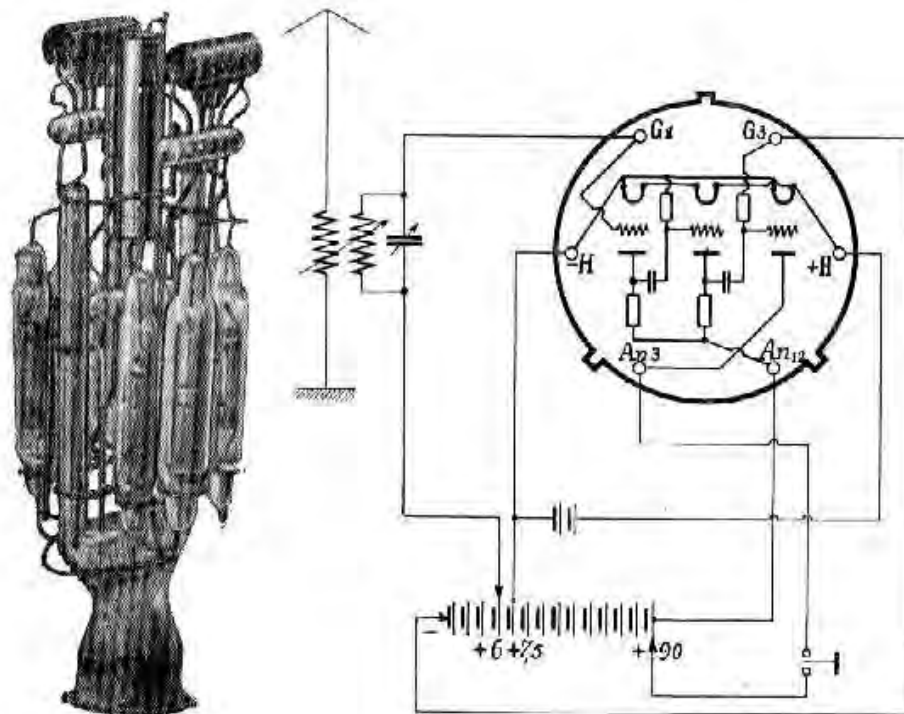
Above: 3 Triodes are located above the passive components. Two triodes mounted horizontally and one vertically between them.

How was the 3NF used?

The Loewe Company developed the equivalent of a 3-valve radio using 1 x 3NF and two interchangeable, plug-in coils. The set worked quite well on a 90volt battery with very good and pure results, with adequate strength for loud-speaker reproduction. Of course, the two resistance stages do not give the same amplification as a resistance and transformer stage. The set functioned admirably as a local receiver with alternative stations available by changing coils!



Above: The Result? The Loewe OE333 Receiver that the 3NF was designed for. The wide glass envelope is 46mm in diameter, and excluding the base pins, is 154mm tall.



Above Left: The 3NF components minus the glass envelope

Above Right: Schematic of the 3NF valve's functions

Loewe Multi Valve Repair Policy

The initial cost of this (virtually) 3-valve set, brought radio within the reach of those who previously could only afford a crystal set. At the same time, the company announced that any 3NF that burned out one of its filaments, could be returned to the store and be repaired. There was a fixed price of 16 shillings and sixpence for this repair, which was less than the price of a super-power valve. Once a Loewe receiver was purchased this would be the only ongoing cost to the consumer.

Cost in today's market

Looking online at various radio collector websites, the 3NF sells in a range from about \$180.00 US (Feb 2020) to \$652.00 US (Nov. 2014) so they are quite collectable.

Find out more

This 3NF is currently held by Mr John Crawford, (HRSASA Treasurer.) John will be demonstrating this valve and other items at a forthcoming presentation ***"The History of the Philips Transistor and IC Manufacture in South Australia"*** with Mr. David Murphy (Audio Engineering Assoc.) as part of the SA History Month celebrations on Wednesday, 11th May at the Parkholme Library, 1 Duncan Avenue, Parkholme SA 5043 from 6:00pm to 7:00pm. For more information, or to book a place at John and David's presentation, go to: <https://festival.history.sa.gov.au/events/the-history-of-the-philips-transistor-and-ic-manufacture-in-sa/>

...oooOOOooo...

Another Puzzling Mystery!

Long-standing HRSASA member, John Wagener sent in this photo. It's a shot of his cat 'Paula' looking for the mouse. *(Can anyone spot it? – The answer is at the foot of this page!)*



John Wagener's cat photo - puzzle... Sorry for a bit of (deliberate) confusion. He's referring to the *Astor Mickey Mouse* radio that's above Paula's head. He thought she looked a bit puzzled!!