

# Vintage Radio

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## Traeger's first pedal radio & other replicas



This is the view inside John Sheard's replica pedal radio. The degree of authenticity is astonishing.

**I never cease to be amazed at the vintage radio collections that some enthusiasts have. One such enthusiast is John Sheard of Mt Gambier. He not only has an impressive collection of vintage gear but has built some impressively realistic replicas as well.**

**S**OMETIMES, while searching for vintage radios, you get a real surprise. One such instance happened to me a couple of years ago when I visited John Sheard in Mount Gambier, to see his collection of vintage sets.

When I got there, I was immediately

ushered down the hall to the room where his collection was housed. And did I get a shock because there in the corner was what appeared to be one of the original six pedal radios built by Alf Traeger in 1929, for use in the Aerial Medical Service (the predeces-

sor to the Royal Flying Doctor Service).

In researching my book, "Outback Radio from Flynn to Satellites", I had previously concluded that none of these original sets had survived and yet here was one fully restored. I just couldn't believe it. Then John let me into the secret; this set is a replica of the original and matches it closely in nearly every detail.

In fact, he had used the information in my book, including the photos and the circuit, to build this great working replica.

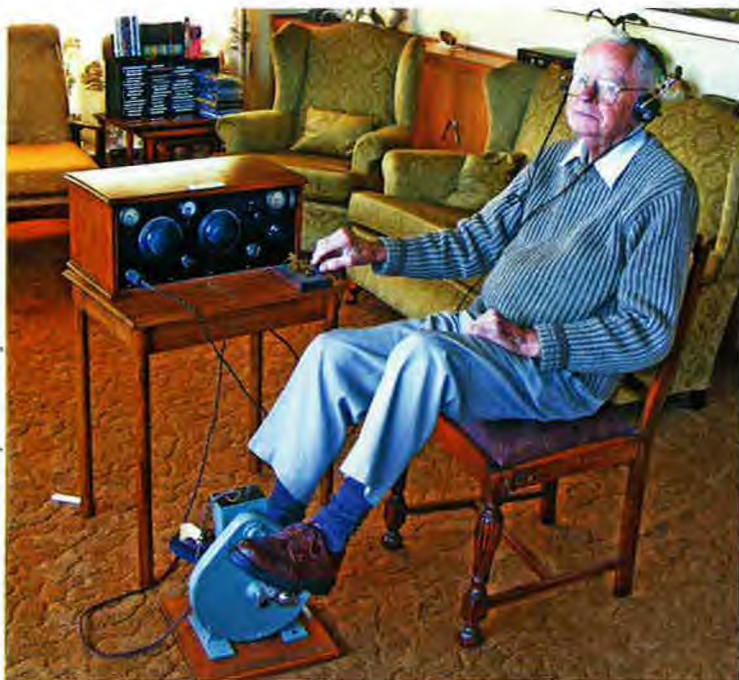
Back in 1928, Alf Traeger, with help from his mentor Harry Kauper, built what proved to be the first transceiver capable of being used by non-technical people in remote areas without mains power. This meant that the transceiver had to be frugal in terms of power usage and in order to generate enough energy to operate the transmitter, a high-voltage generator was used. The final testing of the first practical pedal radio took place in November 1928.

The pedal radio transmitter used a single B205 triode as a crystal oscillator-cum-output stage. The transmitter had an output power of 1-1.5W on Morse code at a frequency of 2230kHz. It was a Morse code-only transmitter as Traeger, Kauper and many others had told the Reverend John Flynn that voice transmissions were not practical at that time due to the high power consumption of such transmitters.

Indeed, "low-power" battery valves suitable for use in voice transmitters did not become available until the mid 1930s.

The receiver in the pedal radio was a 2-valve regenerative TRF (tuned radio frequency) unit. It employed two A141 space-charge tetrode valves that required no more than 20V on their plates, although in this set only 9V was used. There was just one tuned circuit but two separate coils were used to gain the necessary coverage. One coil allowed the set to tune the broadcast band while the second coil is believed





The photo at left shows John Sheard posing with his replica pedal radio while at right is Alf Traeger with an original.

to have tuned from around 1.5-4MHz.

The original pedal radios were located in the hot and often humid areas around Cloncurry in Queensland. As a result, their dry batteries had a relatively short shelf-life. It was for this reason that 1.5V and 3V supplies were used for the valve filaments in the receiver and just 9V for the high-tension (HT) supply.

By contrast, it was necessary to use much higher voltages for the transmitter and dry batteries were unsatisfactory for this work. To solve this problem, Traeger developed a pedal generator that produced nominally 180V of HT and this proved adequate for the transmitter.

### John's replica pedal radio

Although John would have liked to have built a completely accurate replica of the original Traeger pedal radio, many of the original components are unavailable today. The wave-change switch is a standard Oak wafer switch, not one of Traeger's home-made ones, and many of the other components are items as close as John could either obtain or make for the set.

None of the valves were obtainable so John initially put FETs inside old valve envelopes to take the place of the original A141 valves used by Traeger. He also used a B405 valve instead of a B205 in the transmitter. The main difference between the B405 and the B205 is the required filament voltage.

The A141 valves were eventually

replaced with B443 valves and the FET mock-ups discarded. Although the B443 is not even a near-equivalent to the A141, John found that they worked like the A141 in this circuit. It really is the best compromise solution achievable, considering A141 valves are now rarer than hens' teeth.

John built the pedal generator with help from his son Trevor. It consists of a low-voltage generator that puts out about 6V and this is then stepped up to

around 180V via a transistor inverter.

Because he holds an amateur radio licence (VK5JA), John installed a crystal in the transmitter so that it operates on the 3.5-3.7MHz amateur band. Both the transmitter and the receiver work well and John has had quite a few contacts with the set.

As I said earlier, this replica initially fooled me so John is to be congratulated on the detail he has achieved.

By the way, if readers would like to



This working replica of 1902 coherer detector receiver is similar to those used by Marconi in the early days of radio.





A feature of John's collection are some impressive display boards. This one shows a range of different valve types.



Another display board, this time showing a range of vintage-era fixed and variable capacitors.



A replica 1915-era crystal receiver. These were widely used until valves became in the early 1920s.

read more about the development of radio communications in the outback, my book "Outback Radio From Flynn To Satellites" is still available from me for \$30 plus \$5 postage.

### Miniature 6-valve superhet

Another of John's challenges was to build a miniature 6-valve superhet receiver and the set he developed fits comfortably in the grasp of one hand. However, the chassis isn't particularly crowded and the set could have been made even smaller.

The valves are all sub-miniature mains-operated types that are not readily available in Australia. The oscillator mixer is an XR9, which is a twin triode, and this is followed by a 2-stage IF (intermediate frequency) amplifier tuned to 455kHz using two EF70 sharp

cut-off pentodes. Solid-state diodes are used for the detector and AGC functions, while an ECC70 twin triode is used as an audio amplifier and phase splitter. This feeds another two ECC70 twin triodes wired in push-pull parallel as the audio output stage.

The IF transformers and the tuning gang are all types commonly used in transistor radios. These have helped to keep the size of the set down. The HT (high tension) for the receiver is only 90V, so these parts are not unduly stressed.

The only section of the receiver not inside the cabinet is the 36V AC plug-pack supply. I'm sure that John could have fitted the pack inside the cabinet but he chose to keep it external. The 36V AC is applied across the valve heaters (which are connected in series)

and also goes to a voltage multiplier circuit which produces the 90V HT for the plates.

All in all, it's an interesting little receiver that sounds very pleasant in operation.

### Display boards

Most vintage radio buffs know what each item in their collection is and can tell you something about it but not many label their prized possessions, even if they are on display. In fact, this also often happens in museums, particularly the smaller ones. It is disappointing to see items on display and not know what they really are or at best, have only limited information on them.

John labels the majority of his displays and it is easy to learn a little



about what particular items are.

For example, there are two displays of valves, one covering most of the valve era and the other only triode valves of the 1920s. John endeavoured to sell these displays some time ago but was not offered a reasonable price for them. Afterwards, he did a check on the individual going price for the valves in the displays and got quite a shock, as their value is greater than he initially thought.

Another of the displays is of older fixed and variable capacitors – types that many younger collectors are unfamiliar with.

We've had mobile phones now in one form or another since the 1950s. I visited the Ansett Museum in Hamilton and saw some of the early units. Mobile phones at that time were the province of the rich and only about 50 subscribers could be accommodated by any single PMG telephone exchange.

The system was largely a manual system whereby the mobile user would call the operator who would then connect them to the called party. When a caller from a fixed-line phone made a call to a mobile subscriber, the telephone operator would call the particular mobile via a tone encoder system.

The equipment used was large and sets such as the AWA MR10 VHF transceiver were used. It was usually mounted in the boot of the vehicle due to its size. There was no privacy with this system as anyone with a suitable FM VHF receiver could listen in to the phone calls. However, scanning receivers were uncommon at that time so conversations were reasonably private.

John's display doesn't go back that far but he has quite a selection of equipment on display, dating from the late 1980s through to the end of the CDMA era. Early 1980s mobile phones were considerably more bulky than those of the late 1980s but were nothing like the units from the 1950s.

### Pyrox wire recorder

One of John's prized possessions is a Pyrox wire recorder, which was previously owned by "Border Watch", the local area newspaper.

Wire recorders were used before tape recorders came on the scene and John's unit was made during the 1940s. Wire gave way to tape as a recording



A general view of just some of the gear in John's collection. He has an impressive range of vintage and replica equipment, including some military gear.



This working unit is a replica of Marconi's first diode valve receiver, as used on the steamship Titanic in 1912. Note the brass fittings used in this model.

medium during the early 1950s.

What makes this particular recorder special is what is on the spool of wire. It records the official opening of the broad-gauge railway line between Wolseley and Naracoorte in South Australia by the Governor Sir Willoughby Norrie on February 1st, 1950. Other notables on the recording are the Minister for Railways, Malcolm Macintosh and the Premier, Sir Thomas Playford.

So we have in this one piece of

equipment not only an early audio recording device but also a priceless historical audio record.

### The Titanic

Many of us are familiar with the maiden voyage of the "Titanic" and its tragic end.

"Titanic" was equipped with Marconi radio equipment and John has faithfully reproduced some of this equipment using plans from Dr Peter Jensen's book "In Marconi's Footsteps





This Australian Army C42 military transceiver has 25 valves packed into a compact unit but is easy to open up for servicing.



John's Pyrox wire recorder was previously owned by *Border Watch*, the local area newspaper. Wire recorders gave way to tape recorders in the early 1950s.

– Early Radio”. A beautifully-made replica of the diode valve receiver used on the “Titanic” is the result of John’s efforts.

In order to make this replica plus a number of other items from the same era, John had to source a sizeable quantity of brass. This was an expensive part of the project, as it wasn’t readily available from local metal suppliers.

### The coherer detector

One of the early detectors used in the pre-valve days was the “Coherer” detector (see *Vintage Radio* for April 2010). John’s replica is of a 1902 model and is similar to those used by Marconi. They are certainly quite different to the small silicon diodes that we are accustomed to using today.

### 1920s crystal set

Another of John’s replicas is a crystal set of the style commonly used until around 1920 when valves became more than a delicate novelty. Despite the fact that they were only crystal sets, these early receivers would have cost a fortune to construct. Many had adaptable tuned circuits and matching networks so that the maximum possible signal level could be extracted from the antennas then in use.

### An early portable receiver

In the late 1920s, there were many hundreds of experimenters who built radio receivers to sell to people in their neighbourhoods. It was a time when commercially-available receivers were not common and those that were available were expensive.

In fact, John’s own father, a real “wireless” enthusiast, built a small number of sets in the evenings after his day-time work as a draper was complete. One such 4-valve portable receiver was housed in a wooden cabinet and features a loop antenna which sits behind the front cover of the receiver. This is simply swung out when the receiver is to be used.

The set is a battery-operated TRF design using an Osram S625 screen-grid RF amplifier. This is followed by a 615 triode detector and a further two transformer-coupled triode audio stages.

The S625 is unusual in that it is double-ended, with three pins (the filament and grid pins) at one end and the screen and plate pins at the other end. The valve is mounted with one





**This Ericsson 1-131MW wall-type telephone was made in 1907 and has been immaculately restored.**

end through a hole in the side of a copper box which also houses the second tuned circuit. This effectively keeps its input and output pins separated and shielded.

This was quite an innovative design for its time and John says that the set is quite stable and the performance is excellent for a receiver of its vintage.

### Communications in 1907

Another item that John has immaculately restored is a Swedish Ericsson 1-131MW wall-type telephone, made in 1907. This particular model was first introduced in 1890.

On a wall near the telephone is the telephone directory for the Mt Gambier exchange for October 1904. There were 47 telephone subscribers listed and there were two lines to Robe and Beachport, both towns further along the coast towards Adelaide. The hours of operation were 8.30am to 7.30pm Monday to Friday, 8.30am to 5.30pm Saturday and no service on Sundays. How things have changed since then.

### Accessibility

John also has a number of other

## Photo Gallery: Healing Golden Voice Console

**M**ADE during the 1940s, the Healing Golden Voice console model 577E, like all console radios, has acres of room around the chassis and speaker, so it's easy to service. It also gives much better performance than compact mantel radios, due in part due to its large, well-baffled loudspeaker. It is a 5-valve superhet and the valve line-up is 6J8G, 6U7G, 6B6G, 6V6GT and 5Y3G rectifier. Photograph by Kevin Poulter for the Historical Radio Society of Australia (HRSA). Phone (03) 9539 1117. [www.hrsa.net.au](http://www.hrsa.net.au)



pieces of equipment, mostly of military or commercial origin. One such item is a C42 military transceiver. There are 25 valves in the unit plus the associated components, yet it is easy to open up and access for routine servicing. That's because the set is built onto two main chassis and these hinge, allowing easy access to all components that may need attention at some stage.

On the other hand, his AWA AR8 receiver is a nightmare to service. This receiver uses two RF front-ends to tune from 14kHz to 20MHz.

In order to service either of the front-end units, the front panel has to first be removed along with a dozen or so knobs. That done, the connections to the main chassis have to be desoldered, then the sub-chassis for either of the front ends is unbolted after which the particular front-end can then be removed.

But that's not the end of it – the next task is to gain access to most of the components. To do this, a long needle-nose set of pliers and a slim soldering iron are needed. It is not possible to power the front ends up to check their performance in this state, although it's possible that the military had a jig to get around this problem.

In short, the AR8 amply demonstrates how difficult some pieces of equipment are to service, while the C42 transceiver is the opposite (see photo). Similarly, the AWA 617T 7-band receiver takes nearly half an hour to disassemble for service while a small Precedent 4-valve mantel receiver in my collection takes less than a minute.

### Military radio gear (25D13)

I could go on for some time but here is just a short list of some of the military equipment on display: AR8 and AR7 communications receivers, command transmitting and receiving equipment, an FS6 army transceiver (see May 2002 issue), a Bendix frequency meter and a 128 back-pack, 1W, 2-4.5MHz transceiver.

Many vintage radio buffs only collect domestic receivers even though our radio communications heritage covers a vast number of areas. On the other hand, a few collectors go well beyond domestic receivers and their collections can be extremely interesting. John is one of those people and I thank him for the opportunity to show readers his collection of vintage gear and replicas. **SC**