

VINTAGE RADIO

By JOHN HILL



Refurbishing a Trio 9R-59D communications receiver

One of my more interesting jobs recently has been the refurbishment of an old valve Trio communications receiver which I obtained for just \$100. Despite its age, the old Trio performs quite well.

Some time ago, I bought a Trio 9R-59D communications receiver from well known vintage radio collector, Peter Hughes. It's good to buy things from people you know because, in this instance, a service manual had been passed on down the line from the original owner to Peter and then to me some eight months after I purchased the set. You generally don't get that sort of service from your local junk shop or antique dealer.

My radio collection consists entirely of domestic radio receivers with two exceptions: the Trio communications receiver and a military transmitter/receiver, the latter an A510 wireless station of 1956 vintage. The army outfit doesn't turn me on at all and will probably go to the first person who makes a reasonable offer. The communications receiver, on the other hand, is of much greater interest.

The Trio is of Japanese manufac-

ture, is approximately 24 years old, has eight valves and gives continuous frequency coverage from 550kHz to 30MHz. Such a set can receive quite a wide range of transmissions.

A few domestic receivers can also cover this frequency spectrum but they cannot handle SSB (single sideband) transmissions. To make sense out of these "Donald Duck" like sounds, a receiver needs a BFO (Beat Frequency Oscillator) and that is one essential refinement a communications receiver is equipped with.

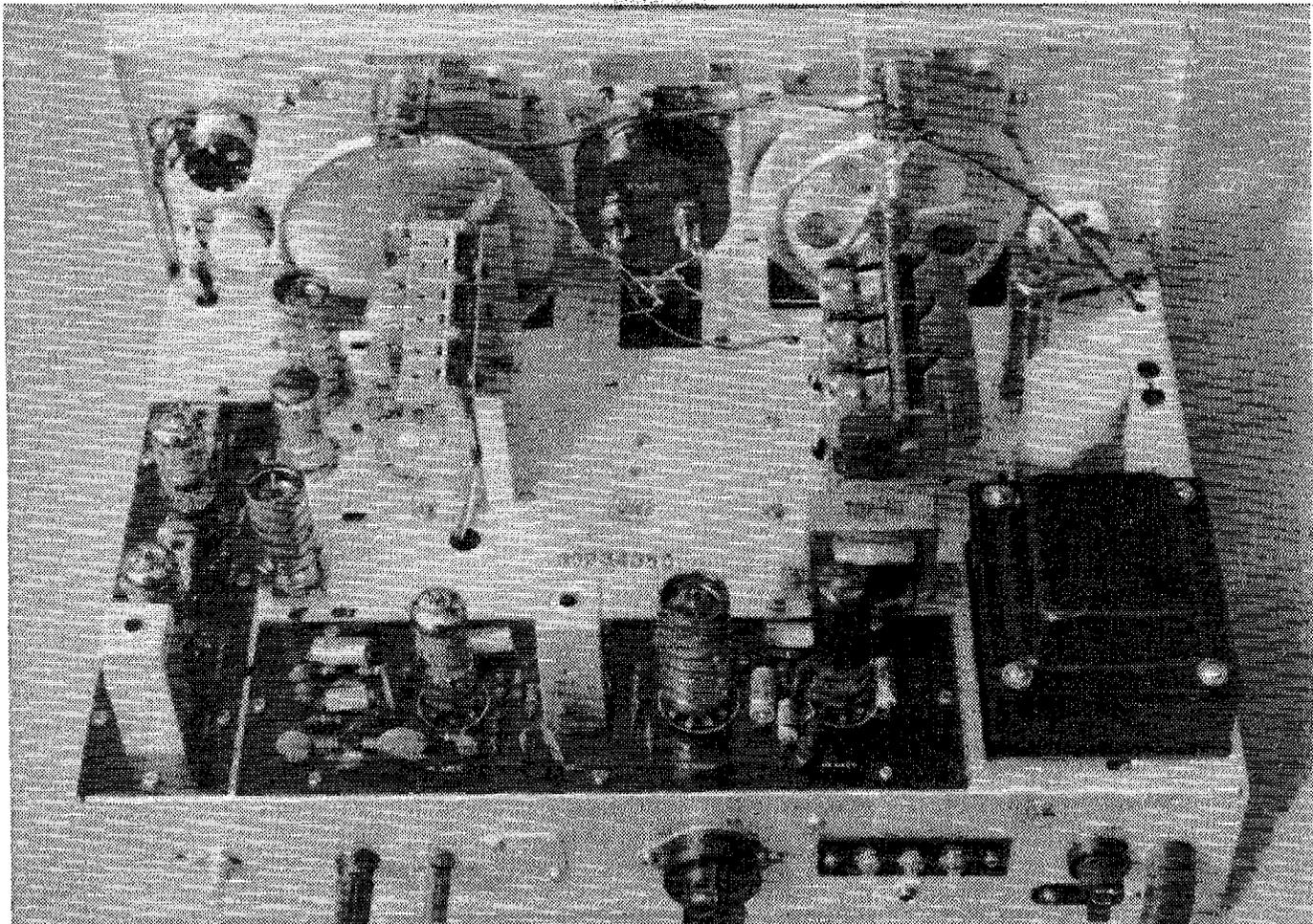
Now anyone who knows anything about communications receivers will know that the set I bought is generally considered a budget outfit. The Trio was built to a price and there is no way it can be compared with some of the more up-market equipment of either today or 20 years ago. It is not, never was, never will be, and was never intended to be the pinnacle of technological development.

However, at the time they were made, they were reasonably priced and the sets sold quite well. In fact, it reached a stage where there were enough of these receivers in use to warrant space in amateur radio magazines regarding various modifications that would help improve their performance. One such modification (the addition of a voltage regulator valve) had already been done to my outfit before I bought it.

I have photocopies of other suggested improvements but I will leave things as they are. There are a few grey areas regarding the Trio's circuitry and to tinker with things that one knows nothing about is inviting disaster. These so called "grey areas" are items such as the mechanical IF fil-



The Trio 9R-59D communications receiver. This particular unit is about 24 years old & although it looked a little unloved when first acquired, the set cleaned up rather well.



A top view of the chassis layout. Note that most of the valve circuitry is built onto two printed circuit boards.

ters and the product or "pro" detector which aids clear SSB reception.

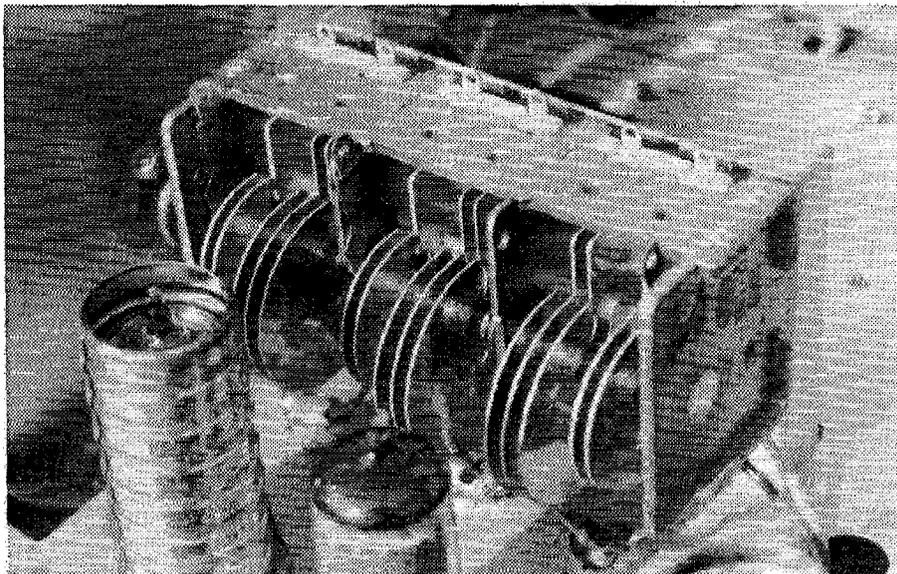
The alignment aspect of the receiver is also a bit humbling as there are nine coil slugs, eight trimmers and a padder. One really needs to know what to do otherwise the whole set can be easily detuned. But more about alignment later on.

Main features

If one has never owned a communications receiver before, the Trio doesn't seem a bad outfit. When there is nothing else to compare it with, the Trio is an impressive box of tricks that has many features not found on domestic receivers.

These extras include: two volume controls (RF gain and AF gain), an S meter to indicate signal strength, an aerial trimmer, a band spread tuning capacitor, and the previously mentioned BFO. In addition, there is a band selector and a function switch, plus a headphone jack for personal listening.

Now that's a lot more knobs and gadgets to play around with than most

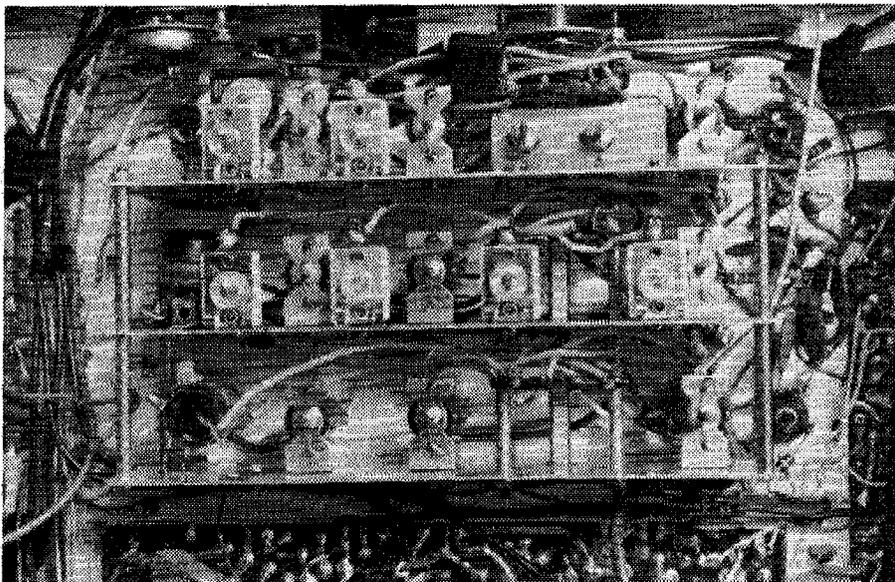


The bandspread tuning capacitor takes the worry out of fine tuning.

receivers have to offer!

At the back of the receiver there is a control to zero the S meter needle, aerial and earth connections, and three terminals for a loudspeaker connec-

tion (either 4-ohm or 8-ohm). I did a little modification of my own here and fitted a 3.5mm mono socket so as to accommodate the plug on my wall speaker lead.



This under-chassis view shows the various alignment components – no less than nine slugs, eight trimmers & a paddler. The factory alignment instructions (in the manual) are essential for aligning the receiver correctly.

There is another of my modifications on the back panel. The sound reproduction was so harsh I fitted a “top-cut” switch to make the set a little more listenable. It’s just a small capacitor across the primary of the output transformer and this reduces the high-frequency response enough to remove the original harshness.

Repairs

The Trio was fairly dusty when I bought it and had the appearance of being unloved for quite some time. This was soon remedied by a good clean up and all the painted surfaces were given the treatment with auto-

motive cut and polish compound. The set came up looking like new.

Very little was needed in the way of repairs. The Trio is a relatively modern set and is built mainly on PC boards using small modern components. The usual “replace all the paper capacitors” routine seemed unnecessary even though there were a couple of paper capacitors underneath the chassis. The high voltage electrolytics checked out OK and were left in place too.

Even the valves tested OK with the exception of the 6AQ5 output valve. This is not surprising because most used 6AQ5s test poorly and they seem

to have a relatively short life compared to many other valves. A near new 6AQ5 was installed so as to keep the valve complement up to scratch.

Incidentally, there is no rectifier valve in this particular radio receiver. The silicon power diodes used in the high tension supply are original equipment.

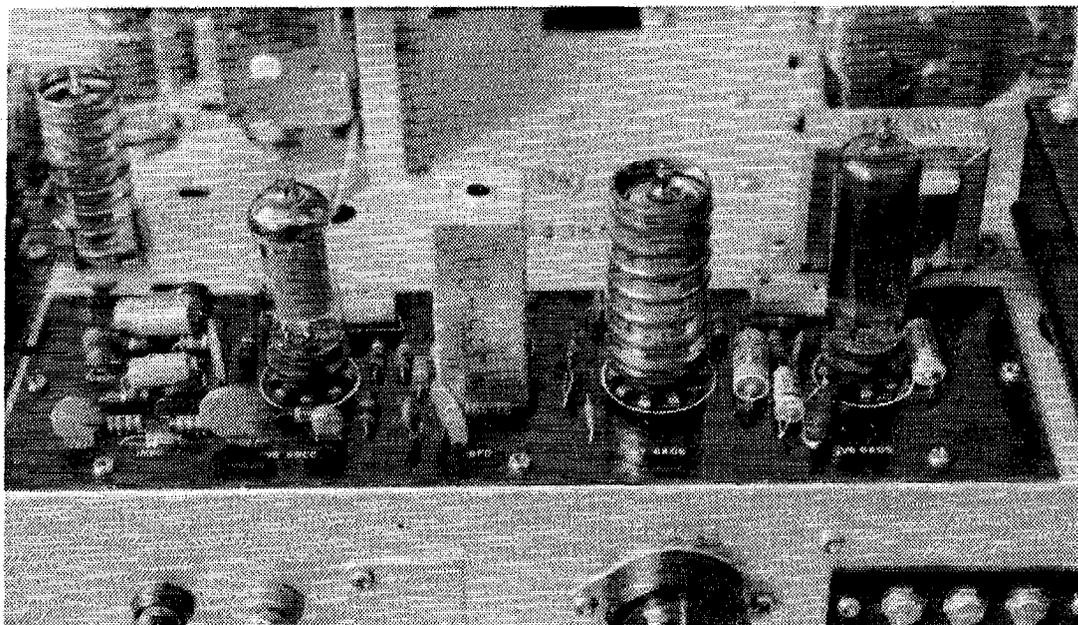
One part of the set that did need attention was the dial stringing. The Trio has two dials and two tuning controls. One is for general tuning, while the other is for bandspread tuning. Both dial cords were quite tatty looking and were replaced. The bandspread dial cord is driven by a very small diameter shaft which seems to fray the cord much faster than a larger diameter shaft.

Alignment

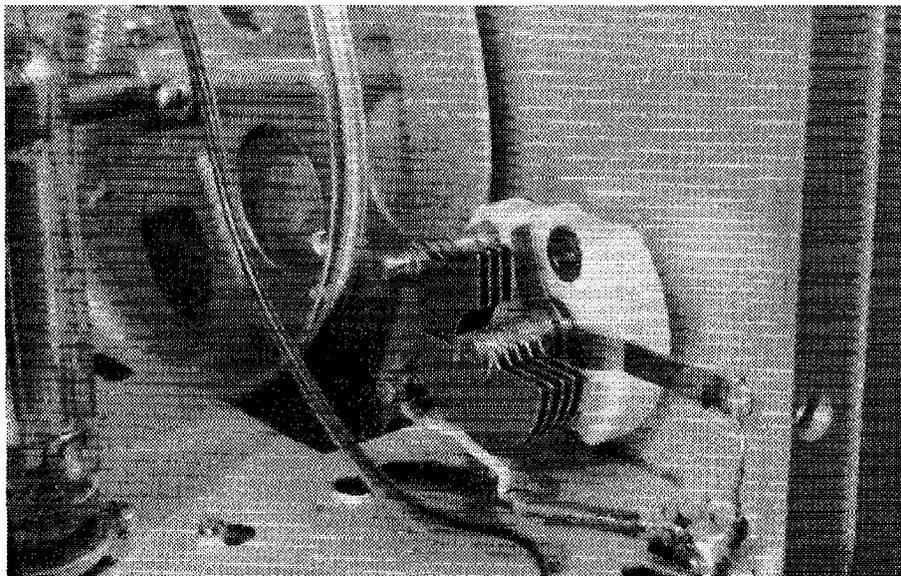
At this stage, it was tryout time and I must confess that I was a little disappointed with the set’s performance. It could only be described as “mediocre” and gave the impression that the set was out of alignment. An 8-valve set should perform much better!

However, at that stage I had no alignment instructions and that formidable array of coil slugs and trimmers was a frightening sight. Unless one is really familiar with the set, these controls are best left alone. It’s not hard to completely detune a receiver when you don’t know what you are doing.

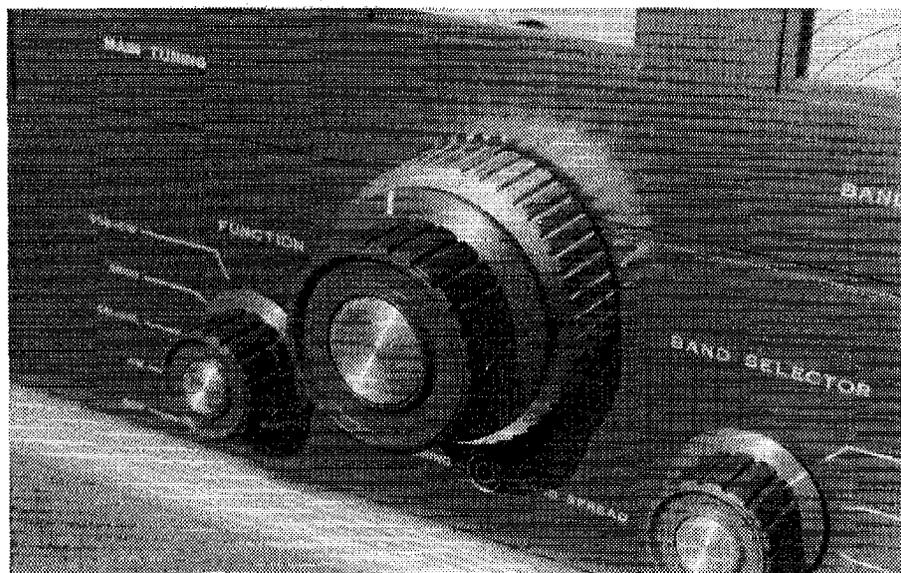
One thing that was noticeable was a slight double peak on the S meter. The meter, which is connected into the IF circuit, showed two peaks when



Many of the parts in the old Trio are mounted on one of two PC boards. Not many valve receivers were built as neatly as this one.



This small variable capacitor adjusts the BFO so that CW (Morse code) & SSB transmissions can be properly received.



This close-up view shows the tuning controls. The large knob in the centre provides the main tuning, while the smaller concentric knob provides bandspread tuning. The control shafts are connected to their respective tuning capacitors by dial cords.

tuning across a station. This is a fair indication of misalignment problems and a thorough tune-up was definitely in order.

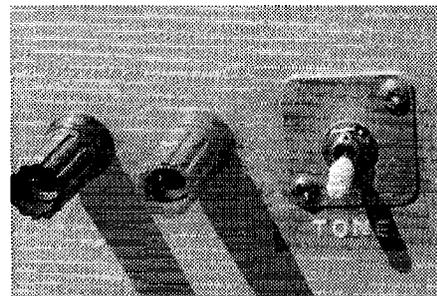
Fortunately, the instruction manual sent by Peter Hughes arrived just at the right time. It contained full details on how to align the receiver using a radio frequency generator – just the information I was seeking.

The alignment procedures were quite detailed and involved no less than 16 individual steps. These steps need to be completed carefully if the alignment is to be accurate. When injecting the generator signal into the

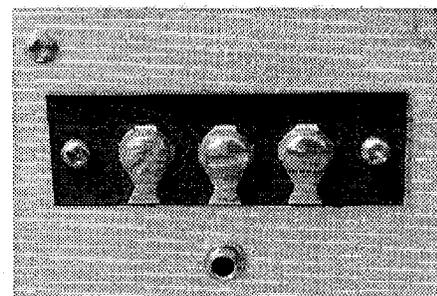
set via the aerial and earth terminals, a 400Ω resistor is bridged across the terminals.

In order to obtain really accurate frequencies, a small modern receiver with a digital readout dial was used to calibrate the RF generator. Although my Heathkit RF generator is reasonably accurate, using a digital receiver to check the various alignment frequencies helped to keep the Trio's dial calibrations spot on. This is often not the case with mechanical dials, particularly with an out-of-alignment receiver.

Naturally, aligning the receiver in



A "top-cut" control was added to reduce harshness in the audio output. It uses a switch to connect a capacitor across the primary of the output transformer.



The rear panel carries output screw terminals for 4-ohm & 8-ohm loudspeakers. The 3.5mm mono socket below these terminals allows the use of a plug-in wall-mounted speaker.

the correct manner made a big difference to the set's performance and the improvement was quite noticeable. As a result of this, the old Trio is about as good as it is ever likely to be.

After comparing the Trio with a couple of other communications receivers (one old, one new), it seems to be a reasonable job for the price – especially the price that I paid for it. When connected to a good aerial and earth, it performs quite well and, no doubt, will keep me occupied for many hours in the future.

One particular use I put the Trio to is listening to the regular Sunday night chat by a number of Historical Radio Society members who have amateur radio licenses. This radio net comes on air around 8.30pm EST on or around 3.575MHz.

An interesting aspect of this Sunday evening session is that it was originally started by Peter Hughes (VK2-MLG) and Phil Ireland (VK2GJF). It therefore seems appropriate that I listen in on one of Peter's old receivers. Anyway, until I buy myself a modern communications receiver, the old Trio will have to do. **SC**