THE WEST RAND AMATEUR RADIO CLUB

January 2007
Volume 7, Issue 6

ANODE

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Editor's Comments

Volume 7 Issue 7 - February 2007

By the time you read this, it will nearly be Valentine's Day. You know what to do… Hug your radio.

Ham-Comp

There probably won't be a Ham-Comp meeting this month as I am being 'taken away'. Not by the men in white coats but by Edith.

Articles for Anode

Thanks to Stuart for a fine article on restoring an ancient transistor radio disguised as a "professional" product. He has spent a lot of time and effort in repairing a fine example of early transistor equipment. He also provided superb detailed pictures of the set. Unfortunately that made the Anode too large to send to you. So I had to remove some of the pictures. However this would make an excellent article for part of a ham radio web site.

In later issues of Wireless World the Eddystone receiver was panned as a good example of how not to design an H.F. radio. With its low frequency i.f. of 465 kHz, it had poor image rejection. It also did not have the high-level signal handling of the previous model

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Resurrecting an Eddystone Receiver

Special points of interest:

- Contact details on back page (updated)

[Resurrecting an old Eddystone EC10 MK2 Communications receiver.]

I am sure every radio ham knows about the famous Eddystone family of radios.

From 1926 to 1996 (when is was sold to Marconi) this company produced some of the finest communication receivers and I don't think there was probably a ship on the high seas that did not have at least one of their models on board.

As far as British ex-pats where concerned Eddystone was the radio to be found in every Englishman's home abroad.

One of the main features of the Eddystone family of radio's, especially from the 1950's was the superb tuning dial assembly which had a weighted fly-wheel attached to the main tuning dial via the geared assembly which allowed a very smooth and when needed fast, tuning with no backlash.

So what is special about the EC10 mk2 - It was first put into production in 1966 and although not Eddystone's first transistor radio it was the first of what has been called the "Compact Transistor Eddystones" For the 1960's this radio was compact and was hailed by the radio press at the time as being "Dinky and Attractive" So what was "Compact" for the 1960"? It measures

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Resurrecting an Eddystone Receiver

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32 x 18 x 15 cm and weighs in at 5 kg (minus the battery or AC power block) and it's only got 10 transistors!

It had 5 bands from 550 kHz to 30 MHz, AGC, BFO, CW filter, RF And AF gain and dial lighting. By 1969 the Mk2 was being sold with the additional controls of a Fine Tune and an S Meter.

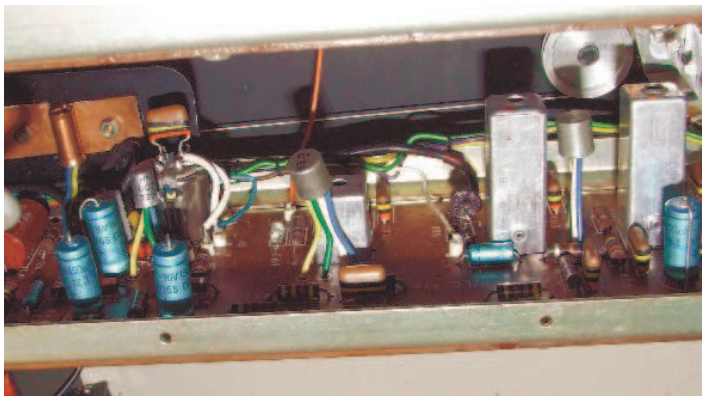
The radio had 10 Germanium transistors and 3 diodes all running with a positive earth i.e. the reverse of what we do now and its something to get ones head around when wiring up the battery leads. The radio is a single conversion with an IF of 465 kHz and the circuit is made up of the following:- 1x RF stage, 1x Mixer stage, 1x VFO, 2x IF amps, 1x BFO oscillator (which feed back into the 2nd IF stage when needed. Single Diode demodulation, 1x AF pre-amp and a class B push-pull final AF stage. 3 sets of RF coils for input, mixer/2nd R.F. and V.F.O., all Ganged together and tracked and wired into 10 switch tabs.

So what did I get for my money as far as a working radio went? Well first of all the radio was free, left at the West Rand Radio Club with a note saying "do what you want with it" from a fellow ham who must have been cleaning out the junk. So back to the Shack it went and the first thing I noticed was the Battery pack had been replaced by a rare Eddystone AC power pack the "924" 110/230 to 9v dc. Yep the radio works at 9v.

After checking, I found the rectifier had blown open and the 9.1v zener (used for regulation) was also gone. I only wanted to run the radio on battery's, so I just cleaned out the case and wired in a DC power connector into the Mains wire entry hole and wired the power leads directly to the radio power socket.

Then it was time to check the radio. Applied 9v and turned on. OK no smoke but also very little noise either. In went the Signal injector, AF and IF section OK (OK so I did blow the AF pre-amp transistor later) but the RF stages where all dead. Quick check with a voltmeter confirmed blown OC171 transistors in the RF/Mixer & VFO sections and considering what had blown in the Power supply I bet the radio had taken a Voltage hit down the AC line. The only thing not blown on the RF section was the 6.2v stabilizing Zener Diode - They made them tough in the 60's.

So what is man to do when his Germanium Transistors are blown and they haven't made them since about 1980, time to call John Brock!



IF & AF stage - notice the lead lengths on the transistors

One quick phone call and a second one to John Whitfield (ZS6WL) and some AF125/6 where on the way to me. Unfortunately ZS6WL gave me the wrong pin outs for the AF125/6 transistors; TO-50 cans come in two types so after blowing a couple and finding out what the problem was I had to find some more OC171 replacements. Craig ZS6CRW popped into Randpark Sound & Vision at the Randpark Mall and found me some ECG160's similar but in theory better versions of the OC171. Originally I was going to make the repairs look the same as the original. If you look carefully at the photo's you will notice all the transistors stand about 2 cm above the board. The new transistors don't have that long a lead so I now soldered them into the reverse side of the PCB. Germanium Tran-

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Resurrecting an Eddystone Receiver

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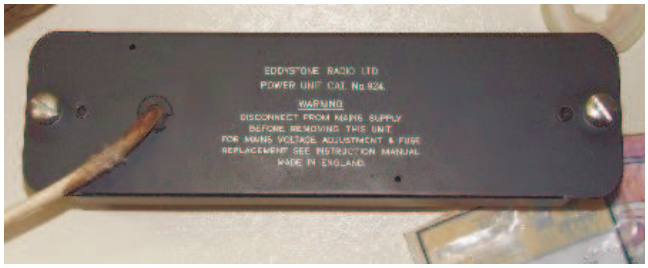
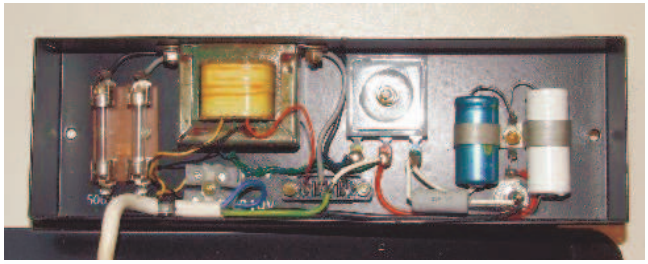
The Ec10 mk2 with external case removed

sistors of the 1960's/70's had a tendency to over heat on soldering hence the long leads.

Below the 924 power unit which slides into the back of the radio, replacing the 6 x 1.5v battery pack





The 924 pack opened

At the same time I replaced the OC83 (which I had blown) with a BC212 again on the reverse side of the PCB.

On turning on the radio (and checking Voltages on the Transistors) the IF/AF stages where 100% but there was still a problem with the RF stages. Only Band 3 was oscillating in the VFO and the front end was dead.

One of the big problems with old radios are the switches in the RF sections. The 2 RF stages and VFO stage where all ganged together and one wafer switch line with 10 sections of switching was being used to switch in or earth all the coils, all 15 of them

Now it was out with the switch cleaner. Isopropyl Alcohol was the choice as there is no residue left after applying. After about 15 minutes of cleaning and many turns of the switch, I turned on the radio. Bands 1, 2 & 4 came to life but band 3 was now dead and band 5 (MW) was in-

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Resurrecting an Eddystone Receiver

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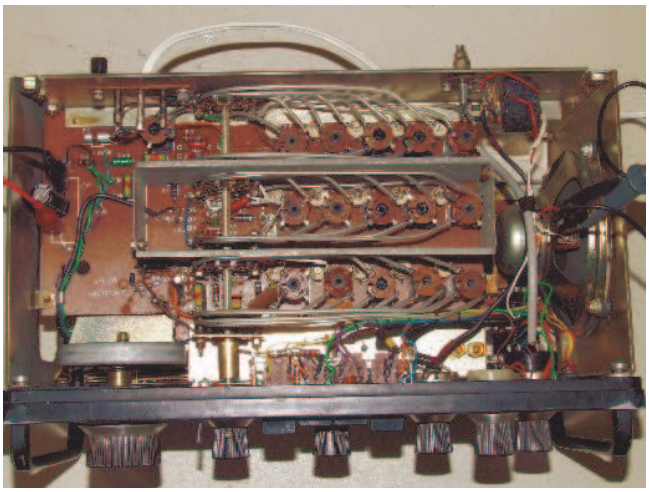
termittent. Out came the oscilloscope probes and a few more plays with the switch found the problem. When not in use the coils not being used are shorted to earth. DC earth was being obtained but so was RF earth via blown caps in the VFO stage on coils that need to be in circuit. Replacement caps where soldered in and the radio came to life. Obviously in the past this radio had gone wrong and the reason Band 3 was now not working was that its coil former needed to be retuned. Band 3 now came to life.

Transistor soldered to the under side of PCB BC212 replacing OC171

All that was now left to do was to re-calibrate the RF sections and sit down and enjoy. The IF cans where all looking good - Thankfully they are not easy to get at and no one had tried to play with them. They are notoriously fragile and not easy to replace. Some things are best left alone.

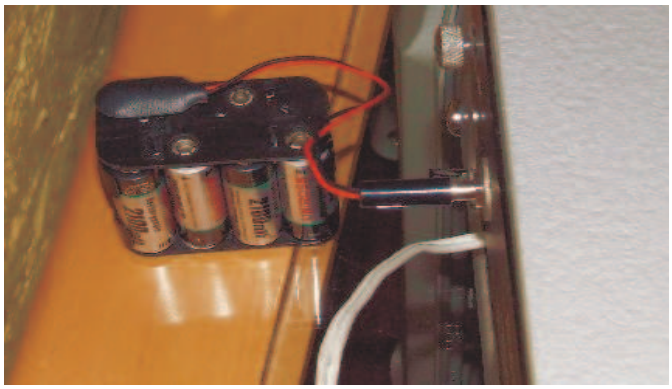
I only have very simple repair equipment and a RF signal generator is something I need but using my GDO and a freq counter I managed to tune all the RF stages into reasonable alignment. Good enough to sit down and enjoy a bit of old time dial twiddling.

So how does the radio compare to modern radios. Well the first thing is that SSB is a no-no.



Top view of radio showing RF stages

The weak BFO injection and lack of real band spread makes it impossible to really use above the 80 metre band. On AM broadcast though it holds its own up to about 17 MHz with my modern portable. Above 18 MHz the IF rejection and sensitivity is bad. To be fair I do need to get this radio onto a RF generator and tune it properly. For the tests I just used a 3m length of Arial [you meant aerial didn't you? Ed] wire, so give it some more and I think it will surprise me.



I cleaned up the case and front panels, made up a 9.6v NMH battery pack and now it is in my office giving me the BBC world service. Will give you all an update once its been given a good going over with a signal gen.

73's Stuart ZS6OUN

Ham-Comp revised aims - January 2007

Ham-Comp

Aims - To provide 'the club' with computers for Radio Amateur use.

Applications

1. Packet Radio using sound card
2. Morse reception and transmission using sound card
3. Radio Teletype (RTTY) using sound card
4. PSK31 using sound card
5. Slow Scan TV (SSTV) using sound card

Antenna rotator control - using the parallel port. Methods and how to achieve.
Logging (Automatic) - manual type / serial input.

Also desired

Test equipment - sound card and dedicated input.
In circuit and workbench software.
Printed circuit board / CAD - layout and design programs / software.
Development software.

Procedure

1. Setup 10pc's individually using boot-rom technology.
2. Install software applications.
3. Distribute to club members - the member undertakes to test, evaluated and report on software and hardware etc.
4. Logbook for each pc. (Suggested by Ron BHH)

Editor's Comments

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which was populated with valves. However that being said, if it wasn't used in the European area, it performed quite adequately. It was also considerably lighter than the earlier models. Later competitors used high frequency i.f.'s above the H.F. bands typically 35 to 45MHz. Also transistor mixers were shown at that time to have poor signal handling, so the trend was to use double-balanced diode mixers. These were usually preceded by a single stage R.F. amplifier to provide a small amount of gain on the higher frequencies where noise was less of a problem.

I also have an article by OM Joop about the fascinating subject of sun spots and their cycles. Look for that in later issues of the Anode.

73 JB

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Bulletins (Sundays at …)
11h15 Start of call in of stations
11h30 Main bulletin start

Frequencies
439.000MHz 7.6MHz split
Input: 431.4MHz (West Rand Repeater)
145,625 MHz (West Rand Repeater)
10,135 MHz (HF Relay)

Radio Amateurs do it with more frequency!

Chairman/Treasurer	Dave	ZR6AOC	475 0566 (H)	zr6aoc@mweb.co.za
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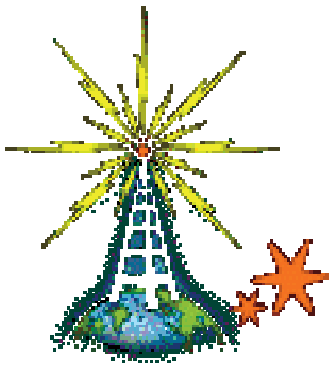
West Rand members - we need your input!

To make this the best ham radio magazine in South Africa we need your input. Please submit articles, comments, suggestions etc.

Please send plain text with no formatting to the email address below.

In July 2003, we re-published an Anode Compendium on CD. It has the issues from July 2000 until June 2005. This included the new Adobe reader. It has been updated, check with the chairman for details.



We need your input! Email us articles, comments and suggestions please.
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