

Lighthouse

The Magazine of
The Eddystone User Group

FOUNDED 1990

ISSUE 62
AUGUST 2000



THE NEW ZEALAND 'ATLANTIC TWO'

UNKNOWN
EDDYSTONE
DISCOVERED IN
NEW ZEALAND



EDDYSTONE USER GROUP

A non-profit-making group for Eddystone Radio Enthusiasts

Founded in 1990 by Ted Moore.

Issue No 62. August 2000.

Membership Details:

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ALL AIRMAIL OVERSEAS

De-luxe metal badge £2

Remittances must be in Sterling. (Regret no plastic).

Membership, badges and Magazine contributions:-

Graeme Wormald G3GGL. 15, Sabrina Drive, Bewdley, Worcestershire DY12 2RJ
Tel: (UK) 01299 403372.
g3ggl@euphony.net

Ted Moore's Mailbox:-

C/O Jim Murphy,
63, Wrose Rd, Bradford, West Yorkshire
BD2 1LN

Service manuals, back number newsletters and spare parts: contact:-

David Simmons,
Windana House, North Aston, Bicester,
Oxon OH6 4HX
Tel: (UK) 01869 347504
eddyspare@onet.co.uk

WE CARRY WANTED adverts for members only, but we carry FOR SALE adverts for anybody!! FREE. Send to Graeme (above).



WANTED: Eddystone 670A or 670C, also 870 or 870A. Also wanted Range 1 coils for 770R tuning turret (114-165mc/s). Telephone Geoff on 0151 489 7427.

WANTED: Good clean EA12, preferably restored to 'as new' condx. Contact C6ANI, PO Box N4106, Nassau NP, BAHAMAS.

FOR SALE: Eddystone Type 40A, HF noise-measuring Rx (QRN detector). Asking price £100 plus carriage or collect from Knightsbridge, London. Call Philip de Cadenet, 07970 546083.

FOR SALE: Stratton Speaker type S.478 (9" square in steel case), part of military VHF telephone set (1943) - S440/450 alias WS57 - as used cross-channel on D-Day. £15. STILL AVAILABLE, cogwheels as described in N/L Number 60 (for most Eddystone slide-rule sets) £5 set. Contact Anthony GW4RYK, 01686 630 255.

WANTED: Eddystone cabin Model 670C, good price paid for one in very good external condition (but need not be in electrical working order). Will pay carriage or collect. Call Graeme G3GGL on 01299 403372 (Bewdley, Worcs - West Mids).

FOR SALE: Eddystone 940, Ex-Govt., V.G.C. £140, Bill 01441-562-4571



Waiting for your
Advertisement



LIGHTHOUSE

Welcome to another edition of the Eddystone User Group newsletter. People have been very complimentary about the magazine feel to the newsletter. I understand that Graeme is giving some thought to a new title as it has now grown to something a bit more than a newsletter. Whatever the title is I am sure it will be a good one. *(Just in case you'd not noticed, it's now called 'Lighthouse' - Graeme!)*

Graeme has sent me the data sheet for the 1705 Series 500 Watt VHF/FM Broadcasting Transmitter. This transmitter was one of a series we created from 500W to 4kW using modules designed by BBC Designs Department and manufactured under licence by Eddystone from 1982 onwards.

The BBC modules were a big success for Eddystone during the 1980's and early 1990's, although because of a design fault on the power supply it very nearly broke us.

By about 1986 we had supplied over 500 of the power supply modules, which were one of the first high power switched mode supplies. They tended to fail dramatically taking out the switching transistors and the capacitors. We had supplied many to both the BBC and IBA and to a number of European broadcasters.

The power supply problems made them unreliable and although the BBC eventually re-designed the unit which proved very trouble free, they were loath to admit to the problems and we ended up having to replace several hundred power supplies with

the newer model. With some customers it destroyed our relationship completely and, even 10 or 12 years later, the problems of the power supply were trotted out (talk about the sins of the fathers!).

Anyway, during its lifetime we sold several thousand power supplies and amplifiers in many systems used throughout the world. The experience gained from manufacturing and designing systems gave us the confidence to take on bigger and bigger projects and eventually fully design our own FM transmitters, the B6600 series.

I would say that even now most of the BBC and commercial FM transmitters currently in use in the UK are based on the 1700 series of FM transmitters. You may start to see some modules come up on the rally scene as they go out of service.

I have had no replies to my request for ideas for a contest for G6SL. If you have any ideas it is not too late.

I had a request for information about the Marconi Marlin Transmitter/Receiver. This model was made for them just before I joined Eddystone in 1984. *(I've just had an e-mail from Richard to say he's had the info from Dave Simmons, - GRAEME)*

My best 73's

Chris Pettitt - g0ey0

Patron (chris@g0ey0.freemove.co.uk)

Further Notes on the

Eddystone 1837 Series

By Gary Donovan GW8BNL

After reading the excellent article by MWIDUJ in the April Newsletter and Graeme's comments in the June Newsletter, I thought some of my findings may be useful.

Graeme's comments about the 1837/1 having USB only were indeed correct; however it should not deter anyone from buying one of these fine receivers. They work very well on LSB, using the BFO and not the SSB button. Tuning LSB is then the same as for any receiver with a BFO.

The first Rack Mounting receiver I bought was the 1837/2. This had several faults on it. The Frequency Display was wandering all over the place and sometimes reading 98.6408.

It was worse on some bands than others, and was cured by spraying the Range Switch contacts with switch cleaner.

If you don't wish to go inside the receiver, then rotate the switch rapidly several times and the problem will usually clear. The fault usually occurs after a long period of non-use.

There seemed to be several problems with the selecting of various modes etc., with an extremely rough note on SSB, caused by SSB and BFO both being selected together.

Checking the switching circuits I found two faulty BC107B transistors (TR3 and TR4 on the Switchboard). These were replaced and cured all the switching problems and SSB was now fine.

The Receiver was working OK but after about three day's almost continuous use it failed, with no signals and a flashing Frequency Display! Checking around I found Fuse 1 (0.5

Amp) on the back panel blown, this was due to a short circuit Condenser C42 (10mfd 25volt Tantalum) inside the Tunable IF Module.

This is best replaced by snipping the old one out leaving its wires in place and attaching a higher voltage one to these wires. Remember to put it in the right way round.

The fuse was then replaced and the receiver worked OK. It has remained in use for around 2 years and gives excellent results with no further problems.

About 12 months ago I bought another 1837. This was a Marconi-badged 1837/1FS, known as the Pacific X. It was in excellent condition but not working.

When switched on it had a flashing Frequency Display with F1 blown and the same faulty condenser. This time the repair only took 30 minutes!

Having seen the fault on two 1837 receivers all I can say is beware! The 1837/1FS has seven digits in the display (only six on most 1837 receivers), giving 10 c/s resolution, and a 10 turn pot for the fine tuning.

If you should purchase an 1837 and the internal speaker doesn't work remember that pins 5 and 9 on the D15 socket on the back must be linked together.

Happy listening and remember if I can help with any problems similar to the ones above Graeme will give you my telephone number.



Eddystone User Group

ISSUE 61, August 2000



Founded and Presented by Ted Moore

Formatting & Distribution by Graeme Wormald G3GGL, Computer processing
by Simon Robinson M5P00

LIGHTHOUSE ?

What lighthouse? Well after more than 10 years Graeme has decided that we need a new name, hence the 'LIGHTHOUSE' title. We all know which one of course.

This is just the latest of the improvements to our Newsletter, which Graeme has made. I hope that none of you will object to my continuing to refer to it as the N/L in my text, old habits die hard. Ted.

DEMOCRACY

A letter from one of our newer members asks how we go about 'electing' those members such as myself, Graeme, Simon, Chris, etc., who run the EUG. Elect?

This is a dirty word. Look at the tricks that some of this country's elected folk get up to!

No, we are running the EUG because we want to, for the benefit of all members. So far we have not had any complaints about the hard work which goes into this job, and I do mean HARD work. It takes a lot of dedication to answer all of the mail from EUGers, to write and produce the Newsletter, to get it out to members every two months, on time. If this is undemocratic well we have the excuse that IT WORKS. Only twice, to my knowledge, in ten years has it been late in appearing*, not a bad record that. - Ted.

(*and that was due to illness at the
Eddystone factory - Graeme.)

From TED's Mailbox

FINALLY

One of the most disastrous Military Procurement programmes, the BOWMAN Project has finally been scrapped. Having already suffered cost over-runs which have cost a total of more than £340 Millions this project to produce a battlefield-secure communications system has suffered continual delays.

The result is that the British Armed Forces are still using the 60s and 70s technology CLANS-MAN equipment. The National Audit Office has finally decided that enough is enough. Having already cost more than three times the original estimated price and being seven years beyond the original completion date the funding has been cut off.

EDDYSTONE PRICES - 1982 VERSION.

A recent comment from Graeme to the effect that in a 1982 catalogue the rather humble EB35 Mk III was listed at £320 plus VAT. A sky-high price for a receiver such as that.

The 958/12 was a modest £7000 plus VAT, with the 990R coming in at a mere £1900 (plus VAT). This seems to show why more sales did not come along. There was inflation in that year but not sufficient to account for prices such as the above.

On the same theme I have received a couple of pages of adverts from the SWM of 1983/4. The adverts of interest are those for SECOND HAND

Eddystone equipment. I must have seen them at the time but have to confess that I found nothing untoward in them, THEN. Looking back though I was busy buying MY Eddystones at various rallies or club sales.

The EUGer who sent me these adverts has a lot to answer for. I have begun researching the prices of several key models down through the years, it is really astonishing. Look at these used prices for 1983:-

Eddystone.....840C.....£109.25
Eddystone.....730/4.....£149.50
Eddystone.....680X.....£166.75
Eddystone.....940.....£236.90
Eddystone.....880/2.....£420.00
Eddystone.....1001.....£517.00

As a comparison, the Cadillac of US-made Comms Receivers was listed in the same ad:- a Hammerlund SP600JX cost a mere £245.00. If you know the SP600 you will see my point. In the same ad for 1984 the 830/7 was listed at £460.00. Hands up the guy who said that second hand prices are at an all-time high?

RIAT 2000

Being located just across the road (A1) from RAF Cottesmore where RIAT 2000 was recently held I had both a good view of, and a good listen to, the Airshow.

The previous week of lovely summer weather turned to an almost winter-like atmosphere with low temperatures, wind, and a cloud level around 500 feet for both days. This limited the hoped for high level

aerobatics of many of the 350 attending aircraft but the Swiss Aerobatic Patrol with its rather venerable F5 Freedom Fighters gave a low level display on both days.

The Red Arrows did their part; however one of their planes suffered a bird-strike five miles out from take off on the Saturday a.m. It got back home to base safely; this left them one plane down but their display was little affected.

The sight of a luxurious DC4 of South African Airways to emulate a Heinkel bomber intent on blitzing Cottesmore Aerodrome, whilst being attacked by defending Spits and Hurricanes was a fine sight. The Father/Sister pilot and co-pilot of the DC4 played their part well right to the point where the attacker was forced down by the defenders.

The many modern fighters and fighter-bombers from East and West did their shows too, as did the monster Transport aircraft such as the Antonov and the Galaxy. For those with an interest in aircraft this was a chance to see them all, in the flesh so to speak.

The Air Tattoo featured its very own Broadcast Radio Station licensed under the 'Sally' scheme by the Radio Authority. Equipment was supplied for 'HARRIER FM' by British Aerospace and Rutland Radio, the frequency was 87.7 Mc/s.

Rutland Radio also helped with some of the programming. On the air for several days before

and after the airshow weekend Harrier FM provided full traffic info, airshow proceedings, and even some 'from the cockpit' dialogue as the various pilots put their planes through the allotted performance.

AERIALS AT GROUND LEVEL.

EUGer John has a 1002 receiver which he has been using with a very simple aerial system, and getting very good results.

He began with a loop formed from bell-wire with a 240 ohms terminating resistance in the side opposite the Rx. This was then changed to twin parallel legs still with the resistance, by the simple expedient — as John says — of a 'darn good tug'.

He got quite exceptional reception at Q5 of one of those 'Sally' QRP stations situated some 17 miles distant. John mentions that his signals were better with the aerial on the ground than up at 20 feet height. Well worth experimenting with this type of simple aerial.

Ted.

COMPARISONS.

Ian has recently acquired a Kenwood R5000 receiver and has been playing around with this alongside his 830/7. Two sets from different generations but Ian found that the ultra sensitive R5000 was not all that much better than the 830/7 on weak signals.

On the Amateur 20 metres band he could copy CW signals more comfortably on the 830/7 when they were almost buried in noise. He believes that the characteristics of the filters have a lot to do with this.

The 830 also appears to be more kindly to his ears. He has noticed earaches after pro-

longed listening to the R5000 on phones. He did discover that a 10db attenuator in the aerial input of the R5000 helps. He adds that he likes the R5000 and admits to using it a lot.

Ted.

680 CONTROL KNOBS

This came up in several Newsletters some years back but a letter from Tom mentions that his 680/2 has a black plastic (!) knob on the selectivity control. Other sets in this series which he has seen have a chrome lever to operate the selectivity switching.

It was all a matter of choice for the particular contract. The sets destined for Australasia had a black ebonite knob specified. A 680/2 bought in the UK would have had the chromed lever control.

These minor differences occur on a number of sets and have no effect upon their value or use. They are of interest to those EUGers who take an interest in the history of their own particular set.

Ted

DAVID'S FOLDED DIPOLE, VERY RECOMMENDED

The "very recommended" comment comes from David who uses this on both his 940 and his 840, plus the Trio R1000 which his shack boasts. This folded dipole appears to offer him good results on both MW and SW so he uses it 'barefoot' i.e. without an Aerial Tuning Unit.

The approximately half inch wide, 300 ohms feeder is black polythene insulated and is the remains of a roll which was bought for 'a song' at a local club boot sale. With a total top length of 66 feet and a feeder length of about 40 feet the

aerial is attached at the high end to the chimney stack and at the low end to the garden fence, this makes it what is known to the cognoscenti as a 'sloper'.

At each end of the 66 foot long aerial the two ends of the twin feeder are soldered together and taped up with self-annealing tape. Each end is attached to a ceramic insulator of about 4 inches length, which is attached to the upper and lower supports by suitable lengths of nylon line.

The feeder is taken to the centre of the aerial where a cut is made in one of the two conductors. At this point some form of support was needed and so once the feeder had been soldered to the aerial proper, two triangular pieces of plastic were glued over the joint and the whole was then taped up with more self annealing tape.

Since the sash window in the shack is never fully closed it was simple to arrange for the twin feeder to be led in through the gap in such a way that it did not touch the wooden frame. This was done by using a spare piece of plexiglass with a slot cut in it. This is then jammed into the gap at the top of the sash window.

Results appear to favour Central Europe although there cannot be too much directivity, as some low powered Mexican stations have been heard. David has also heard a number of French and Spanish Aero beacons in the Beacon Band using this aerial. Ted.

THE 1837 (AND 1838).

Alan has written in to say that the article in Issue 60 where the 1837 was the Featured Model reminded him that he had a

very similar model 1838 stashed away in the loft. It had been relegated there several years back when a black box FRG100 had arrived in the shack.

The 1838 was brought back into the shack and has remained ever since, that is not to say that it has taken over from the FROG but it has seen some considerable use and appears to have better quality SSB reception, less metallic sounding than the FROG.

Both sets are now mounted side by side and either can be switched on and used. A two way co-ax switch has been installed to swop the one random wire plus balun from one set to the other. The one disadvantage of the 1838 is its size compared with the FROG.

Ted.

HELPFUL OLD ADS.

A second letter from a member, to the effect that the old adverts that we include in the Newsletters really are useful.

The first letter came a couple of months back and the second just this week. Sam has been able to identify both a small size variable condenser type 1013 and a B4 valve holder as being Eddystone items.

This after they had been in his junk box for many years. The other EUGer had several chokes obtained from a rally. Two were obviously unused, the third used but still in very good condition.

So let nobody say that our publishing these old ads is a waste of space. Two EUGers are much happier now. Anyway — I LIKE THEM.

Ted.

THE DIMINUTIVE 870A.

When this set was bought last year it was hardly intended that it would become a regularly used item, it was intended simply as a part of a small collection of Eddystone receivers.

Whilst being laid up last winter the 870A was brought into the bedroom and installed on a bedside table to provide some slight continuation of Neil's SWL hobby. It has remained there ever since! For such a small and technically simple set the pleasure derived is amazing.

The simple four valve plus rectifier circuitry copes well without an RF amplifier stage and so long as the aerial is not overlong the set has ample selectivity for broadcast listening, even on 7 Mo/s.

In fact it is presently used with just about 15 feet of wire running up to the curtain rail and there is no lack of signals. Distant 'local' stations on MW are numerous and many can be winkled out at night, the one necessary commodity being patience as this band is now so crowded with multiple use of all channels.

If you are ever laid up in bed for some time and wish to continue with some QAPing then get yourself an 870 or 870A!

Ted.

TRAUMATIC HAPPENING.

This is exactly how James described what has happened to his EC10 Mark II. Having a very noisy volume pot and intermittently dirty contacts on the Range switch the set was carefully delivered into the care of a local licensed amateur who was acclaimed as a good

engineer by other club members.

It took but three days for this genius to get back to James with his apologies. The set was simply not repairable.

When James went round to learn why he was astonished to find that several of the wafers on the Range switch were badly broken with bits of paxolin inside the upturned chassis.

The so-called good engineer had attempted to remove the Range switch spindle but in so doing had pulled too hard and several of the central paxolin discs holding the switch contact strips had disintegrated, pulling contacts and wipers apart. He had to agree that no repairs were possible but asked why it had been necessary to take the spindle out at all. Why not use plenty of switch cleaner?

It was explained that this was necessary to properly clean the contacts. No more was said and James took his set home thinking very dark thoughts. His small collection now has a very nice looking but non-working EC10 II. I guess the warning is that we should not trust our 'toys' to other people without first assuring ourselves of their bona-fides.

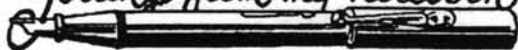
Ted.

**MORE ITEMS
FROM TED'S
MAILBOX
ON PAGE**

30

RADIO RAMBLINGS

Gettings from my Notebook



By
Graeme Wormald
G3GGL

Well, we've finally done it! Christened the EUG Newsletter, that is. I hope the name is acceptable; I couldn't think of a more apt one. Note that it's 'Lighthouse', not 'The Lighthouse'. Ted did a bit of research and discovered that the definite article version had been used as a title for a religious tract some years ago. We didn't wish to be accused of plagiarism!

YET ANOTHER!

First of all, let me report on the latest claim to fame in the EUG longevity stakes.

Last month we had another phone call here at the EUG Bewdley office. It was **Leo Hunt, G4NQ**, from Hayling Island, down in deepest Hampshire.

'Have you had any more claims since that war baby from up on the Yorkshire coast?'

'Do you mean Ernie Beamer, G4TKY, from Bridlington - 1915?'

'That's the chap; you can tell him you can't beat good southern sea air! I've been running on it since 1911'

Absolutely true: Leo had his 89th birthday last March. He was first licensed in 1938. So now we're looking for a nonagenarian EUGer (if any).

NEW TICKET

Second of all, congratulations to EUGer Jack Townsend of Coventry, who has made the quantum leap from SWL to MØJCT, a full 12wpm class 'A' ticket in one. Well done, Jack (and what's the betting his middle initial is 'C' . . .).

AN S.640 TIP

Another phone call, this time from Martyn Lindars, reminding me that the weak link in the signal chain on the S.640 is the little in/out slide switch on the crystal filter. Still easily sourced and replaced; thanks Martyn.

R.N.L.I. THANKS

Since I mentioned saving used stamps for the RNLI (lifeboats) last month, several of you have sent in packets of used stamps. Grateful thanks to you all from my collecting agent (and me).

A CAUTIONARY TALE

I see that Simon 'POO' has finally acquired not one, but two 680s. The 680 'nothing', that is, as opposed to the much more common 680X.

I've been chatting with Bill Cooke recently, about the 680. (Bill, GW0ION, is the former Chief Engineer at the Bath Tub)

He tells me that it had a particularly good AGC system but the first batch was absolutely dreadful; they overloaded at the drop of a hat. It seems that the AGC line

was wired in screened cable. Somehow someone had managed to use special graphite-loaded cable intended for microphones . . . And it leaked away all the AGC voltage. Better watch out, Simon!

ROGER'S PRESENTATION

This Issue of our newly titled magazine sees the first part of Roger Sutton's 1995 presentation to the Institute of Electrical Engineers (IEE).

Roger's association with Eddystone goes back thirty years to Bill Cooke's

QRG RETURNS

This month I've decided to issue a useful supplement in the form of a new, revised, and extended version of QVC—the Quick Reference Guide to Eddystone receivers.

Last presented two years ago, it filled an immediate need in members' (especially new members') reference libraries. It now covers most of the tunable models from 1946 to 1982 – almost half a century – by far the most popular period collected by members.



Graeme loose among the Kilowatts . . . see "LONDON CALLING . . ."

raport with the then new Aston University in Birmingham.

Promising engineering students were encouraged to involve themselves in 'cutting edge' development at the bath Tub. Models 1990;958/7; 1838 and all that sort of thing.

It grew on Roger and when the time came to earn an honest crust he joined the team at West Heath, continuing at Selly Oak with the new owners, where he is now the Managing Engineer.

⌘ ⌘ ⌘

We had a little windfall from our Canadian Eddystone connections – Hammond Electronics, who showed their appreciation for the publicity granted in our Newsletter. They have paid for the extra postage. Many thanks, Rob.

GROVELLING APOLOGIES

Do you remember the old story about the man with a poor memory for names who referred to his new friend 'Crumach' as 'Kelly'? Well you'll have

to work it out for yourself; there isn't enough space here.

But I owe EUG 80-metre Net regular, Chris Morgan, a double apology at least! Chris is the proud holder of the now-venerable callsign G3XFE (*all G3 callsigns are venerable now, aren't they?*).

When he placed an advert in the Newsletter I managed to call him 'G3GXE' Then, by means of apology I managed to refer to him as G3XTE in the last edition of 'Ramblings', and finally as G3XFD (sounds familiar) in something else.

Sorry, Chris, it's just the little grey cells dying off faster than I can reproduce them . . .

FORTY METRES

I hear that the next World Radio Conference (WRC 2003) will, among other things, consider the restoration of the 40-metre amateur band in the Old World.

Old timers like me will remember when we were first licensed in the late 'forties *THE* band to go on was forty. Anyone could squeeze a 66' dipole into their patch. The band covered 7.0 to 7.3 and there was room for all. A first-class QRP band, you could cover Europe on 5 watts (AM at that).

And then Atlantic City came along and took away the top 200 kc/s, giving it to the broadcasters for the cold war barrage on eastern Europe. But the Americas still kept it. . . Here's hoping!

Actually, whilst they're on about it, why not give the rest of the world the 75 meter phone band (as they call it across the Pond). I'm sure Europe must have more licensed hams than North America, and now that the utilities are falling over themselves to get onto satellite it seems a fair exchange. How about making the top 100kc/s AM phone only, whilst they're about it? Ham radio is all set to become an eccentrics' hobby in

the near future . . .

SOLID STATE STRIKES

Last month I actually had an Eddystone 990R to repair for a member. As regular readers will know, the last thing I claim to be is a solid-state aficionado. My protestations of ignorance were swept aside by James who said 'If you can't do anything with it I'll put it in the skip!'

Well, on that basis I said I'd have a look. It just might be the 12-volt shorting link.

The set was very nice and clean. I checked the link plug (it was OK, unfortunately!) and proceeded to set it up with mains power and discone aerial. Two things struck me: the set was absolutely dead (not even a trace of hum) and the tuning meter was working on Radio Two! A fault on the A.F. board . . .

I re-made every joint on the board. Not a hint of sound. Then I administered the drop test. Very gently of course. And it worked! For about 10 milliseconds sound streamed from the diminutive speaker; then stopped.

Reluctantly I spread out the circuit and layout diagrams . . . THERE IT WAS! The muting is carried out in a very basic manner, by switching the speaker out of circuit with a relay. Which is NOT on the A.F. board.

Out with the spyglass (again). And there it was. One joint to the relay was as dry as a bone; had never been tinned in its life! (Bill Cooke please note!).

A touch with the iron and the set was back to perfection. You live and learn.

NEW MEMORIES

Last week I had a phone call from Roger Sutton at Eddystone. 'Do you know an artist in Bewdley who runs a picture gallery by the River,' he said,

'He's called John Instance, he used to run the printed circuit section at Eddystone.'

Do I know him? My walls are covered with his pictures! I was round like a shot: 'John, you never told me! . . .'

'Well, you never asked . . .'

So John's going to write some recollections from the Bath Tub. Keep watching.

730/4 ADDITION

I don't usually approve of modifications to vintage receivers, but this month we've got a reprint which has my approval. Because it's purely an add-on item, no holes or changes.

It was first published in SWM and they've given us permission to copy it. Actually we copied it in 1992 (diagram errors and all), but we've had so many new members since then that I thought we'd play it again.

What is it? Oh! It's a transistorised product detector. An evening's project once you've got the bits. No coils to wind . . . Keep your eyes open further down the pages.

ZL SPECIAL

And isn't it just! A previously unknown Eddystone model turns up in a barn in New Zealand. Thank goodness it's fallen into the hands of a serious collector. Keep on the lookout, folks. There must be more Stratton products tucked away in the Old Empire.

MARCONI MAG

New to me is the MARCONI House magazine, 'Marconi companies and their people.' This particular one dates from 1968, three years after Marconi acquired Eddystone Radio. It can't be the only one to feature the

Bath Tub, so, please, everybody keep an eye open for any Eddystone Flashes like the one EUGer Tony Hornsby sent us.

Originals for scanning would be appreciated. That goes for anything members feel would be of interest such as 'Eddystone Specified' items. We'll pay postage and return. Which reminds me . . .

5-METER MEMORIES

This month's 'Specified' features the 60 mc/s super-regenerative transmitter described in the 'Eddystone Ultra Short Wave Guide' (*as they used to call VHF in those days – and still do in Germany: UKW = ultra kurz welle.*) of c.1936.

It is almost certainly a very close relation of the VHF walkie-talkie made by Stratton for the Oxford University expedition to the Himalayas in 1935, and as such is the basis of the first effective 'hand-held'.

Regretfully post-war licence regulations banned the use of such wide-band 'unstabilised' transmissions, but it gives us a window into history.

Bearing in mind that by 1939 Stratton's had graduated to full crystal controlled VHF radiotelephones (the most reliable then made) it is surprising that in 1945 they decided to drop this aspect of development.

VY 73 – Graeme, G3GGL



REMANUFACTURED SPARES.

This is a thorny subject for many in the hobby but something needs to be done. I have seen numerous Eddystones complete and perfectly able to operate except for a badly erased scale plate.

Over-judicious use of elbow grease has effected the removal not only of the offending dirty marks but also of the scale markings. The same goes for escutcheons or finger plates as we tend to call them.

At first it might seem a simple task to put in hand the production of a batch of new, replacement items. IT IS JUST NOT SO.

To get such things remanufactured you need to order a large quantity, say 500 or a 1000 to get really low cost parts. Alternatively if you only order a small quantity then the price per unit will be exorbitant. Whichever choice is made you will not get your money back from sales, never mind make a profit, for many years.

Again, the apparently simple task is complicated in that every model has a differently marked scale, a differently captioned finger plate. It doesn't end there. To my knowledge the 830 series would need 7 different scale plates to cover all suffixes. It would need 5 different finger plates for the same 830 series. How many of each could you sell in a year? Not enough to make it worthwhile.

Try another model, the EB35/6/7/EC10 series. WOW !!! A mere 14 different scale plates and ditto finger plates to cover this whole series. Again, how many could you sell in a year?

And then there are items such as the diecast feet for raising the front panel for comfortable operating. Here things look markedly better. The same foot, in pairs, fits almost every single postwar model and many owners would buy one or many pairs. You might easily sell 1000 of these in a short enough time to make it a viable project. Ditto for the knobs in black bakelite, two or three sizes would fit almost all of the postwar valve models and sales might be sufficient to make this a viable project.

I hope that this has explained to all of those EUGers who keep asking us, why we cannot get spares remanufactured for sale to members. Original costs and subsequent storage space figure high on our problem list. I do know of one electronic parts company who had some parts specially made in the early 1980's. He's still not sold enough to get back his original investment — and HRO-M & Senior models still exist in their thousands out there.

Ted.

Post-Script from Graeme: I know that Anthony, GW4RYK, had some replacement dial-drive cogs manufactured early this year (to fit all slide-rule valve sets). He's sold six pairs among 300 members.

I think the time has come to realise that original Eddystones cost Roll-Royce prices, and that a worn or damaged one is practically worthless. This should reflect in the asking price. Members ask me "What's the value of (say) a 680X". "Anything from £5 to £500," I reply, "depending on condition." (Just think of a vintage car . . .)

The New Zealand 'Atlantic Two'

Information supplied by Bryan Marsh, EUG Member and Life Member of the New Zealand Vintage Radio Society; and Peter Lankshear, EUG and NZVRS.

Photographs by Lenny Hartley, proud owner of the new discovery.

Feature by Graeme Wormald G3GGL

Last May (as mentioned in the last EUG Newsletter), I had an exciting phone call from Bryan Marsh in New Zealand. He had news of a 'new' Eddystone which had come to light in that far-off land, and photographs were promised. No sooner had a confirmatory letter arrived than an e-mail arrived from EUGer Peter Lankshear, containing a newsflash and pictures from the NZVRS. An embarrassment of riches one might say!

We already have a picture of the 'Atlantic Two' in the Harrods catalogue for 1928, and it looks *NOTHING LIKE THE NEW ZEALAND MODEL!*

But I'm jumping ahead a little. Let's let the new owner, Lenny Hartley, of Hastings (NZ) tell his own story:-

"The only history I have is that it came out of a farm shed full of old radios (the Atlantic Two being the oldest) off a farm in Pahiatua. Owned by an Eddystone ham operator who has two or three (I think from memory) more modern models.

He advertised the "A.T." in a local 'Trader' magazine in Hawker Bay, even though he lives in Pahiatua, a couple of hundred kilometres south.

I read the advertisement and thought 'Very interesting.' He had worded the advert as follows:-

1934 Two valve Eddystone Radio \$100
(that's about £30 Sterling - Graeme)

I rang him and agreed to buy the radio sight unseen with some misgivings! He told me he was coming to Hawker Bay in around three weeks' time.

About three weeks later I got a call from Napier saying he was in the area and could I meet him in Clive at the B.P. station at 7.00pm, which I did. I bought the radio out of this work van, at night in the dark. As soon as I saw it I knew it wasn't a 1935

model. I've only owned the radio for four months; maybe five...

Sincerely, Lenny.

What a story! Lenny goes on to give a few details of the set, such as the ivory licence plate which is engraved:-

This instrument has been manufactured under Marconi Patents for the reception of broadcasts outside Great Britain.

Two valves.

The valves were missing, and have been substituted. The intervalve transformer has also been replaced. The front panel is aluminium, with woodgrain finish. The variable condensers, plug-in coil socket, RF choke and grid-bias battery clips are all marked Eddystone, as is the transfer inside the cabinet lid. The tuning and reaction dials are 'Indigraph' (Igranic) and the valve sockets are 'Wearite'. The tuning coil (which is undoubtedly a medium wave one) is marked MTO in a diamond frame (anybody recognise that?).

Lenny isn't an engineer so he was unable to draw a circuit, but he's copied the layout for us and with the photos we've managed to get one together (over).

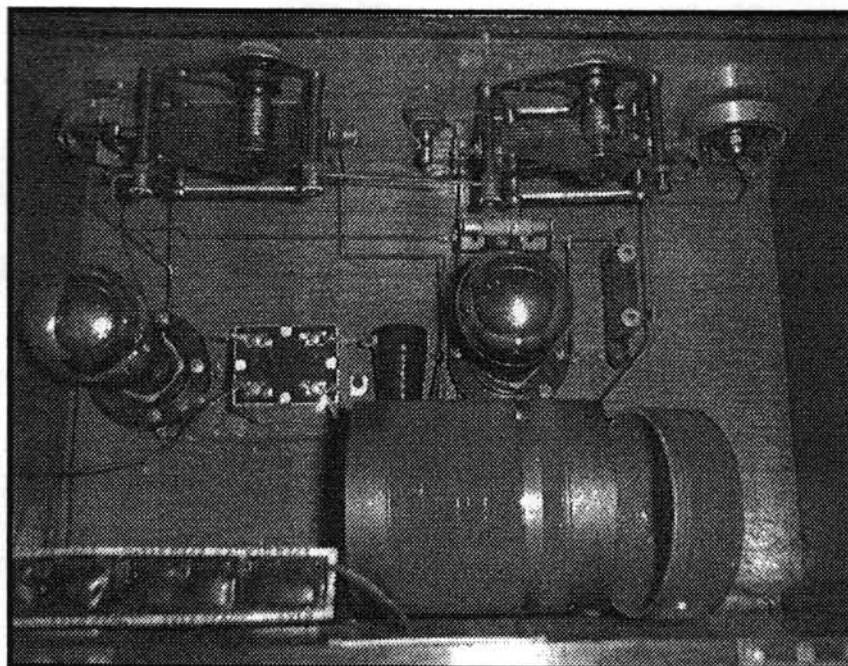
The greatest surprise is the similarity between this set and the Eddystone 'Scientific Short Wave Three' of 1928 (picture shown over).

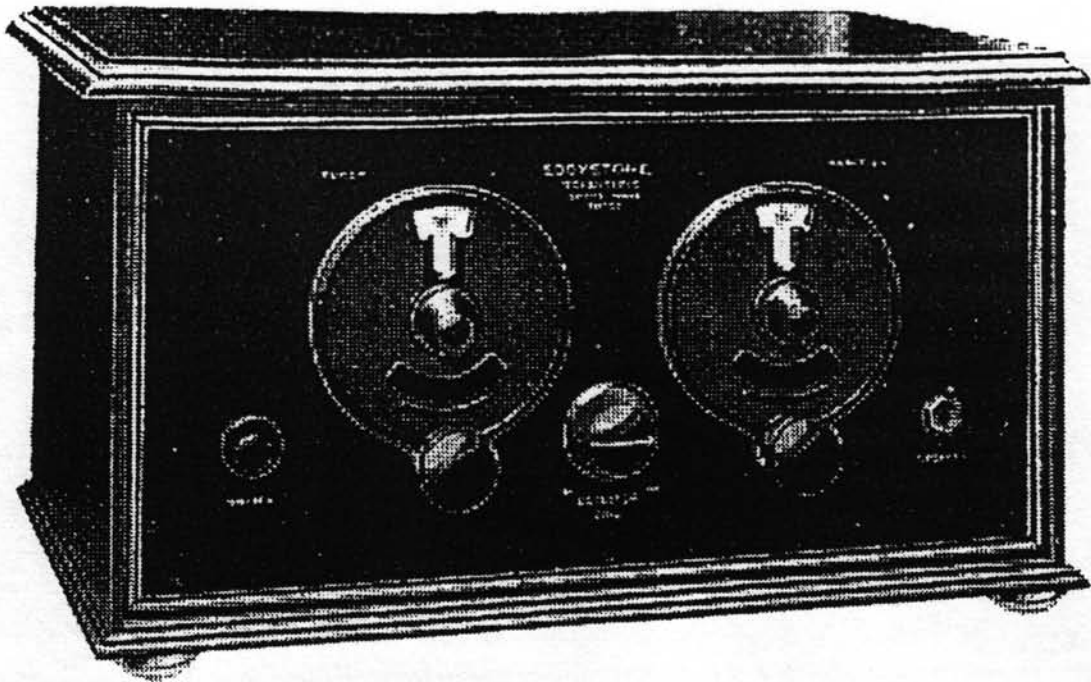
The main differences are an aperiodic RF screengrid amplifier in the 'Scientific Three' and a lack of detector filament rheostat, which probably indicates that the 'Atlantic' pre-dates it (if only by a few weeks!). Unfortunately no paperwork has been seen of the N.Z. version of the 'Atlantic Two', but we do have the 'Harrods Catalogue' version. The original 1928 advert is shown at the end of the feature.



The New Zealand 'ATLANTIC TWO'

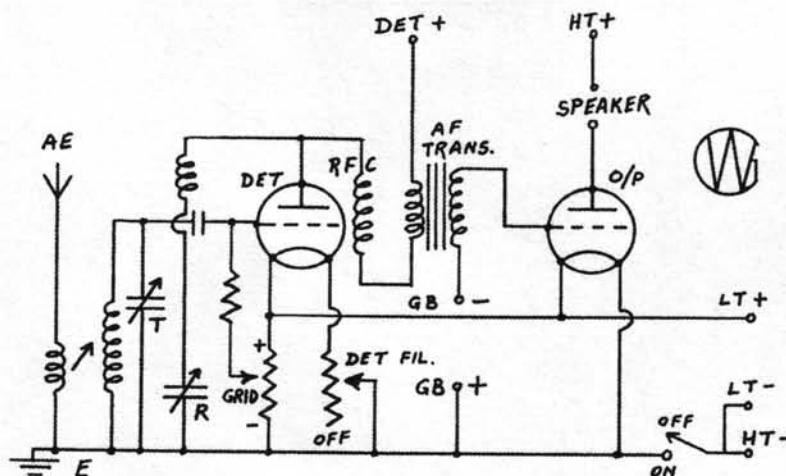
Note how similar the set is to the 'Scientific Short Wave Three' of 1928 (next page). The only front panel difference is the exchange of the detector filament rheostat for a headphone jack . . . The cabinet is undoubtedly the same. Note the medium wave coil fitted in place of the more usual air-spaced Eddystone 'Duplex' coils. The swinging link is aerial coupling coil.



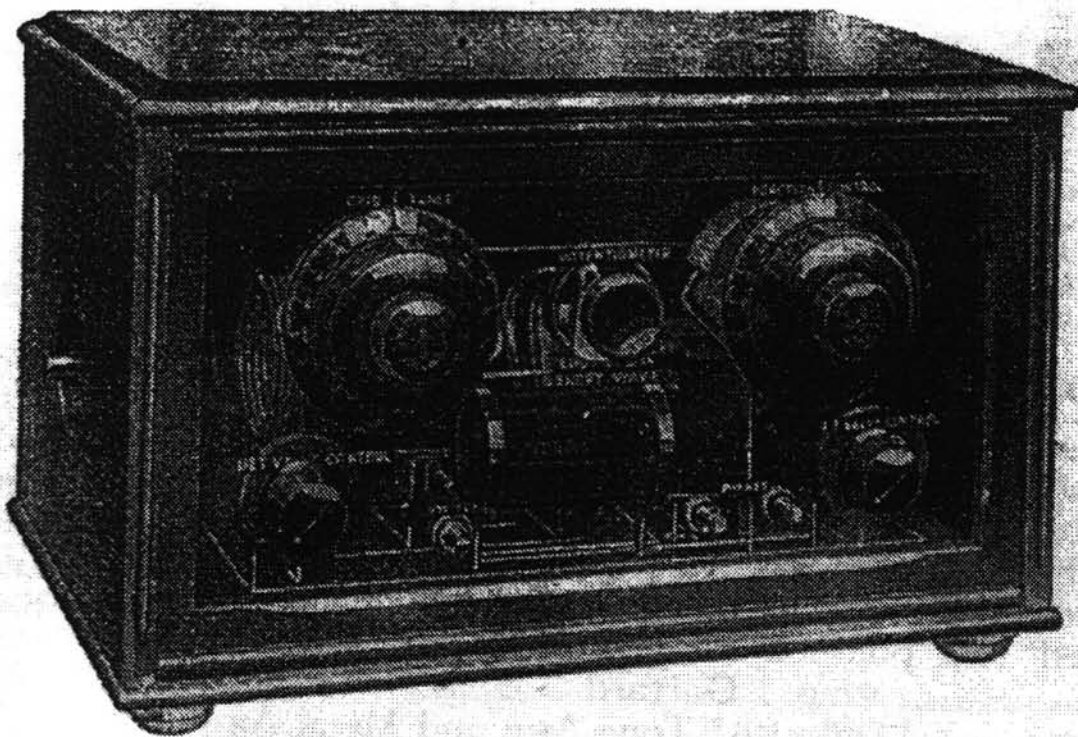


The Eddystone Short Wave Scientific Three (above) of 1928 bears a remarkable resemblance to the New Zealand Atlantic Two. Inside there is an extra valve, an aperiodic screengrid, but it is unlikely that it predates the A-2.

Below is the circuit of the New Zealand Atlantic two. It is much of a muchness with all two-valve sets of the period, yet it does have some little extras. The use of 'throttle' reaction control (instead of swinging coil) seems to have been emerging at this time. The use of a radio frequency choke is necessary for this and Eddystone seem to have produced the first such short wave versions. The adjustment of the detector grid-leak from the positive to the negative side of the filament is a novelty. The rheostat in the detector filament circuit is a left-over from the 'bright emitter' period but must be considered a refinement from the reaction control point of view.



The Circuit of the 'New Zealand' Eddystone Atlantic Two of c.1928



The 'Eddystone Atlantic Two' shown in Harrod's Catalogue 1928
Original Text:-

THIS Receiver is the result of extensive research on short wave working and considerable practical experience. This instrument is as simple to handle as the usual broadcast receiver and the entire absence of body capacity effects and the delightfully smooth reaction control which is characterised by an entire absence of overlap or plop, makes it ideal for the weakest signals.

Transatlantic reception of the U.S. short wave stations is guaranteed and each receiver must receive KDKA and 2XAF before despatch. This latter station can be received extremely well, and nearly always at loudspeaker strength (2 valves).

Great care has been taken to secure the correct components for the purpose, the whole instrument is neatly and properly wired. Each component is carefully

placed so that no interaction or losses occur. 'Eddystone' S.W. Coils, Condenser and S.W. Choke are incorporated, while the low loss antimicrophonic Valve Holders, Fixed Condensers and Grid Leak are all raised up on pillars to facilitate wiring and to minimise damping. The instrument panel is of plate glass, engraved and lettered; the cabinet of Oak with a special glass terminal panel at the side for the aerial terminal. The whole is mounted on 'EDDYSTONE' Absorbers, which insulates the cabinet from earth and takes up all shock.

£10 0 0

Marconi Royalty £1 5 0 extra.

Coils can be supplied for use on B.B.C. Waveband.

(Not quite the same as the N.Z. model, is it? The large SW Choke is between & below the two big dials. The tuning coil is at the left side of the left-hand dial.)

Computer Hash

All attempts at eliminating this local QRM had failed, so far. David used an upstairs back boxroom for his radio hobby listening and the computer was located in a front-of-house downstairs room.

The aerial system had been changed from a simple wire fed in random wire to a folded dipole type made from and fed with 300 ohm twin feeder. This made very little difference on most bands and after all the effort involved in making and putting up the new aerial there was considerable disappointment.

It was only when a friend remarked how come the QRM affected the old 840 less than it did the 940 that David began to really work his grey matter. Disconnecting the aerial system altogether and most of the QRM was STILL present. Shorting the aerial and earth connectors on the rear of the receivers made more of a difference on the 840 than on the 940.

Suddenly the penny dropped. The majority of the QRM must be coming in via the mains lead. How could he have ignored this fact for so long ?

The one difference between the 840 and the 940 was that the 840 was AC/DC. No mains transformer, but it did have an RF filter inside the set in the mains lead. This was a substantial winding of insulated wire on a wood former.

After looking up the matter of mains borne QRM in Pat Hawker's *Amateur Radio Techniques* it was decided that a simple mains filter could be made up

from an 8 inch length of ferrite rod cannibalised from a defunct tranny in the junk box.

The mains lead for the 940 consisted of flat twin which was marked on the outer sheath as 2x0.75. Twenty turns of this was wound tightly onto the ferrite rod in such a way that the rod was close to the end of the mains lead, which had the polarised twin socket that plugged into the back of the 940. The turns were taped solidly in place on the ferrite rod and a test was made. Without any aerial connected. Much Better, but still some slight QRM.

The next step was to pillage the XYL's kitchen for her roll of baking foil. Two sheets of this were taped temporarily to the wall behind the operating position. Unearthed they made a slight improvement, earthed to the outside earth system (not the mains earth which is never used in David's shack) there was a massive improvement.

QRM was negligible below about 16/17 Mc/s and since very little listening is done above this the whole exercise was deemed a success. The foil was eventually glued to the wall and a spare piece of matching wallpaper was stuck over the sheets of foil. When used now there is very little sign of the 'hash' anywhere from MW up to 15 Mc/s — the usual band coverage used by David.

Ted.

(N.B. See "Poo's Ponderings" for more details of Eddystone mains filters - Graeme)

EDDYSTONE RADIO

**A SHORT HISTORY OF RECEIVER
DEVELOPMENT FROM 1965-1995**

BY

ROGER SUTTON

(MANAGING ENGINEER, EDDYSTONE RADIO LIMITED)

In 1995 the Institute of Electrical Engineers (IEE) promoted a Conference to commemorate the Centenary of radio communication. One of the most interesting papers was presented by Roger Sutton, Managing Engineer of Eddystone Radio. It is with the permission of the IEE and the consent of Roger that we are able to offer his treatise to members of the EUG. Due to its length and complexity we are presenting it in two parts. This month's feature covers the section on Frequency Stability.

**International Conference on
100 Years of Radio**

5-7 September 1995

IEE, Savoy Place, London, UK



The Conference was organised by the Science, Education and Technology Division of the Institute of Electrical Engineers in association with the British Vintage Wireless Society and the International Union of Radio Science.

Part One

Introduction

This paper will concentrate on radio communications receivers. These are normally intended for professional use in maritime, aeronautical and signal monitoring services, principally in the range 10kHz to 30MHz. However, they are also used by Radio Amateurs in conjunction with a separate transmitter and by radio hobbyists for general listening.

The evolution of design which has enabled sophisticated reception and monitoring of radio signals to be performed, even by non-professional operators, started in the early 1960s when semiconductors started to replace valves. This did not always provide an immediate improvement in performance, especially when it came to signal handling.

However, with the more complex circuitry possible, it did eventually enable a much wider range of operating facilities and capabilities with a gradually increasing level of performance. It is interesting to note that this has meant that although semiconductors are much smaller than valves, the size of a professional receiver has not decreased in the same proportion.

Evolution over this period can be split into three overlapping stages. These are frequency stability, dynamic range and microprocessor or software control. These directed design in turn as user requirements demanded and component availability allowed.

The basic superhet receiver layout did not alter, but up-conversion to a high first intermediate frequency (IF) became standard. Block filtering and low impedance stages, normally 50 Ohms at RF, also gradually replaced the distributed filtering, high impedance techniques of previous designs, {Gosling et al (1)}. Mechanical arrangements also

became simpler with tuning drives and frequency scales no longer being required and with the use of plug-in modules.

The Search for Stability

Retaining the superhet form of receiver, originally introduced before the Second World War, meant that the generation of the local oscillator frequency remained one of the most important areas of receiver design. In the early 1960s, the increasing use of single sideband (SSB) modulation started to place greater demands on oscillator performance as it began to replace amplitude modulation.

For marine and later, aeronautical use, SSB was also to become mandatory to improve the quality of communication in the increasingly more congested HF radio bands, {McDonald and Burnhazn (2)}.

New communication techniques such as Lincompex and Piccolo required particularly high oscillator stability and setting resolution. It was therefore essential that any new receiver could be tuned easily and reliably to a known channel frequency, with an accuracy of at least 10 to 30Hz. Stability had to be such that the frequency stayed within that limit over a long period.

Ideally all frequencies generated should be derived from a high stability master oscillator, which could be calibrated using an off-air standard. As often happened with later receivers designed at this time were often advertised as High Stability Receivers, that is, with emphasis placed on the improved or new facilities.

From the operator's point of view, this all led to possibly the most significant change in receiver operation. That being the ability to know exactly the frequency to which the receiver was tuned. Up to that time, this

was only possible with crystal controlled receivers. These have a small number of received channel frequencies, not usually more than about ten, which are derived from separate crystals specially cut for the required frequencies.

Their accuracy and stability is not really adequate for SSB, especially at higher frequencies. Thus they, or a separate second oscillator, are made tunable over a small range, usually 100 to 800Hz. The adjusting control is normally called a Clarifier, referring to its most common use in making SSB speech intelligible.

Pre 1960s tunable receivers often had provision for a small number of preset crystal controlled channel frequencies, this facility being retained in simpler designs into the 1970s. The low number of channel frequencies possible, the limitations in stability and accuracy and the inconvenience of having to individually specify crystals meant that this technique would not meet new requirements.

However, before full frequency synthesis became economical, designs with up to fifty preset channels were produced. The Eddystone 964 was one, with all crystals contained in a temperature controlled oven to give adequate stability, even for high frequency use, {Barrat (8)}. The crystal oven and RF tuned circuits were contained in a rotatable turret. This was turned by the front panel channel select knob so that the required crystal was selected.

The Clarifier oscillator fed the second mixer in the double superhet design and also used oven controlled crystals. The difference frequency of two high frequency crystals, tuned in opposite directions, was generated to give the required tuning range and to reduce frequency drift caused by changing temperatures. Multiple crystals, or harmonics generated from a single crystal, had also been used previously in

fully tunable receiver designs. In this case, the selected crystal or harmonic typically was fed to the first mixer of a double superhet design, to give reasonably accurate steps of 1MHz. The second mixer was then fed from a stable low frequency tunable oscillator with a range sufficient to cover the 1MHz steps of the first oscillator.

This second oscillator commonly began to be called the Interpolation Oscillator. Although this technique had successfully been used in many earlier designs, such as the Eddystone 880, it did not normally meet the new requirements. One exception however, was the Wadley or Drift Cancelling Loop.

This had been pioneered by Racal a few years after the Second World War and used in many well known and successful designs such as the RA17 series, {Hawker (4)}. In the middle 1960s, design was started on the Eddystone 958 which was also to include a drift cancelling loop, {Ford (5)}.

The principle of the loop is very elegant. The first mixer is fed from a fully tunable oscillator, the output of which is also mixed with a comb of harmonics, 100kHz in the case of the 958, derived from a high stability master oscillator.

The tunable oscillator frequency and the nearest harmonic produce a difference frequency which is filtered to provide part of the frequency fed to the second mixer. The other part is produced by an interpolation oscillator as previously described.

The significant point to note is that the introduction of a frequency related to the first mixer drive into the second mixer drive is done in such a way, that any drift in the former is exactly cancelled at the Output of the second mixer. Tuning of the 958 was thus in 100kHz steps using one knob with a second knob for tuning between steps.

To simplify search tuning, the loop could be disabled and all tuning done using just one knob. These knobs still directly turned the tuning capacitors of the oscillators and to obtain the required tuning resolution without any mechanical backlash, very sophisticated gearboxes, almost unheard of in modern designs, had to be employed.

In the early days of the 958, compact low cost digital displays were not available. The multiple tuning and vernier scales of earlier designs were not adequate and thus a magnified optical disk arrangement was used for both the main and interpolating tuning controls giving a scale length of about 10mm per kHz.

This was relatively good for the time but did not meet the 30Hz resolution requirement. In the early 1970s therefore, a second range of 958s was started with the 958/7, {Mellor and Sutton (6)}. The interpolating oscillator optical display was replaced with one using light emitting diode displays driven by a frequency counter using digital integrated circuits, new technologies which were, by then, commonly used.

This easily gave the required resolution. The interpolation oscillator itself was also redesigned to improve its mechanical and temperature stability. The oscillator was built into a large, well lagged, temperature controlled box. The final output of 550 to 650kHz was generated by dividing the output of a 5.5 to 6.5MHz oscillator.

This allowed a more compact and stable tuning coil and capacitor and gave temperature stability in the order of 1 to 2 Hz per degree centigrade with similar tuning accuracy. As the frequency counter was also locked to the master oscillator, the whole tuned frequency was now at least displayed accurately. In the 985/12, automatic frequency control was added so that the display would lock to the received

signal's frequency.

The final improvement in this form of frequency generation was to include a frequency locking loop. By this means, the counter which measured and displayed the interpolation oscillator frequency, also provided a binary output which was compared with that set up on control switches.

Any difference would generate a control voltage which would adjust the interpolation oscillator to the desired frequency as set up on the switches. This could be rather cumbersome to use, but it did at least now mean that temperature effects were negligible and that the tuned frequency was truly locked to a single master oscillator.

The loop was slow in action however and mechanical vibration effects could be a problem. A variation of this technique was patented by Eddystone and used in the 1837 series in the middle 1970s, to replace the drift cancelling loop and help reduce costs, {Cooke (7)}.

The Eddystone technique used two free running oscillators, one wide range to drive the first mixer and one narrow range to drive the second mixer and provide fine tuning. Both also fed a frequency counter which showed the complete tuned frequency on a light emitting diode display. Tuning was thus similar to previous receivers except that an accurate digital display of the frequency was available. When the required frequency or signal was found, a lock switch was set and the frequency stored in memory.

Any subsequent change was then measured by the counters and a correction applied to the narrow range oscillator to cancel any changes in either oscillator. Applying correction to one fixed, narrow range oscillator, for drifts in a very wide range oscillator, ensured the technique worked satisfactorily.

Most of the previously mentioned requirements had now been met. During the 1970s and early 1980s however, the phase lock loop, aided by the availability of high speed, low cost digital integrated circuits, replaced virtually all other techniques and the so called synthesised receiver became standard.

Electronic design replaced mechanical design and all requirements of stability and resolution for SSB reception became relatively easy to meet. The principle is straightforward.

The controlled oscillator is divided down and compared, in a phase detector, with a frequency derived from the master oscillator. A feedback loop alters the frequency of the controlled oscillator until the phase, and thus the frequency at the phase detector equals that derived from the master.

By making the divider variable, the controlled oscillator can thus be locked to any multiple of the master derived frequency, usually known as the reference frequency.

In practice several loops, feeding each other had to be employed to obtain the resolution required, with a fast enough operating time so that mechanical vibration effects could be eliminated and no slowness would be apparent to the operator whilst tuning. A considerable number of phase lock loop topologies were developed, enough to occupy several lectures alone!, {IEE Colloquium (8).}

To simplify the design of the controlled oscillator and RF filtering, a first IF of 40 to 70MHz became the standard. This reduces the range of the oscillator to less than an octave and places all image frequencies well above the 30MHz top frequency of a typical receiver, enabling a simple low pass filter to be used in a low cost design.

This standard form has however not always been used. An early synthesised receiver, the GEC RC410R of the mid 1960s, retained the low first IF and narrowband RF filtering of earlier designs, forming what might be called a transitional design. However, this tended to be the exception and designs with high first IFs have proliferated up to the present day.

The improvements in performance of the phase lock loop synthesiser over the period have principally been higher resolution, faster switching speeds and lower oscillator noise, all of which tend to be mutually exclusive.

Integrated circuits containing the required high speed dividers and phase detectors were gradually introduced, much simplifying design. However, the key was to find the simplest circuit arrangement which gave the required performance.

In the early 1980s, Eddystone started design of its first fully synthesised receiver, the 1650, which has continued in production to this day. This used a synthesiser chipset first used on the Marlin, a marine transceiver developed by Eddystone for Marconi Marine.

In the 1650, performance was enhanced by using an arrangement whereby the frequency generated was allowed to have a small error of no greater than 2.5Hz. This was less than the error due to the master oscillator and allowed lower loop divide ratios thus giving high switching speed and low noise in a relatively simple and low cost circuit.

This arrangement was refined and simplified further for the recently introduced 6000 series. In this series, the divide ratios of a single phase lock loop and that of a divider driven from a 436MHz oscillator are calculated, using an algorithm stored in a microprocessor, to give the desired output frequency with an error not greater than 1Hz.

In effect, the use of software improved the accuracy and reduced the cost of the equipment. At present, two other significant techniques are also used. One is fractional-N division, where dividers can effectively divide by non-integer values. This again allows frequency steps smaller than the loop reference frequency, giving improvements in noise and switching speed for a given resolution.

The other is the use of Direct Digital Synthesis whereby a waveform is generated digitally at a frequency determined by the master oscillator and a binary number. No other oscillator or control loop is involved and thus switching speed is very rapid, usually in microseconds.

However, spurious outputs are relatively high. The most favoured use of the Direct Digital Synthesiser is thus as a variable frequency reference for a single phase lock loop. It is capable of providing very small frequency increments (in millihertz) which, if limited to a small range, can be easily filtered to remove spurious outputs.

This is an ideal interpolating reference for a phase lock loop, which now only needs to provide coarse steps of about 25kHz. This technique has been adopted on the Eddystone 7000 range of transceivers to give high resolution, fast switching and low noise from a simple and low cost circuit. The most significant point about these latest developments is that they are only made possible by the recent introduction of reasonably priced integrated circuits designed specifically for those functions.

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Next Month we Conclude Roger's Presentation of modern Eddystone history.

It will cover the important questions of 'Developing Dynamic Range' and 'Making Use of the Microprocessor'. Don't miss it. !

'LONDON CALLING...' (to say nothing of Ottawa and Tokyo!)

2 Eddystone Users take a look at the shortwave scene in Shropshire. Graeme & Simon visit the MERLIN senders at Wooferton.

By Graeme - G3GGL

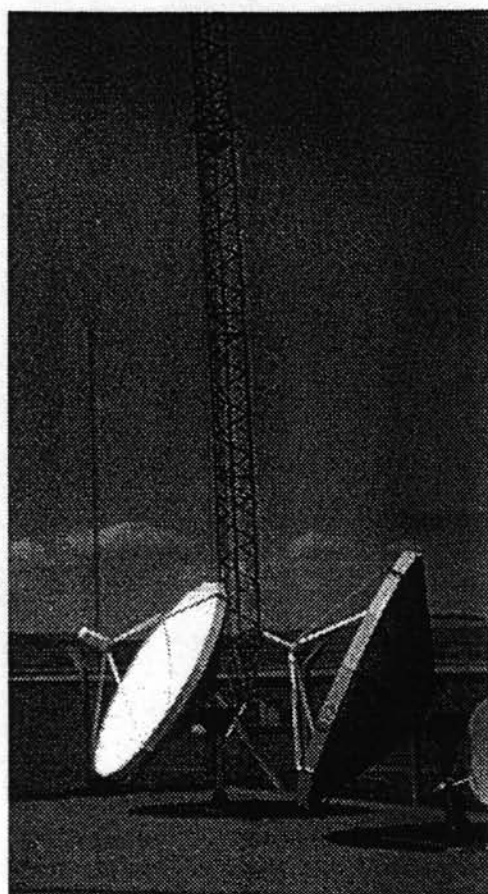
In 1997 the BBC raised some of the cash it needed for the digital revolution by selling its shortwave network to a new company, formed by a management buy-out. The new company was called MERLIN, after King Arthur's magician of Round Table fame.

Earlier this Year I was chatting on the phone to a new acquaintance who happened to mention that he worked at Wooferton, a by-word in the BBC for short-waves. I mentioned that I started my broadcasting career at Skelton, a sister-station, built in the same year, 1943, as a prelude to the invasion of Europe.

My new friend revealed that he'd also started his shortwave life at Skelton and soon we were chattering away like magpies about the changes over the years. In my day (1953) Skelton had a staff of 80 engineers; 20 per crew, 24 hours a day. It's now run entirely by robots!

Wooferton still has a crew of two per shift, and my new-found friend asked "How'd you like the five shilling tour?"

Simon, M5POO (of 'Ponderings' fame) was down from the north-east (where he lives on the edge of Geordie-land). He was visiting to help out at the EUG stand at the NEC. The next day we set out for the wilds of south Shropshire. Those of you who have travelled down the A49

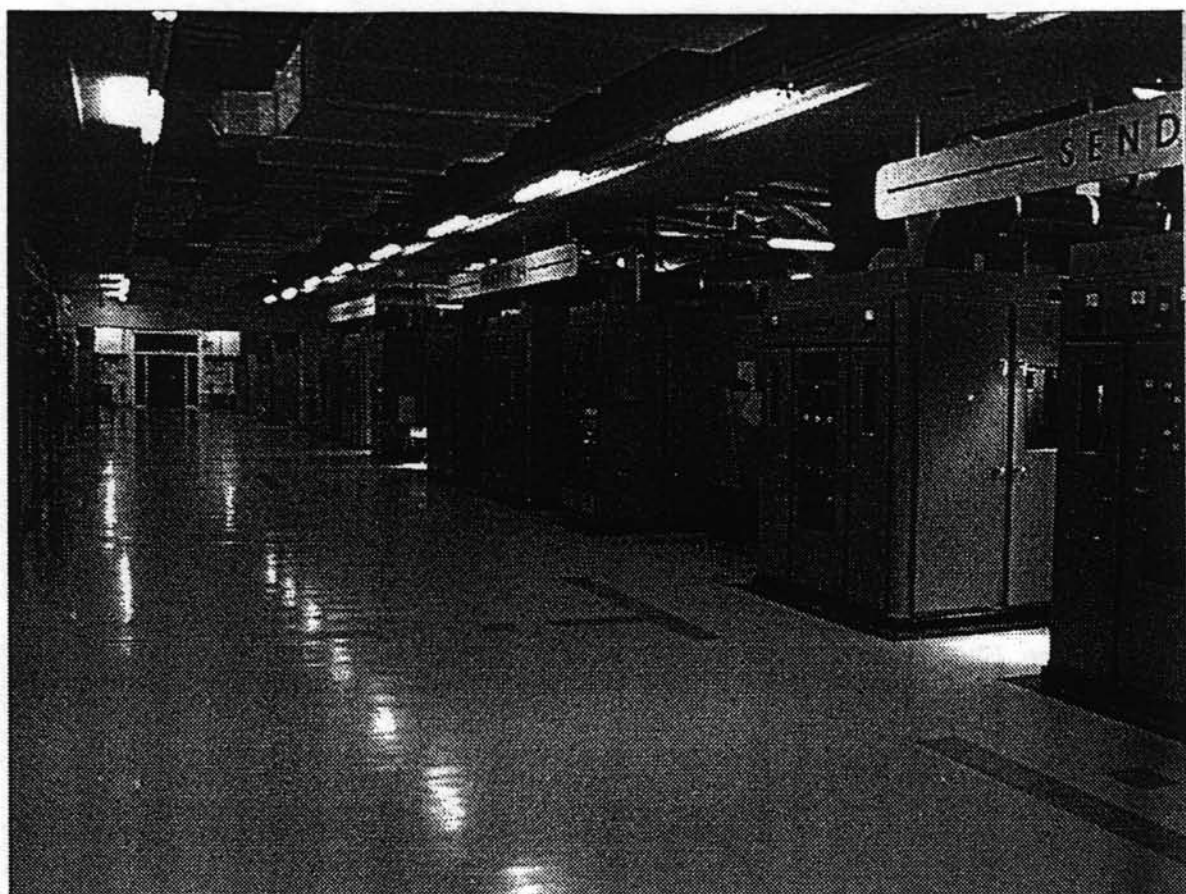


The programmes come in on the satellite dishes and go out on shortwaves via the big masts.

from Ludlow to Leominster (pron: 'Lemster') will have spotted the great aerial-farm near the junction with the A456 (which runs through Bewdley, 20 minutes away). That's Wooferton.

The rather curious sloping aerials, slung between the 20-odd lattice masts turn out to be Marconi Three-band beams. Stacks of paralleled half-waves backed by large reflectors of wire mesh and fed by 600-ohm open feeders (2,400 ohms divided by four equals 600 ohms. Gedit?)

The rather boring-looking block-house which formed the only sign of habitation turned out to be a hall of wonderment. The original transmitters of 1943 were RCA models shipped over from the USA. By the 1950s they were embroiled in the cold war carrying the



The main Sender Hall, five transmitters on each side . . .

VOA (*Voice of America*) programmes to Eastern Europe and the Soviet Union.

In 1963 the wartime transmitters were stripped out and replaced by six Marconi BD272 250kW shortwave senders (*'sender' is the term used by the BBC for all shortwave transmitters as opposed to domestic transmitters*). After almost forty years these are still in reliable service.

When the doors were opened for our internal inspection Simon and I were surprised to see two old friends tucked away at the back of the modulator. A pair of 813 beam tetrodes from over 60 years ago! These were in the pre-driver stages.

In 1981 a further set of four Marconi type 6124 300kW senders were added. They can just be spotted at the far end of the Sender Hall; more compact but less reliable than the 1963 models.

Giant diesel generators were provided for the original RCA (*Radio*

Corporation of America) senders but these were scrapped in recent years.

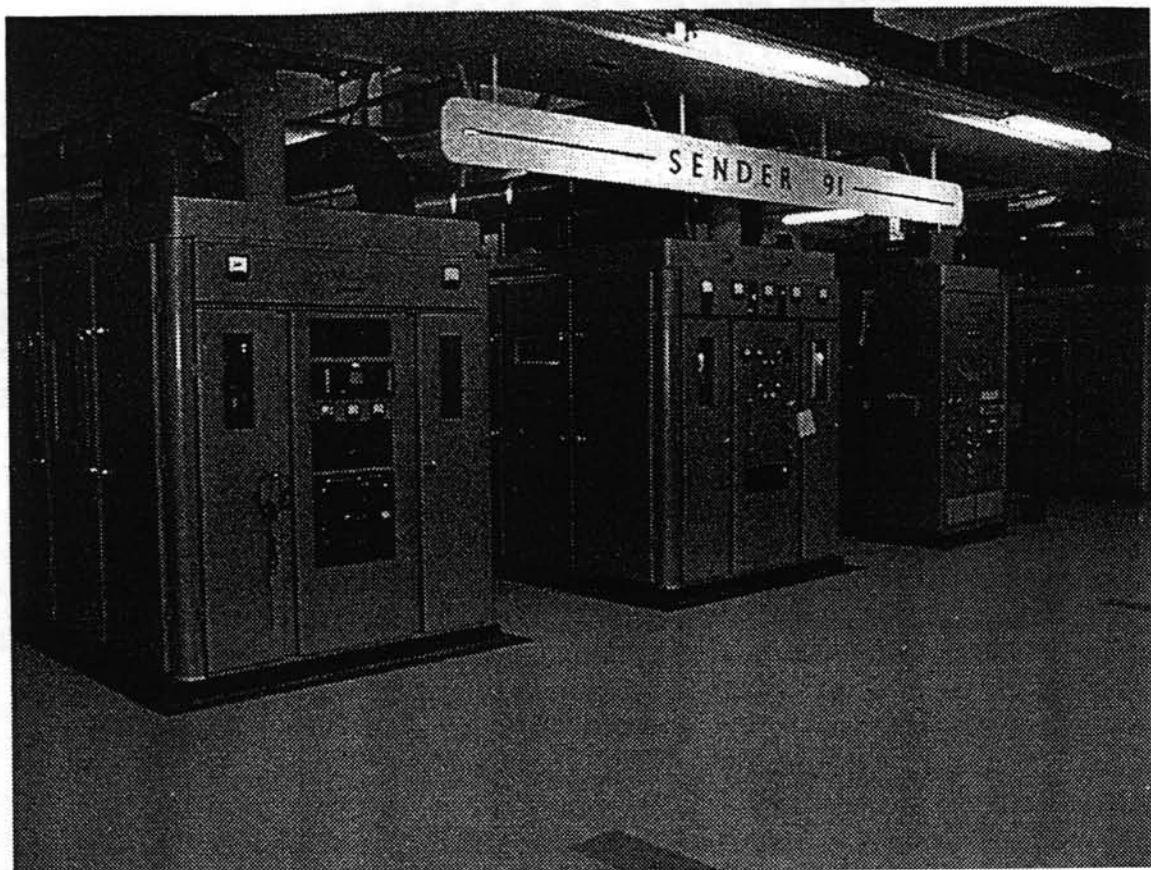
Wooferton beams the BBC World Service to the East, on 17,640 and 12,095 kc/s (old habits die hard).

As more and more satellites carry radio programmes direct into overseas countries, and the BBC use VHF/FM transmitters abroad, the need for high frequency saturation coverage is dwindling.

One of the results is that Merlin lease some of the Wooferton senders to other broadcasters as well as the BBC.

Other users include CBC (*Canadian Broadcasting Corporation*) on 17,820 kc/s; NHK (*Radio Japan*) every morning on 11,710 kc/s; VOA (*Voice of America*) North African Service in English on 9,760 kc/s, and 15,205 kc/s. Don't rely on the station ID to locate the source of the transmitter any more!

We had a great day; thank you Glyn.



Sender 91 (above) showing the RF, Modulator, and control units. Carrier output 250kW. The power supply is housed in a cubicle behind the enclosures.

On the right is one of the RF push-pull Class 'C' output stages type BY1144 (the other is hidden behind it). Each valve is rated at 125kW anode dissipation (water-cooled), drawing 15 amps at 11kV (this isn't a mistake; it's 15 amps anode current!). The grid drive produces a mere 2.5 amps. The low tension of 11.8 volts takes 580 amps (yes, that's five hundred and eighty) in a directly heated cathode. It gives a whole new meaning to the term 'Bright Emitter'

Digital photographs
by Simon Robinson M5POO



PRODUCT DETECTOR FOR THE EDDYSTONE 730/4

AN EFFECTIVE ADD-ON UNIT

In the past few months there have been several enquiries from members about improving the SSB performance of the earlier post-war Eddystone valve receivers, in particular the type 730/4, one of the most readily obtainable top-of-the-range sets of the late '50s, made in quantity for Government service.

Observant EUGer Colin, G4HNN, spotted this article in the Short Wave Magazine for March, 1974, which looks like the answer to all our prayers! My usual response to

anybody wishing to meddle with the works of a 40-year-old radio is: "Don't!" But in this case I make an exception, because the whole thing is just tacked on; no holes, no drills, nothing removed, just a board slipped in and half-a-dozen connections. It could be restored to the original (if desired) in ten minutes. We are grateful to Kevin Nice, G7TZC, Editor of the Short Wave Magazine, for granting us copyright clearance to reproduce it here.

Graeme - G3GGL



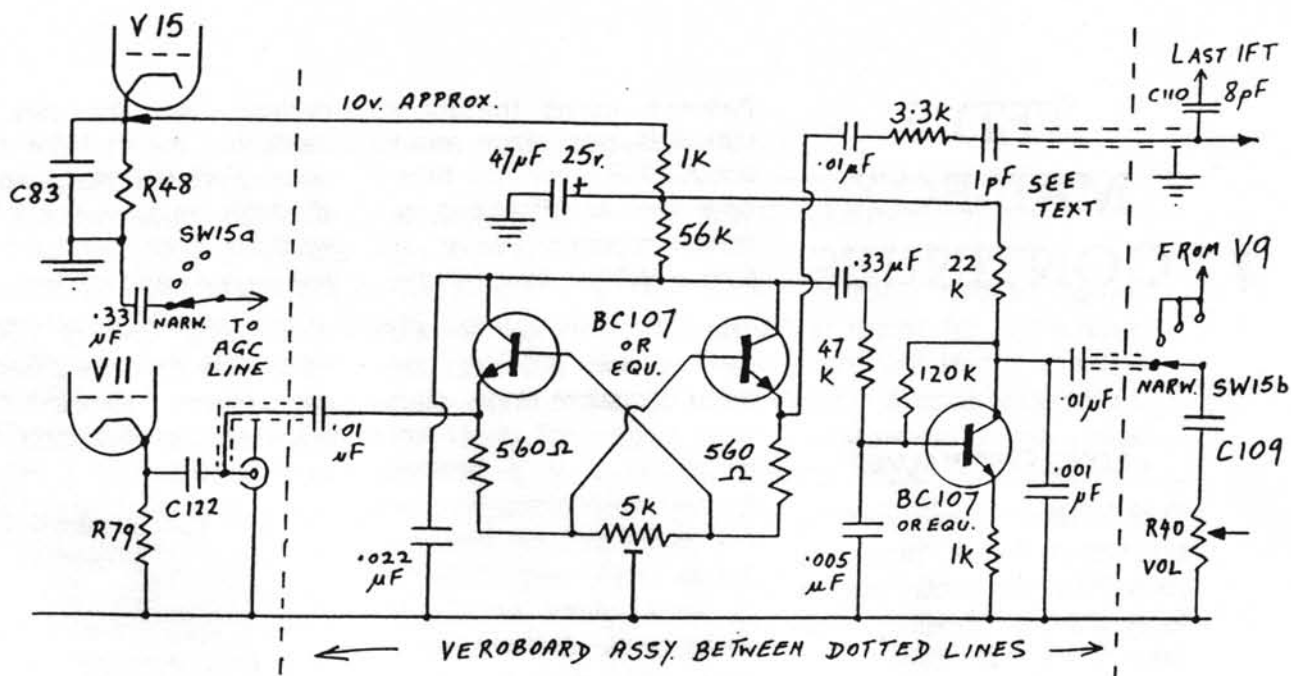
The Eddystone receiver type 730/4 - and its military version, ZA.51262 - is a good general-purpose valve HF receiver but it suffers from the deficiencies of most receivers in this category when single-sideband reception is attempted. This stems mainly from the design of the diode second detector, the inputs of which are adjusted in level to suit AM and CW reception.

The signal (IF) input level is high and the BFO level is fairly low. Other parameters, such as local oscillator and BFO frequency stability are good and so it seems worthwhile to fit a detector more suitable for the SSB signals, which now (1974) predominate in the amateur HF bands.

As is usual with Eddystone designs, the 730/4 presents a clean top layout of the main deck and so it was thought best to fit the new unit underneath the IF chassis. Space here is not great and this restricted the choice of product detector to those using low-volume components. The final selection was of a cross-coupled transistor mixer as shown in the circuit diagram.

It was felt that the existing switching on the front panel of the 730/4 should be left untouched as far as possible and so it was decided to use the "narrow" IF bandwidth position for product detection. This position could still be used for CW and the IF crystal filter could still be switched in, if required.

The IF bandwidth selection switch has two wafers for miscellaneous switching and these were rearranged to allow the audio to be taken either from the diode detector, (via the limiter if switched in), or from the product detector. Further changes were made to switch in a longer time-constant capacitor across the AGC line when in the product detector mode. The problem of feeding the rather low input impedance of the product detector, without extra switching, was solved by connecting it across the very low impedance cathode follower IF output socket. This works well except for a tendency to limit on very high input signal levels (it was intended originally for an FSK output where it would be no problem). The level still had to be adjusted downward by the capacitive input potentiometer.



The BFO input was intended for a high-impedance load but it was found that the inclusion of a series resistor between the existing output and the product detector gave sufficient voltage at the product detector and for adequate mixing and did not load the oscillator too much.

It was found that feed-through of the BFO output via the original 8pF capacitor coupling it to the diode detector was rather high, and distortion on SSB reception was minimised by using a 1pF coupling capacitor. (use a twisted-wire capacitor - G.)

Construction

The unit was built upon a piece of Veroboard approximately 3.5" by 2.5" which was inserted vertically under the IF chassis and held by a bracket fixed by one of the screws holding the cover of the RF coil-box, moving a cable cleat forward to free the necessary fixing point.

Connections were made by screened cable except for the DC power connection, which was made to the cathode of the output valve, (about 10 volts). Residual audio at this point was removed by an R/C filter in this lead.

The only setting up necessary was the adjustment of the pre-set 5k potentiometer and this is quite uncritical. The best point was found by looking, on an oscilloscope, for least

distortion on the audio output from the product detector, but it would be good enough just to listen for the best-sounding signals.

Operation

In use for SSB reception, the bandwidth switch is set to "Narrow," AGC is left at "On," RF gain is set at maximum, the BFO is switched on and its tuning knob set about +/- 15 degrees* of centre according to the RF band in use (i.e. the sideband to be received). *see PS below - G.

Signals are then tuned in and optimised for sound, resetting the BFO knob if necessary to get the best results. In conditions of heavy QRM the crystal filter can be switched in and tuning re-adjusted to clean up the wanted signal, but some sensitivity is then lost.

The suggested modification provides much-enhanced SSB reception with a minimum of disturbance to the receiver.



Post-script from Graeme: If the BFO tuning is a bit 'sharp', try inserting a small capacitor of about 10-20pF in series with the BFO variable tuning. This will make it much more manageable on both CW and SSB.

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TED'S MAILBOX CONTINUES

...

LONG LIFE VALVES

One EUGer has recently purchased for a 'fiver' the remaining test gear from a local dealers workshop. The now Silent Key owner had continued to do repairs for the local populace up until several months back. Not a bad record when you think that he went into the business after his demob from WWII.

The old Mullard valve tester still works, albeit with some intermittent contacts which need cleaning. The AVO 7 works as well as it did when new. The AVO signal generator is defunct at present but no doubt repairable.

The really big surprise is the BC221 sig; gen;/frequency standard which is absolutely pristine, lovingly cared for and spot on frequency if one can still go by R4 on 198 Kc/s. A quick look shows that it may have been re-lubricated at some time but the date stamped both on the inside chassis and on the valves is 1943 and 1942. The bottom battery compartment contains a professionally built, regulated psu employing 3 rather more modern valves but going by the

Parmeko mains transformer date this was made around about 1948 - the first time I have seen an EF91 used as a series regulator valve fed from a 6X5 full wave rectifier.

The paint work on the outer case is now dull with age, there are slight finger marks worn on the still glossy front panel but it is a perfectly functioning anachronism, and one which will be treasured but definitely used. Fifty five or more years of life for components (valves) which were often said to be the component most likely to fail, not bad eh?

Ted.

TRANSFORMER REWINDS.

A reminder here from Dave to the effect that Majestic Transformer Co of 245 Rossmore Rd, Poole, Dorset, BH12 2HQ are still offering custom rewinds of your old trannies be they mains, AF output, TV LOP or any other ilk.

Custom in this case means letting them have your dud and then awaiting the quote. This kind of work is not cheap but if you are in dire need then try a call to them on 01202-734463. If they make you happy then do please let EUG know so that we can tell everybody.

Ted.

BUILD IT YOURSELF ?

For many years the DIY side of our hobby has been in

decline, not for lack of available parts but more because of the vast quantity of high quality equipment available both new and on the second hand market.

Whilst the likes of G3GGL have done their level best to get others involved the response has not been too encouraging.

The kits now available from Kitmaster, 37 Gosbecks Rd, Colchester, 002 9JR, can make it easy for anybody to build their own 'hollow-state' or solid-state receiver.

The kits available range from simple crystal sets to 3 valve MW and SW receivers.

All parts are supplied and the chassis are pre-drilled and valve bases fitted too What more do you need ? Get on with it, the pleasure derived from a totally home built receiver is something you will never forget. It may not be an Eddystone but it will be ALL YOUR OWN WORK.

Ted.

UNIVERSAL-AC/DC SETS.

A renewed warning comes from Sam about working on these when out of their case and upended on the bench.

He ought to have known better, *rephrase that*, he DOES know better but in this case carelessness and Sod's Law combined to upset the applecart (read box of nuts and screws).

His 670A had expired and required TLC if he was to

have his usual evening listening period. Out came the set, onto the bench, plug in the mains lead, switch on, watch the heaters come on, or not as in this case.

Experience dictated that this was a duff valve heater and the usual culprit is either the rectifier or the output bottle. Sam stood up and reached over and above the 670A to reach down his testmeter from the shelf.

The plastic ice cream container full of miscellaneous nuts and screws was alongside and one of the leads of the test meter caught it and pulled it off the shelf. Hoping to catch it before it fell onto the receiver Sam leaned forward and just happened to place one hand onto the top of the hot and live dropper resistance.

You can guess the rest! He got a terrific belt, a bad burn and the box of bits hit the set, the lid came off and about two pounds of nuts and screws scattered all over the chassis of the 670A. He never did get to QAP that evening. The set remained unfixed for several days until the clumsy bandage was removed from his right hand.

He is not at all pleased with himself since some thirty years of experience ought to have taught him better working procedures. The thousands of nuts and screws were hoovered up into a NEW bag, fitted to the XYL's vacuum cleaner and then tipped back into their

container. This is now stored UNDER the bench. Apart from a blown fuse there was no other damage to the 670A. Oh yes, the original fault was a duff output bottle, easily replaced from his stock of new and part used valves. The only lasting damage is a scar on his amour propre.

Ted.

HMS NARVIK — 1957.

An old magazine dealing with RN ships had a photograph accompanying an article on the British 'H' Bomb test at Christmas Island in May 1957. Thanks for sending it in Bob.

V-Bombers of RAF Strike Command (*wasn't it 'Bomber Command' in those days? — Graeme.*) were used to deliver the nuclear weapons to the target area but much of the monitoring and radiation control was in the hands of the RN using ships such as HMS Narvik.

The photo which I spotted showed the so-called 'Forward Control Room' on board the Narvik. Besides the usual, to be expected, CRT monitors and other built in racks of equipment there is one quite anomalous item. Sitting sideways on the Radio Ops desk is a 680X with wires hanging around it.

An apparent aerial lead hanging down to the rear etc; plus an unboxed loudspeaker unit, about 6 or 8 inch diameter, connected to the 680X. It is simply stood atop

the case of the 680X, magnet down, speaker cone upwards. This appears to be a very temporary installation as if the 680X had been roped in at short notice for monitoring purposes.

A blackboard on the side wall of the control room can be read by using a magnifying glass and the names of some of the watchkeepers (?) can be clearly read.

Does anybody know anything of this RN ship and the use of the 680X on board? The names on the board are as follows,— in the column headed PILOT we have, Roberts, Turner, Foster, Langdon, Bates, Cumming, Newton, Brethers, Gibb, and Steele. The second blackboard lists the Voice Callsigns of the various other ships engaged in the operation.

I doubt that the poor quality of the photo would help much but if any EUGer can identify any old mates who were on Narvik and help us out here. Why the temporary hook up of a 680X??

Ted.

AN 888 FROM THE NEC.

The 888 was on offer for £60, as a non-worker, yet it looked and felt good. The seller explained that it had been in use up until the death of his Father but despite all valves lighting up there was now nothing out bar a very slight hum from the attached speaker.

With all sorts of thoughts going through his head the EUGer bartered the price down to £50 and staggered off with the set on his shoulder, out to the car park, hide it in the boot, and back into the show.

Possibilities ranged from duff valves to blown electrolytics, to an O/C transformer secondary. It was too late that night when he got home. Next day was different and soon after breakfast he was at work, with the 888 on his worktable

Powered up whilst still in the case it was seen that valve heaters were glowing. The set was removed and a further check showed that all valves were glowing.

Out with the DVM and some checks showed the presence of all valve HTs both unregulated and regulated, so the fuse in the secondary centre tap was also Okay.

They appeared to be within reasonable tolerances as stated on the diagram in the relevant Newnes R & Tv Servicing. But still no output, not even when an AF signal was injected into the AF input connectors.

This latter was a heartening sign as it indicated a fault around the AF stages and not the RF/IF stages. Thank Lucifer for that, he said. Not being too keen on digging into the RF/IF wiring.

Next stage was to remove all valves for a check and quick clean, at the same time cleaning the dust off the top

of the chassis. As the valves were removed they were marked as to their position,

i.e. V1, V2, etc; — lucky this WAS done. Just keep reading. It was only whilst replacing them that it was noticed that V7 (a D77) and V6 (a DH77) were wrongly marked, or were they? The D77 is a double signal diode used as Noise Limiter and 'S' meter diode in V7 position. He had marked this as V6 because he was almost certain that is where he had taken it from.

The DH77 is a double signal diode and AF amplifier triode which was marked - as he was again almost certain that this was where he taken it from. But he checked the schematic again to be sure and then fitted them correctly, not as marked when he removed them.

Power on and as soon as the ergs began to circulate the set burst into life. Could it possibly be that this was the only fault? Two valves swapped over? Much later, after a number of 'on air' checks the set still functioned perfectly well, apart from a noisy Range switch which reacted well from a squirt of switch cleaner. The 888 was boxed up and put into daily use. Had it been bought as a 'worker' it would have cost at least twice as much. One very happy Euger!

Ted.

C85 IN THE 750.

There ain't no such animal ?? Well sometimes there ain't, sometimes there is.

On the first 750s to leave the Bath Tub there was a C85 fitted across the primary of the AF output transformer, this was later omitted from all subsequent production. So, if your 750 does have a 500 pF tone correction condenser across the transfo primary then you have a VERY early example. Most of the existing schematics do not show this condenser but I have seen it on one schematic and on several sets. Fitting one will make little or no difference in the output quality but if there is one there then DO CHECK IT out. There have been some reports of this paper type condenser being leaky. Just chop it out if this is found, no real need to fit another but if you do, make it a 400 VDC rated item. Okay now James ?

Ted.

SEND YOUR
LETTERS TO
TED'S MAILBOX,
C/O Jim Murphy,
63 Wrose Road
BRADFORD
BD2 1LN

★

Marconi

companies and their people

Volume 13 Number 11 June 1968 Sixpence



A Flash from EDDYSTONE (see over)

Thanks to observant EUGer Tony Hornsby,
this company newsletter was found in a pile of
old Radcom magazines at a radio rally

The photo is a 1930 model "Gwynne Invincible" fire engine which saved the Marconi Works in the Blitz. It has been restored by Marconi apprentices and is seen here in the London to Brighton Commercial Vintage Vehicles Rally in 1968.

A flash from Eddystone

The new 990R receiver looks like a winner

EDDYSTONE'S new receiver the 990R, which follows in the steps of its well-known forbears, is showing its form in the export market. First orders have come from Canada, Australia, and South Africa.

The very first instrument from production went to the Mullard Radio Astronomy Observatory, Cambridge, who find it useful in astronomical noise and pulse investigation. The Mullard Observatory was featured on television in 'Tomorrow's World', after the discovery of a pulsating radio source in outer space and its identification with a visible star.

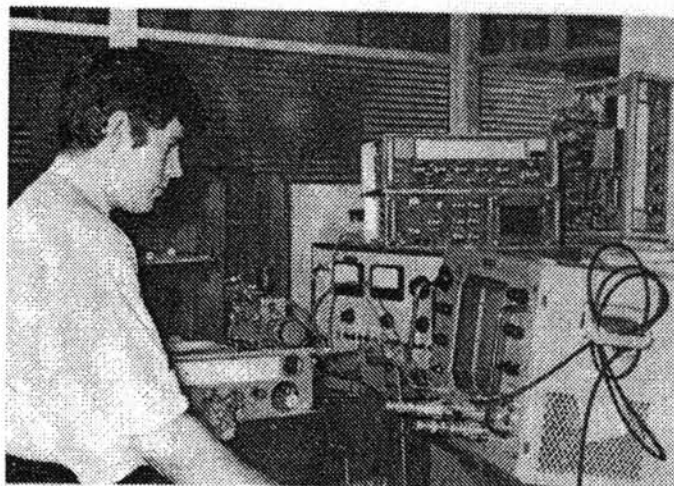
Other universities in the U.K. are also interested in the abilities of the 990R, for it is officially



LEFT: Preliminary stages in the making of Eddystone receivers. On the winding machine, right, is Diane Godbehere, and in the foreground is Mrs. Jean Currier, assembling Vinkor units

BELOW, LEFT: The RF tuning unit of a 990 receiver being tested at Eddystone by Terry Parker. The two instruments at the back are a 990 receiver ready for test, and below it the prototype panoramic receiver type 961. Terry is the secretary of the cricket team this year, and the team has a full league fixture list

BELOW: Working out the shape of things to come. B. Cook, Chief Engineer of Eddystone Radio with H. N. Cox, Managing Director. Mr. Cook has been with Eddystone for thirty years. Mr. Cox joined in 1926 and will have served forty-two years in October

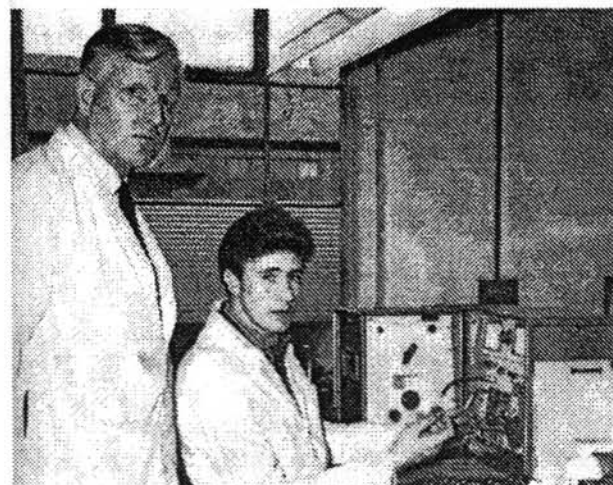




TOP LEFT: The final stages of assembly of one of the units. This is Sheila Smith with Ray Evans, Chargehand of Assembly



TOP RIGHT: Mrs. Diane Patterson winding coils for the RF tuner of the 990R receiver



ABOVE LEFT: The inspection of RF coils in Assembly shop. Doug Bevan is carrying out the operation and with him here is Eric Walmsley, Foreman, Preproduction Department



ABOVE RIGHT: Eddystone receivers have sold well overseas and are a valuable export. Here is a production run of the new 990R, the very first of which is being used by the Mullard Observatory, Cambridge. Here in the front two benches are, left to right, Roy Timmins, Linda Freil, Elaine Hill, Joyce Thomas, Val Simkiss. At the back, Ray Evans, Chargehand, and Eric Walmsley, Foreman

described as a fully solid state, general purpose, continuous coverage, VHF receiver, between 27 and 240 MHz. The Mullard Observatory, by the way, also use a low frequency Eddystone receiver type 850/4 for time-checking national standard time.

Eddystone have made their name with good quality products. H. N. Cox's first Marconi contact was with R. B. Armstrong of Writtle to whom he supplied component parts and then complete receivers. As Mr. Cox took over more of Eddystone's administrative work so B. Cook took over development, and now Mr. Cook is fully responsible for the design of equipment which will stand as a tower of strength to the Company in its business enterprise.



Poo's Ponderings

'Stray thoughts from an absent mind!'

by Simon Robinson M5POO

The Eddystone Light

At long last all the 'Eddystone Light' models have been dispatched. There have only been a couple broken in the post despite careful packing and a "FRAGILE - DO NOT DROP" label on the front. I'm convinced these statements provide a personal challenge to some postmen; I wonder how high this will fall from before it breaks? It reminds me of a story regarding the old eight-inch computer disks; remember them? A friend of mine kept sending them to a particular address in Scotland whilst working on a project. He got fed up with them getting bent no matter how large he wrote, "DO NOT BEND" on the envelopes. Eventually he wrote "EIGHT INCH COMPUTER DISKS DO NOT FIT THROUGH A LETTER BOX". His friend was astonished the next morning when the disks arrived neatly folded on the doormat complete with a note written on the front by the postman. It said "OH YES THEY DO".

At last a 680

Having been in search of a model 680 receiver for some time now, I finally found one. It was heavily modified and was finished in an interesting two-tone hamerite green. Being the glutton for punishment that I am, I have decided that a total restoration would be fun! But then what happened? Only a week later another one turned up complete, unmodified and in fair condition! I thought it was only buses that turned up in pairs having waited so long. Note: these are 680 receivers i.e. half moon dial, not the more common 680X.

Eddystone Mains Filter CAT. No. 732

Over the years Eddystone have produced a wide variety of 'gizmos' and 'doobries' to go with their extensive array of receivers. In the late forties they introduced the above mains filter primarily to go with their AC/DC cabin sets. I recently obtained one of these for a tenner and whilst it doesn't warrant a 'Featured Model' I thought you might like to take a look at one. Before I begin, if you have one of these units be VERY CAREFUL if you wish to plug it into the UK mains. Chances are you may end up with a new hairdo. The filter uses rubber wire and old style waxed paper capacitors. If you MUST try it then replace these first and stand well back.

The following advert is from the back of an Eddystone 670A receiver instruction manual although it appears in several Eddystone catalogues of the era.

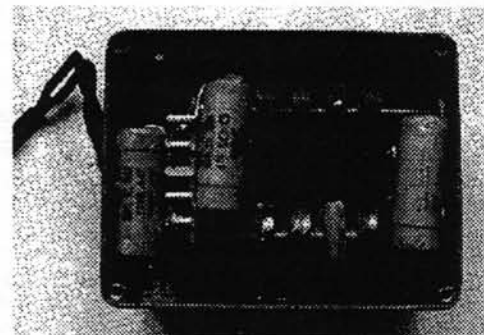
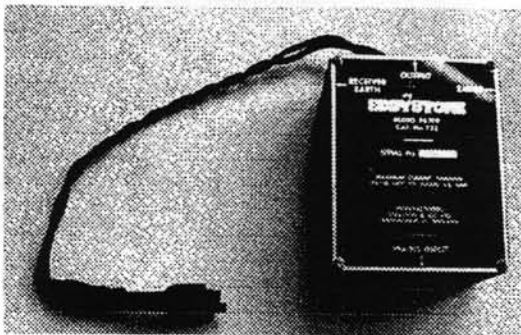


EDDYSTONE MAINS FILTER UNIT

Due to sparking at the commutator, electrical machinery is liable to cause interference to wireless reception. This trouble is often prevalent on board ship, where the dynamo itself may be a primary cause, with possible aggravation when fans, etc., are brought into use. Such interference can be very considerably reduced, if not entirely eliminated, by fitting a suitable filter unit. The Eddystone Mains Filter Unit has been designed specifically for this purpose and will be found most efficient. It takes the form of a small metal box, finished ripple brown to match the "670" Receiver, and is supplied with the necessary mains plug and socket. The unit is inserted between the mains supply and the receiver and takes but a few minutes to fit.

Cat. No. 732 Price £2 : 15 : 0

The pictures below show the inside of the unit and its external appearance from the top.



The 670A manual provides concise instructions on the use of the filter:

"When the Eddystone Mains Filter Unit is used, the following connections should be made **BEFORE MAKING ANY CONNECTION TO THE MAINS SUPPLY.**

The short flexible lead in the unit is plugged into the mains input socket on the receiver. The earth lead is connected to the socket marked "Earth" on the Filter Unit. A connection is made with a short piece of insulated wire between the "E" socket on the receiver and the socket marked "receiver Earth" on the Filter Unit. Finally, the mains lead may be plugged into the socket on the Filter Unit. If the Filter Unit is not used, the earth lead is plugged directly into the "E" socket on the receiver."

Many later receivers featured built in mains filters and therefore production ceased. You may still find these curiosities at rallies and junk sales. Does anyone else have any 'gizmos' lurking in a dark corner? If so, let us know and we'll do a mini-feature on them. That's all for this month folks.

"EDDYSTONE SPECIFIED"

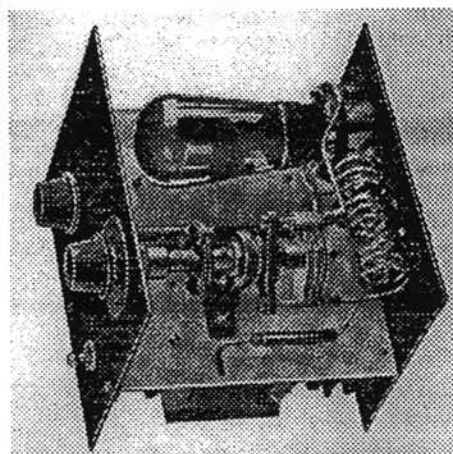
*A Series of Articles featuring Constructional Projects
In which the use of Eddystone Components is specified.*

TWO VALVE TRANSCEIVER

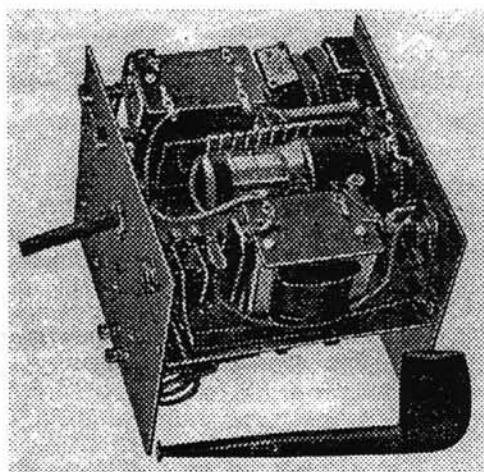
COVERING THE 56 TO 60 MC/S! BAND.

One of the advantages of 5-metre work is the small power necessary to obtain results, and so practical apparatus which is quite portable can be built. Here, we describe a complete 5-metre band transmitter and receiver combined, built from standard parts into what is probably the smallest bulk possible, consistent with efficiency. A 120 volt H.T. battery, a 2 volt L.T. accumulator, microphone, 'phones and a telescopic aerial, form a complete equipment which can be carried anywhere by one person.

The transceiver has given good and consistent results over a prolonged test period and has achieved R9 2-way working over a distance of above 30 miles under favourable outdoor conditions. In the centre of a city, its range is reduced according to circumstances, but 5 mile working has been accomplished consistently under ordinary conditions and 2-way communication has been carried out between two travelling cars.



Top view of Transceiver showing oscillator valve, tuning control and condenser, and coils L1, L2 and L3, which are each 3 turns of 14g. copper wire, wound on a $\frac{1}{4}$ " core. The coils are supported in the wiring except the aerial coupling (centre) which is fastened on the paxolin panel to the feed out terminals.



Under side view of chassis compared with pipe to show small compact size. The modulation choke, modulator valve, send, receive switch, quench coil unit and microphone transformer are all clearly seen.

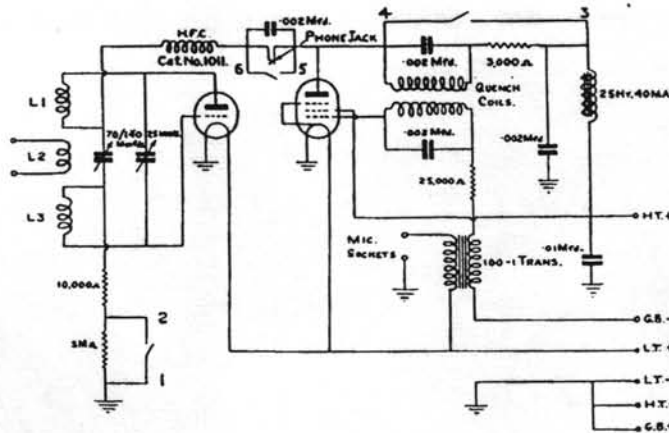
Most transceivers employ the squegging grid leak self-quench detector for reception, but in this model, the detector is not called upon to do both operations, the pentode modulator being utilised as a separate quench valve using quench coils. Change over to send or receive is made by a 3-pole shorting switch. An Osram LP2 small power valve is used as an oscillator for transmission and a detector for reception. The second valve is a Mullard PM22 pentode, used as a modulator for sending and as quench valve for receiving. The action of the switch is as follows. In the receive position, all points are open, the grid leak value being 3 megohms plus 10,000 ohms, 'phones in circuit, quench coils operative with drop resistance in H.T. feed. On send position, the grid leak value is 10,000 ohms, 'phones and quench coils short circuited, full H.T. in use. A microphone transformer is fitted, the microphone being plugged straight into back of set and the L.T. battery is used for energising it.

TWO VALVE TRANSCEIVER—continued

The construction of the receiver presents no great difficulty. A paxolin panel 6" x 5" is used at the back, a front panel 6" x 5" of 060" aluminium and a sub-baseboard of the same, 8 1/4" x 6". The top and bottom views illustrated show the position of the component parts. An Eddystone Slow Motion Head with Flexible Coupler is used for tuning control. The

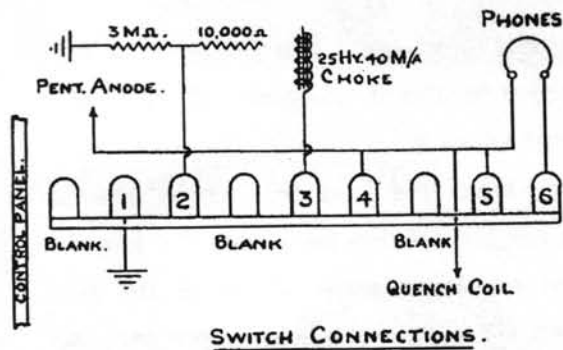
Adjustable Bracket must be cut down suitably in height.

The power output with 120 volts H.T. is about 1.5 watts. A half-wave aerial is recommended and this can be of the Zepp fed, Windom, Impedance matched or Johnson Q type as elsewhere described. The third named was the one used in our experiments.



LIST OF PARTS

	Price
1 Eddystone Valvholder, No. 1015	1/3
1 Eddystone Microdenser, No. 900, 25 m.mfd.	4/-
1 Eddystone U.S.W. H.F. Choke, No. 1011	1/3
1 Eddystone Adjustable Bracket, No. 1007	1/6
1 Eddystone Flexible Coupler, No. 1009 ..	1/6
1 Eddystone S.M. Driving Head, No. 1012 ..	3/-
1 Eddystone Quench Coil Unit, No. 958 ..	4/6
1 Eddystone Knob, No. 903	6d.
1 each Erie 1-watt Resistors, 3,000, 10,000 25,000 ohms, 3 meg.	each 1/-
1 Cyldon 70/140 m.mfd. Capacitor	2/-
1 Igranic Jack	1/3
2 Belling Lee Plugs and Sockets	pair 4 1/2d.
1 T.C.C. "M" type Condenser, .01 mfd. ..	2/-
3 T.C.C. "M" type Condensers, .002 mfd. ..	each 1/-
1 Keston 25 hy. 40 m/a. Choke, No. 204a ..	8/6
1 Keston Mic. Transformer 100 : 1, No. W44	8/-
1 On-Off Switch	1/6
1 Utility Switch, No. W342/3	3/-
1 WB 5-pin Valveholder	10d.
Paxolin and Aluminium Panels, Wire, Leads, etc.	



Another Look at the 940

This was one of the last of the valve sets to be manufactured and so it ought to be one of the last to suffer from component failures. That they DO have these problems now points to the fact that we ought to be looking towards having to service them in the near future.

Resistors and condensers are easily replaced, for the most part. This is not quite true for the resistors and condensers mounted in the BFO can or around the bases of the RF and Frequency Changer stages.

Faults with the IF coils are more difficult to locate. These are not the very solid IFTs of the older models and there have already been reports of low Q and detuning caused by operation of the Rx in areas of high humidity.

The common wisdom suggests leaving the Rx in a nice warm, dry, place for a couple of weeks. I have used the domestic airing cupboard for this in the past. IT WORKS, so don't knock it.

If you have drift then don't go all around the houses looking for a cure. Go directly to the regulator valve, if not lit up with applied HT then there is your problem, so swop it.

If you have drift or an unstable note on CW, or SSB, then have a close look at this regulator valve. If it's flickering badly then it

may be on its way out, or you may need to check R72, the wire-wound 6 watts resistor in series with the anode of the regulator valve. It may have gone high.

This problem may only show up on the CW mode, and not on AM. The small extra load imposed by the BFO stage can drop the HT3 level from a duff regulator valve.

Another cause of drift or an unstable signal can be the decoupling condenser in the anode circuit of V4, the local oscillator. C46 is a 0.047 muf polyester type. It SHOULD be at any rate.

I have encountered one 940 where a paper type condenser of 250v DC rating was fitted. Original equipment too! The correct rating is 400v DC so do check.

One remarkable fault has been reported to me, the DC blocking condenser C101 in the headphone circuitry is a 0.01 muf ceramic tubular type. The owner reported getting tingles from the metal body of the phone plug as he plugged or unplugged his phones.

The condenser mentioned had split along its length and was reading as very leaky on test. Since one end of it goes to the anode of V11, one of the output bottles, there was full HT present Never did like metal bodied phones plugs!

Ted.