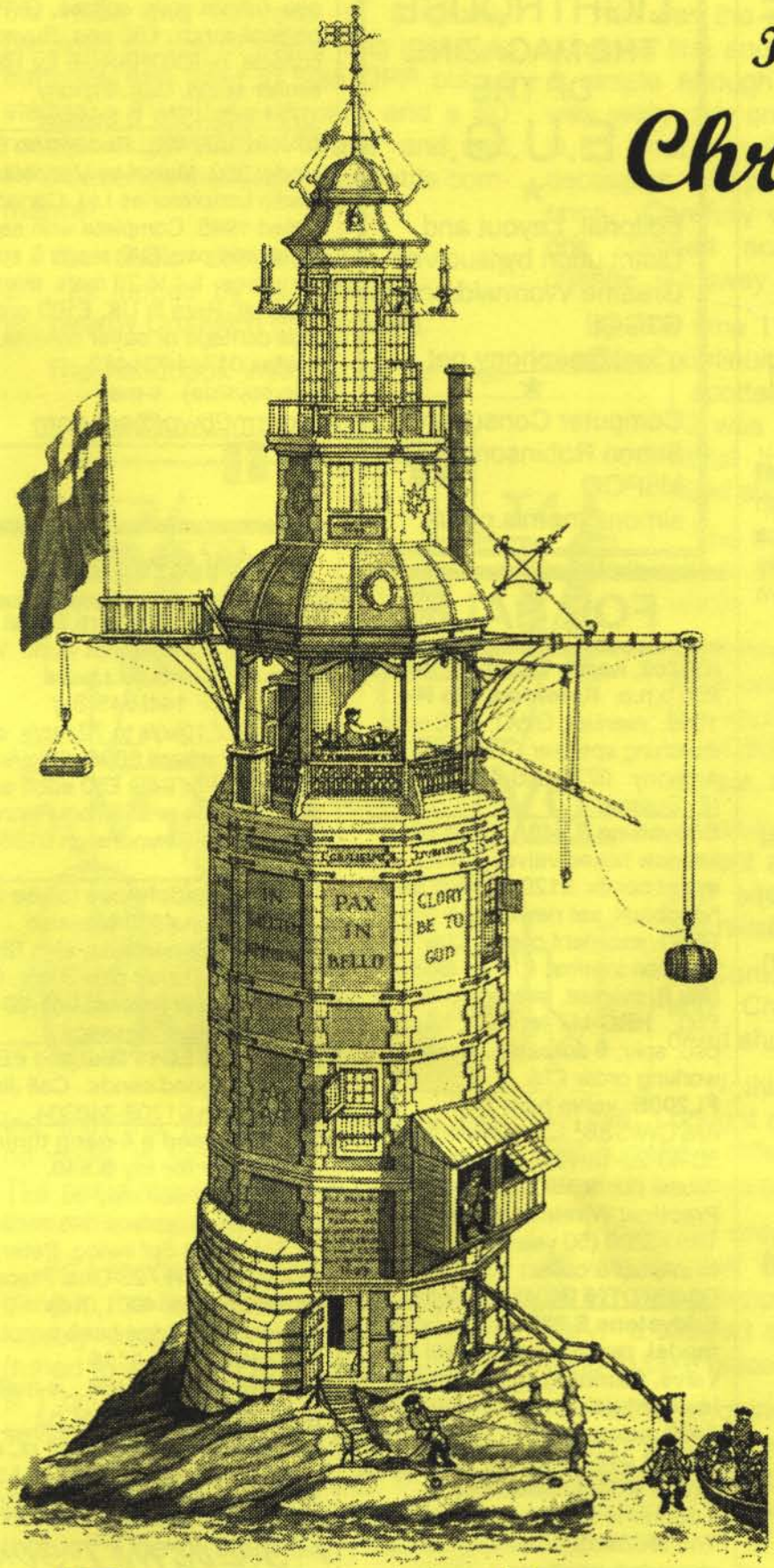
Issue 70

Christmas 2001

Lighthouse

TheMagazine of the Eddystone User Group



EDDYSTONE LIGHT

THE WORLD'S FIRST OFFSHORE LIGHTHOUSE 1699

EDDYSTONE USER GROUP

A non-profit-making group for Eddystone Radio Enthusiasts
Founded in 1990 by Ted Moore
Issue 70. Novem. 2001

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LIGHTHOUSE
THE MAGAZINE OF THE
E.U.G.

★

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WANTED

504 and 659 receivers. Must be complete but need not work. Will swap 680X or buy**. I have Marconi** TF 144H/4S Sig Generator 10kc/s to 72 mc/s, and Hewlett Packard 606A, 50kc/s to 65 mc/s. For Sale £50 each or swap for 504 or 659 Rx. Phone or fax Dave Simmons on 01869 347504

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Eddystone EC10 MkII and EB36 models in good condx. Call Jim MØMAC on 01708-340304

Urgent: I need a 4-gang tuning condenser for my S.940. A damaged one may do, as I only need to replace one section. 11.5pf to 354.5pf swing. Peter, ZL4TCC, QTH:- 23 Oriel Place, Pirimai, Napier 4001, New Zealand. (London bank account) Tel ++64-6-843-1116 Fax ++64-6-843-1488 e-mail:- pleq_tbc@clear.net.nz

Eddystone 1570 or 1590 rx, any condx considered. Dave, 01554-775790 or MW1DUJ@AOL.COM

P.S. EUGNET, SUNDAY 6 JAN 2002 10·00Z 3695± QRM. G3XFE, CHRIS IS CONTROL

LIGHTHOUSE

CHRISTMAS 2001 ISSUE 70

Welcome to another issue of the "Lighthouse". I am sure Graeme has given us something good to read through over Christmas. May I take this opportunity to wish everyone a Happy Christmas and a Prosperous New Year.

This year I have taken over the Chairmanship of my local radio club – Wythall. *(South B'ham)* This is quite an active club who meet every Tuesday and are fortunate enough to have a permanent shack in the cellar of the local community association. The club has its own Versatower and antennas and is QRA on all bands up to 70cms (even 23cm on portable operation). We even have a trailer-mounted Versatower and Contest Caravan. Being active in any club or society certainly takes its toll of one's free time. Looking through some of the community activities that take place in our association it never ceases to amaze me how many of us do give up our time to indulge in voluntary activities.

I had the pleasure of giving a talk to the Cheltenham Amateur Radio Association (CARA) last month. As you can imagine many of the members previously worked at that famous *Cheltenham listening post!. I was very pleased to meet a member who was at Bletchley Park at the same time as I was in the early 1960's. I was a junior member of what was then only known as the Composite Signals Organisation, and spent 18 months at Bletchley before being posted to the War Office station at Beaumanor Park in Leicestershire.

Anyway through this CARA member I was able find out what happened to some of my fellow class-mates. One of them apparently retired from GCHQ recently and only lives about a mile from where I now work. It is a small world. Am I alone in wanting to make contact with people from my past? It must be a middle-age thing. I have joined a web site called Friends re-united who put you in touch with your old school chums. The subject of my talk was the activities of Alan Dick and Company who is now a major Cheltenham employer.

Thinking of talks, I have been asked to give a talk on Eddystone Radio by a local amateur club. Haven't finally decided whether to do it, but I probably will. Simon has offered to help with photos.

A friend who lives locally has put in for planning permission for a mast from the same council that I had my 'run in' with last year. He says that the local planning officer says that they now have to take into account the guidelines in PPG 8 as a consequence of my successful appeal. Nice to know you can take on the system and win sometimes.

2002 is definitely the year I intend to think of some way of getting G6SL on the air for EUG members. Perhaps some kind of commemorative certificate. I will have to see if Graeme can find some Eddystone event of which 2002 can be a suitable anniversary. Watch this space. *(See this month's "Ramblings" – Graeme.)*

My best 73's

Chris Pettitt - GØEYO

Patron (chris@g0eyo.freeserve.co.uk)

*G.C.H.Q.

Follow Up Report

In Issue No. 65 (Feb 2001) of Lighthouse we featured the unusual Eddystone 730/1a which was specially designed to take apart! It's lucky owner, Roger Bebbington, MØBPW, brings us up-to-date on this Diplomatic Wireless Service Special.

Restoration

"The metal top cover had considerably stretched and distorted and I found there were three holes which also had to be welded up". Once I had fully repaired all of the cabinet damage to my satisfaction, I duly dispatched the five case parts and aluminum front panel to Corbridge to be re-stove-enamelled in the original aircraft grey colour. My attention then turned to the rest of the radio.

The set actually worked very well on all but one wave band, which was very noisy. The main problem as far as I could see was that all the internal parts were coated with nicotine including the wave change switch wafers, which were in fact very contaminated with a mixture of dust, nicotine and cleaning fluid.

So I made the decision to clean it in the manner described by Simon M5POO in Lighthouse No 61. *(A ferocious process involving soaking in mousse and total immersion, followed by prolonged drying out in the cylinder cupboard! - Graeme)* I must say the end result was amazing! The radio now appears to work better than ever before and on all wave bands

Scale plate.

I am afraid the scale plate was in much the same condition as the rest of the radio. That is to say it was a brownish colour and also had a small area of damage where an attempt had been made to clean it at some stage. The print had been rubbed through to the metal back plate. Having painstakingly cleaned the scale plate with fairy liquid I was surprised to find that its original colour was grey, but the small area of damage was still visible.

I am told that screen-printing is very difficult to repair invisibly; beyond my skills anyway, and another scale plate has proved impossible to source. But a model-maker colleague at my works QTH has persuaded me that the way forward is to create a replica "decal" of the scale plate.

He makes his own models from scratch, including the decals. He has kindly supplied me with details of a couple of Internet companies who supply decal material that is especially made for a P.C printer "www.thedecalstore.com" or bel inc. custom decals via yahoo shopping; I am sure there are more.

I have taken images of the scale plate in various ways before re-assembling the front of the radio and I hope to be able to create a replica decal of the scale plate complete using a photographic package. I will report in due course on my success or lack of it on this idea. If successful it may be a low cost way of replicating Eddystone dials using the original backing plates.

Cabinet Assembly.

Having received the fully re-stove enameled cabinet pieces from Northumberland, the first thing to do was to

stencil the numbers 65 back on to the inside of the cabinet pieces as original. They are the last two digits of the serial number AH0265 (January 1956). It was also necessary to clean out all of the cabinet nut holes with a 4 BA tap to remove the excess enamel.

When the cabinet was fully assembled my first attempt to fit it to the radio found that the new panel screws were catching on just about everything. Every one of them had to be removed in turn (there are 26 in all), and be shortened by 1/8 of an inch, which brought them flush with the ends of the cabinet nuts. A slow job!

After another struggle to fit the radio to the cabinet, I eventually found the easiest way was to completely remove the top cover and slide the radio down and into the cabinet and then screw the top cover back on again. The cabinet is a glove-like fit to the radio, as the photograph shows every panel is a perfect fit, just what you would expect from an Eddystone.

Front Panel.

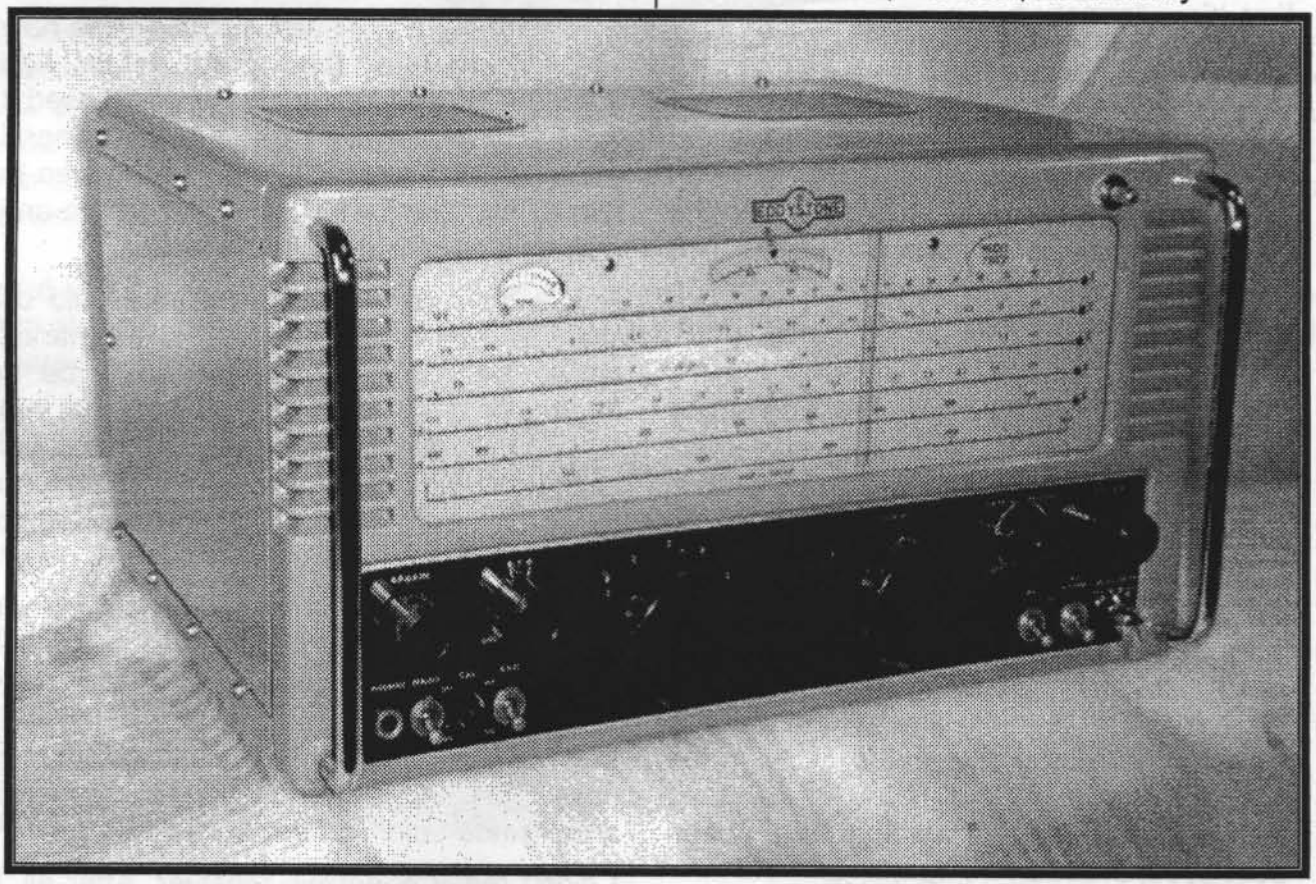
The most obvious thing to notice about the front panel compared to, say, the 730/4, is that the Crystal Calibrator is operated by a black push switch located between the mains on/off and a.v.c on/off switches. So for the record the bottom escutcheon plate control line up is as follows:-

Left hand side:-

phones, mains, cal, a.v.c.

Right hand side:-

n.l, af filter, selectivity



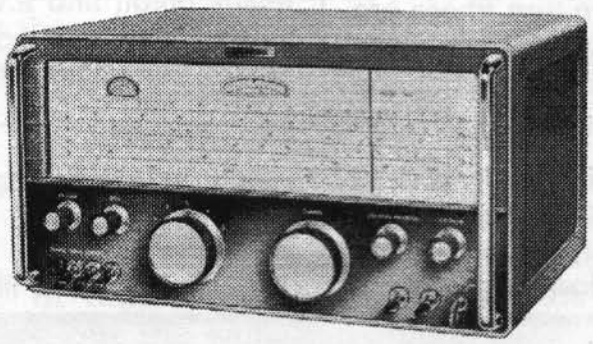
The Special D.W.S. Model 730/1a, which has a fold-flat cabinet and can be dissembled into separate chassis units to carry in the Diplomatic Bag. The inter-chassis connections are all plug-and-socket, thus facilitating re-assembly at the British Embassy in Moscow.

The History of One Eddystone 940 Receiver.

By Peter Lankshear. (N.Z.)

It is always nice to know the background of a favourite receiver but it is not always possible to track down its adventures before you came into its ownership. Recently I stumbled across the early history of my Eddystone 940 and was able to piece together an interesting story that EUG members may like to share . . .

One afternoon about 10 years ago I received a phone call and a rather youthful voice said "I have been told that you can fix Eddystone radios" Although I had only previously delved into my 680 and 870, with my usual lack of modesty I agreed that his information was correct.



My caller then explained that he had one that needed "fixing" and he asked if I would look at it for him. I agreed and was told that he would bring it round in Mum's car the next afternoon after school. I was left wondering how a schoolboy came to be the unlikely owner of such a beast and what model was it anyway?

Sure enough, the next day the Eddystone arrived. It proved to be a 940, and apart from a small hole in one of the end grilles, appeared to be in good physical shape.

Electrically it was not in good order. I had no 940 data, but it was immediately apparent that the cascode R.F. stage was dead, and it was obvious from its inaccessibility that repairs to that section would be very time consuming. Further, the A.G.C. system was not doing its job, and the Band 5 aerial winding had been destroyed, probably by lightning.

Many of the resistors were the little brown "Vitrohm" or similar brand and I knew from previous experience that some would be sure to have radically changed value and need replacing. Already it was clear that it was going to be an expensive exercise to restore the 940, and I hadn't yet done any in depth investigating. Before I could do any work it would be essential to have the service manual. This I ordered from Mauritron Technical Services and meanwhile I pondered the situation.

I was curious as to how the young fellow had come by an Eddystone and what he used it for. I was told that it was used for general radio listening and that it had been given to him by his "stepfather" who was a ham and was no longer living with the family.

It was obvious that repair costs would be likely to total a large portion of its market value, and its eventual fate would be in doubt, for even an Eddystone will not run forever without skilled attention. I could imagine it languishing for want of someone to fix it – a thought that did not appeal to me at all.

Another problem was that the 940 does not provide F.M. broadcasting, an essential feature for today's youngsters. The more I thought about it, the more I felt that the 940 was not what he really needed, and that he would be better served by replacing it with a top grade solid state domestic receiver.

I didn't really need this receiver. After all, I already had a 680, essentially an earlier version, but on the other hand it was unlikely that the 940 would command much of a price if it were sold on the local market.

So, for better or worse I wrote to the lad and his mother, explaining the situation and offering them in exchange the price of a first class domestic replacement. My offer was readily accepted and I became the owner of a third Eddystone receiver. A few weeks later I had a call saying that they were happy with the arrangement and that they had found a loudspeaker belonging to the 940 which I could have.

Naturally I was pleased to have it, but instead of the expected round diecast type, it turned out to be an under cabinet plinth housing with a 10"X 3" elliptical speaker. I noted something that was to have special significance later. There were four 3/8" holes drilled in the face of the plinth but which had been blanked off with blind grommets.

As anticipated, a lot of work was required to return the 940 to something like its original performance. My fears for its future reliability proved to be correct too. Readers may recall my relating in EUG #58 how an elusive intermittent fault was caused by the sharp end of an A.G.C. line resistor lead penetrating the braid of a nearby piece of coax.

On yet another occasion another time consuming intermittent fault was traced to a faulty I.F. transformer tuning capacitor. These problems took quite a while to track down, such is the cussedness of intermittent faults, and as a charged-out repair job, they would have been a disaster. The 940 now works well, and, connected to a wide range loudspeaker, it has a prime position in my den.

Until recently this would have been the end of the story, with the first 25 years of the receiver's history a blank. However, a couple of weeks ago I was lured into tendering on the Internet for a copy of the Eddystone booklet "Better Radio Reception", and at one stage during the transactions I received a phone call from Eddie, a ham acquaintance who lives in a nearby town.

Eddie commented on the progress of the auction and then mentioned that he once owned an Eddystone receiver, a model 940 and that he often wondered what had become of it. I told him that I owned one myself. We compared notes and Eddie said that his receiver had a plinth speaker and I replied that that mine has one too.

This seemed an odd coincidence because in this part of the world, these speaker enclosures are not common. Then came the "clincher" – Eddie said that for distribution to other speakers he had mounted four extra switches on his plinth panel.

Bingo! Eddie had located his long lost Eddystone.

We have now pieced the story together. In the 1960's Eddie was a "Sparkie" (electrician) in the Merchant Marine and in 1964 had purchased the 940 together with a rotary converter to provide 230 volts A.C. power for shipboard operation.

Eventually he dropped his anchor in New Zealand and later sold his receiver to a fellow ham, George, a mutual friend of ours. George confirms that eventually he sold it on to another ham, surely the young fellow's ham "Stepfather", and the rest we know.

Eddie is happy that he now knows what happened to his 940, and that it has gone to a good home, whilst I am pleased to have its complete history.

A nice happy ending, and we finish the story with a little tale that I suspect is typical of Eddystone. It seems that after about three years at sea, the much-travelled 940 developed a fault. When next on leave, Eddie took it to the factory in Birmingham with the request that it be fixed.

He was told to call back in a week, which he did, to be handed back the receiver with the comment that it had been overhauled and the fault in an I.F. transformer fixed and "No charge – the fault shouldn't have happened". ★

JUST FOR THE RECORD

Sometime shortly after World War Two the BBC Home Service (Midland Region) broadcast a programme which included interviews with the leading lights at the wireless department of Laughton & Sons Ltd., better known to us as Stratton & Co, manufacturers of Eddystone radios.

Copies of this transcription were pressed on 12in. 78 r.p.m. discs. These were distributed amongst the Directors of the Company as souvenirs. A copy recently surfaced . . .

". . . although horses do a very important job in the preserving of law and order, wireless is probably one of the things that has helped to catch many hundreds of crooks in recent years. A lot of police wireless equipment and many other types of wireless have been and are being made by a firm in Kings Norton. The firm has had rather an unusual history as you'll hear from this interview with Mr Stratton Laughton . . . "

The record carries on to give the voices of Stratton Laughton (son of George A. Laughton who founded Stratton & Co in 1911) together with those of Harold Cox (Technical Director of Stratton's) and Arthur Edwards, G6XJ (Sales Director).

Stratton Laughton spent the duration of the War in Australia, supervising the Company's subsidiary, Rainsford's Pty., Ltd., in Sydney. He also joined the Royal Australian Naval Auxiliary Patrol and eventually became the Officer in Charge of this operation in New South Wales. The experience shows in his voice:

". . . on the other hand, when you come to many of the Colonies in West Africa and East Africa things are different. There, there are coffee planters and rubber planters and miners, people getting things out of the earth and so on and they're hundreds of miles from anywhere and have no local broadcasting stations of their own and they *are* dependent on overseas broadcasts."

The recording lasts 6 mins 10 secs and has been digitally cleaned up for us. Copies on compact audio cassette may be obtained from Graeme Wormald, G3GGL, 15 Sabrina Drive, Bewdley, Worcestershire DY12 2RJ, England. The cost is UK £3 incl. P&P (coins taped on card), US$5, Can$7, Aus$10, NZ$12. (Airmail) NB> Banknotes from any country are now acceptable, as the B.P.O. changes without charge.

Letter of the Month

Jim McGown, MØMAC, writes:-

"After having a chat with various Eddystone owners we all agree on this: they are very nice performers, are well-built BUT they are a nightmare to service! Especially the RF and LO stages in the coil-box. Why didn't they make them servicing friendly? It would be nice to know what other EUGers think, especially Peter Lankshear and Bill Cooke."

Peter Lankshear replies:-

"I am sure that it was not Stratton's deliberate policy to make access to receiver internals difficult, although I suspect that some domestic receiver manufacturers did so in an attempt to discourage "do it yourself" servicing. The fact remains however, that, for example, accessing a valve socket in the coil box of an Eddystone receiver is not for the easily discouraged.

All receiver design is a compromise, and the trick is to get the best balance of all the factors involved. Some which would have been taken into account would have been labour costs, ease of manufacture, reliability, appearance, cost of materials, stability and above all, performance.

Some aspects are in conflict with each other, and as Jim has observed, access is one casualty. For coverage above 15 mHz, leads of more than a few centimetres must be avoided or they will upset tracking, stability and gain, and about the only way to get really short leads is to group the upper range coils and wavechange switch compactly under the valve sockets. This immediately makes access difficult, but I think that Jim will agree that the rest of most Eddystone chassis is quite accessible.

In my experience, R.F. section accessibility was equally a problem with most communication receivers. Even such diverse types as Racal and Hammarlund Super Pro are all time consuming with about the same frustration factors. In my own experience, it is best to "bite on the bullet" and dismantle as many layers of construction as is necessary to provide the required access. This entails making careful notes and methodical storage of the components. Although it is sometimes possible by indulging in gymnastics to get some sort of access without too much "reverse engineering", the results are often not very professional and damage to other components from soldering irons is likely.

Finally, Jim and his mates may take heart from a comment in an article in the November 2001 "Old Timers' Bulletin", the highly respected journal of the American Antique Wireless Association. The subject is the U.S. Navy's R-1051 "cutting edge of 1960's technology" receiver. The writer states "The R-1051, although highly modularised, is almost impossible to troubleshoot at the component level. The components are almost inaccessible."

Bill Cooke comments:-

"I think Jim is being a little over-critical in his statement 'they are a nightmare to service'. Practice makes perfect . . .

We know that the coil-box is not easy to work inside, but the sets were so well-made that the vast majority lived out their working life (10-15 years) without recourse to such work.

Having said that, Eddystone literature always made it clear that problems beyond valve-changing could (should?) always be returned to an Appointed Dealer, where experts would work on it.

Not wishing to sound élitist, I would remind Jim and his friends that the technicians at Eddystone were very highly trained and knew all the wrinkles.

I would suggest he is not comparing like with like: a Morris Minor is far easier to service than a Rolls-Bentley, and has he ever worked on a Racal?" ★

Keeping on the Right Side

By Graeme Wormald G3GGL

From time to time I am telephoned by a member asking about the local oscillator in his Eddystone. The answer is always simply one word: "High"

The question is always the same. "I can't find it in the Handbook. Which side of the signal is the Local Oscillator, low or high?"

The reason it doesn't tell in the handbook is that it assumes you know!! The local oscillator in any conventional general coverage receiver is ALWAYS HIGH.

"But how can you say that? It doesn't actually matter which side of the signal it is, it will still give an I.F. heterodyne."

Perfectly true, but let us examine the practicalities of the business. Consider a receiver such as an Eddystone 870A tuned to Radio 4 on 198 kc/s. If the L.O. were on the low side it would have to be at minus 252kc/s, which is plainly impossible.

Having got that one out of the way let us consider an imaginary receiver with an I.F. of 500kc/s (it simplifies the arithmetic) with a band tuning from one to two mc/s. This is a frequency ratio of 2:1 (or, simply, 2)

A L.O. on the low side would have to cover from 0.5 to 1.5 mc/s This is a frequency ratio of 1.5:0.5, (or, simply, 3.)

Discounting logarithmic considerations this means that the oscillator tuning condenser would have to be 50% larger than the preselector tuning condensers (R.F. and Mixer).

Although it is conceivable that such an arrangement could be contrived it is cumbersome in the extreme.

If, however, the L.O. is on the high side, matters are quite different. Let us examine our imaginary receiver again.

A L.O. on the high side would tune from 1.5 to 2.5, a ratio of 2.5:1.5 (or, simply, 1.666). As this is less than the signal ratio, the oscillator tuning condenser has to be less than the preselector condenser.

This is easily achieved by placing a fixed condenser of specific value in series with the L.O. condenser (switched for each waveband). It is called a Padding Condenser, but unlike most padding, it reduces the size!

If you find all this a bit of a mouthful, don't worry; just trust me, I'm a Doktor!

★

Field Ambulance for Sick Eddystones

ANOTHER UNKNOWN WAITING TO BE FOUND

Thanks to sharp-eyed EUGer Mike Arnfield yet another data sheet has come to light for a hitherto unknown Eddystone.

Previously the only "first" Eddystone of which we had proof was the Eddystone "TWIN", which is listed in the *Wireless World* table of British sets in 1926. Just why it failed to include what are now seen to be other siblings in the family is a mystery.

It is also a mystery why the sets described on the data sheet had never (apparently) before been advertised in any material extant. The only simple reason, in retrospect, is that in the mid-1920's literally hundreds of wireless manufacturers had sprung up in Britain's manufacturing towns and there were just too many to keep track of.

At this time, Eddystone Radios, manufactured by a small-time hair-grip manufacturer in Birmingham mst have seemed to be an unlikely candidate for the success it later achieved.

It is interesting to note that the price of the set alone, five guineas or five pounds, five shillings (£5.25 in decimal), is writ very large in the Specification, indicating what a great bargain it was.

As a yardstick for the period, in 1928, two years later than this announcement, my father (the late G3JQE) was a young science graduate working in the research laboratories of ICI, Britain's largest chemical manufacturer. His gross income amounted to £225 per annum, or just over £4 a week . . .

On a technical note it is interesting to see that although well-known 2-volt filament triodes were in use, the P.M. (or Philips Mullard) 1 and 2, the bright-emitter practice of using a rheostat in the filaments to adjust the gain (or stability) of the set was still in use. I wonder if any have survived.

The 'TWIN' is now in evidence among members, perhaps the 'Two' will now appear.

Graeme Wormald, G3GGL

"EDDYSTONE"

Two Valve Receiver

1926

"EDDYSTONE TWO"

THIS is a simple but efficient Loud Speaker set for the local station and within 100 miles of Daventry. It is also capable of bringing in a number of other stations if required. Tuning is done by means of the one dial, and the set is switched on or off by a master rheostat. It is exceedingly simple to work, and there are no complications. The set is fully enclosed, and all working parts and valves are protected from damage and dust. The cabinet is mounted on the "EDDYSTONE" Absorbos, which protect the valves.

SPECIFICATION.

	£	s.	d.
"EDDYSTONE" Two, with Coils for Broadcasting and Daventry	5	5	0
Marconi Royalty	1	5	0
"EDDYSTONE" Loud Speaker	2	10	0
1 Mullard P.M.1 Valve		14	0
1 Mullard P.M.2 Valve		18	6
1 60-Volt H.T. Battery		9	6
1 Exide D.T.G. Battery		4	6
1 Set Connecting Leads		2	6
	£11	9	0

Cat. No. 1008.

(For those not familiar with Imperial currency, there were 12d. (pence) to one Shilling and 20s. (shillings) to the Pound Sterling.)

P.S. Don't Forget The EUG 'FIRST SUNDAY' NET EVERY MONTH, STARTING 6 JAN 2002. CHRIS, G3XFE, IN THE CHAIR. 10.00z 3695 ±

Ted's MailBox

Ted Moore, founder of EUG, reviews the Month

Another Xmas ?

Yes, another year coming to an end. This means another of 'GGL's Bumper Issues. Takes me back to my childhood when I always expected a Bumper Beano Annual at Christmas time.

The reprint in the last issue of some of the illustrations from the part 1926 Catalogue that came into Graeme's hands has produced a couple of letters. The one, which asks me how can these models have been so unknown to us for so long is easily answered.

I had previously heard of both the new 'Two' and the new 'Three' but the info had become lost within my personal memory data banks. Some twelve years ago I was given a models list whilst visiting the Bath Tub, a list compiled by a very keen former collector who later disposed of his entire collection.

These two 'new to us' models were, if I recall correctly, both mentioned on the top of this list. However for the first time I have now seen them in illustrated form from this 1926 Catalogue.

EC 10 AF Transfo

A letter from Steve who has had to find a replacement audio output transformer for his ailing EC10.

Having had the set on pretty loud whilst working just outside the shack doorway he was astonished when the set went completely dead. First thought was that the visiting granddaughter had maybe pulled the mains plug out, but no she was totally innocent.

A quick look showed that not only was the plug still in the socket but that the electric fan using the same socket via a two-way adaptor was happily whirring away.

The job in hand took precedence and so the EC10 was unplugged and left for another day. In this event it was several days later when time was found and the set was opened up. Powered up once more from the plug-in battery box for safety, it was still DEAD.

A few basic tests to prove the existence of a near nine volts on both pcbs and some closer tests showed that

the AF output transformer had an open circuit primary, but both output trannies appeared to be AOK.

When the transformer was disconnected and completely removed it was found that the primary was open circuit at the centre tap point and that the cause was a dry joint. There appeared to be no trace whatever of solder on this joint where the two halves of the primary were attached to the lead out wire tag.

The joint was remade with a good soldered joint and the transfo was tested on the table before replacement, it was okay. After refitting to the pcb and powering up the set worked fine once more.

Steve's point is this, the apparently unsoldered but twisted wire joint had worked for all of these many years since new, why had it so suddenly failed ? It can only have been corrosion caused by a possibly hot and humid summer.

World Service Woes

Living quite close to the Medium Wave transmitter site at Orfordness I tend to alternate my serious listening between Radio 4 FM and the World Service on 648 Kilocycles medium wave.

During several months past they have been plagued by a mysterious intermittent fault which has kept taking their transmitter Off Air for minutes at a time, sometimes longer then minutes !

If you can imagine fault finding on a low power appliance such as one of our Eddystone receivers then just imagine the added complications of doing fault finding for an intermittent fault on a multi hundred Kilowatts transmitter.

No way can you go around tapping the valves or other components with a pencil looking for a dry joint, unless you have an endless supply of both pencils and lives. The transmitters use thousands of volts for HT supplies as compared to our few hundreds. In the end they must have solved their intermittent fault since service has recently been back to normal.

Incidentally the 1296 Kilocycles transmitter (two times 648 remember !) at the same site which used to sometimes transmit either the same program or a World Service variant, is now being contracted out for transmission of a continental station's programming. Either Dutch or Belgian I believe, but I am not linguist enough to be certain.

The 648 transmission from the site just six miles North of my QTH produces a tremendous signal even though it is beamed due east towards the continent.

The Venerable 640

This model is getting pretty long in the tooth nowadays and Sam has twice had to do repairs to his 640 during the past year. Again, he cites the humid summer days and the latent heat produced by the 640 as being certainly responsible.

The 6V6 ouput bottle went KAPUT early in the year, this was at the end of a long weekend's listening. Apart from the blue glow in the valve the distortion was very apparent on speech. A new 6V6GT was bought and fitted. All appeared well for a few months but then the distortion re-appeared, but the

valve tested okay on the AVO valve tester.

Tests of some static components were undertaken whilst the 640 was open on the bench, no power applied . The modus operandi at Sam's QTH has always been to start at the speaker and work backwards towards the aerial. Tests of both resistors and condensers in the output stage showed some startling discrepancies in the measured values and leakages.

The kathode bias resistor was reading a mere 180 ohms instead of the indicated 270 ohms. Even worse the grid coupling condenser showed a leakage resistance of just a few Kilohms, and no indicated capacity.

Both, or one of these could have been the cause of the failure of the original 6V6.and so both items were renewed. C50 in the grid decoupling circuit had been a mica dielectric 0.01 muffs and this was replaced with a new ceramic condenser rated at 600 volts DC.

A 2 watts rated resistor was the same size as the original and so this was fitted in the kathode circuit. Although the kathode bypass tested okay this too was swopped

This makes me ask how can a 270 ohms resistor go LOWER in value, except possibly if the coating becomes hygroscopic and starts to conduct, thus effectively putting another resistance in parallel with the real resistance.

The 640 has gone back into almost continuous daily use and the replacement 6V6 appears to have survived so far as operation is once more back to normal.

Sam admits to having thoughts on the advisability of replacing all of the static components, both Rs and Cs but is daunted by the magnitude of the task which he classifies as 'somewhat masochistic'.

Ted's Slinky

An article in a recent radio mag a propos the use of a kid's toy as an HF aerial had me all agog, especially so as I had seen some in shops recently. Do you know what a slinky is then ?

They have been around since about 1945 when one factory in the USA ceased making war products and reverted to 'civvy' stuff. They came up with this stainless metal spring about three inches in diameter which closed up is about two inches in height but which when extended can be many feet long.

The idea as a toy for the non-cognoscenti is that the 'slinky' is placed on the top stair of a staircase and allowed to fold over on itself so that it walks downstairs. Fine for the kiddies (of whatever age) and I did play with the two which I bought.

Prices about £2 to £3.50 according to the shop you choose. By threading a long nylon cord through the centre, anchoring it solidly at the one end whilst soldering a lead-in wire to the other I can string my 'slinky' aerial either up or down vertically, or horizontally.

I can vary the actual extended length by pulling or releasing the nylon cord and using this adjustment in conjunction with my ATU I have a very adaptable aerial which gives comparable signals to those on my long sloping random wire, this on MF to HF.

I am having some good fun using my 'slinky' in different ways. Try one and be astonished by its versatility. A good buy for the price even if you end up playing on the stairs with it.

A Tale of Two Sets

First things first, my newly acquired 940, thanks to Jim and Anglian Rail. This was collected from Jim last week and carried home on my shoulder(s), the set is perfect but my shoulders are still sore.

It came with a very professionally made and fitted Plinth speaker and a set of spare 'bottles', worked as soon as it was powered up and has seen continuous daily use since. Heck, I haven't even opened it up yet Jim.

Where is the 'tale' in this? Well it is being operated alongside a modern black-box type, a DX394 by Realistic. This is a pretty good communications receiver in a small format, about the smallest that my arthritic fingers can easily handle.

When I am using the DX394 and have the 940 on at the same time the 'noise' QRM produced on my 940 is considerable, separate aerials but same mains supply and earth. The 940 does not cause any such problem with operation of the '394' though.

On another tack here. I am astonished at the receiver noise on any frequency on the 394 as compared with the 940. I shorted out the aerial inputs on both sets, turned gains full up and WOW I . Just try this sometime and you will see what I mean. But don't try operating your 940 or whatever alongside the switched-on 394 or another of similar ilk as the QRM will mask weak signals picked up by your 940 etc.

The Second Set

Well now, the 870A which I bought by mail from a non-EUGer for £45 plus p&p. It does work after a fashion. All the valves are new(ish) and externally the set looks good.

Problems arise when you get it opened up. The cord drive has been done with some kind of nylon multistrand sewing thread, which is very stretchy, so that the tuning is not up to standard.

A few components have been swopped for originals with non-standard values 0.22 muffs for 0.1s etc; and the mains lead. Oh dear, a three core of the kind used on electric irons which has been on for ages by the look of the kinks in it.

Still, at least half of the pleasure in this hobby is putting things right (Yes ?). If I can drag myself away from the 940 long enough then I shall begin to work on the 'little one' soon, and no doubt will find other 'mods' to tell you about. At present playing with my new 940 is taking precedence over doing up the 870A

1002 Woes

The 1002 which I wrote about recently (Graeme may have found room for the item in this Issue) *(Yes, I have, keep on looking – Graeme.)* has succumbed to what may be an age related disease.

The FM band is tuned by a pot; which is coupled by gears to the normal MF/HF tuning gang. At the moment it just isn't tuning, except in

big jumps which occur very erratically as one tunes the FM band. May well be no more than a dirty track on the pot; but it must take a back seat for the time being.

Those of you who know my situation will be pleased to know that I am now working most days of the week in a retail electrical shop in the local town (Woodbridge). I hardly ever thought that at my age I would be working again full time, and thoroughly enjoying it.

Versatile Co-ax

Working in the Electrical Retail Trade, as I am at present you do get some strange customers with their equally strange appliances. This gent came in with his office fan, used all summer apparently and now needing a new mains lead (his words).

Well it did; need a new mains lead that is, the lead on the darned fan was made from black heavy duty co-axial cable.

He admitted to having fitted this himself last year but now wanted it replaced as the black polythene insulation was nicked in a few places, caused he said by being trapped in the drawer of the filing cabinet upon which the fan stood.

I suppose that one would have expected a solicitor to know something of the legal niceties of exposing his staff to such a dangerous appliance but he seemed hardly concerned when the danger was explained to him.

Metal Bottles !

My recent article, which mentioned these 'M' versions of many of the popular 1930s & 40s valve types, has brought several letters commenting upon various facets of this component.

The letters point out that not all contained a miniature glass 'bottle' valve, but that many used the metal case to contain the vacuum and that this must have been effective since many such are still in use today.

Jeff comments that the BC453, so-called Q-fiver, which he stills uses alongside his Hallicrafters, is still happily plodding on with what he is fairly sure are the original set of six that came when he unboxed it as new in the mid-fifties.

Trying substitution with others does not apparently show any improvement so they stay in there. He does ask whether anybody has a list of all of the 'M' types that came out as not all of those valves of that era did come as 'M' versions.

(Note from Graeme: Yes, the ARRL Handbooks of the fifties list valves under the heading "Metal receiving tubes". This, however, only covers 6-volt heater valves. To find the 12-volt ones you have to look under "High voltage heater tubes." And pick out all those that don't have a /G or /GT suffix! Here is my list from the 1952 Edition:

6A8, 6AB7/1853, 6AC7/1852, 6AG7, 6AJ7, 6AK7, 6B8, 6C5, 6F5, 6F6, 6H6, 6J5, 6J7, 6K7, 6K8, 6L6, 6L7, 6N7, 6Q7, 6R7, 6S7, 6SA7, 6SB7Y, 6SC7, 6SF5, 6SF7, 6SG7, 6SH7, 6SJ7, 6SJ7Y, 6SK7, 6SQ7, 6SR7, 6SS7, 6ST7, 6SV7, 6SZ7, 6T7, 6V6, 1611, 1612, 1620, 1621, 1622, 1851, 5693, 12A6, 12A7, 12C8, 12H6, 12K8, 12SA7, 12SC7, 12SF5, 12SF7, 12SG7, 12SH7, 12SJ7, 12SK7, 12SQ7, 12SR7, 12SW7, 12SX7, 12SW7,

12SX7, 12SY7, and no doubt a few others for those who wish to dig deeper.!

But if you want to know the types and characteristics of the above you'll have to get your own copy of the ARRL Handbook !)

A Skip Find !

Yes it still does happen. Whilst walking along the street in Oxford recently this knowledgeable SWL spotted a brown, round diecast speaker which except for the colour was a 'dupe' for his 640 model speaker.

He 'rescued' it of course and carried it home in his Sainsburys bag together with the groceries. It did not work and this proved to be an open-circuit speech coil. He has substituted a replacement from an ancient and much cannibalised BC set.

This is a Plessey speaker and whilst the speech coil impedance is not known he believes it to be of the correct type as most of the speakers of the era were similar 2.5 to 3 ohms coils. His reason for writing to EUG was to find out which models came with the brown diecast speaker, he now knows.

EUG & Subs

One letter recently from John was asking whether we had thought of canvassing members as to whether they would be willing to pay increased subs in order to have a larger (thicker) magazine. No canvassing has been done on this matter simply because the present size is just about the most that can be conveniently handled by our 'editing & publishing gang'. I am sure that 'GGL will expound on that matter if asked to.

We must just be satisfied with the Lighthouse as it is, a far better read than those Advert-filled commercial magazines which are beginning to bore me. And it IS a VERY GOOD BUY.

(Note from Graeme: I think forty pages is about right for the amount of material we get. I always try to have more than I need, as an insurance against a lean month.

But on the average it pans out over the year. The result of canvassing members – e.g. which models they have in their collections - never produces more than about a 30% return, which isn't what you'd call a mandate to start changing things, and we might lose members if the subs doubled !!)

BA sizes

From my own perusal of Catalogues such as RS or CPC (Farnell) I can see that drills and taps/dies as well as bolts and nuts etc are all still available in BA sizes.

Since all of our valve type Eddystones use BA hardware this is good to know. I have been restoring some 'antique-ish' table and standard lamps lately and have been able to order up the necessary BA hardware. It is VERY necessary to mark containers for such items as BA in order to avoid confusion and frustration caused by today's metric bits.

A similar matter, screwdrivers ! How many people know the difference between Phillips, Pozidrive, Torkx etc;?

Not many as I am finding out in my work. Customers asking for a Phillips driver, then coming back with a mangled screwdriver and saying it won't grip properly. They produce a

sample screw which is always of the pozi-drive variety.

It pays to make oneself aware of the various different formats available these days. It makes me cringe when I see a professional engineer using a too-small flat blade driver to turn a large Phillips or Pozidrive type of screw.

Frequency Jumps.

This EUGer has been experiencing poor reception on SSB and CW when using his 830/5 recently.

He must be a bit of an amateur detective since he peered at the regulator valve whilst receiving SSB and noticed that the frequency 'jumps' coincided with an almost complete on/off of the glow in the valve.

A new valve did not help at all, anyway the one in the set had been there less than a year. He began swopping the various components around the regulator valve and having swopped both a condenser and a resistor he has cured his problem.

Unfortunately Fred has not said which ones. Still he now can listen to his 830 again.

I.F. Transformers

James has bought an 840A which has obviously seen better days as the case and front panel casting have been re-painted by hand using a non-original grey gloss.

He has made arrangements for this to be removed and for a more genuine looking paint job to be done for him, professionally.

What he is perplexed by is the fact that the IF transfos are so very obviously NOT of Eddystone origin at all. They are of the type sold by Radiospares in the fifties. He wants to know if any EUGer has any info on the different IF bandwidths, which his set will show, compared with one with original spec IFTS.

The 840A was not designed to be as selective as the real communications receivers but I would expect the Eddystone types to have just a bit more selectivity than those made for replacement purposes in broadcast receivers. Can anybody help him out here ?

A.F. Output Transformers

These are not readily available nowadays, and those that are are usually either made for the very expensive Hi-Fi valve amps or are designed with a step-down ratio to suit semi-conductor amplifiers.

Having had the need to replace an output transformer in a domestic set recently Ken tells me that he began with a half dozen or so transformers of the mains down to 3, 4.5, to 9 volts type and chose the one which gave him the best audio response.

Ken's tip is that you will only get best response if you use a condenser across the primary winding, 0.0005 to 0.01 are good values to start with he says.

If a scope is available then you can check the response for 'ringing' or 'flat-topping' of the audio signal, this is almost always cured by the addition of

the parallel condenser on the primary winding.

This is an old trick but it is becoming more important now those genuine transformers are so scarce.

Wages in 1926

George has written to me a propos the reproduced item in the last issue on the 'TWIN'.

In George's family there exist many old diaries and records of household expenditures for the 1920s and 1930s onwards. They make very interesting reading and are often brought out when comparisons are made with present day prices.

George's grandparents mention in these records that with a family of eleven (repeat that ELEVEN) children, themselves the parents and a dependent great-grandmother their income from father's office work on the Bristol dockside was a munificent ONE GUINEA per week. *(£1.05, for those of you too young to remember – Graeme)*

Yet they managed and did not consider themselves very poor. It would take almost two months of this to purchase a Twin without the battery cabinet, at £8.

Computer QRM

Remember my gripe about this in last issue ? Well now I have it in this QTH. No not the aforementioned DX394, nor this word-processor, but one of those mini RTTY/CW readers. In this case an ERA Microreader on loan from 'GGL. Graeme admits to having had little success with it himself in the past but me, being big-headed (or pig stubborn, or both) I did think to try and use it. There seems little hope of any success with the DX394 as both items generate all sorts of square waves which cover the part of the RF spectrum in use.

Using very heavy gauge earthing wire for both Rx and □reader and by powering one receiver from the mains and the ERA unit from a Nicad pack. And by using screened connecting leads I hoped for more success.

It was only partially successful. I still have problems reading the SITOR NAVTEXT signals on 516 Kc/s despite the signal, especially from Ostende, being very strong.

But I have managed to read some commercial CW on around 17 Mc/s and a French military RTTY signal on eleven Mc/s although even on these signals the reader sometimes fails and brings up the logo 'TOO NOISY'. Has anybody got any experience with this particular unit as used with a modern semicon receiver, PLEASE. Ted.

ENDIT

That is it, my personal best wishes to all of you for the coming year, more Eddystones in your collections, more Dxg as a result. 73, Ted.

Write to:-

Ted's MailBox

c/o Jim Murphy

63, Wrose Road

Bradford BD2 1LN

Don't Come off the Rails

Earlier in this edition of 'Lighthouse' you will have read about the 'simple' matter of aligning the Local Oscillator of your Eddystone on the high side of the signal ('*Keeping on the Right Side*'). But now read this awful warning from somebody who thought he knew all about it. *(By Graeme Wormald, G3GGL, to his eternal shame . . .)*

My 'new' Eddystone 840C, a well-loved and easy-to-find economy model of the 1960's, came to me by chance. A very slight acquaintance rang from Bristol and offered it to me.

It had belonged to his late father, an oil-man in the Gulf. My friend had given it shelf-space for twenty years and was having a clear-out; it was bound for the skip – and then he remembered me!

We rendez-vous'd on the M5 one afternoon and we went round to his car boot. My heart sank. The front of the set was covered in streaks of brown gunge. "Had some trouble with a pot of varnish," he said. "The top flew off and it went everywhere."

Well, you don't look a gift horse in the mouth so I thanked him profusely and headed home. Off came the case, the fingerplate and the glass. The glass was easy. The front was better than I expected and at the end of the day it was clean.

The finger-plate was a different matter. After the varnish had gone, it was left with horrible shiny streaks all over it. Some finger-plates of 'Style C' sets are a different finish from 'A' and 'B'; more of an eggshell.

I tried everything, without success. Then I had the bright idea of trying 'Sol-Vol Autosol', a paste in a tube sold for cleaning metal finishes on cars, etc. It worked like magic. Remember it.

But that wasn't the point of the story. After having made it look 'as good as new', I decided it needed the alignment checking (of course!). So I did it according to book, then put it in pride of place in the EUG office.

It worked a treat except for one thing. On Band 2 (5.5-12.5 Mc/s) there was something wrong mid-band. The 40-metre ham-band was in the wrong place and the 31-metre broadcast band was right up the creek. The 49-metre and 25-metre bands were OK.

Over a period of some months an awful feeling came over me. It couldn't possible be, could it? Could it . . . ?

I am the renegade owner of a Sony 7600 paper-back size general coverage set with a BFO (although you could use anything with a BFO . . .).

I held it near the set and listened as I tuned the Eddystone. At the 5.5 Mc/s end of the band the Local Oscillator was at 5.950, as expected.

But at the 12.5 Mc/s end of the band it was on 12.050. High at one end of the band and low at the other! The set was 'jumping the points', so to speak.

Just don't ask! But the normal alignment procedure doesn't preclude this awful gaff. BEWARE; check the calibration at mid-dial as well as the ends!

And If I could manage it on Band 2 it must be dead easy to do on Band 1 with a 450 kc/s IF.

One wonders just how many vintage sets have this curious problem —— unbeknownst to their slightly puzzled owners. ★

Notes on the Refurbishing of an Eddystone 830/4 Receiver

Reported by: Joel Balogh, AB3J
Landenberg, Pennsylvania, USA

An Eddystone 830/4 Receiver was purchased through eBay from a seller in Canada. This transaction took place in August 2001. It was advertised as a working receiver. The following notes were written in November 2001 after the following problems were corrected. *('caveat emptor' -- Graeme)*

1. Flexible coupling on the main tuning capacitor shaft.

Someone had managed to use a steel disk to rebuild this flexible coupling. The main tuning knob had a very stiff action when rotated, and there was considerable backlash between the tuning knob and the cursor that moves across the front dial.

The entire main tuning capacitor bank (four sections) had to be removed from the chassis to gain access to the front coupling. It became obvious why the original flexible coupling had failed - the shaft at the front of the tuning capacitor assembly was offset by almost 1/8-inch horizontally from the shaft which extended from the rear of the dial mechanism.

This put a great deal of stress in the flexible coupling linking these two shafts. This condition was corrected by elongating the holes in the brackets that mount the tuning capacitor assembly onto the chassis, and shifting this assembly sideways to align the two shafts.

A new ceramic flexible coupling was fitted to the two mating shafts, and the supports under the capacitor bank were adjusted to obtain good mechanical alignment. The ball bearings that support the capacitor's shaft had to be tightened to remove some play in these bearings. The main tuning knob now has a very smooth feel when it is rotated, and there is no backlash.

2. A pair of small flexible couplings on the Peak R.F. capacitor shaft.

Someone had replaced the front small coupling with a hollow shaft that was cemented to the small diameter (1/8-inch) shaft. The next small coupling in line had been lashed together with some copper wire.

A new pair of small flexible couplings was obtained from Dave Simmons. *(EUG spares supplier; see Page 2).* These were easily installed, but then the receiver went dead when the Peak R.F. capacitor bank was half way meshed.

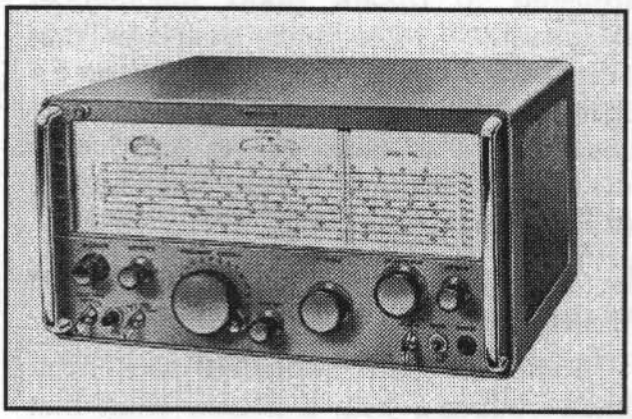
This was determined to be caused by a short circuit between the rotating and stationary plates of these capacitors.

The construction of these capacitors allowed me to make a small shift of the rotating plates so that they no longer shorted to the stationary plates when meshed.

3. A noisy mixer tube.

The original first mixer (6AK5 sharp cut-off pentode) was determined to be the major source of noise on the higher short-wave bands. This was replaced with a 6EH7 remote cut-off frame-grid pentode.

The 6EH7 has triple the conversion transconductance and one-third the equivalent noise resistance as exhibited by the 6AK5. The original 7-pin socket was replaced with a 9-pin socket for the new tube. This required the careful use of a large round file to enlarge the hole for the socket in the thick aluminum chassis.



The Eddystone 830/4 was a 'special' produced for the Canadian Government. Its main difference from the rest of the acclaimed 830 family is its frequency coverage, having Long Waves in place of Medium Waves (120-560 kc/s and 1.5-30Mc/s). It is virtually unknown in Europe but the handbook may be obtained from EUG (Dave Simmons, page2).

It was later determined that the control grid of this mixer was the source of a negative bias which was on the AGC bus - apparently the local oscillator voltage injected at the cathode of this mixer was large enough to cause grid current to flow to the AGC bus.

The grid-to-AGC bus resistor was moved to ground (instead of the AGC bus). This eliminated the (unwanted) negative bias, and resulted in a big jump in the apparent gain of the entire receiver. The 6EH7 was replaced with a sharp cut-off frame-grid 6EJ7 pentode at this time.

4. Audio pulsations on the AGC bus.

The signal-strength meter responds to the bias on the AGC bus. It was noticed that the AGC bus was pulsating in response to modulation on AM signals - this produces an undesired counter-modulation of the received signal. It was corrected by increasing the AGC decoupling capacitor from .1 microfarad to 3.3 microfarad. Now the signal-strength meter responds to varying signal strength and not to the modulation on the received signal.

5. The volume control did not turn off the audio when set for minimum level.

This was corrected by using a large (100 microfarad at 12 VDC) capacitor to bypass the cathode of the 6AT6 audio amplifier directly to ground.

6. Low-Q RF tuned circuits.

Re-alignment of this receiver was straight forward, but disconcerting was the apparent low-Q (or broadband) nature of Band 2 which covers 11-to-18 MHz. This was also noticeable as a reduced sensitivity on this band.

Graeme had mentioned in an early e-mail that the .047 microfarad red Hunt capacitors might be the cause of low-Q circuits. I lifted one end of the Hunt capacitor that is used to bypass the HT supply to the primary coils found in the output of the cascode-triode R.F.

amplifier. This capacitor had no leakage and measured to be .06 microfarad on my capacitance bridge.

Years ago, I learned to look at a capacitor as a series circuit consisting of the actual capacitor and the inductance of its leads. Typical tinned wire used on these capacitors has a self-inductance of 22 milli-micro-henry per inch.

Thus, a capacitor of .06 microfarad and a total of 1 ½ inch leads (33 x 10 minus 9 henry) has a series resonant frequency of 3.6 Mhz. This circuit is inductive at frequencies higher than the series resonant frequency.

The proper design is to use a bypass capacitor that has a series resonant frequency that is slightly ABOVE the highest frequency encountered in the circuit.

Another approach is to use two or more bypass capacitors at the same location. The Eddystone designers used this later approach when they used two bypass capacitors from grid-to-ground on the output triode of the R.F. amplifier, as well as from screen-grid-to-ground on the first mixer.

This second location uses .047 as well as .001 microfarad capacitors. A capacitor of .001 microfarad with a total lead length of 1½ inches has a series resonant frequency of 27 Mhz. I installed a 1000 picofarad silver mica capacitor in parallel with the original .047 Hunt capacitor to cure this low-Q problem.

7. Resistors out-of-tolerance.

I have had to replace about eight of the large gray-body 1-watt resistors that were out of tolerance. These were in the signal-strength meter circuit and the BFO circuits. Whenever possible, I used metal-film resistors which should have longer life then the standard carbon-composition resistors.

8. Trying to use low-impedance earphones with this receiver.

The original circuit design, which was used to drive a pair of earphones, assumed that the earphones would have a high impedance load (several thousand ohms). Most earphones available on the market now are designed for a low-impedance stereo source.

I found that using one-half of the 600-ohm audio output winding worked just fine for driving the stereo earphones. I ended up putting a 1200-ohm resistor is series with the earphone jack to cut down the audio level in the phones to nearly match the audio level heard from my speaker.

I also use an external plug/jack adaptor to convert the stereo plug on the earphones to interface with the monaural jack.

9. Missing shield plate. ***(Coilbox cover)***

When the receiver is upside-down, there should be a metal shield plate covering the many adjustable tuning coils and capacitors, which are used for aligning the nine different bands.

This receiver is missing this plate - unwanted coupling may occur between the various tuned circuits that are active on any one band. I have a friend who is getting me a piece of 1/32-inch brass plate for this application. Then I will have the fun of locating and drilling the 78 holes that allow the alignment process to be done with the shield plate in place.

Postscript: This receiver is now a pleasure to use. Indeed, it is a crown jewel!

Joel Balogh, AB3J

E.U.G. PRIZE CROSSWORD NEWS

I think this is probably the first "Crossword News" in which I haven't had to start with grovelling apologies!

So here goes. We are starting to get a distinct coterie of puzzle-fans amongst our members. Three out of four winning entrants this month are winners of previous puzzles, to wit:

Gary McSweeney, Gi4CFQ, N.Ireland

Peter Beardsmore, G4IXY, of Herts

Jack Read, of Cheshire,

Who are joined by Richard Steed, G3YUJ, of Suffolk.

Well done, chaps, you will have had your souvenir G6SL souvenir QSL cards by the time you read this.

Bearing in mind that 'Lighthouse' is distributed to 330 members, of whom 98% have English as their mother tongue, I think this is a little marginal, to say the least (as Anne Robinson would say).

It's not really so very hard; if it was I wouldn't be able to do it, and that's a condition of our contract with Ace Compiler Colin Crabb G4HNH. If I can't do it I get him to change it!

I did insist that he accepted either of two answers for six down. If you remember this was "Recognised abbreviation for a triode oscillator, where feedback occurs through internal valve capacitance (4)".

Well, maybe it's something to do with my using the ARRL Handbook to swot for my C & G, but I've always called this "TPTG" *(Tuned Plate Tuned Grid).* Colin, being of a more Anglo-Saxon turn of mind said it should be "TATG" *(Tuned Anode Tuned Grid").*

As it didn't affect any other clue we agreed to differ and accept either answer. In the event Colin's answer was favourite by three to one!

Here are the rest of the answers to Puzzle number four:

ACROSS : 1 Nineteen Set. 7 Ozone. 8 Idents. 9 Bus. 10 Ladle. 12 New Mod. 15 May Day. 18 Idris. 20 Les. 21 Call DL. 22 Whoop. 23 Dual Winding.

DOWN : 1 Neon Lamp. 2 Noon Day. 3 The Beta. 4 Edison. 5 See Saw. 6 TPTG or TATG. 11 Adds Mpeg. 13 Ediswan. 14 Marconi. 16 Dahlia. 17 Yellow. 19 Band.

And this brings us round again to the thorny question of this month's prizes. If we had some mixing of the winners I could probably rotate the prizes, but with our keen little team returning to the fray I must keep on changing.

And here it is. With most issues of 'Lighthouse' for the past three years (or more) we have been including a glossy sales pamphlet from the latter days of the Bath Tub. These are almost at an end.

But I do have some 'handfuls' of older sales sheets which will never be included with the 'Lighthouse' because there are nowhere near enough to go round. The first of these is a glossy black and red four-pager for the famous High-Stability Receiver, Model EC985/7E of 1977.

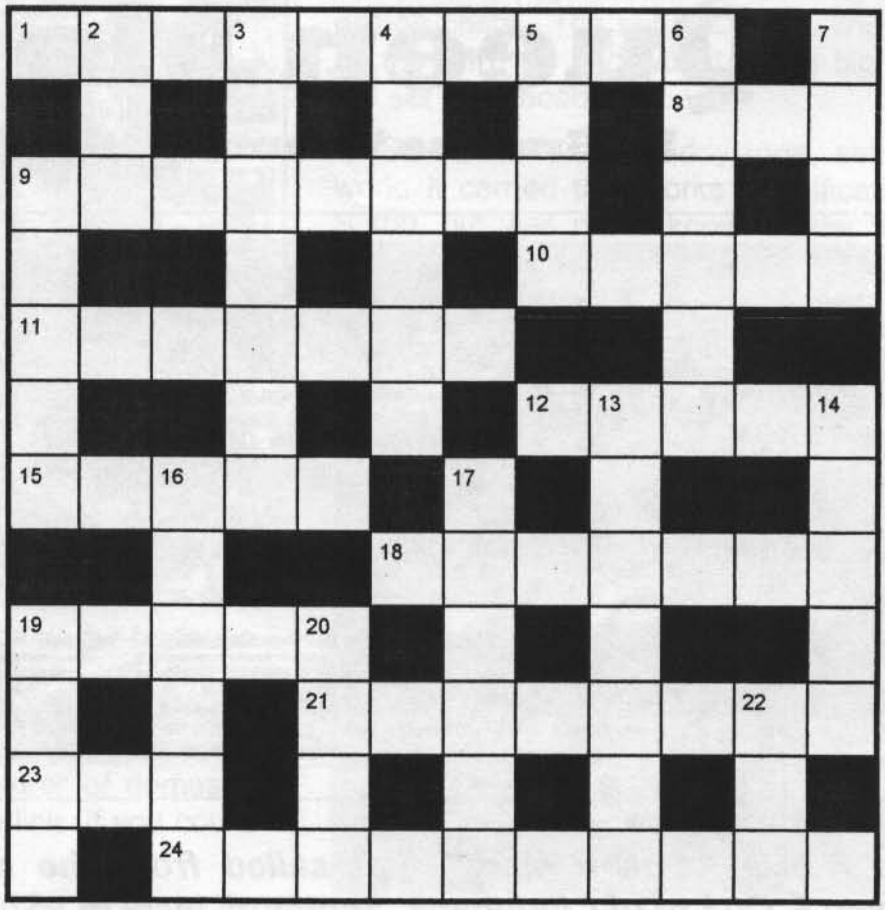
A full technical description of this famous (and some say best ever) professional radio, together with three photographs. A 'must' for any collector of Eddystone Ephemera.

Come on, chaps, get cracking!

E.U.G. PRIZE CROSSWORD No. 5

COMPILED by COLIN CRABB G4HNH

Photocopy or write out the answers so as not to spoil your copy. Send to Graeme Wormald at 15, Sabrina Drive, Bewdley, Worcestershire DY12 2RJ, England, to arrive not later than 20th January 2002. See previous page for further details.



ACROSS

1. Stratton's original retail chain (5,5)

8. This airborne vehicle, in short, would have been unlikely to respond to IFF (3)

9. Spacer used in the construction of home brew balanced line feeders (8)

10. Recorded (5)

11. This process is part of the alignment sequence of a model S.640 (for instance) (7)

12. Phonetic identifier reveals a place to stay (5)

15. French river (5)

18. Reduce to fine particles (7)

19. British WW2 term used to denote intelligence gathered by deciphering German signals ((5)

21. Radio engineer testing rf output levels gets the 'Bird' (4-4)

23. Initial controllers of British commercial television (3)

24. Scottish physicist who, in 1935, developed a system of radiolocation of aircraft that proved to be the forerunner of radar (6-4)

DOWN

2. Watts on the air, briefly (3)

3. Popular cw keying system (5,2)

4. On a 22k vintage carbon resistor, the second significant figure is indicated by the —— —— (3,3)

5. Enemy number one for carbon tracked potentiometers (4)

6. This stage of a receiver usually incorporates a power amplifier (6)

7. Any device which receives the output from an Eddystone receiver (4)

9. Superlative for a het up rx (5)

13. This electrical edict could fittingly be distributed On Her Majesty's Service! (4,3)

14. Belgian province south east of Brussels (5)

16. This fugitive from justice is unfashionable as a rule (6)

17. Standard audio system, conforms to a type (6)

19. Information technology used by the United Nations reveals a standard quantity (4)

20. A wee dram south of the border, perhaps (1,3)

22. On the ball with the EUG radio regulars (3)

★

Stratton and the Queen Mary

By Graeme Wormald, G3GGL

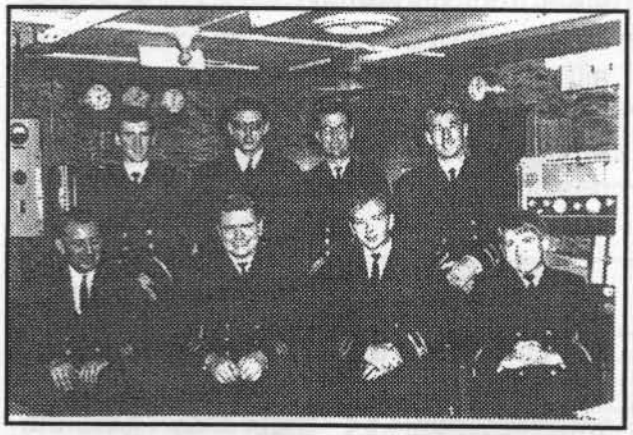
The R.M.S. "Queen Mary" first sailed from the shipyard of John Brown & Co Ltd of Clydebank, Scotland, in 1936. She was the world's largest ocean liner, 1020 ft long and 81,237 tons. In 1938 she won the 'Blue Riband' of the Atlantic for Britain in a time of 3 days, 21 hrs, 48 mins. During WW2 she carried a total of 765,429 U.S. military personnel across the world. She retired from passenger service in 1967 after making 1,001 crossings of the Atlantic and was acquired by the City of Long Beach, California, where she is operated as a floating hotel and tourist attraction. The wireless room is the headquarters of the Associated Radio Amateurs of Long Beach and still contains the Eddystone ship's receiver, the IMR. 54. Read on . . .

Can any of you remember those adverts in the Daily Mail and Picture Post during the 1950's and early 60's for KB Radio (Kolster Brandes)? There was a picture of the "Queen Mary", that most evocative of all British liners, and the legend "KB Radio, as used on the Queen Mary"

I remember, as a young ham, thinking, "Pull the other one!" It wasn't until much later that I discovered how right I was. You must remember that the Trades Description (Sale of Goods) Act was a mere twinkle in some young politician's eye in those days.

And here's the story: The wireless room of the *R.M.S. 'Queen Mary'* (R.M.S. stands for 'Royal Mail Steamer', for all us landlubbers) had been fitted out in 1935 by S.T.C., (Standard Telephones and Cables), in the guise of I.M.R.C., (International Marine Radio Company),

one of its subsidiaries. The parent was an American company, I.T.T. (International Telephones and Telegraphs).



The Radio Officers of R.M.S. 'Queen Mary' on her farewell Voyage, 1967. The IMR.54 receiver is clearly visible on picture right of the back row. (Picture via Michael J Phillips, EUG)

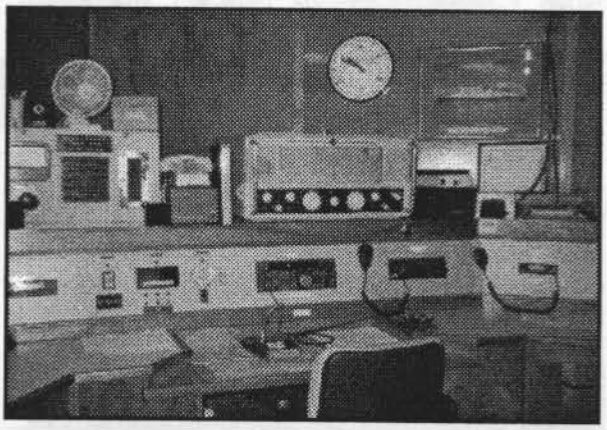
I hope you're with me so far because there's more to come. Another subsidiary of this extended family was Kolster Brandes (K.B. Radio), a well-known British manufacturer of domestic radios. And there's the link (if you count it on your fingers!).

Anyway, the 1935 set-up had an I.M.R.C. set (Type IMR. 42) as the main receiver. It was quite a large chunky thing. By the turn of the 'fifties it was getting long in the tooth and Cunard *(the shipping line which owned the Q.M.)* were expecting a refit to match the rest of the ship.

The picture in the top RH corner of the W6RO QSL card. See anything familiar?

I.M.R.C., in its wisdom, being overloaded with work in its development department, farmed out the job to Stratton & Co. in Birmingham. They set the overall specification and paid for the design costs. The set was to be known as the IMR. 54 and would be as big as the set it replaced.

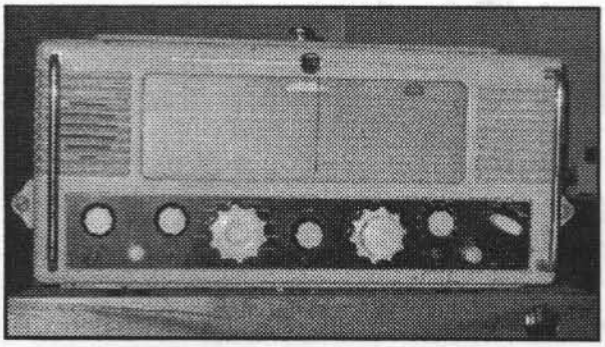
So Stratton, alias Eddystone, set to work. It carried the Works Specification S.700, but was never known under this name (*but see later*). The monster they produced was quite recognisably from the Eddystone stable, its huge cabinet being half as long again as the normal 680X (*which was top-of-the range at the same time*).



The radio room in R.M.S. 'Queen Mary' in 2001 (Photograph by Nate Brightman, K6OSC, curator of the Q.M. radio museum.)

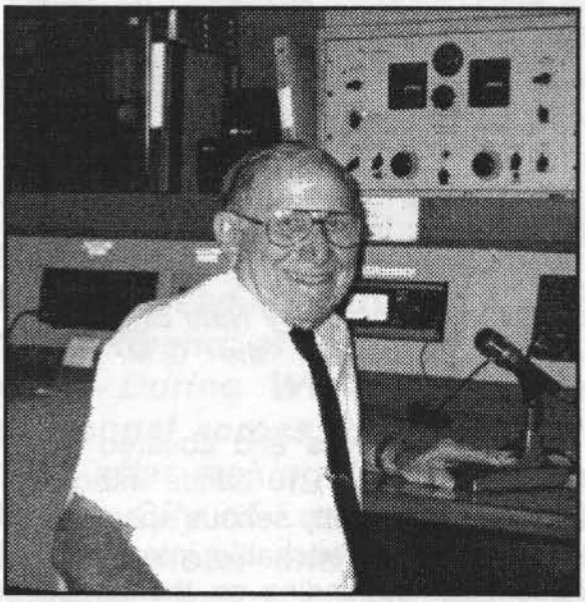
It had 12 valves and covered from 15kc/s to 31mc/s in 10 bands without a gap !! That's a pretty serious spec and it did it by using switchable intermediate frequencies, depending on the band in use. The power requirement was to operate on supplies of 100-120v AC or DC (*those being the standards to be found with various shipping companies*).

The band-switching was so heavy that giant knobs from the old-fashioned B.S.A. motorcycle front suspension dampers had to be fitted. The coil-box was about 18" square by 4" deep and the front panel was so big that it was gravity cast (as opposed to the die-casting used by the company for all its high-street models).



Close-up of IMR.54, Serial Number 008, on display at Long Beach, CA, this year (picture by Nat Brightman, K6OSC)

The IMR.54 didn't use a mains transformer, being suitable for DC supplies as well as AC and this made it slightly lighter than you would expect. Stan Carney (whose garden party we reported in our last issue) was involved in constructing the greater part of them, which were built in two batches; one of 150 and one of 100.



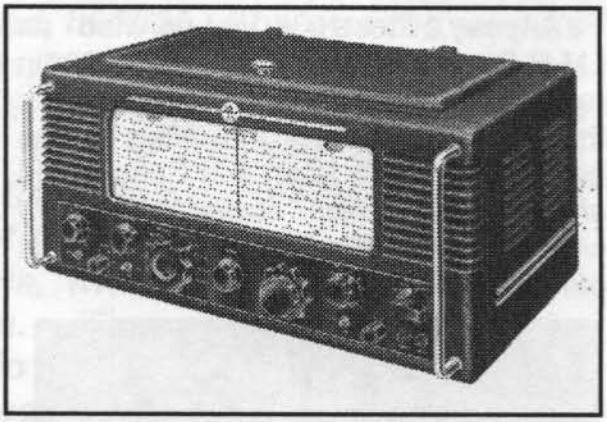
Nat Brightman, K6OSC, curator of the radio museum in R.M.S. 'Queen Mary', to whom we are indebted for details and photographs.

But that wasn't the end of the story. When I.M.R.C. wanted a third batch making they asked Stratton to reduce the price! 'On your bike!' was the snappy catch-answer. The result was that all the patterns and drawings were taken away by I.M.R.C. and they commenced to make their own! Nobody is quite certain how many were made but one thing *IS* certain: you won't ever mistake one for a Stratton-built model.

The entire third batch had flat pressed-steel front panels; no Eddystone 'trade-mark' grooves. In fact, no character at all! If you keep watching you might see one, but don't be misled into thinking it's an Eddystone. Stratton may have designed it but they certainly didn't build it.

And this is where we come to the twist in the tail of the story. The directors of Laughton and Sons, the parent company of Stratton, were so impressed with the IMR.54 that they got the 'wireless department' to make them one to put in the board room at the Bath Tub to impress visitors.

Stan Carney, as a bright young engineer, got the job of building the one and only Eddystone S.700 ever made. The main difference was that it was finished in traditional black wrinkle instead of light grey and it had a mains transformer; it was AC-only and would work straight off British 230v mains - unlike the IMR.54, which was 110v only.



The one and only Eddystone Model S.700, made by Stan Carney c.1953 (Photo courtesy of Eddystone Radio)

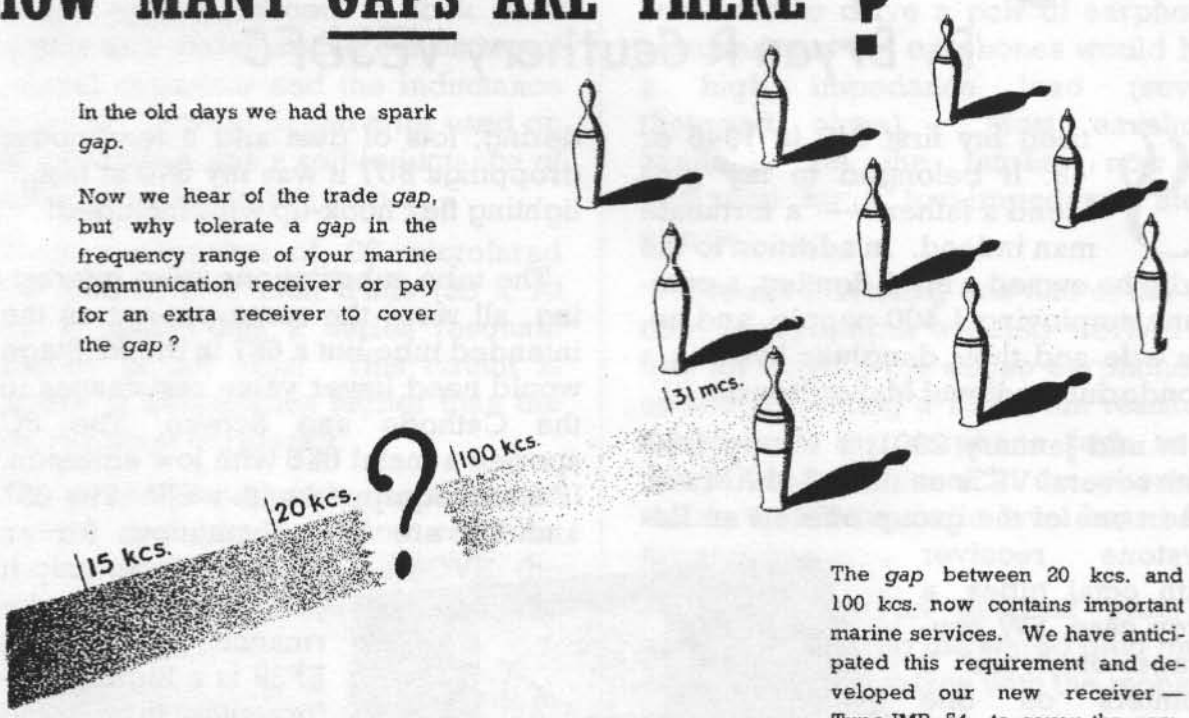
Everybody was so proud that an Eddystone (albeit in disguise) was used in the R.M.S. 'Queen Mary' (among many other famous liners) that the name was transferred to the S.700, which was always known to the staff and company as the 'Eddystone Queen Mary'!

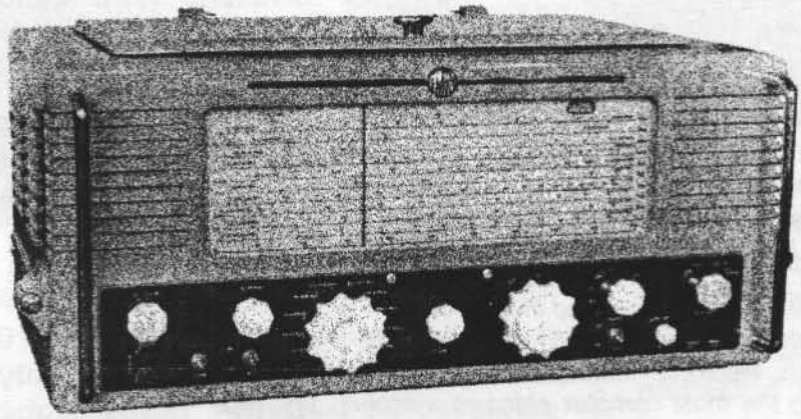
★★

HOW MANY GAPS ARE THERE ?

In the old days we had the spark *gap*.

Now we hear of the trade *gap*, but why tolerate a *gap* in the frequency range of your marine communication receiver or pay for an extra receiver to cover the *gap* ?





All-wave Marine Communication Receiver Type IMR. 54.

The *gap* between 20 kcs. and 100 kcs. now contains important marine services. We have anticipated this requirement and developed our new receiver — Type IMR. 54—to cover the complete frequency range 15 kcs. to 31 mcs. *without break*.

The IMR. 54 complies with the new U.K. specification and has many other features, such as operation from D.C. or A.C. without external conversion equipment, but . . .

Why not write for the full specification and details of our complete marine equipment range to:—

INTERNATIONAL MARINE RADIO COMPANY LIMITED
INTELCO HOUSE,
CROYDON

Trade Advert for Stratton-Built IMR.54, c.1952

It has taken me 53 Years to get an Eddystone 640!

By Bryan R Cauthery VE3DFC

I tried my first 640 in 1948 or '49. It belonged to my girlfriend's father — a fortunate man indeed. In addition to the radio he owned a Mk 6 Bentley, a company employing 1,400 people, and he, his wife and their daughter lived in a wonderful medieval Manor House.

In mid January 2001, 1 was in QSO with several VE3s on the 3.745 AM net, when one of the group offered an Eddystone receiver with octal tubes, a grey case, SW coverage only and 2 pointers on one shaft . . . obviously a 640 with a respray. The price asked was $75, the set did not work but was all there, except the aerial connection.

The Eddystone S.640 was the first model manufactured in quantity after WW2. From 1947-49 a production of 4,000 was aimed mainly at the Ham & SWL. The handsome diecast panel was designed to take twin speakers but were not fitted in the 640.
It was the only Post-war Eddystone to be fitted with electrical bandspread, thus embodying the most complex stringing system of any Stratton radio!

Six days later, I drove to Wainfleet near Niagara Falls and bought the 640 for $50 – the owner reduced the price because... "it's going to a good home". The 640 was in a barn with 70 or 80 other geriatric radio gems including a complete marine installation of an HRO (2.5v tubes) with 15 coils; a Hallicrafters S27; an RME 6900 etc., etc., etc.

The 640 (EY 0900) was indeed complete. No non-original holes drilled anywhere; 3 of it's red EF39's; the EB34 minus most of it's metalising; and some tube substitutions. The mains transformer was leaking wax; there was a fine selection of overheated resistances; some awesome poker soldering; lots of dust and a few mouse droppings BUT it was my 640 at last.... lighting flex hook-up wire included!

The tube substitutions were interesting, all were the same pin-out as the intended tube but a 6S7 in the RF Stage would need lower value resistances in the Cathode and Screen. The FC sported a metal 6K8 with low emission. IF 2 was equipped with a 6J7. The 6S7 and 6J7 are OK substitutions for an EF39 although only if you accept the performance penalty; the EF39 is a higher performance tube. *(and the 6J7 isn't variable μ, either – Graeme.)*

The real horror was the 6R7 in place of the specified 6Q7 in V5 location, the 2nd detector/lst audio. The 6Q7 has an amplification factor of 70 and the 6R7 is only 16. The output stage is substantially underdriven. The only good thing about this tube selection is that it fits. The back of the chassis was dominated by a ½ pint bottle sized EL32.

The tube bases showed no signs of burning or tracking. A new power cable had been installed (2 core only). The front glass and dial plate just needed cleaning to return them to as new. A surprise to me was that not a single screw was missing and no self tapping substitutions had been forced into the BA tapped holes. In fact the only real detraction from the appear-

ance was the use-worn fingerplate and I have still not decided how to recondition it, and of course the bright grey respray.

Another surprise was the contents of the file folder which came with the 640. On 14 pages of computer paper was a complete and very accurate hand drawn circuit diagram with component values and a commentary about wiring errors and substitutions.

A test of the tubes revealed low emission on the 6K8 (metal) FC (V2). The EL32 output tube was marginal, as was 1 of the EF39s. The rest of the tubes were suitable for further use.

I telephoned Dave Simmons and ordered one 640 manual and 5 EF39's. The manual arrived in 4 days and the tubes in 6. All undamaged. I thought the extra copy of the circuit diagram plus the reports from SWM etc. about the 640 were a splendid addition Mr Simmons - my sincere thanks.

The clean-up began with the removal of the front panel and a rather painstaking detailed degreasing of the chassis with Windex and a lot of paper towel. I loosened off the mains transformer, the IF's, the output transformer and the smoothing choke. By doing this, one can get at the dirt which lodges in the interface between the chassis and the mounted components.

After this detailed work, I was still left with corrosion products on the upper chassis and IF cans. I cleaned this off with small wads of brass wool (like steel wool but it does not scratch the plating on the chassis) held in the jaws of needle nosed pliers. This was very effective and the top of the chassis and all the mounted parts were returned to almost new appearance. Then I removed both tuning capacitors and soaked them in an industrial cleaner. Then a boiling water rinse, followed by 3 hours in a hot air blast and finally relubricating with a Silicone grease which contained finely ground copper for conductivity.

Continuity checks revealed that the mains transformer was not burned out... just rather overheated. Perhaps caused by the 117v ac which is common in rural Ontario, 117v on a 110v tapping is a 7 to 8% overload. I recovered as much of the leaked wax as possible. Then I removed the transformer from the chassis and after a good cleanup of the case and underside, I placed it in a polyethylene bag (bottom up) then in just boiling water. I was able to pour the recovered wax plus a table-spoon of new wax into the transformer case to complete the refill. Another clean of the case and masking of the top rivets and 3 coats of matt black spray paint and the tranny was ready for use again.

I was not so fortunate with the output transformer, the primary was open circuit. I unsoldered the can with a propane torch (low flame, lightly applied) but the wire break was inside. So I bought a new output transformer suitable for a 6V6 to 3ohm secondary, fitted it inside the 640 can and soldered the base back on, bringing the connections out through the ceramic insulators.

A previous owner had installed a 3ohm speaker in the 640 case. The 4 holes exactly matched those in the 640 front panel and a BA tap had been used, thus maintaining the design dictum. A screened 2 core cable ran from the speaker, clipped to the chassis and connected to the speaker terminals on the rear apron... a very nice piece of work.

The repaint of the front panel was the start of my woes. The grey repaint was well done and I should have cleaned the case and front panel with thinners and then put 2 or 3 coats of spray enamel over the grey. Instead, I had the case and panel glass bead blasted to bare metal. Followed by a primer coat and then 3 coats of spray crackle black. 75% of it crackled, 25% didn't.

On the cans the instructions read "target and paint must be at room temperature" I found the stuff would not crackle unless the paint and the part were warmed to at least 50°c and then you must put plenty of paint on and when you think you have put enough on PUT SOME MORE ON. Eddystone were much better at it!!

Next, I cleaned the tube pins and socket sleeves with contact cleaner. Following this, the set was inverted for the really interesting bit and stage II of my woes.

I built the capacitor tester detailed in Newsletter 34 Page6 and added 12, 36 and 60 volt dc outputs for the lower voltage caps. Then I added a rotary switch (from the junk box) so that I could test for leakage, resistance and capacity with one connection and rotation of the switch.

The rotary switch came from a BC 342 I repaired 3 decades ago and if I had put a tag on the switch I would not have used it in the condenser tester at all. It shorted to ground on position 3, the position I used for the leakage test. Even with this situation, it got the correct answer on the paper .01 decouplers...the neon lamp showed charge/discharge cycles 3 times per second or dead short (depending on the exact position of the switch contact) and all were genuinely faulty.

But it also faulted all the silver mica and tubular ceramic, NONE OF WHICH WERE FAULTY. In fact all of the caps in this 640 except the tubular paper were as new and most still within their ± 2% capacity specification.

However I had replaced them all before I discussed the matter with Graeme and his comments caused me to revisit the test result. The originals are now back in the radio.

The resistances were generally outside the 20% spec limit and those which showed signs of overheating (mostly the screen droppers) were 40 to 70% high. So I replaced these with 1 and 2 watt modern parts which approximated the dimensions of the originals

To replace the paper caps, I found a box of new .015 Hunts 45Ov computer grade capacitors. They are a little smaller than the original paper caps but close enough.

The next job was the removal of the lighting flex hook-up wire and the installation of colour-coded wires to match those used by the builders of the 640. Then I wicked off about half-a-poundof excess solder. An exhaustive recheck of the circuit revealed only one error (at first) and that was in the AVC connections.

In some previous repair endeavour on V5 and V8, the enthusiastic rebuilder had not mentally transposed the tube positions when he inverted the set so part of V5 was connected as V8.

The dial pulley cords were quite frazzled so I replaced them. It's a simple operation for which I had a diagram but it still took me 4 hours to get it right... . one wishes to avoid having the spring clip going around the drive wheel groove if smooth tuning is important to you.

The installation of the front panel has a few critical points. Set the chassis on the bench front towards you. Put a ½" wedge under each front corner. Offer the panel carefully up to the chassis and install only the 2 lower mounting bolts in the precast HEXAGON holes.

Set both pointers at 100 on the logging scale and with the panel leaning towards you, install the glass; then angle the dial plate and with care maneuver it over and along the pointers; put the right angle backing strips on 2 small knitting needles.

With the backing strips hanging down, feed the needles through the holes in the upper corner of the dial plate. Then put the glass retainer strips

towards you, install the glass; then angle the dial plate and with care maneuver it over and along the pointers; put the right angle backing strips on 2 small knitting needles.

With the backing strips hanging down, feed the needles through the holes in the upper corner of the dial plate. Then put the glass retainer strips onto the needles BE CAREFUL, THERE IS A RIGHT AND WRONG SIDE and then push the point into the tapped holes in the rear of the front panel.

Ease the front panel into its correct position and install the 2 upper mounting screws – do not tighten them yet. Now leaving the knitting needles in place, install the 2 lower glass/dial plate retainer screws. Be prepared for several minutes of fiddling, I use a small wire hook to hold the screw and a long screwdriver to seat it.

I find that BA screws find the start thread very well. When you tighten the screws which hold the side chassis and the audio output chassis to the coil box, be careful not to trap any of the interstage wires which nest in detents in the chassis edges. On my 640 the AVC wire was trapped and shorted.

After checking for shorts and resistances to ground and the connected resistance from the output of the smoothing choke to the anodes and screens, I put in the old tubes and turned on the heaters... all OK. Next came the HT soak, in stages of 60v—100v—150v—250v dc for periods of 3 hours each.

At 150v the 8Mfd electrolytic began to gurgle, followed by a jet of foul gas and white powder. This was replaced with a 15Mfd 450 volt which was exactly the same size and the soak was repeated. All ok this time.

In this instance, I used the transformer in the 640 to supply the heaters and an external DC supply for the stepped B+ (HT). Graeme is absolutely right, under-running the heaters (the result of stepping the primary voltage supply to the set's transformer) isn't good for the tubes.

After 6 weeks of enjoyable work on the 640... the great moment had arrived. I attached an antenna to the grid of the Frequency Changer and there were 2 or 3 signals immediately. Next, following the 640 Manual, I injected a 1600Kc signal and with a little rocking of the tuning knob of the Sig Gen, I found the crystal peak 1599.25.

The IF alignment was very simple except IFT 3 would not peak on the primary. Further investigation revealed a broken wire at the coils input end . . . easily repaired.

The BFO was the next problem, it's signal was very weak, to the point that CW was difficult to read and SSB quite impossible. The old 6R7 and a 2nd alignment really didn't help. The rate of change produced by the BFO tuning knob has been the subject of comment but none of the 640 folklore complains of a weak BFO.

However this one was bad. A check of the circuit revealed no problems and the voltages were in the right range. Was the 95v on the anode of the triode-strapped EF39 sufficient for proper operation? An increase in the voltage to 225v and increasing C66 (the BFO injection cap) to 10pf made things a bit better but clearly, this wasn't the real problem. I put the set back to the correct C66 value (3pf) and 95v on the BFO plate.

Then I tried injecting the BFO into Grid 1 of V5; G2 of V4 (2nd IF) and it worked fine . . . the 640 was instantly transformed but into the correct diode of V5, the set's function was dismal. I had only one 6Q7 and it was not until several weeks later that a NOS Brimar 6Q7 solved the problem.

Strange thing is that I cannot see anything wrong within the (faulty) 6Q7 and the inter-electrode capacitance readings are much the same BUT one diode will not inject the BFO.

I checked with Graeme by phone that the local oscillator is on the high side of the signal frequency. Nowhere in the manual or literature is this information given, although the oscillator section of the main tuning cap is the same as the RF and Mixer sections and this usually means that the oscillator is high.

By contrast, the R1155 Receiver has a double sized oscillator tuning capacitor . . . typical of a low side tracking oscillator.

I aligned the 640 oscillator by tuning its signal on the 830 . . . The 1kc readout makes oscillator alignment simple but I had to change C27 several times to get the tracking correct on Band 1 (16 - 32 Mhz). The magic number was 87pf for dead on.

With the RF and Mixer stages aligned, there were lots of stations on all 3 bands but the audio output was rather less than I expected. My only 6J5 was 40% on the tube tester so I installed a new 6C5 (very similar to the 6J5). However it broke into wild oscillation immediately.

Both cathode and grid bias resisters had to be increased to correct this and the output was about the same as the 40% 6J5. In the end I settled for a 6W6 which has the same pin out as the 6V6 but really needs a couple of component value changes for permanent use. (Since writing the 1st draft of this, have obtained a new 6J5 and the audio output is fine).

So how is the 640 in 2001?—It's better than I thought it would be overall. 80 and 40 CW and SSB are very good until the band gets crowded and even though the crystal filter is pretty good, the sets bandwidth was selected for conditions almost 60 years ago.

I have used the 640 on 10 with OK results. There is a fair amount of retuning needed to hold SSB stations in readable form but 10m. AM, it's great. It really pulls them in.

And the fingerplate . . . well Letraset just didn't please me and you have to settle for white when silver is needed. Then I tried paint applied with a steady hand—it was a mess.

So I finally scanned the plate into the computer, cleaned up the worn letters and printed it on low gloss black background with silver lettering on white paper.

Lastly, I cut the paper to fit inside the silver outer edge of the original fingerplate; stuck the paper to the original fingerplate and gave the front 3 coats of clearcoat lacquer. The result looks like new. *(Note here from Graeme: Brian sent me a sample of this fingerplate 'renewer' and it looks good. Any member wishing to try one contact me.)*

Biggest surprise? . . . The accuracy of the calibration.

Disappointment? . . . Only my crackle finish of the case ! !

A rewarding set to restore and I'm sorry I waited 53 years to get one.

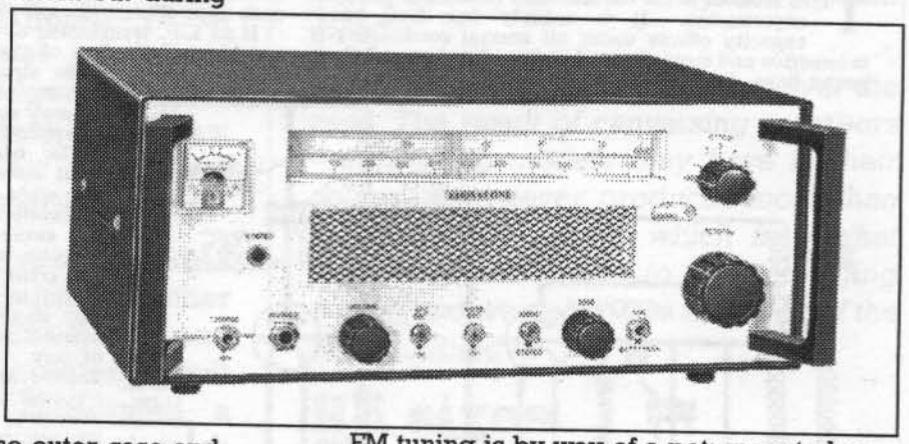
BRIAN R CAUTHERY
VE3DFC

(Post Script from Graeme: just in case you are confused by Brian's 'output tubes' in his set, the 640 was designed to use a 6V6GT, but can use a 6J5GT triode – same pinout – with less audi – or be re-wired to use an EL32 with a saving of 0.25 amps in the heater supply.)

MODEL 1002

This is my current project receiver. A project in so far as I have decided to clean it up, both inside and out. This was originally a gift from Chris Pettitt a couple of years ago and it has soldiered on very well, if one considers that it is by way of being a prototype for the 1002 receiver later marketed.

Mine has several idiosyncratic touches about it that I have had to fathom out during the past couple of years. I have the handbook and schematics but there are some vast differences in the layout and circuitry. Both the AM and the FM pcbs are hand drawn with ICs and trannies all over the place. The wiring looms appear to have had last minute alterations leaving spare wires in place, just to confuse the unwary.



Besides all of the above the outer case and front panel had become grubby from continued use. There is a tendency for these light coloured, buff panels to show dirt but this one cleaned up okay using a number of those alcohol wipes; these were used too on the scale window.

The black case was wiped over with some more of these 'wipes' and then the scratches were touched up with a Black Permanent Marker pen, before giving the whole case a good going over with an aerosol furniture polish. All this was the easy bit, read on.

The Long Wave range had always been a bit mediocre, never wanting to track properly across the range. Checks showed that pieces had broken off the coil slug in the RF stage tuned circuit. When the set was inverted and correctly tracked, then turned right way up, they moved about in the core of the RF coil so upsetting the tracking.

The slug was removed and the bits fished out with a blob of Blu-Tack on the end of a trimming tool. Re-inserting the slug and retuning cleared that problem. The same thing had to be done also on the Mixer coil of Range 3, but by now I knew what to do. The wiring loom around the output side of the PSU was in a quite parlous condition and looked as though somebody had been chasing a fault there at some time past. It was necessary to trace and tag each wire since the usual colour codes were not followed.

The opportunity was taken here to remove a number of wires in the loom, which simply went nowhere. I ended up by renewing the loom binding altogether between the PSU and the FM board making notes as I went along. These are now included in the handbook.

FM tuning is by way of a pot; mounted on a bracket and gear driven from the variable condenser spindle. The wiring here appeared to have been modified previously and so it was all renewed, a new loom being made up from the pot to the VHF/FM tuner.

The final job was to trace and record the wiring in the loom from the range switch to the main pcb. Since it went under the FM board and split before coming out in various places this was a horrendous task. Again a number of unterminated wires were eliminated from the new wiring loom and the job was finally complete, but not without many trials and tribulations.

It says much for the quality of the mains transfo and PSU that it survived a few seconds of complete shorting when I was attempting to sort out the AM/FM switching; I realised my problem when the wire insulation from the psu to the range switch started to melt.

The 1002 is now working well again and performing all the functions that Eddystone designed it for. The lack of a BFO takes it out of the Communications Receiver category and puts it into the Enhanced Broadcast category. In this role it excels. **TED.**

"Eddystone Specified"

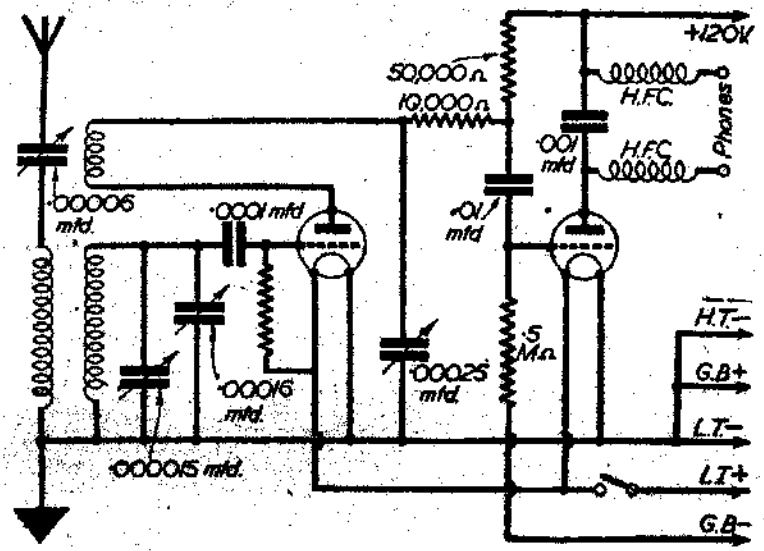
A Series of Short Wave construction projects from the past.

A Two-valve Short-wave Receiver

A Fine Headphone Set of Tested Efficiency, Ideal for the Battery-operated Station

By F. G. RAYER

THIS receiver is the outcome of a number of practical experiments. It is entirely free from hand-capacity effects under all normal conditions; it is sensitive and most easy to handle. The layout follows sound lines, the connection from coil-holder to bandset and bandspread condensers is only 11ins. long. All the components can be obtained from firms whose advertisements regularly appear in the pages of PRACTICAL WIRELESS.



Here is the circuit of the receiver. Quite simple and very efficient.

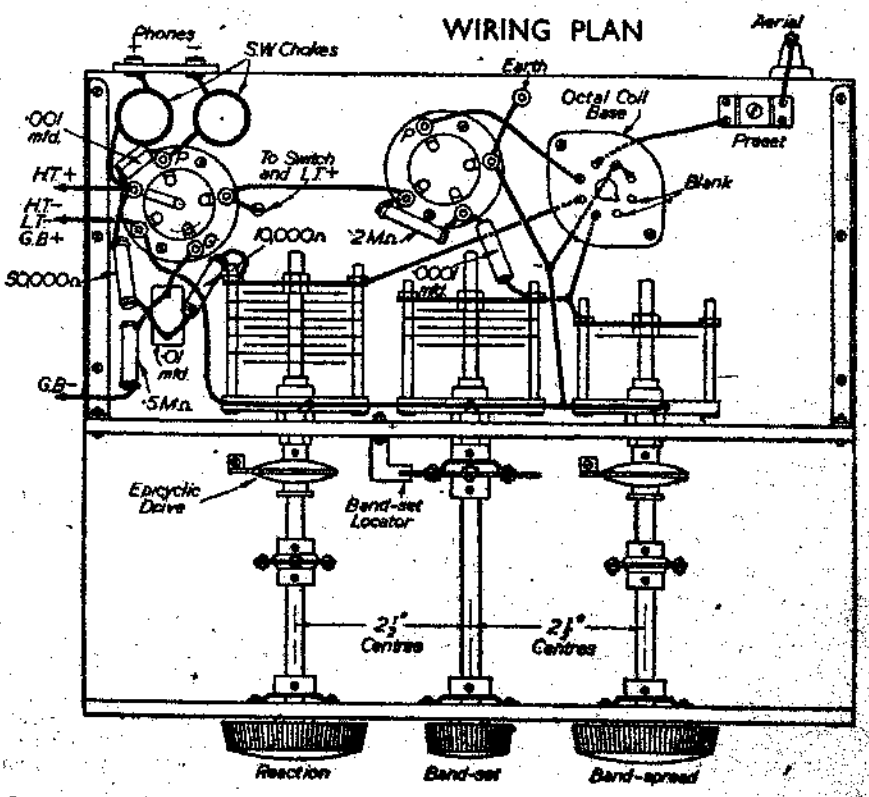
Construction

The chassis—9ins. by 11ins.—is made from 4-ply and has runners 1in. deep. The small sub-panel is mounted 3ins. from the rear edge of the chassis and is supported by stout brackets, and the layout shown (right) should be followed as closely as possible. The coil-holder is mounted 1½ins. above the chassis by means of long bolts and insulated sleeves of appropriate length. The variable condensers should be fixed to the sub-panel so that the soldering-tags which are connected to the fixed vanes are at the same height as the tags of the coil-holder. It should be noted that the soldering-tags of the reaction and band-set condensers are located adjacent to each other to simplify and shorten wiring.

If an L.F. transformer of reliable make is to hand, it can be used in place of the R.C. coupling, and it will provide slightly louder signals; a separate H.T. connection should be taken from its primary so that a suitable voltage can be applied to the detector.

The band-set condenser has the great advantage of being set in definite steps—thus assuring accuracy of calibration. The locating mechanism is easily contrived; the flexible couplers will be found to consist of two cranks with centre boss bolted to two thin discs of flexible material. One should be dismantled and reassembled with a metal or ebonite disc of, say 2ins. diameter, replacing the flexible disc. Around one-half of the circumference of the disc, 14 notches are filed, and a catch made from springy brass is arranged to locate with them. The slight labour involved will amply be repaid by convenience of operating.

The spindles of the controls are extended with lengths of ¼in. diameter ebonite rod, secured with shaft-couplers; wooden dowel could be used, but



it can only be regarded as a substitute. The method of arranging the bandspread condenser's pointer and dial is not shown, as this is a matter for individual preference. The band-set condenser should be equipped with one of the small knobs supplied with the epicyclic drives and a scale marked from 1-14. These details will become apparent when the actual components are to hand.

Operation

A valve of the H.L. type can be used as detector; the L.F. valve is of the detector or L.F. type—the former for preference. The aerial-series condenser must be adjusted until entire freedom from dead-spots is obtained with all coils, and then securely locked. The 'phone leads should not be run near the receiver or batteries as this will tend to partly remove the advantages obtained from the two H.F. chokes connected in series with the leads. There will be no hand-capacity troubles, even if the receiver is used without an earth—this being a valuable point when listening to low-power DX.

The receiver should be housed in a cabinet; if an existing cabinet is to be used, it is well worth while to make it dustproof—thus assuring that the receiver will not become noisy in operation. It is also a sound plan to make a coil-box having individual compartments lined with felt. Near the top of the coils will be found a groove into which a cardboard disc can be fitted—if the coils are thus identified and placed in the coil-box they will be saved from possible damage and will always be to hand.

It should be noted that a pentode may be placed in the L.F. stage without altering the wiring, but the grid-bias must be adjusted to suit.

LIST OF COMPONENTS

One each S.W. variable condensers: .000015, .00016 and .00025.
One each ½ watt resistances: 2 meg., 10,000, 50,000 and 500,000 ohms.
One each mica fixed condensers: '.001, .0001 and .01 mfd.
Two 2in. diameter control knobs.
Two epicyclic reduction drives.
Two S.W. high-frequency chokes.
Six flexible couplers.
One 60 mmfd. pre-set condenser, Steatite insulation.
One octal coil base, coils type O6, O6A, O6B, O6C (or as required).
One small stand-off insulator. All above items from "Premier Radio."
One 4-pin ceramic valve-holder, "Webb's Radio."
One 5-pin ceramic valve-holder, "Webb's Radio."
On-off switch, connecting wire, etc.

FAREWELL

The following Shift Engineers were manning their FM Broadcast Transmitters on the 110th Floor of One World Trade Center when it collapsed, and are missing, presumed dead;

WPIX – Steve Jacobson, N2SJ
WCBS – Bob Pattison and Isias Rivera
WNBC – William V Steckman, WA2ACW
WABC – Donald DiFranco
WNET – Rod Coppola, KA2KET

★

RADIO RAMBLINGS

Jottings from my Notebook

By Graeme Wormald G3GGL

Bewdley, November 2001

Greetings to EUGers one and all, may the Season of Goodwill rest easy on Your House and may the forthcoming Year be of Good Cheer.

I'm not sure yet how many pages this bumper Christmas Issue will run to (I never am until all is gathered in) but I do know that members have been very good with their written compositions. Keep it up!

I'm in the middle of restoring a member's Model S.687. Another previously unknown receiver? No, not at all. It's the 6v vibro-pack inverter provided in the late forties/early fifties for powering that well-known trio, the 640, 740 and 750.

Remember the octal socket in the back of the set, which must have a shorting plug for AC mains use? Hands up all those who've been tricked into fault-finding a set with this plug missing . . . yes, I see plenty of you (me too).

Well, it wasn't put there to fool you; it was put there to insert the connector from an S.687 PSU, which gives 250v output, along with the 6v for LT from the 100 ampere-hour battery with which Webbs Radio supplied the listener in the jungle or the outback.

And if you're wondering how he recharged it after long hours listening to "London calling in the General Overseas Service of the BBC", the answer is: with a "Chore-Horse". That wonderful little petrol generator supplied to the armies of the free world during World War II.

Well, that isn't quite what I set out to tell you. I was going to tell you my latest wheeze for cleaning up black wrinkle finish.

The vibro-pack is about half the size of a shoe-box and it had been completely dismantled, including the case into its three component parts (top, bottom and four-sides-in-one). The black finish was a pale smudgy grey in daylight.

So I put it all in the dishwasher. The case, that is, not the chassis! It came out very clean, darkish, but with a distinctly mattish finish and every blemish was showing. This is the point where you traditionally reach for the black boot polish (Kiwi for preference, according to Peter Lankshear).

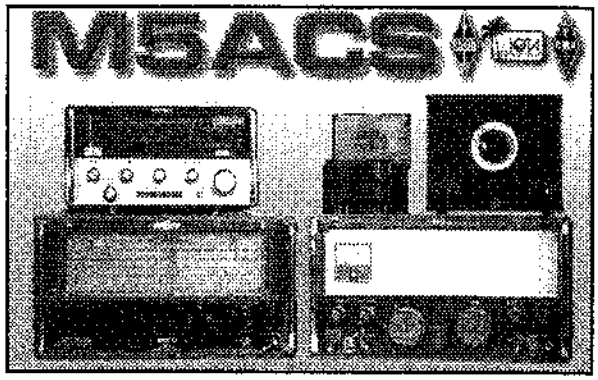
Well, I went rooting in the boot-box and came out with a new(ish) product. Self-shining liquid shoe wax. Two makes; Kiwi and Sainsbury's; much the same. So I tried this on one half of each item, and traditional brushing polish on the other half. The liquid variety was the clear winner. I commend it to you.

From time to time members send me their QSL cards and I mount them with small pieces of sticky-backed Velcro to use on our stand at the Spring National Vintage Communication Fair (NVCF) at the Birmingham National Exhibition Centre (NEC).

That's all very well but only about fifty or so members see them, so I thought I'd put them up here for members to see. The first is that of Mike Arnfield, M5ACS of Cheshire, showing a very neat across-

the-board collection of Eddystone Radios.

The 'All World Two' of 1936, together with its coil-box is presented at top right, sitting on a ham-bands EA12 of 1964.



On the top left is shown the famous EC10 Mk II, also of 1964, sitting on top of the British Army 730/4 of 1959.

Below is one of our newer members, SWL Derek Gavin of County Down.

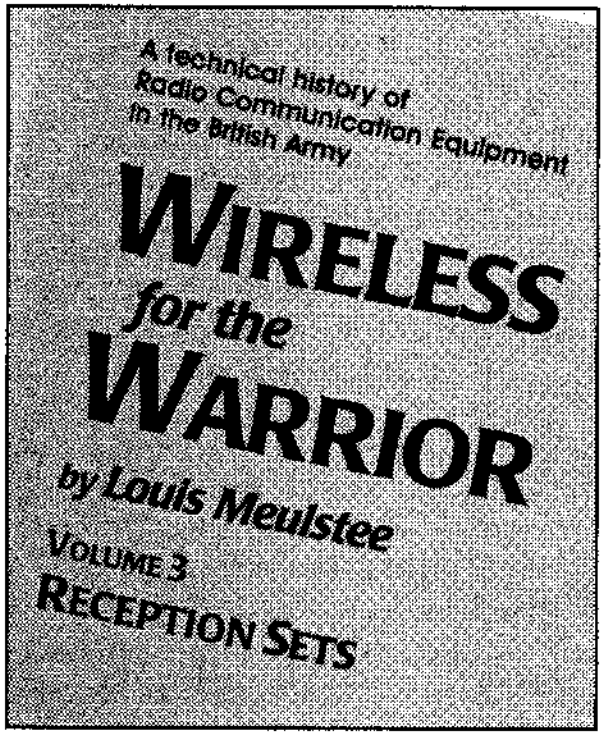
I apologise for the loss of colour in these otherwise very cheerful presentations!

Books for Christmas! Last month I told you about the publication of "Marconi's Atlantic Leap", an absolute 'must have' treatise for students of wireless history. Full of never-before published pictures of that great wireless achievement of December 12th 1901, it is now available as a Special Offer for just £4.60 post paid.

Get your credit card ready and telephone (UK) 01825 723398. I cannot recommend it too highly, especially at this price, and remember, it's hardbound!

As a matter of interest, this self-same book was being offered on a second-hand book-stall at the NVCF this September for £14. When challenged about the price the stallholder said that it was now out of print! Get in quick . . .

Louis Meulstee has now produced his *magnum opus* of "Wireless for the Warrior, Volume 3 – Reception Sets" and what a blockbuster it is! This much-acclaimed (and awaited) work has no less than 546 pages. It includes information on more than 70 receivers used by the British, Australian and Canadian armies, featuring more than 230 photographs, 470 line drawings and 220 data tables.



The receivers described span the era 1932 to the 1960s and include such Eddystone favourites as the R101 (a variant of the LPC, itself a variant of the famous All World Eight), the S.358-series and the S.730/4.

This really is another 'MUST' for all valve-receiver enthusiasts. Large format hardback, it retails for £36 plus postage. Order from your local bookseller if you want to save on post (ISBN 0952063 35 2) or have your plastic ready and phone (UK) 01202 873872.

Prices including p&p are: U.K. - £40.00; Europe airmail or Rest of World surface (except Canada) - £46.00; Rest of World airmail - £55.00. If you think it's

expensive look at it this way: It's 50 pence for each radio and the information is *par excellence*. You'll never find it any other way.

If you're still wondering what to ask for from your nearest and dearest you could do much worse than this:

It has been said that the First World War was fought by chemists; the Second by physicists. Some 20-odd years ago the BBC produced a gripping documentary series called "The Secret War" which told the story of that later conflict. The "Wizard War" as Winston Churchill called it.

In 1988 the BBC offered all eight episodes on video (two episodes per video). I have had all four VHS cassettes since they first appeared, but they've been long 'out of print' (if you can use that phrase for a magnetic tape – I suppose you can).

Well, last week I was delighted to see them re-issued (with a new cover design, which confused me!). They are available from all good record shops, as they used to say on the telly. Or order them if you can't see them.

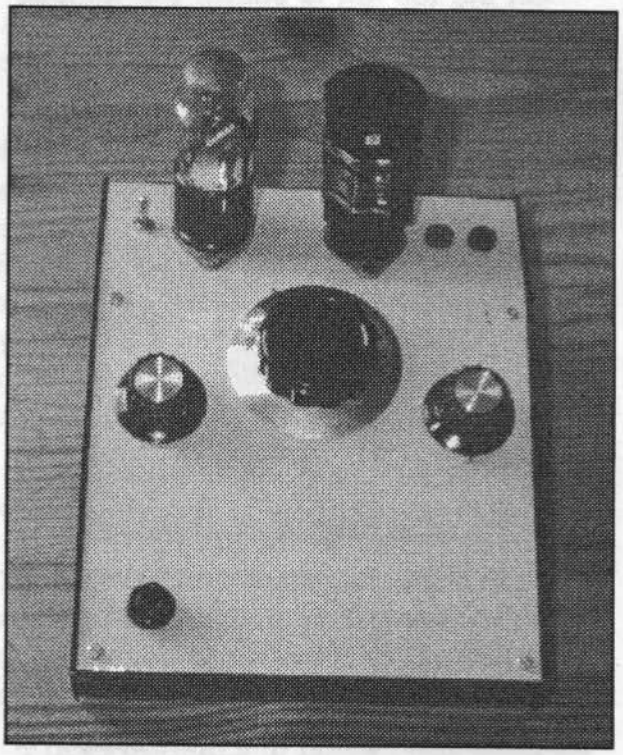
Volume 1 covers (first) "The Battle of the Beams" presented by the late Professor R.V.Jones, a 'natural' if ever I saw one. And second, "To See for a Hundred Miles", the story of wartime radar. If you only want one tape, this is the one to get.

Volume 2 covers (firstly) the German Terror weapons (V1, V2, etc) and secondly, the weapons which only just (or never) made it into war. A jolly good 'watch'. The 3rd and 4th Volumes are good, but in my (no doubt biased) opinion the best stuff went into the first two. There you have it. You pays your money and you takes your choice!

I was entering up the EUG membership renewals at the weekend and suddenly had a feeling of *déjà vue*. Now I'm not a natural pen-pusher and sometimes I imagine I've done things when I haven't! But this feeling was stronger than usual. I was entering a member and I was sure I'd entered him five minutes previously.

Stranger things have happened and when I backtracked through the papers I found two members living in "Hillside Avenue". Honestly. But one was in Essex and the other in Fife . . .

One thing I always enjoy is trying out a device that's all my own work. It's quite true what they say - "There's absolutely nothing worth doing as much as messing about with valves". And here to prove it is a little one-valver made by EUGer Ron Pearce of Suffolk:



As Ron says, he pulls in stuff from all over the globe with it. Talk about creative satisfaction! You can't beat it.

Richard Witney, G4ICP, from Essex, points out an 'Inexpensive Audio Source' from the 'Hints and Kinks' column in a 1968 issue of QST *(the Magazine of ARRL)*. The principle is that of the very best audio signal generators; a beat frequency oscillator.

But in this case the designer uses the station receiver in CW mode, beating against the station crystal calibrator. (And don't tell me you haven't got one!) Adjust the heterodyne to a suitable AF

and feed it through a variable pot'meter into the item under test. Easy!

The writer then goes on to suggest that you calibrate it from Middle C on a piano . . . As there are few shacks fitted out with pianos, or even tuning forks, you could calibrate using a 'scope. Or just listen. I'll bet any SWL worth his salt can tune in on either 400 cps or 1kc/s (both of them standard line-up tones by short-wave broadcasters).

In his Page 3 Leading Article, our Patron, Chris Pettitt GØEYO (former MD of Eddystone Radio) tells us that he is going to welcome the New Year 2000 by getting on the air using the old Eddystone callsign G6SL ('Stratton Laughton' – founder of Eddystone, see 'For the Record' feature in this Edition).

Chris has held the call when he became MD in 1984 – and still does. I am now scratching my head to find a suitable Eddystone commemorative event which is having an anniversary ending in a 5 or a zero!

Believe it or not we seem to have just passed by some of the main ones. 2000 was the 140th anniversary of the founding of Jarrett & Rainsford, of which Eddystone was a subsidiary.

2001 has been the 90th anniversary of the founding of Stratton & Co Ltd in 1911, which became absorbed into J & R in 1918. The Australian branch was founded in 1928; nothing there. Short wave components were first marketed in 1926; just missed the 75th of that.

BUT WAIT, I've just missed something! Although Stratton's was created in 1911 (by George A. Laughton, already a manager of J & R), it was NOT REGISTERED as a Limited Company until 1912. So there we have it; the 90th Anniversary of the Official Founding of Stratton & Co Ltd, the originators of Eddystone Radio!

Actually, I was just about to suggest that we abandoned the search for an Eddystone date and joined in with the other big radio event of 2002. And if you're wondering what that was it was the first TWO WAY QSO between Europe and North America.

I know we are celebrating Marconi's Great Atlantic Leap this month, but remember that the famous three dots transmission was a one-way only event.

Two-way communication was not achieved until the following year when messages were exchanged by the Marconi Company between Cornwall, England, and Glace Bay, Nova Scotia (now a Province of Canada).

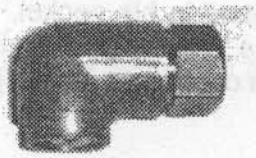
And you can't say that the Marconi Company is nothing to do with Eddystone! Of course it is, Marconi owned Eddystone for 33 years!

So we now have two celebrations for 2002: the Centenary of DX two-way communication and the 90th Birthday of Stratton & Co. As far as I can see from our membership list, we have eight licensed ham members in North America, of whom three are in Canada.

We have about 200-odd licensed members in the UK, of whom about 140 are Class 'A' (all bands). Of this number about ten appear from time to time on the EUG 'first Sunday' net, but I know there are more active members, especially on the DX bands. So it shouldn't be beyond our capabilities to arrange for an EUG two-way across the Atlantic (just for starters).

Then, perhaps, certain periods of the year would be set aside for G6SL activity. Any member working, or any SWL reporting a QSO would be given a special certificate of merit. We'll have it all sorted out by the February Lighthouse.

For those of you seeking 'PYE' co-axial connectors for the 730/4 (à la WS19, etc); these may be acquired from Chevet Supplies, telephone (UK) 01253-751858; Price £1 + p & p. (Plastic taken)



EDDYSTONE RECEIVER REPAIRS FOR BEGINNERS – PART 3.

TEST EQUIPMENT

BY PETER LANKSHEAR, ENGINEER, NZBC, (RETIRED)

The choice of test instruments can be confusing for the new owner of an Eddystone receiver. Naturally, much depends on the depth and amount of work anticipated, and obviously it would not make much sense to buy £1000 pounds-worth of test equipment to maintain a lone receiver worth £100. Although considerable savings can often be made by shopping around, attending auctions and amateur sales and the like, it is easy to get carried away and end up with a collection of equipment that is not really needed, but which will take up space better allocated to more receivers!

No Substitute for Experience

One fortunate aspect of valve radio equipment is that, unlike many modern testing procedures, measurements are relatively straightforward and simple. It has been said too, that the quantity of testing facilities required is in inverse proportion to the experience of the repairman. This is a bit of an exaggeration of course, but I well remember seeing it demonstrated some years ago by a technician with many years of fixing domestic receivers behind him. It took him less than a minute to diagnose a receiver with no sound without using any instruments at all.

First he used what he called his "calibrated screwdriver" to check the H.T by shorting the output filter capacitor to the chassis. The size of the resulting "splat" indicated that there was plenty of voltage available.

He then touched the grid pin of the output valve and the resulting "burp" confirmed that the output stage was working. Next he set the volume control to mid range and touched his screwdriver on the grid cap of the first audio stage. There was no response and as this valve was glowing and therefore likely to be operating, he suspected that the problem could be its anode resistor.

He confirmed that the fault was indeed the case, by the simple process of licking the tips of his thumb and index finger and then, with his other hand in his pocket, using his fingers to bridge the suspect resistor! The set burst into life confirming his suspicions.

Now I don't recommend using this type of diagnosis (for one thing some of us are more sensitive to shocks than my hard case horny handed friend) but it does indicate that there in no substitute for experience and that an elaborate test setup is not always warranted. In fairness I would add that, after replacing the defective resistor, he did run a test meter over the receiver to check its overall operation.

The One Essential

Regardless of the number of receivers in a collection, the one absolutely essential test instrument is a multimeter. These come in a wide range of prices and specifications, varying in price from less than ten pounds to many hundreds, and to a certain extent you get what you pay for.

There are two basic types of meter. The older moving coil analogue pattern has a pointer and printed scales and although dating from the 19th Century, it has stood the test of time. Alternatively, there is the digital readout multimeter often with features and testing facilities not possible with the moving coil type.

After their introduction, digital watches became quite popular, but it was soon found that unlike the traditional timepiece with hands, they have the disadvantage in not providing a sense of proportion in their readings. So it is with digital meters, but even so, because of their other advantages, they are increasingly popular.

Some digital meters have a lot of "bells and whistles" which can be used as an alternative to other test equipment. One

useful facility is the provision for capacitance measuring. Other features of less value to the Eddystone owner are continuity checking, and measurement of temperature, frequency and inductance.

Auto ranging, where the meter senses the correct range to suit the voltage being measured is useful, as are diode and transistor testing and A.C. current measurements. Other meters are intended for specific trades and an electrician's meter, for example, is not as convenient for radio repairs as an electronics meter.

Even the most expensive and sensitive analogue meter requires power to move the pointer. The circuit being tested must provide this power, and this can cause errors. A few dozen microamps taken by a meter measuring a high tension line is of no consequence, but it can be a different story with a high resistance source such as the anode of a resistance coupled amplifier operating at less than a milliampere.

A typical inexpensive test meter would have a 10kohm per volt rating. On a 100 volt full scale range this meter would present a 1.0 megohm load, (10K X 100) resulting in a significant error when testing the voltage across a high value resistor. This error is taken into account in older circuits and is the reason why many Eddystone diagrams list separately readings for different makes of meters.

A typical example is the model 750. Readings are given for the Weston and AVO Model 40 meters. Both give a reading of 225 volts for the main H.T. line, but for the anode of the 1st audio amplifier, the Weston meter is 65 volts, whereas the AVO reading is only 13! It is not that the more rugged AVO meter is less accurate, it simply indicates that there is more to interpreting meter readings than taking them at face value. In reality, the true voltage would be about 100 and this is nearer the reading that would be indicated by a digital meter, which normally has a very high input resistance.

The digital meter is really a descendant of the vacuum tube voltmeter, which was used to overcome this basic weakness of moving coil meters by isolating the meter with an amplifying valve. This is very good argument for using digital meters, but it is important to remember that when measuring voltages involving high resistances, readings will be higher than Eddystone have indicated. In fact, a good VTVM such as the Heathkit or an RCA *Voltohmist* can still be a useful instrument.

My recommendation is to buy a mid range priced digital meter which should not break the bank and yet will be capable of serious work.

Oscilloscopes Look Impressive

Other test equipment is not essential, although some instruments are nice to have. One of the first that comes to mind is an oscilloscope. Personally, although I have one, it is not used more than about once a year in receiver servicing. Certainly a wide range unit could be used for signal tracing, but there are simpler ways of locating a fault. Probably the most useful purpose for a 'scope is checking the response of variable selectivity I.F. systems that some of the larger Eddystones feature. However, this also entails using a frequency modulated signal generator (or "Wobbulator"), an activity that I would hesitate recommending to a novice. In short, an oscilloscope makes a great centre-piece for a test bench, but is not at all essential for anything but really advanced Eddystone work.

Capacitor checkers were often found in service workshops, but as mentioned earlier, they have to a certain extent been displaced by some of the digital readout test meters. Dedicated instruments can be more accurate than multimeters and often will handle a wider range of values. If you can get one at a reasonable price, do so, but otherwise a digital meter is likely to be all that is really needed in practice.

Whole books have been written about signal generators and alignment of receivers. I will deal later about alignment procedures, but for now we will look at some suitable types of instrument. **First though a warning that alignment is all too often attempted as a substitute for fault finding.**

There is often a temptation for the novice to blame receiver alignment for indifferent reception when he cannot locate the real fault. A set of the quality of an Eddystone will hold its original alignment indefinitely and adjustment is normally necessary only after major surgery to the R.F. or I.F. sections, or because it has been meddled with. Realignment should not be undertaken lightly and then only when you are certain that there is not another problem.

Accuracy Essential

Signal generators, like other instruments come in a wide range of specifications and with prices to match. At the top of the range would be a precision frequency synthesised laboratory instrument with many refinements that the novice would not need and with a price to match.

At the other end of the scale would be a salvaged old radio servicing generator without the accuracy or control to be of any real use. It is important to realise that an instrument with a scale accuracy inferior to the receiver being worked on, is useless.

Other features to look for especially are frequency stability and very importantly, good shielding and a good output attenuator. Two quick checks can be made for an instrument's suitability, both needing access to a good receiver. (Naturally an Eddystone would be preferred!) Tuning in WWV on 5, 10 or 15mHz and beating the oscillator against the transmission can obtain some idea of the oscillator's frequency accuracy.

Cheap oscillator output attenuators may consist only of a variable resistor and become progressively less effective with increasing frequency. A well-shielded generator with a good attenuator will reduce a 15mHz signal sufficiently for the receiver noise to be heard along with the signal. Admittedly, it is possible to reduce an oscillator signal to a low level by the simple expedient of disconnecting it from the receiver, but it is inconvenient and not very precise. Bear in mind too that double conversion Eddystones (e.g.750 and 888) have a very low 2nd I.F. frequency of 85kHz, that is not covered by some generators.

One very useful instrument is the WWII BC221 heterodyne frequency meter. These still appear at sales and are adequately accurate for any Eddystone alignment. Make sure that the calibration book accompanies the BC221.

As always, there is need for a sense of proportion and the owner of a single Eddystone receiver that is in real need of alignment may be better off to persuade an experienced EUG member with suitable facilities to assist.

Valve Testing

Next on the list is a valve tester. There were two basic types. First there was the inexpensive simple emission tester that often graced radio shop counters but are of limited use to the serious user. The only parameter indicated was emission, with the meter scale reading "Bad-?-Good", and taken in isolation this can be very misleading. More than one cynical dealer has stated that this type of meter made the real profit for his business.

The best type of valve tester measures various parameters including electrode currents, gas and most importantly of all, mutual conductance. Well known makes are AVO, Taylor and, from the USA, the Precision and Weston. These instruments give reliable measurements of a valve's condition, but it is essential to make sure that their data sheets or manuals accompany them.

With valve testers, the economics of ownership again is a factor. If one can be found, a good tester can easily cost as much as or more than a receiver and the use that it would be put to with a modest receiver collection would be minimal.

Under these circumstances it would be better to invest in a set of one each of the valve types in use and to use substitution, still one of the best methods of valve testing. I will cover this in more detail in a later article.

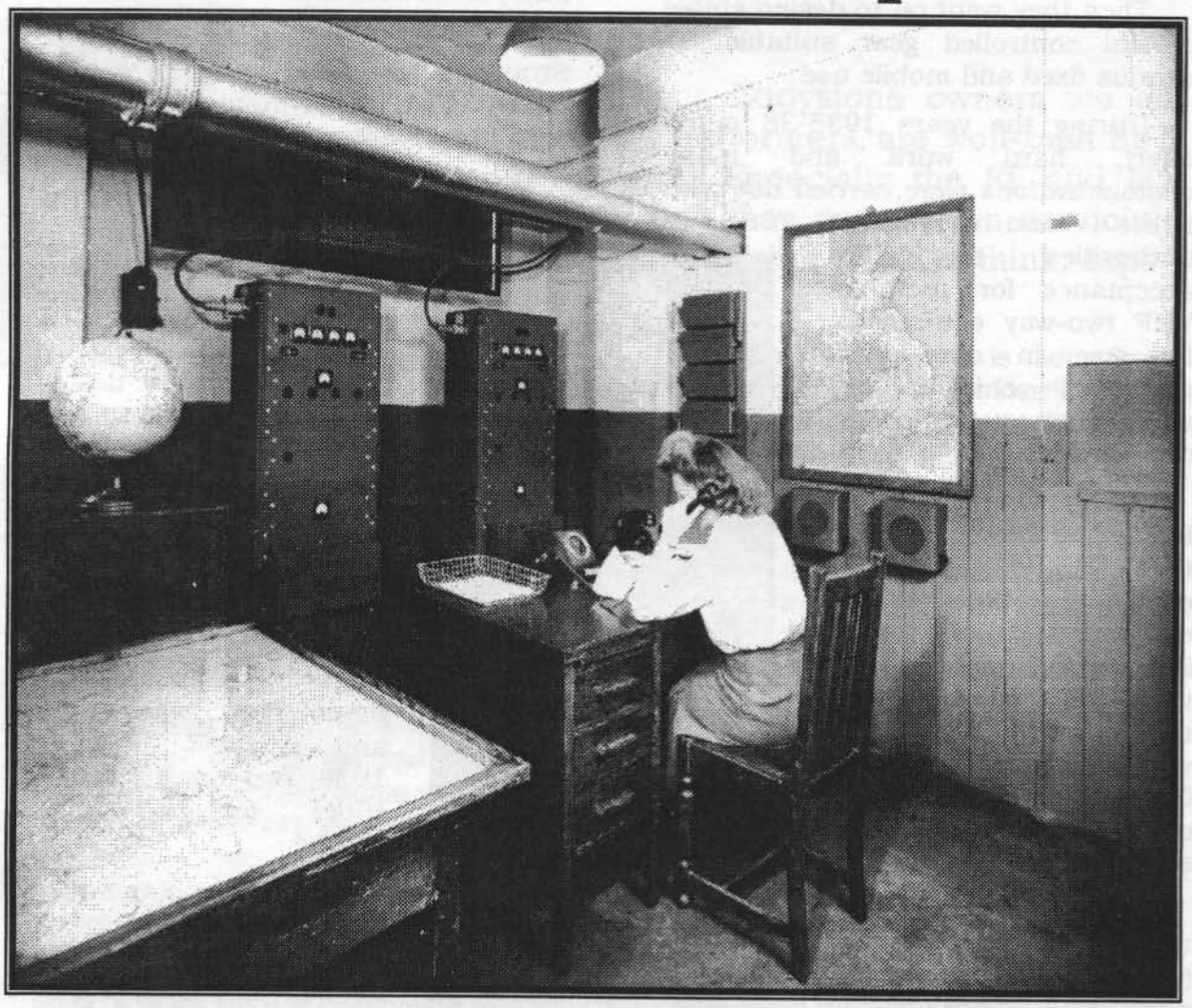
One instrument sometimes used in servicing is the signal tracer. In my opinion they are too limited in their use, and there are better and simpler was of locating the faulty section of a receiver.

To summarise, the one essential test instrument is a good multimeter. Others can be regarded as being "nice to have". There is no instrument that can unaided diagnose a receiver performance, and the final analysis comes from between the operator's ears. In future instalments we hope to give some hints to assist this process.

A post script: It has just come to my notice that reprints of the "Radiotron Designer's Handbook" (1498 pages), mentioned in my first article, are available for $US69.95 (about £50) from Antique Electronic Supply, P.O.Box 27468, Tempe, Arizona USA, 85285-7468. This company stocks a wide range of valve radio components, including a huge stock of valves and radio books, and their catalogue is well worth writing for.

★

Can this be Interpol ?



No, not quite, but it's a pretty fair imitation!

The location is the basement at Stratton's 'Bath Tub' factory, West Heath, Birmingham, some time in the 1940's. The young lady is called Frances and she worked on the company's switchboard when she wasn't modelling for the firm's photographer.

The two big rigs in the 6ft racks are Model S.215, 100 watt VHF radiotelephone transmitters. One in use, one on standby. The little boxes on the wall are a couple of associated receivers, type S.214, with power units and speaker cabinets.

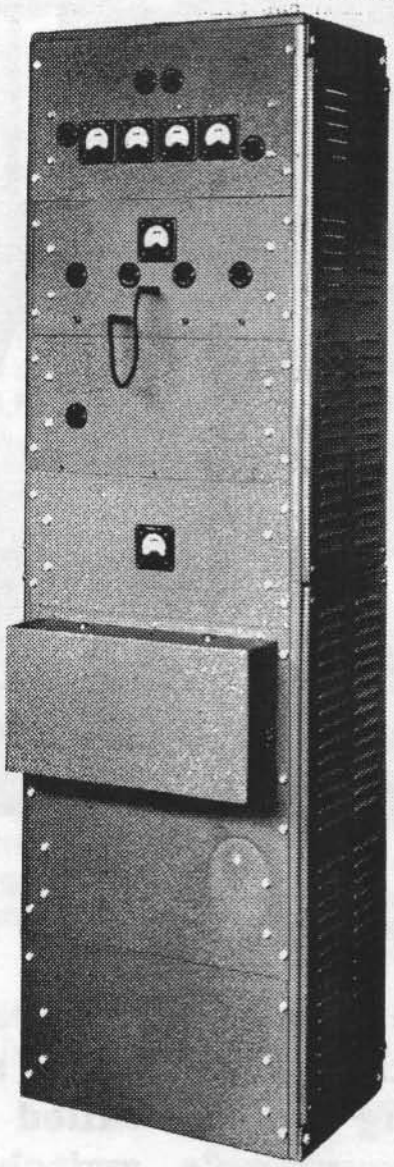
Eddystone Radio had been involved in the development of VHF since the early 'thirties. They devised a 5-metre transceiver, which had been used successfully in the Oxford University Expedition to Mount Everest in 1935.

The effective range was around 5-6 miles and it is believed to have been the first 'walkie-talkie' in the world (although recent claims have been

made for this to have been in USA in 1938 . . . ?)

Then they went on to design stable crystal controlled gear suitable for serious fixed and mobile use.

During the years 1935-38 much effort, hard work and many demonstrations were carried out with Police and Military authorities to gain acceptance for portable VHF two-way equipment for use in cars and armoured vehicles, but without success and at considerable cost.



Certain sections of the Police in different parts of the country built their own experimental equipment and Eddystone components were sold to them, but the military authorities were lagging behind Germany in making use of portable two-way VHF equipment.

It was not until after the Munich crisis in 1938 (when Hitler annexed part of Czechoslovakia) that Strattons' years of effort and development work on VHF bore fruit and was able to serve a purpose of national importance.

The Metropolitan Police Authority, covering some 95 police stations and Scotland Yard, sent out an urgent request to Stratton & Co Ltd (who were easily the smallest organisation among much larger radio firms) to submit equipment for test and also to tender for an automatic wireless telephone network.

By this time it was obvious to many that war was inevitable and fear of enemy bombing was justified. In the event of such action putting landline telephone communication out of action, this equipment would be essential for Air Raid Precautions (ARP) to be effective.

This was the class of job which Stratton's had been trying to get for three years. A night and day effort was made, seven days a week. The S.214 receiver and S215 transmitter were built and submitted. It gave the best performance in trials and the order was placed with the company.

The excellent design and results obtained were largely due to Harold Cox, Technical Director, and George Brown, G5JB. Early delivery was vital and by good teamwork and disregard of working hours the whole installation was built and delivered by July, 1939, two months before Hitler marched into Poland.

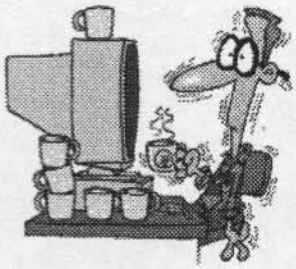
The Metropolitan Police radio-telephone network performed perfectly during the blitz and over 250 Transmitters were supplied to the Police and the Admiralty during the War.

The nominal range was 25 miles and equipment was ordered by many other prominent Police forces, including Birmingham, Glasgow, The City of London, Edinburgh, Renfrew, Dumbarton, Paisley, and Stoke.

The output frequency could be set anywhere between 40 mc/s and 150 mc/s with suitable crystals and coils. Weight was 524 lbs (about a quarter of a ton) and the S.215 remained in production until the early 1950s.

GRAEME - G3GGL

This advertisement for Eddystone VHF Radio-telephones appeared in the 'Wireless World' magazine for July 1945. The company had a good success with this equipment both for Police, Military and Naval uses during the War.
Incredibly, after the war, a decision was made to leave this market. By 1960 the parent company , Laughton and Sons, admitted that this was probably an error.

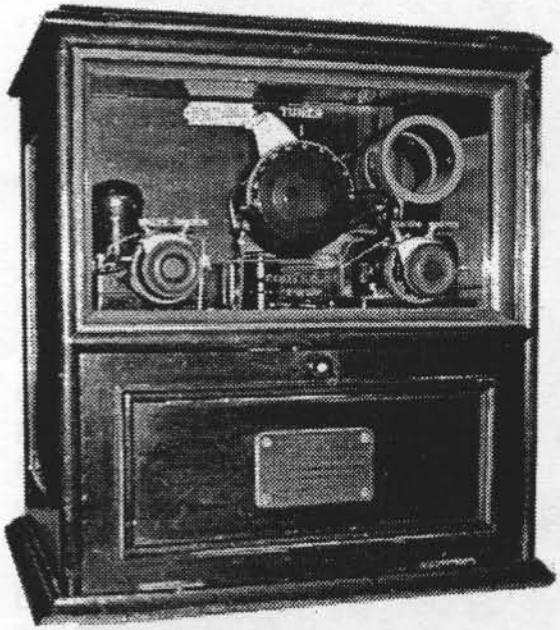


POO'S PONDERINGS

'Stray thoughts from an absent mind!'
by Simon Robinson M5POO

Graeme hinted in the last issue of 'Lighthouse' that *another* Eddystone Twin had been unearthed. Indeed one has; surprisingly it appeared on a stall at the last NVCF in Birmingham. When Graeme and I visit the NVCF we often lose each other in the crowd, so a couple of years ago we began the practice of taking along a couple of low power 70cms handhelds. A fringe benefit of this is that we can start our mooching from opposite sides of the hall and cover more ground.

I had just completed the first aisle and become engrossed in some old 'Editors and Engineers' handbooks from the States when a voice came over and said "Simon' there's a Twin on a stand over here". I hurried over and negotiated a deal with the very pleasant Dutch dealer who was selling it. These very early Eddystones tend to be unique in some way and this one is no exception.



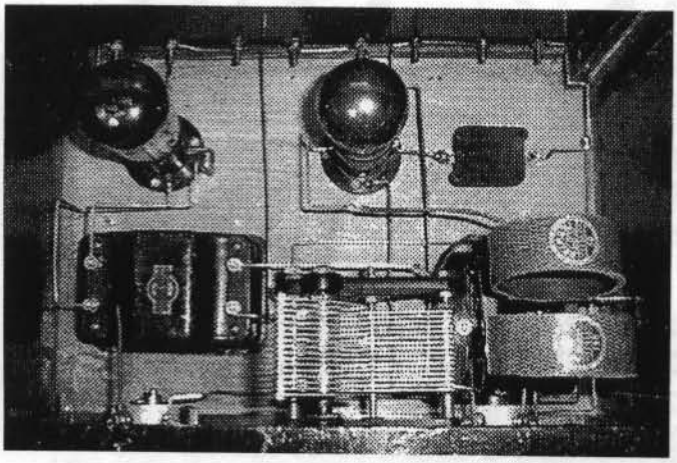
At first sight this particular receiver appears to be a 1926 model by virtue of the two potentiometers to control each valve separately. But take another look, the markings on the glass front show "Valve Switch" and "Station Switch", both of which are features of the later 1928 model.

We suspect that there are two possible explanations for this 1) the original glass was broken and Eddystone supplied the only spare type they had in stock or 2) the set was built from parts in stock at the time. The latter was often the case in the very early days of wireless.

The set is the 'built in drinks cabinet' version (I think the batteries were really meant to go behind the front flap) although the rear of the set has a complete row of external type terminal connections.

One criteria applying to all the sets in my collection is that they must work. This old twin is no exception and I have acquired some spare valves with that in mind. Care is necessary with a set of this age and heritage however one of my greatest concerns is the complexity of the circuit in the event of a fault. Have I the time to spend with an oscilloscope and signal generator, possibly a wobbulator, to track down that elusive high value resistor?

I'll let you know what happened in the next issue of 'Lighthouse'.



The picture on the left shows the vast myriad of coils, capacitors and inductors used in the Eddystone Twin.

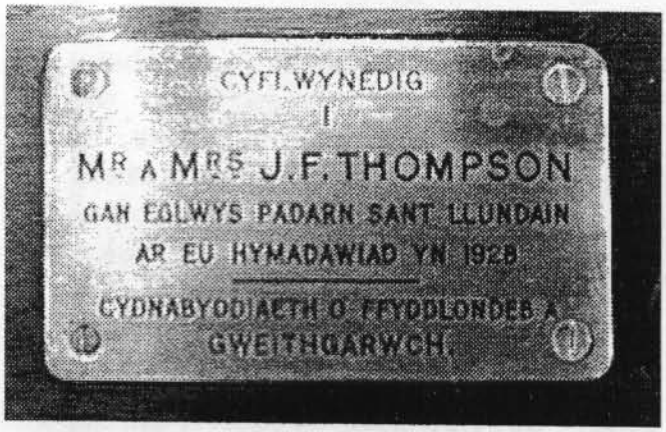
With a component count that I can only estimate at a figure of 10 I've certainly got my work cut out. Notice the ex-WD mica capacitor at the top right. Time travel was in its infancy back in the late 20's but they managed to get this one through. I might just change it for a more authentic 'feel' to the set.

On a more serious note, the simplicity of these old receivers at one time held no interest for me but having 'tasted' several over the last couple of years I find them most intriguing. Their designers were in fact just as accomplished as those who design our new Intel Pentium 4 computers. I wonder how they would react if presented with the latest HF set from the Eddystone stable?

Oh, the brass plaque!

The more observant of you will have noticed the small brass plaque on the front of the battery compartment. All by myself I worked out it was in Welsh! However I don't speak Welsh, nor do I know anyone who does; maybe I should ask Anne Robinson! Graeme came to the rescue here as he does know (at least) one Welshman. However it turned out that even his contact was unsure of the text as it was in *Church Welsh*. Have you ever wanted to be a Hieroglyph specialist?

Several visitors at the NVCF had a go at translation and I myself managed to decipher the names of a married couple from the jumble of letters correctly. The true translation was awaited and here it is with a picture of the plaque alongside for comparison.



From the Congregation (cyflwynedig)
To (I)
Mr & Mrs J.F.Thompson
In (gan) Padarn Church (eglws) of Saint (sant)
Llundain (place names)
On (ar) Your (eu) Retirement (hymadawiad) In (yn) 1928
In Recognition (cydnabyddiaeth) Of (o')
Faithfulness (ffydlondeb) In (a)
Service and Hard Work (gweithgarwch)

There's no more news from the 'Land of POO' for now so I'll bid you farewell and wish everyone a very Merry Christmas and a Happy New Year. Don't over indulge, unless I get an invite, but take some time out from this frantic world we live in. *As many people tell me – "Chill Out"*

73 de Simon M5POO

STRATTONS AND OHMS LAW

By Jack Read

Reading Roger Bebbington's 940-repair note in Lighthouse No. 68, page 39, rang a familiar bell and set me thinking. With half a dozen Eddystones in the collection I have over the years repaired probably a dozen or so faults. The funny thing is that they always seem to be the same! Like the 940 my problems have invariably been high value resistors heading off towards infinity. But why? Poor components?

Some time ago I took up paper and pencil and tried some Ohm's Law calculations with intriguing results. In almost every case the sums came out the same. The high value resistors, generally 100K or so, and generally part of a potential divider chain between the HT rail and chassis, were ½ watt rated but ran continuously 30% to *50%* overloaded.

No wonder they overheated and drifted high. But how could the hallowed designers at the bathtub make, let alone perpetuate, such a simple mistake?

Recheck calculations: same answer. Decide to keep quiet lest drummed out of EUG for heresy!

Feeling bolder now may I venture a theory on patient readers. In order to get intermediate voltages, somewhere between full HT+ and earth, it is normal to set up a chain of two or three resistors between the HT rail and chassis so that the voltage required for a particular function can be picked off at the appropriate junction.

Having selected suitable value resistors the designer will then check the volts across each and the current through, and specify resistors of the appropriate wattage rating. Job done.

However during development, or when introducing a further variant, it is quite likely that the initially chosen voltage may have needed to be adjusted or changed. The development engineer would do this by altering the value of one or more resistors in the chain.

The design action would then be to run Ohms Law again and check that the wattage ratings down the whole chain were still in limits, or make adjustments as appropriate. Bear in mind that if the current has increased it will be the high value resistor that cops it first.

My hypothesis is that late changes, mods on production, and other downstream adjustments of this apparently simple nature did not get recycled to the design office, and thus never got checked. Would any ex design office member care to come forward and contest this theory? ★

REPORTS FROM OVERSEAS *and from reconnaissance flights and shipping are received by radio and simultaneously typed at one of Britain's Area Collecting Centres.*

DO YOU RECOGNISE THIS PICTURE ?

This picture was found by EUGer Peter Beardsmore, G3IXY, in a book entitled "The World's Airways and How They Work". Odham's Press published it in 1950 and, apart from the caption beneath it, has no other specific reference. The chapter is all about weather forecasting and it mentions Prestwick as being the centre for the North Atlantic run.

Quite clearly visible are four Eddystone receivers (maybe more) type S.358X, developed during 1940 at Balmoral Works, Birmingham, before the factory was totally destroyed in the Blitz.

They were actually produced during 1941-44 at the West Heath Lido (a.k.a. The Bath Tub). They are known to have had wide use in the Royal Navy where they were given the Admiralty designation of B34. The British Army gave them a Stores Reference (ZA 7488) but didn't seem to use the model.

The RAF got involved in a 'special' which they labelled the R 1448, and about which some interesting details have only recently come to light. But that's another story and those shown in our picture are different.

The gentleman standing in the middle centre is quite clearly wearing RAF eagle shoulder badges (worn by all airmen below the rank of Warrant Officer), with signallers' sparks above his sergeant's stripes. This is obviously a serious Air Force operation, so what is it and where is it?

Somebody, somewhere must know. I don't honestly believe it is a post-war picture. The received wisdom is that the HRO and the AR88 replaced the 358-series by the end of the war. But did they? Are they actually receiving weather reports from ships in 1950 or is this a wartime Y-service Intercept Station?

GRAEME -- G3GGL

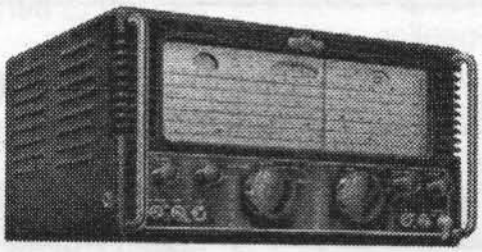
MY FIRST EDDYSTONE

(And a lesson learned!)

By Graeme Wormald G3GGL

In the mid nineteen-eighties I thought that an Eddystone valve set would make an interesting addition to my ever-growing stable of vintage valve radios. As this pre-dated the EUG era I had no QRG to help me out, so it was a stab in the dark. How did I make out?

I'd been using Eddystone parts since the radio bug bit just after the War (WW2, that is, not the first one), but the only actual set which had impressed itself into my subconscious was the S.640. I suspect this went for most of my generation, but as an impecunious teenager there was no chance!



In the early 'fifties the two-metre bug led to the acquisition of the well-known S.440 transmitter (famous for its use as a duplex radiotelephone by the Navy on D-Day). I think this cost about £3 (nearer £100 at today's reduced value of the Pound, remember). It worked well but taught me nothing about the Stratton products of the day.

So I started to scan the small-ads of RadCom and finally found a model within 50 miles of Bewdley. Burton-upon-Trent, to be precise; where the best beer comes from. A phone call confirmed availability and directions so off we went. (At this point I must note that the 'Royal We' is used by most radio hams to mean the first person singular.)

The model offered was described as a 680X, which meant nothing to me. Condition was stated to be 'good, clean, and in working order'. Price £80. Compared with the price in 1953 (£106) and my income the same year (£370 per anum), I think part of the magic of Eddystone valve sets is revealed!

The vendor had the radio coupled to a very long aerial and it was warmed up and working when I arrived. Condition was perfectly clean; one 'coffee-cup' mark on the top but perfect in front. The forty-nine metre band was booming through (but doesn't it always!). I paid up.

Fortunately there was a handbook with it and I soon realised that I'd got the top of the range. Then I fired it up on the kitchen table with the proverbial bit of wet string. Actually about ten feet of wire thrown over a chair.

It did work, but I started to have misgivings. It was fine on the BBC but rather deaf elsewhere. Old stories of 'deaf' Eddystones started to stir in my memory. Were they true? Could it be . . .

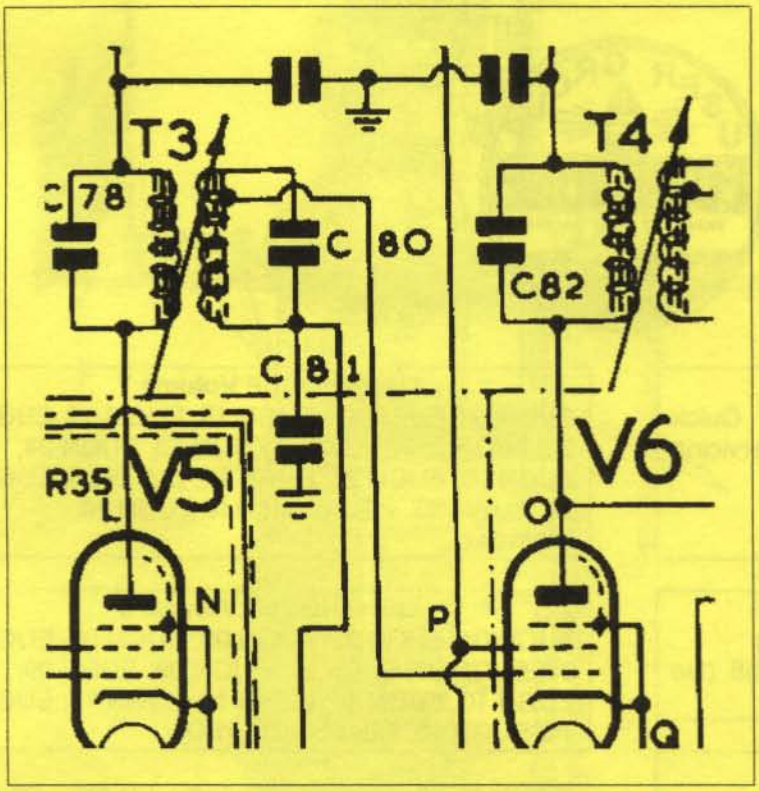
But common sense told me otherwise. I slept on it. And slept. And slept! The real problem was that my test gear at the time was very minimal; a multimeter and a 1938 RAF battery-powered signal generator (with no batteries).

Fortunately the battery requirements were modest; 2 volts for the filaments of

the HL2s and 16 volts HT (originally provided by one of those long grid bias batteries that used to bias QPP output stages). Two 1.5 volt cells and a 5Ω resistor supplied the former and two PP3 batteries the latter. Let battle commence!

The audio section was obviously OK, as judged by its performance on the nearby Droitwich transmitters.

The handbook instructions for dealing with the IF amplifier were a little daunting; in fact, downright off-putting! The basic requirements were a wobulator and an oscilloscope . . .



So I shorted out the Local Oscillator gang in the time-honoured manner and loosely coupled my vintage sig genny (tuned to 450 kc/s) to the mixer grid until I could hear tone. That gave me seven dust cores to peak up.

The first thing noted was that they were not all that far out. Except for one that is. One of them didn't really peak at all. The core seemed to be moving but everything was quite flat. Mmmm.

This was the secondary of T3, coupling the first and second IF amplifiers. A simple enough circuit; in fact there was really only one passive component in it. That was C81, a .01 mfd paper decoupler. Paper? Yes, check it at once. Carefully unspotted and a new one dabbed across the leg. No change. Go away and think about it.

By this time I was reduced to idly checking continuity of the wiring. Then I spotted that the primary of T3 was a dozen or so ohms, whilst the secondary was a dead short!

The screening cover had to come off for close inspection within.

Nothing obvious. But there were only two items involved; the secondary winding of T3 and C80, the fixed tuning condenser, 400 pf mica (+/- 2%).

Well, the winding looked perfect and everybody knows that silver mica condensers are reliable. Don't they?

Carefully unsolder one end. Check the continuity. A dead short. WHAT!

Nothing out of the junk box for this. I bought a new one. And wow! Did it make a difference! Sensitivity increased by several thousand.

I think the only reason it worked at all with the duff 'C' was due to the grid of V6 being tapped down the secondary. It allowed a slight aperiodic coupling to take place.

Further enquiries produced the information that occasionally silvered mica condensers may go short-circuit due to migration of the silver. Honestly! And remember, all IFTs have silver mica condensers in them!

★

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