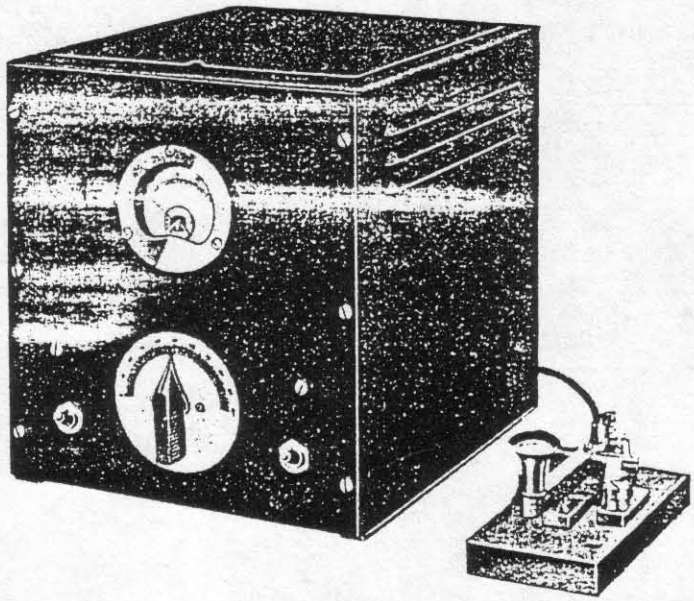
Eddystone User Group Newsletter

Issue No: 47 **February 1998**

Featured Model: RAFCWR/RNWAR Transmitter



*A non profit newsletter for Eddystone Users
*Compiled and edited by Ted Moore
*Information quoted from Eddystone Literature by kind permission of Chris Pettitt, G0EYO, Managing Director of Eddystone Radio Limited

*Please address all mail to:
Eddystone User Group
c/o Graeme Wormald, G3GGL
15 Sabrina Drive,
Bewdley,
Worcs, DY12 2RJ
Tel:01299 403372

And so into a new year and another packed newsletter from Ted and others. I hope you all managed to wade through the double issue mailed just before Christmas. Certainly the copier was running hot in Christine's office for a few days.

This month we present the delayed 'Christmas Special' by courtesy of EUG member Simon G8POO. Probably the earliest British Call Book in existence, it is well over 70 years old and makes fascinating reading for wireless historians. Professional and amateurs alike are lumped together. 2LO and 2MT. Connections you never realised; 2CK, 2BP and 6XX. Surely 5dB and 2WS weren't real people! Trail blazers such as Gerry Marcuse, 2NM, who was to pioneer Empire Broadcasting in 1927. 5SU, Captain Ian Fraser, the war-blinded ham who became Col. Sir Ian Fraser, C.B.E., M.P., G5SU; later Lord Fraser of Lonsdale. The more you look, the more you find. But the "G" prefix wasn't added until 1928. Happy browsing.

We shall be attending the National Vintage Communications Fair at the NEC on Sunday 10th of May this year. We hope to see many of our old EUG members who usually take the opportunity to renew their subscriptions (see below) and often sign up new members. Graeme is in charge of what we will show and I am sure it will be interesting.

This will be my last Frontis as Managing Director of Eddystone Radio. After nearly 14 years at the helm, I am leaving GEC-Marconi for (hopefully) pastures anew. It has been a very exciting period for me and certainly the founding and continued existence of the EUG has been a highlight and I have only been too happy to give of my time. Hopefully my successor will wish to support the EUG and for as long as I have the time I am sure I will be able to help Graeme and Ted in some small way, even if it is only to fill the envelopes and keep the membership database up-to-date for the address labels. Thanks for your support over the years.

Subscriptions
Subscriptions are £10 per year UK and £11 per year overseas. Metal EUG badges are available at £2 each. Any remittances for subscriptions, badges or manuals must be by cheque or money order and in sterling. Make your cheques payable to **Eddystone User Group.** Subscription rates will be going up from issue 49 onwards, see previous newsletters for details.

Chris Pettitt -(G0EYO)
Managing Director. (home e mail G0EYO@compuserve.com)

- ISSUE 47 -

A New Year and my resolution with regard to this Newsletter is already broken. The idea was that from this issue I would refrain from splitting up the Members Ads, try to keep them in one place. But it did not work ! Sorry about that for those of you who have asked for them to be kept to the one page but they come in useful for filling in the spaces at the bottom of the pages.

The Xmas mail brought me some more early Strattons/Eddystone ephemera, courtesy of Tor over in Norway. The main item for many EUGers will be the complete Instruction booklet for building and testing the **1935 Kilodyne Four** receiver. By now this will be in the hands of Graeme in order that EUGers may purchase copies. Together with the full Instructions for the **HOMELANDER** and circuits for both, these will enable members to build replica sets. From the mail there are a number of members who are interested in doing this, some have already done so. The ESWMs are of course replete with similar articles for the construction and use of many other models of receiver, converter, transmitter etc; so there is no shortage of circuits to try out.

The hiatus of the delayed issue 45 is behind us now and thanks to so many of you for being patient, only a handful of enquiries and **NO** complaints !

With the popularity of the EUGnet it has been suggested that this month's **Featured Model** should be the simple transmitter unit that was a feature of the ESWM 4. This simple unit was designed for use by members of the **R.N.W.A.R. & R.A.F.C.W.R.** units but was easily usable on the amateur 1.7, 3.5, 7, and 14 Mc/s bands. With just one valve in the Tx and one valve in the psu there was some 20 watts input when used on CW. Both of the valves suggested are still available and are quite inexpensive. The parts list, whilst mentioning many Eddystone items, is such that modern substitutes may be utilised. The level of DIY expertise necessary is not too high for anybody with a knowledge of electronics to Amateur Licence level. Here it must be stressed that operation of this will need an Amateur Licence.

It appears that this unit, ready built, was offered for sale in the pre-war SWM by WEBBS, the retail arm of Strattons.

So, one last reminder that subs; will have to go up next year, and that they will be due soon.

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- The EC10 -

Nice to see one of 'ours' mentioned in Chas Miller's mag; **The Radiophile**, I have great admiration for Chas and the manner in which he has built up the magazine, it is an immediate 'must read' when it arrives in my mail. The problems mentioned with regard to that particular EC10 are such as will be found on many of this series, EC10, EB35, EB36, EB37, and other models

of that era. The problem with paper type condensers losing their capacity and/or going leaky is well known to us EUGers. The resistors which go high in value with age, especially those old carbon types which carry a DC component of the HT supply. Again the 'dead' diodes, either they have gone o/c or s/c, is a common one for us. Often these will show no external signs, sometimes the black epoxy type will have a split case.

The point made by the writer of the article in The Radiophile which is of interest is that when either a condenser goes low or leaky, or a resistor goes high, the set may STILL work, albeit with lowered sensitivity. Depending upon the position of the component in the circuit the AVC may be affected, the quality of the audio may be reduced, the selectivity may be reduced also. Many of the problems which we encounter these days with older models are due to components having passed their designed life expectancy - I know how they feel as I am the same some days !

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- Dipoles -

The item in the previous issue re aerials for VHF/UHF sets such as the 770/990 series has brought me some mail, some EUGers who cannot comprehend the technical points of the article. One letter from Ian mentions the matter of his dipole which is fed with ordinary Tv type co-ax. Ian says that he gets better results when the outer co-ax screen is left floating. This is surely a sign of bad matching between the dipole, feeder and receiver. It is definitely the case for an aerial matching unit, and YES Stewart, an ATU can be made and used on VHF despite what your mate at the club tells you.

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- I.F.Ts -

The news that **DENCO** had restarted production of some of their plug-in coils last year was a big boost for those EUGers who like to build their own sets but hate the 'roll your own' aspect of DIYing. Now it seems that they are also manufacturing small replacement IF transformers. Whether we will see them producing units suitable for repairs to our Eddystones is yet to be seen. One point already mentioned in previous issues is that those IFTs used in a particular model of Eddystone will almost certainly have been used in several other models. Rather than advertising, or just asking, for such and IFT replacement for YOUR model, do quote the part number of the item so that you will have more chance of getting a reply.

- Punctured Glass -

A letter from David mentions that whilst reading through his set of ESWMs over the Xmas break he met up with a statement which he finds hard to believe. David asks whether it is true that leaving the stationary spot in the centre of a working oscilloscope is actually dangerous. He accepts the fact that such a practice will cause severe damage to the screen phosphor

but queries the assertion that prolonged operation of a CRT with the spot in one place on the screen can cause failure of the glass at the place where the spot impinges upon it. He makes the point that if this is the case some wear must inevitably take place on the entire screen of large Tv type CRTs and that with age the entire screen must be weakened ?

I have never heard of this happening myself but there was an apocryphal tale told whilst I was an employee of Decca Radar in the 1950s, to the effect that a ships radar had been left on for long periods and that the circular timebase having failed the single line from centre to the edge of the tube face had burned through the glass causing the tube to implode. Anybody out there know any more on this ?

- Not Many Bits ? -

From Colin I get a letter about the apparent simplicity of so many of the older receivers. He comments that there appear to be so few components in these models, that an entire valve stage may have but one resistor and two condensers. His comparison is with the modern black boxes that are so common today. A look at any of the early models from the '20s, '30s, or '40s will show the EUGer just what Colin is on about. This does mean that they are easy to build, that they are easy to 'trouble-shoot' when built, and easy to repair when they go wrong in later life.

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- IF Realignment -

A useful item of testgear has been built by one EUGer who does all of his own repairs and servicing. The use of one of the period Signal Generators for IF realignment is at best fraught with problems. Not many of the sig; gens; of the analogue age are anywhere near accurate enough for the correct realignment of the IFs in a Communications type receiver. The item in this case is a simple crystal controlled oscillator utilising one of the ceramic resonators available in most of the dealers catalogues. This, and an oscillator using a FET can be built into a small box. when built and tested it can be checked for frequency and if necessary trimmed against a DFM borrowed for the purpose. No need for attenuators or matching circuits here. The unit can be used to zerobeat the shack sig; gen; to the correct IF and then the sig; gen; itself used for the realignment. Mike has used this method successfully for several years now and finds that there is no apparent drift of his oscillator when it is fed from a regulated 5 volt supply.

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- 870A -

Am I imagining it or are there a lot more problems with the 870/870A sets just lately ? Anyway this EUGer has been the owner of an 870A for about one year and has replaced his rectifier valve now for the third time. Something wrong here

as the 35W4 valve usually soldiers on for many years. A few possible reasons for the premature failure of the heater in any of the series chain of the 870A may be looked at.

The correct value of dropper series resistor, or the wrong voltage will be across all of the valve heaters. This can come about simply because the voltage adjustment panel is incorrectly set. Or, it may be that with one part of the dropper winding having failed a substitute resistor of lower value has been fitted. Another point to look for in series heater chains is where a heater-kathode failure causes the particular heater to go to chassis. this will cut out all valve heaters below it in the chain and put an excessive voltage on those above it.

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- GREMLINS in a 730/4 -

Graeme has apparently met up with these pesky critters again in the 730/4 owned by Phil. The set has been thoroughly checked out and repaired for Phil yet it has once more failed. A burnt out wire wound feed resistor in the HT line was replaced and all was well for a time. NOW Phil reports that it has gone dead again, no audio but lights on. Gremlins started on WW II Spitfires and Hurricanes and have graduated to Eddystones, a liking for QUALITY ? Another trip to Wolverhampton for Graeme.

On the subject of repairs, this time a 740 for David, another EUGer. The set has had a series of problems lately but now it has begun to smoke and smell so he has wisely decided to send it back to the seller.

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- Beacon Receiver Gen -

My personal thanks to Keith Seddon for the copies of gen on the Beacon receiver and blind approach equipment. Not a mention of Strattons there but still it was worth a try.

This is how we get so much 'new' info on the old models, by following up all the small facts, the subtle mentions in mags and letters. Sometimes we get lucky, other times we strike out.

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- PANTO TIME -

Definitely non-Eddystone this item ! Graeme and family will be coming down to Grendon, will have been by the time this is read. Not a usual gossip visit this, we are both going to Ali Baba and the 40 Thieves as put on by the Grendon Panto Group. Well it does say "for kids from 4 to 94" so we both fit in that category comfortably. I am certain that somewhere we shall have a few words on the state of EUG and Eddystones, might even find one in Ali's Cave !

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Dr R.V.JONES DIES AT 86

One of Britain's most brilliant wartime scientists, Dr R.V.Jones had just received his Oxford Doctorate for research on infra-red detection when he was invited to join the Air Ministry Research Establishment. He became Head of the Air Ministry Scientific Intelligence in 1939 at the age of 27. Born in London, he died on December 17th 1997 at his Scottish home.

Reginald Victor Jones was one of Britain's back-room boys, or boffins as they were called, who quietly waged a war of science against Hitler's secret weapons. One of his early successes was the Battle of the Beams . . . a secret which wasn't revealed for over 30 years until the B.B.C. broadcast *The Secret War* television series. (Available on VHS Cassette, BBC VIDEO, The Secret War, VOL. 1)

GERMAN SECRETS LEAKED . . .

In November, 1939, an anonymous letter was delivered to the British Naval Attaché in Oslo. It described how Germany was developing pilotless aircraft, radio ranging, rocket missiles, radar, and many other secret devices. It became known as *The Oslo Report* and landed on R.V.Jones' desk.

CODENAME DISCOVERED . . .

In the spring of 1940 a Heinkel 111 was forced down, the crew captured and the aircraft searched. It had the usual radio communications and blind landing receiver and a scrap of paper with the words *Knickebein Beacon 315°. Knickebein,* which translates literally as Crooked Leg, is the name of the Magic Raven in a German fairy story and was obviously a codename. More captured aircrew were interrogated about *Knickebein* and one German pilot spilled the beans (beams?). Crews were left in a bugged room to chat and one said "They'll never find it!"

WOLF IN SHEEP'S CLOTHING . . .

Jones double-checked with the specialist who had examined the captured aircraft for anything which may have been overlooked. "Nothing at all, except that the *Lorenz* blind landing receiver is far more sensitive than it needs to be." That was it! The *Luftwaffe* was using high power *Lorenz* beams as bombing aids. (See EUG Newsletter #46, page 29.) Then an *Enigma* intercept gave details of beams intersecting near Bedford. R.V.Jones conferred with Winston Churchill's scientific advisor, Professor Lindemann, who had been very sceptical about the range of VHF waves, due to the Earth's curvature. Lindemann accepted Jones' arguments and an Avro Anson patrol aircraft was fitted with an American Hallicrafters S27 VHF (28-142 mc/s) ham radio receiver. The only source of these sets in Britain was Webb's Radio in London; the retail branch of Stratton's Eddystone empire. An RAF officer was despatched to acquire the whole stock on credit. Then a note was found on a captured navigator which read *Stollberg 30.0 mH, Kleve 31.5 mH.* At last; frequencies to monitor had been found.

DISCOVERY . . .

Jones reported to Churchill and was told to organise counter-measures at once. It was just five days after the evacuation of Dunkirk. In the face of great scepticism from 'The Experts', Jones ordered the Anson to fly that evening, with Corporal Mackie on the Hallicrafters.

Mackie belonged to the RAF's highly secret *Y-Service*, a group consisting mainly of pre-war radio amateurs.

Approaching Spalding, Lincolnshire, he heard weak signals on 31.5 mc/s which gradually

increased to a steady tone. They were in the beam. It was 400 yards (360 metres) wide. Re-tuning to 30.0 mc/s Cpl Mackie found the other beam. The two intersected over the Rolls-Royce Aero Engine factory at Derby, the only source of Merlin engines for Hurricanes and Spitfires. The factory was just under 400 yards wide.

JAMMERS FOUND BY MEDIC . . .

The only transmitters in Britain covering *Knickebein* frequencies were the medical diathermy units used in hospitals. A Harley Street consultant told Jones he knew all about them. Jones enrolled him in the RAF at once!

GERMAN BOMBERS STRAY . . .

The next day he was in uniform scouring Britain's hospitals for diathermy machines. These were commandeered and hastily modified. Each evening a flight of *Y-Service* Ansons searched out the beams and the diathermy jammers got to work. German aircrews started to drift off the beams as they were garbled by jamming. Many of them never got back on course and jettisoned their bombs way off target. One even bombed Dublin in error. *Knickebein* was defeated.

The *Luftwaffe* then changed over to the *X-Geräte* and *Y-Geräte,* more advanced beams. R.V.Jones defeated them also, but that is another story . . . ** *(see below)*

AVRO ANSON

Wingspan: 56 ft 6 ins (17.22 m). Max speed 188 mph (303 km/hr). 2 machine-guns. A coastal reconnaissance aircraft introduced in 1936 and already considered obsolescent in 1940. It found a new role as a trainer and transport, continuing in production until 1952, by which time over 11,000 Ansons had been delivered. They served with the air forces of all the major Commonwealth countries as well as those of Egypt, Finland, Greece, Ireland and the U.S.Army. *GRAEME - G3GGL*

*** For the full stories see 'Most Secret War' by R.V.Jones and 'The Secret War' by Brian Johnson*

RADIO RAMBLINGS
by Graeme - G3GGL

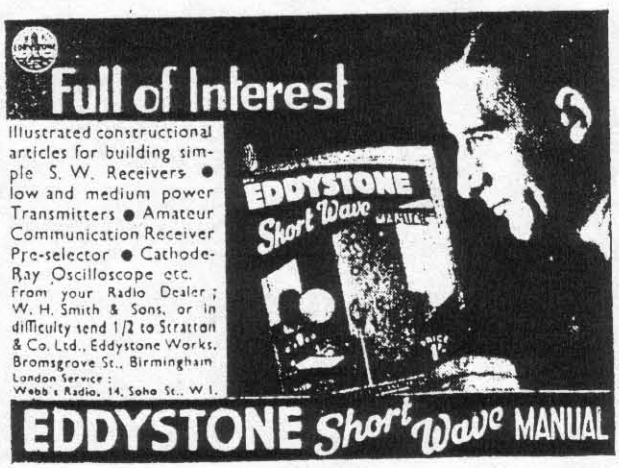
May I take the belated oportunity of thanking all those EUGers who sent good wishes and seasons greetings last December to everybody connected with the production of the EUG Newsletter and our Handbooks. It was very much appreciated

MEDIUM WAVES IN ACTION
Now that the Winter Solstice brings the medium wave DX season there is some news for MF fans. The new expanded medium waveband in the USA (1600-1700 kc/s, the X-Band) has started up. As our MW ends at 1602 that means 98kc/s of interference-free listening space! Since the early 1980s when all-night transmission bacame the rule in Europe it has been hard to find North American stations in the QRM. But now the QRM is only cordless phones, and they don't go on all night . . . So take a listen at bedtime. Already operating:

1650kc/s KWHN Fort Smith, Arkansas. News/talk format.
1650kc/s KGXL Costa Mesa, California. Classical music.
1700kc/s WCMQ Miami Springs, Florida. All Spanish/Cuban music.
Ident: "CMQ en Miami". Heard by many DXers.

NEW RADIO-HOBBIES MAGAZINE. "Radio Active", the magazine for Citizens' Band, Amateur Radio, Shortwave Listening and Scanners was launched in December, having formerly been a CB-only publication. Copies may be ordered from your newsagent or direct from the publisher at 1A Munster Road, North End, Plymouth, Hants PO2 9BS. Price £1.95.

HELP NEEDED! A Christmas acquisition by yours truly has been a vintage ex-RAF receiver, an R1224A. This was widely offered on the surplus market in the 'fifties and 'sixties, mainly by H.P. Radio Services of Liverpool. Front panel about 15" x 10", Air Ministry grey with a wooden cabinet, obviously for ground use, BUT WHERE? It has the distinctive Muirhead epicyclic dial with 180° markings. Inside the lid three conversion charts give the frequencies (1-9 mc/s in three switched bands). It uses five 2-volt battery valves and is a superhet with a regenerative detector! I understand it was intended for air-dropping, but to whom, when and why? Can any EUGers remember one in action? If so, let me know. Thanks!



DONT FORGET
Eddystone S.W. Manuals still available. Send to me at the address on the front of this Newsletter. No 1 1932; No 2 1934; No 3 1936; No 4 1938; (shown, left) No 5 1946; No 6 1947. Price £5 each incl p&p.

Bryan B Marsh
20 Rimu Rd
Mangere Bridge
Auckland 1701
NEW ZEALAND.

E U G No.183

22nd Dec.1997.

Eddystone User Group
C/- Graeme Wormald
15 Sabrina Drive
Bewdley Worcs DY12 2RJ

Dear Graeme,

Received the double issue newsletters 45 & 46 and was very disappointed in your Featured model in NL No.46.

WOULD THE CORRECT EDDYSONE 880/2 PLEASE STAND UP

This is not the first time that an incorrect illustration has been used, in fact I have complained before about the featured model not being illustrated. The other gripe about NL No 46 is only a half page about the 880/2, now this is just not good enough for your top model valve receiver. The lame excuse about a block schematic being too complex to print means that whoever did the article did not do much research. I would suggest that a new article be written and presented early in 1998. To help with this proposal I have enclosed copy from my own original 880/2 manual plus two copies of copies of different sales brochures. Thankyou for the long awaited article/info on Aerial Systems for the Models 770R & U, so maybe EUG Members can expect the same number of pages in a coming Newsletter devoted to the **Eddystone 880/2**

I have had to put my radios aside this past month and drag out from under the house my old model aeroplanes for the 50th Anniversary of the first New Zealand Model Aeroplane Championships which will be held over the New Year . The photo copy enclosed was taken in 1952 with my 1949 model which flew in Finland in 1950. I had other models proxy flown at Cranfield in 1949 and 1953.

Kind Regards and belated

SEASONS GREETINGS

Bryan Marsh

- Eddystone in New Zealand -

A nice packet from Ross Paton down there with lots of Strattons/Eddystone related info.

I shall be using this info in future issues but one immediate item is the article about a 3 x EF50 TRF receiver utilising many Strattons parts. There has been a fair bit of correspondence recently between Graeme, myself, and other EUGers about this model. Problem was we could not locate the article in any UK magazine of the era, nor was it in any Eddystone literature.

This article comes from a magazine called Australasian Radio World but my memories seem to recollect it being also in one of those 'pocket format' SWMs of the -50s.

The article in this issue is not of very good quality and the typography is a bit below what we expect, but still. Thanks Ross.

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- Mea Culpa, again -

Graeme takes me to task for saying that the 640 was about the only real receiver manufactured in the UK at the time, for Amateurs. He mentions such as the Radiovision Commander, the QMax 5/10 etc; but as I said to him I never did see a 5/10 in my travels and only a few Commanders were to be seen around. This latter was more costly than the ubiquitous 1155 and yet performance was similar.

I guess that there was also a comms receiver produced by Philips at that time as I saw a preview for it, but was it ever marketed in the UK ?

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- Eddystone 6 pin Coils/Sockets -

Now we have a request, Graeme has some of the 6 pin coil formers bought at a Rally - but none of the matching 6 pin sockets. Does anybody out there have any to spare please ?? Alternatively I have in mind some equivalent style 6 pin sockets with plugs or formers to match, that were produced in those years by another component company. The name that tripped off my tongue was REPCO, but Graeme believes this may have been REPANCO. I also seem to recollect that the company was located in Yorkshire, but again could be wrong here.

Does any EUGer have any info that may help Graeme and other EUGers to get their hands on 6 pin sockets to match the Eddystone 6 pin formers ? Info please to Graeme Wormald.

- - - -

-ex R.A.F. -

A recent happy meeting with EUGer Dave Simmons from Bicester when we discovered that we had similar memories of places we visited whilst in the RAF.

Dave had borrowed and was returning my file copy of the S.358 manual which he had need of for the restoration of his 358. Surprising how many of this model still exist and are still being used on the air. It was - as the saying goes - built like a battleship and could take a few knocks without harm.

The 358/1 was also recently mentioned when an EUGer wrote to say that he had at last got his hands on a suitable 6 volts vibrator unit for his.

cont; p. 16 -

- MEMBERS ADVERTS -

WANTED - somebody to check out my 940 receiver, repair the RF stages and realign. Phone Bill on 0141-562-4571, (Glasgow).

FOR SALE - 940 receiver, with manual. In GWO with no mods. Prefer buyer inspects and collects but may deliver within 80 miles of Hull. £125. David Taylor, G4 EBT, phone 01482-876702.

FOR SALE - 990S in excellent condition c/w manual, £75. 40A receiver/noise measuring unit, Mains psu and battery pack, c/w manual, mint £145. Sailor R2022/T2031 complete 400 watt station, vgc, c/w manuals, was asking £600 must sell so now asking £350 ono. JIL SX400 receiver/scanner 26-520 Mc/s, no gaps all mode, 12 volt DC, c/w manuals, like new in flight case, must sell was £275 now £225 ono. Antenna, telescopic 46 feet, complete kit, £80. Yaesu FTM2001 handheld, new/unused boxed, cost £300 sell £250. Standard HX238S/TB professional marine VHF, £250. Please call Jim Cameron evenings on 01202-668446.

FOR SALE - EC10 in mint condition with original mains psu and in original carton which is a bit tatty. Prefer buyer collect from Northampton, full details from Ian on 01604-406247

WANTED - £100 offered for one of those useless 1650/6 receivers, I know it wont work but I want one anyway. Dave Jones on 01554 - 775790 or E mail Daiungoed@aol.com

FOR SALE - EC10 at £85, 358X with coils and correct psu at £110, 870A and 870 at £70 each. Scrap 770 for spares/repairable at £25, Still Wanted - 890,930,960, contact Peter Lepino on 01372 - 454381 or 0374 - 128170 anytime.

FOR SALE - pair of 958s, rack mounted, ex diplomatic wireless service, with handbook. £225 the pair, will NOT split. Buyer to examine and collect. Call Paul on 01844 - 237131 (Oxford area).

FOR SALE - Dial type 898, unused but needs attention, £5 only. Also For Sale 659/670 receiver, and sell/swop knobs type 2416P/785 (Eddystone parts numbers). Phone Pete Roberts on 01792 - 232782, or GW6 AYM,QTHR.

FOR SALE - 940 gc receiver, with manual, GWO, no mods, prefer buyer inspect but could deliver within 80 miles of HULL, £125. David Taylor, G4 EBT, 01482 - 876702.

WANTED - by EUGer in AUSTRALIA. Any info on models of Eddystone used by Australian Antarctic Expeditions in the 1920s,30s,40s. Contact Al Moore, PO Box 4572, Kingston, Canberra, Auatralia, 2604, or via Ted Moore.

WANTED - Info on the Eddystone CWR/RNWAR Tx as advertised by Webbs in SWM of Sept; 1939. Was it the same as in the Eddystone Manual and in this issue ? HELP ! Ted Moore.

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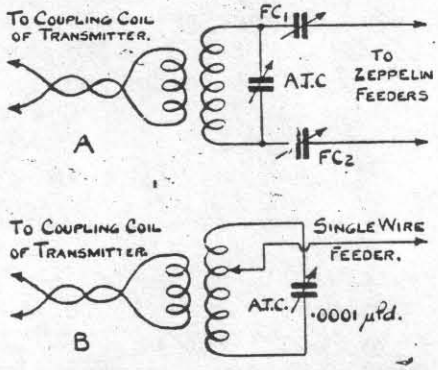
A GENERAL PURPOSE CRYSTAL CONTROLLED C.W. TRANSMITTER (continued).

AERIAL.

To facilitate individual aerial arrangements the transmitter coil is fitted with an aperiodic winding, the connections from which are brought to dual output terminals at the rear of the chassis. From this aperiodic coil an untuned transmission line of twisted flex can be taken to a further tuned circuit, provided the untuned line terminates in an additional aperiodic coil coupled to the centre of the aerial tuning inductance. This is shown in sketches "A" and "B" below. When a doublet aerial is used, the feeders are attached direct to the dual output terminals, thus dispensing with the further tuned circuit mentioned above.



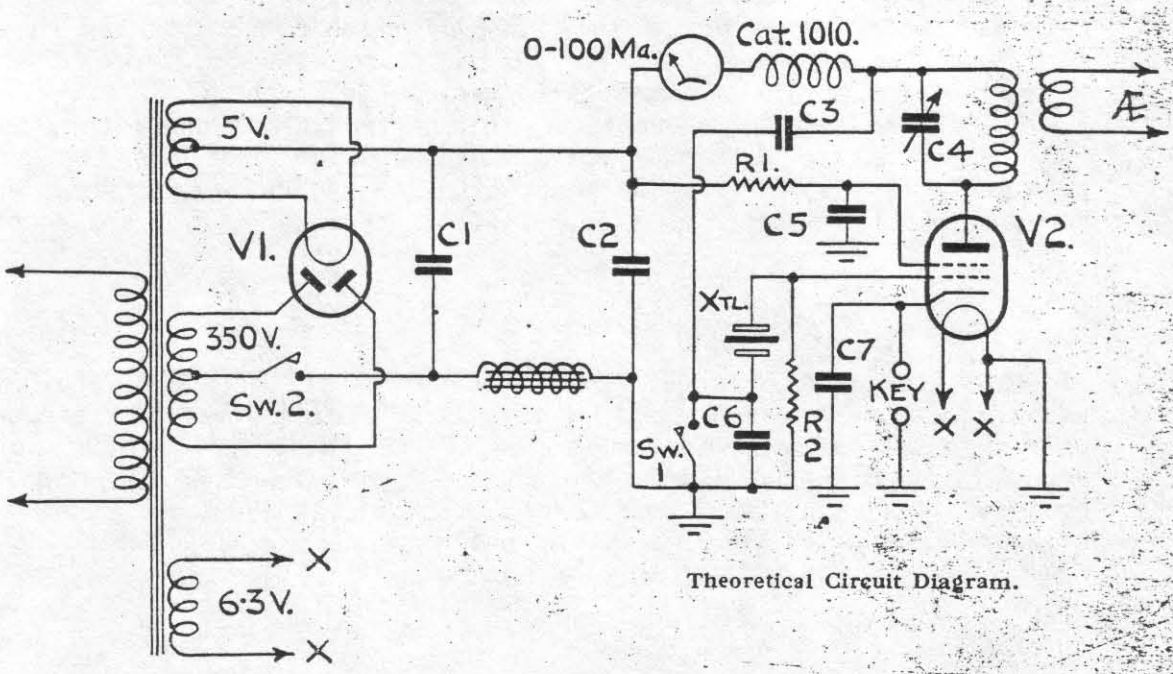
Showing Methods of Aerial Coupling.

LIST OF PARTS

	Price.
EDDYSTONE COMPONENTS.	
1 Welded steel cabinet and panel No. 1033	10/6
1 4-pin Valve-holder No. 4073	9d.
2 Octal Valve-holders No. 1120 (1/3 each)	2/6
1 H.F. Choke, No. 1010	2/-
1 Microdenser, 60 mmfd., No. 1093	4/6
2 Midget stand-off insulators, No. 1019 (4½d. each)	9d.
1 Pointer Knob and Dial, No. 1027	1/3
1 20 Metre Amateur Band Coil, No. 1135	4/-
1 40 Metre Amateur Band Coil, No. 1136	4/-
1 80 Metre Amateur Band Coil, No. 1137	4/-
1 160 Metre Amateur Band Coil, No. 1138	4/-
1 RAFCWR Coil, No. 1139	4/-
1 RNWAR Coil, No. 1140	4/-

MISCELLANEOUS PARTS.	
1 Crystal (Webbs Radio)	
1 Crystal Holder (Webbs Radio)	
1 Mains Transformer, 350v., 5v., 6.3v. (Webbs Radio)	
1 Smoothing Choke 60 MA (Webbs Radio)	
2 2-way Cables	
1 Milliammeter, 0-100mA (Webbs Radio)	
2 On-off QMB Switches	
1 Dubilier 8 x 8 mfd. Condenser type, 0289, C1, C2.	
3 Dubilier Fixed Condensers, .003 mfd., type 691, C3, C5, C7	
1 Dubilier Fixed Condenser, 0003 mfsd, type 690, C6	
1 Erie Resistor, 15,000 ohm., R1	
1 Erie Resistor, 100,000 ohm., R2	
1 Mains Socket Panel	
1 Sheet Metal Chassis, 20WG.	
1 Ebonite Base (for mounting Tuning Condenser)	
Screws, Wire, etc.	
Approximate cost of miscellaneous parts	£3 14 0

VALVES REQUIRED.
V1. Osram U50 or 5Z4.
V2. Osram KT66 or 6L6.



Theoretical Circuit Diagram.

This version used a 6J5 AF output valve as this was considered sufficient for headphone operation and meant reduced battery consumption.

- - - -

- Equivalents -

I got taken to task again last week by Ian for saying the L63 was a direct equivalent for the 6J5. But it is, at least in my valve data tables. Does anybody know differently please as I have frequently used the one type in place of the other.

- - - -

- Making Components.-

The article in this issue, next page, is reprinted from the old, the real, Wireless World, of December 1938. I have another, poorer quality copy with some employees names marked in. Photo top right on first page of this article do I see a Marconi Sig; gene; on the bench under the window ? Can anybody identify the test gear in the bottom, left hand photo ?

- - - -

- 870 TRF Revisited.-

A recent letter mentioned the acquisition by an EUGer of a much cannibalised 870 that had been converted into a rather inefficient TRF. the good news is that with the help of donor parts and a lot of 'elbow grease' the 870 is once more burbling away happily in its original superhet format. It even sports a newly sprayed front panel and cabinet as the member's XYL works at a factory where a full time spray shop operates and they even had it oven dried afterwards ! The HT is a bit down but this is as a result of a low emission 35W4 which must be replaced when the funds allow.

Resistors had to be replaced in most positions where they carry HT as the originals for the most part measured high enough to be outside the tolerance ratings. The volume control was noisy but a squirt of cleaner cured the problem, but a spare is available if it re occurs (from the donor set).

- - - -

- 500 Kc/s O.T.A. -

The item in the latest RB magazine about the ending of the H24 distress watch on 500 Kc/s by BT stations caught my eye. And yet that frequency still carries a lot of routine traffic on CW/MCW using the "defunct morse code". Just listen down there and see what I mean. So says Bill, an ex marine operator. I have listened on '500' but from my QTH there are some weak distant signals and the only identifiable one came from a 'D' station to 'ships at sea'.

- - - -

- Incoming Mail -

A recent letter from an EUGer mentioned the fact that whilst his 830 BFO was perfectly stable when tested on the WWV signals it appeared to drift when used to resolve some amateur band signals. Several readjustments might be necessary over the period of a QSO. Colin wonders whether this can be

his 830 or is it the Tx frequency that is unstable. It has to be the latter I believe so Colin please don't go digging around inside the 830.

On a different matter Colin brings up the question of aerials, and their durability in winter weather. His longwire which ran down the length of the garden for some 130 feet came down during a recent rain and wind storm - the QTH is on the East Coast and within sight of the sea. A check on the aerial wire at the point where it had failed was pretty conclusive.

At the time of construction several years ago the top of the aerial had been soldered to the downlead and formed into an 'eye'. The whole aerial being made from multistrand 'yellow/green' earth wire, 27 strands of tinned copper wire.

The joint had been protected with heatshrink tubing and silicon sealant. All to no avail since the tin coating was missing altogether from the wire in the 'eye' and joint. The exposed copper wire had simply corroded away at the edges of the soldered joint causing the mechanical failure as soon as the high winds had begun to sway the aerial. Whether this was simply rainwater corrosion or whether there was an element of salt laden moisture involved Colin does not care to speculate. However given the inexpensive construction methods used he is happy with some $3\frac{1}{2}$ years from the longwire aerial. Another has gone up using similar techniques and all new wire and hopefully Colin will get a couple of years of trouble free reception.

Another letter from Brian Cauthery in Canada, details of the use and modifications done to an AR88(CR91A) which he owns. Brian is intent on doing fine comparisons between this set and his 830. The CR91A was professionally modded for the RCAF and Brian has traced much of the paperwork involved, more on this when we get the results of the comparisons.

In his letter Brian mentions the 80 metre dipole which he is using, fantastic results for stations in Norway and Morthern Russia but not a peep out of a UK amateur station. Sounds like a pretty tight beam on the above areas and just missing on the UK

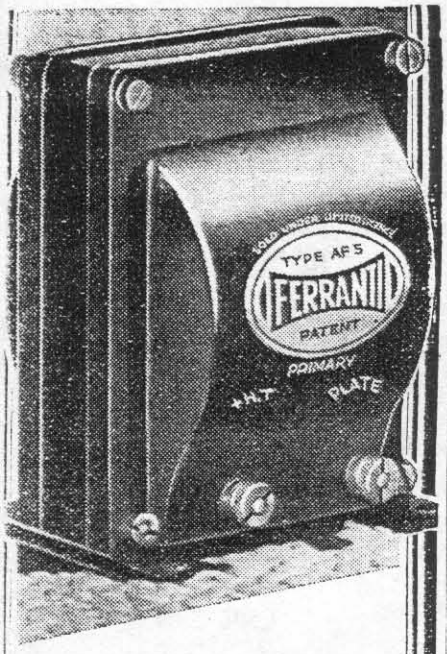
Brian Marsh in the Southern Hemisphere writes in about the lack of info on the Featured Model, especially the recent 880/2. And the fact that the 880 (no suffix) was shown on the cover. The lack of info is because we simply want to provide some identifying info on the model, if you need more then the manuals are available. And space in the N/L is becoming critical as so many EUGers participate. I wpould love to have a 50 or more page N/L, and could fill it from your mail. the limit comes from simple logistics at the Factory. Economics play a large part in the limitations on space in the N/L.

The wrong picture was used by the non-technical 'volunteer' who makes up the front cover for printing, I take the blame for this as for all 'errors' in your N/L.

Keith Quarman writes in re the 958 'digital display dilemma' and says that the 958 he purchased some years back at the Dunstable Downs Radio Club car boot sale is a /7 and has a digital display but no trace of the 'E suffix'. Someday we shall solve this one ! Like all other mysteries the solution will appear just when I have given up on it.

I received an ad page from a 1934 WW for the Kilodyne 4 and it is in this issue. What takes my eye on this page is the ad for Ferranti transformers. Just look at it - "this nearly perfect transformer", would it get by the consumer watchdogs in these enlightened days ? no way ! The bit about "-makers of transformers since 1882" also is of interest. And we think of Eddystone as being a longlived Company, mind you, Ferranti are no more.

- - - -



AF5

This nearly perfect transformer is chosen by engineers and musicians alike—specified where uniform amplification and high-grade reproduction are essential.

Made by Ferranti Ltd., transformer builders since 1882. Where else can such experience be found?

Type	Ratio	Inductance	Price
AF3	1:3.5	220 60 hys. 0.6 m/A.	25/-
,, 5	1:3.5	260 80 hys. 0.10m/A.	30/-
,, 6	1:7	85 50 hys. 0.6 m/A.	30/-
,, 7	1:1.75	400 120 hys. 0.8 m/A.	30/-
,, 8	1:3.5	45 20 hys. 0.6 m/A.	11/6
,, 10	1:3	35 20 hys. 0.6 m/A.	8/6

A FERRANTI TRANSFORMER MAKES ANY SET A BETTER SET

FERRANTI
TRANSFORMERS

FERRANTI LTD., HOLLINWOOD, LANCS.
London: Bush House, Aldwych, W.C.2.

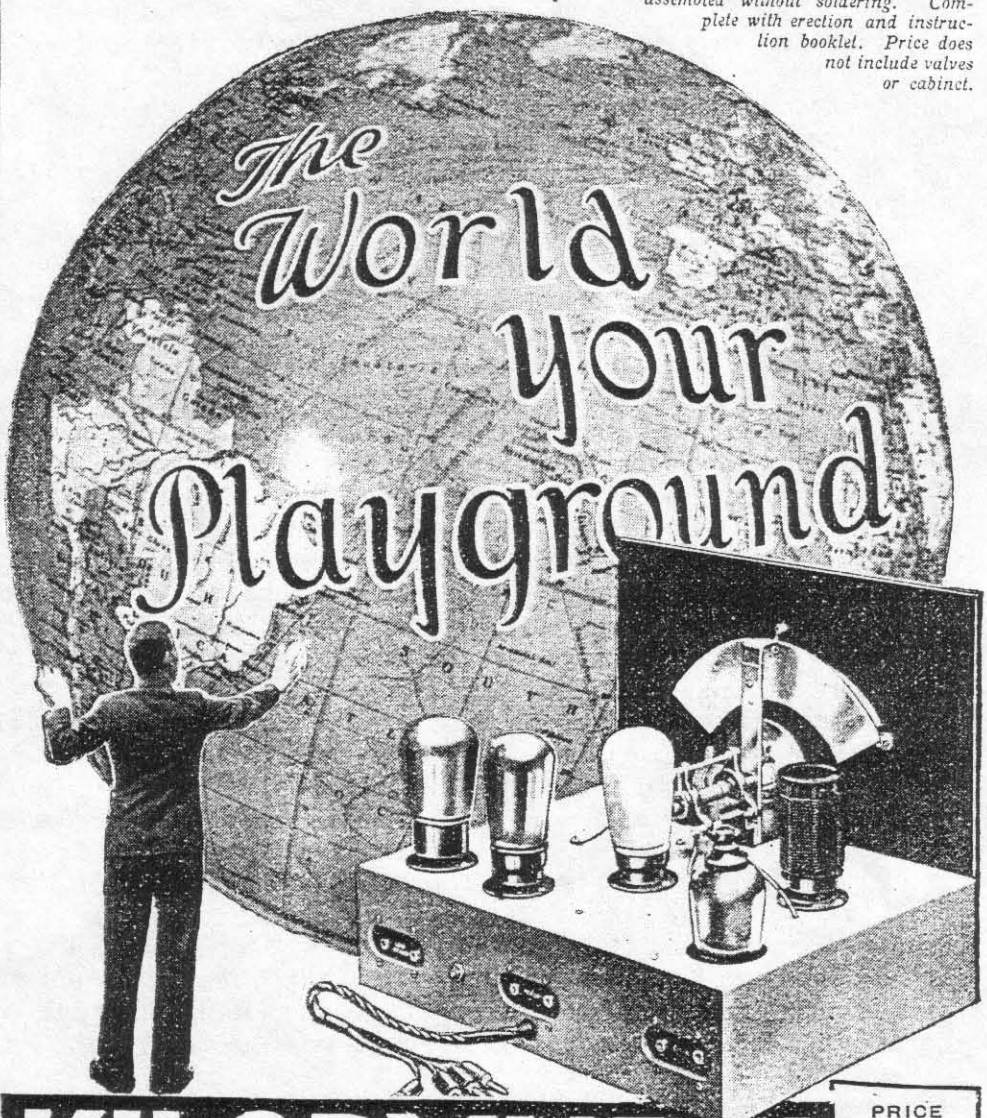
EDDYSTONE ALL WAVE RADIO

Only those who have handled the new 1934 Kilodyne can appreciate its wonderful capabilities. Unlike many "All Wave" receivers, the Kilodyne is not an ordinary set adapted afterwards for short wave working, but an instrument designed for efficient short wave reception as a first consideration and adapted later for the higher wavelengths. The features of the design are ease of operation, an excellent slow motion open vision tuning control, freedom from objectionable body capacity effects even on the shortest waves, no dead spots in any wave-range, and smooth and definite reaction everywhere.

Folder K.6, free on request, gives full particulars of this outstanding receiver.

SPECIFICATION

COMPLETE KIT OF PARTS FOR BATTERY OR A.C. MAINS WORKING:—*Four valve stages. S.G. Det. L.F. Pentode. Rigid one piece die-cast aluminium chassis, battleship grey cellulose finish. Bakelite wood finish panel. Automatic grid bias Drop fed, decoupled H.T. Genuine one-dial tuning. Gramophone P.U. Terminals. Wave-range 13-92 metres and 230-490 metres, but adaptable to any other wavelength up to 2,000 metres if required. Easily assembled without soldering. Complete with erection and instruction booklet. Price does not include valves or cabinet.*



KILODYNE 4

PRICE
Battery Model
£6·15·0
A.C. All Mains Model
£12·0·0

STRATTON & CO., Ltd., BROMSGROVE ST., BIRMINGHAM. London Service Depot: WEBB'S RADIO AGENCIES 14, Soho St. Oxford St. W.1.

- 940 Differences -

The item recently about the slight differences in some versions of the 940 has brought in quite a lot of mail. For the most part the information gleaned from this mail bears out what was written, however there are some points to make here.

There is no difference in the electrical specification for the two apparent variants. There may have been some sent out from the Factory which had some but not all of the slight differences we have noted. Some 940s, serviced over the intervening years, may have gained or lost these slight differences in external appearance.

In so far as I am personally concerned we have but one model here, the 940.

- - - -

- APOLOGIES RE THE 880 -

As just three correspondents have pointed out in the mail, the cover picture shown recently was for the 880 (no suffix)
and not that for the 880/2 which was the featured model that issue.

This came about whilst the N/L was being made up for copying, and was a genuine error on the part of somebody not well-versed in the older models. Still, nice to see that three EUGers felt it necessary to write and point out the error.

- - - -

- Oldies Criticism, Again -

This does come up occasionally and I have said my piece in the N/L, that I personally am more into the 'hollow-state' models rather than todays 'solid-state' technology.

For the most part - exception being such as the 1650/6 model - manuals and information is still available for these latter day receivers, off the shelf.

The 'oldies' are another matter altogether. Those pre-WWII models for which we do have info, well that we do have the manuals and schematics for the old sets is due solely to the enthusiasm of those EUGers who have had the will and the time to go chasing after this info. Remember that in WWII Strattons were particularly hard hit when the Blitz on Birmingham destroyed all three of the Companies Factories. The history is quite clear on this point, they had to start from scratch with no machinery except one item of test-gear, no schematics or blueprints, nothing but the determination that Hitler would not be allowed to defeat their object - to help win the War.

For several decades the Company did not have any information on those early models from the '20s and '30s. Then from various sources these early archives began to be reconstituted.

I suppose that we at EUG are very lucky in that we have always had the support of the Company, and Chris Pettitt, and that our efforts at rebuilding the archives have been appreciated.

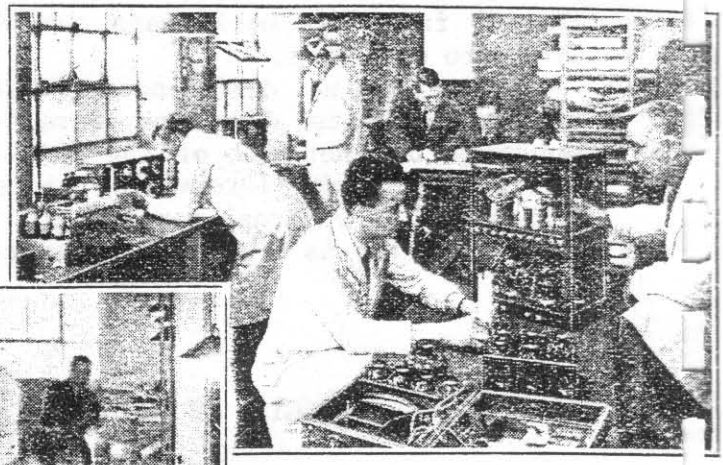
That there are still some early models about which we, as yet, know nothing, I doubt not. That EUGers will continue to help with the provision of such info as they can locate, is something about which I have no doubts either. I make no apologies about the bias in the N/L towards the 'oldies', it is intentional. It is also what most EUGers want also, going by your mail.

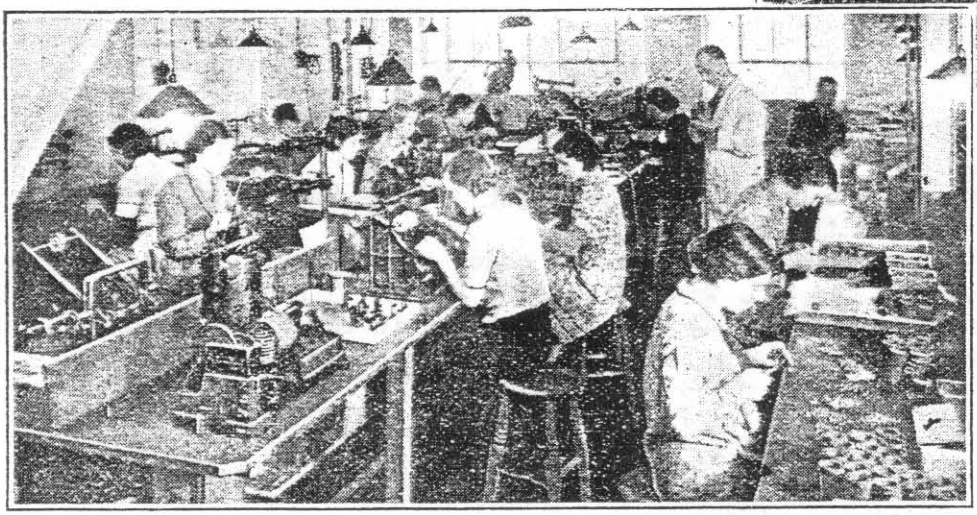
- - - -

Making Short-wave Components

WHY SPECIAL PRECAUTIONS ARE NECESSARY

IT is not generally realised that the design and manufacture of short-wave components, at any rate of those intended to work at ultra-high frequencies, is quite a specialised business, calling for particular care in both mechanical and electrical details.





The Eddystone experimental section showing in the foreground a short-wave transmitter in course of assembly. The picture on t : left shows a section of a coil-winding sho : RF chokes are in course of manufacture.

NO better example could be found to illustrate the specialised nature of short-wave component manufacture than the apparently straightforward variable condenser. Quite apart from such obviously important working parts as stator, rotor and bearings, the design of the framework supporting both moving and fixed vanes plays an important part in the efficiency of the finished product.

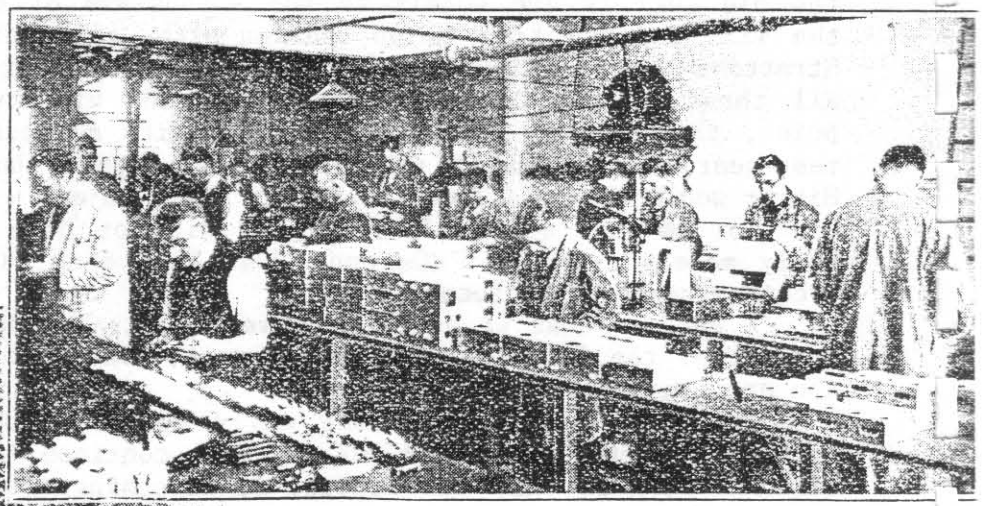
If the frame of the condenser is of such size and nature that it forms a loop of metal in parallel with the moving and fixed vanes of the condenser, so constituting a tuned circuit independent of any external coils, it may, in certain types of short-wave oscillators, be responsible for the production of parasitic oscillations at a very high frequency.

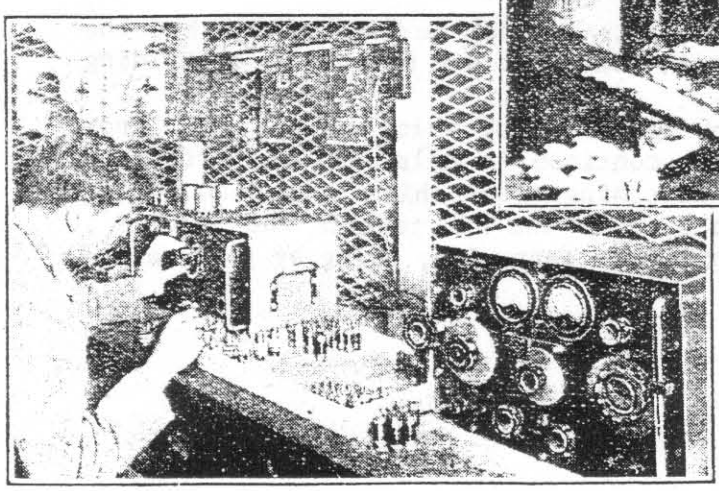
The dielectric losses of most insulating materials increase as the frequency is raised, so that for a short-wave condenser only those materials that exhibit a relatively small loss are really suitable. Since the condenser insulators are in parallel with the tuned circuit, it would be tantamount to joining a resistance of perhaps quite low value across the circuit if these losses were unduly high.

The bearing, or bearings, supporting the rotor of the condenser has to be taken into consideration and a design adopted that ensures silence in operation. Condenser bearings, especially on the s ort waves, have been known to pro ce crackles and other undesirable noises wher the condenser spindle is rotated.

How these and a host of other prob ns are tackled by one of our leading sh rt-wave component manufacturers was explained to a member of our technical staf during a recent visit to the Birming m factory of Stratton and Company.

Having seen the manufacturing processes adopted, the supervision exercised and the tests to which all parts are ub-jected, one can well appreciate the rea n why Eddystone components enjoy such a high reputation for quality and workmanship.





Receiver chassis being drilled and prepared before passing to the assembly shops. Every Eddystone component is tested as it leaves the production lines. One of the testing booths where the inductance of coils is measured is seen on the left.

Accurately made jigs are used in h assembly of receiving-type variable con densers, which ensures that any two selected at random will have almost i en tical minimum and maximum capac e Considerable work has been done in co nection with the design of the rotor bea ing, both from the points of view o rigidity and silence in use. The sp ia

cont; next page

cont:-

Making Short-wave Components—

moulded material used for the end plates is prepared in the Eddystone factory, where the actual mouldings are also made.

Great attention to what might be regarded as insignificant points is paid in the manufacture of all the components. Any new design is withheld from production until very rigid tests have been carried out. For example, a certain new component soon to become generally available has been in the hands of the Eddystone research department for six months, and it was not definitely passed for production until they were absolutely sure it would satisfy the purpose for which it was designed.

In their receivers Eddystone cater for all classes of amateur experimenter. The practice of building up chassis from stamped metal parts does not hold favour, and, despite the cost entailed, the firm prefers to employ one-piece castings. And some of the chassis are quite intricate, with a number of completely screened compartments, partitions, and the like.

We were informed that this is considered to be the only satisfactory way of ensuring complete screening, and that the practice adopted is justified by the enhanced performance thereby obtained.

Eddystone short-wave receivers are very largely hand-made sets—that is to say, they are assembled and completely wired by skilled workmen. All sets are subjected to a searching test, not only by means of signal generators and output meters, but also by actual performance on an aerial.

The executive staff of Stratton and Co. are all keenly interested in short-wave reception and transmission; consequently they are well equipped to appreciate the needs of the amateur. Though no specific mention has been made of their many components for short- and ultra-short-wave transmitters, it may be taken for granted that, in view of the staff's personal interest in this subject, they do not fall short either in design or in workmanship.

Letters to the Editor

The Editor does not necessarily endorse the opinions of his correspondents

Interference from Baku

HERE in Ipswich I am getting quite definite interference from Baku as a background to the National transmission. We hear a good deal about interference from Jerusalem, but I have never heard the little 10 kW station on the shores of the distant Caspian cited as an offender.

Ipswich. R. GRAHAM PIPE.

Short-distance Fading

MY occupation leads me to visit well over 1,000 homes a year, mostly in or round London. In three—and only three—of these homes I have noticed that signals from London National have been subject to severe fading, such as one would expect from a distant transmission. The fading, which was carefully verified, was accompanied by severe distortion.

So far this effect has been observed only in certain parts of S.E. London, usually after 4 p.m. in the winter months. The effect seems to be extremely localised, as receivers in houses only 100 yards away were free from the trouble.

London, S.E.18. C. E. Le VERRIER.

Amateur Film Recording

AS I have had the pleasure of contributing to your columns on the topic of synronised sound-on-disc films (July 30th, 37), I would appreciate an opportunity to comment on Mr. Percy Harris' article (November 24th).

First, Mr. Harris refers to a letter from Mr. Hamilton H. Pace. I imagine Mr. Harris was quoting from memory, for the gentleman's surname is Tait, and his letter peared in *The Wireless World* for January h, 1938. As one might expect from Mr. rris, his article shows a grasp of both film problems and photographic requirements in sound recording, and after following his carey reasoned exposition, I feel one cannot agree with his conclusion that when the nd track is separated from the picture ll the advantages of disc recording can be obtained with sub-standard sound-on-film, plus other advantages. In view of the general character of the article, Mr. Harris, of course, did not offer a practical design of his solution for the problem, but would any workable sound-on-film (separate) system be able to compete on the scores of (1) cheapness of purchase and running costs, and (2) simplicity of operation in recording, with a synchronised S.O.D. system?

Space limitations preclude giving detailed reasons for the following statement, but, in my opinion, the synchronised S.O.D. system has not yet outlived its usefulness for certain aspects of amateur "talkie" work, as it is comparatively inexpensive and easy to get high-quality sound, and with the aid of "dubbing" and post-recording excellent results are possible, especially when exact lip-synchronisation is not required.

Although no specific reference is made to it, I am sure Mr. Harris is aware that at least one practical system, working on the lines of his suggestion, has been in use for a considerable time, namely, the Sonodisc system, developed by my friend Mr. D. Roe. I wrote a short description of this method in *The Wireless World* for November 25th, 1937.

DONALD W. ALDOUS.

Ilford, Essex.

Sets for Seafarers

"SEAFARER" reproaches the British radio industry with neglecting the market for receivers suitable for working on 110 volts DC. We should like to point out that, although the market for this type of receiver is relatively small and that certain technical difficulties present themselves in the design of such a receiver, we have several types in our standard range for 100 to 120 volt working, and a fair proportion of these have actually been successfully installed on ships.

As an instance of the care required in design, we find it essential to connect an electrolytic condenser across the pilot lamps to ensure a long life, owing to the low resistance of the valve heaters when cold, and the fact that there is only a very low value of fixed series resistance when working on 110 volts.

REGENTONE PRODUCTS, LTD.

Isleworth.

ON reading "Seafarer's" letter in your issue of December 1st, one finds it a little difficult to believe that he can have looked very thoroughly for a standard British broadcast receiver that would operate from 110 volts DC.

For the last three seasons it has been the practice of this company to market DC converter units for use with a number of the standard Philips AC receivers, making the latter suitable for direct operation from either high- or low-voltage DC mains, the DC input ranges being 110-145 V and 200-250 V respectively.

In the range of Philips sets for the current season every AC model (excepting only the popular 8-guinea receiver) is available for operation from 110 volts DC.

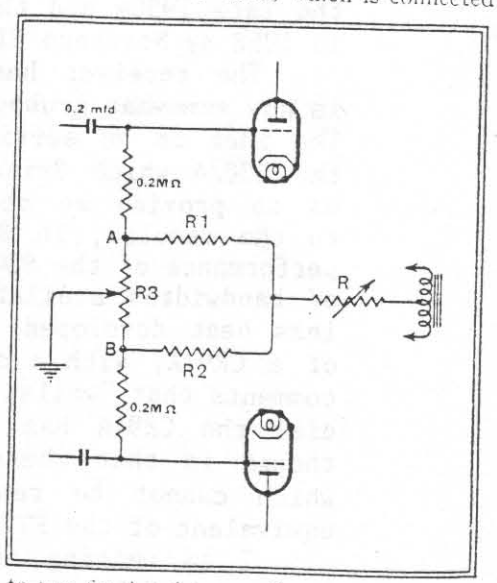
Your correspondent might also be interested to know that we have available two specialised models giving continuous wave-band coverage from 9.5 to 570 metres and 5 to 580 metres respectively. These receivers have been specially developed to give exceptional short-wave sensitivity, low background noise, and high-quality output. Like our other models, they can also be operated on 110 volts DC.

London, W.C.2. JOHN DYER,
Philips Lamps Ltd.

Push-pull Balancing Circuit

YOUR readers may be interested in a simple method of balancing the push-pull valves of an amplifier where a common bias resistor is used.

The bias resistor is replaced by a variable resistance (R in the accompanying diagram) of suitable value, which is connected



to two fixed resistances R1 and R2 of about 50 ohms each. R3 is a potentiometer of 200-250 ohms, with the slider earthed and the push-pull grid leaks connected to A and B, forming a simple bridge circuit. With the slider at end A, the grid B is a few volts positive. With the values given and a total current of 85 mA, B will be about 4 volts positive. As the slider is moved along to-

- EA12 Meters -

Several persons have written in regarding the problem, if that is what this is, of the meter needle slamming hard over when power is first applied to the EA12.

Graeme has pointed out that there is a basic imbalance of the bridge circuit when HT is applied via the solid-state diode rectifiers, that this lessens gradually as the valve kathodes warm up and start emitting. Yet, despite this, some owners do not appear to have this problem to such an extreme extent.

I suppose that the designers must have thought that the meter could take this electrical and mechanical overload for the short period necessary for warm up. But then why do some meters not appear to be affected so badly as others ?

Of the several suggestions sent in I guess that the most effective would appear to be either the fitting of a thermistor in the HT supply line, this might also help the e'lytics to live a little longer. Second idea is from Jerry Ward, G4 JQN. Jerry suggests the fitting of two back to back Germanium diodes across the meter terminals. Not Silicon please !

- - - -

- S.830 Comparison -

From Brian Cauthery, VE3 DFC, in Ontario we have the news that he is engaged in some very thorough tests on the relative merits of the 830 as compared with the AR88. This latter RCA model has for many years been much touted as the 'ultimate' in valve HF receivers of its era. Many thousands were used in this country well on into the '50s by all the military in the world. There were even many in use in the former USSR, they still turn up in the hands of SWL and Amateur operators in the soviet bloc countries.

What Brian has is the Canadian version of the AR88, built under licence from RCA, designated the CR91A.

He has researched the history of his particular set which set him back about £50 sterling from Globe Electronics in Toronto. This is a 14 valve set, with 16 valve functions. Brian's research has brought out the fact that this particular receiver was one of a batch used by the RCAF in the late 1950s and that it was brought up to spec and modified for the RCAF in 1958 by Northern Electric of Belleville, Ontario.

The receiver has since been through the hands of several owners and is now somewhat grubby, but all there and working.
The idea is to service and bring back to original spec both the CR91A and the 830/4 which Brian owns. He will then conduct thorough tests on both so as to provide an objective comparison of the two. I for one look forward to the results, in Brian's letter he does say that so far the weak signal performance of the 830 is way ahead of the CR91A, partly because of the choice of bandwidths available. The 830 uses far less power than the CR91A, hence less heat developed in the shack. The 830 is about 40% down on the weight of a CR91A, with a corresponding reduction in required bench space. He also comments that "whilst the 830 has about 2½ acres of plainly visible calibrated dial the CR91A has but a small, cramped dial". What did fascinate Brian though is that there are very few signals which his FT1000m can resolve, which cannot be resolved by the CR91A, and that the 830 is easily the equivalent of the FT1000m receive section.

I am waiting for the full comparison tests from Brian and they will be in this N/L soonest. Ted.

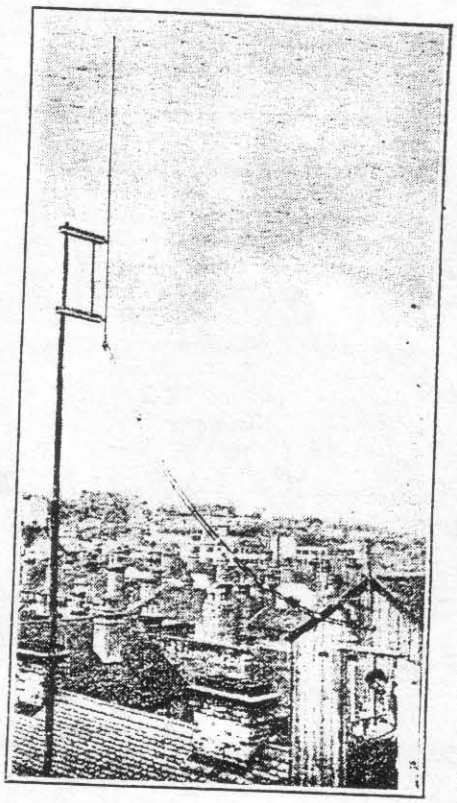
- - - -

Range of Five-metre Transmissions

Conditions Under Which the Theoretical Limit is Exceeded

By D. R. PARSONS, Grad.I.E.E. (*Stratton and Company, Ltd.*)

IT is now well established that the optical limitation of range, as originally predicted for ultra-short-wave transmissions, has on occasions been greatly exceeded. The author of this article discusses the conditions under which ultra-optical ranges may be obtained.



The Eddystone experimental transmitter, though situated in surroundings that are by no means ideal, has been heard at "ultra-optical" distances.

AT the present time of year, when 5-metre activity reaches its height, it is of interest to cast our minds back and see what we have learned about the receiving and transmitting possibilities of these ultra-short wavelengths.

In the early days of 5-metre working we were informed by the few experts available that radio waves propagated with a frequency of 60,000,000 cycles/sec. would obey quasi-optical laws, resulting in communication between points which were only visible from each other. The only way, therefore, of increasing the receiving range would be by raising the transmitter or receiver well above the surface of the earth. It was supposed that no reflection or refraction occurred from the Heaviside or Appleton layers, the direct ray being the only wave suitable for reception purposes. How far these early assumptions were correct will now be discussed at some length.

If we have a listener operating a receiver at ground level, then the maximum theoretical distance (still on the assumption of a purely visual range) over which he can receive signals from a given transmitter may be calculated from an extremely simple formula. Alternatively, it may be ascertained from Fig. 1, which shows the relation between the height of the transmitter above sea level and the distance over which signals can be heard on the horizon. It should be emphasised that this curve is definitely theoretical and is based on an elementary principle which most of us learned many years ago. It assumes that the intervening ground between the transmitter and the receiver is flat and that the power of the transmitter in question is sufficient to energise the sensitive detector of the receiver at the distance given on the ordinate. It is interesting to note, however, that the slope of this curve falls off rapidly as the height of the transmitter increases, particularly above 2,000 feet.

Since the early days of 5-metre working it has been known that a slight bending of the waves occurs, resulting in slightly larger distances being covered. The same thing appears to occur with light rays, for local inhabitants claim that the Eddystone lighthouse can be seen from the summit of Cader Idris (2,927ft.) on a clear day, a distance of 170 miles. Since the writer has never been up Cader Idris on a clear day he cannot substantiate this claim! Fig. 2 shows the effect of this bending property.

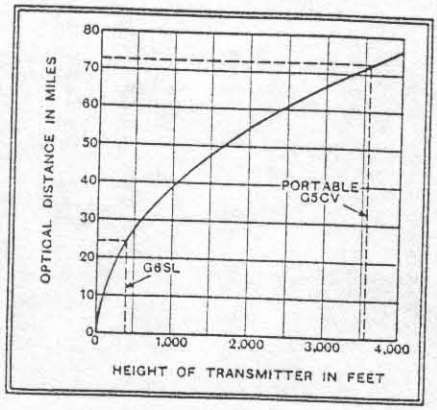


Fig. 1.—Theoretical maximum range, on an optical basis, for various heights of the transmitter.

Extremely long distances have recently been covered. The Berlin television transmissions from the Brocken Mountains have been received daily by the English Post Office Engineers, and the German authorities have recently been receiving enthusiastic reports from amateurs in Buenos Aires and New York. In the last two cases the reliability of the reception has not been maintained.

In the United States of America, consistent two-way communication between

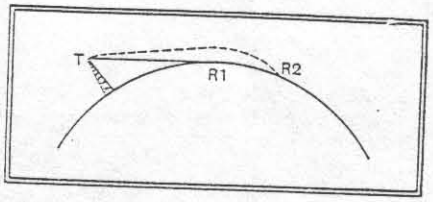


Fig. 2.—Illustrating range (R1) of a transmitter T on the assumption of a straight optical path. R2 shows the increase of range of waves following a "bent" path.

the Blue Hill Observatory of Harvard University and West Hartford has been regularly obtained at a distance of ninety-three miles. Scheduled reception on 234 days out of 239 days has occurred, and the conditions were such as to make it a commercial proposition. Farther, Chicago and New York City have been linked by 5-metres, the distance in this case being no less than 720 miles!

Turning to our own country, we had Mr. Douglas Walters (G5CV) radiating a small signal from the top of Snowdon and being picked up 207 miles way. Further, the Eddystone transmitter (G6SL), situated at Birmingham, 400 feet above sea level, has been received South of London, a distance of 110 miles. The latter is not a freak result, since the transmitter is situated in the heart of a big city, as the accompanying photograph shows. The theoretical reception distances of the last two stations have been indicated on the curve of Fig. 1.

Two questions arise out of the above

Range of Five-metre Transmissions—

reports. First, what atmospheric conditions cause such results, and, secondly, what can we learn from these pioneering experiments?

Readers are well acquainted with the indirect ray method of reception used on ordinary short wavelengths. On the broadcast band the direct ray becomes attenuated after fifty to eighty miles—on short waves it disappears after about twenty miles, but signals reappear in the form of an indirect wave, perhaps 5,000 miles away. It is not too fantastic to presume that on the ultra-short wavelengths, where the direct ray is purely optical, that the indirect ray appears at such a distance that it only comes back to this earth during rare atmospheric conditions.

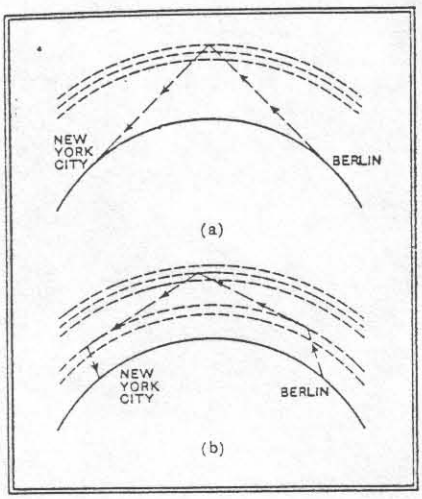


Fig. 3.—Illustrating the effect of reflection from a single ionised layer, and of a combination of refraction and reflection by two separate layers.

It seems to the writer that these long-distance records should be divided into two categories, namely:—

(*a*) Reception from 20 to 100 miles.

(*b*) Reception at great distances, i.e., above 1,000 miles.

Taking case (*a*), we have some valuable information available from the American experiments, covering reception up to 100 miles.[1] These experiments have shown that stratification of the lower atmosphere bends the ultra-short waves over a much larger path of reception. Photographic recordings taken over a long interval of time have shown that there is a close relation between the periods of large temperature inversion in the lower atmosphere and the periods of very strongly received signals. The term "temperature inversion" should be defined.

Normally, as is generally known, the temperature of the air decreases, or has a lapse rate of 1 deg. C. for every 300 feet rise in elevation. Sometimes, however, the temperature does not fall as rapidly as this, in fact it may rise, and a temperature inversion is said to take place. To put it simply, a layer of warm air on top of a layer of cool air causes good reception conditions. It was found that if a subnormal lapse rate occurred between 900 and 7,500 feet high, then a large signal was obtained over the path of reception. When the air mass conditions were not so heterogeneous and a normal temperature lapse rate occurred, signals dropped back to very low levels. Comparison of hourly readings taken shows that signal strength is lowest at mid-day and high during the period 10 p.m. to 7 a.m. So clearly do the signal strength and lapse rate measurements coincide that it is even suggested that 5-metre receivers and transmitters may be used in the future by the meteorologist. In the case of extremely long distances being covered (*b*), the information available is very vague. Some authorities have suggested that the sky wave pierces the upper ionised layers and is finally reflected back from some heavenly body!

However, it is highly probable that a highly ionised layer does exist well above the Heaviside and Appleton layers, as shown in Fig. 3 (*a*), and signals are not often heard, either because of the limited number of listening posts or else the layer is insufficiently ionised for reflection. Alternatively, two layers a few hundred miles above the earth's surface could cause distant signals by a combination of refraction and reflection, as indicated in Fig. 3 (*b*).

Which of these theories is correct time and experiment alone will tell, and up to the time of writing we can draw the following conclusions for an elevated transmitter of relatively high power (25-50 watts):—

(*a*) 5-metre signals give good reliable signals for police working, etc., up to five or six miles in densely populated areas.

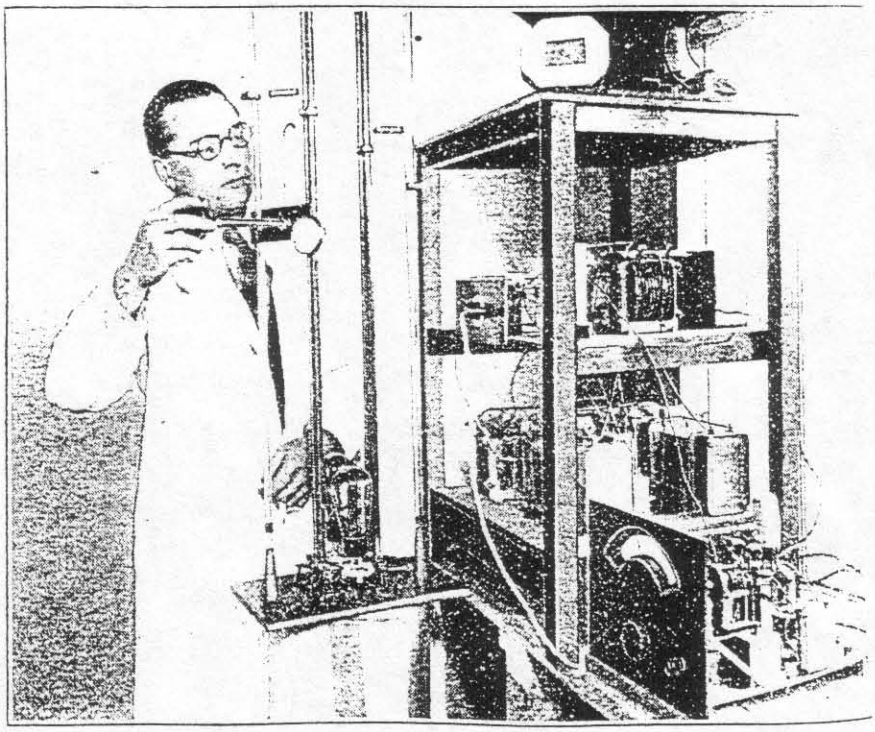
(*b*) Thirty miles is the normal reliable distance over which reception can be obtained under usual circumstances, i.e., over flat, open country.

(*c*) Signals up to 100 miles can be received only if the lapse rate of the lower atmosphere is subnormal.

(*d*) Greater distances are obtained during rare atmospheric conditions.

The 5-metre band was given to amateurs in the belief that consistent communication was impossible on these wavelengths. Yet again the amateurs of the world have proved by their ingenuity, resource and perseverance that reliable results can be obtained on what were believed to be useless frequency bands.

[1] For a detailed report see "QST" for June, 1935.



ULTRA SHORT WAVES IN THE MIDLANDS. Station G6SL at the works of Stratton and Co., Ltd., Birmingham, which transmits regularly on Sundays with beam and omni-directional aerials.

- Is it Really Necessary ? -

Well is it ? Is that projected re-alignment really necessary or are you just tempting fate ?

If you are thinking of re-aligning a set that has been in your possession for 'yonks' and which has not been twiddled by you or any other then the advice is to forget it ! The odds are that there is no need whatever for you to get stuck into those IFTs or RF coil formers with your filed down knitting needle.

If a good visual examination of a newly acquired set gives the impression that none of the cores or trimmers have been touched by a previous owner then again - please desist !

Under normal, non-destructive operation there is very little chance of there being any profound changes in the alignment of either IF or RF circuits. I have personally checked out the alignment of such as 830s or 680s that have been in continuous professional usage for many years, there has never been any need for re-alignment despite the 24 hour application of power and use by non-technical (often) operators.

Another factor that dictates prudence before beginning alignment is the fact that so few of the second, or third, or fourth, hand signal generators that we have in our shacks are sufficiently accurate in their calibration for the serious alignment of these communication sets, and measurements of the output signal from these sig; gens; is rarely - if ever - accurate.

So there you are, rather than getting stuck in and possibly making things worse you should maybe put poor, or reduced performance down to your imagination, shack environmental conditions (noise), or maybe just the need to replace a 20 year old mixer valve.

And NO, you don't have to do any re-alignment on any of the Eddystones I know when replacing an old valve with a new one.

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- A Cause of Poor Selectivity.-

One factor that is often overlooked by even the most experienced of service engineers is that when you have leaky paper condensers in the AVC circuitry both the FC and the RF valves are liable to be drawing grid current on strong RF signals due to insufficient bias.

What does this do ? It will certainly damp down the Q of the tuned circuits making adjustments flat and the correct point of resonance impossible to ascertain.

Can I say here "I told you so" to Bill, who found it hard to accept but did try my suggestion and got his 740 back to spec; by swopping just one paper condenser.

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- A Soapy Cure.-

Whilst renovating a poorly maintained 840C recently Tommy had problems with peaking up the Rf circuits. It was just simply

not possible, and sensitivity was way down on the published spec; for this model.

In the event a very close look was taken at all the component parts of this front end circuitry. The dirty state of the tuning gang was immediately obvious. The chassis top had been cleaned up with a few whiffs from the Hoover but looking down between the plates of the tuning gang it was obvious that there was dirt in there !

For fear of doing irreparable harm to the plates it was decided that the best thing to do was to take it out of the chassis and clean it on the bench. This was done easily enough using a 45 watt iron to unsolder the braids earthing the tuning gang.

A bowl full of warm water and detergent was procured from the XYLs domain and the whole gang was submerged in this over night. The following day being Sunday, Tommy had plenty of time to take out the tuning gang and to shake out the drops of liquid before laying it on a few thicknesses of tissue (bog roll) and placing it in the airing cupboard - top shelf.

By evening the tuning gang appeared to be not merely dry but thoroughly clean, some ordinary 3 in 1 oil was used on the bearing/moving surfaces. This was followed by an application of graphite grease on and in the bearings.

Having replaced the tuning gang and resoldered it the set was powered up and Hallelujah the trimmers peaked up just fine.

The set was left on overnight to ensure the complete drying out of the gang bearings.

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- Medium Wave Numerology.-

By international agreement all the licensed stations on this broadcast band are spaced NINE Kc/s apart. If you don't believe me look at a list of MW stations as in say SWM, or your copy of The Listeners Guide.

NOW here comes the interesting bit ! If the digits of any of these frequencies are added up they will always come to a total of either EIGHT or EIGHTEEN. Go on you doubting Thomases get out your calculators , if you were born more than 30 years ago do it in your head.

Just one of those fascinating snippets of useless info that are stored in my biological RAM, or ROM or whatever my brainbox contains.

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- Wrinklies ? What Us ? -

A recent letter from a newish EUGer mentioned that he was in his mid twenties and that he "supposed he would be in a minority amongst EUGers who would undoubtedly be mainly from the older group of hobbyists".

Well, when I had picked myself up from the floor, and had time to think about it, I could see why he had pre-supposed this to be so. But I have to say that it ain't necessarily fact ! From my mail I realise that there a good number of the younger enthusiasts amongst the EUG membership. Okay there are

the usual Wrinklies such as myself and others but to my knowledge the youngest EUGer - well the youngest who has owned up to his age - is just 24 years young. He also owns up to having caught the habit from his late Dad whose 640 plus 940 have been breeding and now number ELEVEN ! Not bad going for just three years of EUGing is it Timmy ?

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- More Age Related Comments.-

Yes - I guess so. This year - 1997 - is the 75th anniversary of our favourite Company, Eddystone Radio Ltd. From 1922 to 1997 isn't bad going by anybody's standard.

Now here comes the quiz question/conundrum or what you prefer to call it.

How many models have they made during this 75 years of existence ??? Not me mate ! I have just not got the time to work it all out but if YOU want to have a go then I am always willing to learn. Answers to me via Jim please and I shall find you a prize for the FIRST most likely answer. State your source(s) please.

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- Hum when your Noise Limiter is ON.-

This is a real Lulu of a fault and its cure. Not such a new one as I can recall having it several times over the years. Simon traced the fault symptoms and cure out for himself on his own set but is still having doubts about whether he got the right 'cure'.

Now if you have a 680X as has Simon, or any model with a similar circuit, then look at the noise limiter circuit. The heater is fed with its LT supply from a separate winding on the transformer. The winding has a centre tap that goes not to earth but to the junction of R63 and R65 which makes a potential divider across HT to earth. Not the full HT, note well, but from the stabilised line provided by the VR150/30.

In the event Simon found that R65 was to all intents open circuit. It actually measured out at about 1.8 megohms when it ought to have been merely 6·8 kilohms !

The symptoms that had caused Simon to 'dig in' were a pronounced rough AC note superimposed on the signals whenever the Noise Limiter was brought into use. the roughness of the note was somehow a by-product of the stabiliser valve and the higher than normal resistance value. Chopping out the dud 6·8 kilohm and fitting a new, modern, one provided a complete cure of the problem. Being still rather doubtful as to his diagnostic skills Simon actually went to the extent of dissing one end of the component to verify that the hum came back - it did !

I guess that from now on Simon will remember that his faults may be caused by problems in areas of the circuit quite remote from where the symptoms are noted.

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- Being Scrooge-like.-

Several members have sent in tips lately and in one case the EUGer concerned began his letter by stating that he was not normally a 'Scroogelike Character' but that in this case he had been so struck by the idea of wasting the items by binning them, that he decided to both keep them and let other EUGers into the secret.

In the one case it was a case of an almost complete re-valve of an S.358X. The duff valves had such poor emission that they had no value as valves but, here we go Jim, the valve bases did look useful !!! Well Jim set to and separated the bottle part from the ebonite type base and dumped the former whilst putting the bases on a shelf where he could contemplate them at leisure.

Eventually he remembered the tips in earlier N/letters re the manufacture of plug-in adaptors to enable use of newer, high slope, valves to boost performance. No sooner thought of than done. The S.358X now has a twin triode cascode input stage and is much quieter and has increased performance on all ranges.

Next letter came from France and it mentioned the use of those 'Universal' or 'AC/DC' models where much unwanted heat is developed when they are used on 220 to 240 volt supplies.

Most of the power drawn by these sets goes simply to heat up the dropper resistor, only slightly less than half the power is dissipated when the set is used on its 110 volt setting on a supply of the same voltage.

This prompted some thought as the 670C is operated in the South of France, famed for long, hot, summers. A number of toroid transformers were in stock in the shack and it was found that one intended for a PSU had a rating of 60 watts yet was pretty small relatively speaking.

The primary winding of this transformer was in two halves, 2 x 120 volts, put in series for 240 mains or parallel, in phase, for 120 volt mains, the secondaries were 2 x 55 volts at 500 mAmps.

Wiring the mains for 240 volts meant it could be used on the local supplies of about 225. Wiring the two secondaries in series meant a supply of 110 volts at about 55 watts, almost twice that needed for operating the 670C on the 110 volt tapping. The transformer was so wired and connected to the 670C and tested with excellent results. To finalise this permissible mod the transfo was through bolted to the 'holey' part of the rear of the receiver case. in use - after several hours of summer temperatures - the transformer hardly changes from ambient room temperature, the set is far cooler and drift on the topmost HF range is much less of a problem.

It is emphasised here that the transfo used MUST be adequately rated or it will overheat and there will be a fire hazard, with no temperature reduction advantages at all.

Toroid types are often available ex equipment and they are almost always smaller than a similar older type for equal power ratings. They also have no problems with external magnetic fields !

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- The Kilodyne Booklet -

Further words with our able EUG administrator, one of the hats worn by Graeme, and he tells me that the Build and Test Booklet, plus schematics, for the 1935 Kilodyne Four will be available soon from him at the price of £4.00 which includes p&p and a nice neat plastic cover for the booklet. Hopefully this will entice some of you into the replica building business.

Graeme also mentions that the equivalent booklets for other models such as the Homelander and the Scientific Three are available at the same price and similarly with plastic covers.

Take your pick, a 3 lunger or a 4 lunger ! (okay then, for the uninitiated one lung equals one valve).

Graeme would like me to point out to those who may wonder at the term QMB which pops up in some of the older literature. No, it is not part of the well known Q-Code, it refers to a Quick Make & Break switch as often specified in such as the older models.

- 3 x EF50 Receiver -

This model was designed by an Strattons/Eddystone engineer and does use Eddystone parts. It was featured in an old SWM or WW, I think. I have only the article sent in by an EUGer and which featured in the Australasian Radio World Mag; of April 1949. Quality is poor but I shall do my best and this will be your next Featured Receiver - cheating a bit ? okay it ain't an Eddystone model EXACTLY but there has been interest in this over the years from various members, and EF50s are still pretty cheap and available easily. This does not mean I have run out of Featured Models to use, not by any stretch of the imagination. I have them and use them according to the interest shown by EUGers. One member had a suitable case made up for this model last year, out of alloy. Cost was just £8.50 from a back street body shop, so start looking. I would have liked to put this article in this N/L but as usual space limitations preclude that ! Such is life. There are those who sneer at such simple TRF receivers but used sensibly they can more than hold their own on the crowded bands of today.

- Those First Issues -

The vexatious problem with those first issues of the N/L may soon be solved ! We hope. The first 4 or 5 issues that we have for use as 'master' copies are in fact 3rd or 4th generation copies. The originals having been misplaced over the years. Now we have an EUGer who has offered to attempt a re-mastering of them for us. You have heard of those old shellac 78s being re-mastered digitally ? well looks like EUG will soon have it's own equivalent - more when we get them.

- MORE MEMBERS ADS -

WANTED - EP1061B panadaptor unit, call Peter as below. Also
FOR SALE - Rx 770R 19-165 Mc/s and 770U/1 150-500 Mc/s. Both working, no mechanical faults, £50 each, delivery by arrangement, please call Peter01935-881763 (Somerset)
WANTED - info on the operation and effectiveness of WWII RAF FISHPOND airborne night fighter detector. Call Keith in Manchester on 0161-224-9313.

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- The 1650/6 -

The possibility of using this controversial model as a general purpose HF Rx must have been a definite challenge to some of you out there. Ite was certainly challenged and he has apparently succeeded in coming up with a method of putting the /6 on HF/AM. A certain degree of electronics and computer knowledge is necessary from what Ite tells me.

I would suggest that any of you interested in trying out the software/hardware mods necessary should get in touch with Ite directly. The last thing I want is for this N/L to becomea 'computer oriented' newsletter. Do send him IRCs for postage.

Some of these sets are already being sold on again by the original buyers so keep an eye on the magazine ads.

The address that you need is as follows;-

Ite Weide, Breitnerstraat 12,

3817 DT, Amersfoort, Holland.

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- 958 Original Manuals -

Graeme still has some original manuals for the '958 Series', 958/7 and 958/12. He will sell these on a first come, first served basis until there are but two left. The last two will be kept for archives. If you want one of the above manuals then cost is £30 p&p included - THEY ARE BIGGIES !

As Graeme says, the chances of anybody being prepared to do a photocopy of a manual this size are minimal, definitely not Eddystone. It would be a full days work for one person.

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- AW-4 Resurrection -

Graeme is building an all purpose battery eliminator and when completed he intends having a try at getting the AW-4 from the Company Museum back on the air. The N/L will then get an 'operators review' of this historic model, just cannot wait to read this one myself !

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- Mystery Schematic -

From 'down under' we have a letter from Keith Norton, and an enclosed schematic. This is the standard copy of an Eddystone Blueprint for the AW2 which should be titled BP290. Instead it is titled SKC47.

The date of 1942 means nothing since all of these BPs were lost in the blitz and then redrawn by apprentices in the following years.

I have never seen this SKC47 numbering anywhere before and wonder whether it might be the file number for some outside supplier of schematics ? Any help here would be appreciated, just write me. Ted.

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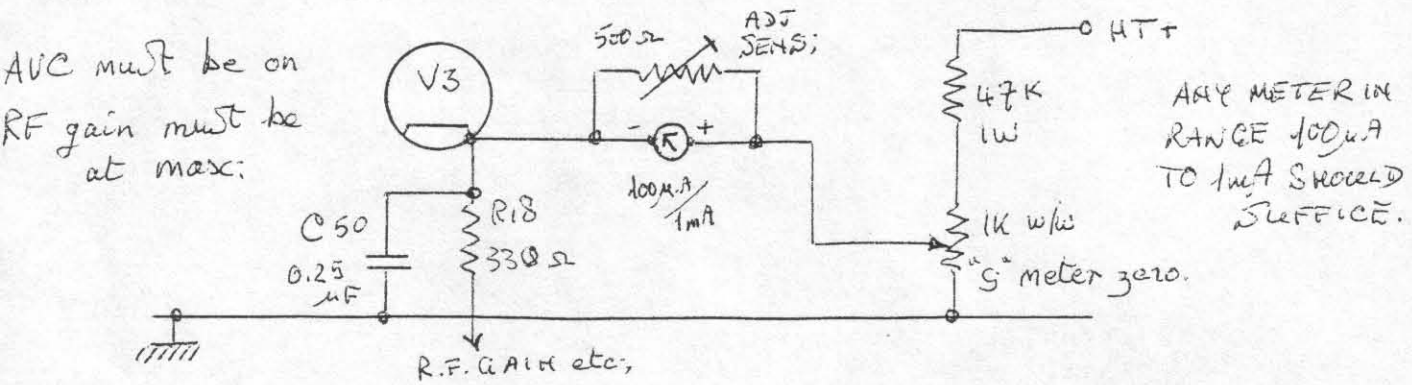
- 'S' meter for the 840C ? -

A letter from Trevor, G8 KNJ, asking about the provision of an 'S' meter facility for his 840C has had me a bit flummoxed, Graeme too by the sound of things. However be that as it may, Graeme has come up with what appears to be a possible circuit for Trevor, an easily reversed mod should the set ever be resold. From the looks of the suggested circuit, shown herewith, there will be but a three way lead coming out of the 840C to the separate meter module, with it's meter zero pots. I suppose a simple stereo jack mounted on the rear case would suffice, but insulated from it having regard for the AC/DC circuitry of this model. The RF gain pot would have to be kept at Max whilst the meter is in use in order to get full deflection of the meter. As Graeme remarks, the circuit is nothing more than a dressed up version of the old schoolroom favourite, the Wheatstone Bridge. The meter will read the current difference between no signal potential on the kathode of V3, and the standing potential produced by the setting of the 1K zeroing pot.



*****Don't forget that this AC/DC set has the internal chassis connected to the Mains whilst the outer case is EARTHED.**

- A Nearly New ECR Receiver -

Well Tor bought the one that Howard had for sale at Centre Electronics ! He was not disappointed eother since the ECR in question is in very good condition and came together with the original loudspeaker. It is working okay but Tor mentions that several of the decoupling condensers are leaking pitch so he has a choice of replacing them with new polyester types, maybe mounted inside the old cases, or of leaving them as is and keeping the set as near original as is. Most other components appear to be original, i.e. a an e'lytic and a mansbridge type condenser both having the embossed Eddystone logo. The main smoothing condenser has been disconnected - evidently duff - and two newer types fitted but leaving the old one in situ should it be desired to do a rebuild of this original e'lytic. Maybe we shall hear more of this set, serial number AP3, if Tor decides to do any restoration work.

- Featured Model, RAFCWR Transmitter. -

This model was one that first appeared in the ESWM Number 4, in - I think - 1939. It was designed as a simple transmitter unit that could be used by Amateur operator members of the Wireless Reserve formed pre the start of WWII. It would, even today, serve as a very useful adjunct to any station for emergency CW working. Just don't anybody believe that simple cannot equate with effective.

- The End of The Morse Era -

Don't you believe this Goebbels-like propaganda ! It just ain't so pal ! Go

on, tune around the SW bands and see how popular it still is, both commercial and amateur stations still make use of Morse, and will do so for many years to come. Anyway if digital communications are the 'IN' form for today, then why NOT morse ?
It is after all a very definite form of digital comms;

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- 33 Years Constant Use -

From 4X1 MH in Haifa, Israel we have a letter re his Eddystone Bug Key. This must be a world record worthy of the Guiness Book of Records. A number of EUGers mention having one of these bug keys in their collection but only 4X1 MH can claim to have had 33 years of usage from one of them.

- ENDIT -

Certainly a bit tight for space this month, and the volume of mail would allow of a much larger N/L. Hope that all is in order this time, I do my best.
Any late ads will be after this blurb, have a fun read and 73, Ted.

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- LATE MEMBER'S ADS -

WANTED - Eddystone Edometer condition not important, working or not. ALSO WANTED - Circuit diagram for Advance Model OS240 or ma manual for same. Photocopies would do, all costs refunded. Write to Roy Taylor, 23 Lancaster Close, Clive Street, Bolton, BL1 1PJ.

WANTED: S.640 Receiver in good working order and condition. Please contact Peter Scott on 01383 881081 or write to 30 Main Street, Newmills, Fife.

FOR SALE: Eddystone Models 840A, 840C, 730/1A, 990R, EA12, 830/9; all good workers. 990S non-worker for spares. Also RCA AR88 (two off). (Reducing collection) Call Arnie (County Durham) on 01325 333488