

Finally we come to the matter of the six metre licences. Requiring informed advice on this matter (a concession obtained only by the efforts of our National Society) to whom should the Home Office turn? To whom could they turn except to the National Society which represents British amateurs. Some may say they should have turned to G4JST the liberal-minded editor of our latest mag. Others may think it significant that they did not.

If as you claim you have all radio amateurs' interests at heart then I suggest you use your best efforts to persuade all new licencees to join the RSGB. This gives us maximum voice at the ITU conferences on frequency allocation, whilst those who think the RSGB unrepresentative can offer themselves for election, thus bringing about the 'change from within' which you yourself advocated in the February issue.

If you throw stones you must expect at least some of them to be returned, although you will notice that I am somewhat more selective in my target.

FRANK SIMPSON G3EFR

## B-K OR G-M OSCILLATIONS?

Sir, Your article in the January issue, brought back many memories and the letter from K V Entinger's reference to Eric Megaw (G6MU) reminded me of his lecture to the RSGB on March 25 1931, published in the T&R Bulletin, July '31 (ten pages): *Electron Oscillations and their Application to Very High Frequency Communications*. In this, the history of the development of electron oscillations was given. He summarised to two forms as:

*Barkhausen-Kurz* (BK): oscillations whose wavelength was determined by the electrode dimensions and potentials.

*Gill-Morrell* (GM): oscillations whose wavelength depends only on the external circuit.

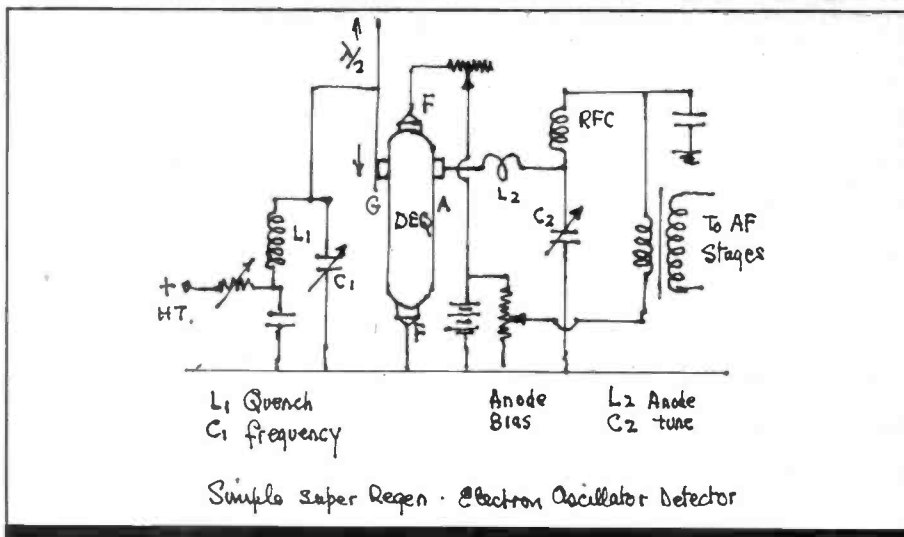
A British Patent was granted to Gill, Morrell and MWT Co (No. 108757). An abstract appeared in *Wireless World* in an article *Very Short Waves* by P R Coursey (17 Oct 1918).

The two different forms of electron oscillation was fully covered by Hollmann in *Proc. IRE* Feb 1920.

It appears to me, that the cross-channel link was most likely to have been using G-M oscillators rather than B-K. At that time, however, all electron oscillations were usually described as 'B-K type'. Eric Megaw spent most of his working life at GEC Research Labs, now known as Hirst Research Centre, working on the generation of Ultra High Frequencies and considerable work on the electron oscillators preceeded his work on the split-anode magnetron, the CWII produced 50W at about 1.5 metres.

I do not now recall the valves used in the cross-channel link, most were modified 'R' type, in which the anode and grid connections were brought directly through the bulb — see attached sketch. I still have one sample which looks as though it would still operate. A simple self quenching super-regen receiver using an electron oscillator is pictured on page 3 of chapter 1 of the new edition of the *VHF/UHF Manual*. The circuit of this detector is attached. I hope this information is of interest to you.

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## MOSCOW MUFFLER

Mr. Ogden, Reference the article/review *The Moscow Muffler* by T. Bailey in the May 1983 issue of *Ham Radio Today*.

With all due respects, the details given in this article about the so called 'Woodpecker' signals are not quite correct. Firstly, it is known that there are four Russian OTHR systems in operation and that the transmitter power output is not 4 Megawatts but varies between 20 and 40 Megawatts depending on the degree of ionospheric reflection necessary for the function of OTHR stations.

It is not known for absolute certainty whether the Russian OTHR systems are using back scatter technique as employed by the American CONUS-B OTHR or, forward scatter as used by OTHR stations operating in the Middle East and Australia. It is most likely however, that the Russian system uses the back scatter mode, in which case the antenna for transmission would of necessity have a very narrow beam width and therefore be capable of high ERP. The 'low power' experimental American CONUS-B OTHR at present operating has an ERP of 100 Megawatts (confirmed by the USA Air Force Electronics Division at Maine). The ERP from fully operational Russian OTHRs could well be in the region of 200 to 400 Megawatts.

With the Russian on-off pulse system the PRF is always 10 per second (100mS interval) and the pulse width 4mS. However, the transmissions are not always single pulses. For example, there are often short transmissions using a 4 pulse sequence (unmodulated) which are thought to be solely for ionospheric soundings; necessary with OTHR systems. In normal search and target interrogate mode, the pulses may be single or multiple and also code modulated, each pulse being 4 milliseconds with a spacing of 5 milliseconds, that is leading edge to leading edge, when a multiple pulse sequence is used. These are also repeated every 100 milliseconds. Note that pulse transmissions from other OTHRs (mostly American) use PRFs between 16 and 60 per second and which are often frequency modulated as well.

Whilst the so-called *Moscow Muffler* device may be effective in reducing, or even eliminating typical on-off pulse signals at one's own station it does not follow that the

station with which a QSO has been established, will be receiving your signals through this type of transmission; unless a similar device is in use. This could well be the case since Russian OTHR signals (Woodpecker) are frequently heard just as strongly and at the same time as say in Australia or America as they are in the UK. Calling CQ or making any other form of transmission on the frequency in use by one of these stations will cause no interference to them whatsoever, as all CW, FM, AM or SSB telephony and teletype transmissions etc. are converted into broad band noise which is suppressed by the OTHR receiving system.

It should be mentioned that on-off Russian OTHR pulse transmissions can only be fully resolved for oscilloscope examination of the de-modulated pulse formations and encoded modulation, by using a receiver with a through bandwidth of at least 2 MHz and an oscilloscope with a wide band 'Y' amplifier. Spectrum analysis can and has been used to reveal the nature of the modulation on the Russian pulse transmissions.

Finally, it has been found that some noise blander circuits on communications type receivers will greatly reduce 'Woodpecker signals', almost to the point of elimination if they are properly adjusted. Whilst the amplitude of wanted signals is reduced somewhat, readability is still acceptable although much depends on the relative strength of the wanted signals and the pulse QRM. At high level, the bandwidth of 'Woodpecker' signals can be in the region of half a Megahertz or more.

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## FIGHT AGAINST TV LINE TIMEBASES

Sir, I would like to raise the question of RFI and TVI and the recent USA legislation which requires the manufacturers of receiving apparatus to include filters to keep out the unwanted whistle, while admitting the wanted signal.

I seem to recall hearing Timothy Raison on this subject recently on the Radio 4 early morning programme discussing this subject.

We need a campaign mounted, to give the amateur some protection under the law, but I cannot see the RSGB (which acts like an