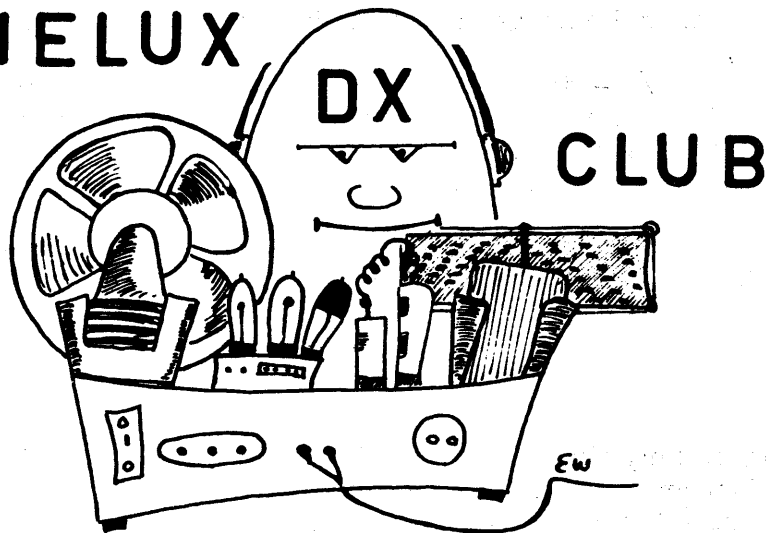


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OUR RECEIVER

In this series on receiver improvements without actual meddling in the circuitry of an individual receiver, we can deal with a special subject today: the short wave converter. As the name already suggests, the instrument converts one range of frequencies into another. In our case, part of the short wave range is transformed into one frequency in the medium wave range. Thus, if the converter is used in combination with a receiver tuned to 1500 kc/s, the tuning knob of the converter permits listening to a whole range of short wave frequencies.

Apart from the actual conversion, adding this unit has some additive advantages: it improves performance of the set in this specific range by providing a favourable image frequency rejection, and by the extra sensitivity inherent to the concept. One such concept we like to deal with today. It is a brand new folder that will be issued by Radio Nederland one of these days and features a short wave converter fitted to receive the 21, 17 and 15 megacycles bands (12 to 20 metres).

It is a separate, tube operated unit which can be made by everyone able to make soldering joints, because the folder does not only give a circuit diagram, but also top and bottom views of the chassis, completed with a five page description (written by yours truly) dealing with both principle operation and practical construction of the unit.

Let's face a practical example to clear up the principle operation of this converter unit. A frequency of 17 megacycles, that is 17000 kilocycles in the 16 metre band enters the antenna and is fed to the aerial circuit of the converter. Here we find our first tuned circuit, even before the RF pre-amplifier tube can commence its work. The roughly selected frequency range is fed to the control grid of the RF tube, which is of the variable mu type. In its anode circuit we find a second circuit, also tuned to the 17000 kc/s frequency, and its function is -among more- to increase the selectivity of the unit.

A second tube is called the frequency changer. It will mix the frequency of 17000 kc/s fed to it, with another signal created in an oscillator circuit also connected to this tube (6BE6). Thus we get a number of signals after mixing has taken place, among which we will find both sum and differential signals. The difference between the antenna signal and the oscillator signal is chosen usually, and it can be kept constant by mounting the tuning condensers of both circuits on one common shaft, and so all incoming short wave signals within the tuning range of the converter are "transformed" into one intermediate frequency. In this case, the IF is selected in the medium wave band: 1500 kc/s, and that's exactly the frequency you must tune your receiver to.

The converter is connected to the antenna and ground connections of the radio set by means of a cable, and has not other connections with it, unless you want to draw the heater and high voltage supply from it.

A special feature of this Radio Nederland converter is, that it is equipped with a RF amplifier stage, which makes it a very sensitive device, offers an excellent image fre-

quency rejection and is relatively easy to make by a choice of components which are universally obtainable.

It's range - 15 to 24 mc/s - is selected not only because many radio sets miss this particular range, but also because the short wave bands in this range are most suitable for long distance reception, especially under conditions of high solar activity, which are expected to occur in the near future. Therefore, the publication of this folder is considered well-timed.

Are you interested in receiving a copy? Then we advise you to report one of Radio Nederland's transmissions and ask for the new converter folder. It will be sent to you free of charge soon after it rolls off the presses.

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FREQUENCY METERS

by Jim Vastenhoude

What is a frequency meter, what can I do with it and what does it cost. Moreover, where can I obtain one and what are the critical points to keep in mind when pondering? These questions were put by one of our members recently, and form the reason why we deal with this subject today.

A frequency meter is a piece of equipment able to generate a carrier between 125 kc/s and 20 mc/s with great accuracy. This carrier is very weak and can only be received when the aerial (antenna) of the instrument is coupled with the antenna of the receiver. The receiver will then indicate the carrier somewhere in the band. Now, for what purposes can we use the frequency meter?

In the first place, the alignment of the set or deviations on the dial can be checked with it. The operation mode is quite simple; just generate a frequency and check its place on the dial with the pointer. Trimming of course is more difficult, and should not be carried out without experience.

In the second place, the frequency of a station can be determined with the frequency meter. Tune the receiver to the station, tune the frequency meter to approximately the same frequency and a beat note will become audible in the loud speaker. Then let the carriers coincide (zero beat) by adjusting the frequency meter, and read the instrument. The last method is applied by DX-ers to check the frequency of a station before reporting to it. And the reading is correct, with an accuracy of even less than one kc/s in the high frequency bands.

Frequency meters of the type BC 221 or IM 13 (IM14) are still available on the market today, especially in war surplus stock. They are battery-operated, so it will be necessary to construct a small voltage supply unit for mains operation, but this is simple. The price can vary. Recent magazine checks indicate a value of L 15.- for London (UK) and \$ 75 for the US, complete with original crystal and calibration book "used but like new". As the quality of the crystal determines the value of the unit, and only an original calibration book will indicate the exact reading, it is important to keep these two points in mind when going to a store. Otherwise, check the general condition by inspection of the chassis, making sure that it is still in "factory"-condition.

Although the BC-type is best known, the IM is maybe even better, because it has a handy extra; it can not only create a carrier, but also a tone modulated carrier, which facilitates identification of the carrier sometimes.

The frequency meter is the best piece of auxiliary equipment the DX-er can possess, I think. Maybe the price is an objection? in that case, pay some attention to the "crystal calibrator" article expected soon in this series.

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COLOUR TELEVISION

Just a little remain talkin on the problem of the colour television standard for Europe, which was subject of discussion during a recent meeting in Vienna. As you know already, the conference was a failure because no unanimous advice on a system could be made. There are several reasons for this, and some of them are political, some are purely technical, such as the different terra in circumstances experienced in Europe, the price of receivers, the compatibility with the already existing NTSC-system, etc. Also, money is involved! Because patents are involved for each system, and so the matter must have been quite complex. Now, after the gunpowder smoke has lifted, what are the expectations? As far as we can guess now, the system will be determined by the first station starting colour television in Europe, and BBC stands a good chance to be the first one. What will BBC use? Well, it is known that they are generally in favour of the American NTSC system, however with the colour subcarrier on the frequency applied in the German PAL system. Not because of

a compromise, but because the colour subcarrier is less visible in the picture when it is shifted 3931 cycles from its original position at 4.43 megacycles above the video carrier.

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THE EARLY BIRD

Lifted to its stationary place in orbit 22,300 miles above the earth 6 weeks ago was the Early Bird, the first commercial satellite in orbit now. Because it is so far from the earth, it will seldom have to rely on its storage cells, so for most of the time the 6000 solar cells will be able to supply the satellites receiver and transmitter equipment. The bird is basically a relay station, stationed high over the Atlantic ocean and able to supply direct communication between Europe and North and South America, In the course of time, two more such satellites are expected to appear: one over the Pacific Ocean and one above the Indian Ocean, and together they will pretty well cover the whole earth. Early Bird can relay TV programs, or can handle 240 simultaneous telephone conversations. This means an active support to the five transatlantic cables, which can together handle just 412 telephone calls. One disadvantage, and at the same time a curious proof to the user will be that it will take radio waves almost a quarter of a second to make the round trip. This will lead to little "waiting times" between question and answer. How long Early Bird will perform is still a question. Solar activity is rising, and the satellite will be bombarded by blizzards of high energy particles from the sun trying to damage the intricate mechanism of the capsule, but for the moment commercial telephone traffic via satellite is starting.

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NEWS FROM RADIO NEDERLAND

Great joy in the studios in Hilversum when at last the report arrived from Bonaire that the 260 kW shortwave transmitter was ready for use. The first day's broadcast started without announcements in the other Radio Nederland Programmes. Only a small number of listeningposts were informed. The motto was to be quite on the safe side. The first telegraphic reports were very encouraging, so that the next day the relay transmissions were announced in all other programmes to same directions.

It is a matter of credit to the DX-ers activities, that many of them heard the first transmissions and sent a report on it.

As appears from the reports which are received up to now, the first block of programmes, respectively 2000-2050 GMT English to W.Africa; 2100-2220 GMT Dutch to W.Africa and 2230-2320 GMT Spanish to South America on a frequency of 15290 kc/s can be received very well in the whole of Europe. At present it may be still possible that the Spanish broadcast will fade out, but within a month the propagation conditions will improve. So during the Summerschedule, Bonaire will be a big competitor for the 10 kW transmitter for Europe on 6020 kc/s.

In the last block of transmissions, there has been an important change. Now the English programme to North America can be heard from 0130-0220 GMT and the Spanish programme to Mexico from 0400-0450 GMT. The Dutch programme to North America remained unchanged from 0230-0350 GMT. So far as the frequency of this block of programmes concerns, the results of the chosen frequency of 9690 kc/s were not as expected. A strong interfering signal caused bad reception in the eastern part of North America. In the western part reception is good, due to the worse propagation path of the interfering signal. Because better reception is much desired, a new frequency channel is needed. Propagation conditions for the path Bonaire - North America and Mexico make it possible to use a 9 mc/s frequency throughout the year. With effect of the new schedule, that is per the 2nd of May, the 9690 kc/s will be replaced by 9590 kc/s, being one of the oldest Radio Nederland frequencies used for these programmes to North America via the Lopik transmitters.

As a result of this change, it was needed to make some more minor corrections in the schedule you received last month.

Please correct your schedule as follows;

0130-0150 English on Sundays to Australia/New Zealand/West Indies on 11730 and 9525 kc/s; 0100-0120 on Sundays and 0130-0155 on weekdays several languages to West Indies on 11800, 11730, 9715 and 6005 kc/s;

Note c) should read 11730 and 6005 kc/s not in the night of Saturday to Sunday.

We hope that the good news will result good reception.

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NEXT DEADLINE MAY 20TH - BE SURE YOU SEND YOUR CONTRIBUTIONS IN TIME