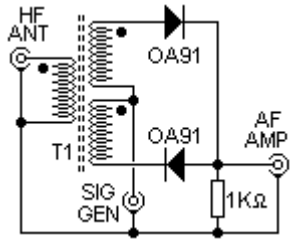
QUICK RECEIVER

by Harry Lythall - SM0VPO

How many of you have got loads of test equipment in the shack that is not really doing anything most of the time. I have got a couple of RF signal generators and a stereo amplifier (for music) amongst other things. Thats all I needed to receive SSB and CW on the HF bands.

A Direct Conversion receiver is nothing more than a mixer, an AF amplifer and a stable oscillator. I took one of my standard building blocks; a two diode mixer and connected it to my stereo amplifier PHONO input then fed the signal generator into the mixer. Connect an antenna to the third port of the mixer and you can receive HF SSB and CW signals.

The mixer I use is a standard "building-block" for nearly all my projects that require a simple mixer and is given below.



T1 is a Triflar wound component on a 1/2" ferrite ring. Twist together 3 lengths of thin enamelled wire and wind 17 turns on the ferrite ring. One winding is for the antenna and the other two are for the mixer. The black blobs by the T1 windings indicate the polarity of the transformer. All of the black blobs are the same end.

The mixer works best with a high level of RF input from the Sig-gen, but a "Marconi 995" works well if you take out the impedance matching box and screw the RF LEVEL right up. My Hewlett Packard Sig-gen gives out +7 dBm which is more than adequate. If you do not have a Sig-gen then you can do the job with a GDO. Wind 20-30 turns of wire on the end of a pencil and stuff it in the end of the HF coil.

The final receiver is as stable as the RF Sig-gen and as sensitive as the AF Amplifier. A typical stereo amplifier will give out its full audio if there is one millivolt at the PHONO input. You can hear signals that are less than 1% of this (10uV).

I usually etch a PCB for my mixer modules and these are always 2cm square and masked with "sticky-tape"; i.e.: "SELLOTAPE" in England, "DUREX" in Australia, "SCOTCH" tape in the USA (don't get them mixed up when you buy them - could be embarasing).

Now that is what I call a cheap receiver for the HF bands!!

Here is a letter from Barry Dieser that may give you some forther ideas.

Barry wrote:
I was intrigued by your HF direct conversion receiver. I am a VLF buff. After thinking about it for awhile, I put together a circuit very much like yours, but using a small radio shack center tapped transformer, 2 1N34 germanium diodes, an audio frequency generator, and a small audio amplifier. Wasn't using much for an antenna, so I didn't expect much. To my surprise, it worked

quite well between the frequncies of 15khz to about 60khz. I think it would work better above 60khz with a better antenna. Below 15khz, the LO can be heard, so it's not much use below that. The transformer is an audio center tap transformer that I was using. Further investigation with a scope and the audio generator shows that the degradation above 60khz is a limitation of the transformer itself. However, the receiver works remarkably well between 15khz and 60khz. Thank you very much for this idea!

Have fun, de HARRY, Lunda, Sweden.

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