Re: AM receiver convert to ATC receiver

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- *From*: Tom2000 <abuse@xxxxxxxxxxxx>
- *Date*: Thu, 17 Apr 2008 02:25:40 −0700

On Wed, 16 Apr 2008 22:44:46 −0700 (PDT), Archimedes
<shelton.dcruz@xxxxxxxxx> wrote:

> Thanks for all the reponses − yes i can calcualte the required
> parameters to get this into the ATC band − but im now confused − some
> say it will work some say it wont? So will it or will it not ?

My guess is that with enough fooling around, you might get something that will tune a few of the very strongest signals occasionally, but never very well. You'll never get any selectivity out of it, and it will be unstable as all get out. All in all, I think you'll be quite frustrated, if you can ever get the fool thing working at all.

But your desire for a simple air band receiver reminds me of a project from the old vacuum tube days −− a tunable air band converter that you connect between the antenna and a standard AM broadcast band receiver.

The converter mixes the air band signals between 108 and 136 MHz to a fixed IF frequency somewhere in the AM broadcast band. Just tune your AM receiver to that frequency and tune air band signals by changing the converter oscillator's frequency.

These days, folks would probably want to build something like that all fancy and complicated, with PLL tuning and a tracking front end, but that primitive vacuum tube converter worked pretty well with some very simple circuitry. It might be funto blow the dust off that old design and give it a new life.

You could bring that converter design into the 21st century easily and cheaply using an SA612 chip. The SA612 contains both an oscillator and a mixer, and is even available as a through−hole part. You could tune its oscillator with a varactor diode driven by a cheap 10−turn pot you might scrounge through the surplus channels.

That might provide all the gain you'd need. But if you wanted a bit

more pop, you could use a couple of J310s in cascode as an RF amp. Shooting from the hip, I don't think an RF amp would be necesssary, though. I wouldn't use it for my initial design.

You can find the SA612 data sheet here:

http://www.nxp.com/acrobat_download/datasheets/SA612A.pdf

You should get quite a few ideas for a converter design just from reading the data sheet.

SA612s, J310s, toroidal cores for coils, varactor diodes, voltage regulators, and all sorts of other good stuff is available from Kits and Parts:

http://kitsandparts.com/

The idea would be to keep the design really, really simple. Don't add anything that you don't absolutely need. Feed the antenna directly to the mixer (through a toroidal transformer, perhaps) and the output of the mixer directly to the AM broadcast receiver. Let the radio do all the post−mixer filtering for you.

You might find, through test and experimentation, that your converter needs something more. If so, figure out what's causing the problem, sort it out, and fix it.

But I think that a simple SA612 design won't need much debugging. It's a "high probability of success" project, right out of the can.

Have fun!

Tom

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