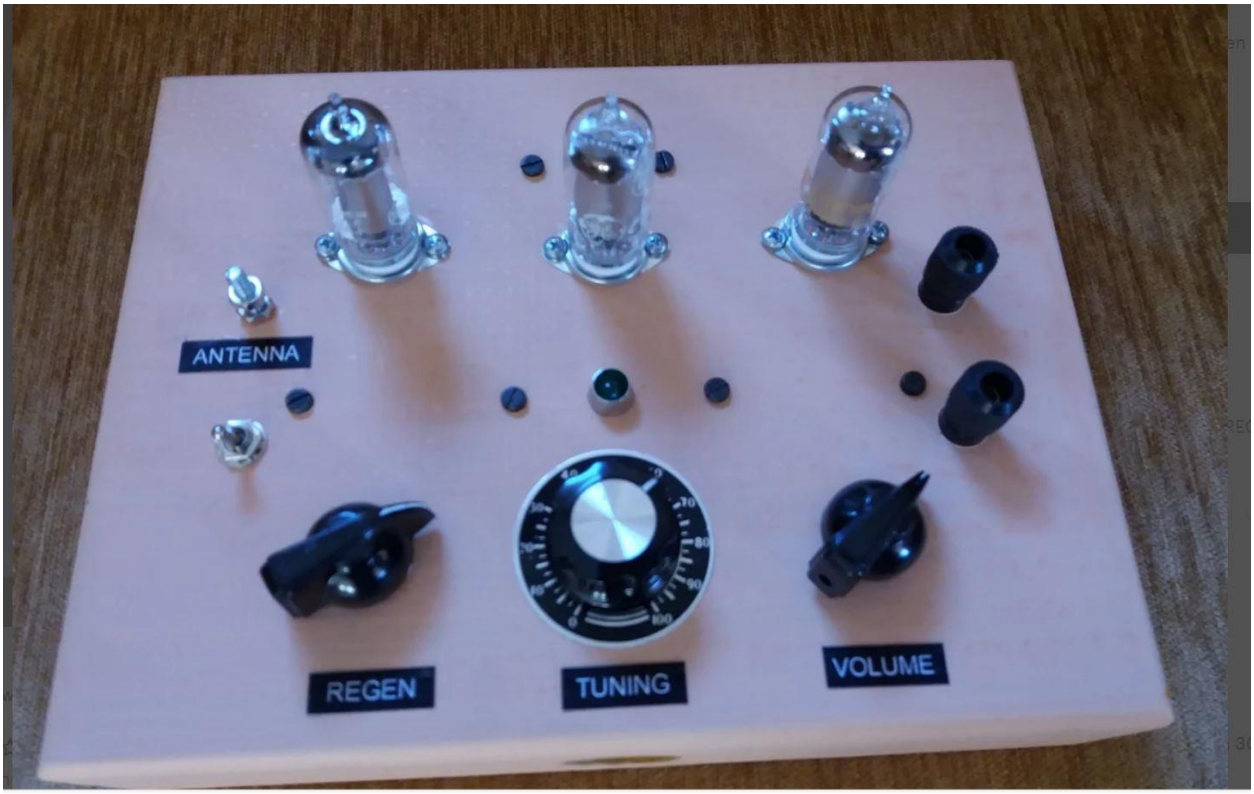

What is it?

The circuit in fig. 1 can best be described as an RF converter followed by a tunable regenerative detector. There are many advantages to this scheme:

Selectivity:

The detector is allowed to operate on a low frequency, where these types operate most efficiently. With the resultant higher Q tuned circuits there is greater inherent selectivity.

Stability:

The detector is isolated from the antenna, greatly reducing signal generation, keeping varying antenna reactance from affecting the tuning and loading of the detector. The detector is allowed to operate under a more constant load environment.

Tuning:

The tuning rate is constant for all bands because the detector tuning range never changes. Band changing is just a matter of switching a crystal, not a coil. This allows for instant band changing.

Sensitivity:

The front-end provides some conversion gain (as well as increased selectivity) thereby presenting the detector with an amplified signal.

Construction:

This receiver is no more difficult to build than any two or three tube regenerative receiver. Coils are few, easy to make, and permanent. I built three of these radios so far, and each one averaged two afternoons of construction time.

Since parts are not really that critical or numerous, the cost of construction is minimized. Most of your money will be spent on niceties like vernier dials or authentic antique parts as you choose to incorporate them.

A Little Background

This type of receiver represents a period of technological crossroads, a time when old schemes and philosophies were giving way to new ones. TRF type receivers were grudgingly being given up for the more sophisticated superhets, both in the amateur and in the Broadcast industry. It was a financially difficult time as well, and many of these more advanced designs were just out of reach for the average ham of 1936.

A three-dollar tube could equal a week's food allowance. If you had work. Otherwise, it might have meant the bread line. This environment spawned many design innovations, some of which were strokes of genius. Some were quaint. All were meant to make a dollar go as far as it could. One way of upgrading the old TRF without blowing the budget was to just make the converter stage and follow it with the TRF, using it as a variable IF tuner. Mr. Frank Jones came out with an "every man's" type handbook which enabled many hams to build versions of more expensive commercial devices on a Depression budget. One such innovation was the "Super-Gainer" receiver.

This was a true superhet design incorporating a tunable first detector, generating a fixed output at a very low frequency, about 100 KHZ or so, followed by a regenerative detector.

This design put to practical use the best of both circuits. It is very hard to beat a regen detector for sensitivity and selectivity at those frequencies! Since the Local Oscillator provided the tuning, only a few hundred KHZ from the receive frequency, much care had to be taken in it's construction, for stability's sake. The potential existed for the variable Local Oscillator to react to the dynamics of the receiver input. This is one reason why many hams kept the Local Oscillator as a separate circuit from the actual Mixing circuit long after pentagrid converters were available.

As economic times got better, hams were better able to get into the technological strides of the day, with it's buffered RF stages, multi-element converter tubes, AGC, Single Signal Crystal Filtering, "Silent Cans",

and all the niceties that eventually eclipsed the old regenerative receivers and regenerative-superhets, at least on the HF bands. High Schoolers were buying Sky Buddies by 1939.

Let me add an observation here. Regenerative receivers were not replaced because of faulty, erratic behavior, such as I read in today's descriptions of them, or else they would not have lived far beyond the early 1920s. In fact, many radio manufacturers continued to use the principle of regeneration in their products up onto the 1960s, and even beyond (after all, what was your basic Q-multiplier, anyway?). The descendance of the Regenerative Receiver occurred with its inability to accommodate the technology then developing. They were viewed as sort of a technical cul-de-sac. All attention was therefore diverted to the superhet. And why not? They are better performers, albeit more complex devices, and the niceties are. . . well, nice to have.

But the regenerative detector remained, and is still to this day a viable scheme, when properly constructed and utilized. The type circuit described here is a version of the Frank Jones Super-Gainer. The chief difference lies in the tunable detector approach. This design places the tuner in a more stable low frequency stage and utilizes a more stable crystal local oscillator for the mixing circuit. In my opinion, this makes for an all-around more rugged design, and simplifies things considerably. In that the detector is regenerative and acting as the primary selectivity and tuning device, I opted for the term "Regenerodyne" for this approach.

"Regenero" - for having been brought forth from regeneration, and "Dyne" - for "powered". (Regeneration being the primary dynamic, or "power" that makes this scheme worthwhile.)

Regenerodynes, therefore, differ from Mr. Jones' Super Gainer in that the LO is fixed, and the detector, which is always regenerative, is a tunable detector.

Here's a very nice three tube, handcrafted, vintage style, high-performance shortwave regenerative radio. This all-tube regenerative receiver utilizes 3 tubes (6BA6, 6J6, 6BA6) and covers a 4.50-18.50 MHz shortwave band. Runs on 12 Volts DC, and you can use a power supply to listen this beautiful radio. Receives AM, CW and SSB signals. It has a loudspeaker, so you don't need to use headphones to hear the sound of this nice radio. This great looking, high quality vintage style radio is designed to be just like homebrew radios that were built in the 1930s and 1950s by radio hobbyists in the great vacuum tube era.

I am an experienced radio receiver and transmitter engineer and developer, constructing radios for more than 40 years, so you can buy confidently. You will get a very good performance within its frequency coverage. You will need an antenna, and a 12 Volts 15W DC power supply only to operate this small radio. Volume is very good and lots of stations can be picked up even with a short antenna (min. 5 meters).

Specs:
Radio runs on 12 Volts DC (power supply).
Low power consumption.
One 6BA6 tube as regenerative detector.
One 6J6 tube as high gain AF driver.
One 6BA6 tube as audio amplifier.
Volume control.
Regen control.
Main tuning control.
LED power indicator.
On/off main switch.
Plenty of volume.

All wooden case.
Built-in speaker.
Frequency coverage from 4.50 Mhz up to 18.50 Mhz.
Easy to set up and operate.
Extremely stable, not sensitive to hand capacitance.
You need a 12V power supply and a good antenna (5 to 10 meters long) to operate this radio.