What 1932 Holds for Radio

A Review of the features of the modern Set

WITH the approach of winter are coming better radio conditions, and it can be expected confidently that this winter will be one of the best yet. It is generally assumed that radio conditions move in cycles, and that we are now almost at the peak of a cycle, meaning that conditions have been steadily improving over the last few years, and now are almost as good as they will get. Next year it is expected will be even slightly better than this for radio conditions, so we can look forward to two or three years of really good radio.

Furthermore the sets are being improved at a marvellous rate. Many new and desirable features are being added and some of the older and less desirable are being done away with. This, season, however, we must look for minor changes in design only. Last year saw the introduction of the superheterodyne receiver, and this year will probably see an increase in its popularity.

But what is this superheterodyne receiver which has earned such popularity? While it is not desirable in this brief review to go into the technical details of the set, we might say that it is a type of circuit—it is not new—whereby a portion of the set acts like a portion of the transmitting station. The waves are collected from the air and slightly strengthened by the first valve in the set.

Here they are mixed with other somewhat similar waves, which are generated, not at a transmitting station, but within your own set. When the switch is turned on these valves set up, but they are controlled so that they will not be radiated past your own set. In times past this was one of the difficulties of the superheterodyne, and it restricted its use to a loop antenna, from which radiation could not take place. But now that has been overcome and all oscillation, as it is called, is kept within the receiver.

This wave is scientifically mixed with the waves coming in from the station, and the two form what is known as a "beat note," or a third wave, different from them both. No matter what the wavelength (or frequency) of the broadcasting station may be, it can be tuned in on the superheterodyne and mixed with the wavelength generated in your set, which is likewise altered when your tuning dial is rotated, so that the difference between these two is always the same. It is really a case of simple arithmetic. Say we decide that the third number is to be 4 and the wave coming in is 9, then we would mix with it a wave of the value of 5. The incoming wave is 15, then the wave generated will be 11, and so is constantly generated a wave of 4.

Now the point making the design thus is that any set, or amplifying system, can be made to amplify best on one wavelength (or frequency) only. So, by reducing all incoming signals to the one wavelength, the set can be more scientifically built.

When two signals are mixed and the constant product arrived, that product is amplified, or strengthened by what is known as the intermediate frequency amplifiers. When they are past this stage, they go through the same treatment as does the incoming wave in the ordinary or, what we call, the t.r.f. (tuned radio frequency) set. They are detected and then amplified.

The main features of this year's sets may be summarised as follows—

1. *Superheterodyne circuits, with multi-mu, pentode and spray-shielded valves.*
2. *Development in t.r.f. sets of band-pass tuning filters.*
3. *Pushpull detectors and pushpull output.*
4. *Short-wave combinations.*
5. *Elimination of a large percentage of noise.*
6. *In the midget sets, fewer valves, employed in a more efficient circuit.*
7. *Automatic volume control.*

The superheterodyne has several advantages. It is selective, that is, it can distinguish between two stations operating on very close frequencies. Most of you who have had the older type of set and have lived near the city, know how difficult it is to get past the local station, but with the superheterodyne receiver, it can be tuned out in a very few degrees. The other advantage is its sensitivity, due to the fact that all waves are reduced to the same value at which the receiver is designed to amplify greatest.

And that is why the superheterodyne has become very popular. However, it would not be fair to say that it is the only type of set which has been popular, or which is likely to be popular during the coming year. The superheterodyne has certain inherent faults, and the ordinary t.r.f. set has maintained a certain degree of popularity on account of this.

It can be charged against the superheterodyne that it is too sensitive, that it amplifies beyond the noise level. By this we mean that there is a certain degree of amplification beyond which it is useless to go for, when this is exceeded, the noise is so great as to render the broadcast inaudible. Thus, if your receiver is capable of tuning in a 50 watts station in the United States, and at the same time brings in a deafening amount of static, then it is no use being able to bring in that station, and this is the argument that the manufacturers of the t.r.f. set have advanced.

Two or three notable manufacturers have not taken up the superheterodyne on this account. They have worked on the selectivity question and, by introducing certain features, generally what is known technically as band-pass tuning, have evolved a very selective set with a degree of sensitivity which will satisfy the requirements of most listeners.

So far, so good. We have seen the reason for the popularity of the superheterodyne and for the continuance of the t.r.f. set. It is merely a matter for the listeners to judge between the two and see which suits his own needs the best.

THE past twelve months has seen some notable developments in the valve line. It is an old saying, and not without truth, that a set is no better than its valves; in fact, radio is entirely dependent upon valves. Before Fleming and de Forrest developed their valves, and made possible the amplification of radio signals, radio was at a standstill. Transmitting as we know it to-day was possible only because of the valve, and each development that took place was occasioned by some improvement in this essential piece of apparatus. The introduction of the a.c. set came about only because a valve was found, the filament of which could be operated from the a.c. current. The screen-grid valve, with its marvellous sensitivity, has made possible a great advance in the design of radio receivers.

Then came the pentode, which did away with audio amplifiers. In fairness to the English and Con- (*Continued on page 9.*)