very effective because, although the average power level may be improved by up to four times, the benefits are masked by a load of unwanted rubbish. When the SSB output level from the transmitter is viewed on the standard type of power meter there is great temptation to wind up the processor level to peak on the output meter. Don't do it. There is a critical point where distortion on the signal will undo the good work of a processor.

A great improvement can be made on the simple processor of **Fig. 1** by adding another filter ahead of the limiter which performs the clipping function as shown in **Fig. 2**. It limits the frequencies which are presented for processing to those which have communications value. The effect of the extra filter is to reduce the possibility of frequencies outside the desired spectrum mixing down to produce in-band intermod products. Given that most transmitters and transreceivers already have substantial amounts of AF filtering it could be argued that filters placed after the limiting element have little value. It is strange therefore that most published designs in other magazines hardly ever include filters in the right place!

Furthermore the pre-clipping filter should also possess an LF rolloff characteristic for a similar reason: high level, low frequencies can mix upwards to produce very unpleasant intermod products in the passband.

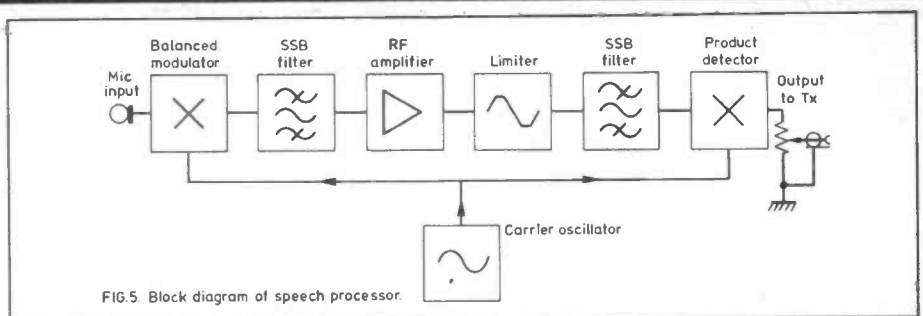

FIG.5. Block diagram of speech processor.

A further sophistication can be added to the processor of **Fig. 2** in the shape of a VOGAD — Voice Operated Gain Adjustment Device. This type of circuit produces autolevelling of the audio presented to the clipper/limiter. It ensures that the optimum level of speech is always applied to the processor element. If the level of voice drops — for instance if you move further away from the mic — the VOGAD brings up the gain. Its position in circuit is shown in **Fig. 3.** For those that want to try their hand at building one, an IC based VOGAD circuit is shown in **Fig. 7.** This combination offers a worthwhile improvement on traditional processor designs.

RF Speech processor

There is quite a lot of talk on the airwaves about the magic of RF speech processing. Generally held opinion considers that this method is very effective in increasing talk power. It is certainly far more effective in use than simple baseband processors of the type shown in **Fig. 1.** RF processors work by converting microphone audio into an SSB signal, amplifying the resulting RF envelope, clipping it and then passing it through a further SSB filter to remove the harmonic and intermod products.

There is no difference in operation, from the processing point of view, between baseband and RF units. The RF method is clearly and demonstrably superior because the resulting cutoff characteristics of the crystal filters usually employed are far steeper than anything which could be fabricated at audio frequencies. For instance, a good quality SSB filter may attenuate signals 2kHz beyond the edge of its passband by up to 60dB, a ratio of 1000:1. You would be lucky if the average audio filter attenuated by 12dB under similar conditions.

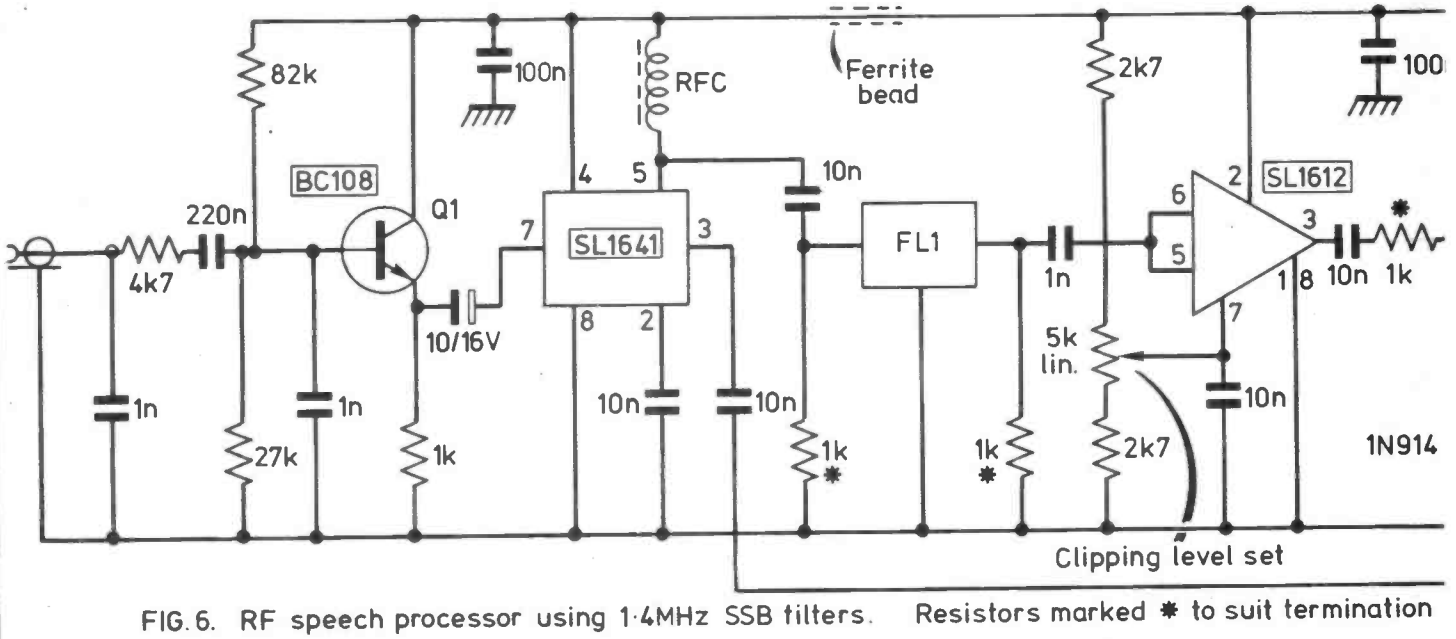

FIG.6. RF speech processor using 1·4MHz SSB filters. Resistors marked * to suit termination