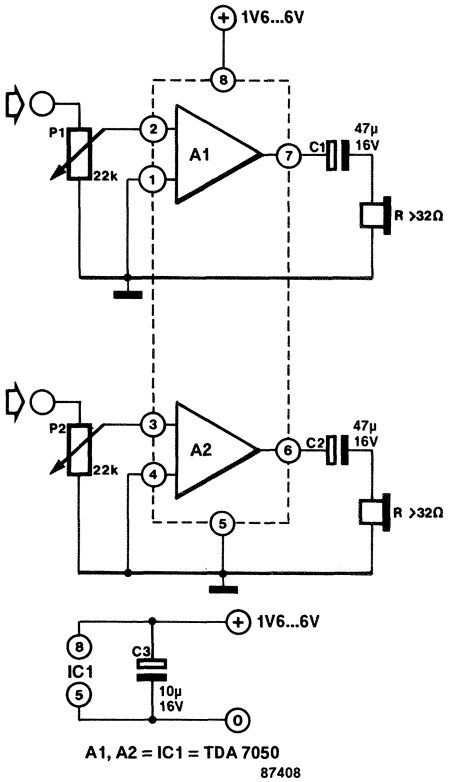


pins 6 and 7.
The current consumption of the chip at maximum output power is of the order of 100 to 150 mA, while the quiescent current amounts to a mere 5 mA. The amplifiers should be terminated in 32Ω, a common value for modern headphones. The supply voltage is normally 4.5 V, and pins 6 and 7 are at half the supply potential during quiescent operation.

# 027 SPEECH PROCESSOR WITH BACKGROUND SUPPRESSION

A speech processor is commonly used in public-address installations and in utility transmitters. It augments the average value of the speech signal, so that in spite of a high level of background noise or, in the case of a radio transmission, a lot of interference, speech recognition remains possible. In many cases it is, however, undesirable that this background noise or interference is enhanced together with the wanted signal. A possible remedy, as outlined here, is to provide an adjustable threshold at which the speech processor becomes active.
With reference to the diagram, the signal from the microphone is amplified in $T_1$ (a low-noise amplifier) and in $A_1$. Limiting (or clipping) of the signal takes place in $A_3$.
The signal (taken from the output of $A_1$) is also amplified in $A_2$. When the output of this opamp reaches a certain level, electronic switch $ES_1$ is actuated. Consequently, the monostable formed by $ES_2$ changes state, and this closes $ES_3$, whereupon $ES_4$ is opened, which in its turn increases the amplification of $A_3$. When $ES_4$ is closed, the amplification of $A_3$ is determined by the ratio $P_1$:$R_5$; when the switch is open, by the ratio ($P_2 + R_8$):$R_5$. The mono-time, determined by the time-constant $R_{20}$-$C_{19}$, has been chosen such that speech is not clipped. The low-pass filter between $A_3$ and $A_4$ ensures that frequencies above 3 kHz are severely attenuated. The required output level is set by $P_3$.
Calibration is somewhat unorthodox: a signal source with a continuous output of speech by trained speakers is used. The microphone is positioned in front of the loudspeaker at normal speaking distance and the sound level adjusted to roughly the level of the user. Next, connect a pair of headphones to the output of the processor and make sure that only the output of these phones can be heard. Adjust $P_4$ for maximum resistance, and then set the clipping level with $P_2$ (which is a matter of

personal taste). At maximum clipping level, intelligibility of the speech will remain good in the presence of interference, but it will have a somewhat harsh, metallic character. Then, adjust $P_1$ for maximum resistance, and $P_4$ till all background noise disappears. Finally, set the ratio signal: background noise with $P_1$; this is best done by making a recording of the user's speech via the microphone and the processor. When the processor is active, i.e. clips, $D_4$ lights.

$L_1$ to $L_4$ incl. are 6 turns 36 SWG CuL through 3 mm ferrite beads.