POWER (W)	R4	R5	Q3	HEATSINK	SUPPLY/V	O/P TRANSFORMER
3	1k5	390R	2N3904	50 C/W	15	—
10	1k5	390R	2N2222	22 C/W	24	15R:8R0
30	1k0	270R	TIP29C	10 C/W	40	22R:8R0
100	820R	180R	TIP29C	5 C/W	60	35R:8R0

Efficient P.A. Amplifier

N.D. Sheldon

INPUT

Vin

TIME

OUTPUT

Vout

TIME

1k5   180k

R4

Q3

R5

Q2

1n8

Q1

27k

1n8

NOTES:
Q1, Q2 IS 2N3906

+Ve

0V

The efficiency of this amplifier is so high that an output of 3 W can be obtained with a 2N3904 used as the output transistor, even without a heatsink.

The amplifier consists of a voltage controlled pulse width oscillator working at about 6 kHz, driving a class D output stage. Since the output transistor is either hard on or completely off, the dissipation is minute — hence the high efficiency. The output waveform bears no resemblence to the input, but the integral of the output waveform is proportional to the integral of the input waveform, both with respect to time.

A table of component values has been given in order that any amplifier with an output of between 3 W and 100 W can be constructed. Still higher powers up to 1 kW can be obtained.

The drawback is that it produces about 30% distortion and can, therefore, be used for sound reinforcement only. It is especially suitable for public address systems, as speech is completely intelligible.