

*bias* causes the plate efficiency to be slightly less than that calculated by Eq. (10-28), but otherwise does not greatly change the behavior.

The same power triode, pentode, and beam tubes that are suitable for Class A amplifiers can be used in Class B systems.

Since the d-c plate current in a Class B amplifier draws from the power supply depends upon the amplitude of the signal voltage applied to the Class B system, it is very important that the power-supply system used with a Class B arrangement have good voltage regulation. Otherwise the grid bias voltage corresponding to projected cutoff will vary with the amplitude of the signal voltage applied to the amplifier. To the extent that d-c grid current affects the bias voltage applied to the Class B amplifier system, it is also necessary that the grid-bias voltage have good inherent voltage regulation if, as is usually the case, the grids of the tubes are driven positive to obtain the full rated output.

Compared with Class A power amplifiers, the Class B arrangement has the advantage of higher plate efficiency, negligible power loss when no signal voltage is applied, and greater output power available from a given tube and given plate-supply system. The disadvantages of Class B operation are a tendency toward somewhat higher amplitude distortion, more critical operating conditions, and the necessity that the plate-supply and bias voltages have good regulation. Class B amplifiers find their chief use where the amount of power to be developed is large, as

is the case in large public-address systems and in the modulation of radio transmitters.

*Class AB Amplifiers.* The Class AB amplifier is a push-pull system in which the grid bias is adjusted to a value intermediate between that which would be used for Class A power amplification and that which would be appropriate for Class B power amplification. Under these conditions, the instantaneous plate current of each individual tube flows for more than half of each cycle, but becomes zero for a small part of each cycle, as shown in Fig. 10-23*b*. This causes the wave of current in the plate circuit of an individual tube to be considerably distorted. However, the push-pull connection removes much of this distortion, and if negative feedback (see Sec. 11-1) is then added, the results are quite acceptable for most requirements.

The Class AB power amplifier has operating characteristics such as

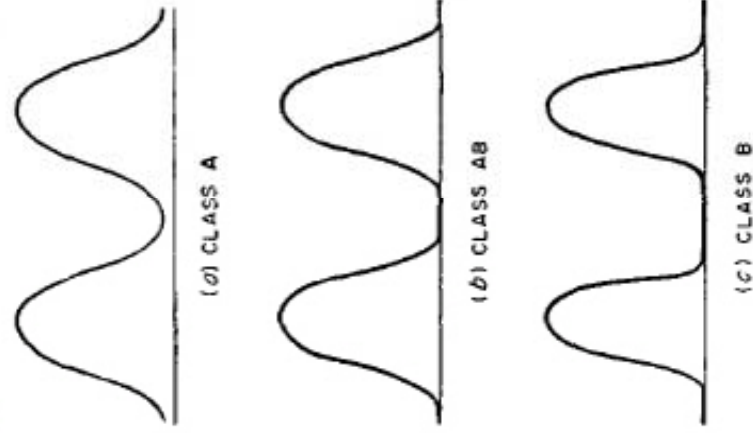


FIG. 10-23. Plate-current waves illustrating differences between Class A, Class AB, and Class B operation.