



### Drum Sense Amplifier

The drum sense amplifier is used to amplify the sinusoidal signal from the sense winding of a drum head. The GU - - card consists of two emitter followers and a grounded base voltage amplifier, all operated class A. A voltage gain of near 30 from the amplifier provides a sine wave output capable of driving a drum shaper amplifier. Frequency of operation for this circuit is 250kc.

A sine wave input signal having a peak-to-peak swing of 150 to 550 millivolts from the sense winding is coupled to pin A.

#### Circuit Description

Assume that no signal is read at the sense winding and all transistors are forward-biased on for class A operation. Circled voltage values indicate emitter and base potentials at this time.

When the sense winding passes a recorded spot on the drum, a sinusoidal voltage is induced in the winding. This voltage varies the bias level of T5, causing the conduction through R22 and T5 to vary accordingly. The emitter of T5 follows the input signal and couples the small changes

in voltage through C2 to the emitter of T1. Conduction through the grounded base amplifier and high impedance load provides a voltage gain of near 30 to the base of T3.

The output from the emitter follower T3 is an in-phase sine wave output of 5v to 14v peak-to-peak, which is coupled to the drum shaper amplifier.

Because the sense winding is also used as the record winding, a high inductive kick-back voltage is seen at pin A when writing on the drum. D27 prevents this high voltage from damaging T5. It is also necessary to place R28 in parallel with the 1.5v stabistor (D30), as its back resistance can be as high as 210 megohms. If R28 were not in the circuit the back voltage developed across the stabistor could exceed its specified 12.5v limit and damage the stabistor. L5 and C24 are used as filter networks to ground.

#### Application

Pin B of the drum sense amplifier is connected to the center tap of the erase and record windings. Pin A is connected to the other end of the record winding as shown.