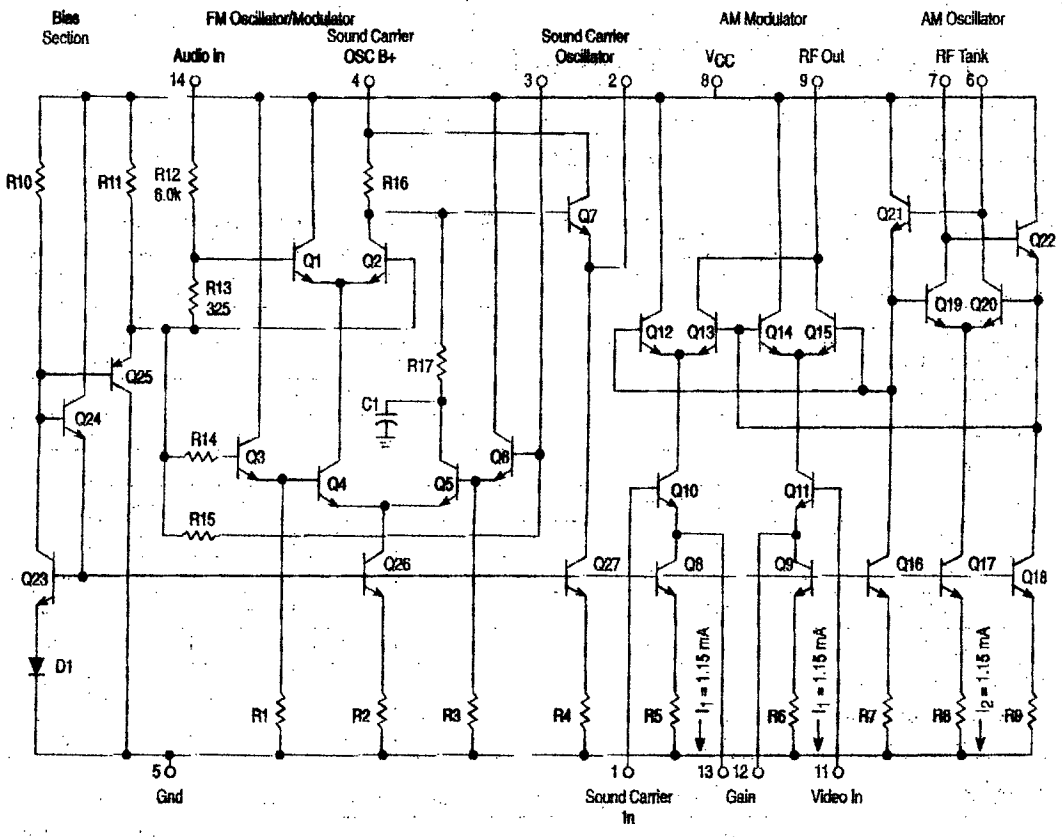
Figure 2. TV Modulator



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GENERAL INFORMATION

The MC1374 contains an RF oscillator, RF modulator, and a phase shift type FM modulator, arranged to permit good printed circuit layout of a complete TV modulation system. The RF oscillator is similar to the one used in MC1373, and is coupled internally in the same way. Its frequency is controlled by an external tank on Pins 6 and 7, or by a crystal circuit, and will operate to approximately 105 MHz. The video modulator is a balanced type as used in the well known MC1496. Modulated sound carrier and composite video information can be put in separately on Pins 1 and 11 to minimize unwanted crosstalk. A single resistor on Pins 12 and 13 is selected to set the modulator gain. The RF output at Pin 9 is a current source which drives a load connected from Pin 9 to V_{CC}.

The FM system was designed specifically for the TV intercarrier function. For circuit economy, one phase shift circuit was built into the ship. Still, it will operate from 1.4 MHz to 14 MHz, low enough to be used in a cordless telephone base station (1.76 MHz), and high enough to be used as an FM IF test signal source (10.7 MHz). At 4.5 MHz, a deviation of ±25 kHz can be achieved with 0.6% distortion (typical).

In the circuit above, devices Q1 through Q7 are active in the oscillator function. Differential amplifier Q3, Q4, Q5, and Q6 acts as a gain stage, sinking current from input section Q1, Q2 and the phase shift network R17, C1. Input amplifier Q1, Q2 can vary the amount of "in phase" Q4 current to be combined with phase shifter current in load resistor R16. The R16 voltage is applied to emitter follower Q7 which drives an external L–C circuit. Feedback from the center of the L–C circuit back to the base of Q6 closes the loop. As audio input is applied which would offset the stable oscillatory phase, the frequency changes to counteract. The input to Pin 14 can include a dc feedback current for AFC over a limited range.

The modulated FM signal from Pin 3 is coupled to Pin 1 of the RF modulator and is then modulated onto the AM carrier.