

# MC1377

## FUNCTIONAL DESCRIPTION

Figure 2. Power Supply and  $V_B$

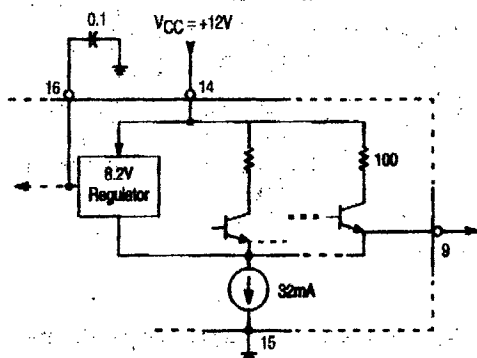


Figure 3. RGB Input Circuitry

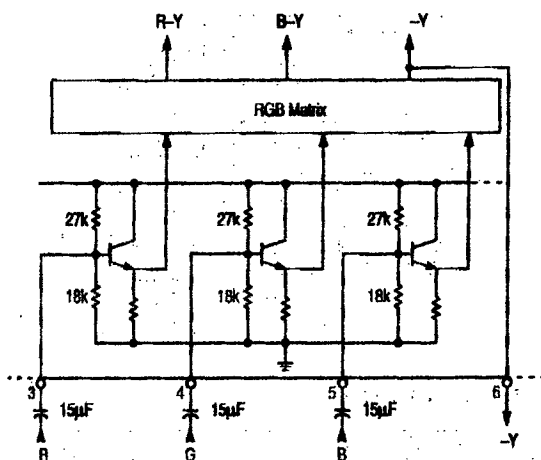
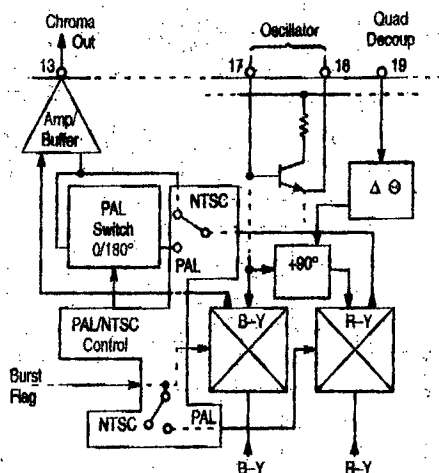


Figure 4. Chroma Section



### Power Supply and $V_B$ (8.2 V Regulator)

The MC1377 pin for power supply connection is Pin 14. From the supply voltage applied to this pin, the IC biases internal output stages and is used to power the 8.2 V internal regulator ( $V_B$  at Pin 16) which biases the majority of internal circuitry. The regulator will provide a nominal 8.2 V and is capable of 10 mA before degradation of performance. An equivalent circuit of the supply and regulator is shown in Figure 2.

### R, G, B Inputs

The RGB inputs are internally biased to 3.3 V and provide 10 k $\Omega$  of input impedance. Figure 3 shows representative input circuitry at Pins 3, 4, and 5.

The input coupling capacitors of 15  $\mu$ F are used to prevent tilt during the 50/60 Hz vertical period. However, if it is desired to avoid the use of the capacitors, then inputs to Pins 3, 4, and 5 can be dc coupled provided that the signal levels are always between 2.2 V and 4.4 V.

After input, the separate RGB information is introduced to the matrix circuitry which outputs the R-Y, B-Y, and -Y signals. The -Y information is routed out at Pin 6 to an external delay line (typically 400 ns).

### DSBSC Modulators and 3.58 MHz Oscillator

The R-Y and B-Y outputs (see (B-Y)/(R-Y) Axes versus I/Q Axes, Figure 22) from the matrix circuitry are amplitude modulated onto the 3.58/4.43 MHz subcarrier. These signals are added and color burst is included to produce composite chroma available at Pin 13. These functions plus others, depending on whether NTSC or PAL operation is chosen, are performed in the chroma section. Figure 4 shows a block diagram of the chroma section.

The MC1377 has two double balanced mixers, and regardless of which mode is chosen (NTSC or PAL), the mixers always perform the same operation. The B-Y mixer modulates the color subcarrier directly, the R-Y mixer receives a 90° phase shifted color subcarrier before being modulated by the R-Y baseband information. Additional operations are then performed on these two signals to make them NTSC or PAL compatible.

In the NTSC mode, the NTSC/PAL control circuitry allows an inverted burst of 3.58 MHz to be added only to the B-Y signal. A gating pulse or "burst flag" from the timing section permits color burst to be added to the B-Y signal. This color burst is 180° from the B-Y signal and 90° away from the R-Y signal (see Figure 22) and permits decoding of the color information. These signals are then added and amplified before being output, at Pin 13, to be bandpassed and then reintroduced to the IC at Pin 10.

In the PAL mode, NTSC/PAL control circuitry allows an inverted 4.43 MHz burst to be added to both R-Y and B-Y equally to produce the characteristic PAL 225°/135 burst phase. Also, the R-Y information is switched alternately from 180° to 0° of its original position and added to the B-Y information to be amplified and output.