Theory of Operation:

The transmitter consists of a primary frequency VCO that is modulated by up to two subcarriers and a processed video signal. The modulated carrier is then amplified prior to transmission.

The two subcarrier circuits are identical and consist of a VCO operating in the range of 6.0 to 7.5 MHz. At system power-up, the subcarrier PLL controllers (and the main carrier PLL controller) are all powered-up and programmed via a common bus. The subcarrier VCOs are activated when a microphone is connected to the unit. The subcarrier VCO output signal is amplified by a CMOS gate and then lowpass filtered before being applied to the video amplifier.

The video input signal is pre-emphasized according to the prescribed standard NTSC curve and applied to the video amplifier. The video amplifier sums the video signal and the audio subcarrier signals together to form a combined modulation signal. This combined modulation signal is then applied to the main carrier VCO via the PLL loop filter.

The main carrier PLL is programmed when the system is powered up. Power to the final amplifier stage is withheld until the carrier PLL attains lock. A fixed attenuator acting as an isolator protects the phase locked carrier signal from the VCO. The carrier signal is then amplified by two linear gain stages to attain sufficient level to drive the class B power amplifier. The power amplifier consists of a single discrete FET, which is impedance matched with discrete and distributed elements. The output impedance match is lowpass in form and provides the required filtering. RF power control is accomplished by varying the bias voltage on the gate terminal of the final amplifier transistor. The amplified and lowpass filtered carrier signal is connected directly to the chassis mounted antenna connector.