What's a Keyed Circuit?

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Keyed circuits (or gated circuits—same thing) crop up more and more in today's electronics, and especially in TV. The best-known ones are used for agc, to pick the agc voltage only from the horizontal sync pulses for better noise rejection.

But there are other kinds, for other jobs. In a color set, you'll find one usually labeled "Burst Keyer" (Fig. 1). Here it controls the burst amplifier through the common 1,800-ohm cathode resistor. On the plate, there's burst and video from the video amplifier. How do we make the circuit react only to burst? Key it.

Notice the connection to pin 2 of the 6AN8 marked "flyback pulse". The burst is on the back porch of the horizontal sync pulse. Element voltages are arranged so that the burst keyer (triode section) keeps the burst amplifier (pentode section) cut off during sweep time, so that no video gets into the burst circuits. But during horizontal *retrace* time, the flyback pulse opens the gate and lets the burst amplifier amplify burst. (See Fig. 2.) Eventually the burst ends up controlling the 3.58-mc crystal reference oscillator through the phase detector circuit.

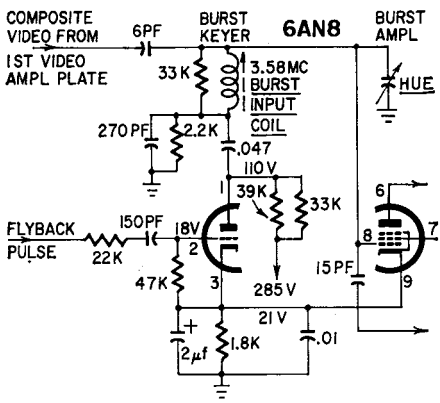

Fig. 1—This circuit separates color burst from rest of signal. Keyer turns amplifier on and off with flyback pulse.

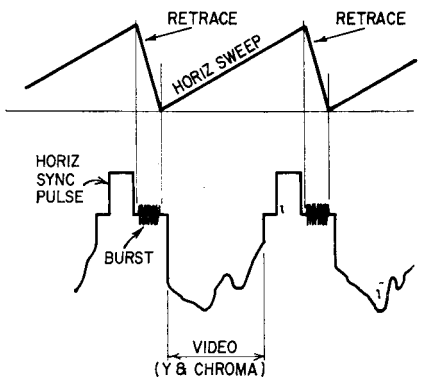

Fig. 2—Time sequence of events in composite video and sweep circuits. Gate opens just long enough to let burst through during horizontal retrace.

Now look at Fig. 3. These are color demodulators. At the input, from the bandpass amplifier, we have two signals mixed together at the transmitter, and we have to recover the separate signals.

To do it, we can use another gating circuit, but this time *phase* is the key, not amplitude, as it was with the burst circuit. The two signals, mixed though they may be, are in *quadrature*—90° apart in phase. Now see how the cathodes are connected: both to the same source (the 3.58-mc reference oscillator, through a transformer), but one goes direct and the other through a phase-shift network. The shift is exactly 90°.

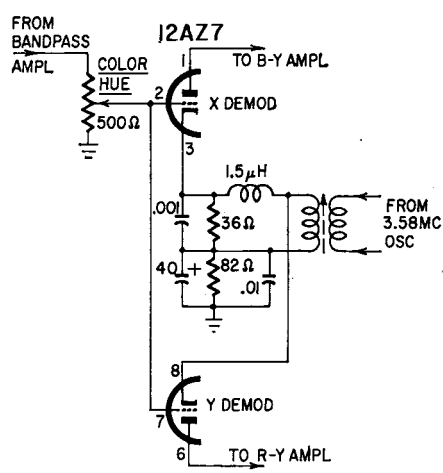

Fig. 3—A different kind of keying uses phase rather than amplitude to route components of composite color signal along proper paths.

Each tube conducts only when its grid and cathode voltages are in phase, not when they're 90° apart. So only that part of the grid signal which is at that moment in phase with the 3.58-mc reference at the cathodes gets through. In other words, the tubes are keyed by the phase of the reference oscillator voltage, and the B-Y and R-Y signals are sent along the right paths.

There! That's not so tough, is it?

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