

SCR COLOR ORGAN

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Unijunction transistors cut response times and improve the stability of a solid-state, 3-channel color organ.

A few years ago, Donald Lancaster wrote an article in this publication ("Simplified Solid-State Color Organ," January, 1964) which described a novel method of firing silicon controlled rectifiers to improve his original color-organ circuit of April 1963.

Now the firing circuits have been improved again by adapting them to unijunction oscillators. This was done to establish a very stable bias and to make the color organ more sensitive.

The three input circuits from the original article were retained because of their low cost and good performance. The three large-value capacitors, C1, C2, and C3, have to be non-polar types. If these are not available, then two polarized units with double the capacitance value can be connected back-to-back.

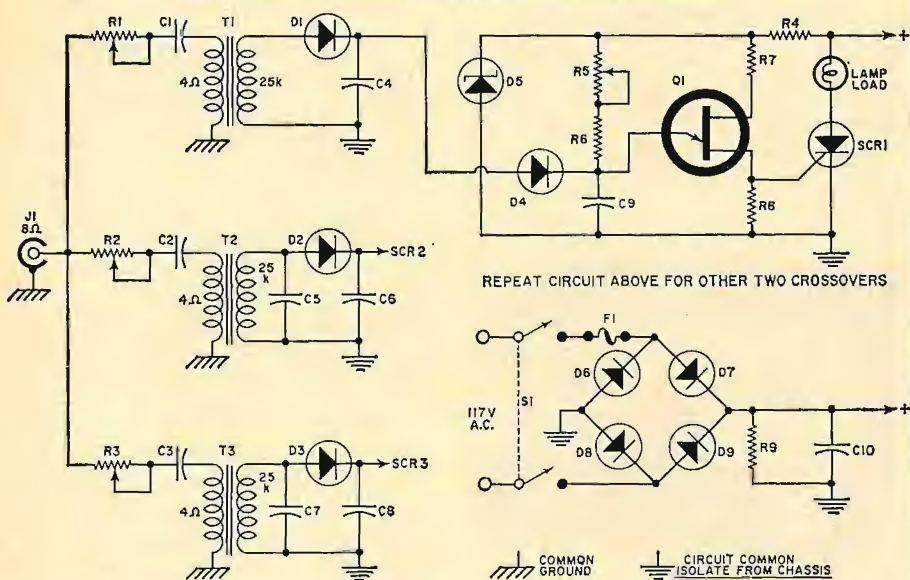
The unijunction firing circuit is an a.c. line-synchronized type which is described in *General Electric's SCR Manual*. The bias potentiometer sets the

unijunction firing time to a point where the SCR fires just far enough into the conduction angle to dimly light the bulbs. When a peak from the audio crossovers comes into the unijunction's emitter, the unijunction fires earlier in the a.c. cycle and more current is passed through the bulb, raising the color level.

The circuit components are not critical, and many substitutions can be made. The bias circuit has enough range so that any unijunction may be used. The size of the SCR's and the diodes in the bridge circuit can be chosen to fit almost any load, but keep in mind that their p.r.v. must be 200 volts or better.

Editor's Note: We are sorry but we are no longer able to supply copies of Mr. Lancaster's original articles. Those who have built his original color organs or still have the January 1964 and April 1963 issues in their files should refer to the original schematics. ▲

Fig. 1. Color organ's SCR's are fired by unijunction oscillators.



REPEAT CIRCUIT ABOVE FOR OTHER TWO CROSSOVERS

- R1, R2, R3—50 ohm pot ("Level")
- R4—5000 ohm, 10 W res.
- R5—10,000 ohm pot ("Bias")
- R6—10,000 ohm, 1/2 W res.
- R7—180 ohm, 1/2 W res.
- R8—47 ohm, 1/2 W res.
- R9—4000 ohm, 5 W res.
- C1—10 μ F, 25 V non-polarized capacitor
- C2—25 μ F, 25 V non-polarized capacitor
- C3—100 μ F, 25 V non-polarized capacitor
- C4, C7—0.047 μ F, 100 V capacitor
- C5—0.01 μ F, 100 V capacitor
- C6—0.1 μ F, 100 V capacitor
- C8—0.25 μ F, 100 V capacitor
- C9—0.47 μ F, 50 V capacitor

- C10—0.01 μ F, 200 V capacitor
- D1, D2, D3—1N1693 or A13B
- D4—1N1693 or A13B
- D5—14 V, 1 W zener diode (Z4X14B)
- D6, D7, D8, D9—G-E-X4 diode
- SCR1—G-E X1 silicon controlled rectifier
- F1—5A fuse
- S1—D.p.d.t. switch
- T1, T2, T3—Audio output trans. 25,000 ohms: 3.2-4 ohms
- Q1—2N1671B or equiv.
- *One crossover only: three are required. Values for D6, D7, D8, D9, SCR1, and F1 can be varied, depending on load. The listed parts run cool at 300 W load.