

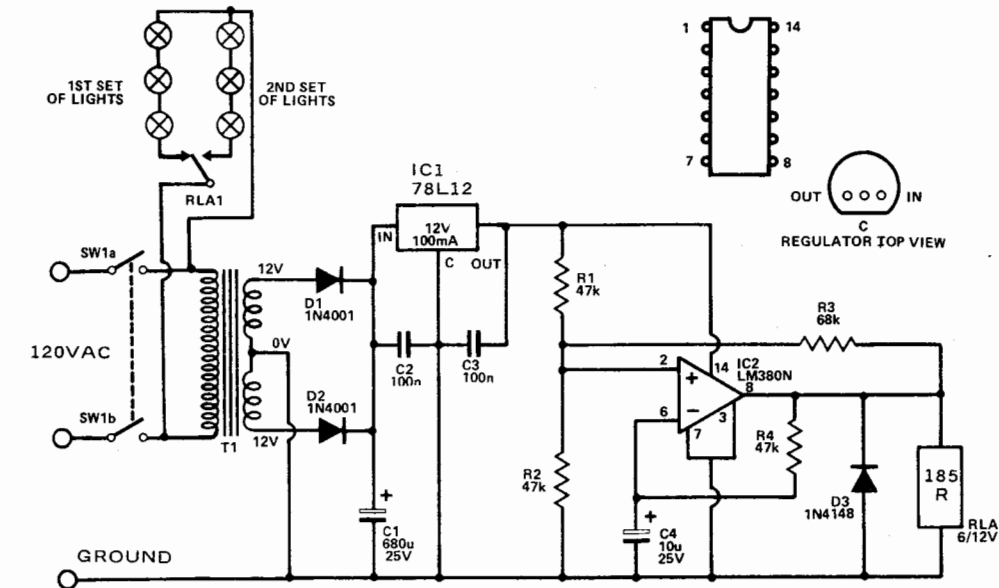
Designer Circuits

CHRISTMAS TREE LIGHTS FLASHER

The usual method of getting the lights on a Christmas tree to flash on and off is to use a bimetal-strip type flashing bulb in the series chain of bulbs. As this switches on and off it breaks the circuit to all the bulbs so that they switch on and off in unison. One drawback of this system is that most flashing bulbs provide a rather irregular flash rate, and another is that it cannot be used to operate two sets of lamps so that when one set switches off, the other switches on.

Both these problems can be overcome by using the simple circuit shown here. It is a low frequency oscillator (about 0.5 Hz) which controls the lights via a relay. Thus the lights are switched on for periods of about one second in duration at intervals of roughly one second in length. By using a changover relay contact it is possible to use two sets of lights with the relay switching the power alternately from one set of lights to the other. If this alternate mode of operation is not required, then one set of lights is simply omitted.

The unit is powered from a



supply having on/off switch S1, stepdown and isolation transformer T1, push-pull rectifier D1 and D2, smoothing capacitor C1, and 12 V monolithic regulator chip IC1. C2 and C3 aid the stability and transient response of IC1, and should be mounted physically close to this component.

A well known oscillator configuration is used here, but it is a little

unusual in that it employs an audio power amplifier IC, rather than the more normal operational amplifier device. However, the LM380N audio IC has, like an operational amplifier, both inverting (−) and non-inverting (+) inputs, and can be used in operational amplifier type circuits. In this application it has the advantage of having a power output stage that can

directly drive the relay with the family high current it requires. D3 is used to suppress the high back EMF which is generated across the relay coil as it de-energizes, and which could otherwise destroy IC2.

The switch on and switch off times of the circuit are proportional to the value of C4, and if desired they can be altered by changing the value of this component.