

FLUORESCENT SIMULATOR

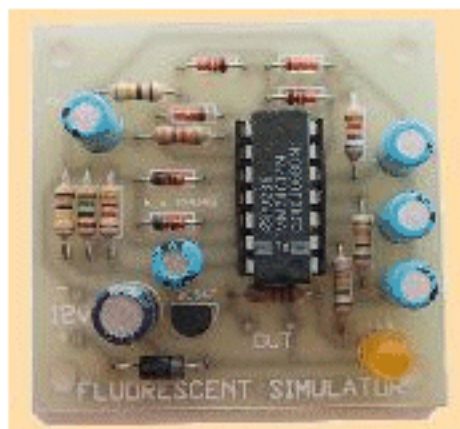
This kit is available from:

Talking Electronics

email Colin Mitchell:

talking@tpg.com.au

for pricing and postage.



SCALE FLUORESCENT LAMPS

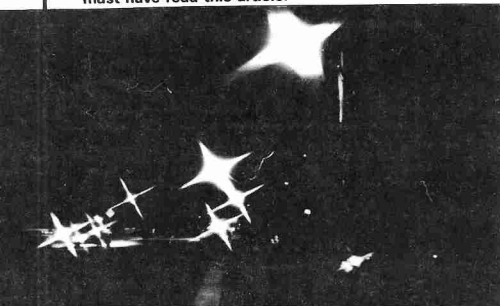
Simulates the effect of a fluorescent lamp starting or the flickering of one with a fault.

REALITY is the keynote with this project.

It is a simple yet clever circuit to provide the flickering effect of a fluorescent tube, when it is first switched on. The clever part of the circuit is the type of lamp it drives. We are producing the flicker from a normal incandescent lamp!

Imagine the reaction when you ask your friend to turn on the street lights on your layout. He will not realize you have installed 3 Fluoro Simulator units and connected them to a row of model fluorescent street lights.

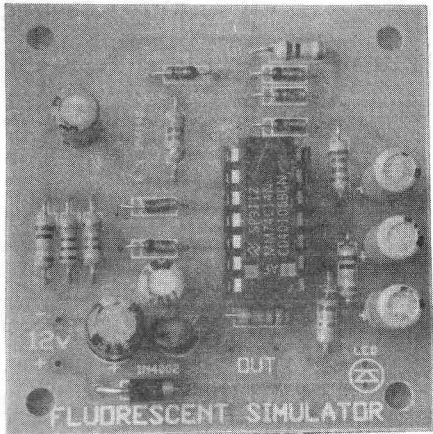
The lamps flicker, flicker, flicker then come on... exactly like real fluoro's! If he isn't surprised... he must have read this article.



HOW IT WORKS

The Fluorescent Simulator is built around a 74c14 Schmitt Trigger. See the explanation of the operation of the chip in the Warning Lamp Flashing Unit.

The circuit can be divided into several sections to make explaining how it works easier.



Four of the six Schmitt Trigger inverters are wired as oscillators, each having a different frequency as determined by the resistor and capacitor in the R-C network.

The second section is an OR gate followed by an inverter. It consists of four diodes, a 100k pull-down resistor and one inverter. The outputs of the four oscillators are fed into this OR gate.

The percentage of time when four independent oscillators are LOW, is very small. And to make it more interesting, these pulses are of random duration. We invert these pulses to produce short ON times for the lamps.

The sixth Schmitt inverter is wired as a delay. When power is first applied to the circuit, the 4.7mfd electrolytic is uncharged, holding the input (pin 13) of the inverter HIGH.

The output (pin 12) will be LOW. The 4.7mfd electrolytic charges slowly through the 1M resistor and as the voltage on the input passes the lower threshold of the Schmitt inverter, the output will go HIGH.

The output of this delay, and the 'flicker' circuit, are gated together via D5 and D6 into the driver transistor.

This gate passes the signal from the flicker circuit while the output of the delay is LOW, but when the output of the delay goes HIGH, the flicker circuit has no more effect. The result is the output of the gate remains HIGH.

Any lamp connected to this circuit will flicker for a length of time at switch-on and then remain lit.

If you wish to simulate a 'dead' fluorescent, leave out D5 (which is marked by two circles on the component overlay on the PC). This will disconnect the output of the delay from the gate and means that the flicker signal will be present at the output for the full length of time.

The fluorescent Simulator is built on a PC board 5cm x 5.5cm. This can be made smaller but our size makes construction easy.

First solder the diodes. Make sure they are the right way around. Decide if you want the unit to simulate a working or non-working fluorescent. Leave out the diode marked by two circles as explained previously. Next solder the resistors, then the IC socket, the transistor and the electrolytics and finally the light emitting diode.

Don't forget to insert the IC into the socket.

Quite often the lamps are not visible when you are working on the electronics under the layout. The LED on the PC board is used as an indicator lamp. It will help to test the unit before wiring it into the layout and also serve as a test-lamp when trouble-shooting.

1 - 1k
1 - 4k7
1 - 47k
1 - 68k
3 - 100k
1 - 150k
1 - 1M

4 - 2.2mfd electro's
1 - 4.7 mfd electro
1 - 100 mfd electro

1 - 1N4002 diode
6 - 1N914 diode

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- 1 - 4k7
- 1 - 47k
- 1 - 68k
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- 1 - 150k
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- 1 - 100 mfd electro

- 1 - 1N4002 diode
- 6 - 1N914 diode

- 1 - 3mm LED
- 1 - BC 547 transistor
- 1 - 74c14 or CD 40106 IC
- 1 - 14 pin IC socket
- 1 - PC board "FLUORESCENT SIMULATOR"

