In-Circuit Digital IC Tester

Yet another cheap, easy and useful test device from ETI.

THIS VERY SIMPLE project allows digital integrated circuits to be tested, whilst in circuit.

Using an ic test clip clamped over the device to be tested, a series of Light Emitting Diodes indicate whether the pins on the ic are going high, low, or switching. Working with a manual or data sheet for the particular ic, this LED indication will show how the ic is functioning.

The standard project uses a 16 pin test clip, allowing up to 18 pin devices to be checked. This can be done by applying the clip in two stages, so as to cover all the pins. The same method will allow you to check 40 pin devices using a 24 pin clip. Due to changes in ic width versus pin numbers, different size clips are necessary.

The project can be used on digital ic's from 5 Vdc to 22 Vdc (on the pins). The current rate is set at 3 mA for 5 Vdc, and 20 mA for 22 Vdc. Note: Inputs and outputs below 3 mA may not have sufficient current to light the LED — but if there is less than 3 mA going to the ic then it probably wouldn't trigger anyway.

Voltages below 1.8 Vdc are considered "lows", and greater than 2 Vdc are considered "highs". The trigger voltages for the LED's are provided by the ic pins switching high or low.

By using a data reference for the ic being checked (this can come from the circuit or a data manual) it is possible to establish if the ic is functioning correctly.

HOW TO USE

Clip the test clip onto the ic — making sure that pin 1 of the ic matches pin 1 of the clip.

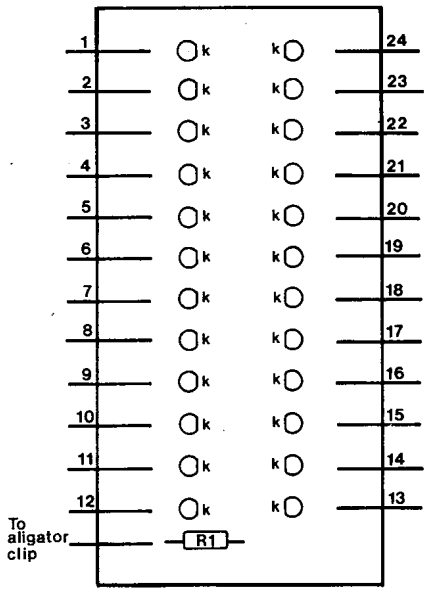
Any lit LED means that on that pin there is a high, unlit LED's infer a low, and flickering LED's indicate that the pin is switching high/low.

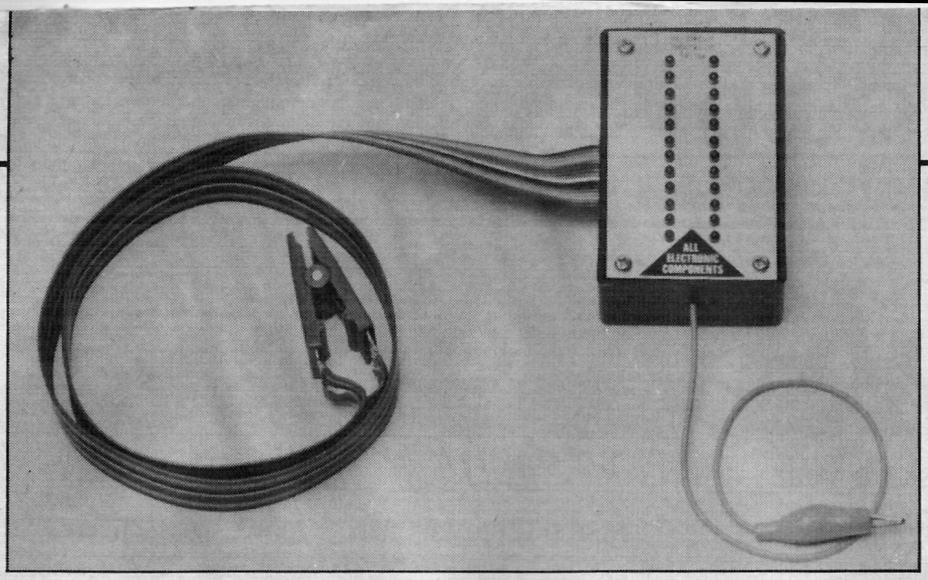
Ic's with the same body width as the test clip being used, but with a greater number of pins, require two stage checking. Follow the above procedure, and after testing the first 16 or 24 pins, remove the clip and re-clamp it onto the remaining pins.

CONSTRUCTION

Construction is very simple, and has been made easier through the use of a Printed Circuit Board. Start by soldering R1 (1k2 1 Watt) onto the pc board. Next, place the LED's on the board but do not solder yet. Push the LED's into the panel (prepunched) ensuring that they have a firm, tight fit, and are all level. Wriggle the pc board down the LED leads as far as possible to the bases of the LED's. Now solder the LED's.

Cut a slot, or drill a hole in the side of the case to accept the rainbow cable. Then drill a small hole for the common flying





lead. On the lead, solder the alligator clip on one end, and the other end to the board.

Solder the rainbow cable to the test clip — we found it best to solder the first wire to pin 1 of the clip, and the second wire to the pin opposite pin 1, and so on. This avoids bending and twisting the cable. With a black marker pen or texta, mark pin 1 of the test clip for identification.

All that remains is to solder pin 1 of the test clip to the pc board on LED 1, and so on.

To check that the unit is functioning correctly, use a supply between 5 Vdc and 20 Vdc — a 9V battery will do. Clip the alligator clip to the negative terminal of the supply and check that the correct LED lights with the correct pin on the test clip, from the positive of the supply. ●

PARTS LIST
ETI-184

R1 1k2 1 watt 5% Resistor
LED1-24 3mm Red LED
PCB AEC 87-5-1 Single-sided tinned.
PANEL Silk-screened aluminium.
TC1 16 pin ic Test Clip.
CASE UB5
MISCELLANEOUS 1 metre 24 way Rainbow cable, 1 metre hook-up wire, Alligator clip, solder.

This project was designed by the technical staff at All Electronic Components.