Circuit & Design Ideas

Interesting circuit ideas from readers and technical literature. While this material has been checked as far as possible for feasibility, the circuits have not been built and tested by us. As a consequence, we cannot accept responsibility, enter into correspondence or provide constructional details.

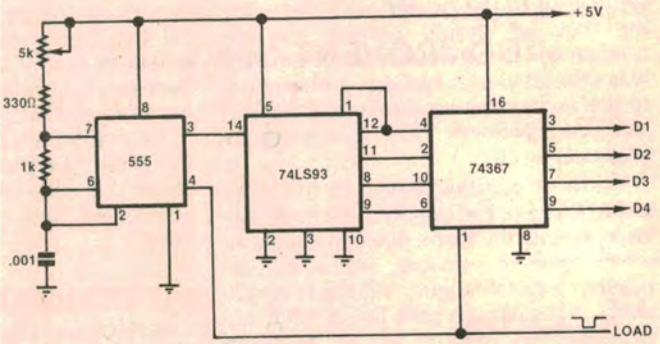
Bliss is a random number generator with 3 ICs

From experience with many "pseudo–random" number programs it has been found that most are not sufficiently random to provide universal application. Here is a design for a random number generator. which may be used with almost any microcomputer.

It will be seen that the 555 timer is connected as a free-running multivibrator, whose output is applied to the input of 74LS93 4–bit binary counter. By connecting its Qa output (pin 12) to its B input (pin 1), it functions as a divide-by-sixteen counter, with its binary outputs being fed to four data inputs of a 74367 Tri-State hex buffer.

Normally the 555 is oscillating freely with the device counting through the numbers at a high speed; if suddenly stopped the resulting number is truly random. If accessed by a computer, a negative load pulse is applied to the system such that it simultaneously inhibits oscillation of the 555 (via its RESET input), and loads the random number onto the data buses – through the load pulse being fed to the control input(pin1) of the Tri–State 74367.

This circuit generates random 4-bit numbers which can be loaded directly onto a computer data bus.



G. Hausfeld,
Gunnedah, NSW.

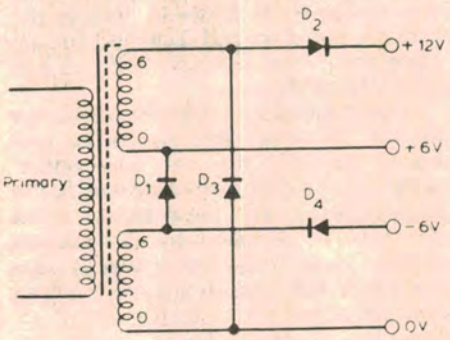
One transformer, two secondaries, three supply rails . . .

Some devices such as the 710 comparator and 1496 balanced modulator need three separate supply rails, with differing current requirements.

In order to solve this problem a more complex and therefore more costly power transformer is often required, or alternatively the use of two separate transformers.

The accompanying circuit shows a method whereby a transformer with only two secondary windings can provide the three rails required.

In the circuit shown the positive six-volt rail can provide substantial current whilst the other two rails cater for smaller loads. It can be seen that during positive half-cycles the lower winding feeds the +6V rail via D1, and the two windings in series feed the +12V rail via D1 and D2; whilst diodes D3 and D4 are biassed off. During negative half-cycles D1 and D2 are biassed off. The upper winding now feeds the +6V rail with a return via D3, whilst the lower winding feeds the −6V rail via D4.



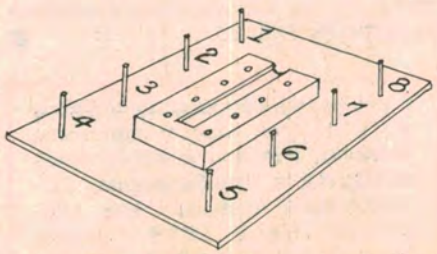
Therefore the +6V rail is fed during both half-cycles by the two secondary windings alternately, ie full-save rectification; and both low current rails are fed on alternate half-cycles only, ie half-wave rectification. Naturally the voltages shown increase when filter capacitors are added to provide an adequate ripple margin for the ensuing regulators.

From "Wireless World",
March, 1980.

Hey diddle diddle, it only costs a little . . .

DIL sockets mounted on 50mm squares of scrap copper-clad pc board, with the board being etched to connect each contact of the socket to pins or turret lugs at the perimeter of the board, make useful gadgets for the experimenter. No mechanical damage is inflicted on the integrated circuit, so that it can be salvaged for use in the final product.

These "diddle boards" may be interconnected with clip leads whilst experimenting, and allow for instant changes to the circuit. It is advisable to fabricate several boards in both 8, 14 and 16 pin DIL, and also 8 and 10 pin TO configurations, so that full use can be made of this "diddle" system.



From "Break-In" (NZART journal),
December, 1980.

PSST! Got any neat circuit ideas? Why not send 'em in to us? We pay between $5 and $20 per item, depending on how much work we have to do to publish it.