

divide by 1 to 10

Using the CD4017AE (COS/MOS integrated circuit RCA) it is possible to make a universal frequency-divider that will divide by any number from one to ten.

If a square wave is presented to the 'clock' input while the 'reset' input is connected to circuit 'ground', a square wave output at one tenth of the clock frequency will appear at pin 12 (the 'carry out'). Each positive-going edge of the clock signal will cause the outputs 0 to 9 in turn to assume the value '1' for a single clock period. Suppose for example that the first positive-going edge of the clock signal has caused output 0 (pin 3) to become '1' – all the other outputs are then '0' – the next positive-going edge will cause output 1 (pin 2) to become '1' and output 0 to return to '0'. Since the outputs 0 to 9 act as a kind of shift register the circuit can easily be made to divide by any whole number from 2 to 9. All that is necessary is to interconnect the output having the desired number with the reset input (pin 15). If the reset is obtained from output 7 (pin 6) for example, the IC will always count up to 7. Any of the earlier intermediate outputs (in this example 1 to 6) can be used as the output of (in this case) the divide-by-seven. Note that the value of load resistance applied to any output must not be less than 47 k Ω .

If any output is required to drive TTL, the simple buffer stage shown connected to output 4 can be used.

