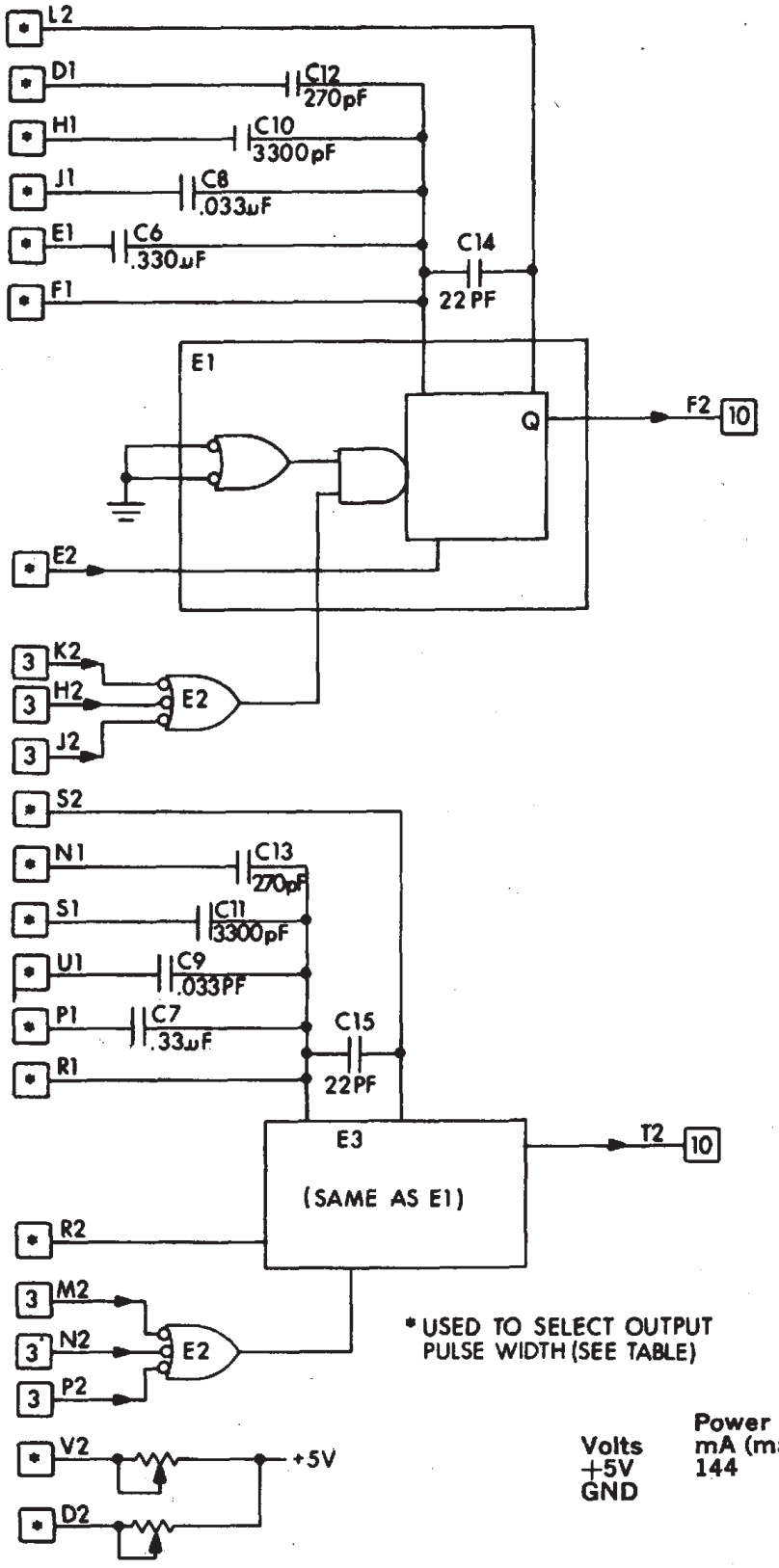
M3020
DUAL DELAY MULTIVIBRATORS

TIME RELATED

M SERIES



* USED TO SELECT OUTPUT PULSE WIDTH (SEE TABLE)

Volts	Power mA (max.)	Pins
+5V	144	A2
GND		C2, T1

The M3020 Module contains two monostable multivibrators, each of which is activated by the output of a Schmitt Trigger circuit. A low input transition on any one of the three inputs to the Schmitt Trigger circuit produces a positive output pulse and triggers the multivibrator. The Schmitt Trigger circuit provides a hysteresis current which prevents the multivibrator from being triggered erroneously by noise signals at the input.

When activated, the multivibrator produces a positive pulse at the output. The width of the pulse is variable from 50 ns to 40 sec and is selected by the external connections to capacitors mounted on the M3020 and by the variable Vcc available.

The M3020 contains two delays (one-shot multivibrators) which are triggered by a level change from HIGH to LOW or a pulse to LOW whose duration is equal to or greater than 50 ns. When the input is triggered, the output changes from LOW to HIGH for a predetermined length of time and then returns to LOW.

The delay time is adjustable from 50 ns to 7.5 ms using the internal capacitors and can be extended by adding an external capacitor.

APPLICATIONS

- Time delays
- Variable width pulses

FUNCTIONS

Delay Range: The basic DELAY RANGE is determined by an internal capacitor. The delay range may be increased by selection of additional capacitance which is available by connecting various module pins or by the addition of external capacitance. An internal potentiometer can be connected for fine delay adjustments within each range or an external resistance may be used. If an external resistance is used, the combined resistance of the internal potentiometer and the external resistance should be limited to 10,000 ohms.

Delay Range	Capacitor Value (Internal)	Interconnections Required	
		Delay E1	Delay E3
50 ns — 750 ns	22 pF	None	None
500 ns — 7.5 μs	270 pF	D1 — L2	N1 — S2
5 μs — 75 μs	3300 pF	H1 — L2	S1 — S2
50 μs — 750 μs	.033 μF	J1 — L2	U1 — S2
500 μs — 7.5 ms	.33 μF	E1 — L2	P1 — S2

Adjustable Delays: Connect pins D2 to E2 for delay 1 and V2 to R2 for delay 2 in order to add the internal potentiometers. NOTE: If there is no external pot, these pins must be jumpered.

Without a potentiometer, the delay will not recover. An external potentiometer of less than 10 K ohms can be used by connecting it between E2 or R2 and ground pin C2. Use of an external adjustment resistor will cause some increase in jitter. It is recommended that leads to an external potentiometer be twisted pairs and as short as possible.

PRECAUTIONS
Care should be exercised in the selection of external capacitors to assure low leakage as leakage will affect the time delay.

SPECIFICATIONS
Trigger Input Fall Time: Must be less than 400 ns

Recovery Time: Defined as the time all inputs must remain HIGH before any input goes LOW to trigger the delay

1. Without external capacitance: 30 ns min.
2. With external capacitance: 300 C ns min. where C is in nanofarads