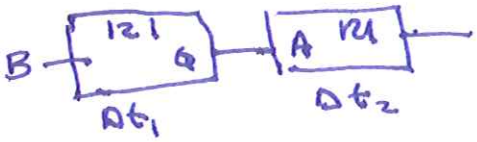
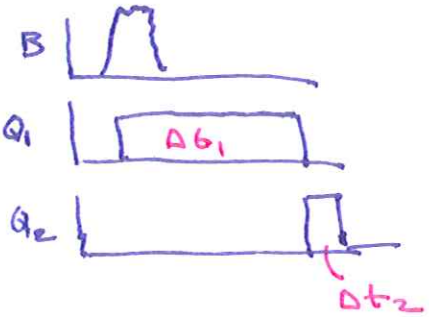
Notes: monostable aka one shot →

121: hysteresis on B ↓ ; digital ↓ on A1 & A2
no retrigger $\Delta t \approx .7RC$

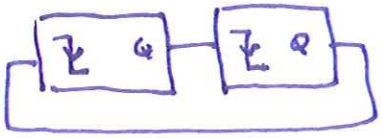
122/3 : retriggering

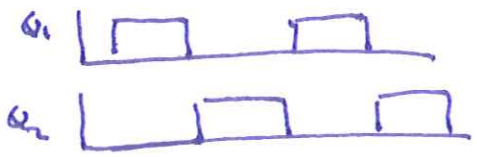
Pulse delay





clock

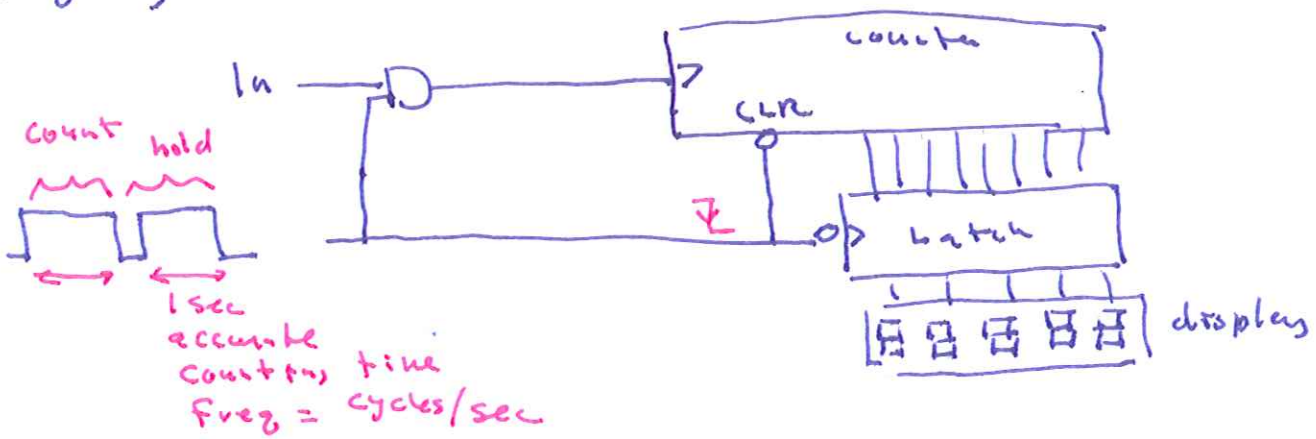




555: clock or mmostable (see following)

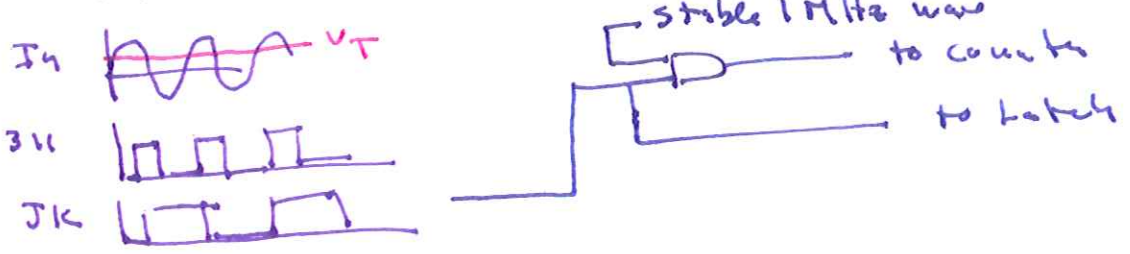
VCO: Voltage Controlled Oscillator ($f \propto V_{in}$)
(good for FM)

Frequency Meter



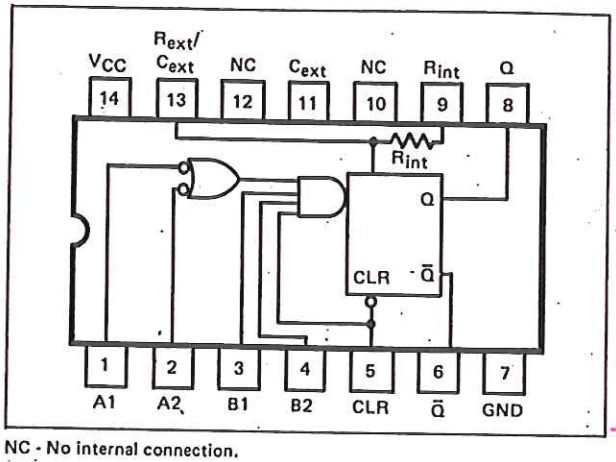
Note: Accurate clocks via quartz oscillators HH 5.19

Period Meter: mostly as above. Convert wave to square wave with ½ freq → comparator + JK to toggle

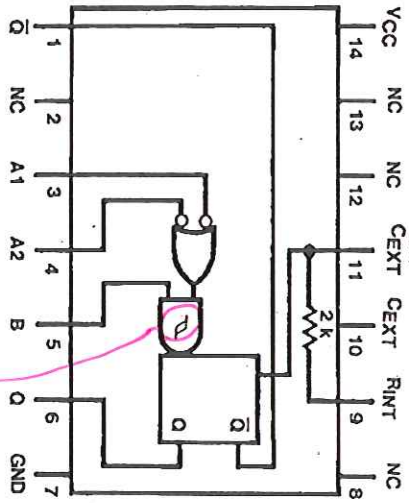


SN54LS122, SN74LS122

(TOP VIEW) (SEE NOTES 1 THRU 4)



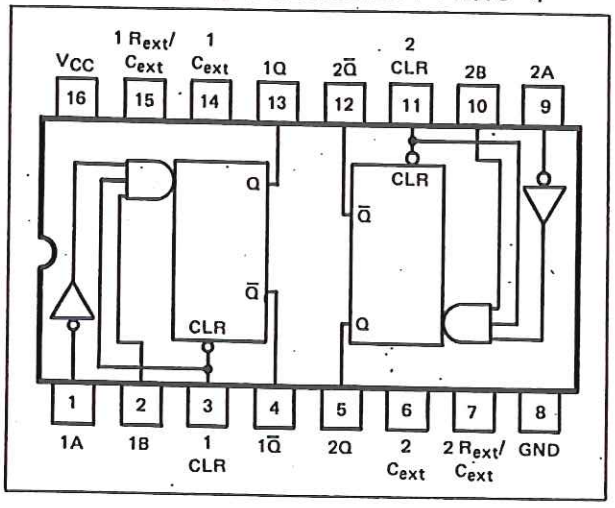
NC - No internal connection.



hysteresis symbol

SN54LS123, SN74LS123

(TOP VIEW) (SEE NOTES 1 THRU 4)

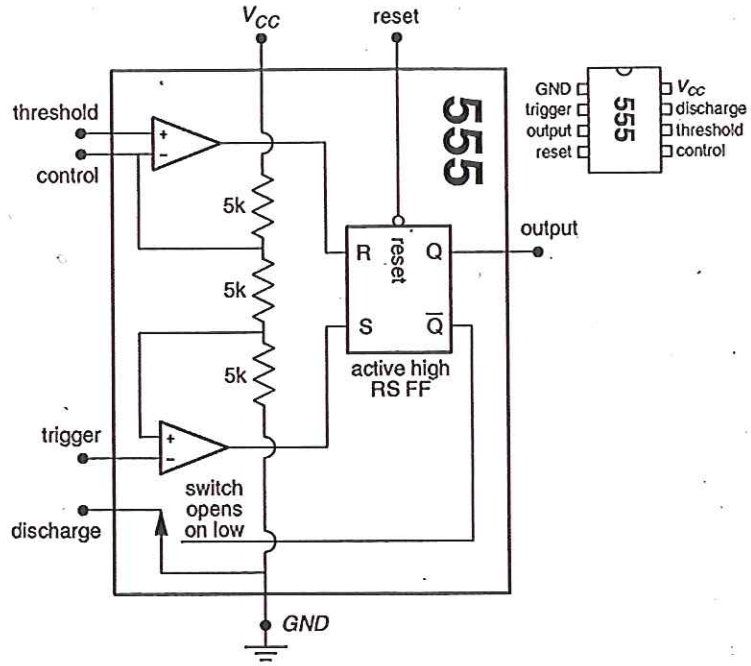


Function Table

Inputs			Outputs	
A1	A2	B	Q	$\overline{Q}$
L	X	H	L	H
X	L	H	L	H
X	X	L	L	H
H	H	↑	⊓	⊔
H	↓	H	⊓	⊔
↓	H	H	⊓	⊔
L	X	↑	⊓	⊔
X	L	↑	⊓	⊔

H = HIGH Logic Level
L = LOW Logic Level
X = Can Be Either LOW or HIGH
⊓ = A Positive Pulse
⊔ = A Negative Pulse

↑ = Positive Going Transition
↓ = Negative Going Transition



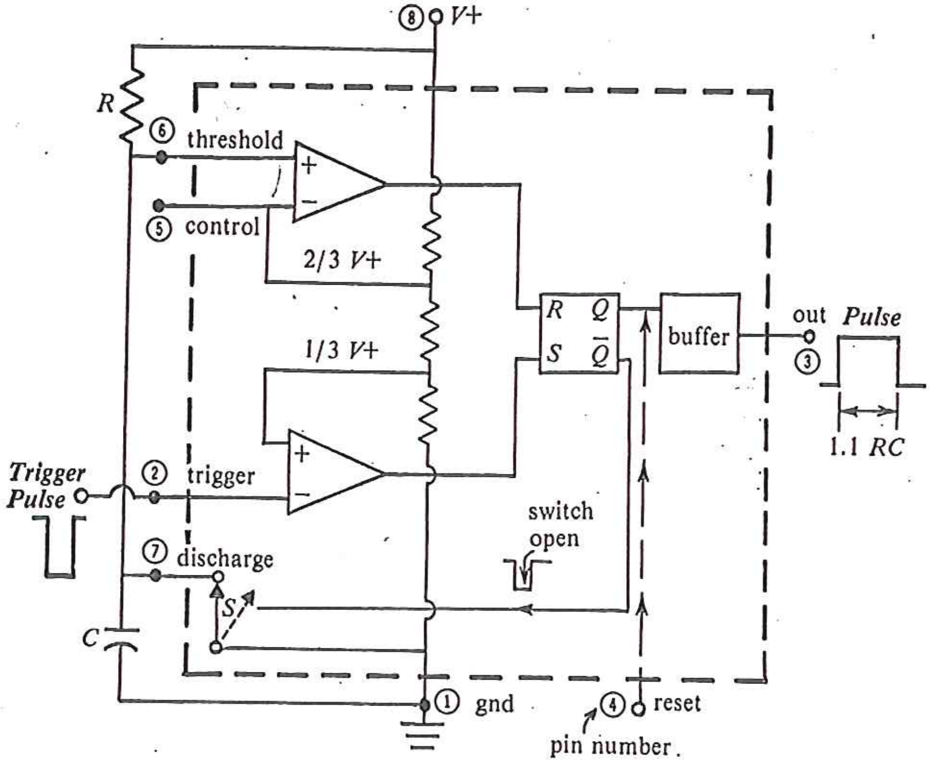


FIGURE A7–12. *Multivibrator Circuit with Monostable Connection*

Remark: if trigger $> \frac{1}{3}$ V $S = 0$ } together to hold
if threshold $< \frac{2}{3}$ V $R = 0$ }

$Q = 0 \Rightarrow \bar{Q} = 1 \Rightarrow$ discharge connected to GND

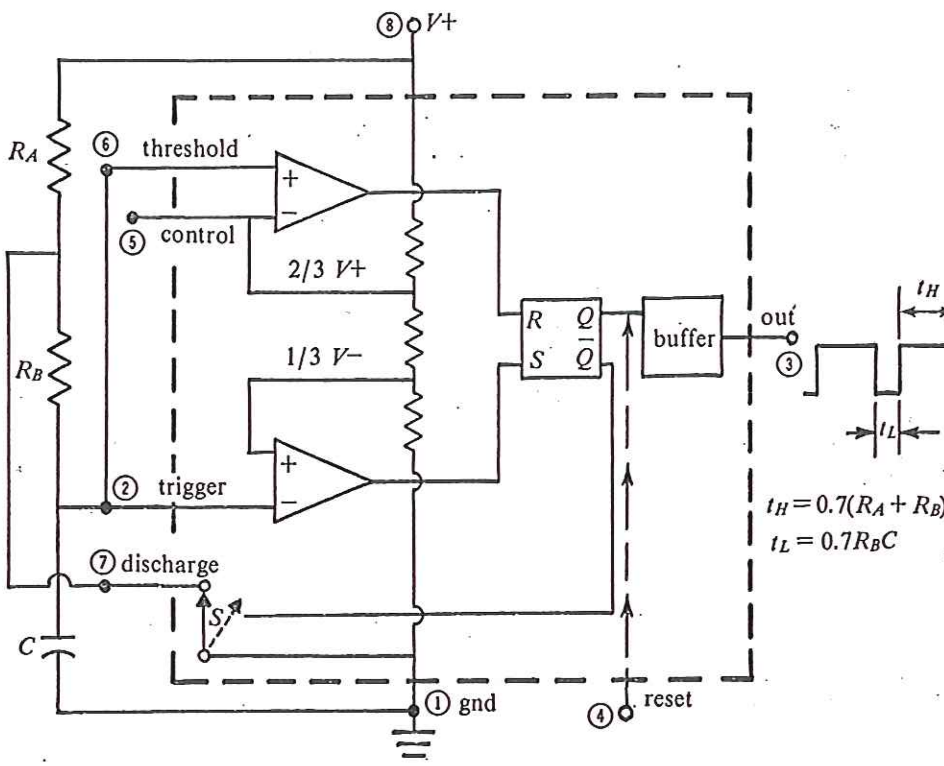


FIGURE A7–15. *555 Multivibrator Circuit with Astable Connection*

initially $Q=0 \rightarrow \bar{Q}=1 \Rightarrow$ switch closed
capacitor discharged $\Rightarrow$ threshold ~~@ 0V~~
top comparator NOT satisfied $\Rightarrow R=0$
Trigger High $\Rightarrow$ bottom comparator NOT
satisfied $\Rightarrow S=0$ (hold state) when
trigger goes below $\frac{1}{3}$ V $\Rightarrow$ comparator
satisfied $\Rightarrow S=1$ (set state) $Q=1$
$\bar{Q}=0 \rightarrow$ switch open capacitor
starts charging thru R. (if Trigger
returns High back to hold) charging
continues until threshold $> \frac{2}{3}$ V $\rightarrow R \rightarrow 1$
$\rightarrow Q=0 \rightarrow \bar{Q}=1 \rightarrow$ switch closed
capacitor discharges

Initially $Q=0 \rightarrow \bar{Q}=1 \rightarrow$ switch closed, capacitor discharged
trigger/threshold GND. Top comparator NOT satisfied
$R=0$; Bottom comparator satisfied $\rightarrow S=1 \rightarrow Q=1$
$\bar{Q}=0$ switch opens & capacitor starts charging thru
$R_A + R_B$. when trigger/threshold $> \frac{1}{3}$ V Bottom comparator
Not satisfied $\Rightarrow S=0$ (hold state). when trigger/
threshold $> \frac{2}{3}$ V top comparator satisfied $\rightarrow R=1 \rightarrow Q=0$
$\rightarrow \bar{Q}=1 \rightarrow$ switch closes $\rightarrow$ capacitor discharges thru
R_B. As long as capacitor voltage between $\frac{1}{3}$ V & $\frac{2}{3}$ V
$R=S=0$ (hold) but when capacitor voltage $= \frac{1}{3}$ V
$S=1$ (set) $\rightarrow$ switch opens $\rightarrow$ capacitor charges until $\frac{2}{3}$ V.