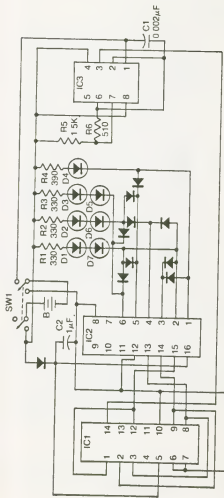


Fig. 25-1. Electronic roulette wheel counter decoder logic.



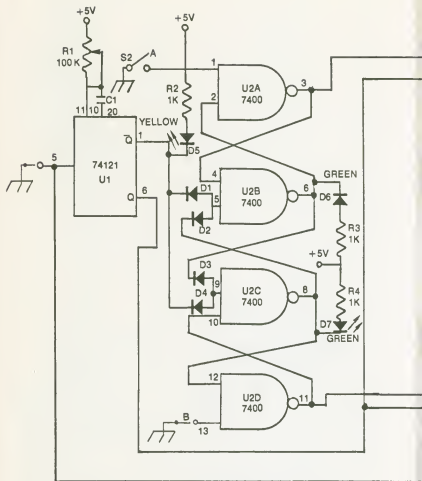
LED DISPLAY	IC1		IC2	
	PIN	PIN	PIN	LOW
1	0	0	1	
2	1	0	2	
3	0	1	0	3
4	1	1	0	4
5	0	0	1	5
6	1	0	1	6

PARTS LIST

- IC1 7490 decade counter IC
 IC2 7445 or 74175 BCD to Decimal IC
 IC3 555 timer IC
 D1-D7 (7) LEDs Motorola MLED 650, Hewlett Packard 5082-4882 or similar
 Unmarked Diodes (10) 1N914s or 1N4148s or similar
 R1-R3 (3) 330Ω, 1/2W
 R4 390Ω, 1/2W
 R5 1.5K, 1/2W
 R6 510Ω, 1/2W
 C1 0.002 µF, 5V or greater
 C2 1 µF, 6V
 Battery
 SW1
 Misc

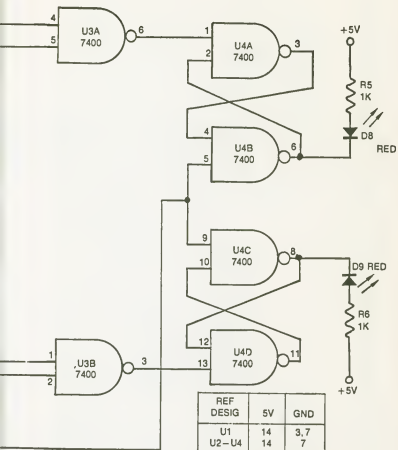
- (4) Penrite cells in series
 Double Pole Double Throw, make before break (see text)
 Wire, circuit board material or perforated board.
 IC socket, battery holder, plastic box

Fig. 25-2. Schematic of the digital electronic die.



C1	1	20 μ F, 25 V dc	R1	1	100,000 OHMS, VARIABLE
D1-D4	4	GENERAL PURPOSE	R2-R6	5	1000 OHMS, 1/8 WATT
D5	1	LED, YELLOW	S1, S2, S3	3	SPST, NORMALLY OPEN
D6, D7	2	LED, GREEN	U1	1	74121 MONOSTABLE MULTIVIBRATOR
D8, D9,	2	LED, RED	U2, U3, U4	3	7400 QUAD 2-INPUT NAND GATE

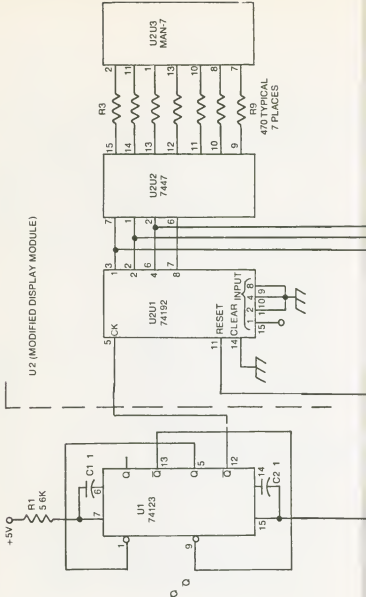
Fig. 25-3. Two players can test their reaction time with this reflex game. These cross coupled NAND gates make up a common form of latch circuit.



UNLESS OTHERWISE INDICATED:

A. ALL RESISTANCE IN OHMS

B. ALL CAPACITANCE IN mF



U2 (MODIFIED DISPLAY MODULE)

470 TYPICAL
7 PLACES



C1, C2	4	1 μ F, 12 V
C3	2	20 μ , 12 V
R1, R2	4	5600 OHMS, 1/8 WATT
R3 - R9	14	470 OHMS, 1/8 WATT
U1	2	DUAL RETRIGGERABLE MULTIVIBRATOR
U2	2	BCD1 DECADE COUNTER
U2U2	2	BCD TO 7-SEGMENT DECODER/DRIVER
U2U3	2	MAN-7, 7-SEGMENT LED DISPLAY
U2U4	1	TRIPLE 3-INPUT NAND
-	1	POWER SOURCE AS DESIRED
-	-	PACKAGING AS DESIRED

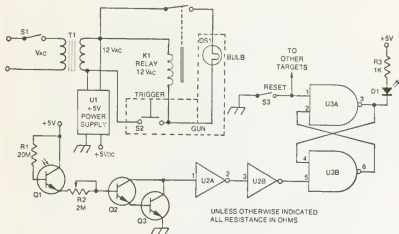
UNLESS OTHERWISE INDICATED:

A ALL RESISTANCE IN OHMS

B ALL CAPACITANCE IN μ F

REF DESIG	+ 5	GND
U1	16	8
U2U1	16	8
U2U2	16	8
U2U3	3, 14	-
U2U4	14	7

Fig. 25-4. Electronic dice update this ageless game for home entertainment. Multivibrator U1 increments a display module modified to count from 1 to 6, corresponding to the spots on a die. The NAND gate senses a 7 to reset the counter to 1. The final count is determined by the multivibrator discharging capacitor C3.



UNLESS OTHERWISE INDICATED
ALL RESISTANCE IN OHMS

DS1	1	12 VOLT BULB
K1	1	12VAC TIME DELAY RELAY, N O
S1	1	SPST POWER SWITCH
S2	1	SPST PUSHBUTTON N O
T1	1	110V/12V TRANSFORMER
U1	1	5 VOLT POWER SUPPLY
-	-	WOOD AND PLASTIC FOR TARGET, GUN AND BAR
-	-	VECTORBOARD AND TERMINALS

THE FOLLOWING PARTS ARE REQUIRED FOR EACH TARGET:

D1	1	LED MEDIUM RED
Q1	1	FTP-100 PHOTOTRANSISTOR
Q2, Q3	2	2N3568
R1	1	20 MEGOHM, 1/8 WATT
R2	1	2 MEGOHM VARIABLE
R3	1	1000 OHMS, 1/8 WATT
S3	1	SPST PUSHBUTTON, N O
U2	*	7404 HEX INVERTER
U3	*	7400 QUAD 2-INPUT NAND

* EACH TARGET REQUIRES 2 INVERTERS
AND 2 NAND GATES

Fig. 25-5. Each target for the shooting gallery requires a duplicate of circuits related to phototransistor Q1 and LED D1. Only one gun is required.