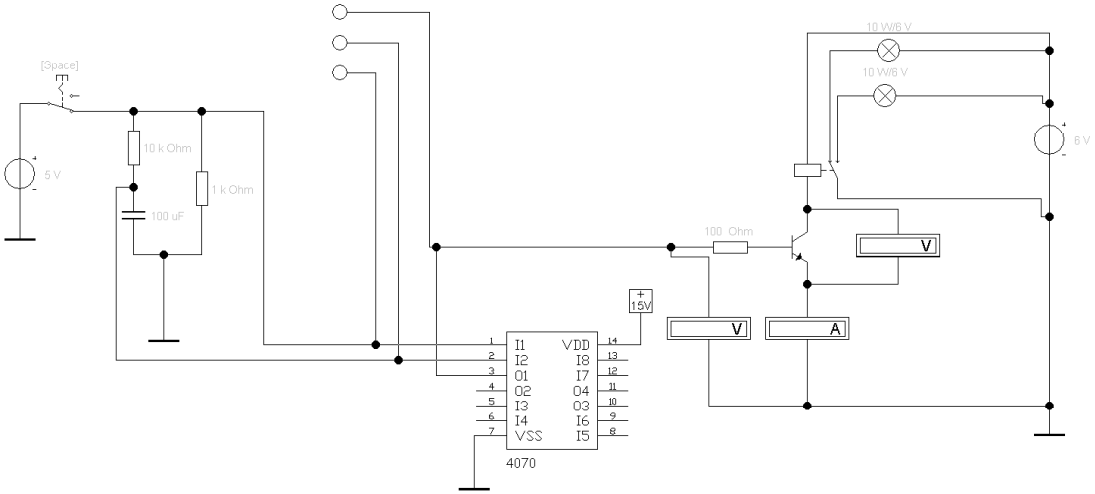

Parts list

Description	Quantity	Reference ID
+Vdd Voltage Source, ideal	1	U18
4070 (Quad 2-In XOR), ideal	1	U21
Ammeter, 1mΩ, DC	1	M2
Battery, 5V	1	V1
Battery, 6V	1	V2
Blue Probe, ideal	1	U23
Bulb, 10W, 6V	2	R10, R9
Capacitor, 100µF	1	C1
Connector	15	
Green Probe, ideal	2	U25, U24
Ground	4	0
NPN Transistor, ideal	1	Q1
Node	11	
Relay, ideal	1	R8
Resistor, 1kΩ, 0Ω/℃, 0Ω/℃²	1	R3
Resistor, 100Ω, 0Ω/℃, 0Ω/℃²	1	R6
Resistor, 10kΩ, 0Ω/℃, 0Ω/℃²	1	R2
Switch, [Space]	1	S1
Voltmeter, 1MΩ, DC	2	M3, M1

Digital Model "ideal" Library "default"

VOH	High output level	5	V
VOL	Low output level	0	V
VIH	High-level input voltage	2.5	V
VIL	Low-level input voltage	2.5	V
TPLH	Propagation delay time, low-to-high level output	1e-08	s
TPHL	Propagation delay time, high-to-low level output	1e-08	s
VTG	Threshold voltage	2.5	V

NPN Transistor Model "ideal" Library "default"

IS	Saturation current	1e-16	A
ßF	Forward current gain coefficient	100	
ßR	Reverse current gain coefficient	1	
RB	Base ohmic resistance	0	Ω
RE	Emitter ohmic resistance	0	Ω
RC	Collector ohmic resistance	0	Ω
CS	Substrate capacitance	0	F
CE	Zero-bias B-E junction capacitance	0	F
CC	Zero-bias B-C junction capacitance	0	F
φE	B-E junction potential	0.75	V
φC	B-C junction potential	0.75	V
τF	Forward transit time	0	s
τR	Reverse transit time	0	s
ME	B-E junction grading coefficient	0.33	
MC	B-C junction grading coefficient	0.33	
VA	Early voltage	1e+30	V
ISE	Base-emitter leakage saturation current	0	A
IKF	Forward beta high-current knee-point	1e+30	A
NE	Base-emitter leakage emission coefficient	1.5	
NF	Forward current emission coefficient	1	
NR	Reverse current emission coefficient	1	
VAR	Reverse early voltage	1e+30	V
IKR	Reverse beta roll-off corner current	1e+30	A
ISC	B-C leakage saturation current	0	A
NC	B-C leakage emission coefficient	2	
IRB	Current for base resistance equal to (rb+RBM)/2	1e+30	A
RBM	Minimum base resistance at high currents	0	Ω
XTF	Coefficient for bias dependence of τF	0	
VTF	Voltage describing VBC dependence of τF	1e+30	V
ITF	High-current dependence of τF	0	A
PTF	Excess phase at frequency equal to 1/(τF*2PI) Hz	0	Deg

XCJC	Fraction of B-C depletion capacitance connected to internal base node	1	
VJS	Substrate junction built-in potential	0.75	V
MJS	Substrate junction exponential factor	0	
XTB	Forward and reverse beta temperature exponent	0	
EG	Energy gap for temperature effect on IS	1.11	eV
XTI	Temperature exponent for effect on IS	3	
KF	Flicker noise coefficient	0	
AF	Flicker noise exponent	1	
FC	Coefficient for forward-bias depletion capacitance formula	0.5	
TNOM	Parameter measurement temperature	27	℃

Relay Model "ideal" Library "default"

LC	Coil inductance	0.001	H
ION	Turn-on current	0.05	A
IHD	Holding current	0.025	A
RC	Coil resistance	1e-06	Ω