

Video Car-Racing Game

Here's a simple and inexpensive car-racing game for video game addicts, the construction of which will save regular visits to video game parlours and the consequent recurrent expenses. Though the mode of its operation is quite different from the actual video game equipment, this game will pro-

vide much the same excitement as the rules of the game are same.

The model

The game should be housed in an enclosure which is fitted

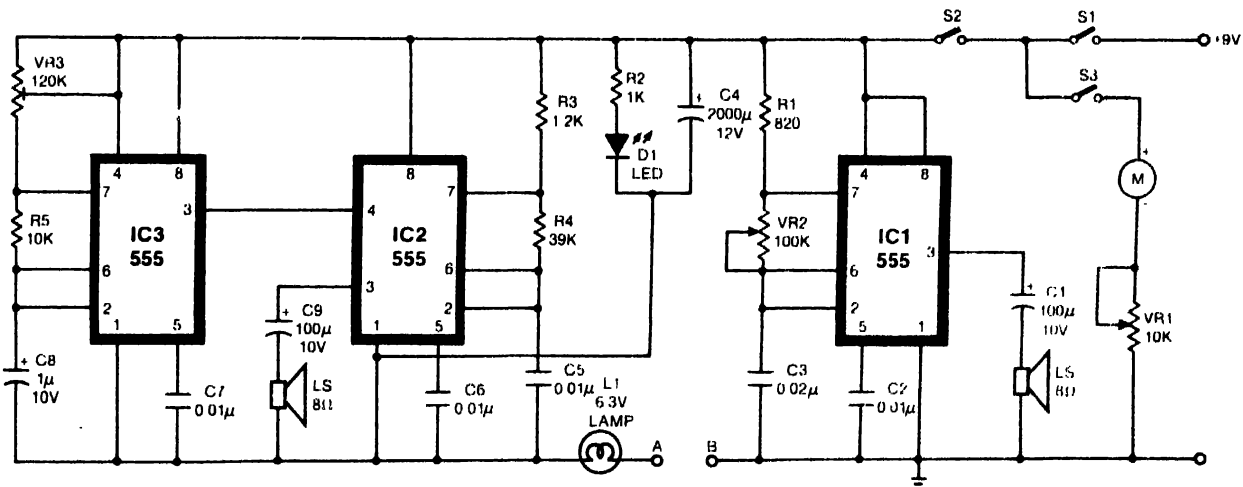


Fig. 1: Circuit diagram for car-racing video game.

PARTS LIST

Semiconductors:

IC1, IC2, IC3 NE-555 timer
D1 5mm light emitting diode

Resistors (all 1/4 watt, ±5% carbon):

R1 820-ohm
R2 1-kilohm
R3 1.2-kilohm
R4 39-kilohm
R5 10-kilohm
VR1 10-kilohm linear potentiometer
VR2 100-kilohm linear potentiometer
VR3 150-kilohm preset

Capacitors:

C1, C9 100μF, 10V electrolytic
C2, C5, C6, C7 0.01μF ceramic disc
C3 0.02μF ceramic disc
C4 2000μF, 12V electrolytic
C8 1μF, 10V electrolytic

Miscellaneous:

LS1, LS2 8-ohm tweeter
L1 6.3V, 0.5A miniature lamp
M 9-volt DC motor (without governor)
tinned copper wire, polythene sheet, aluminum toy cars or sheet, typewriter ribbon spools, metallic roller, suitable enclosure, hardware etc.

with a screen (a hard polythene sheet), a steering wheel and some controls, as shown in Fig. 2(a).

The steering wheel arrangement is to be fashioned out of two typewriter ribbon spools, potentiometer VR2, an aluminium rod shaped as a steering wheel and a thin but strong copper wire, as shown in Fig. 2(b). The potentiometer's spindle may be ganged with the steering wheel so that the two rotate together.

In the middle of the copper string over the spools, a fancy racing car should be suspended. The 2cm car should be of aluminium sheet with copper bristles underneath, as shown in Fig. 2(c). The bristles can be charged through the copper wire.

All these should be fixed in the cabinet such that the racing car is seen moving across the screen on turning the steering wheel.

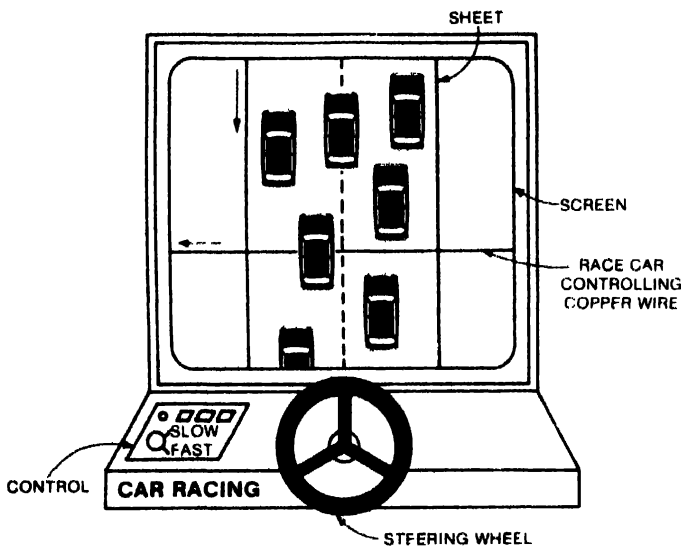


Fig. 2(a): Front view of the prototype.

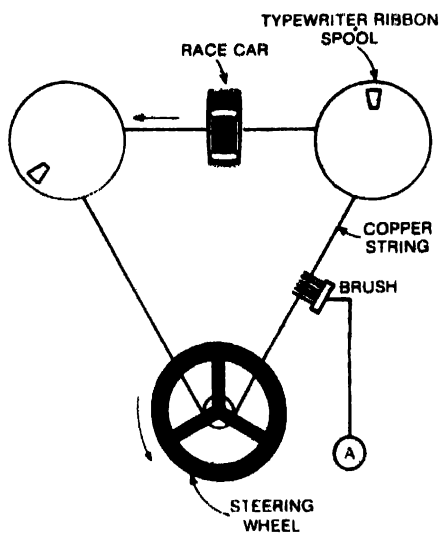


Fig. 2(b): Typical threading system for steering wheel arrangement.

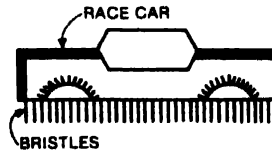


Fig. 2(c): Front view of the race car.

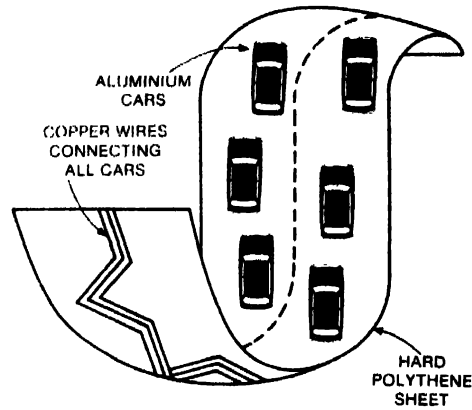


Fig. 2(d): Construction of road using polythene sheet.

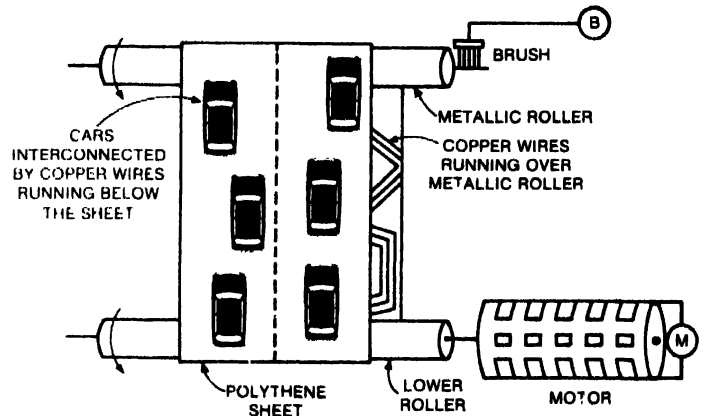


Fig. 2(e): Schematic showing the arrangement of polythene sheet over the metallic roller.

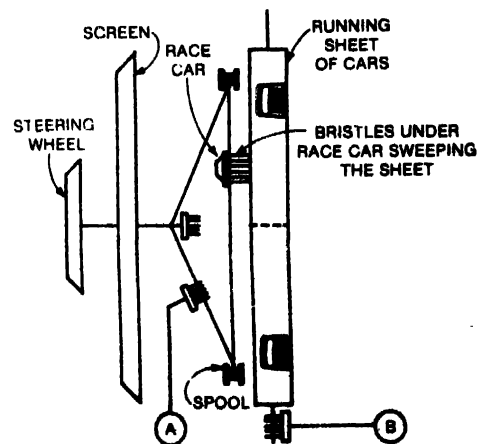


Fig. 2(f): Upper view of the mechanical assembly.

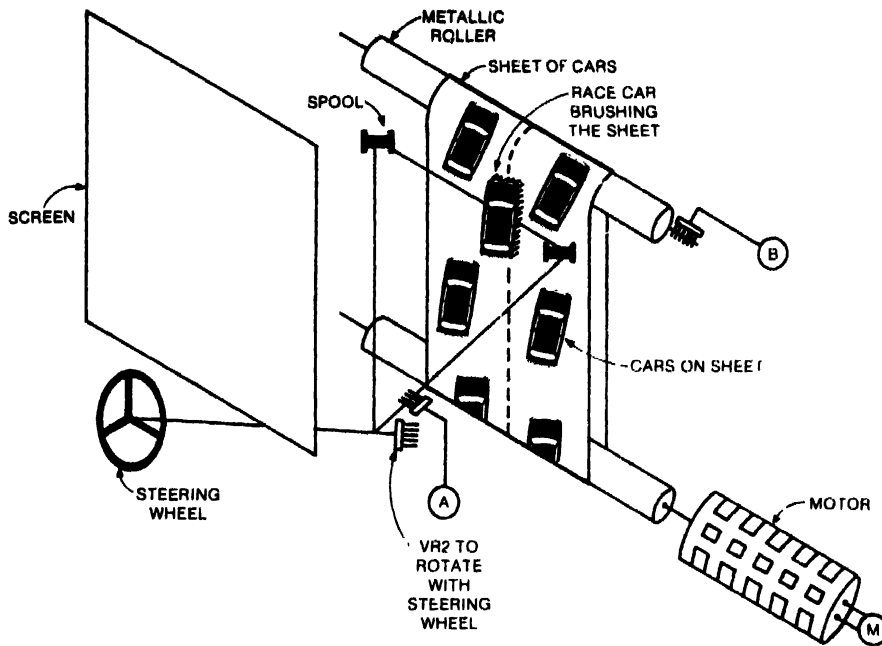


Fig. 2(g): Side view of the mechanical assembly.

Now about the other cars. These should be aluminium sheets cut out in the shapes of racing cars. They should be mounted on a translucent hard polythene sheet, cut out to resemble a highway. The aluminium cars should be interconnected by a thick bunch of copper wires running below the sheet, as shown in Fig. 2(d). The long sheet of paper should be connected like a belt and slipped over the two rollers, as shown in Fig. 2(e).

The upper roller should be metallic so that the copper wires under the sheet going over it carry current to each car whenever the roller is charged. The lower roller should be fastened to a motor whose speed is controlled by potentiometer VR1. The potentiometer should be on the control board to control the speed of the cars. A copper brush should be connected to point B of the circuit in such a way that it is in constantly in contact with the metallic roller. Another brush from point A of circuit, as shown in Fig. 2(f), should be in touch with the copper wire of the steering system. Now if the racing car touches any car on the 'road' it means points A and B of the circuit are connected.

Arrangement

The arrangement of the game should be made in this order:

1. Screen
2. Racing car controlled by the copper string and steering wheel
3. Sheet of cars running just below the racing car with the bristles of the racing car brushing the sheet as shown in Figs 2(f) and (g).

Now if we start the motor, the sheet under the racing car will move with the racing car brushing the 'road'. As the cars

on the road go down the screen, the racing car appears to race up the screen. All you have to do is to steer the car from side to side on the 'road' without brushing any car. Once you fail to dodge an oncoming car and your race car touches it (i.e., A of circuit contacts B), lamp L1 flashes, indicating a crash; D1 glows for some time; a beeper beeps for a while, indicating the end of the game.

Extras

Switches, LED, VR1, etc should be on the control board. Printed circuit board, loudspeakers, etc should be suitably placed inside. Lamp L1 should be near the racing car. Many interesting modifications are possible. Inside of the cabinet must be illuminated to make the cars on the polythene sheet visible.

A tape recorder motor is made for constant speed requirements and thus varying VR1 has no effect on it. So it's better to use ordinary toy motors without electronic governor.

The circuit

The circuit is built around three 555 timer ICs. All the three ICs are associated with generation of an audio output. While IC1 and IC2 generate high frequency, IC3 is part of a low-frequency oscillator. The IC1 circuit generates a pleasant sound. Potentiometer VR2 and capacitor C3 determine the frequency of the sound. As VR2 is connected to the steering wheel, the sound represents that of a speeding car when the racing car swings left and right. For a better effect the value of C3 should be increased.

When points A and B are connected, current flows through L1 and it flashes, while C4 stores up charge. Even though it is a momentary touch, the capacitor stores charge

for the operation of the LED and the beeper. The time of operation can be extended by choosing higher values of C4.

IC2 generates high notes. IC3 produces 'ticks' through pin 3. The timing of the 'ticks' is controlled by preset VR3. Now we know that IC2 will oscillate only if the reset pin 4 is fed with some voltage. When IC3 begins to oscillate and delivers 'ticks' (voltage) to the reset pin 4 of IC2, IC2 oscillates accordingly and beeps are produced instead of ticks. Thus the frequency of the beeps is controlled by C5 and R4 (timing being controlled by VR3).

Rules of the game

Switch on internal light etc. Now turn on switches S1 and S3. The cars on the 'road' race down the screen and the racing car goes up the screen. Taking the racing car to one side of the 'road' by means of the steering wheel, switch on S2 and start steering through the speeding cars. Try not to collide.

The sound of your speeding car comes through IS1. When you collide the indicators are started. Note the time with a stopclock.

Don't be dismayed if your game lasts for only a couple of minutes. Try playing a slow game by adjusting VR1. With practice, proceed to fast racing car games. A week later, your professional video game pal won't stand a chance against you. Good luck! □