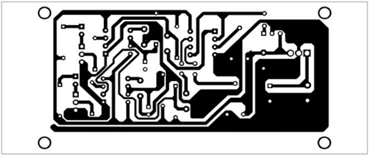

Fig. 4: Actual-size PCB layout of bike turning signal system

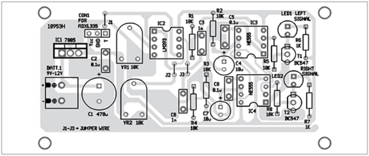

Fig. 5: Components layout for the PCB

will be in high (5V) state. This high output signal is fed to pin 2 of IC3. Because of this output of IC3 will be low.

Whenever the bike handle turns left, voltage at pin 2 of IC2 will be 2.6V. This results in low output at pin 1. The low output signal is connected to trigger pin 2 of IC3. The low signal at pin 2 makes output pin 3 of IC3 high. Transistor T1 conducts and LED1 glows. Output of monostable IC3 is a generated pulse width given by the following relationship:

t = 1.1 × R2 × C4 seconds

Right signal. When the bike handle moves towards right direction, it gives tilt angle output in the form of 2.6V to 1.2V voltage (decreases from high to low). Inverting terminal pin 6 of IC2 is connected to preset (VR2), and non-inverting terminal pin 5 to ADXL335 sensor Y signal.

Set reference voltage at the inverting terminal to 1.6V using VR2. Initially, when bike handle turns 90 degrees, voltage levels at pin 6 will be 1.6V and at pin 5 will be 2V. This means that comparator output will be in high (5V) state. This output is fed to pin 2 of IC4, which makes its output pin 3 low.

Whenever the bike handle turns right, voltage level at pin 5 of IC2 will be 1.2V. This is lower than the reference voltage (1.6V) at pin 6. This makes output pin 7 of IC3 low. The low output triggers monostable multivibrator IC4. This makes output pin 3 of IC4 high, transistor T2 to conduct and LED2 to glow.

Monostable output pulse is given by the following relationship:

t = 1.1 × R3 × C7 seconds

Construction and testing

An actual-size PCB layout for the bike turning signal indicator is shown in Fig. 4 and its components layout in Fig. 5. Assemble the components on the PCB as per the circuit diagram.

Connect a 9V-12V power supply to the circuit. Adjust voltages at pins 3 and 6 of IC2. The bike signal indicator is ready for use. EFY

PARTS LIST

Semiconductors:	
IC1	- 7805 voltage regulator
IC2	- LM393 dual comparator
IC3-IC4	- NE555 timer IC
T1-T2	- BC547 npn transistor
LED1-LED2	- 5mm LED
Resistors (all 1/4-watt, ±5% carbon):	
R1-R5, R8	- 10-kilo-ohm
R6-R7	- 1-kilo-ohm
VR1-VR2	- 10-kilo-ohm preset
Capacitors:	
C1	- 470µF, 35V electrolytic
C2, C5, C8	- 0.1µF ceramic disk
C3, C6	- 1nF ceramic disk
C4, C7	- 10µF, 16V electrolytic
Miscellaneous:	
BATT.1	- 9V-12V battery
CON1	- 3-pin connector for ADXL335 sensor
	- ADXL335 accelerometer sensor

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