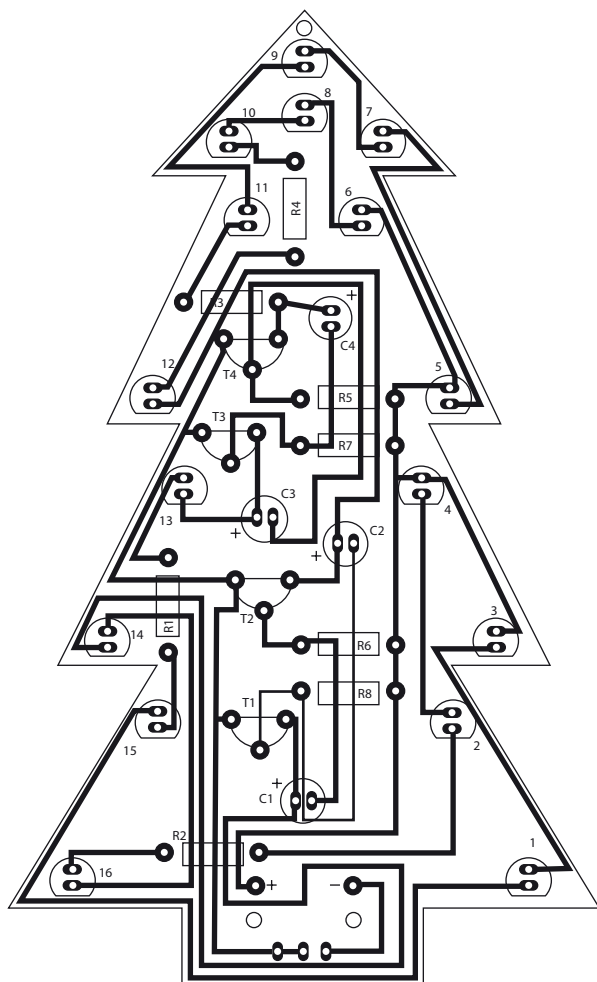


FLASHING CHRISTMAS TREE KIT



**OWNER'S
MANUAL**

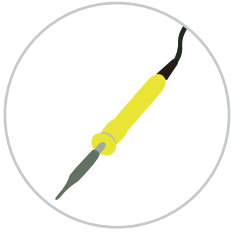
TANDY

**Cat. No.
277-8001**

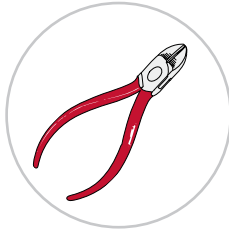
ASSEMBLY NOTES

TOOLS

You will need the following tools to assemble your kit...



Soldering Iron



Side Cutters

ASSEMBLY

Tandy kits feature our unique in-line assembly system; making them easy to follow. With our in-line assembly system all of the components have been provided in a sealed plastic sleeve in the recommended assembly order. Simply open each section in turn and install them on the circuit board to complete the kit. Each component is clearly labelled for easy identification.

SOLDERING

Soldering is one of the most important operations you will perform while assembling your kit. A good solder connection will form an electrical connection between the component and circuit board. A bad solder connection could prevent an otherwise well-assembled kit from operating properly.

It is easy to make a good solder joint by following a few simple rules:

1. Use the right type of soldering iron. A 15 to 25watt standard soldering iron designed for electronics or a temperature controlled soldering station with a 2 to 3mm conical or pointed tip fitted should be used.
2. Keep the soldering iron tip clean. Wipe it often on a wet sponge or cleaning pad; then apply solder to the tip to give it a thin coating of solder. This process is called tinning, and will protect the tip and enable you to make good connections.
3. Apply the iron to the component lead and circuit board pad at the same time and apply the solder to the joint rather than the iron.

NOTE: Always use solder 60/40 rosin core or lead-free solder intended for electronics use. We recommend a fine grade of 1.0mm for best results.



IMPORTANT

Due to the risks of injury when using a hot soldering iron it is recommend that children are supervised when soldering.

PARTS LIST

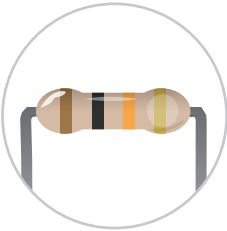
Inspect the kit and check each part against this list. Do NOT remove the parts from the plastic sleeve at this point as doing so would make the components more difficult to identify during construction.

1	100Ω Resistors (R1,R2,R3,R4)
2	100KΩ Resistors (R5,R6,R7,R8)
3	5mm Red LEDs
4	22 μF Electrolytic Capacitor (C1 & C2)
5	10 μF Electrolytic Capacitor (C3 & C4)
6	Transistors (T1,T2,T3,T4)
7	Switch
8	Battery Clip

STEP-BY-STEP ASSEMBLY

Remove the circuit board from the packet and identify the top side, the top has the part numbers printed on it, all of the components will be placed on this side of the board and soldered on the underside.

RESISTORS



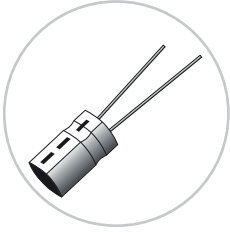
The first component to solder are the 100Ω resistors marked R1, R2, R3, and R4 on the circuit board. Carefully bend the wires at 90 degrees from the body of the resistor, parallel to each other so they will fit through the holes on the circuit board. Resistors can be inserted either way round as they are not polarity sensitive, however it does look neater and make identifying things easier if you solder them all in the same direction.

Now follow the same procedure with the 100KΩ resistors to be soldered in to the positions marked R5 through to R8.

LEDs

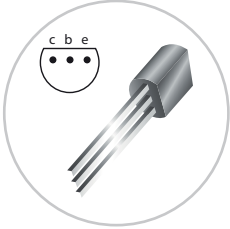


LEDs or Light Emitting Diodes must be soldered in the correct way-round or they will not light up. There are two ways to identify which way-round an LED should be used. The first is that the legs are different lengths, the shorter one goes at the bottom. There is also a flat edge on the side of with the short leg. You will see that the flat edge is printed on the circuit board to help with positioning.



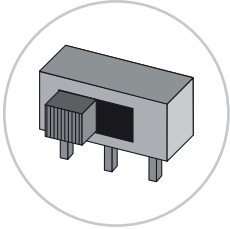
CAPACITORS

The capacitors supplied in this kit are polarized Electrolytic Capacitors meaning that it is important that they are installed the correct way-round. The negative leg can be identified by a white stripe printed on the side of the capacitor. Printed on the PCB is a + symbol to show where the positive leg should go. The longer leg is the positive connection.



TRANSISTORS

There are three connections on a transistor, the collector (c), the base (b), and the emitter (e). To make it easy to identify how to fit the transistor it has a flat side and the circuit board has an outline printed on it to show what direction to install it. The legs of the transistor will need to be separated a bit in order to fit in the holes, take care not to push the transistor in too far.

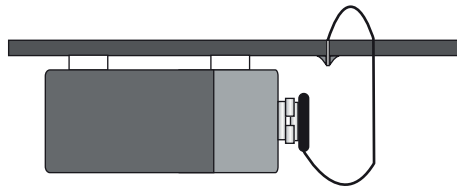


SWITCH

Solder the switch in place so that it points towards the base of the tree.

BATTERY CLIP

Pass the wires from the battery clip through the two holes on the circuit board from the back to the front. The red wire is the positive terminal and should be soldered to the point marked + on the PCB.



CIRCUIT DESCRIPTION

The Christmas tree circuit consists of two astable oscillators. Astable means not stable meaning that the circuit keeps changing state. The speed that the LEDs flash (known as frequency) is determined by the value of the capacitor and the charging resistor.

The frequency is dependent on the amount of time it takes for the capacitor to charge, increasing the value of the capacitors will slow down the flashing (reduce frequency) as they will take longer to charge.

SCHEMATIC DIAGRAM

