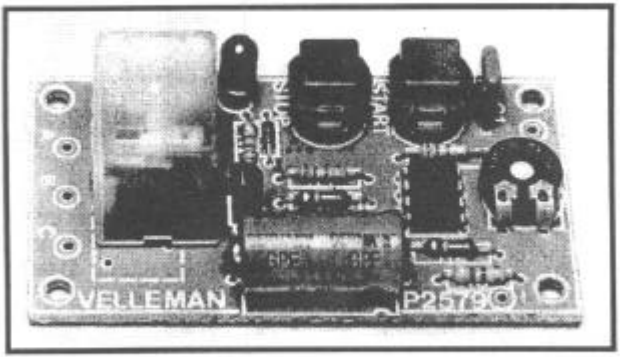
HIGH-Q

velleman-kit

Skill level : 1

UNIVERSAL START / STOP TIMER K2579

- Ideal for small timer applications from a few seconds to 60 minutes
- Power supply : 12 V DC
- Supply current : output on : 55 mA
  output off : 20 mA
- Start / stop function to command the timer at any desired time
- Relay output : 2 A / 240 V max.
- Dimensions : 38 x 69 mm (1.50" x 2.72")



While the soldering iron is heating, read this first !

You want to enjoy your Velleman Kit as quick as possible, these hints will assist you !
First, take your time. Hasty jobs often result in disappointments. Make sure your workspace is wide, clean and well lit. Collect all the necessary tools you might need for the assembly. Take care, while unpacking that nothing is left in the wrapping or boxes, such as small parts, manuals and leaflets. Please check if all components are present. Use the supplied partlist as a guide. In case there is something missing or damaged, return the Kit to your dealer. Read all supplied manuals and notes carefully before you start constructing...

The Velleman Kit Warranty

Please read this carefully. In most cases, you can easily solve problems yourself. This text tells you all about.

The Kit, you have built or intend to build, was design by a team of highly skilled design engineers. Before their design reaches the customer, it has been tested and re-tested over and over again. This procedure guarantees you that every design actually works, when it is put together in the right way. But what if something does go wrong ?

Avoid unnecessary expenses and loss of time ! Examine the whole circuit closely. An even better procedure is to let someone else do this for you. Every tiny detail is important. Are all components put in the right place and correctly oriented. Watch out for bad or forgotten solder joints and short-circuits ! What about the power supply ? Is it correct and present ? Does the Kit require special calibration or adjustment ? Do the possible external devices such as computers, audio sources or power circuits match the Kit specifications ?

When all the above did not bring you any closer to a solution, start thinking of a defective part or parts. Semiconductors like transistors, FET's, IC's and processors, although very reliable do not support abuse. You can send us suspect semiconductors for inspection and eventual exchange but keep in mind. Our experienced technicians can tell the difference between a defective and a fried transistor, and in several cases a stamp is much more expensive than a replacement semiconductor bought at the local store.

Any Velleman-Kit if defective will be repaired or replaced at our option within 30 days of purchase.
Simply return it to the place of purchase with proof of purchase.

K2579 UNIVERSAL START/STOP TIMER

INTRODUCTION

Due to its simple design and universal character, this mini timer is usable in the most current applications needing time intervals from a few seconds through approximately 60 minutes.
By simple modification it is possible to adjust the maximum time and the timing scale as necessary.
A a relay permits adaptation to whatever apparatus.

TECHNICAL DATA

- Power supply : 12 V DC
- Current consumption: output "OFF" : 20 mA
  output "ON" : 55 mA
- Relay output (inverter) : 2A/220V
- Timer interval : adjustable between 0 and ± 15 minutes
- START/STOP function allowing to switch-over at any desired moment.

UNIVERSAL START / STOP TIMER
ASSEMBLY AND TOOLS

Check that you have all the parts.

RECOMMENDED TOOLS

Miniature 25W soldering iron
Multicore solder
Soldering iron stand and sponge

ASSEMBLY

1. RESISTORS

Start assembly with the resistors .They are not polarized, so they can be inserted in either direction. Only the three primary color bands are mentioned. There may be a fourth band which can be ignored.

Inventory	Sequence of assembly	Reference	Part number / description
○	○	R1	1KΩ (brown-black-red)
○	○	R2	10 KΩ (brown-black-orange)
○	○	R3	4K7Ω (yellow-violet-red)
○	○	R4	1KΩ (brown-black-red)
○	○	R5	10 KΩ (brown-black-orange)
○	○	R6	4K7Ω (yellow-violet-red)
○	○	R7	1KΩ (brown-black-red)
○	○	RV1	2M2Ω trimmer. May be a horizontal or vertical type one

2. DIODES

Align the banded end with the band drawn on the PCB board.

Inventory	Sequence of assembly	Reference	Part number / description
❍	❍	D1	small signal diode such as 1N914, 1N4148 or similar Watch the polarity !

3. CAPACITORS

These capacitors are not polarized, so they can be inserted either way.

Inventory	Sequence of assembly	Reference	Part number / description
❍	❍	C1	100 nF Sibatit capacitor (sometimes marked 104)

4. THE ELECTROLYTIC CAPACITORS

Note carefully the positive leads before you fit the capacitor into the PCB board.

Inventory	Sequence of assembly	Reference	Part number / description
❍	❍	C2	100 µF electrolytic condenser (watch the polarity)

5. SOCKET

Inventory	Sequence of assembly	Part number / description
❍	❍	IC socket Mount an 8-pin IC socket at the position marked "ID"

6. TRANSISTORS

The transistor has a flat side and rounded side. The flat side faces the same direction as the flat side drawn on the PCB board.

Inventory	Sequence of assembly	Reference	Part number / description
❍	❍	T1	Transistor type : BC547, 548, 549, BC237, 238 or 239

7. SWITCHES

Inventory	Sequence of assembly	Reference	Part number / description
❍	❍	SW1	Push-button switch Mount SW1 at "START". Ensure that the flat side of the button corresponds to that on the PCB
❍	❍	SW2	Push-button switch Mount SW2 where marked "STOP". Ensure that the flat side of the button corresponds to that on the P.C.B.

8. RELAY

Inventory	Sequence of assembly	Reference	Part number / description
○	○	RY	Relay type SRU 112D or V23027-B0002. The PCB accepts both types but mount the relay corresponding to the printed component drawing.

9. INTEGRATED CIRCUIT (IC)

Inventory	Sequence of assembly	Reference	Part number / description
○	○	IC1	Fit the integrated circuit, NE555, CA555 or equivalent, in its socket with the notch toward resistor R1

10. LIGHT EMITTING DIODE (LED)

Inventory	Sequence of assembly	Reference	Part number / description
○	○	LD1	Mount LD1, red led. Look for the correct polarity (flat side)

TESTING

❍ Turn RV1 completely CCW (to the left).

❍ Connect a 12 V power supply to the points "+" and "-".

❍ At this moment the relay will close slightly and LD1 will start to glow.
The led LD1 will glow as long as the relay stays closed.

❍ Now, turn the trimmer RV1 slowly CW (to the right) towards the mid position and press the "START" button. The relay will close for about 5 minutes. By pressing the "STOP" button, it is possible to interrupt the contact and to reset.

❍ If you turn the trimmer RV1 fully clock-wise (to the right), the relay will close for about 15 minutes.

❍ Anything may be connected to the output with condition that it consumes under 2 amps. This output is a switch of which point "A" is the common.
In the off position, "A" is connected to "B"
When the unit is in use, "A" is connected to "C"

❍ The scale of the trimmer is non-linear. This because the logarithmic load curve of condenser C2.

❍ The time may be adjusted by changing the value of RV1. This can also be obtained by modifying C2. The kit contains a 100 µF electrolytic condenser. By multiplying or dividing by two the value of this condenser, one may obtain twice the time or half of the time, respectively.

❍ The relay outputs are electrically isolated from the rest of the circuit.

FUNCTION

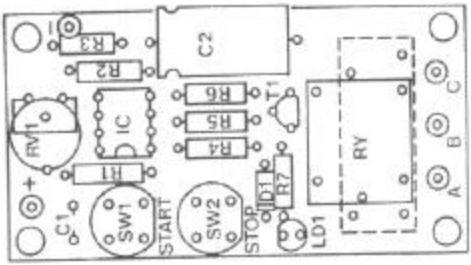
The circuit is constructed around the now classical timer NE555. Inputs 2 (START) and 4 (STOP) are held at the "+" potential by the resistors R4 and R6.
At the off position, C2 is short-circuited to ground internally in the IC.
By pressing the "START" button, this short-circuit is removed. The output is supplied via T1, and C2 starts to be charged via R1 and RV1.
The greater the value of RV1 (and of C2), the longer it will take before the voltage at C2 will reach the same value as at the juncture of "R2-R3". which are connected to pin 5 of the IC as voltage reference.
Once this value is reached, the output goes "OFF" and C2 returns to the ground potential.
When, during the charge, the "STOP" button is pressed, the same will happen.

REMARKS

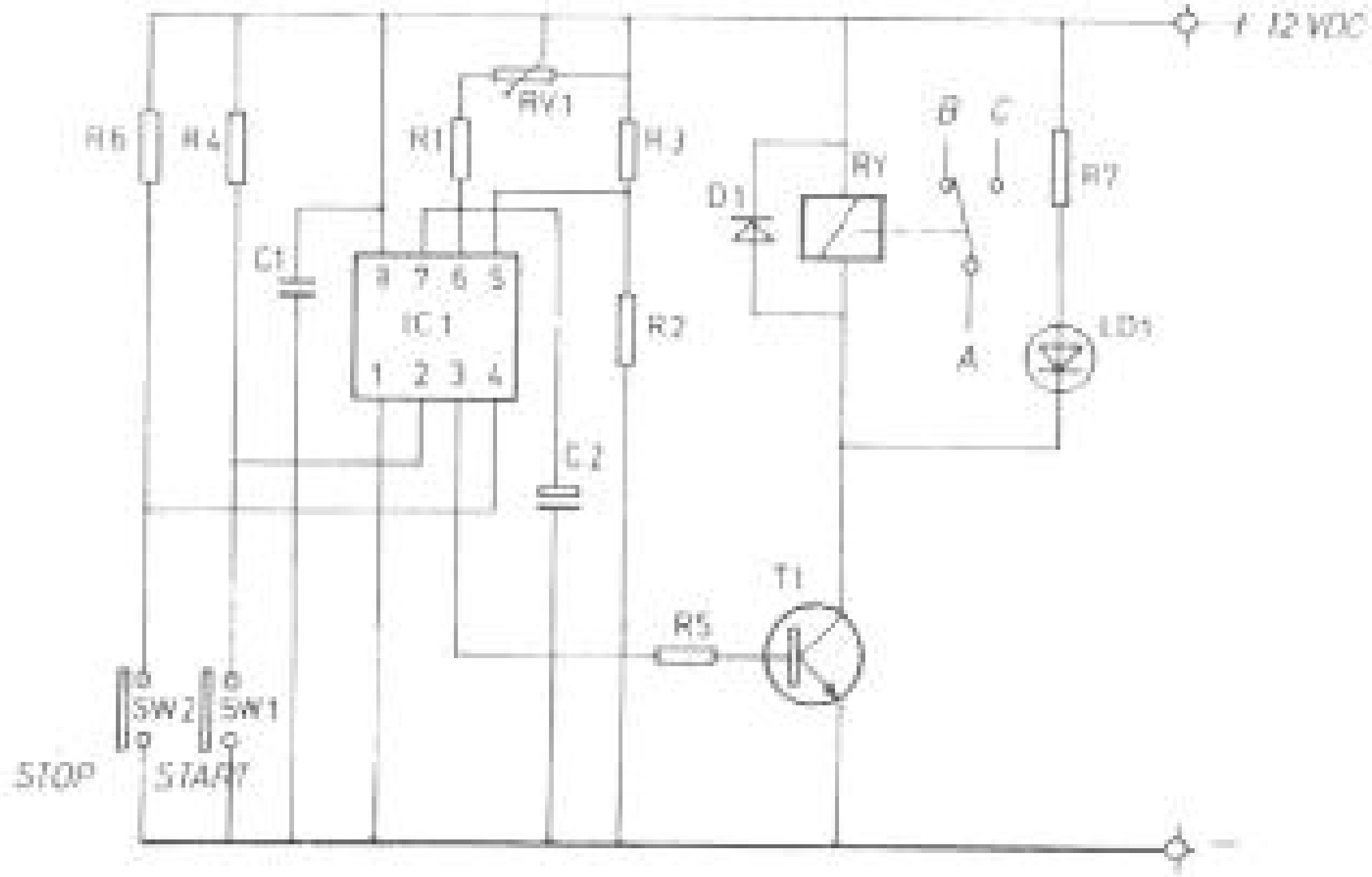
The "START" and "STOP" buttons may be removed from the printed circuit board but keep in mind that the inputs, at which they are connected, are very sensitive to disturbances.
Keep the distance between the board and the buttons as short as possible and use screened wire to make the connections.

If inductive loads are connected to the output, disturbances and wear of the contact may be heavier. If necessary, connect a 0.1µF capacitor across the contacts.

Ensure that the power supply of the circuit is sufficiently HF filtered. Noise from the power-supply may start and stop the circuit unnecessarily.



Universal Timer PCB layout and component location



Universal Timer
Schematics