

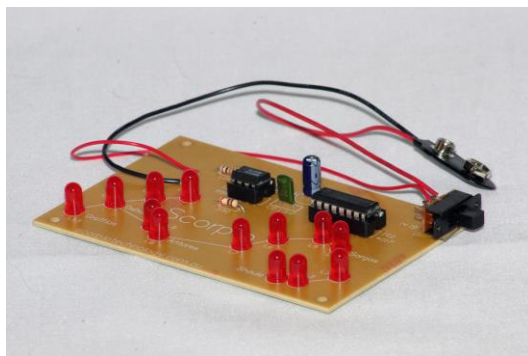


SCORPIO CONSTELLATION (Code: SCOR)

DESCRIPTION

Scorpio is an appealing member of the zodiac. It is one of the oldest constellations and was known as far back as the Sumerian civilizations, over 5,000 years ago. The constellation Scorpio contains the stars Antares, Graffias, Dschubba, Sargas, Shaula, Jabbah and Lesath.

The *SCORPIO CONSTELLATION* has an LED positioned on the location of the major stars in the Scorpio constellation. The LEDs flash in a set sequence.

**LEVEL:**

Intermediate

HOURS TO CONSTRUCT:

2 - 3 hours

SKILL DEVELOPMENT:

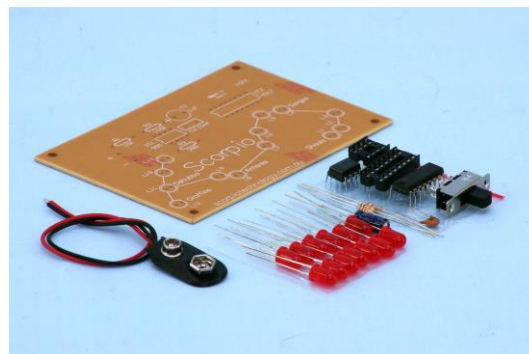
- Planning and Design
- Manufacturing
- Soldering
- Electrical
- Digital electronics
- Component recognition
- Electric circuits





WHAT'S IN THE KIT?

- ❑ All the mechanical and electrical components required to make the *SCORPIO CONSTELLATION* work including the PCB, LEDs, battery clip and switch.
- ❑ A detailed teaching unit with a complete parts list, design suggestions, general construction guidelines and suggestions for testing.



WHAT ELSE IS NEEDED?

The following items are required in addition to the kit and must be supplied by the maker – some are available from Scorpio Technology, but need to be ordered separately:

ADDITIONAL REQUIREMENTS	ORDERING CODE
Multi strand hook-up wire in assorted colours	WIREHU10
1 x 9V battery	BATT9
Hot glue or Double-sided adhesive tape	GLUESTK or TAPEDS
If making Christmas Tree (<i>see Project Sheet for requirement</i>)	
If making Rear Bike Light (<i>see Project Sheet for requirement</i>)	

TOOLS REQUIRED

The following tools are required. Some are available from Scorpio Technology, and can be ordered separately if required:

REQUIRED TOOLS	ORDERING CODE
Soldering Iron and Soldering iron stand: – a good quality soldering iron, with a fine tip or	SOLDIRN SOLDIRNSTD
Soldering station	SOLDSTN
Solder: – 0.71mm 60/40 solder is recommended	SOLD500
Wire strippers	WIRESTR
Side cutters	SIDECUT or SIDECUTM

ADDITIONAL / USEFUL EQUIPMENT FOR ELECTRONICS

Component lead forming tool (for resistors, diodes etc.)	COMPLFT
PCB Holder	PCBHOLD
IC Inserter	ICINSERT
IC remover	ICEXTRACT
IC straightener	ICSTRAIT



ABOUT THE PROJECT

The major features of this project are the planning, design, construction and assembly stages of a project featuring digital electronics.

DESIGN PHASE

- Create your own *SCORPIO CONSTELLATION* based on our information. Students can determine any practical uses for this kit and decide how they will mount their completed project. They can investigate modifying their kit and producing alternative individualised designs (such as in our free “Project Sheets” found on our website) and increase their engagement in the project by making either a Rear Bike Lamp or a Christmas Tree – or something of their own design.

During the **Design phase**, students will need to:

- Evaluate the suitability of various materials, such as PVC, acrylic, plywood or balsa wood for a mounting plate
- Evaluate available technologies that can be used, for example:
 - 3D printer
 - laser cutter (which allows more interesting shapes than usual)
- Investigate a number of ideas to modify the circuit to achieve different project outcomes (e.g. operating at different speeds; incorporating variable speed; operating at a different voltage)

MAKING / CONSTRUCTION

Once the Design process has been completed, the students will be able to start **building their design**. They will:

- Mount / insert electronics components on the PCB
- Solder the parts in place
- Wire up and solder the battery holder and switch
- Test and adjust the *SCORPIO CONSTELLATION*
- Troubleshoot any problems!

DOES THE TEACHING UNIT INCLUDE ANY THEORY?

The Teaching unit has a THEORY section that covers:

- Schematic drawing
- Timer IC – 555
 - Description; Schematic diagram; Connection diagram; Astable operation
- Decade Counter IC – 4017
 - Description; Logic diagram; Connection diagram; Timing diagram
- LEDs

