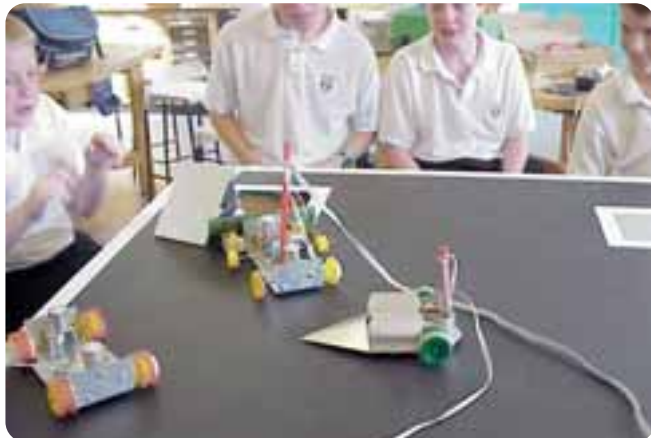


Mini Robot Challenge

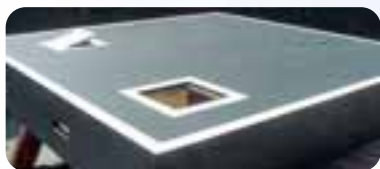
A low-cost way to tackle Robot Wars

The BBC programme “**Robot Wars**” is still a very popular programme and has caused Technology teachers a lot of difficulties sidestepping demands for help in the design and building students’ own robots. The Young Engineers clubs have taken on board Rex Garrod’s Robot Challenge, which is a much simpler way of getting involved, but still requires a lot of resourcing and building, and when you have finished it you need to be in touch with others who have built one to test them out.

Having suffered from the “*I want to build a robot for Robot Wars*” demands for some years I finally came up with the idea of the “*Mini Robot Challenge*”. This entails building a small,

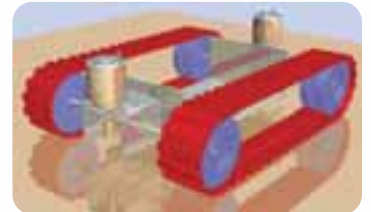


remotely controlled vehicle based on the TEP “Rover Kit” and then having contests to see who can push an opponent out of the ring. No weapons are allowed, it is a test of skill in control and designing and building a superior robot. The TEP Rover kit is cheap enough for a class group to build several. Working in pairs, they can create ten different designs based on the simple criteria of manoeuvrability, speed, durability and control. A bench top sized ring made from half a sheet of MDF and you have the makings of a very exciting competition.



The Micro Rover Kit

The basic “Rover Kit” comes with instructions to turn it into a four wheeled, track laying vehicle, which is remotely controlled via an umbilical cord and two forward and reversing switches. Most pupils find this a very exciting model to build and it teaches them a great number of basic metalworking skills, but there is very little design work involved. The project takes off when you introduce the concept of the “Mini Robot Challenge” and the design criteria mentioned above. Having made up the Rover kit, it very quickly becomes clear to students that a four-wheeled vehicle



is much less manoeuvrable and therefore harder to control than a two-wheeled vehicle. It is also much slower if it is track laying. This then leads them onto body design, methods of construction and suitable materials. The “Rover Kit” lends itself well to the “try it and see” approach

because, with care, it can be assembled, tested, disassembled, modified, re-assembled and tested again several times.

The very nature of the project fuels the desire to modify and re-build as students all want to have another go after the first competition. In fact, it can be very difficult to stop them and move them onto another project. By restricting all the students to the same basic components it is their skill and ingenuity that are tested and not the depths of their pockets.

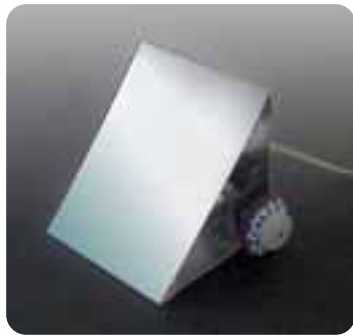


Project Organisation

The organisation of the project depends on the individual teacher and whether or not it is undertaken by a class group or an after school club, on the organisation of the school. The best advice is to start with a KISS, Keep It Simple and Small, to

Mini Robot Challenge (Cont.)

start with. Introduce the basic craft skills needed first and practice them on scrap material, i.e. drilling holes in metal and getting holes to line up with the base plate on the motor gear boxes (a good opportunity to introduce drilling jigs), cutting and filing sheet and round metal, and bending and shaping sheet metal. Stress accuracy and finish. Once these basic skills are learnt, design work can move on a pace, with little for the teacher to do but offer



use of **vacuum forming** to manufacture body shells, but this could be left to enhance the project later, if it is needed.

In Conclusion

If you are looking for an exciting project for a class group or a club, this one has a lot going for it. It fits in well with the National Curriculum, it allows for group work, it teaches basic skills, it engenders enthusiasm in your pupils and encourages research and testing like no other project I know. It leads directly into computer control and the development of real robot design. The quality of outcome is essential to the success of an individual project and students quickly learn that the detail within their project is important. The finished robot is only as good as its weakest part. They also get a great deal of fun out of it.



advice and supply any extra materials if needed. The process quickly generates its own momentum and the skill is in managing the speed of the project so that quality of outcome is maintained.

Resources

The basic "Rover Kit" comes with enough materials to make a working vehicle, but for the "Robot Challenge" you will need extra **Aluminium Sheet** (0.6mm thick) and access to basic **metalworking tools and equipment**. If you have a **TEP Manufacturing Centre** so much the better, as this contains most of the equipment you will need for the project. Jigs for drilling and marking out, should be seriously considered as they improve the quality of the finished project, speed up the early stages of the manufacturing process and cut down on waste due to mistakes. You might also want to consider the



▲ The winners of Mini Robot Wars 2002

① If you require any more help or advice on running a Mini Robot Challenge, contact Kieron McGeever email: mac@cercot.demon.co.uk

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