Making Systems Compatible

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Time is probably the greatest problem any student will have to face when it comes to project work in the Craft Design and Technology department.

One solution to the problem is to use ready made components and to extract suitable parts from construction kits for incorporation into the finished product. A second solution is to use the construction systems available in the school to 'model' the project before going to the production stage.

In either case it is absolutely necessary that the student is able to select the most appropriate component for the job in hand so that the solution of his design problem is not dictated by the construction system used. This brings us to an area that, especially in connection with computers and related products, has almost become a dirty word: compatibility.

As technical manager for a technology supply company, I have for some time now, been looking into this problem of compatibility and product selection with particular reference to the use of construction kits for practical problem solving and project work and there is one area where almost all construction systems have a similarity. They all use 4mm as a diameter for shafts and fixing holes. This point can be stretched a little to include the 3/16th shafting as used by Meccano and the 4.5mm holes in Lego beams with either a little judicious paring down, or padding out with a bit of tape.

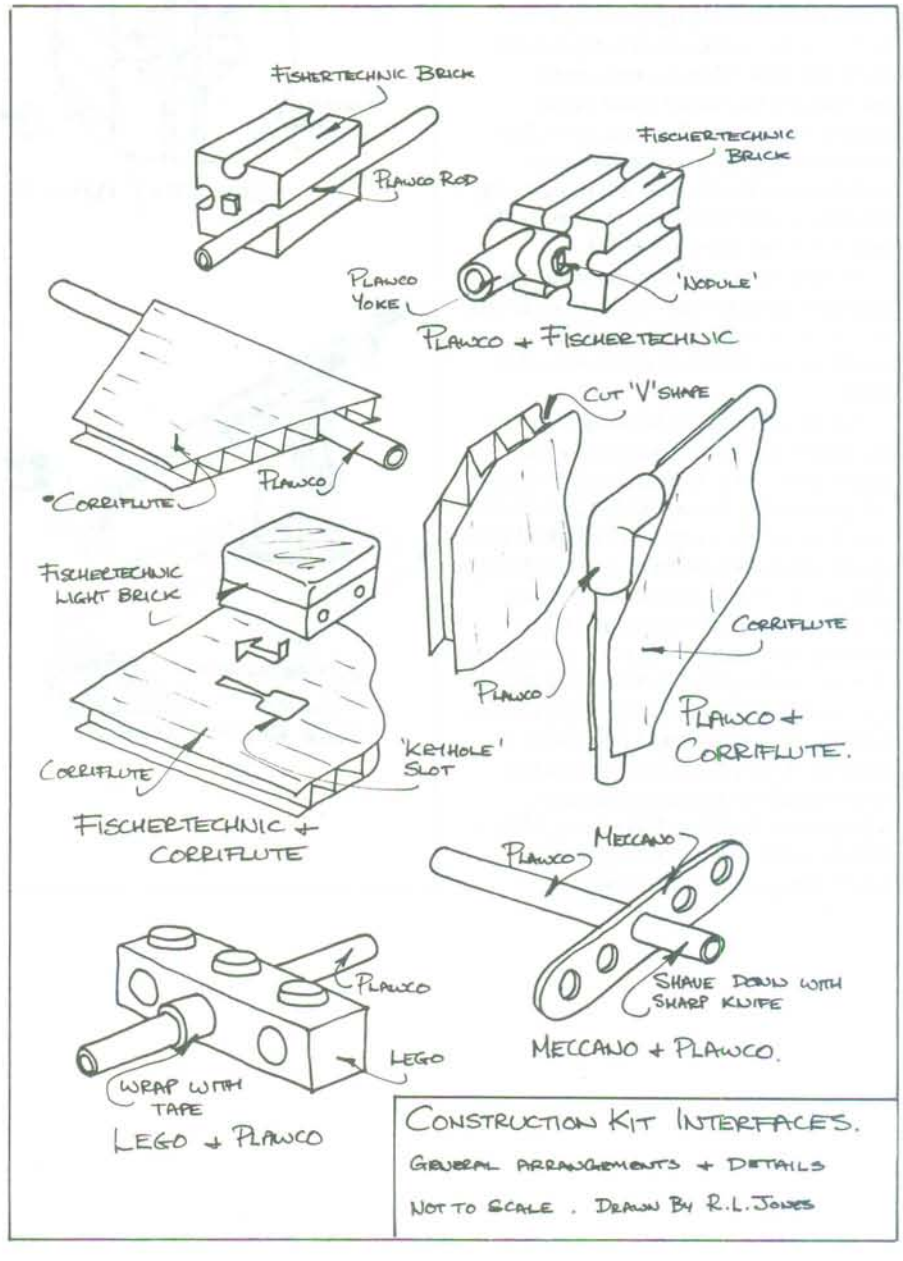
None of this is of any use without a universal system to connect all the various parts together and it was quite by chance that I discovered the ideal material for the job, Plawco. Plawco was designed as a structures and statics modelling system and consists of 4mm diameter plastic coated mild steel rods and ABS corner pieces and junctions. In its own right it is excellent for modelling trusses, bridges and beams and the finished models can be loaded to teach each of the structures for rigidity and strength.

Of course most of these models are static and a bit 'dry'. What was needed was a way to get life and movement into them. It was discovered that the Plawco rod was an exact fit in the grooves in the Fischertechnic brick and also that a standard Plawco fitting (called a yoke) clipped superbly onto the little black nodule that is the heart of the Fischertechnic system.

Instantly we had a solution to two long standing problems. The static Plawco structures could be animated and the cost of large Fischertechnic models could be reduced by replacing the structural parts with Plawco. The advantages were tremendous. Both systems were enhanced by their combination with the other, models could be built which more closely resembled the finished or full size versions and most important of all, the student had a choice.

Suddenly the search was on for other materials to increase the choice and versatility of all the construction systems currently in use. Our next major find was Corriflute.

Corriflute is a rigid, fluted polypropelene sheet material and the flutes in it are 4mm square. Plawco fits exactly into the flutes and by using various methods of cutting the material we became able to build machines combining Plawco structures, Fischertehnic modules and Corriflute cladding.



All this theory was put into practice when I was asked by the BBC to build a robot for a children's programme. The result was MARTHA, the Mobile Automatic Robotic Transport and Home Auxiliary, a 4'6" tall mannequin robot, capable of serving tea, sweeping the floor and squirting the presenters with water! She was built around a Plawco skeleton and had a skin made from corriflute. Pivots and hinges were from Fischertechnic kits and the arms and head were moved by Beasty servos. The whole structure was mounted on a plywood base and rode on two wheels powered by d.c. motors and gearboxes. To complete the illusion Martha was fitted with flashing lights and a CB radio so that someone off-stage could make her talk. Martha was a great success and has made other guest appearances since that first show, but without the ability to use standard components in this mix and match way, Martha would have been far too costly and time consuming to build.

As time has gone by more ideas for connecting further components into the system have come from our own experiments and from teachers in the field.

We are continually looking for more solutions and as they appear I write them up in 'Tech. Centre Notes' which are given away free at exhibitions and at our Technology Centre in Enfield. I have taken a selection of these ideas and hope that the following notes and sketches will help to explain more fully what I have been talking about here. I would, of course, be delighted to hear from anyone else who has been working along similar lines to swap notes and I am always at the end of the phone line for anyone who would like more information, advice or even just a chat about, what I believe to be, a very exciting area of Craft Design and Technology.