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Playtable for Bed-Bound Children

During the October of 1977 we received a circular from the Birmingham Technology Forum inviting us to submit a project for a Technology Conference and Project day. They submitted a list of suggested projects, the first of which immediately took my eye. It was a play table for bed-bound children. The problem was set by Mrs. Kay Johnson who works at the Birmingham Accident Hospital with pre-school children.

We encouraged three of our pupils to take up the challenge of this project, namely Stephen Frak (Lower 6th) taking Metal Design, Stephen Hinsley (Upper 6th) taking Wood Design and Kevin Murrell (Lower 6th) taking electronics. I arranged with Mrs. Fox for the boys to visit the Accident Hospital to observe first hand some of the problems involved. The boys talked with Mrs. Fox who explained some of the difficulties she was encountering with the younger children and we ascertained that basically she required a table that was adjustable in height, because of the variety of beds and cots in use. It was also desirable to have a surface which was adjustable from horizontal to vertical to overhang a bed or cot which could be used as a painting or drawing surface and a type of welled surface on which younger patients could play with cars, bricks, etc., without them falling off. The boys were introduced to the resident teacher, who's concern was mainly for a good working surface. They talked to several of the patients in the childrens ward to discover the type of games preferred. Finally we were taken to see a boy of 16 years of age who was in an adult ward after being involved in a motor cycle accident. He was on traction and trying to practice for his mock examinations in Technical Drawing on a small board propped up between the wires of the apparatus. As we were shown around, the boys took measurements of beds and cots and of restrictive hospital equipment such as gallows and traction frames, taking photographs of children both at work and play.

The boys spent some of their Christmas holiday formulating some of their ideas in sketch form for the basic construction of such a play table and then after guidance developed their better ideas, eventually reaching their final design.

They worked out independently numerous ideas for games and working surfaces and came together to correlate their ideas and work out which could be best used on the two inter-changeable boards. (The storage space limiting the number of boards. However, there is room for development in this field using a separate storage unit). Having exhausted the design procedure, they made final working drawings of the proto-type and began construction of the same. They each worked in their own specialized field.

The finished play table has two inter-changeable boards and a tray, which easily screws to one surface to enable young children to play with paints, bricks, cars, etc. The latter is made from acrylic sheet, the sides of which are formed using a strip heater. The surface it is attached to is arranged for peg games (Master Mind, Chinese Chequers, Solitaire and Three in a Row [a type of noughts and crosses]). Some rely on more mobile patients playing with bed bound children. On the opposite side is a plain formica surface for any type of writing or drawing. It is, however, most useful for those patients who cannot sit up. By attaching paper to the board with drafting tape, it can be used vertically.

On one surface of the second unit is a chessboard. The transparent perspex top covers a sheet of tin plate. The chess pieces have a magnet set into their base, which allows the game to be played on a tilt. On the reverse side we have two electronic games. They are not original but were built by Kevin Murrell. The object of the first game, Marbles is an attempt to get a 'marble' to stop as near to a wall as possible. Pressing the start button starts an oscillator, the initial frequency of which is dependent upon how long the button is depressed for. When the button is released the frequency of the oscillator gradually decreased until it stops (i.e. the marble slows down to rest).

The object of 'Shoot', the second game, is to hit the moving target (generated by pressing the 'shoot' button) by pressing the button as soon as the light is opposite the switch. If the player 'hits' the light, it goes out, but if he misses, another target is generated. Each game uses TTL (transistor-transistor logic) gates for the logic functions, and LED's (light emitting diodes) because of their inherent reliability. One game is constructed on a photographically made printed circuit board and the other on a matrix board. The top cover of acrylic sheet unscrews to renew alkaline type batteries. However, we have found these rather an expense and inconvenience and would use re-chargeable batteries if we were making another model.

One of the boards and the tray, if not in use, are stored in the unit below which is made in two halves, by laminating marine ply. Its rebated plywood top is covered with formica and it is designed to fit under the cot with its sides down or under the new type of bed where there is only 100 mm clearance so the table can be positioned over the patient, the latter being the reason for the single stem support to the table. The bottom bend in the tubular frame is filled with molten aluminium to add rigidity.

All metal parts are chromium plated and flat surfaces are acrylic sheet or 'formica', enabling everything to be wiped clean. It has been said that it is too clinical and that younger children may be afraid of it, however, we hope it will help to break down their fear of medical apparatus. The table runs on castors for ease of transportation.

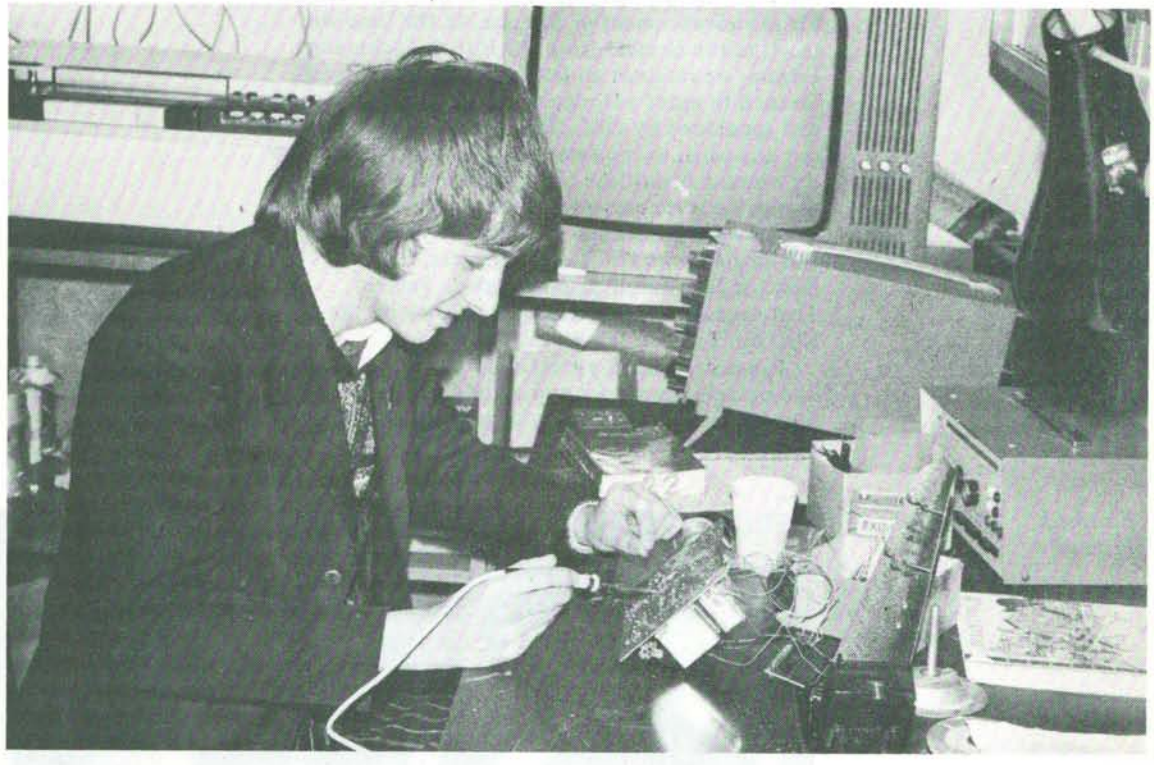
When the play table was completed, the boys and I took it in to the Accident Hospital to try it out on the patients in the childrens ward. The table proved to be very versatile and very popular with the children. As a result of the Birmingham Technology Forum Project day, it was selected for exhibition at

the 1977 annual meeting of the British Association for the advancement of Science. At the time we received the circular from the British Technology Forum, we received an invitation from the Design Council to enter a Design Competition run by them and sponsored by GEC. This competition influenced our approach to the design and we finally ended up by winning one of the top five awards in the age group. We were presented with our prizes at the Royal Institute and later that day received certificates from His Royal Highness, the Duke of Edinburgh, at Buckingham Palace. That evening our play table was shown by the BBC on 'Tomorrow's World'.

It has stimulated a great deal of interest inside and outside the school and a London firm are looking into the possibility of putting the table into production.

Finished Product

Designing the game



Assembling the table