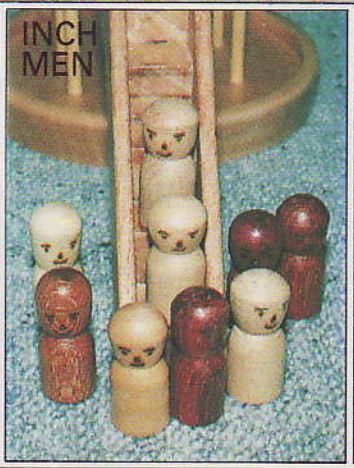
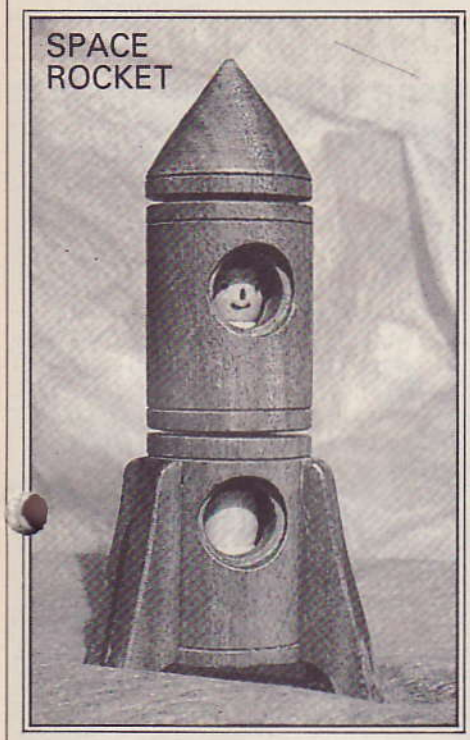
# INCH MEN VENTURE INTO SPACE

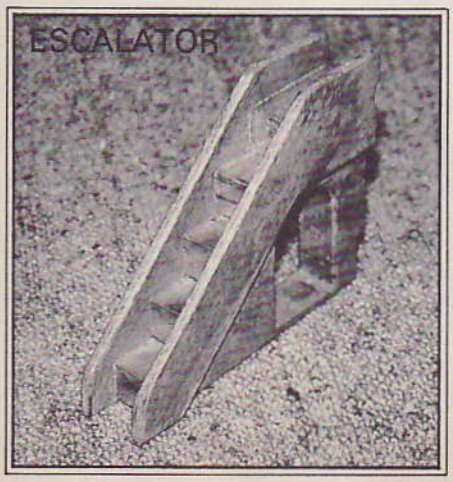
Designed and made by C.E.BALL

DESIGN A TOY Practical WOOD WORKING STANLEY 1990 COMPETITION


*C. E. Ball has created a world for his Inch men and in this inter-galactic episode they will need for their spacefaring a space explorer, a space rocket and a space bus and of course a control tower. Intrepid or what? Let the children decide.*




FIRST, let's bring on the 'Inch men'. A small population is necessary and the variety of humankind is demonstrated by the use of several types and shades of wood. Pokerwork is used for the features although they could be painted. Height of the figures should not vary more than ¼in. Why 'Inch men'? Well, they are all one inch in diameter.

## SPACE ROCKET

Let's start with the space rocket, which consists of three main components for the two-man version, with the middle section left out for the one-man rocket.

A piece of selected timber 2½in. square by 11in. long was turned to 2⅜in. round. Mark off the three sections leaving enough to part each piece, then turn down the two male interlocking parts, marginally more than the 1in. hole you will eventually drill, with a very small taper to ease entry but remain tight. The nose cone can now be turned down.

To draw less attention to the joints, a small decorative feature is cut on the joint and ¼in. each side.

The pieces can now be parted off leaving the base still in the lathe. Now drill the hole to within ¼in. of the bottom, reinsert the centre piece B into the new hole and drill it likewise.

Remove from lathe and place in a V-block, mark the observation holes to suit your turned men, in my case 1⅛in. from the entry to centre. At this point decide if you want a 'porthole rim'. If so, select a 1¼in. Forstner bit and drill just enough to clearly see a full circle, then using the same centre and a 1in. drill complete the hole. Repeat at other points.

It remains now to put on the 'fins' which add stability to the upright position. Four fins are better and note they are not equally spaced, two spaces are wide and two narrow, this is to maximise the viewing area. Cut them to the shape required, place the body on a V-block, cut a groove with a router at the four points indicated, glue in fins, or you may choose to dowel them in.

## SPACE BUS

Choose a suitable timber 2⅜ by 3 by 12in.; plane the two sides to 2¼in; fix in the lathe and turn as a 2½in. spindle; turn down nose cone and part off. Mark on one rounded side (call this the bottom) the six points as shown in the drawing and drill with a ¾in. Forstner bit ⅜in. deep. Mark the same six points on the opposite side (the top). This time drill 1in. holes to within ¼in. of the bottom.

Turn on flat side, mark holes as before. This time drill using a 1¼in. Forstner bit to a depth only which shows a full circle, complete the hole with a 1in. Forstner bit. Repeat on opposite side.

The stabilisers can be cut from a piece 10 by 2½ by ½in. Plane sides before cutting as with the first rocket. I cut a groove in the body with a router and let them in just lower than the port-holes.

The nose can now be cut down by placing the body in a V-block and routing to shape and depth less than half-way down from the top. Drill front pilot's view and round off all edges.

Note, the bottom holes are not necessary but enable Inch men to be ejected.

## LAUNCH PAD

We now need a launch pad for the space bus.

A piece 7½ by 2½ by 3in. is cut to shape and planed. It is not essential to cut out the ramp with a curve to match the underside of the space bus, simply rebating out with router or circular saw will suffice.

A 1in. hole is drilled in the side as a mechanic's inspection pit with, of course, the appropriate 1in. hole in the top to see the underside of the bus.

## INTER-GALACTIC EXPLORER

This is not as difficult as it may appear. You need a piece of 1⅛in. thick timber to cut two 8in. circles. Plane one side, mark two 8in. diameter circles and centre. Use the same centre to mark a 6in. diameter circle. This one will provide the centres for drilling later. Drill ¼in. hole in the centre.

Around the 6in. marked circle, mark six equal divisions and drill 1¼in. hole, with a Forstner bit to a depth of ½in.

At this point you will find it pays to make a small jig to simplify the cutting out of the sleeping bays.

Make this in such a way that when a ¼in. dowel is fitted in the centre of the main disc and a 1¼in. dowel fitted into any pre-drilled recess on the main body, the jig enables you to rout out to a depth of say 1in., each of the sleeping quarters. When each bay has been completed move round to the next position and repeat.

Cut out an 8in. disc and assemble on the lathe. The ¼in. diameter hole will enable you to do this accurately, say a scrap piece on base plate with 1in. long, ¼in. dowel glued in centre. Two or three dabs of hot melt glue and then

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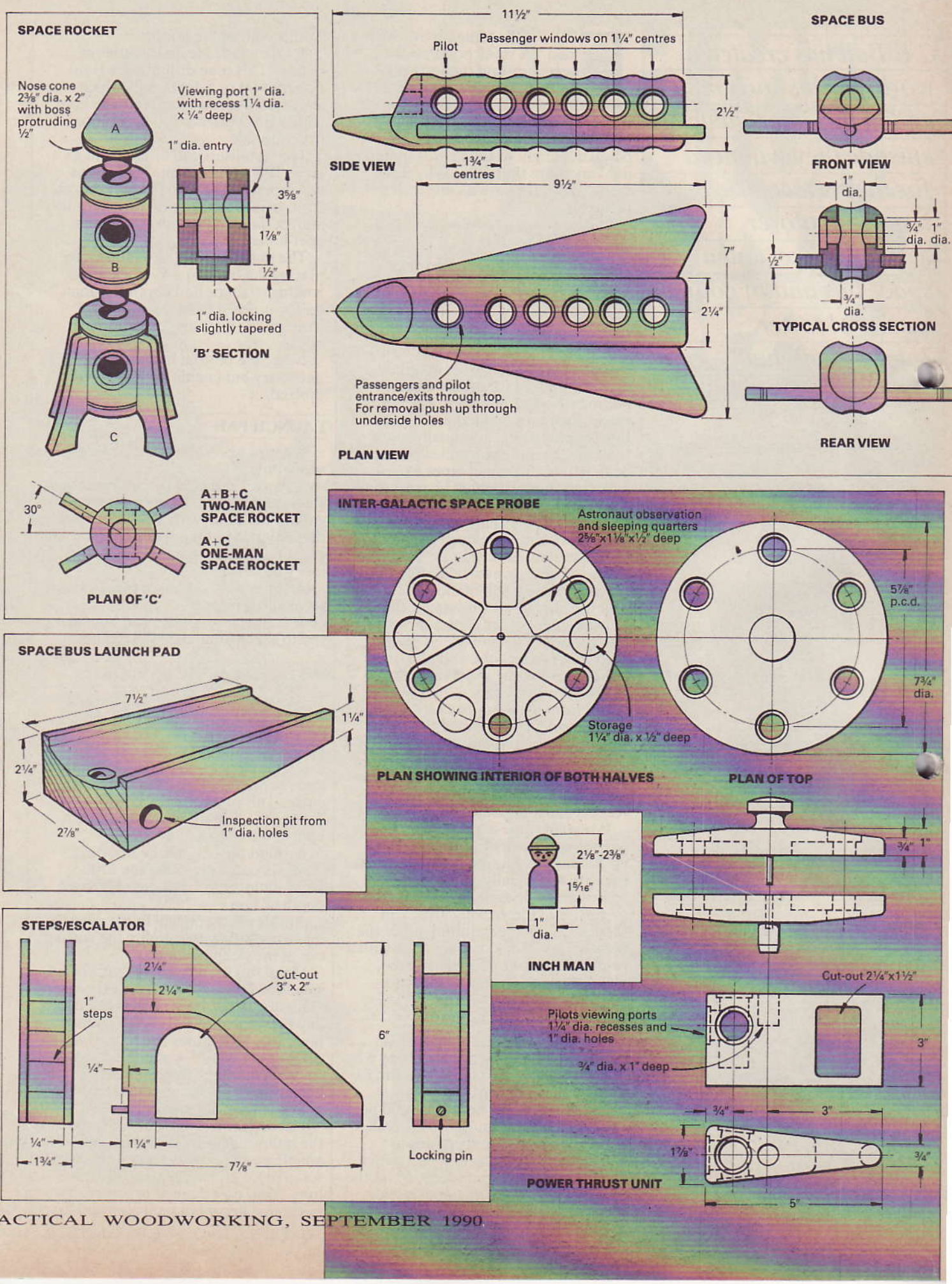

SPACE ROCKET
Nose cone 2⅜" dia. x 2" with boss protruding ½"
A
B
C
Viewing port 1" dia. with recess 1¼ dia. x ¼" deep
1" dia. entry
3⅝"
1⅞"
½"
1" dia. locking slightly tapered
'B' SECTION
30°
A+B+C TWO-MAN SPACE ROCKET
A+C ONE-MAN SPACE ROCKET
PLAN OF 'C'
11½"
Pilot
Passenger windows on 1¼" centres
2½"
SIDE VIEW
1¾" centres
9½"
7"
2¼"
Passengers and pilot entrance/exits through top. For removal push up through underside holes
PLAN VIEW
SPACE BUS
FRONT VIEW
1" dia.
¾" dia.
1" dia.
½"
¾" dia.
TYPICAL CROSS SECTION
REAR VIEW
INTER-GALACTIC SPACE PROBE
Astronaut observation and sleeping quarters 2⅝"x1⅛"x½" deep
5⅞" p.c.d.
7¾" dia.
Storage 1¼" dia. x ½" deep
PLAN SHOWING INTERIOR OF BOTH HALVES
PLAN OF TOP
¾" 1"
SPACE BUS LAUNCH PAD
7½"
1¼"
2¼"
2⅞"
Inspection pit from 1" dia. holes
2⅛"-2⅜"
1⅝"
1" dia.
INCH MAN
STEPS/ESCALATOR
2¼"
2¼"
1" steps
Cut-out 3" x 2"
6"
¼"
¼"
1¾"
1¼"
7⅞"
Locking pin
Cut-out 2¼"x1½"
Pilots viewing ports 1¼" dia. recesses and 1" dia. holes
¾" dia. x 1" deep
3"
¾"
3"
1⅞"
¾"
5"
POWER THRUST UNIT

# INCH MEN VENTURE INTO SPACE

slip on the disc holes to scrap and you are now ready to turn.

Trim to 8in. circle and bevel about ¼in. on edge to centre. Round edge slightly and repeat on other disc. Take one disc and enlarge centre hole to receive ¾in. dowel, 1¾in. long with ¼in. hole as indicated and glue in.

Turn small 'radio tower' (knob) to shape. Fix ¼in. dowel ready to glue into other disc. You now have two halves of the main body with sleeping quarters and storage. Observation levels can be cut in the same way as for the space bus and rocket, taking due care in marking out. It is useful to make a pencil mark at 6in. diameter before moving from the lathe.

The pilot and power thrust unit, which has a cut-out to serve as a handle, should be fairly simple to make from the drawings. The pilot position and his viewing ports follow the same procedure as used elsewhere.

## CONTROL TOWER

This has a simple working part and seems to fascinate my grandchildren.

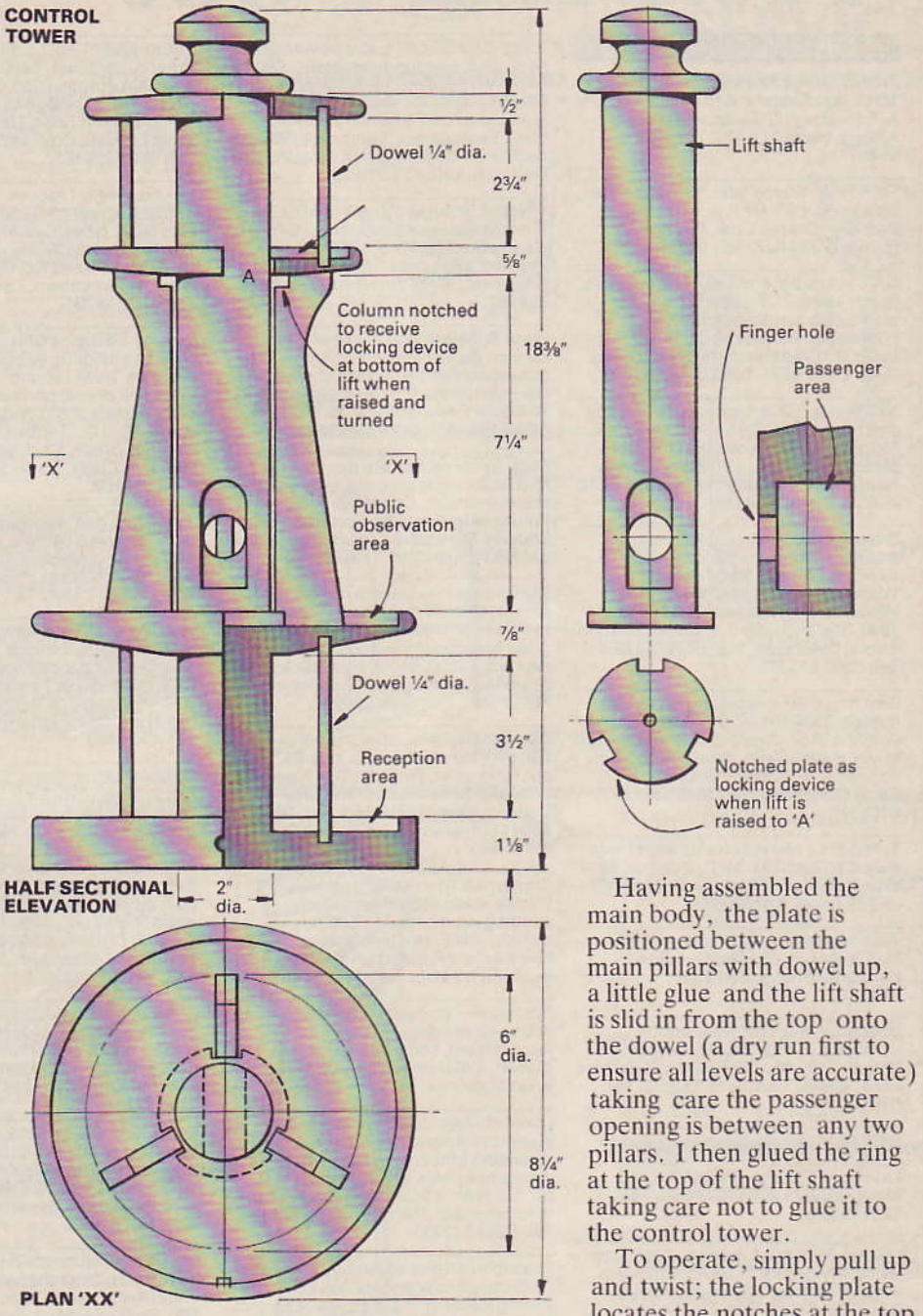
It involves turning three shallow bowls, a small disc and a lift shaft. Though it is not essential, the discs are shaped or recessed.

The base and first observation levels are glued together with a 2in. round centre pillar and three ¼in. dowels are spaced equally around. Allow 1in. between them and the round pillar. The dowels can project ⅜in. through the first platform to secure the shaped pillars which are cut out of ½in. dowel, and planed to the shapes indicated. Note the notches on the inside both top and bottom to receive notched plate at bottom of lift shaft.

On the control level disc I chose to rout out three small grooves to receive the main support pillars. This has the effect of ensuring they are accurate when being glued together. Again the three dowels which support the top can protrude through the control floor into the main pillars though not through the top.

In the control area and top the centre hole is just sufficient to clear the thickness of the lift shaft.

The lift shaft is simply a spindle turning job, 13in. long, the top turned to one's own choice. I chose to also fit a small extra band at the top (turned just as you would a bangle). This is glued on later.




The passenger area is routed out and bottom corners squared with a chisel; it is essential the floor of the lift is equal to the thickness of the top control area floor, we can't have the controller tripping up!

To ease passengers in and out, I found an additional hole in the back an advantage for my thick fingers.

All edges here and round the lift are rounded generously.

The ¼in. thick disc for locking is fairly self-explanatory being a disc with three equally spaced cut-outs marginally wider than the main column thickness with a hole in the centre for ¼in. dowel to fit and glue into the lift shaft, do not glue yet.

Having assembled the main body, the plate is positioned between the main pillars with dowel up, a little glue and the lift shaft is slid in from the top onto the dowel (a dry run first to ensure all levels are accurate) taking care the passenger opening is between any two pillars. I then glued the ring at the top of the lift shaft taking care not to glue it to the control tower.

To operate, simply pull up and twist; the locking plate locates the notches at the top of the columns, twist again and down it goes. Six possible entrance and exit points are available.

Access to the first floor public observation area can be either by steps or escalator.

A 1⅛in. thick piece of timber with steps cut out and an archway big enough for an Inch man to stand in. The sides, each in one 5/16in. thick piece are glued on and are intended to represent an escalator. Care should be taken that the height of the top step is equal to the height of the first floor of the tower.

A dowel in the steps with a corresponding hole in the tower base can be a location point in one or more positions.