The Peacock ChairCharles Oakely, Edited by Arundel
Spiffing up your Campsite...

The Chair

Being a true and accurate description of the manufacture and construction of the chair, known in some corners of the Middle Kingdom as
The Peacock chair
in honour of those individuals of that August company in the manufacture of 18 of these chairs in a single project.
Written in the year A.S. XXXI
by Charles Oakley, Esquire,
follower of the company, in service to his companions and friends of that worthy body known as the Grand Company of the Peacock, with whom he laboured for many months in the completion of this project.

Forward:
Some months ago the Grand Company of the Peacock, a tournament company of the
Society for Creative Anachronism, made the fateful decision to undertake the construction of matching chairs. It was felt that undertaking and completing such accouterments would be a lot of fun, a great way to learn some new stuff and a really cool thing to do. So the project was adopted...
First, after disassembling an existing chair... rumored to have at one time been and ancient throne of the Middle Kingdom, but now have barely sufficient parts from which to derive a pattern, members of the company gathered together and after making minor changes and improvements to the original design, went out and procured 550 board feet of unfinished poplar (the estimate was pretty good... we have less than 25 board feet left....) and began the project....
Now, before this all begins to sound like something you're ready to undertake... it should be clearly understood that we had at our disposal (thanks to Baron Roghallach the Strong) a thickness planer, two band saws, two drill presses, a heavy duty router, table saw, two sanding machines and an almost infinite number of hand tools.... not to mention a large space to take over in which to make the project happen.
After numerous work parties that lasted complete weekends, countless hours from the company and their Ladies... the project was finished in November of 1996.
This booklet is a "how to" for anyone intrepid enough to go where we went...
GOOD LUCK.
Parts List:
Each chair will contain the following number of parts:

Leg pieces - 18 (see Estimating the Project...)
Seat pieces - 17 1 1/4 x 16 rough
Feet - 2 3" x 21" rough
Arms - 2 1 1/2 x 22 rough
Back - 1 25 1/2 x 7 1/4 rough
Back support - 2 3" x 1/2"
Dowel rods - 4 24" x 1/2"
Dowel caps - 8
Total 54

In addition, you will need carpenter's glue and deck screws.

Tools Needed:

If you follow the same procedures and methods of construction that we used, you will need access to the following tools:

Thickness planer
Band saw
Drill press (w/mortising attachment)
Table saw
disk & drum sanders
drill
finishing sander
heavy duty router with router table
radial arm saw
rubber mallet
chisels & hammer

There are probably others that I have either forgotten or am blocking on at this time.... just have a Sears or other handy hardware store nearby and keep your credit good....

Getting Ready...

The first thing you need to do if you decide that you really want to undertake this project is to sit down and think it over again. This project is not simple... in fact... its darned hard. There are a lot of parts, dozens of machining operations, hand fittings and thing that can... and will... go wrong. Wood will check and split on you... machines will take chunks out of things that they shouldn't be taking chunks out of (if you are very lucky... YOU won't be one of those things that the machine takes a chunk out of...). If you don't have a good familiarity with power tools and their use I don't recommend this project.... If you decide to do it anyway.. Good Luck... and BE CAREFUL... Luckily we all ended up with all of our fingers and toes still attached... but there were one or two times when we weren't sure the count going in was going to equal the count going out....

Now... if you really decide that this is something you want to do. The first decision point is to decide what kind of wood you want to use for your project. We settled on poplar for two reasons... first, it was the cheapest hardwood we could get from our local supplier and, secondly, it was a workable wood that was somewhat lighter than most other hardwoods.

Oak was considered but it is considerably more expensive and has significantly

more weight to it.... As they are built and given our source for lumber, each chair cost $66.50 for the wood and weighs (upon completion) about 32 pounds...

Estimating the Project:

Because we were dealing with unfinished lumber, our method of estimating how much we would need for the project was somewhat different than if we were estimating material using dimensional lumber. When you order unfinished lumber, lengths and widths of boards vary. Generally we figured on getting 2 legs from a 71/2" wide piece 36" long. Now... if the board were 9 1/2" wide we could get 3 legs out of a 36" long piece... provide there was no checking or knots or .... well, you get the picture.

So, assuming that you had perfectly usable wood of 7 1/2" wide, you'd need 27 linear feet of 7 1/2" inch wide material to get the 18 legs out of.... Now, if you're making a small run of chairs I would recommend having at least 2 extra legs as spares in case of errors during the machining process. (Technically known as "oops-es".) If you are only building one or two chairs you might want to consider buying finished lumber or hand selecting the pieces. As we were building 18 chairs this was not a practical way to buy lumber.

The seat slats are 1 1/8" wide and raw cut to about 16" long. These are nice straight boards and some can be gotten out of the scrap from which you cut the legs... if you're careful. Once again, the random widths of lumber you get will have a great bearing on how many linear feet of lumber you'll need. I recommend that you examine the parts list, consult with your local lumberyard and then spend some time with pencil and paper to figure out what you might need.

The arms and feet are a fairly straight forward estimate as they are all straight pieces. You can get one arm and one foot out of a piece of 2" true width lumber 4 1/2" wide and 22.25" long (remember to allow for the saw kerf...). As the quantities of this material you will be using is relatively small, I recommend that you go ahead and buy finished material and hand select the pieces.

Pre-processing the parts...

If you choose to use unfinished lumber as we did, it is recommend that you plane all of your lumber to the appropriate thicknesses as a first step. The planing process makes a phenomenal amount of waste in the form of small chips and dust... This is a job that you want to do once and then put the planer away.

When we bought our lumber, all of the wood for the legs, seat and back was 5/4 unfinished with one edge trued. We planed all of this material down to 15/16". The arms and foot pieces were originally 2" thick and planned down to 1 3/4".

Cutting out the parts:

Note: The center page of this document contains a grided drawing of the leg design we used. By drawing a grid (1 square = 1 inch) and then plotting the drawing onto that grid you should be able to recreate a full sized pattern. Another way of doing it, if you have or have access to a scanner and some computer equipment, is to scan the image into a computer and then blow it up and print it in sections... either way will work.

The Legs:

Careful cutting out and preparation of the chair legs is a critical element in

the successful creation of the chair. Each leg is identical in every respect. In fact... the more identical you can make them the better.

You will need:

- **a leg template**
- **a pencil**
- **a bandsaw**

If you have not already made a full scale template of the leg pattern at the end of this article please do so now. When we made our chairs we had one made from stainless steel... as we were also using this for a router guide during one of the steps it seemed like a reasonable thing to do at the time.... if you don't want to go to the time, trouble or expense of creating a metal template for yourself, a reasonable substitute can be made using particle board. First, lay out the full sized drawing on paper and then transfer the pattern via tracing or another method to the particle board. CAREFULLY cut out the template. I can not emphasize enough the requirement to be precise during this step. This will be the master template for every leg in every chair you make. Any errors that you introduce here will be duplicated over and over again.... so....now that you have a template...

The first thing to do is identify which boards you want to use to make the legs out of... Take the selected pre-planed lumber and, using your template... lay out each piece on the planed lumber. When you have 18 (or more) legs laid out, take the lumber to the band saw and cut out each leg.

Cut out each piece VERY carefully and as close to the lines as possible... WITHOUT GOING OVER!!! When you are done, use a 1/2" drill bit to drill each of

the two holes in each leg. At this point you should sand down to the lines using a drum sander. Try to get all saw marks out of the wood. You shouldn't have to sand any of the flat services as they have already been planed. Sand lightly... and keep clear of the last 1" or so from each end of the piece... You don't want to remove too much material on the ends as it will make fitting them into the arm and foot pieces more difficult in later steps.

Drilling Note: When you do any drilling, put a piece of scrap wood under the piece you are drilling. This way, when the drill bit exits the work piece, tear-out will be minimized on the underside of your work piece...

The Seat:

Again, we had a steel template made to facilitate layout of the piece and placement of the holes.

Using the table saw, each seat piece (17 total) is cut 1 1/4" wide and 15 3/4" - 16" long out of planed material (15/16"). The material is then run through the planer to take the 1 1/4" thickness down to 1 1/8".

At the top of figure showing the leg pattern you will also find the pattern for the seat piece. This shows the rough cut dimensions and hole placements. Each piece should be cut to match the pattern as shown and drilled with a 1/2" bit. Again... care needs to be taken to ensure that the piece is fabricated as carefully as possible. Do not sand this piece.

The Arm:
The arms are cut from some of the thicker stock. Using the table saw, cut out the basic shape, i.e. pieces 22" long by 1 3/8" thick.
There are three operations that can be performed on each arm piece at this time.

First, using a 1/4" rounding over bit, relieve the TOP edge of the arm around all 4 sides.

Secondly, a decorative groove may be placed down the side of each arm using a 1/2" cove bit. It is our intent to someday use this groove to hold on padded "over arms" for the chairs (slip on padded arms...). This is an optional step (both the padded arms and the groove...)!!!! But, as it is something that we did, Im writing it up.
The illustration to the right shows an end view of the arm. The cove bit cuts are centered on the sides of the arms and are stopped 5 1/2" from the end of the arm.
The next step that can be performed at this stage is the cutting of the slot that will hold the chair back in place. Now in most illustrations that I have seen, the backs of chairs in period were straight up and down... not slanted as we chose to do. The measurements I have given are for the way we did our chairs.... We used a dado blade attached to a radial arm saw to cut the slot.... Two of the chairs we made had straight backs on them... If you make a straight back, position the forward edge of the dado no more than 3" from the end of the arm... 2 3/4" is better. This will ensure that the back doesn't run into the end of the back most leg when assembly begins.
Each dado should be just 1" wide... Don't over do it! Remember, the back is 15/16" wide... You want the dado just over this so that the back can slide on and off fairly easily and yet not be sloppy in its fit...
If you want, cut the dado to 15/16" and then using a 4-in-hand, work the back edge of the dado to where the back will fit properly.... This is the way we did them... it's a bit of a pain but makes for a nice fit.
The Feet:
Like the arms, each foot is cut from the thicker stock (1 3/4") on a table saw. Each foot should be cut 22" long and 2 3/4" wide.

There are two processes that you can perform on each foot at this time. First, make the relief cut on the bottom of the foot. The cut should begin about 2 1/4" in from one end and end about the same distance from the other end. The cut should not exceed 1/2" in depth. The purpose of this cut is to allow the chair to sit more firmly on uneven surfaces. This cut is executed on a bandsaw...

Secondly, you can... if you choose, route a decorative edge around the top of the foot. We chose to use a decorative ogee bit to relieve the edges of the feet however there are any number of options including simply rounding over the edges. Whatever bit you elect to use, run the pattern around all four sides of the top but make sure that there is at least 1" either side of center (2" total width) left on the top of the foot. This

will ensure that there will be sufficient surface area for you to cut the mortises needed to receive the base of the legs into the feet.
These pieces can now be hand sanded and set aside.

The Back:
The back is a single board 25 1/2" x 7" or so. The design of the back is basically up to you... with the following exceptions... As you can see from the illustration, when the slots for the arms are cut into the back, it leaves two "tabs" that , because of the run of the grain on the board, become weak points. These should be reinforced by drilling 1/2" wide holes about 3" deep on each side of the back. Glue and insert a 1/2" dowel into these holes and let everything set up. Once the glue has dried, trim the dowels off and sand the area. Take a 1/4" rounding over bit and relieve all edges of the back. DO NOT CUT THE ARM SLOTS YET!!! EACH BACK MUST BE CUSTOM FIT TO EACH CHAIR!!!.
Assembly.... (the beginning of the end)...

Well, if you have gone this far and have been following all of the steps outlined above you should have a sizable pile of parts by this time and you now need to start converting them into a chair.
Step 1:
The first step is to put the basic chair together. In other words, the dowels, the seat boards and the legs into a functional pile. If you examine the picture at the beginning of this article it is easy to see how the legs, alternating left and right are joined by a dowel through the lower hole.
The only special requirements involved in this step is to fit each of the seat boards. The seat boards should be a bit long on each end. You will need to cut and fit each end so that it fits the curves of the leg it is intended to fit against. The best way to do this is to put a dowel through the center hole of two seat boards (opposing) and then clamp them together so that the plane of the seat is level. Test fit these pieces to a leg and then mark and trim the pieces. Repeat until you run out of pieces. This is a consuming process but by fitting each seat board individually you will ensure that the seat of your chair is flat and has a smooth appearance.
Step 2:
After you have the chair legs & seat assembled the next step is to attach the feet. Take one of the foot boards and place it under the legs on one side of the chair. Take the feet and place them under the legs of the chair (both sides).... the front of the feet should be even.... you'll notice that the front leg on one side is closer to the front of its foot than on the other side... that's the way its supposed to be... the feet are NOT centered fore and aft under each set of legs... they ARE centered right to left.

Once you have the feet aligned under the legs, carefully layout where you need to put the mortises that will receive the legs. After all the cutting and sanding you did on the legs you'll probably find that the leg are all of

slightly different sizes where they meet the foot. Each mortise will, in effect, be custom fit to each leg that is to receive it... it is important to keep track of which foot goes with which set of legs and in what orientation... it will make your life simpler in the long run. Each mortise should be approximately 1/2" to 3/4" deep... your choice.

Once all the mortises are cut and the feet have been test fitted successfully to the legs, place glue in each of the mortises (use a brusth to get the glue unto the interior sides of the mortise) and insert the legs. It takes a bit of jockying around to get everything to fit and you want to use a persuader (that's a hammer to any civilians out there) with great care. If you examine the legs you'll note that, because they were cut out of a length wood the grain can create some weak lines... pounding on the leg can cause a fracture of the leg along these grain lines... I know... been there... done that. (If you break a leg you have two choices... you can take the chair apart and make a replacement leg and then put it all back together again or you can glue up the break... only the situation at the time will tell you which is the best option. If one side is already glued up then repair is probably your best option).

O.K.... now that you have the feet glued on, turn the chair upside down. Using a drill and a narrow bit... drill pilot holes into 3 or 4 of the legs through the bottom of the feet. Use 1 1/4" decking screws to secure the feet to the legs. These screws ensure that the feet are drawn up to the bottoms of the legs properly and will hold everything in place until the glue sets. The glue is what really does all the work and provides the permanence in the joint.

Step 3:

Using the same technique as described in step number 2 (except for the deck screws...), install the arms on the chair. Make sure that the arms are even front to back... the slots that will receive the back board have to line up or the back board won't slide on and off properly.

Step 4:

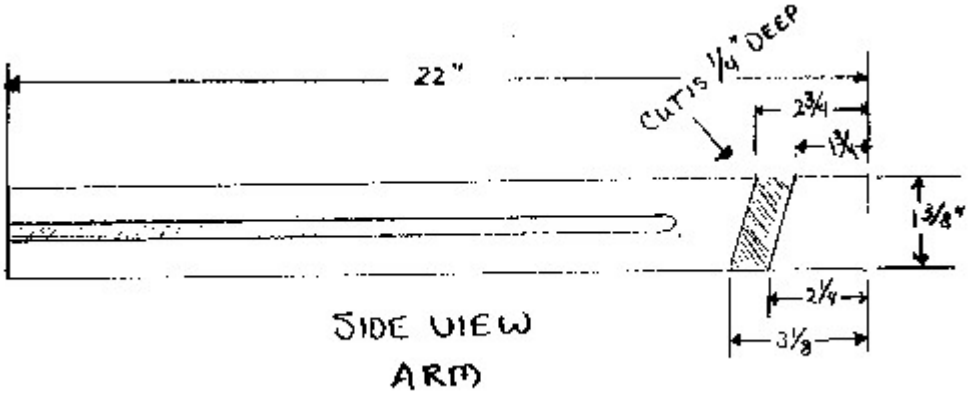
After all of the above has been completed and the glue has set up the final step is to cut the notches in the back board. Laying out these notches is is a simple matter of setting the back board on the arms where the dados are located. Mark the back board so that the notch is just a bit wider that the arm at the dado. The notch should be just deep enough so that the back board will extend just past the bottom of the arm when it is installed.... If you haven't inserted the dowels on the corners yet it would be best to do that before you cut the notches.

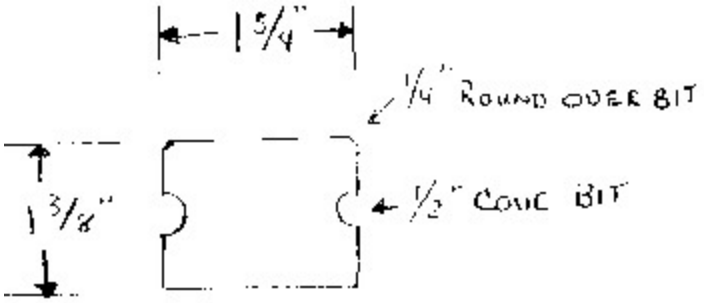
Finished:

Although most of the techniques used in making this chair are similar to the making of any other `x' type chair a great deal of care needs to be taken in the construction of this chair for several reasons. First is a cost factor. All of the curved pieces and extra thick pieces tend to increase the cost of the raw material... if the chair doesn't turn our or if your parts don't fit properly it can get pricey to start over again... secondly, some woods are brittle and breaking pieces can raise your frustration level considerably... and finally,

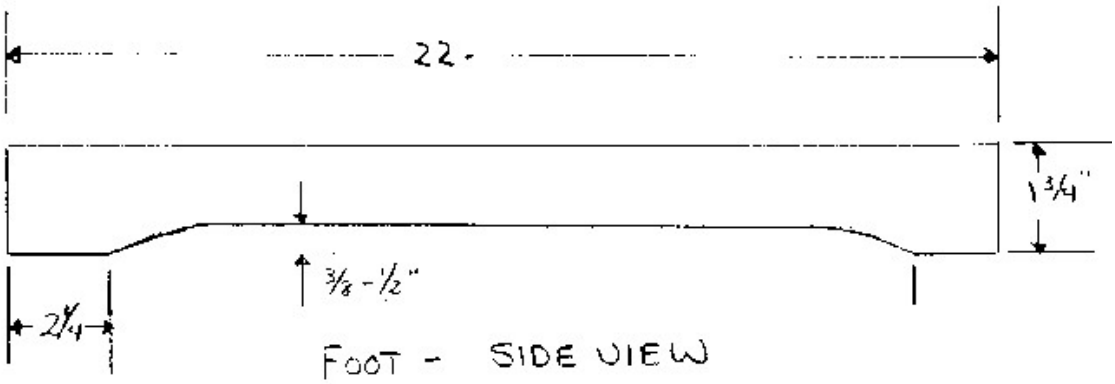
there is a tremendous amount of layout involved with these chairs. Mistakes in layout will almost insure that the first and second problems will be encountered.
Before you launch into this project, proto type the legs, seat board, and other parts out of some cheap scrap wood. Make sure that things are going to fit.. and then take your time when you launch into the project for real...
Have fun, Make stuff...

Chas.
You are customer 3 since I installed the counter
By the way... here is the leg and seatboard layout grid...

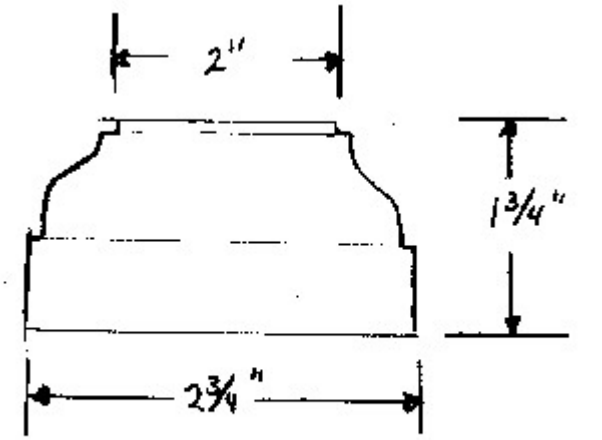




END VIEW
ARM

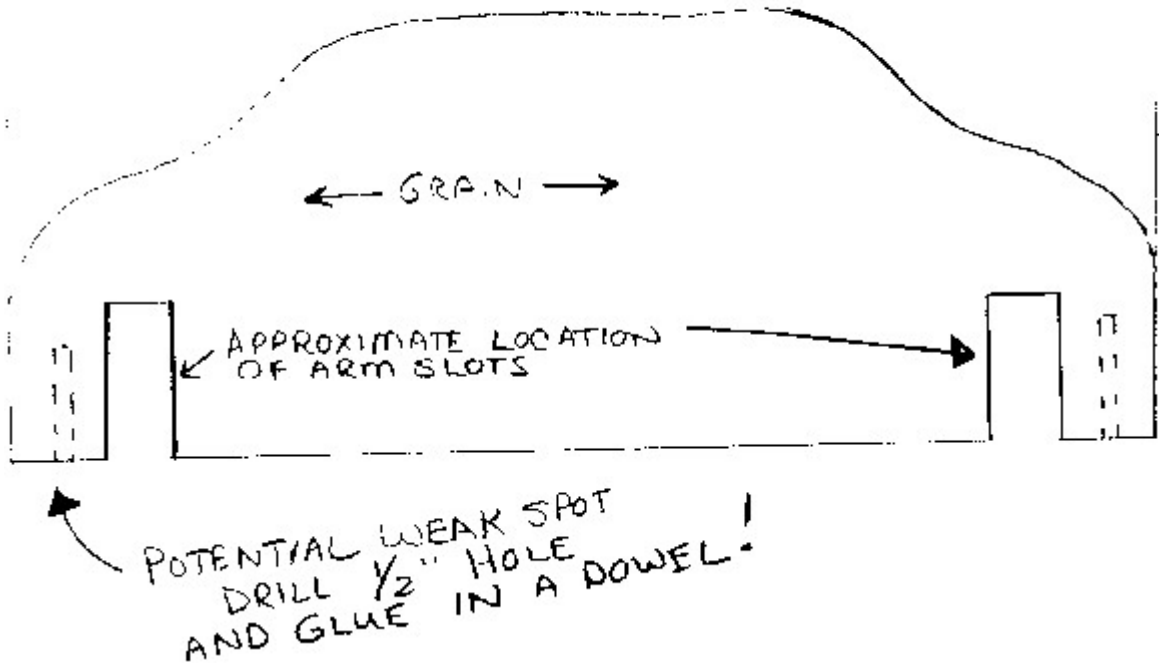


FOOT - SIDE VIEW



FOOT - FRONT VIEW

BACK BOARD


GRAIN
APPROXIMATE LOCATION OF ARM SLOTS
POTENTIAL WEAK SPOT
DRILL 1/2" HOLE
AND GLUE IN A DOWEL!