

SAN JOAQUIN FINE WOODWORKERS ASSOCIATION
INTRODUCTION TO WOODWORKING
A SERIES OF TEN SHORT COURSES

FIRST COURSE: PLANNING THE PROJECT

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First Session

1. What is planning?

1.1. Eisenhower is reported to have said something like, “Plans are nothing: planning is everything.” That view seems to fit the rapidly changing and often surprising situation faced in war. The specific plans may be made worthless by a changing environment, but the process of thinking, of considering alternative actions and the complexities associated with each alternative are essential for rapid response to the environment of the battle.

In fine woodworking, the conditions rarely change much during the construction of the project. As a result, a plan may last through the entire project life. When need for altering the plan arises, usually the basic plan remains intact, with only minor variations made to make the work of the project proceed either more efficiently or toward a better project. Sometimes an early error can be overcome by changing the plan, but we ought not rely on that often.

So, beyond our intention to use the project plan, the planning process represents “building the project in our mind” and is intended to improve the efficiency and quality of our work. A careful, thorough “mental walk through” with good records (drawings) are the guide for systematic, effective work..

1.2. In the theory of evaluation and design of transportation systems (or networks), the plan is a scheme or model of ways to go from a beginning point to a destination point. Here the saying is, “If you don’t know where you are or you don’t know where you are going, any trip will do.” The beginning point and the ending point define the transportation problem.

We will devote attention to the beginning and the end, with the plan setting forth the path of travel to the desired end. The beginning gets as much attention as the end because the work and how we will accomplish it depends as much on where we start as where we intend to finish.

1.3. Another useful view is that plans are a means to coordinate actions so they fit together harmoniously. These actions may be taken by different people, or by a single person in some sequence. A good plan should provide the essential information on the

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interface of one action to another so the parts of the work are married seamlessly toward creation of the desired result.

1.4. For our purposes, plans also can be used to communicate from one person to another the ideas and information needed to duplicate a product without having the original product available for making the copy. The plan is a paper model that can be followed by different craftsmen in different places with duplicate results. Of course, a single craftsman at different times is similar to different craftsmen.

1.5. We will apply the lessons in these differing views to our planning.

2.0 A glimpse at the end product as a guide to preparation of a sufficient understanding of the beginning state

2.1 If you have a good idea of where you are going (what you want to produce) you can avoid a lot of wasted time in specifying where you are (what tools, materials, knowledge and skill, and what you want to learn). That destination is given specific, initial form as a sketch of the hoped-for final product.

2.1 What is the purpose of the project? That is, when you are finished with the product, what do you intend to do with it? Some examples are:

You want to place it by the telephone as a stand for the directory, the phone, some note paper, pencils and pens, etc., and you want it to look nice in that setting.

You want to enter it in the Association annual project show, and therefore want it to show certain characteristics (now list what you want to demonstrate and show, or perhaps even “show off.”)

You want it to be a gift for your (mother-in-law, sister, wife, or daughter) for storing jewelry. It will sit on a walnut dressing table, and it would be nice if it contained a music box.

You want to produce about a dozen of some item that will be given to a charity for their annual auction of gift items.

You want it to fit in the corner of the dining room, match the white oak dining table, and store the fine china, glassware, and silver. Some space should display the nicest plates.

2.2 Sketch the item. This is not a working drawing, but is an overall impression of the final product. The scale should be consistent throughout, and the design “tested” to see if it is pleasing to you. Some factors to consider are:

The proportions of the various parts.

The appropriateness for the intended purpose.

Your best estimate of the complexity of the work.

An idea of the material(s) to be used.

What hardware (if any) would make the project pleasing, and not too expensive. (Sometimes “very expensive” is acceptable, but you should always fit the expected cost to the project needs.)

The setting for the finished project, and the size for that specific use.

You are going to build this sketched product --- build it in your mind, recording it on paper as drawings and instructions so you can do the actual work according to those plans. So, sketch the project well enough to guide you as you draw the plans.

If you can't draw it, you haven't thought enough about what it is.

2.3 What if you want to build a project according to someone else's plan?

There is nothing wrong with using a plan you can obtain. However, you should be able to prepare your own plan, if for no reason other than this ability is useful in understanding and evaluating a plan, checking the published plan for errors (yes, they do occur), and developing your own scheme for the work to be conducted. So, go back to the sketch.

3.0 Elements of a plan

3.1 The most common element of a plan for a woodworking project is a set of drawings.

3.1.1 From the drawings, a list of parts can be constructed. Most of these parts will be machined to mate with other parts, so the drawings must show each part as it will be in the final product.

3.1.2 From drawings of the finished parts, the gross part needed for creation of this finished part can be identified. The entire set of these gross parts is used to prepare the cut list. (The term “gross part” is a piece of wood from which the final part will be machined. Some workers cut the part to final dimension initially. Others, wisely cut these initial parts slightly larger than is needed as the final piece. Take your pick.)

3.1.3 In preparing the drawings, any fabricated parts to be purchased should be identified. Drawer slides, door and drawer pulls and other hardware needs to be specified, and the source(s) found. If you had wanted to use a particular part, it is better to learn that you

cannot find it before you proceed than to be disappointed later. Usually, if you cannot find your most preferred part, an alternative can be found in time to adjust the plan at this stage.

3.2 The cut list is the set of pieces needed to make the finished parts. The cut list is exactly what its name suggests --- a list of pieces cut to be used in machining them to fit into the final product.

3.2.1 Use the cut list to lay out how your material will be cut to produce the needed gross parts with least waste. Here you want to think about grain match, or desired contrast. Don't just bash in and make initial cuts without considering the final product. For example, for your project, you may wish to:

For a box, consider a single board to "wrap around" the box so the grain matches at the dominant corners.

For a table or desk top, consider carefully how adjacent boards create an impression of continuity.

For a desk using quarter sawn white oak, consider constructing legs with the flake sides showing on all four sides.

To accomplish some desirable esthetic effects, the waste may be greater. That may be a good trade-off, but do consider the improved appearance as costing more.

3.2.2 The cut list, cutting plan, and expected waste are needed to prepare a budget for the project.

3.3 The work schedule (or sequence) is as important as the working drawings. The two main functions of the work schedule are (a) to determine the work processes needed in the project so that a common process for many parts may be conducted at one time, and (b) to see the best sequence for assembly of the final product.

3.3.1 Preparing the wood for the different parts almost always involves some work common to those parts.

Sometimes it is important that such work be identical for each part, such as in preparing boards for joining to make a top of a desk. If you do not have access to a planer wide enough to plane the glued up part, you will want the parts to be of precisely the same thickness. You will glue up using cauls and then sand to remove any small deviations. On the other hand, if you have access to a wide plane you may wish to prepare the boards thicker than the intended final dimension, and plane them after gluing them. The tools you have, and the precision you need determine the best sequence. Plan for that.

You may have several mortise and tenon joints to prepare, all of the same dimensions. A single set-up may save you time, and may reduce the “testing” steps considerably. Plan to do them as a single process.

If you apply the finish by hand, you may wish to finish all the parts after dry fitting, but before final assembly. That could save you dealing with corners and edges that are difficult to do well. So plan for that.

3.3.2 The assembly sequence should be planned so that you avoid “Oh darn it all, I should have done that before gluing those parts.”

Sometimes a part can cause difficulty in assembly if it is even a little too large or small. A tiny error at one stage may be critical if you have not planned for that. For example, if that part can be made after dry fitting the other parts, thereby assuring that multiple adjustments can be made easily, imagine that ahead of the critical time, and fit that part at the time of dry fitting.

Sometimes a particular sequence of assembly cannot be accomplished. That is a good reason to “dry fit” the project. Pay attention to the assembly when dry fitting, and then set the final assembly sequence to take advantage of what you have learned.

These and other opportunities can be discovered through careful sequence planning.

3.4 PLANNING THE SEQUENCE OF WORK AND ASSEMBLY IS VIRTUALLY BUILDING THE PRODUCT IN YOUR MIND AND ON PAPER. DOING THAT WILL MAKE ACTUALLY BUILDING THE PRODUCT MORE EFFECTIVE AND MORE EFFICIENT. THIS PERMITS THE TRIAL AND ERROR PROCESS TO BE INEXPENSIVE FINANCIALLY AND EMOTIONALLY.

4.0 The budget

4.1 A formal budget may not be necessary if the project is simple (made so by virtue of good planning) or your financial resource is far beyond the expected cost. This often happens when you already have more than ample supplies of wood on hand and you are engaged in your hobby. On the other hand, if you expect to make a product commercially (either one-of-a-kind or multiple copies) you better prepare a budget so the pricing can be sensibly.

4.2 Price each item in the cut list, and in the purchased fabricated parts list. Include those in the budget. From the cut pattern, estimate the waste and include that in the budget. Estimate the costs of sharpening, of glue, and other indirect materials and include those in the budget.

4.3. In a commercial operation, and perhaps in a hobby shop, you will want to develop a rational method of charging for indirect costs. That is beyond this course, but your

instructor will help you do this if you are interested. Electricity, heating and air conditioning, insurance, depreciation that is use based, and time devoted to tuning and maintaining your equipment are some of the items that deserve attention here.

In this process, we distinguish between direct costs and indirect costs. Indirect costs are divided into those which can be allocated (sharpening, glue, miscellaneous screws and nails) and those which must be prorated (electricity).

Finally, costs which do not vary by virtue of the quantity of work you do in your shop should be considered. Fire insurance, real estate taxes, roof repair, and many other items fall in this category. These costs are inescapable, and do not vary either directly or indirectly with the amount of project work. They still must be supported with revenue, so take them into account. Don't try to associate these with individual projects, but do plan a sufficient margin to be able to pay them.

5.0 Project review. Post-mortem review is necessary to learn from our experience.

Second Session

Last session you were left with the task of applying what we discussed by preparing a plan for the project you sketched in the first session. Our process for today is to have each member review the plan prepared by each other member of your group. Obviously, that requires each member to present and explain his own plan.

1. The review of plans has two purposes:
 - a. To help the presenter improve his plan.
 - b. To give the reviewers an opportunity to learn how to improve their plans.
2. A review or critique is NOT a process that leads to "gotcha." Any criticism must be in the form of a question or suggestion that leads to improvement. If you think you see a flaw, think of a way to make an improvement. If you cannot suggest how you think an improvement can be made, you have not found a "flaw" worthy of comment.
3. Examination of another person's plan should give you ideas on how you can improve your own planning. The presenter's good concept or execution ought to suggest what you might do in the future. The presenter's weakness in the plan should inform you how to avoid that same problem.

WE SHOULD LEARN FROM OUR MISTAKES. EVEN BETTER, WE SHOULD LEARN FROM THE MISTAKES OF OTHERS: IT IS LESS COSTLY.

4. Some categories for attention in the review are:

- a. Is the statement of the beginning point clear and complete for practical purposes? What equipment will be needed? What knowledge or skill is needed, with emphasis on the additional learning that the woodworker will need, or skill that remains to be developed to complete the process? Is the worker willing (or eager) to add these elements to his or her skill or knowledge?
- b. Is the working drawing clear and complete? Does the scale permit good understanding of what is to be accomplished? Do the plans present front, top, and side views? Is an oblique view useful in showing the core of the product and its parts? Does the plan depend on clearly available component parts to be purchased?
- c. Are the parts list and the cut patterns set forth so they can be practical guides?
- d. Is the quantity of wood planned well, with adequate provision for waste (and errors)?
- e. Is the work sequence set forth, providing for efficient and effective machining? Is dry fitting provided? Is surface finishing given good position in the sequence?
- f. Are any jigs or fixtures needed for safe and for effective machining? Are these jigs and fixtures present or well planned if they are to be constructed?
- g. For after dry fitting, is space planned for storing the parts for easy access during final glue-up?
- h. Is the budget decently matched to the woodworker's requirements?
- i. You will think of other items as you examine plans. Please keep these items in mind to suggest as we conclude our session.

5. After the project is completed, conduct a review of the plans. Make notes on how the plan could have been better as a guide for your work. One key to becoming a better woodworker to extract every good lesson that is in your experience: things to avoid, things to improve, and things to repeat