A Schaff Piano Supply Company Exclusive:

Building the Collapsible Work Bench:

Sample Pages

Bench designed by Chuck Behm

Shop Ideas

The Collapsible Work Bench

Rationale-

A solidly built, functional work bench gives the piano technician the platform on which to do many of the jobs necessary in restoring pianos. With a dedicated work area such as this bench provides, bringing actions, keyboards and even entire pianos to the shop to work on is more feasible than if temporary work areas (card tables, the kitchen table, countertops, etc.) are used.

For the technician who is currently without actual shop space, the building of this work bench would be a good first step in the construction of a professional quality work area. One advantage of this bench is that it was designed to be useful for a variety of purposes. Convenient storage for small tools and action parts, plus a large flat work area makes it ideal for action repair and grand action regulation. With the attachment of the suggested woodworking vise, keytop replacement and repair may be easily done. For the refinisher who brushes on a finish, all aspects of refinishing may be completed on this bench.

The bench was designed to be extremely solid and is very professional looking. When properly equipped with tools and supplies, it affords the technician a focal point for a small shop which would be an inspiration to do top quality work.

Overall Game Plan

The suggestions on these two pages are for the benefit of the technician unaccustomed to undertaking substantial woodworking projects such as will be entailed in the building of this bench. For those who are used to shop work of this nature, feel free to skip ahead to the blueprints to get on with actual bench building. For everyone who has purchased these plans, woodworker and non-woodworker alike, thank you and good luck in building an extremely useful piece of shop equipment.

1. Look over the plans: Before purchasing any lumber or hardware, check over the overall dimensions of the bench as described in these plans, and compare those measurements with the space which the bench will occupy. Now is the time to decide on any alterations in dimensions that would affect the amount of material to be purchased. If, for example, you wish to build a bench longer than the 6 foot described in the directions, that will affect the length of certain boards you will need to purchase.

2. Shop for materials: With your bill of materials (detailed on page 5 following Game Plan) in hand, do your shopping for lumber and hardware. Home improvement stores such as Menards, Home Depot, or Lowes, etc. should carry everything that you will need. (As far as the screws listed, an attempt was made after the fact to count all the screws used in the finish product. The price quoted is merely a guesstimate, however, since I used screws from bins already stocked in my shop. Whenever possible, I would recommend buying screws by the box to have plenty to spare.) Everything required to build your bench will fit in the back of a minivan (with the rear seats removed), or on the bed of a full-size pickup. If a vehicle of adequate size is not available, most home improvement stores will deliver your materials for a fee, or offer a truck to rent.

3. Space requirements: It would work best if one half of a stall of garage space (or the equivalent in your basement or shop) could be cleared out for the building of your bench. Some of the assembly will be done on the floor, while other work would be best done on a bench type surface. Obviously, if you're building a bench, it may be because you don't have one, so feel free to improvise for a temporary work surface. An old door on top of two card tables, for example, would give you an adequate space to do the assembly work requiring a bench surface. Working in either a heated or air-conditioned area, or a garage open to the weather in the spring or the fall (if you live in a climate with extremes in temperature) would be preferable.

4. Tool requirements: Although this bench could be built with hand tools alone, certain power tools will make the job much easier. In building the prototype the following power and hand tools were used:

- Power miter saw
- Table saw (used both with dado-head set up and ordinary crosscut blade)
- 14" band saw
- Drill press
- Mortising machine
- Electric hand drill
- Router
- Various bar clamps and C-clamps
- Various drill bits, router bits, saw blades, etc.

The most useful single power in the list above for this project would be the power miter saw, in that it was used to cut all the longer boards to length. A circle saw could do the work of the table saw, and a saber saw could be substituted for the band saw. The drill press, mortising machine and router are used for operations which could hypothetically be omitted.

5. Time requirements: The prototype bench took the better part of 3 weeks to build, but that was without a clear plan, or single measurement to work with, except that the finished product needed to fold down to a dimension that would fit into the back of a minivan. With a proper materials list (so that 6 trips to the home improvement store would be unnecessary!), and actual measurements to be used for cutting the lumber, this should be a project that would be doable in a couple of weekends, for the average woodworker, at any rate. If this is the first major woodworking project attempted, you could probably count on doubling that time.

6. Skill requirements: The tried and true woodworker should find this project a piece of cake to build. I've tried to write the directions clearly enough that even someone unfamiliar with wood shop procedures should have a good idea of what needs to be done. If you happen to be a person with little or no experience in building projects from wood, I would encourage you to enlist the aid of a friend or relative who is more experienced to lend a hand.

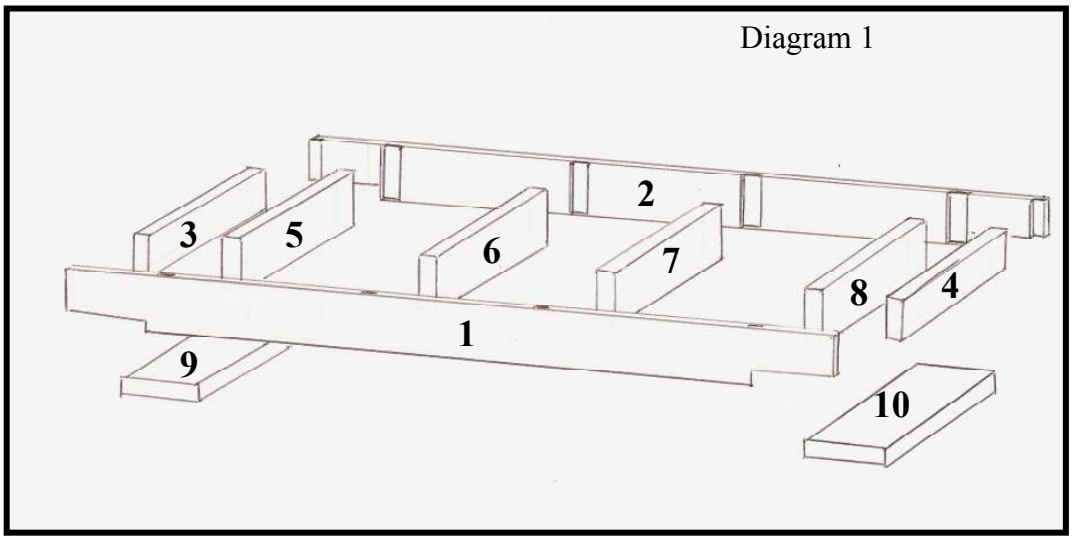
For everyone building this workbench, whether experienced or not: For any procedure in which heavier power tools, such as the table saw, are used, have another person in the shop. *Do not, under any circumstances, use power equipment when overly-tired, or impaired with alcohol or medications.*

Bill of Materials

	Quantity	Dimension	Type	Estimated Cost*
Lumber:	3	2 X 6 X 8 foot	Douglas Fir	$9.48
	7	2 X 8 X 8 foot	Douglas Fir	$27.72
	10	1 X 8 X 8 foot	Clear pine	$159.80
	1	15/32 inch sheet	Plywood	$22.98
	2	¾ inch sheet	Plywood	$63.92
	1	¾ inch sheet	Oak veneer plywood	$56.88
	1	¼ inch sheet	Pegboard	$15.00
	4	1 X 8 X 6 foot	Oak lumber	$80.00
		Description		
Hardware:	68	2" self-tapping Phillips screws		
	20	1 1/2" self-tapping Phillips screws		
	63	1" X 8 slotted screws		
	12	3" self-tapping Phillips screws		
	54	1" X 4 slotted screws		
	24	1 1/4" X 6 slotted screws		
	6	1 1/4" X 6 oval slotted screws		
	2	1" X 8 round head screws		
	5	9" bolts, nuts and washers		$50.00
Misc:	6	1 1/2" X 48" nickel plated continuous hinges		$59.88
	1	15" X 9 3/4" 30 drawer storage cabinet		$14.48
	1	15" X 9 3/4" 9 drawer storage cabinet		$11.48
	8	#2 storage bins 8 pack		$6.97
	1	14" X 10' roll flashing		$8.98
	2	12" X 36" X 1/8" gasket cork		$12.98
	3	Electrical boxes, 2 1/8" deep		$6.39
	3	20 amp receptacles		$7.47
	3	Stainless steel receptacle plates		$4.47
			Grand Total of Estimate**	**$620.00**

*Based on the expenses in building the prototype.
**Keep in mind that your cost will be influenced by any alterations to the plans which you make. This is intended to just give a ballpark look at what you might expect to spend.

Suggestions for Construction of Inner Frame



Inner Frame - Exploded View.

Parts List - Actual Dimensions* / Inner Frame (I.F.)

Part #1: Front I.F. rail - 1 1/2" X 5 1/2" X 69"
Part #2: Back I.F. rail - 1 1/2" X 5 1/2" X 69"
Part #3: Left I.F. rail - 1 1/2" X 4" X 28"
Part #4: Right I.F. rail - 1 1/2" X 4" X 28"
Part #5: Left I.F. cross support - 1 1/2" X 5 1/2" X 28"
Part #6: Left center I.F. cross support - 1 1/2" X 5 1/2" X 28"
Part #7: Right center I.F. cross support - 1 1/2" X 5 1/2" X 28"
Part #8: Right I.F. cross support - 1 1/2" X 5 1/2" X 28"
Part #9: Left I.F. leg anchor - 1 1/2 X 7 1/4" X 30"
Part #10: Right I.F. leg anchor - 1 1/2" X 7 1/4" X 30"

Step-by-Step Procedures

1. Select straight boards of top quality 2 x 6 dimensional lumber for building the inner frame of the bench top. Economizing on poor quality lumber will make construction of an absolutely flat bench top (necessary for regulation work) very difficult to achieve.

2. Cut all boards to length, notch the ends of the front and back rails, and make all necessary dado cuts before assembling and gluing together any of the parts. (See page 8 for details [steps 2A and 2B] on notching and dado cuts.) Test the width of dado cuts with a piece of scrap 2 x 6 lumber. The fit should be snug, but not so much that a mallet is needed to pound the pieces together. The two pieces for each joint should fit together by hand.

*To be exacting, actual dimensions will be given in parts lists - instead of listing part #1 as a 2 X 6 (what you would ask for at the lumber yard), the actual working measurements will be given.

3. Drill pilot holes for screws to secure cross supports in dado slots. Counter-sink holes for a neater appearance.

4. The flatness of the top of the inner frame is critical to producing a level bench top. A simple method to achieve this is to assemble and glue up the parts of the inner frame on a perfectly flat area of a concrete or other hard surface floor. Cover the area to be used with a layer of contractor paper or newspaper. Then lay out the parts in their respective positions, with the top side of each piece down towards the floor.

5. Dry fit the parts together, driving self-tapping deck screws through the pilot holes drilled in the front and back rails and in to the cross supports.

6. With the parts fitted together, check the squareness of the assembly. If out of square, adjust and use a length of scrap 1 x 2 on a corner to secure.

7. Remove all the screws, disassemble the parts, while keeping everything in approximate position and ready for gluing.

8. If Titebond® is to be used, lightly coat both the ends of each of the cross supports, and the inside of the dado cuts, then fit all pieces together. Tighten all screws, which will serve as clamps to draw the joints together. If Gorilla Glue® is to be used, dampen the ends of the cross supports, apply a thin layer of glue to the inside of the dados (using latex gloves), and fit the pieces together. Tighten all screws.

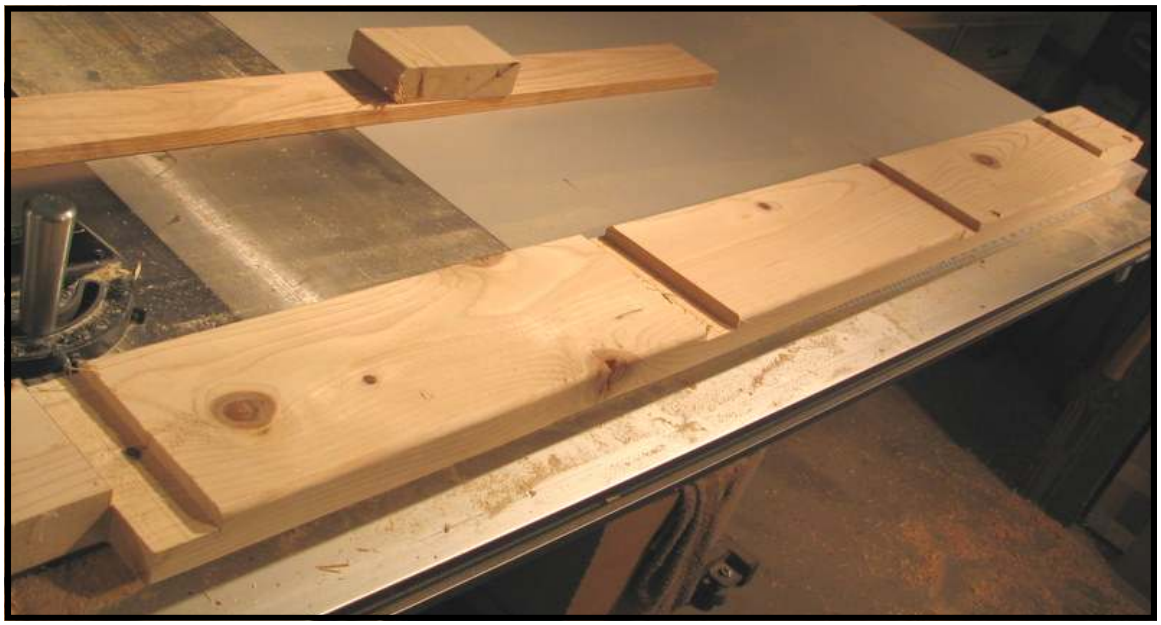
9. If a scrap of 1 x 2 lumber was used to hold the assembly in perfect square, screw that down now.

10. Let completed assembly dry over night.

11. Once dry, turn assembly over, so that the top side is up. If paper has adhered to wood where glue squeezed out, sand paper any excess glue off with 100 grit sandpaper.

12. Before proceeding to the construction of the outer frame, mount the inner frame on top of a pair of sawhorses, or other large improvised bench area.

Details for Notching Front and Back Inner Frame Rails



Front inner rim rail with cuts made.

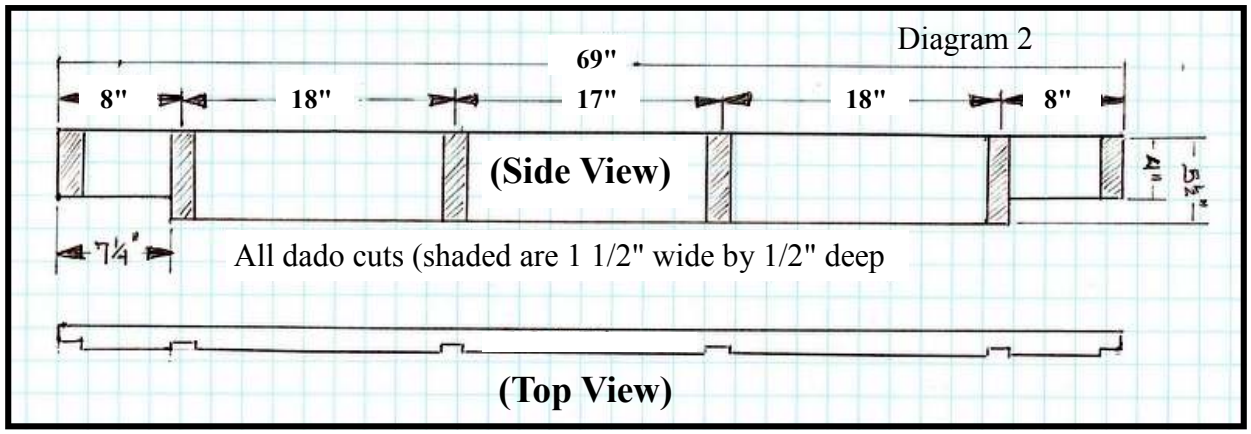


Diagram of identical cuts to be made in front I.F. rail (part #1) and back I.F. rail (part #2).

2A. Use either a band saw (recommended) or saber saw to cut notch on either end of both parts. The notch is meant for the ends of the left and right leg anchors to fit into, so check the fit with a scrap piece of 2 X 8 stock.

2B. On a table saw, use dado head set up to cut out 1 1/2" X 1/2" dado cuts at intervals indicated in the above diagram. An alternative tool for this job would be a router with a 1/2" or 3/4" straight bit. A easier, but less rigid method would be to use butt joints in place of dado joints. To use butt joints, trim 1" off of the right and left rails, part #3 and 4, and also off of the cross rails, parts # 5, 6, 7 and 8.

To the customer of Schaff:

Thanks so much for taking the time to preview the plans for the collapsible bench. It is a great project for anyone who is either building or updating their shop.

The complete 33 page version of the plan is available from Schaff as item #1969. Once the order is placed, the paper copy of the entire plan will be mailed to your address.

I will be happy to personally answer any questions directed to me via e-mail in regards to building your bench, once your plans are sent out.

Thanks again for considering Schaff for your piano shop needs.

Chuck Behm