Build a Classic Grandfather Clock
Woodline USA

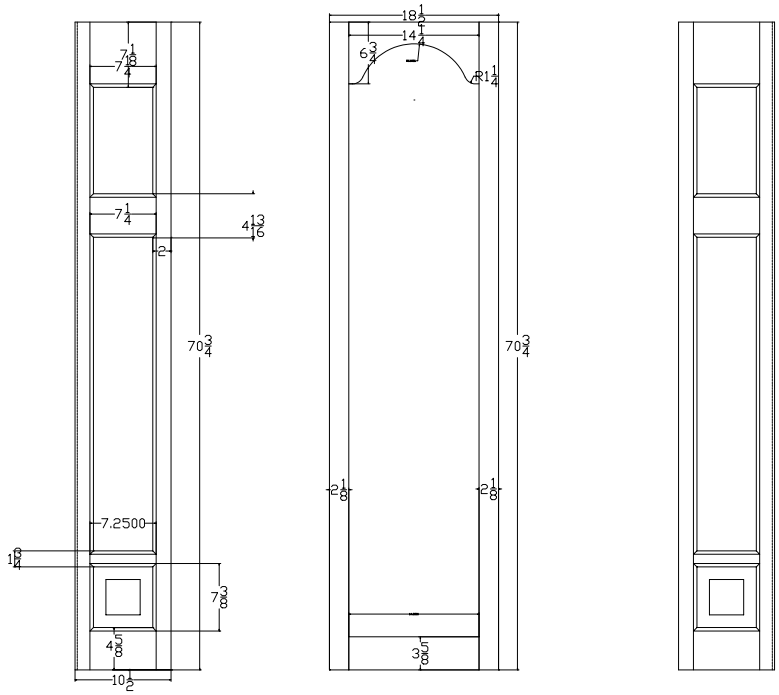
Everybody loves a beautiful classic grandfather clock. The clocks rich beauty and beautiful tones will enrich any home. Grandfather clocks dominate almost any room Many woodworkers may be hesitant to tackle a project as large as a traditional clock but construction of the clock is easy and rewarding.

It is strongly recommended that the builder obtain the glass, clock works and face plate prior to beginning construction. The clock is based on the all brass Hermle 8 day movement part number 13062 from the Klockit Company and glass kit part number 99182. These movements are very high quality and are easy to install. If you have a different size movement or faceplate some adjustment of sizes must be done to accommodate dial and glass parts.

The clock is composed of a basic boxlike case made with rail and stile construction similar to cabinet doors combined with applied moldings and details that enhance the appearance of the project. A finial adds the crowing touch.

Any project this large should be broken into steps. Work carefully and check dimensions as you build the clock. Every effort has been made to assure the measurements are accurate but each builder is encouraged to build parts slightly oversized and trim to fit as required. We will build the carcass first and then the applied moldings. add the movement mounts, apply the finish and install the movement. The clock is constructed from walnut but also looks great in cherry, mahogany, ash or oak. All wood is standard ¾" finished thickness unless otherwise noted. All dimensions are finished dimensions. Rails are terms for horizontal pieces and stiles are vertical pieces.

The basic carcass is composed of a left and



right side and a front frame with attached door. The back of the clock is a ¼" plywood panel divided into two pieces.

The left and right side are mirror images of each other and can both be constructed at the same time. We will use an Ogee pattern cabinet door set Woodline WL 2020-1 but any cabinet door set can be used depending on the builders preference (my wife makes the design decisions) The construction is straight forward and is identical to building a kitchen cabinet door frame. The glass parts will be added later after the door and side frames are built and the finish applied

Cut and joint all parts for rails, stiles and dividers as well as lower panels for left and right side. Also cut parts for the door since it uses the same setup for making the rails, stiles and lower panel. Using a piece of masking tape, place part number on face of part. .

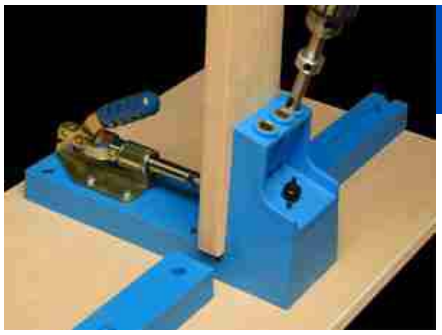
Transfer the curve pattern to the curved door parts and cut the curves using a band saw or jig saw. Curved parts should be sanded smooth using a drum sander.

Setup to make the rail cuts in the end grain first. Carefully make the cope cuts using a push block to prevent tearout. The process is identical to making standard cabinet doors. Most cabinet sets are cut with the face side down so place the tape numbered side up and all will be fine.

Setup and make the stile cuts. Note that some parts receive cuts on both sides and some on only one side. The stile cuts should mate with the cope cuts to produce a flush surface on the face of the parts.

Setup and cut the raised panels for the side and lower front panel. The recommended cutter for this operation is the WL 1346 included in the WL 2020-1 kit. This bit includes a back cutter that will produce a finished tennon that will fit perfectly into the slot left by the stile cutter of the door set.

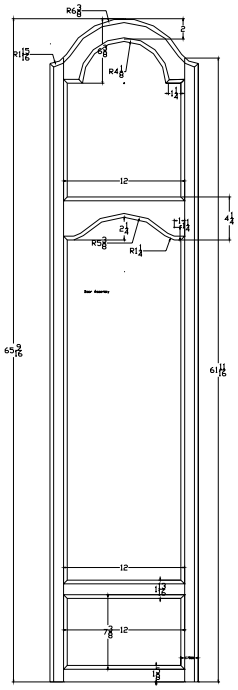
The rear stile for the sides should have a ¼" x ¼" rabbet to install the back of the clock later. This rabbet should be cut using a router or table saw prior to assembly of the side panels.



A Kreg Pocket hole jig system makes assembly of the clock easy and fun. The pocket holes are hidden and the joints are strong and easy to make. Pocket holes are very strong and when combined with glue they are as strong as a mortis and tenon joint.

Carefully measure and gently mark the location of the rails and dividers per the drawings. Begin at the bottom of the sides and match the rail to

the stile. The glass can be used as a pattern to make sure the parts will fit when installed later. Drill pocket holes, assemble and glue the frame for each side securing with fine thread pocket hole screws. . Use any good quality wood glue. Install the insert panels but do not glue them in place, panels must float to allow for expansion. Be sure to make a left and right side. The rabbet on the side stile should be on the rear inside edge of the side panel when the clock is assembled. Set the side panels aside to dry and assemble the door frame. Drill pocket holes in lower, upper lower and curved middle rails. Glue up the frames and secure with pocket hole screws. Use a square to assure the assemblies are as square as possible. The door has a curved upper portion with no room for pocket holes. The top of the door is curved on both inside and outside edges. The sides of the door will be long until trimmed after the glue has dried. The inside curve should match the glass. Glass will be inserted after door frame is assembled



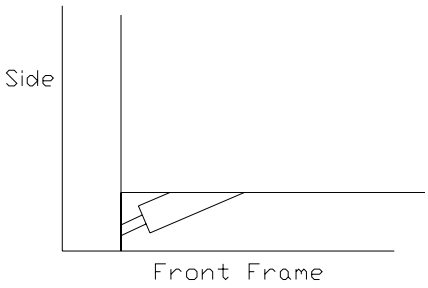
The front clock frame is a simple construction with a curved top and a single bottom rail. The joints are simple but joints held with pocket hole screws and glue. Assemble the frame and make sure it is square and true. The front frame is held to the sides by a series of pocket hole screws that are easily drilled with the Kreg Jig. Do not assemble the front frame and sides until the glass rabbets are completed.

After the sides and front door frame are completely dry and prior to joining them together, a rabbet must be cut to allow the glass to be installed. We will use a special bit designed for this purpose. A Woodline WL 1213-1 is similar to a solid carbide laminate trimmer but is ground to fit into traditional ¼" slot left in a cabinet door. All areas that hold glass are rabbeted all around. The upper portion of the clock side holds the grill work. The grill is held in place by only partially rabbeting the frame. Rabbet only the stile portion of the frame around the grill. The upper and lower rails should be left with the ¼" slot intact in the area where the grill goes.

Glass is held in place by simple strips of wood held in place with small brads. As an alternative, you can use glass retainer clips which are held in with screws or you can make matching molding using the stile cutter from the rail and stile set. Run the stile cut on a length of wood and then table saw the molding from the stile. Glass retainers will be attached after the finish is applied and the glass is installed.

The door frame must be prepared for glass also. The glass kit includes beveled glass for the lower portion of the door and a curved top glass for the dial area.

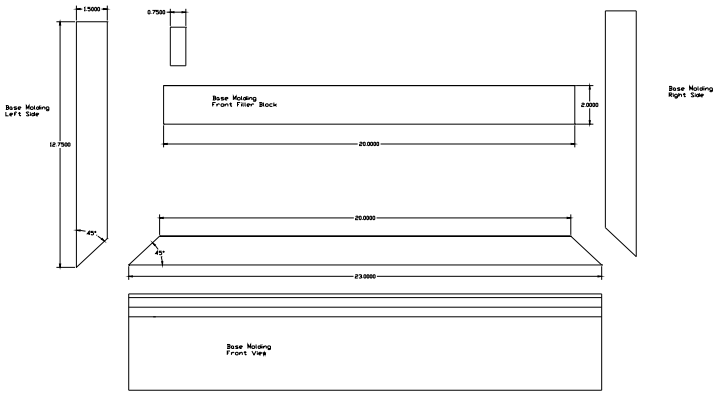
Mount the sides to the front frame with pocket hole screws. The sides of the clock should be outside the front frame resulting in a joint visible on the front of the frame (this joint is covered by molding). The completed assembly should be 20” wide and 70-3/4” tall with three sides and an open back. Install the back lower support at the bottom of the back. Mount the top support at the top rear and the middle support 19” down from the top edge of the clock. These supports should be flush with the rabbet in the stiles and are held in place by a single pocket hole screw in each end and glue.

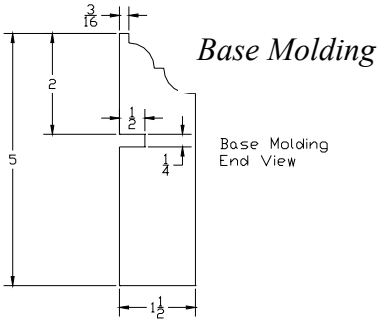


BASE OF CLOCK

The molding around the base is next. This molding cut with a clock molding profile bit WL 1274. The base molding is 1-1/2” thick made by gluing up 2 pieces of 3/4” material. and is easier to cut both the front and sides as a single piece then miter the material to fit. A filler block is attached to the front inside top edge to make the base protrude beyond the clock door.

Base assembly



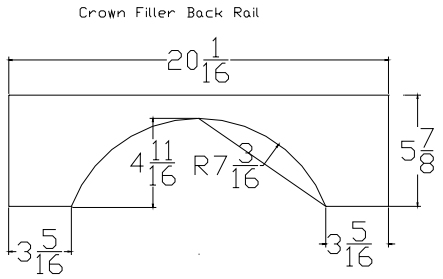


The base of the case includes a ¼” dado ½” deep 2” from the top edge of the molding. This dado should be cut before the molding is cut and mitered for the sides. Once the base is mitered and secured, the spacer block is added and the ¼” plywood clock bottom is added to the base assembly. The clock frame sits on the base and is secured by glue and screws from the inside of the clock sides and front frame.

Once the clock base is completed and attached you are ready to build the upper cap and moldings.

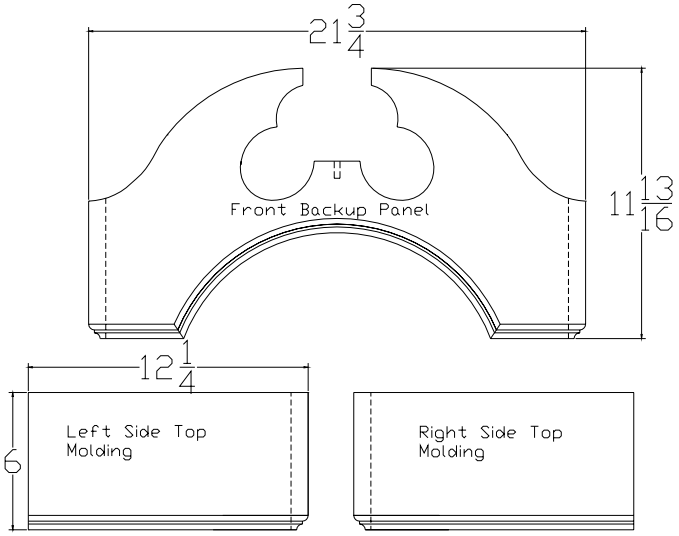
Top Of Clock

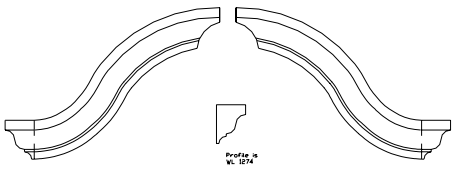
Cut the crown filler back rail and mount to top front of case. This board only shows on the curved edge so it can be of lesser quality.



The top cap parts are next. These components support the top moldings and give he clock its classic shape. Refer to the pattern and layout the curves using a grid transfer method and a band saw or jig saw, sand the parts and miter the edges and affix the front piece first then miter and carefully fit the sides with glue and a couple of brads.

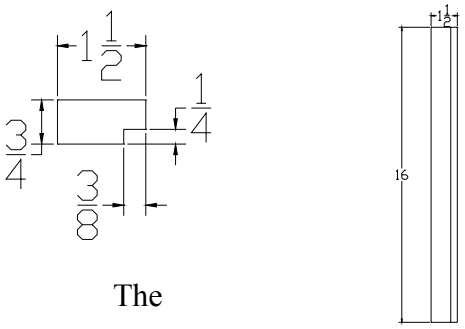
The top moldings also serve to strengthen the frame. The upper swan neck moldings give the clock its classic appearance and are made on the router table using a large molding bit called a "clock molding" bit. The sizes of the side molding pieces are ½" longer than required to allow for trimming at the rear of the clock after assembly. The large side molding and "swan's neck" moldings" are made by gluing up stock and making a template then carefully cutting the clock molding on the router table.





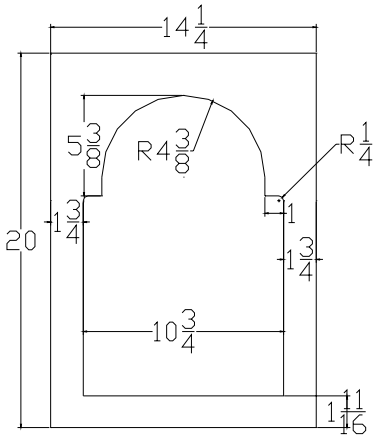
Cutting the curved molding is a tricky operation and should be done in several passes. The safest way is to mount the molding blank to a piece of plywood and then run it by holding the plywood. This method will protect your fingers! Run both the side moldings and front moldings at each pass height. It is a good idea to practice the cuts prior to cutting the finished pieces. When complete, miter and affix the curved moldings first then miter and affix the side moldings. Moldings are held in place with glue and screws from the inside edge.

Dial Panel



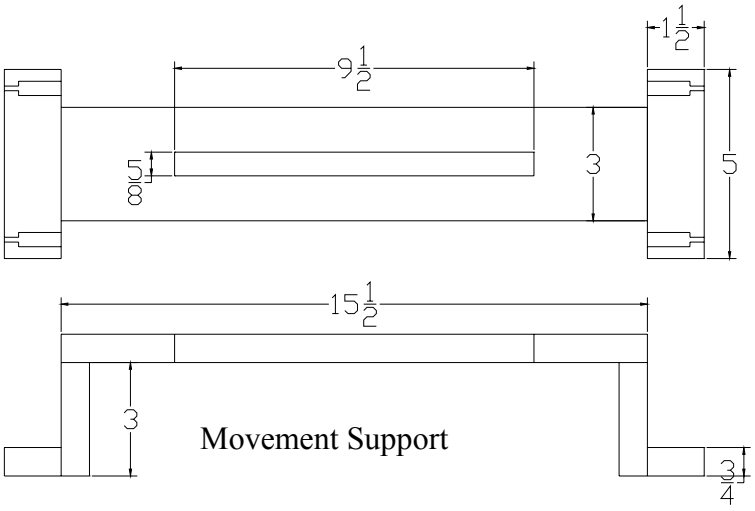
Mount the dial panel supports on the inside edge of the front frame. They are secured with brads and glue. These supports have a rabbet on the inside edge and are mounted 3 ½" down from the top inside edge of the front frame so the inside edge of the rabbet is flush with the inside edge of the frame.

The dial panel is constructed to accommodate the clock dial. The dial face comes with the movement kit and is made of soft brass with decorative trim. The pattern in the drawing is based on the mounting requirements of the faceplate. The dial panel should be a close fit inside the front frame and should slide up in the rabbets of the dial panel supports. Do not secure in place until the movement is installed and the dial positioned properly.



Movement Support

Movement support location is critical and is determined by the dimension of the clock movement. The critical measurement is the dimension from the center of the clock hand arbor to the mounting plate. The movement support is held in place by pocket hole screws on each side and the front and by support blocks. The movement support has a slot cut into it to allow the weight cables to pass through. This slot is also used to mount the movement.



Movement Support

Clock Back & Chime Support Block

The clock back also supports the chime block. The chime block is 6" by 8" and should be made of hardwood. It mounts directly to the plywood back of the clock The block should be secured with screws through the back of the clock.. Check the method of securing the chime rods mounting block. Most will require countersunk holes from the back side of the chime mount block. Drill these holes and countersink as required. The block location is important to so the movement and the chime rods are held in proper alignment. The

movement location and the chime hammer location are critical to proper sound of the chimes. Locate the chime block only after mounting the clock movement which is done at final assembly.

The back of the clock mounts into rabbets cut into the side of the clock. Fit the lower back and mount with screws from the back of the clock.

Cut a piece of ¼" plywood to fit the top of the clock. 19" x 11". The clock top can be secured with staples or brads.

Mount the door before adding column trim.

The columns add a nice tough and dress up the case. To make the long round sections you can clue together 4 pieces of ¾" stock (part --) between the center two pieces place a layer of newsprint paper and glue it all together. The part will later be split into two pieces making two identical sections. The columns are made by using a round over bit with a 1" radius and a router table. Saw a chamfer on the column blank to reduce the amount to be removed by the router. Use a router table and round over the blank into a dowel. Sand the finished blank to 220 grit before splitting the column into the two parts required. Scrape and sand the paper and glue from the split area. The blank is specified a little long to allow for trimming for final fit.

The same paper centered glue up technique is used for the top and bottom column sections. The top and bottom are turned on a lathe using a live center and standard lathe techniques. The ends are trimmed and the parts clamped and glued to the base unit along with the column sections. I have found that a better fit is achieved if you start at the base of the clock and install the turnings working toward the top, cutting and fitting each piece to exact requirements.

Side Grills

The side grills are made by creating a pattern and using a pattern cutting bit. The bit rides against the pattern to produce a grill quickly and easily. Layout the pattern using the scaled grid method. Carefully drill holes in each area and use a scroll saw or saber saw to cut the pattern. Sand and file the pattern to a smooth fit. Use double stick tape to adhere the pattern to the grill blank. Drill a ½" hole in the center of each area to be cut out. Using the pattern bit in the router table, place the pattern against the table over the bit and proceed to cut the pattern. Make 2 identical grill pieces. After the clock is finished you can cover the inside of the grill with dark speaker cloth to reduce dust in the movement.

Finial

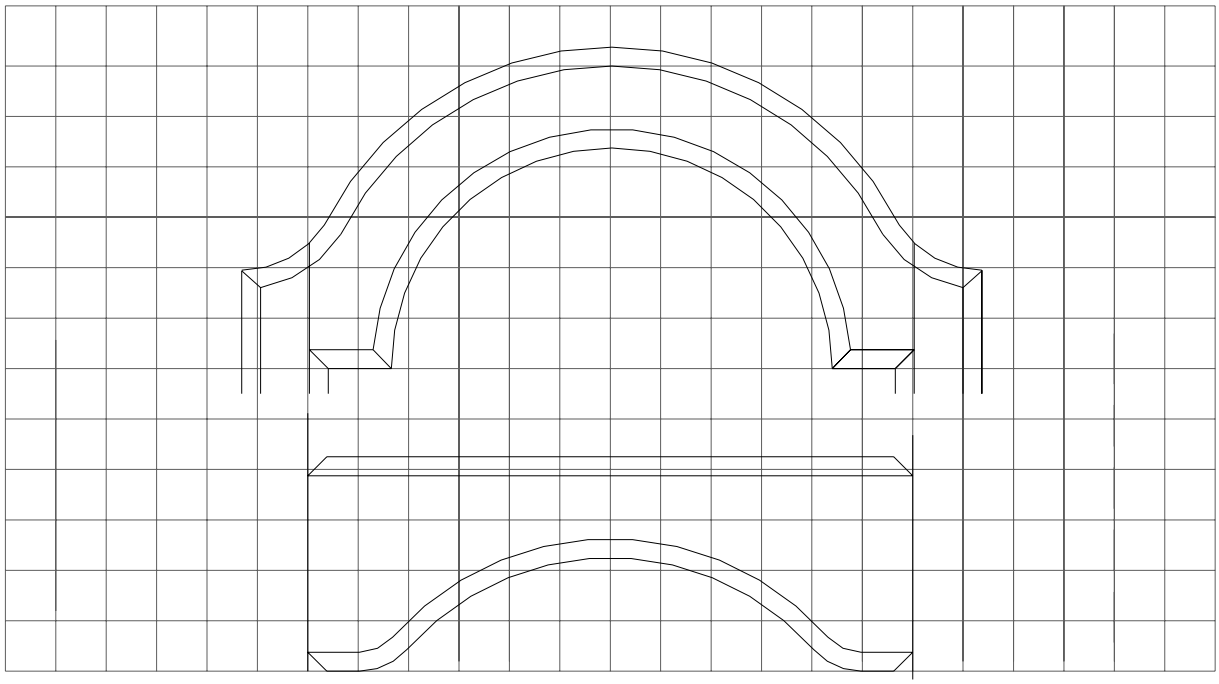
The finial is the crowning touch. It is turned from a 2” section of material. Finials can also be purchased from many wood working supply stores. The exact pattern of the finial is not critical. . The finial is mounted by drilling a ¼” hole in the top of the clock and using a dowel to

Finish.

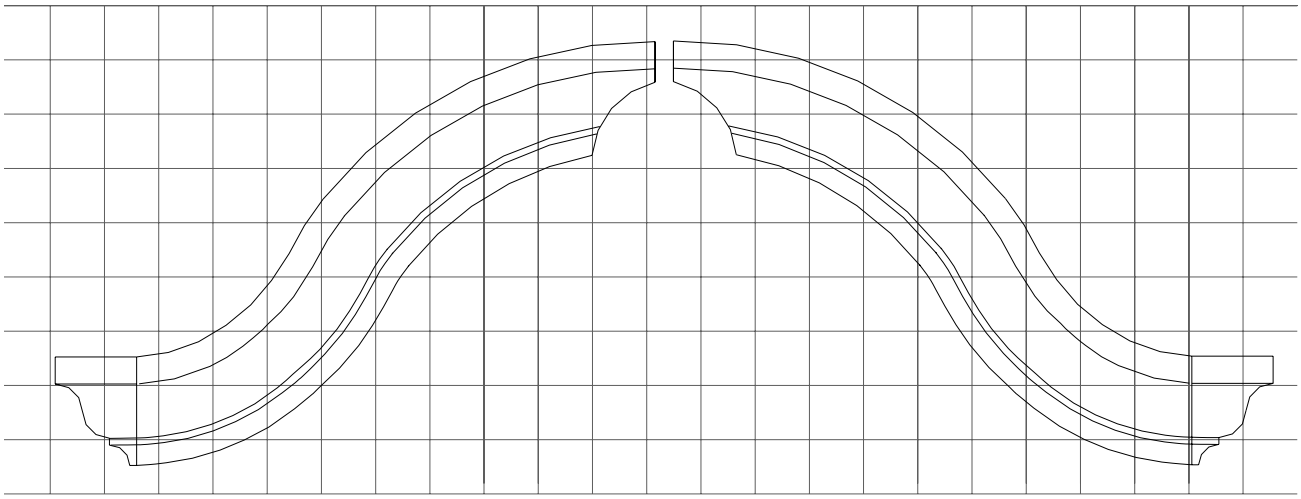
The clock should be finished inside and out. Any good wood stain can be used. It is recommended to use a satin finish with wax as a final buff. Sand all parts to 220 grit. Be careful on the plywood parts not to sand excessively

Installation of movement and dial.

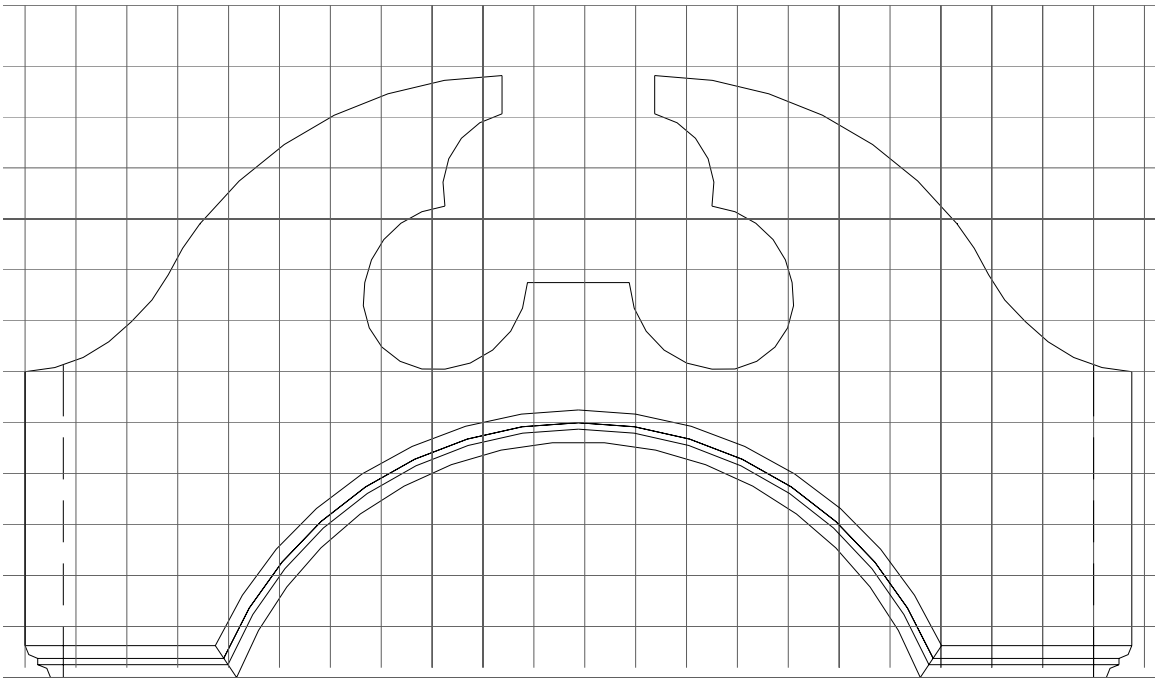
Very good instructions come with the movement and will give all the details necessary to install the movement. When installing the chime rods be sure they are centered on the strike hammers. The hammers can be bent to strike the rod correctly. Be gentle and test the sound by pulling the hammers back and releasing them. Balance the sound of each chime until the desired results are obtained.



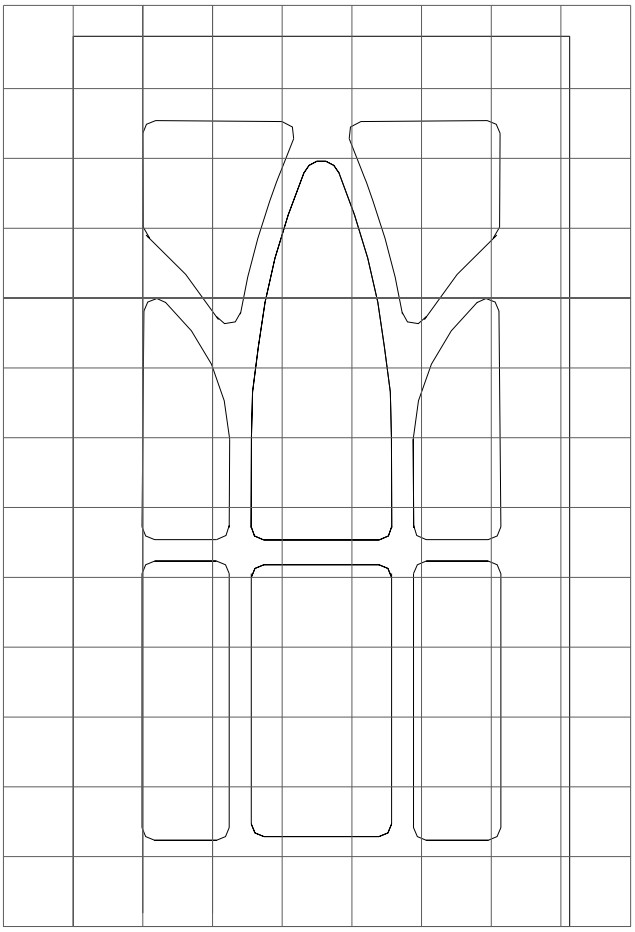
Door Profiles
each square equals 1″



Swan Molding
Each square equals 1 inch
Profile is WL 1274

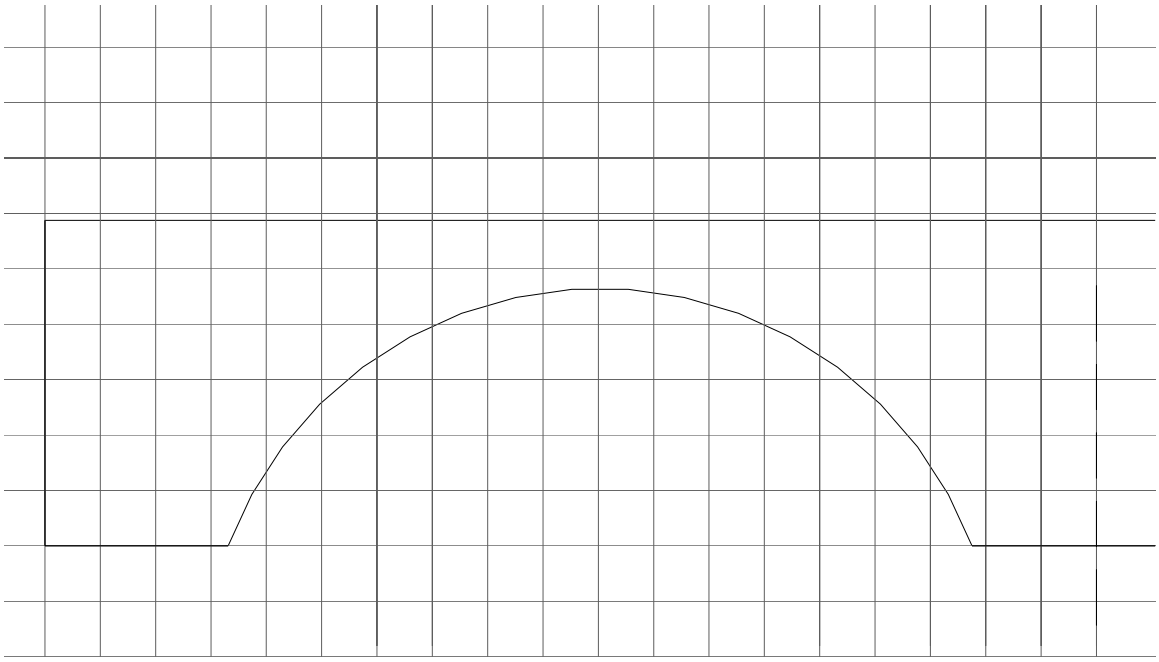


Front Backup Panel
Each square equals 1 inch
Profile is WL 1273



Side Grill panel
Each square equals 1 inch

Required Tools



Front filler panel
Each square equals 1 inch

Woodline Router bits (800-472-6950)

WL 2020-1 Cabinet Set
WL 1213-1 Glass adapter bit
WL 1274 Clock Molding
WL 1246 Ogee edge bit
WL1057 1" Roundover bit
WL 1400 Pattern Follower for side grills
WL 1073 Bead bit

Kreg Pocket Hole Jig Kit and square drive screws. Pan head #6 1-1/4 long

Klockit (800-556-2548) movement, pendulum, dial kit # 13062, Optional glass kit 99182, Hinges # 39489, Latch #39501, Escutcheon # 39942

#	Amount	Name	Width	Length	Thick	Material	Instructions
1	1	Lower rail	1 5/8	12	3/4	Hardwood	Cope both ends and stile cut one side
2	1	Next to lower rail	1 13/16	12	3/4	Hardwood	Cope both ends and Stile cut both sides
3	1	Middle rail (curved)	4 1/4	12	3/4	Hardwood	Cope ends and stile both edges
4	1	Top Door rail (curved)	6 3/8	12	3/4	Hardwood	Cope sides before cutting curves. Stile cut bottom curve the assemble into door. Cut top curve only after door is assembl
5A	1 0F 2	Door stiles,	1 7/8	62	3/4	Hardwood	Finish length when blended with top rail
5B	2 0F 2	Door stiles,	1 7/8	62	3/4	Hardwood	Finish length when blended with top rail
6	1	Door Panel	7 1/4	11 7/8	3/4	Hardwood	Raise panel sames as side panels
7A	1/4	Side Stiles	2	70 3/4	3/4	Hardwood	Two stiles have rabbets and two do not. Each side is identic except for position of rabbet. Rabbet if for mounting rear c panel
7B	2/4	Side Stiles	2	70.75	3/4	Hardwood	Two stiles have rabbets and two do not. Each side is identic except for position of rabbet. Rabbet if for mounting rear c panel
7C	3/4	Side Stiles	2	70.75	3/4	Hardwood	Two stiles have rabbets and two do not. Each side is identic except for position of rabbet. Rabbet if for mounting rear c panel
7D	4/4	Side Stiles	2	70.75	3/4	Hardwood	Two stiles have rabbets and two do not. Each side is identic except for position of rabbet. Rabbet is for mounting rear c panel
8A	1/2	Lower rail	4 5/8	7 1/4	3/4	Hardwood	Cope both ends and stile cut one side
8B	2/2	Lower rail	4 5/8	7.25	3/4	Hardwood	Cope both ends and stile cut one side
9A	1 0F 2	Side Raised Panel	7 1/8	7 1/4	3/4	Hardwood	Side grill panel. Cut with pattern cutter to make exact duplicates
9B	2 0F 2	Side Raised Panel	7 1/8	7.25	3/4	Hardwood	Side grill panel. Cut with pattern cutter to make exact duplicates
10A	1 0F 2	Rail above panel	1 3/4	7 1/4	3/4	Hardwood	
10B	2	Rail above panel	1 3/4	7.25	3/4	Hardwood	
11A	1 0F 2	Middle Rail	4	7 1/4	3/4	Hardwood	Cope both ends and stile cut both sides

			13/16				
11B	2 0F 2	Middle Rail	4 13/16	7.25	3/4	Hardwood	Cope both ends and stile cut both sides
12A	1 0F 2	Top rail	7 1/8	7 1/4	3/4	Hardwood	Cope cut bith sides. Stile cut one side only
12B	2 0F 2	Top rail	7 1/8	7.25	3/4	Hardwood	Cope cut bith sides. Stile cut one side only
13	1	Lower rail	3 5/8	14 1/4	3/4	Hardwood	
14A	1 0F 2	Front Frame Stiles	2 1/8	70 3/4	3/4	Hardwood	Stiles are simple with no detail cuts. Butt Joint
14B	2 0F 2	Front Frame Stileses	2 1/8	70.75	3/4	Hardwood	Stiles are simple with no detail cuts. Butt Joint mwith pock holes
15	1	Top Frame Rail (curved)	6 3/4	14 1/4	3/4	Hardwood	Join to frame stiles with pocket holes
18	1	Center Back Cleat	1	18 1/2	3/4	Hardwood	Pocket hole in each end
19	1	Upper Case support	1	18 1/2	3/4	Hardwood	Pocket hole in each end
20	1	Lower case support	1	18 1/2	3/4	Hardwood	Pocket hole in each end
21	1	Dial Panel	14 1/4	20	1/4	Plywood	Width must fit inside front frame exactly Make a little wide trim at final assembly
22	1	Crown Filler back rail	5 7/8	20 1/16	3/4	Hardwood	
23A	1 0F 2	Side grill	7-1/4	12 3/4	1/4	Plywood	
23B	2 0F 2	Side grill	7-1/8	12.75	1/4	Plywood	
24A	1 0F 2	Dial Panel side cleats	1 1/2	16	7/8	Hardwood	
24B	2 0F 2	Dial Panel side cleats	1 1/2	16	7/8	Hardwood	
25	1	Base Molding Front	5	23	1 1/2	Hardwood	Laminate from two pieces of 3/4" material Cut slightly long, trim at install. Miters are 45 degree
26A	1 0F 2	Base Molding Side	5	13 1/2	1 1/2	Hardwood	Laminate from two pieces of 3/4" material Cut slightly long, trim at install. Miters are 45 degree
26B	2 0F 2	Base Molding Side	5	13.5	1.5	Hardwood	Cut long and trim at install
27	1	Base Molding Filler Block	2	20	3/4	Hardwood	Laminate from two pieces of 3/4" material Cut slightly long, trim at install. Miters are 45 degree
28	1	Base Panel	11	20 2/4	1/4	Plywood	Fits into slot in base molding. Install with best plywood si up.

29A	1 0F 2	Top Side Molding	6	12 1/4	3/4	Hardwood	Cut long Trim at install. Cut molding profile at same time a front backup panel. One end of each side is mitered at 45 Degrees.
29B	2 0F 2	Top Side Molding	6	12 1/4	3/4	Hardwood	Cut long Trim at install. Cut molding profile at same time a front backup panel. One end of each side is mitered at 45 Degrees.
30	1	Front Backup Panel	11 13/16	21 3/4	3/4	Hardwood	Cut long Trim at install
31A	10F 2	1/2 Turnings upper half	2 1/4	42 7/16	2 1/4	Hardwood	Make one piece and split
31B	2 0F 2	1/2 Turnings upper half	2 1/4	42 7/16	2 1/4	Hardwood	Make one piece and split
32A	1 0F 2	1/2 Turnings lower half	2 1/4	11 5/16	2 1/4	Hardwood	Make one piece with 32B and split
32B	2 0F 2	1/2 Turnings lower half	2 1/4	11 5/16	2 1/4	Hardwood	Make one piece with 32A and split
33	1	L Swan Molding	4	13	1 1/2	Hardwood	Molding are mirror images, Sizes are slightly long. Bandsaw sand then mold to profile. Do top side molding at the same t
33	1	Movement Support Center Board	3	15 1/2	3/4	Hardwood	Cut Slot in center. Joint to assembly before installing
34	1	R Swan Molding	4	13	1 1/2	Hardwood	Molding are mirror images, Sizes are slightly long. Bandsaw sand then mold to profile. Do top side molding at the same t
34	1/2	Movement Support Side Support	3	15 1/2	3/4	Hardwood	Pocket Hole to Movement Support and side connector
35	2/2	Movement Support Side Support	3	15 1/2	3/4	Hardwood	Pocket Hole to Movement Support and side connector
36	1/2	Movement Support Mount To Case	1.5	5	3/4	Hardwood	Joint with support to complete assembly
37	2/2	Movement Support Mount To Case	1.5	5	3/4	Hardwood	Joint with support to complete assembly
38	1/2	Dial Panel Support	1 1/2	16	3/4	Hardwood	3/8" by 1/4" rabbet cut into length of part. Mount 3 1/2" do from top edge of clock To hold dial panel

39	2/2	Dial Panel Support	1 1/2	16	3/4	Hardwood	3/8" by 1/4" rabbet cut into length of part. Mount 3 1/2" do from top edge of clock To hold dial panel
40	1	Top dust panel	11	20 1/2	1/4	Plywood	Cut to fit top of clock and brad into place