

# Designing for Dining

## Dutch pull-out extends table for guests

by Tage Frid

There are several different systems to choose from when making an extension dining table. Some you can purchase ready-made; they are usually quite expensive. Of the ones you can make yourself, I prefer the "Dutch pull-out" dining table. It is both simple and fast to make.

The tabletop consists of two pieces of plywood, both the same size, one mounted right above the other on the base. The lower piece is cut into three sections—two of them are the leaves, and the third is a fixed center piece. The top rests on the center piece and the leaves and is held there by two vertical dowels sitting loosely in guide holes. Thus it is free to move up and down but not from side to side. The leaves are mounted on long tapered slides that allow them to be pulled out from the ends. The slides travel in grooves in the end aprons and in a supporting rail across the center of the table base. As a leaf is extended, the taper makes it rise slowly throughout its travel to the level of the top. As the leaf rises, so does the top, until the leaf is fully extended and clear of the top. Then the top drops down again, flush with the leaf. Before the leaf can be pushed back in the top has to be lifted high enough to clear, then the top settles back down onto the center piece as the leaf travels back to its original position.

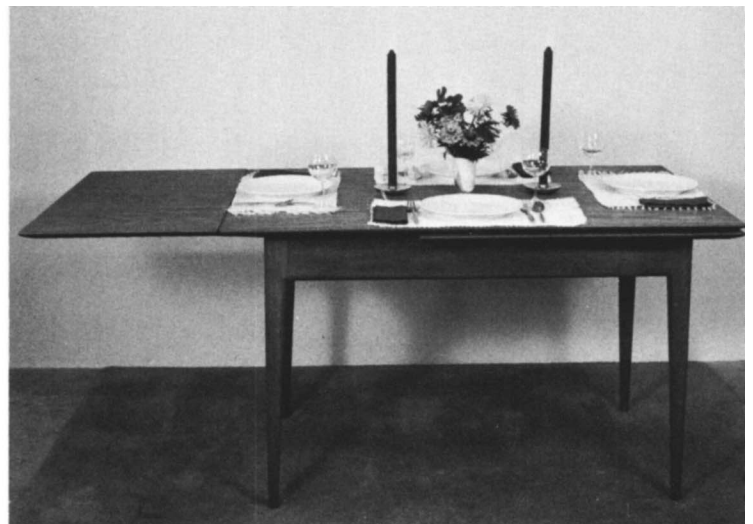
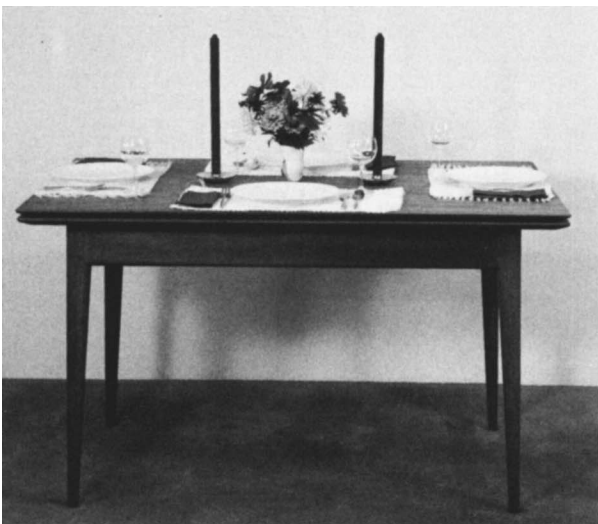
I made the table illustrated here 25 years ago, and it took four or five days, including veneering and edging plywood for the top. Once you understand the system, the work is easy and should go very quickly. You'll have to make four slides and only eight mortise-and-tenon joints. Other than wood for the base and the slides, you need hardwood-veneered ply-

wood, two 3/4-in. dowels and edging for the top.

In addition to being easy to make, the leaves store right inside the table and are easy to pull out, even with the table set. If uninvited guests show up just when the food is on the table and you are ready to sit down, and they apologize for interrupting your meal but hint that they haven't eaten yet themselves, before you know it they are invited to join you. With most extension systems you would have to clear the table before you could enlarge it. But with the Dutch pull-out you can pull out the leaves without disturbing the setting at all.

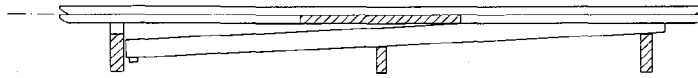
There are several important dimensions you must consider when designing a dining table. Since the seat height of a dining chair is usually about 18 in., the height of the table should be between 29 in. and 31 in. I usually use 30 in.—this seems to be most comfortable for the average person. And since people differ in height more from the hip down than from the seat up, the distance from the floor to the bottom of the table apron should be at least 24 in., so that someone's long legs or fat legs aren't the legs holding up the table. In the length, I like to allow 24 in. for each person, so no one feels squeezed in. I try to place the legs so that no one ends up with a table leg between his or her own. (The easiest way to avoid that situation is to make a pedestal or trestle table.)

A place setting—dishes, glasses, and so on—is about 14 in. deep. So the minimum width of the table must be 30 in., or else you may drink the wine of the person across from you. Whenever possible, I make dining tables 42 in. wide, to leave space in the center for food, wine, flowers and condiments.

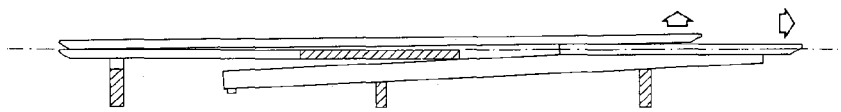


*Leaves of Dutch pull-out store right inside table and can be extended from either or both ends without disturbing dishes.*

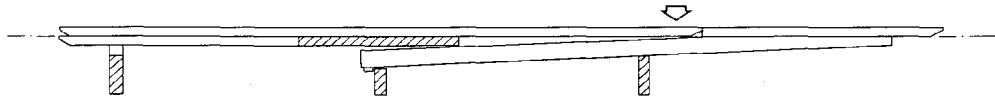
*Table at rest. Shaded end aprons, center supports are fixed.*



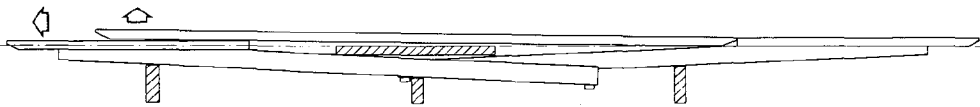
*As leaf is extended, tapered slide lifts top.*



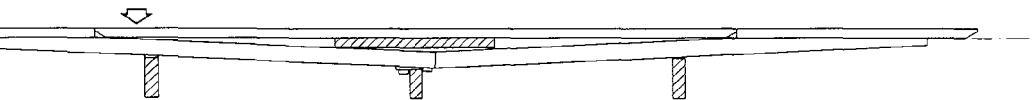
*Top drops down flush when leaf is clear.*



*Left leaf starts outward, lifting top.*



*And voila.*



The table shown here was designed for a very small room and is only 32-1/4 in. wide, about the minimum.

For the last 12 years I have belonged to a gourmet club made up of seven men who cook for each other once a month during the winter. We have five good meals for ourselves, and at the last dinner of the season, two of us cook and the wives are invited. I feel that half the success of a meal is a result of how it is presented, and how comfortable each person is.

There is nothing worse than being seated near one end of a long, straight table and trying to talk with someone on the same side at the other end. If you want to see the person, you have to lean in so far that you might get gravy on your ear. The most logical shape for a table is round or oval, so everyone can see each other. And with a round table, each person uses less space because the chairs and elbows are out in a bigger circumference. A simple Dutch pull-out cannot be used on a round table, although complex systems using the same idea have been thought of. But a Dutch pull-out will work for a table with curved sides, though the overhang between the top and the leaf will not be the same all the way around (which I don't mind). I prefer to curve the sides slightly.

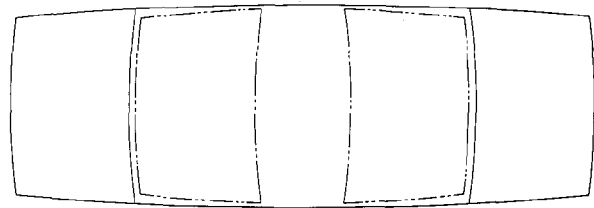
In designing a Dutch pull-out, remember that the less overhang there is between base and top, the bigger the leaves can be. This is because each leaf must travel its full length outward before it can clear the top. The tail end of the slide to which the leaf is attached of course travels the exact same distance. But the slide can't go any further than the inside length between the apron and the center support, less about an inch for the stop. Therefore, when you have chosen the length of the closed table, you can decide how much the top will overhang the base and calculate the length of the leaves. Or you can decide the length of the leaves and figure the overhang. One determines the other.

The measurements given in the drawings were taken from the old table in the photographs, and I will use these dimensions to explain the system. But you will want to use your own dimensions and make the table to suit your own dining area.

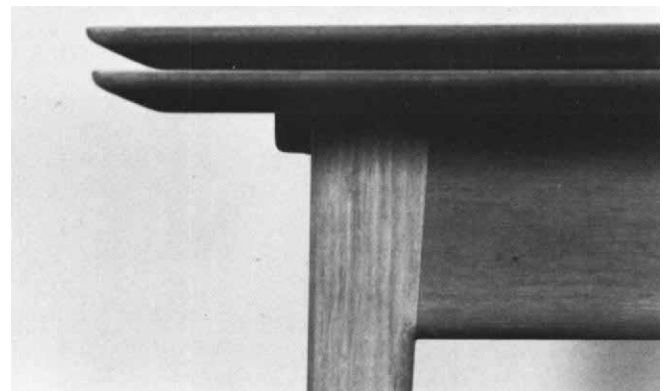
When my table is closed it is 50-1/2 in. long. I decided the top should overhang the base by 4 in. all around. Since the apron is 7/8 in. thick, the aprons and overhangs at both ends



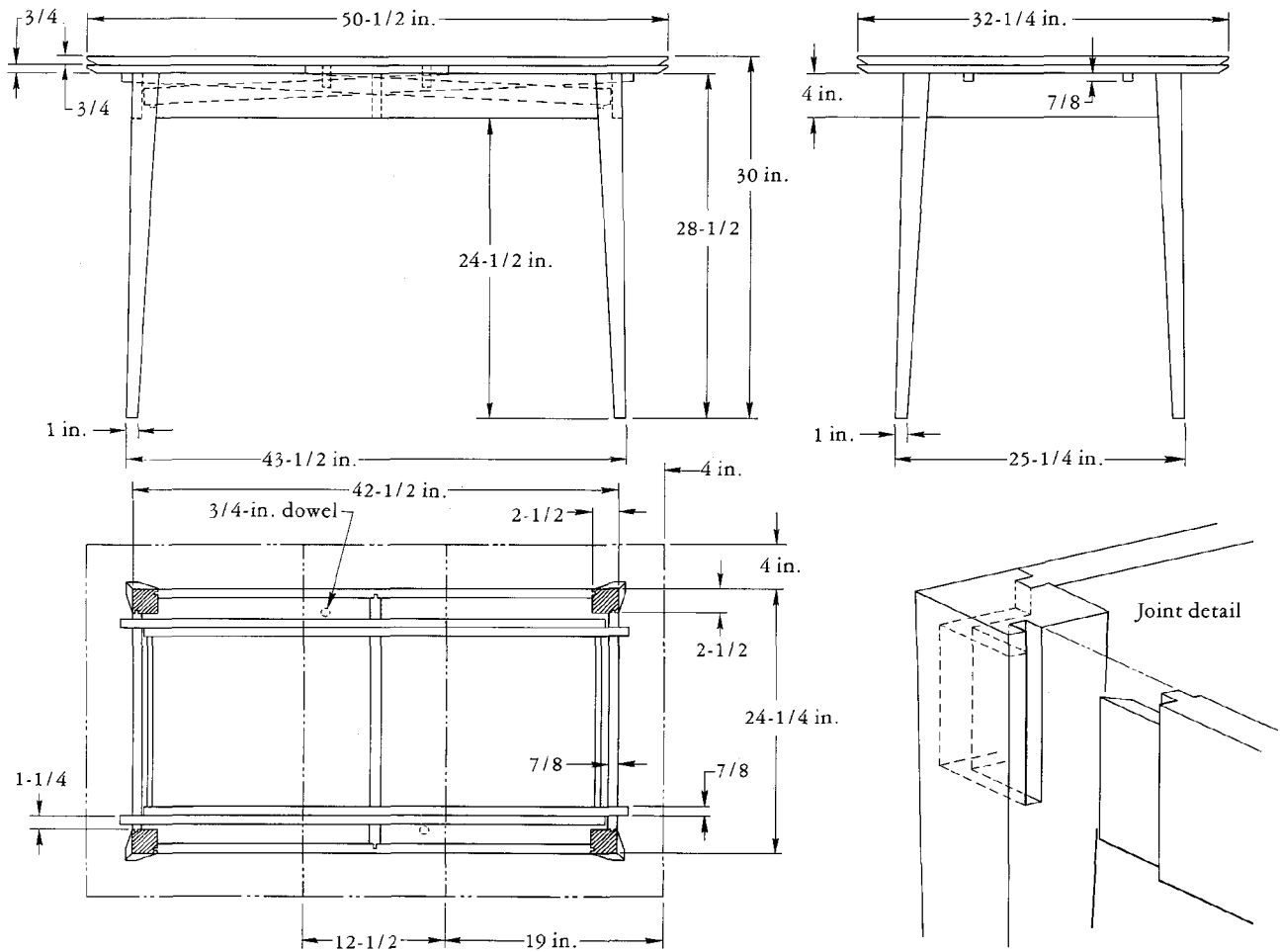
*Partly open view from below shows system of slides, stops.*



*System works with curved sides, although overhang is uneven.*



*Table has beveled edge and careful rounding where leg joins apron.*



add up to 9-3/4 in. Deduct that from 50-1/2 in. and you get 40-3/4 in., the inside length of the base. Divide that in half (20-3/8 in.) and deduct 1-3/8 in. for the stop and half the thickness of the center support, and you get 19 in. for each leaf. Thus the table will extend 38 in., its open length will be the sum of the leaves and top, or 88-1/2 in., and the width of the center piece will be the difference between the leaves and the top, or 12-1/2 in.

If I had started with both the open and closed lengths, I would follow the same calculation in reverse to find the overhang. Since my table measures 50-1/2 in. closed and 88-1/2 in. open, simple subtraction gives 38 in. for the combined length of the leaves. Add the thickness of the two aprons (1-3/4 in.), both stops and the center support (2-3/4 in.) and you get 42-1/2 in. Deducting this from the length of the top gives 8 in. So the top would be allowed to overhang the base by 4 in. at each end.

The table base consists of four tapered legs joined to an apron that is 4 in. deep. I used haunched tenon joints in the legs. If the tenon came up through the leg in a slip joint, you would have to clamp across the cheeks when you glue the pieces together. By leaving the leg solid on top this is not necessary; you need clamps only in the direction that will pull the tenon into the mortise. To get as much strength as possible, I let the two mortises meet and cut the ends of the tenons to 45°, but left a 1/8-in. space between them for expansion. Use a tongue and groove to join the center support across the base. This piece will guide the slides and serve as a place to run the stops against to keep the leaves from falling out.

Because the tabletop is loose and the slides are glued and screwed to the leaves, the top and leaves must either be made out of plywood or be made using frame-and-panel construction. If you use plywood, you should get a top grade. You can buy it already veneered, or veneer it yourself, or you can paint it, stencil it or finish it however you like. I veneered the top and leaves together, so the grain would follow when the table is open, applied solid wood edging and beveled it. There are two reasons to bevel it. First, if the table gets used a lot, there might be a little play in the dowels and the beveled edge will help to hide discrepancies; second, when the leaves slide down, they will slide more easily.

The success of your table will depend on your accuracy in laying out and cutting the four slides. Be sure that the wood you use is straight. I usually cut the slides oversize and leave them for a few days to give them a chance to warp. Then I joint and thickness-plane them to size, in this case 7/8 in. thick and 1-1/2 in. wide. Their length is the inside measurement of the base (40-3/4 in.) plus the 7/8-in. thickness of the apron plus the 4-in. overhang, or 45-5/8 in. The slides will be trimmed shorter later, for looks, but they have to be full length now, for measuring.

The ends of the slides that hold the leaves must be cut at an angle so that they will wedge the leaves up to the level of the tabletop as they are being extended. On this table, the top and leaves are 3/4 in. thick. Thus each leaf must rise 3/4 in. when it has traveled 19 in., its full extension. From one end of one of the slides, measure down 19 in. and square the line off. Then make a point 3/4 in. over on the same end. A line

connecting this point with the edge of the 19-in. mark will give the angle at which to cut the slides.

To be sure that all the slides will have the same angle and be cut exactly the same, you should construct a jig. Square a piece of plywood about 6 in. wide and a foot longer than the angled portion. Place the slide over the plywood with both marks (the ends of the line you have drawn) just touching the bottom edge of the plywood. Then trace the end and the other side of the slide and bandsaw out the shape.

With the table-saw fence still at the same setting you used to cut the plywood jig to width, insert the slide into the jig and make the cut. Use the same setup for all four slides and you can be sure they will all turn out the same.

The slides run in slots in the end aprons and the parallel center support. One pair of slides travels inside the other pair, and the two run side by side in the slots in the center support. To lay out these grooves, mark lines on top of the apron at both ends, 1-1/4 in. from the inside edge of all four legs. With a long straightedge, transfer these lines to the center support. Mark the thickness of the slide to the *outside* of the table from these lines on one apron, and to the *inside* of the table from the lines on the other. On the center support, mark the thickness of a slide to *both* sides of the center line.

The grooves on the end aprons must be the same depth as the slide at that point, so that the leaf will clear the apron as it is extended. To find this depth, measure in 4 in. from the tapered end of the slide and cut the groove to the exact depth of the slide at this point, in this case 7/8 in.

To find the depth of the grooves in the center support, first mark its location onto the slides, in this case 25-1/4 in. from the tapered end, or half of the length of the closed table. Then push the tapered side down flat and measure the depth at the marked point, in this case 1-7/8 in. This is the minimum depth that will allow the leaf to rise 3/4 in. in its travel; the grooves may be cut a little deeper if you wish.

Now that all the measurements and cuts have been made, the tapered ends of the slides can be trimmed. I wanted the closed slides to extend 1 in. beyond the apron, so I cut off 3 in.

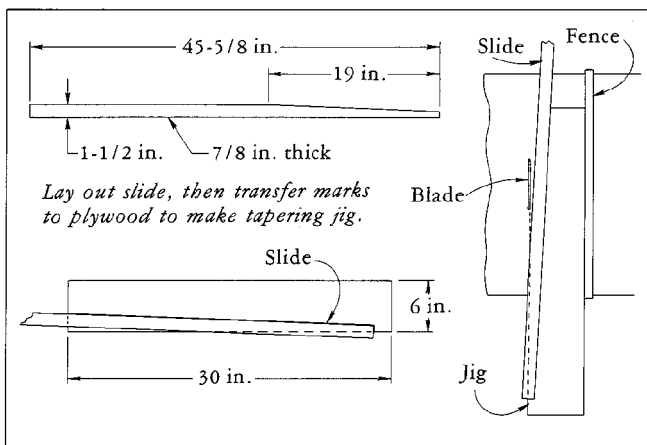
To assemble the table, place the slides in the grooves with the angled sides up. Put the leaves in position (don't forget that you just trimmed 3 in. off the end of each slide), and glue and screw the slides to the leaves. To locate the stops, extend the leaves 19 in. and mark where the slides pass through the center support. Then screw on the stops at this point.

The central plywood piece is screwed to the base above the central support. It prevents the leaves from falling down when they are pulled out and locates the tabletop. Drill two 3/4-in. holes in the central plywood piece between the slides and the apron; these are the guide holes for the top.

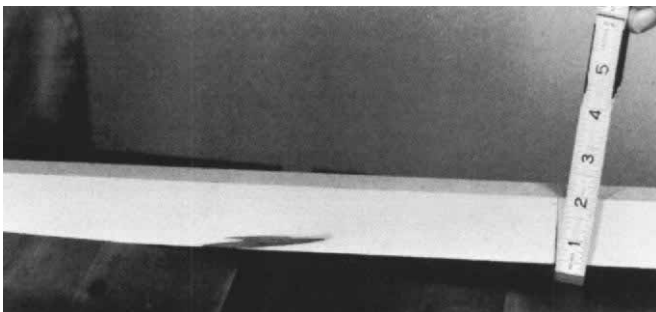
Now push the leaves in and locate the top in its correct position. Clamp it down to the leaves and mark the location of the guide holes on the underside of the top. Then drill and glue two 3/4-in. dowels into these holes. The dowels should be about 2-1/4 in. long, since the top has to move up a full 3/4 in. while the leaves are being extended.

When you push the leaves back in you have to lift the tabletop. To prevent scratches that would result from the tabletop sliding on the leaves, I glued two strips of felt to the bottom of the top. Use hot hide glue or rubber cement.

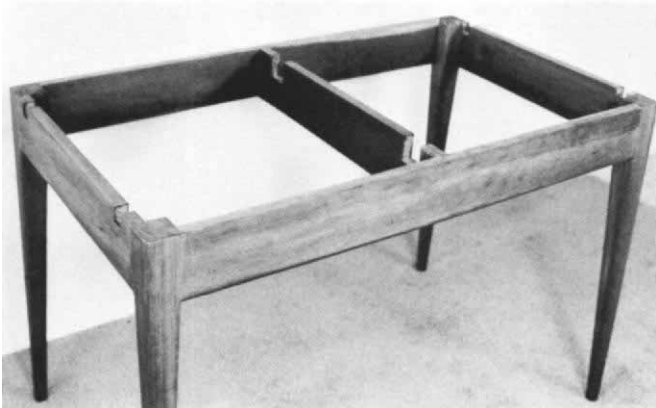
*Contributing Editor Tage Frid is professor of woodworking and industrial design at Rhode Island School of Design.*



*Ripping the taper: Jig guarantees four identical slides.*



*Push taper flat to measure depth of slot at center support line.*



*Slots for slides are cut in aprons, center support.*