

A step-by-step guide to fast and accurate kitchen installation

by **Bob Cox**

Installing frameless kitchen cabinets is a precise task. If you proceed logically and measure accurately, you'll get good results.

The following steps are a time-tested and proven method for properly installing frameless kitchen cabinets at controlled costs.

Step 1: Check Specs

Start out by fully familiarizing yourself with the details of the kitchen installation. Unfortunately, errors in paperwork or cases where the specs and the drawings differ occur too frequently. There is no better time than now to correct or adjust for discrepancies.

Step 2: Check Materials

A missing or damaged cabinet or part could delay installation. Depending on your past experiences with the supplier, you may want to unpack or unwrap each cabinet. If you do so, repack and/or rewrap the cabinets to protect them during the preliminary work. Unprotected cabinets are vulnerable to damage.

Step 3: Check Dimensions

One of the most costly errors in kitchen planning and design is incorrect or missed measurements. It doesn't take long to verify floor plan dimensions, but it could make the difference between a profit or loss on the entire job.

Make sure you have adequate clearances: that you are not trying to fit 144 inches of cabinets into a 144-inch space. Where a row of cabinets fits between two walls, make sure you leave 1 to 3 inches for fillers at one or both ends.

Also, check now to see if walls are so far out of square or plumb that you'll need to spec a smaller cabinet or make other adjustments.

Step 4: Find the High Point

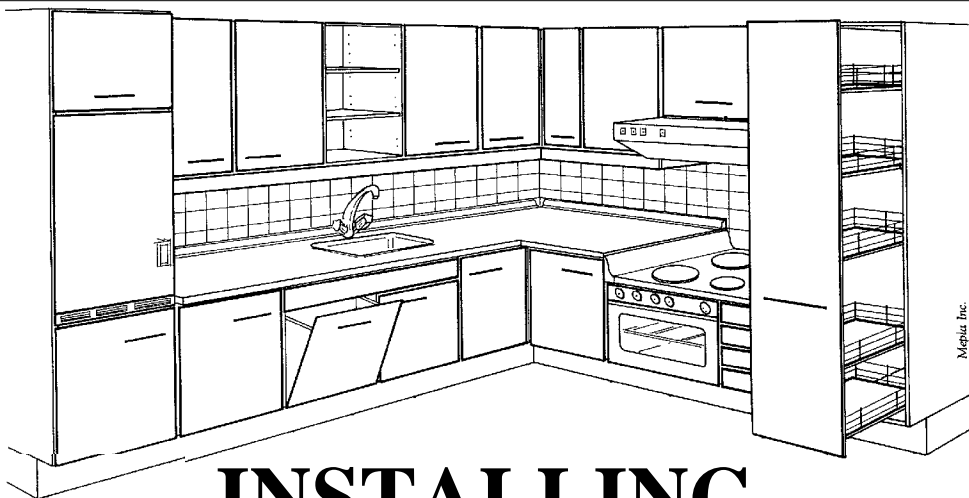
Start the layout by locating the high point on the floor. Regardless of whether you install wall cabinets or base cabinets first, the following procedures will insure that all the cabinets on all walls will be level.

If the kitchen to be installed is:

- On one wall only, mark and locate the high point of this wall.
- An "L" installation, determine the highest point of the two walls.
- A "U" installation, determine the high point of the floor on three walls.

If the kitchen contains a peninsula, this floor area must also be checked. In any case, there can be only one high point in the entire installation.

Many installers use a 6- to 8-foot straight piece of lumber (2x4 or 1x3) and a 4-foot level to check out and locate the high point.



INSTALLING frameless CABINETS

Step 5: Draw Horizontal Lines

Locate and draw horizontal lines on walls on which cabinets are to be installed (Figure 1).

After you've found the high point of the floor, measure from the high point up to 34-1/2 inches and draw a short line.

Using a 4-foot level, draw this horizontal line at 34-1/4 inches on all walls that will receive cabinets.

Next, draw a line 84 inches high (measured again, from the high point) using the 4-foot level. Draw this line on all walls on which wall cabinets are to be installed.

Finally, draw horizontal lines to mark the bottoms of the wall cabinets.

Step 6: Locate Stud Centers

Locate and mark the centerline of each stud. Where it crosses the horizontal lines drawn at 34-1/2, 54 (bottom of wall cabinets), and 84 inches high.

Draw short vertical lines to mark the studs (Figure 2). For each wall with cabinets, start with one stud, then measure off it to locate the others.

Double check stud location. Then repeat for each wall on which cabinets are to be installed.

Step 7: The Final Check

Check 90-degree corners and vertical walls on which cabinets are to be installed. Use a carpenter's framing square to check corners and a straight edge and level to check walls. It is rare that any room has corners that are exactly 90 degrees or walls that are all exactly plumb.

Slightly out-of-square corners and out-of-plumb walls are easily corrected when installing cabinetry. On most cabinets, the sides project beyond the back by up to 1/2 inch. These extensions can be scribed to fit to irregular surfaces (Figure 3).

Use shims in back of wall, tall, or base cabinets to pad out a depressed section of wall.

If you discover variances that are beyond the reach of normal corrective

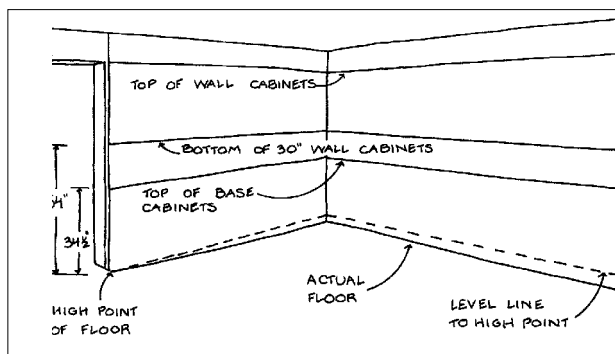


Figure 1. Starting at the high point on the floor, draw level lines to locate cabinet tops and bottoms.

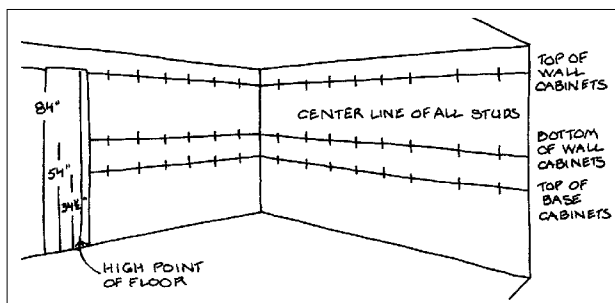


Figure 2. Mark the center line of all studs where they cross horizontal level lines.

steps, however, you must evaluate the problems and decide on corrections before starting the installation. If this occurs, ask yourself these questions:

- Will additional or wider fillers compensate for the variance?
 - Are new wall or base cabinets needed?
 - Can the counter top (if prefabricated) be used as furnished?
- Then make your decisions.

Step 8: Layout on Walls

Measure and mark on the walls the width of each item (wall and base

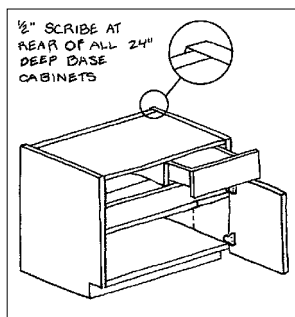


Figure 3. If needed, scribe the back edges of the cabinet sides to fit to the wall.

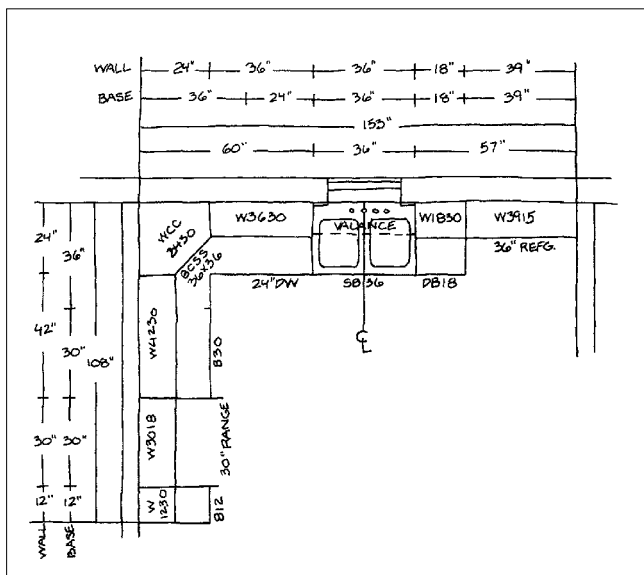


Figure 4. Measure and mark on the walls all the cabinets and open spaces.

cabinets) to be installed and each open space—for appliances, windows, or space to be left clear (Figure 4).

After completing the layout, double check with the floor plan and measurements. When you're sure everything will fit, proceed with the installation.

Step 9: Install Base Cabinets

In L-shaped layouts, start your installation out of a corner. In U-shaped layouts, start in one corner, then the other, and fit the cabinets in between. If a line of cabinets ends in a corner, start in the corner, but leave space (minimum 1 inch) for a filler to scribe to the wall. If the wall of cabinets is open at both ends, you can start in the middle of the wall and work your way out in both directions.

In fact, if you've done your layout accurately, left space for fillers, and marked all the cabinets on the wall, as described, you should be able to start the installation anywhere without running into problems.

Install first base cabinet. If you're starting with a standard cabinet (not a corner cabinet) proceed as follows: Remove the doors and drawers from the cabinet. Then locate its position marked on the wall.

Set the top of the base cabinet to the 34-1/2-inch line and plumb the front of

cabinet. Use shims on the bottom of the toe kick and back of the cabinet as needed.

Drill pilot holes through the inside of the cabinet back. Make holes slightly down from the top and slightly up from the bottom at each stud marked on the wall. The hole size must accommodate the flat-head wood screw used (see "Installation Hardware"). Assemble dimpled metal washers or plastic washers to the proper screws, (typically 8- or 10-gauge phillips-head screws).

After running the screws through the back into wall studs, recheck all levels and adjust as necessary. Loosen the screws, adjust shims as needed to level and tighten screws.

Install lazy-susan and adjacent cabinet. Start a U- or L-shaped layout in a corner—typically with a pre-cut lazy-susan cabinet. Most frameless lazy-susan cabinets take up 36 inches of wall space, but are built in a 27-inch box. To start then, you'll need to attach two 36-inch long furring strips to the wall, aligning the top of the strips with the top-of-base-cabinet line as shown in Figure 5.

Next install the adjacent base cabinet on either the right- or left-hand side. The side of the corner base cabinet must

THE 32MM SYSTEM

Fast, but not easy

The new kitchen-cabinet buzzword is "32mm." It conjures up images of sleek European cabinets in mauve and grey laminates. In fact, 32mm construction did start in Europe, but it has nothing to do with laminates. It's really just a way to build cabinets more quickly, while using fewer and less skilled workers. The secret's in the machinery.

The 32mm system was developed in Germany as a way to standardize cabinet manufacturing. It gets its name from the drilling patterns that are used to fasten all cabinet pieces and all hardware. The holes are all set apart on 32 mm centers. The modular approach allows the manufacturer to use the same basic components to make a variety of cabinets and to easily furnish the cabinets with whatever options are ordered.

One boring pattern is a set of 8mm holes located at the butt joints between cabinet sides, bottom, and top. The butt joints are joined with metal or hardwood dowels. The other boring pattern consists of 5mm holes. These holes hold all the hinges, slides, catches, and other hardware. Some fabricators—for aesthetic reasons—do not drill all the extra holes, just the ones that will be needed for box construction and hardware attachment.

The 32mm construction systems offers the cabinet shop several advantages over face-frame construction. Once the shop is set up and the workers trained, a shop can turn out more cabinets in less space and in less time. Traditional cabinet-making skills are not required.

The trade-off is that 32 mm con-

struction requires very complex and costly machinery and demands great precision. The core of the system is a panel saw, boring machine, and edgbander. The switchover from standard equipment often costs over \$100,000. Although less skill is needed to run the machines and produce cabinets, setups take more time and tolerances more familiar to a machinist. Technical backup for the equipment may be hard to come by. Also, the system demands new levels of precision. All cuts must be accurate to 1/64 of an inch and panels must be cut perfectly square. If cabinet doors are over by 1/16 inch, for example, they won't fit. Production may ultimately be streamlined, but getting up to speed is likely to take time.

Despite its European origins, the 32 mm system can turn out almost any style of cabinet in wood or laminated material. Also, the manufacturing system can turn out bookshelves, closet systems, or anything else built around a modular box.

Although other systems can be used to build frameless cabinets, the 32mm system appears to be the most efficient and economical approach. An estimated 10 to 30 percent of U.S. shops now use the system, according to a report in Kitchen & Bath Design News. And most industry observers expect that number to steadily grow.

Few, however, expect the bulkier but sturdier face-frame cabinet to roll over and play dead. Traditional cabinet makers and traditional-cabinet buyers are sure to keep this niche alive well into the future.

—NEB

INSTALLATION HARDWARE

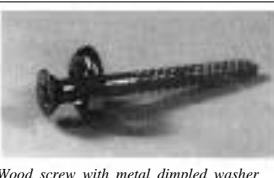
Only a few types of hardware are needed to install frameless cabinets.

To join one cabinet side to the next you use four threaded connectors in the four corners. These have either metal or nylon nut-caps. The one shown here is nylon.

Occasionally, the cabinet sides will not pull tightly together and you will need to use a few flat-head wood screws (just shorter than the thickness of two cabinet walls). These are best used with a metal dimpled washer, shown left. For securing the cabinets to the walls, use longer flat-head wood screws with the same metal washers and caps, or with plastic washers and caps, also shown here.



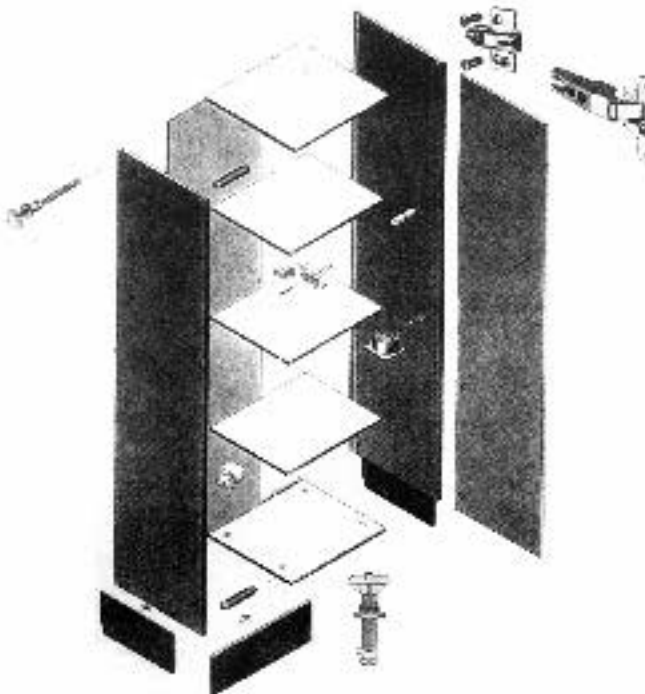
Nylon-capped threaded connector



Wood screw with metal dimpled washer



Wood screw with plastic washer and cap



Exploded view of 32mm utility cabinet.

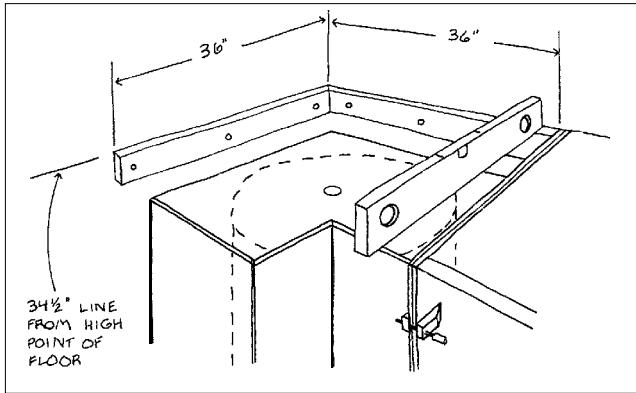


Figure 5. With L and U kitchens start with a corner base cabinet and one of the adjacent cabinets.

be placed 36 inches out of the corner. The layout of the base cabinets marked on the wall will have accurately located this cabinet.

Install the adjacent cabinet as directed above in the section titled "Install first base cabinet." Then place the 36x36-inch corner cabinet in position. Align the side of the corner cabinet and level it. Then clamp the two cabinets with a "C" clamp as shown. Level to the 34-1/2-inch line.

Drill four holes through the sides of both cabinets (in the four corners) and secure with connector screws.

Other base cabinets. Remove doors and drawers. Locate the cabinet to the side of the first installed cabinets, shim as required to level with the first installed cabinet and to get it flush with the front of the first cabinet.

Clamp the two cabinet sides with "C" or wood clamps (Figure 6).

Where the two cabinets connect, drill four holes through the adjacent sides. Make two holes near the top (front and rear) and near the bottom (front and rear). With 32 mm cabinets (see sidebar), these holes will already be partially drilled and will line up automatically. Install four connectors and screw tight. After connecting the side panels, drill holes through the back of the cabinet, near the top through to the studs. Recheck all the cabinets for level.

Install doors and drawers on the first cabinet. Reinstall the doors and drawers on the cabinets as soon as possible. This will reduce the likelihood of their being damaged while laying around the job.

Repeat above until all base cabinets have been installed.

Installing base fillers. Frameless cabinet fillers come in two basic styles (see Figure 7). Both types attach to the side of the case near the front. The only difference is that one type mounts flush with the front of the doors and one type is recessed. Which type you use is a matter of preference.

In all cases, install the cabinet before the filler. Next scribe the filler to the wall. Cut the filler with a sharp fine-tooth saw—a 12-tooth hand saw or coping saw.

The easiest way to attach the filler is to drill through the cabinet side from inside the cabinet and use two wood screws. Another method that some prefer is to remove the cabinets and attach the filler with two cabinet connectors or wood screws.

Step 10: Install Wall Cabinets

The same basic procedure used to install base cabinets and fillers is used to install wall cabinets.

Install first wall cabinet. Lay out

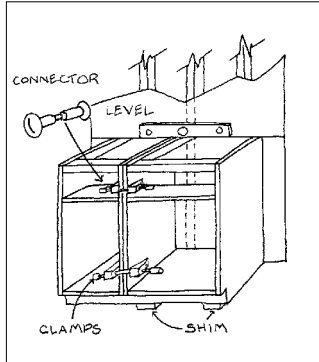


Figure 6. Line up adjoining cabinets, clamp the sides, and fasten with special connectors in the four corners.

and pre-drill holes in the back of the cabinet so the wood screws will hit wall studs. The holes should be slightly down from the top and up from the same bottom.

Align the cabinet to the proper level

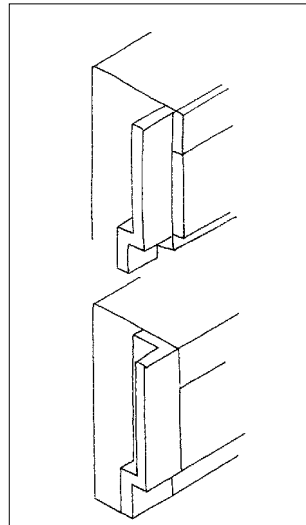


Figure 7. Attach fillers (either flush or recessed) with wood screws from inside the cabinet. Allow room for fillers during layout.

line and drive the screw to within about 1/4 inch of its final tightness. Level top, sides, and bottom of cabinet. Use shims where necessary. Run screws in and recheck all levels.

Second and additional wall cabinets. Remove doors. Set second cabinet next to first cabinet. Clamp the two at top and bottom while aligning the fronts flush and level to the first cabinet.

Drill four holes for connections and install them. Drill holes through the back of the cabinets and install flat head wood screws into the wall studs—shim to all levels as necessary.

Install wall fillers in the same manner as base cabinet fillers.

When all cabinets have been installed and trimmed out:

- Clean out insides of cabinets and drawers.
- Adjust all doors, drawers, and catches.

- Make minor "touch ups" where practical, such as brad holes in molding.

Occasionally, the connectors will not pull the adjacent cabinets tight—particularly in tall cabinets—leaving a gap in the joint. The reason could be that the cabinets' sides are either concave or convex.

You can usually correct this by driving a few flat-head wood screws through the side of one cabinet into the adjacent cabinet. Use dimpled, metal washers and pilot holes and screw in tight.

Step 11: Adjust Hinges

Hinges for frameless cabinet allow doors to open from closed to 90 to 180 degrees. They allow a door to be mounted directly against a wall and still fully operate. All these hinges have a wide margin of adjustment at least four ways after the cabinet is installed.

The adjustability is important, since frameless cabinets are less forgiving and have smaller tolerances than the typical framed cabinet. But if you carefully follow this step-by-step approach, you'll find frameless installations efficient and accurate. ■

Bob Cox is a 36-year veteran of custom kitchen and bath remodeling. He now consults, publishes self-study manuals for kitchen and bath contractors, and operates the Bob Cox Training Schools, in Baltimore, Md.