BY DAN SCHULTZ

# Freezer

## Conversion for Fermenting and Serving Homebrew

One thing that most homebrewers never quite have enough of is temperature-controlled cooling space. For starters, there is the collection of beer that you want to have ready to drink—both homebrewed and commercial. Next come beers that are at the peak of flavor and need to be cold-stored until you get a chance to enjoy them or show them off. And of course, since we are brewers, there are all the production considerations: various temperatures for fermentation, lagering and maturation of various beers. While refrigerators can fill many of these roles, freezers are a viable—and often preferable—alternative. The horizontal orientation and the larger box offered by freezers helps to accommodate Cornelius tanks and fermenter carboys. In addition, the overall storage capacity is significantly greater than the typical refrigerator.

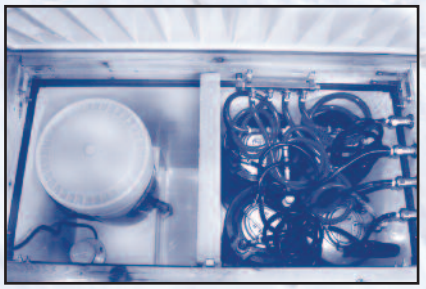
Of course freezers are made to *freeze* things, and we usually just want them chilled. This is easily fixed with a temperature controller, but it also means that there is excess cooling capacity. Thus, to further expand the storage space offered by the freezer and create other opportunities for better utilization, I have come up with a modest freezer expansion project. This approach utilizes a collar at the top of the freezer box to raise the lid and provide a solid and semi-permanent mounting place for taps. In addition, it creates a section of wall that can be breached for gas and beer lines without concern for the location of cooling coils and insulation inside the freezer walls. I have also found that the collar also allows a fermentation carboy equipped with an airlock to sit on the internal shelf without hitting the lid. Finally, I have also divided the interior of the compartment into two sections that can be set at different temperatures to accommodate different temperature needs simultaneously.

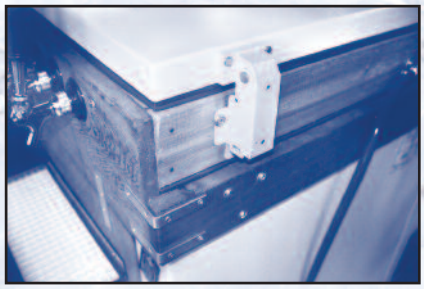
This project started out as a 10.5 cubic-foot freezer. It now has two chambers, one holds a fermenter, the other holds up to four Corny kegs. It currently has two taps to serve my homebrew with room to add two more. While fermenting a batch of homebrew, the fermentation chamber temperature is closely controlled by an add-on temperature controller.

With that introduction, let me proceed to tell you a bit more about the project and how you can apply it to your own homebrew freezer.

### Construction Details

I started out with a typical chest freezer and purchased a FermTemp temperature controller from Brewer's Resource. The freezer's built-in thermostat is set to maximum cooling (my freezer maintained a 0° F (-18° C) temperature at this setting) and the external FermTemp controller uses feedback from its thermocouple located inside the freezer to either turn on power to the freezer or to turn power on to a heater also located inside the freezer.





Here is the list of additional materials needed for construction of the collar itself:

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|---|---|
| 2 | cedar 2-by-4s (5 cm by 10.1 cm) 6-foot (1.8 m) or 8 ft (2.4 m) long |
| 1 | 8-foot (2.4 m) or 10 ft (3 m) cedar 1-by-8 (2.5 cm by 20.3 cm) |
| 1 | 6-foot (1.8 m) cedar 1-by-4 (2.5 cm by 10.1 cm) |
| 12 | 3-in. (7.6 cm) right-angle brackets |
| 22 | #8 1 in. (2.5 cm) wood screws |
| 8 | #8 0.5 in.(1.2 cm) wood screws |
| 18–22 | 0.25 in. by 3 in (6.4 mm by 7.6 cm) carriage bolts |
| | Machine screws to match those that secure the hinges to the freezer box but 0.75 in (19 mm) longer. |
| | A drill, saw, screwdrivers, wrenches and clamps are necessary. A router also helps but is not necessary. |

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The heater was made from a typical electrical junction box, ceramic light bulb base, electrical cord, and a ceramic reptile heater available from pet supply stores. I placed the heater in the fermentation chamber. If you live in a cold climate like I do (Portland, OR) and keep your freezer/fridge in a non-heated area like a garage, an internal heater will be necessary to maintain temperatures above that in the surrounding room.

Here is the list of additional materials needed for construction of the collar itself:

The first thing you will need to do is remove the lid from the freezer, keeping the hinges attached to the lid.

Next, measure and cut the two-by-fours to make a collar that will sit on top of the freezer compartment. When constructed, the outside edge of this collar should be flush with the outside surface of the freezer. If you wish, you can use a router or circular saw to notch the corners to improve the strength of the collar. Consult a cabinetry book if a fancy joint is desired.

Right angle brackets are attached at each corner on the inside of the joint. At this point only one of the two mounting holes on each leg of the bracket is used. Each right-angle bracket has two holes on each leg of the bracket. The inner hole is the one closest to the bent part of the bracket. At this point in the process, you want to fasten the brackets to each corner using only the inner bracket holes and the one-inch long #8 screws.

Next, cut the cedar one-by-eight to mount on the outside of the two-by-fours for the two sides and the front. The top edge of the one-by-eight needs to line up with the top edge of the two-by-four. One at a time, clamp a one-by-eight to a two-by-four and drill out the open hole in the right angle brackets in order to fasten the carriage bolts. Repeat with the other two one-by-eights.

Sit the freezer lid on top of the wood collar you have built and mark the holes for the hinges in the two-by-four on the back side. Drill holes for the screws one-eighth inch lower than the marks to ensure that the lid gasket will contact the collar when closed. Fasten the hinges with the one-inch #8 screws.

Cut the cedar one-by-four to match the length of the back of the freezer. You will mount this on the rear of the freezer below the two-by-four. But before mounting it, locate the holes that were originally used to mount the lid to the freezer. In a minute you will attach screws through the one-by-four and into these holes, so you want to determine where to drill holes in the one-by-four in order to make that attachment. Once this is done, attach the one-by-four to the side one-by-eights with right angle brackets placed on the outside of the joint using the half-inch #8 screws. Now attach the one-by-four to the freezer box using appropriate-sized machine screws. This is the only place the wooden collar attaches to the freezer box. The three one-by-eights and the one-by-four will hold the collar in place. The machine screws provide just a bit more strength.

Improvements to this design would include sealing the cedar against moisture and adding a sheet metal strip to the top of the collar for an improved seal.

### Adding the CO2 lines and taps

The CO2 manifold allows the CO2 line to be split into multiple lines; one for each keg. Mount it on the collar. Supply the CO2 manifold from outside the freezer by running the CO2 line from the tank through the collar to the manifold.

With access to the freezer being from the front, it's a good idea to put the taps on one side or the other. I used a three inch spacing for the taps but I would suggest four inches if you are going to use nice tap handles. Drill the tap holes with a one inch wood drill bit.

### Multi-compartment temperature control

If you keep your freezer in the garage and live in a cold temperature climate, you'll need a thermostatic controller that has a heating circuit as well as a cooling circuit. The controller for this freezer is an older model that is no longer available. It allows for heating or cooling without flipping any switches. An insulating wall can be added that will allow for two different temperature settings within the freezer. This works great when lagering and serving or fermenting and serving from the same freezer.

Split the freezer into two sections with a piece of two-inch polystyrene insulator board available from most hardware stores. The better it fits, the better the temperature differential will be. Place the heating element on the warmer *(continued on page 56)*

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**Freezer** *(from page 28)*
side along with the thermocouple for the thermostat. The heater can be a ceramic reptile heater bulb, a reptile heater pad or a brewer's heater belt.

When the thermostat calls for cooling, the entire freezer will cool. When it calls for heating, only the heated side will heat. Some heat will get to the other side and help stabilize the cooler side.

On the system described here, a 10-15° F (5.6–8.4° C) differential is typical. More in summer (more cooling), less in winter (more heating). The my case, the seal between the two sides is not very good, so you could expect a 15-20° F (8.4–11.2° C) differential if a better seal is devised.

A second controller can be used to control the cooler side. The cooling of the warmer side can be accomplished by adding a fan in the insulator board that separates the two compartments by pulling air from the cooler side over to the warmer side.

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