

C&C 40

Originally built to race under the IOR, this boat remains competitive as a club racer.

While C&C did not invent the racer/cruiser, the Canadian-based company has remained dedicated for two decades to the concept of the dual-purpose boat.

With the notable exception of a few pure cruisers—the relatively low-performance Landfall 35, 42, 43, and 48—a racer-based cruiser (the Landfall 38), and a real oddball (the Mega 30), most C&Cs have paid at least lip service to contemporary trends in racing boats.

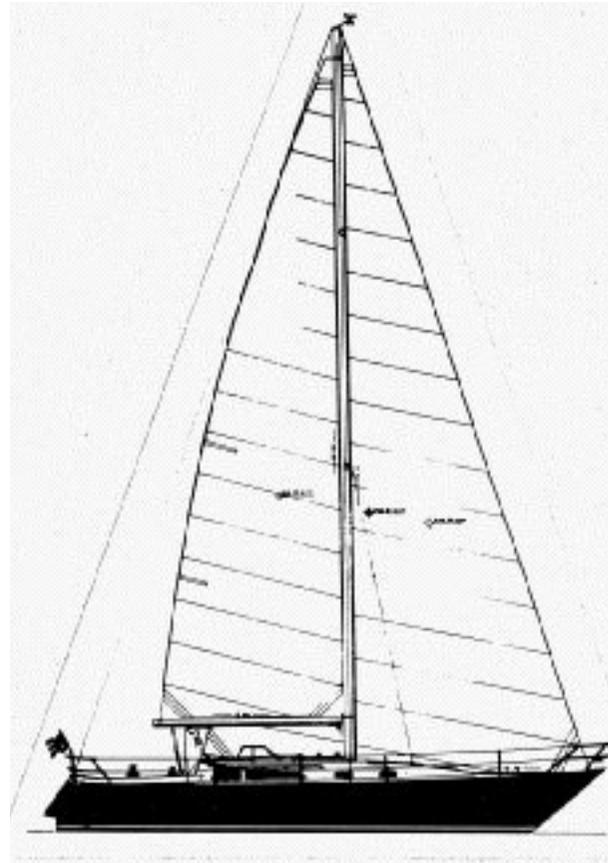
In some cases, C&C's boats have been closely designed to the racing rules. The C&C 38 was a somewhat modified old IOR (International Offshore Rule) one-tonner, the later C&C 41 was a development of several C&C custom IOR boats, and the C&C 37+ was designed to be competitive under the current IMS (International Measurement System) handicapping rule.

The C&C 40 entered production as a 1978 model, and was phased out in 1983, replaced by the higher-performance C&C 41—a bigger, much faster, slightly lighter, more powerful boat, which still managed to be cheaper than the last C&C 40s built.

Sailing Performance

The 40 was an IOR design, but she was not heavily optimized to the rule. In the late 1970s, custom IOR designs featured not only somewhat tortured hull shapes to fool the rule into thinking they were slower than they were, but in many cases had grapefruit-sized “bumps” at critical measurement points. By comparison, the hull of the C&C 40 is undistorted, fair, and conservative.

This lack of distortion was reflected in the boat's IOR rating. A reasonably optimized custom 40' IOR design of the late 1970's rated about 10' lower than her overall length. The C&C 40, at 39.58' long, typi-



Specifications

LOA	39' 7"
LWL	31' 6"
Beam	12' 8"
Draft	7' 0" (std keel)
Displacement	17,100 lbs.
Ballast	7,910 lbs.
Sail area	740 sq. ft.

cally rated from 29.5 to 30.5, depending on the keel and rig configuration of the boat.

With a rating as high or slightly higher than that of custom boats, which most likely were lighter and had better weight distribution, the C&C 40 was reasonably competitive under the IOR in her first year, marginally competitive by the second, and a good club-level racer by 1980. Top-flight IOR boats then had a serious competitive life of two years or less, which was a major factor leading to the near-demise of the rule.

Fortunately for the C&C 40, the MHS (Measurement Handicap System, later renamed the IMS) began to grow in popularity after 1980, giving the boat a new lease on competitive life, at least at second-echelon levels of competition. The boat is no

IMS rule-beater; she's handicapped fairly by IMS, which means she'll do neither better nor worse racing under the rule than the crew sailing her.

This boat has good all-around performance upwind and downwind, in both light and heavy air. Despite a wide maximum beam, the boat's ends are fairly well balanced, and the rudder is deep enough to stay in the water in all but a flat-out broach.

You'll find a number of different keel and rig combinations. As designed, the boat has a high-aspect-ratio fin keel drawing 7', with an "I" (height of foretriangle) dimension of 53'. This configuration is reasonable for all-around performance, but is a little lacking in power for lighter air. A rig 2' taller was introduced, and to increase sail-carrying ability, this is usually coupled with a 4" deep, 300-pound lead shoe bolted to the bottom of the keel. Stability of the two versions is virtually identical: the addition to righting moment from the shoe is almost exactly offset by the heeling moment of the taller rig.

The tall rig, deep keel version is on the average about three seconds per mile faster than the standard rig, standard keel model.

With a draft of 7' or more, this is not a boat for gunkholing, nor is it a good cruiser for areas of shallow water. A keel/centerboard variation was also built, drawing about 4' 9" with the board up, 8' 6" with the board down. To maintain the same stability as her deeper-draft sisters, the centerboard boat carries an additional 885 pounds of ballast, making her noticeably slower in light air. The IMS velocity prediction program shows the standard rig, centerboard model to be about four seconds per mile slower than the standard keel, standard rig version in eight knots of breeze. In 16 knots of wind, all three configurations are virtually identical in speed.

In areas traditionally known for heavy air, a keel shoe coupled to the standard rig has proven to be a powerful and competitive combination.

Like many IOR boats from the mid and late 1970s, the C&C 40 has a very high-aspect-ratio mainsail: about 3.5:1 with the standard rig, almost 3.65:1 with the tall rig. The result is a mainsail of just over 300 sq. ft., but a 100% foretriangle of about 440 sq. ft. This means lots of headsail changes, since reefing the mainsail has relatively little impact on total sail area.

With a racing crew of eight, headsail changes are no big deal. For a cruising couple, wrestling down a #1 genoa of over 650 sq. ft. would be no fun. For shorthanded cruising, a modern headsail reefing system is an absolute must for this boat. We'd also forget the 150% genoa for cruising, using a 130% genoa—about the size of a racing #2—which could be effectively reefed to about 100%.

It's not realistic to expect more reduction from a single sail. In winds of 10 knots or more, the loss in speed from the smaller genoa is virtually meaning-

less when cruising: it's still faster than 90% of the 40-footers out there.

C&C rigs are generally well designed, with masts of reasonably high-performance characteristics. The 40 has a keel-stepped, double-spreader rig with single lower shrouds, Navtec rod rigging, and a forward babystay. This allows good mast control for racing. Tensioning the babystay pulls the middle of the mast forward, flattening the mainsail in heavy air. With all the shrouds in a single plane, the mast can assume a fair bend from top to bottom.

Most of these boats are equipped with a hydraulic backstay, with the babystay adjusted by a traveler on a track mounted atop the cabin. Boats that have been set up for racing may also have hydraulics for the babystay and vang. Without hydraulic mast controls, it's virtually impossible to take advantage of the spar's sail-shaping capabilities.

The mast is made from a reasonable section for a racer/cruiser. It is bendy enough for sail control when racing, but not nearly as fragile as you would find on a flat-out IOR racer of the same rig size.

If you intend to use the boat only for cruising, and you install a headsail reefing system, it would be almost imperative to add an inner forestay, particularly if you're headed offshore. The existing staysail track in the middle of the foredeck is not really strong enough for the attachment of a true heavy-weather staysail or storm jib.

In addition, we'd add running backstays to counteract the pull of the inner forestay, but you'd only have to set these up in heavy weather when sailing with a staysail or storm jib on the forestay.

The deck layout is definitely designed for racing. Halyard and spinnaker gear winches are mounted atop the deckhouse, aft of the mast. This works fine on a racing boat, keeping the center of gravity low, making it possible for one person to jump the headsail or spinnaker halyard while another tails, out of the way, further aft.

For shorthanded cruising, however, mast-mounted winches are superior. When reefing the mainsail with mast-mounted winches, one person can ease off the halyard, hook in the reefing tack, crank down the clew, and grind up the main halyard, all without moving. With deck-mounted winches, it's back and forth between the mast and the deck if one person has to do the whole job.

Construction

Like most C&Cs, the 40 was built with a balsa-cored hull. The result is a hull that is extremely stiff for its weight, but balsa coring is not without its potential for problems. In the event of delamination or rupture of the hull skin, the balsa coring can absorb moisture. Moisture penetration of the outer laminate could ultimately reach the balsa coring. It is imperative

that a balsa-cored hull be carefully examined by a knowledgeable surveyor before purchasing a used boat.

As with most boats, the deck of the C&C 40 is also balsa cored. The deck, too, should be carefully sounded to check for delamination. In our opinion, deck delamination is potentially a very serious problem in almost any boat—not just this one—and the cost and difficulty of repair is frequently grossly underestimated.

C&C uses a basic inward-turning flange for the hull-to-deck joint, with a through-bolted aluminum toerail providing the mechanical fastening. Unlike many builders, C&C uses butyl tape in this joint. Butyl tape has no structural or adhesive properties; it just keeps the water out.

Uniform tensioning of the bolts in the joint is important with this type of bedding compound. Leaks in the joint can frequently be solved by careful re-torquing the bolts, but don't tighten them so much that all the compound's squeezed out.

As is typical of C&Cs, owners give the boat high marks for quality of construction, and in general, their enthusiasm is justified. The boat does, however, have a potential weak point. Like most late IOR boats, the hull is virtually flat on the bottom, with the shallow bilges having little depth for strong transverse support. The keel has a relatively short root chord, so the keel stresses are very concentrated. In a hard grounding, the trailing edge of the keel can be levered up into the hull, resulting in devastating damage.

We examined one C&C 40 that ran into a rock at about seven knots during a race. The aft edge of the keel punched through the bottom of the boat, and the owner just managed to power the boat 20 miles to a boatyard, which hauled her instantly to keep the boat from sinking.

That boat required massive bottom rebuilding—the boat was actually replaced and the damaged hull repaired and re-sold. Over the years, we have looked at several C&C 40s with similar, though less dramatic, bottom damage as the result of grounding while racing. Remember that with this boat, you need more than 7' of water under you.

Beginning with 1981 models, both the deck and rudder installations were more heavily reinforced.

Most boats were retrofitted with these upgrades, and you should check with previous owners to see that they were done.

Engine

Several different engines were used in the C&C 40. Early models usually have a Yanmar 3QM-30. Later boats typically were fitted with a Westerbeke 30, although some boats were equipped with the more powerful VW-based Pathfinder engine.

All the engines are capable of driving the boat to hull speed in calm water.

The engine is mounted under the bridgedeck, just below the companionway. You must remove the companionway ladder and the front of the engine box to get access to the front of the engine. You can get at the port side through the quarterberth.

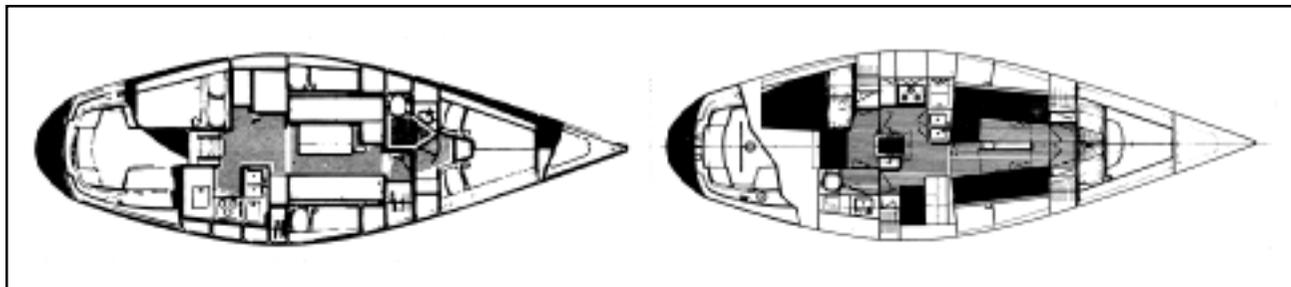
The boat handles extremely well under power, thanks to a big rudder well aft, very little wetted surface, and a prop mounted just forward of the rudder. Most boats are equipped with Martec folding props for racing—not the best installation for handling in reverse—but since the prop is so far aft, the boat handles very predictably when moving astern. For cruising, we'd rather see a feathering prop, which is an expensive but worthwhile retrofit.

Interior

C&C never skimped on the interiors of its racer/cruisers, and the 40 is no exception. The interior is built up of teak-faced ply, rather than incorporating a fiberglass liner with molded furniture bases.

The oiled teak ply makes for a darkish interior, which could be lightened considerably by varnishing both the ply and its solid teak edging. A nice combination is to use satin finish varnish on the ply, glossy varnish on the solid teak trim. This is time-consuming, of course, but it can noticeably brighten a drab interior.

The C&C 40's original layout (left) had a conventional racing boat interior with a large galley, a head in the forward section and two pilot berths. The last few boats built had a revamped interior (right). The pilot berths were eliminated, the galley and nav station were flopped, and the head moved aft, all to create a private aft cabin.



The cabin sole is teak and holly-faced ply, and the teak veneer is so thin that it chips easily, particularly at the edges when you pry up the floor boards.

There are plenty of berths for racing, and too many for cruising. The V-berths forward can be made into a double with an insert, and the quarterberth is wide enough to form a very tight double or a very big single.

Interior layout is fairly prosaic: V-berths forward, settees and pilot berths both port and starboard in the main cabin, quarterberth aft. Some early boats were built with a split quarterberth, with a narrow inboard berth and a narrower pilot berth outboard, tucked under the side deck. This is a particularly useless arrangement for cruising, and we wouldn't be too happy getting stuck in either of those berths when racing, either.

The head compartment is good-sized, and is accessible from either the main cabin or the forward cabin. We're not sure you really need two doors mere inches apart to get into the head, but perhaps the additional privacy for head access from the forward cabin is important to some people. We'd rather have the separation that a solid bulkhead between head and forward cabin would provide.

Main cabin storage is sacrificed to get in the two pilot berths. If you're planning long-distance racing with a big crew—or weekendening with lots of friends—the pilot berths are nice. But the lower third of the pilot berths is recessed behind a longitudinal bulkhead which serves as the shroud anchorage. There will be no air circulation around your lower body in this berth.

Space over your feet is further reduced in the pilot berths by a locker tucked into the upper part of this longitudinal bulkhead. The result is a pair of berths that would be okay in cooler climates, miserable in the tropics.

Ventilation below is generally inadequate for anything but cooler climates. While there are good-sized aluminum-framed hatches over both the forward and main cabins, plus a small hatch over the head, the only provision for ventilation in bad weather is a pair of cowl vents in dorade boxes at the aft end of the main cabin.

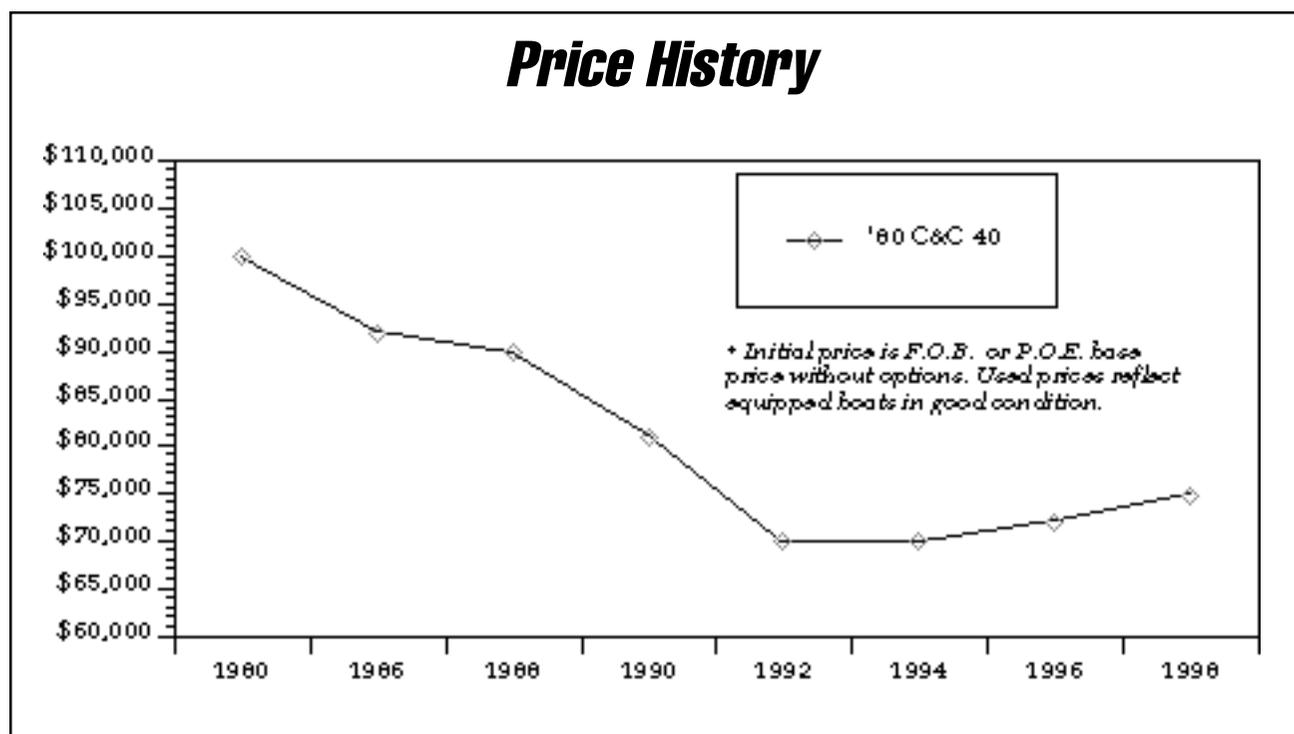
C&C racer/cruisers have good galleys. The galley—aft on the starboard side—is the classic U-shape, with double sinks and a large bin in the forward counter; a large, well-insulated icebox under the aft counter; and the stove in the middle, at the base of the U.

The builder was a pioneer in the use of propane aboard boats, and that's what you'll find as a cooking fuel in virtually all C&C 40s. It's a good installation, with gas bottles located in small lockers on either side of the helmsman's seat at the aft end of the cockpit.

This is a very usable galley, with good storage outboard, a fair amount of counter space, and a practical layout.

The nav station opposite the galley has its own seat (you don't sit on the quarterberth) and a big chart table.

The bookshelf outboard is usually sacrificed for navigation and communication electronics, leaving you no place for your navigation texts. In fact, that



single 2' shelf is the total amount of book shelving in the entire boat!

If you're thinking of cruising, you may want to sacrifice one or both of the main cabin pilot berths, replacing them with storage lockers and shelves. Otherwise, there's little readily accessible storage space in the boat.

In these days of tri-cabin layouts in 30-footers, it's unusual to find the basic two-cabin layout in a 40' boat. In fact, virtually every 40' cruising boat built since the early 1980s has a three-cabin interior.

With the racing competitiveness of the C&C 40 decreasing, and its desirability as a cruising boat limited by lack of a good owners' cabin with a double berth, a major re-thinking of the boat was required if it was to continue in production. This resulted in the short-lived aft cabin version of the C&C 40. In the last year of production, the deck was re-tooled, and the interior redesigned to create a tri-cabin boat with a stateroom aft.

The new interior was a mixed success. The pilot berths were eliminated, replaced by much-needed storage. The galley lost some space—it became L-shaped, giving up one leg of the old U—and was shifted slightly forward and to the port side. The nav station was flopped to starboard.

Aft, to starboard, is the head. On the port side aft is the owners' cabin, with a double quarterberth, hanging locker, and a seat. A doorway through the starboard bulkhead gives access from the owners' cabin to the head, and there's another doorway to the head from the main cabin.

In order to accommodate this new arrangement aft, the companionway was shifted forward, so that you must climb on top of the deckhouse to get to the companionway, which is a sliding hatch in the deck.

This deck layout is similar to that used on some older Swans, and it's a poor solution for a cruising boat, since it basically eliminates the possibility of a full-width dodger over the front of the cockpit.

You can install a dodger, but it will be so far forward as to offer minimal protection to the cockpit, and it makes climbing down the companionway a gymnastic effort with the dodger in place.

With the aft cabin C&C 40, you still have a high-performance boat, and you still—unless you opt for the centerboard—have a boat that draws at least 7'. The deep-draft, high-aspect-ratio fin keel and small mainsail are not the best combination for most cruising.

On the plus side, the aft cabin boat has significantly more privacy, eliminates unneeded berths, and has much more storage space.

Ventilation and light below are also much better in the aft cabin boat, although the big hatch over the main cabin is lost to the main companionway. In addition to the large hatch over the forward cabin, there are two small hatches over the main cabin, plus small hatches over both the aft cabin and the head. There are also additional fixed ports in the deckhouse, adding light to the main cabin.

Relatively few aft cabin boats were built. It was an expensive layout to construct, and the 40 was already getting pricey due to the built-up interior, which is much more labor-intensive than an interior based on a liner with molded furniture.

Conclusions

Despite her heavy interior, the C&C 40 was a reasonably competitive racing boat when introduced in the late 1970s. On the plus side, the interior was comfortable enough for cruising when the racing was over—as long as deep draft and a big rig don't intimidate you.

Some 200 C&C 40s were built, and many of them did a lot of racing. It's not unusual to find a 40 with very complete electronics, a full hydraulic rig control package, and a big inventory of racing sails.

Since the design's days as a serious racing boat are pretty much over—although you can certainly compete at the local level—many owners interested in racing have unloaded C&C 40s at near fire-sale prices.

In general, the C&C 40 is a well-built boat, in the same class as other boats from the company. The construction is not particularly high-tech, however, and some boats may have suffered under the strains of very heavy racing.

In particular, we'd recommend careful examination of the hull bottom in the way of the keel, and the attachment of structural components in the way of the mast and rudder.

Newer designs from C&C have taken advantage of higher-tech materials such as molded interior and hull support modules, and in general are probably stronger per pound of structural weight than older boats such as the C&C 40. Nevertheless, a C&C 40 which surveys cleanly can be an excellent value for club racing, and—with some re-working of the deck layout—for shorthanded cruising in areas where the deep draft is not a problem. • **PS**