

Uncle Rod's Used SCT Buyer's Guide

v1.1

The 'Orange-tube' (OT) C8

This is the granddaddy of them all, the telescope that made the Schmidt Cassegrain available, practical and affordable. Celestron produced the initial model for 13 years, from 1970 to 1983, which means that there are a lot of these basic models available for purchase on the used market. A few mostly minor changes were made to this telescope over the course of its lifetime. The initial and beautiful sandcast fork mount and drivebase were replaced with a smoother and more *modern* looking design toward the end of the 1970s. The most notable difference between early and late OT C8s is found in the (optional) tripods sold for use with these scopes. From its introduction until about 1982, the C8 used the wonderful non-extendable "triangle tripod." Just before the C8 was phased out, this stable support was replaced with an adjustable model similar to the units in use today.

The original C8's OTA is very much like those found on current telescopes. Despite some minor changes in appearance, everything works pretty much the same way on these CATs as on the most modern SCTs. The focusing method is the same (though these old models had a nicer knob), and accessories mount the same way. Like today's budget models, the Orange-tube is equipped with a small (but pretty) 30mm finder.

The mounting will also be very recognizable to today's SCT fancier. The scope is held in a fork that rotates on a circular drive base. There are no sophisticated electronics, of course. What you have is a simple AC drive motor which can be plugged into a wall socket for normal tracking or into a drive corrector for photography. The drive system is equipped with spur gears rather than a more accurate worm set. The wedge and tripod, especially the original tripod, are well made and steady.

Are there any potential problems with these Orange-tube C8s? Very few. They are simple telescopes, so there's not much to go wrong. Time is beginning to take a toll on the very earliest C8s, though—the earliest mass production (Celestron produced quite a few larger SCTs for sale to universities and other institutions in the 60s as *Celestron Pacific*) CATs to come off Celestron's assembly line are now 30 years old. We're now, for example, beginning to see drive motors fail in some of the earliest Orange-tubes. But this is an item that should be easy and inexpensive to replace. Technically, after 30 years the mirrors probably need recoating, but I can testify that the primary and secondary mirrors on my university's 27 year old SCT are still bright and shiny. The closed-tube nature of the SCT is probably responsible of the longevity of the aluminizing. After 30 long years, especially if the telescope has been inactive, the lubricants on the drive gears and the focusing mechanism (inside the OTA) can probably stand to be refreshed. A return to Celestron for a good cleaning and lubrication isn't very expensive, and can help ensure that that beautiful mint-condition Orange Tube C8 is ready to go for *another* 30 years.

I would not hesitate to buy a good condition original C8. As I said, these are *not* fancy scopes, but they are well-built, and can now be had for good prices. If you want something bigger than the common 8” C8, Celestron also produced 11” and 14” ‘C11’ and ‘C14’ Orange-tubes for many years. In most respects they are very similar to the C8 version (the C14 does have an electric declination motor included as standard equipment). The storied C5, a smaller—though not much less expensive—version of the OT came along in good time, before the end of the OT’s long, long reign.



The Original...oh how I longed for one! And, oh!, how I loved my Orange Tube when I finally got one!

Meade’s 2080

In 1980 the Earth shook—for SCT fans anyway. In this year, Meade brought forth its 2080, the first serious competitor for the venerable C8, which had remained much the same as when it was introduced in 1970. The 2080 made it clear that the Celestron scope would have to change, since the new Meade offered some important advantages over the Orange-tube.

There is no doubt that the Meade was a beauty, with its glossy blue-black finish it made the dull orange of the C8 look positively *ancient*. The 2080 can be easily mistaken for a current SCT while the C8 just looks ‘old’ (or *classic*, depending on your perspective). But what does the 2080 have to offer that the C8 lacks? The only truly important design improvement is the worm gear drive. By the 80s, serious deep sky astrophotography was becoming more and more a part of the amateur astronomy world. And photographers really were ready for an improvement upon the “jumpy” spur gear drives used in Celestron’s CATs. Other than the gears, though, the 2080 is pretty much the same as the C8. You get an AC motor with a line cord. Plug it into a drive corrector or an inverter, and be prepared to lug a big storage battery into the field.

Meade made a lot of claims for the 2080 when it was introduced, but most of its advantages beyond its gears indeed amount to little. The manufacturer made a big deal

out of this telescope's "oversized primary mirror" when the 2080 first came to market. And it is true that the primaries on these scopes are about $\frac{1}{4}$ inch bigger than that on the Celestrons due to a differently-shaped mirror blank. But, despite claims to the contrary in old advertisements, this means absolutely nothing either visually or photographically. The extendable tripod and wedge do look a little more up-to-date than the spindly-appearing triangle tripod on the C8, but the C8 tripod is actually steadier.

Not that a 2080 wouldn't make a decent telescope even today. It's quite capable for visual work, and if it is in good condition mechanically, can take pictures at least as well as current bargain CATs. One real advantage the 2080 has over the C8 is that you can find one that's a lot younger than the youngest Orange-tube. Meade kept selling the basic model 2080 off and on for about 15 years, while the original C8 was phased out in 1983. Because of this longevity, the 2080 can be found in a number of configurations, from the basic 2080 with non-enhanced optics and a 30mm finder, to a 2080 "B" model which possessed a 50mm finder scope and MCOG optics (Meade's name for enhanced optics, called "Starbright" by Celestron).

The 2080 was soon followed by a 4" SCT, the **2045**. In a move to counter Celestron's C11, a third model was added in 1983, the 2120 ten inch. The 2120 can be recommended. Many were very well made (if a bit light for photo purposes). The 2045 was problematical throughout its life, and should be avoided.



Not exactly a Criterion! The 2080!

The Celestron Super C8

Not far from Meade's headquarters in Irvine, California, Celestron's management, based in Torrance, realized that there was a *problem*. The 2080 *did* make the classic Orange-tube look ancient. It took a few years for the company to switch gears, but in July of 1983, readers of the astronomy magazines noticed a new advertisement from Celestron. This full-page, full-color ad featured the headline, "**Superceded.**" The photo showed the beloved Orange-tube being practically pushed out of the frame by a snazzy looking black (tubed) CAT, the Super C8. What makes a Super C8 Super?

In addition to its more modern and admittedly 2080-style looks, the Super brought some genuine improvements to the C8 line. Foremost was that it, like the Meade scope, was equipped with a worm gear drive system. And this was not just any worm gear, but one by the highly regarded Edward Byers company, renowned among amateurs for their high-precision mounts and drive gears. The drive is still powered by AC, but the single motor of the C8 has been replaced by dual motors, which supposedly provided more torque. The dinky 30mm finderscope is gone, replaced by an 8x50 model equipped with a star diagonal for comfortable (if mirror reversed) right angle viewing. Celestron claims "improved" coatings are applied to the scope's optics, but "real" Starbright coatings are an extra cost option (about \$100.00 more in big 1983 dollars). Like all the pre-1990s SCTs produced by both companies, the Super C8 is provided with a convenient footlocker type case that holds the scope, drive base and a few accessories.

Is the Super C8 a "good" telescope? *Quite* good, but rather hard to find. The Super C8 was around for less than a year before it was replaced by a new Celestron model. A well maintained Super C8 with its gleaming black tube (it was also available with an orange-colored tube for a short time after its introduction) and old-style fork mount is a thing of beauty capable of producing beautiful photographs and delivering stunning visual performance.



The Super C8 Cometh!

The Celestron Super C8 Plus (+)

The “new and improved” Super C8 had only been on the market for about two years when Celestron surprised us with another introduction, the Super C8 *Plus*. This telescope has some advances to offer, but they are of a more incremental nature than those of its predecessor. The fork mounting has undergone a slight redesign and is somewhat sturdier than those of the previous Celestron CATs. The finder is still a 50mm model, but it is in an improved ring mount and includes a better, integral 90 degree star diagonal. The drive motor and gears on this model are the same as those found on the original Super C8. The Plus is the Super C8 that most used CAT fanciers run into, since it was around for a much longer time than the standard. The plus was Celestron’s flagship 8 inch telescope for over three years. The Super C8+ is a well-accessorized scope. In addition to a couple of eyepieces and a footlocker case, the scope came standard with a wedge and tripod, as would most Celestron CATs from this point on.

Super Polaris C8

Celestron had at least temporarily caught up in the features race. But it was taking a beating in another arena: price. In an age when most amateurs thought \$1000.00 was an almost *impossibly* high sum to pay for a telescope, The Super C8+ was really pushing the envelope. **\$1400.00** seemed an insurmountable obstacle for many observers. Meade was another problem. While they were in the process of upgrading the 2080 into the upscale LX-3, they had also introduced a basic scope on a German mount, the **2080 GEM**, which sold at the all important \$1000.00 price point. Celestron hit on an expeditious solution. They’d take a garden variety 8” OTA and put it on a GEM made by a third party, Japan’s Vixen Telescope Company. The mount chosen was the Vixen Super Polaris, and, thus the Celestron Super Polaris C8 was born.

What could Celestron sell you for a little less than a grand in 1985? A good quality scope that offered few accessories, but decent performance for the budget-conscious observer. Actually, if you hunted around, you could find a SP C8 for even less than a thousand. But the price came back up to this amount in a hurry once you added a few “options” like a drive motor! The scope was and is reasonably steady on its GEM, though not a steady as the average fork mounted telescope. You can, of course, use the Super Polaris mount for other telescopes too, and easily mount the OTA on a modern and heavier duty GEM. This telescope was always considered a bargain compromise, and was never as desired or popular as the fork mount models. But Celestron has made a lot of them. This telescope, in fact, continues to this day in slightly altered form as the G8, so you’ll find many for sale used. Novices: a good condition SP C8 looks high tech on its German mount. Impressive, even. But this was never a premium scope. Don’t pay a premium price for it!

One oddity about the Super Polaris C8 is that it was one of the first amateur CATs to attempt to feature a goto system. By the late 1980s, Celestron was selling Vixen’s original Sky Sensor computer. This early attempt included a controller with a library of deep sky objects and a pair of motors. Did the Sky Sensor take the world by storm? No. It worked, but only barely. Finding objects with it required precise polar alignment, and its

slewing speed was very slow. Most owners were aggravated by the Sky Sensor's problems and only used it as a drive/drive corrector. One interesting Super Polaris variant is a model from the late 80s that featured an Orange-colored OTA. Whether Celestron was feeling nostalgic, or merely found a cache of orange painted tubes, I can't say. What of the Meade GEM which inspired the Celestron scope, the 2080 GEM? It wasn't made for very long and is now rare on the used market.

Meade LX-3

Before Meade introduced the 2080 LX-3 in 1985, everybody knew how you made an SCT. You took an OTA, put it on a fork mount, installed an AC motor, and you were done. The 2080 LX-3 retains the basic OTA of the earlier Meade scopes, but changes just about everything else. In fact, many CAT fanciers point to 1983 and the coming of the LX-3 as the birth of the modern Schmidt Cassegrain Telescope.

What's so all-fired new about the LX-3? The fork is beefed up a little. The finder is a really nice illuminated right angle model. The Multi Coated Optic Group coatings are *standard*. The wedge is equipped with fine adjusters and a compass. All-in-all, a top of the line deluxe scope. But the revolutionary aspect of the LX-3 is its drive. The laughably simple synchronous AC drive has been replaced by a quartz-oscillator controlled DC motor drive that can be powered from an external 12 volt battery or from 120vac household current. There's even a hand controller with directional buttons for photography and a two position switch to select sidereal or solar speeds! The entire telescope is very well laid-out and equipped, even by the standards of today.

Unfortunately, some of the advances made by the LX-3 make it a somewhat less than ideal telescope for today's used telescope hunter. The modern style DC drive means there's a little more to go wrong. And the hand controller is becoming a real problem. Failures are occurring and there's no current source for replacement units. Another problem lies in the fact that some of these telescopes were sold with "super enhanced" **MCSO** optics. MCSO means Multi Coated SILVERED Optics, and "silvered" means that as the scopes age their secondary mirrors (which were the silvered surface) tarnish and degrade. To their credit Meade has proven very honest in this regard, repairing/replacing these scopes' optics for a nominal charge (the silvered elements were not covered by the normal lifetime warranty).

The problems brought on by an old scope with increased complexity can and *should* give today's users pause, but in good condition, the LX-3 is a cheap and effective telescope. The PECless drive cannot compare with the accuracy of today's scope motors, but good pictures can still be taken with these CATs, and much more easily than with an AC motor telescope. Incidentally, the introduction of the LX-3 meant the basic 2080 (which had been only slightly remodeled in "LX" and "LX-2" versions over the few years preceding the LX-3's birth) disappeared for a few years. Like the 2080, the LX-3 is also found in a 10" version, which is identical to the 8 except for the larger OTA and modified fork arms.



That dern “3” shore was purty, even in black and white!

Celestron’s Powerstar 8 (and a last C8+)

The introduction of the Meade LX-3 seemed to have taken Celestron by surprise. They didn’t respond with a “modern” SCT of their own for a while. But it was clear that they would have to do something. Meade once again had bested Celestron in the features race, and the DC drive on the LX-3 was a much more serious challenge to the Celestron scopes than was the simple addition of a worm gear drive by the 2080 a few years previously. Celestron was no doubt unhappy that the Super C8+, which was and is a very nice CAT, obviously wouldn’t be able to remain the company’s flagship instrument for long. The Super C8+ remained on the market for less than two years after the introduction of the LX-3. As quickly as possible, Celestron brought forth its own ‘high-tech’ telescope, the Powerstar C8.

When the Powerstar 8 appeared in late 1987, it didn’t really surprise anyone. It was about what we’d expected, a Super C8+ type telescope with a DC drive motor. The LX-3 had stolen the Powerstar’s thunder some time back, but this doesn’t make it a bad telescope. It is actually very attractive and is a good performer. What will we find if we open that dusty old Powerstar case? The OTA is the familiar Celestron black tube equipped with the usually very good Celestron optics. The fork and drive base are similar to what’s found on the “Super” as well. With one *important* difference. Inside the drive base is a DC powered quartz-locked drive motor. An optional hand controller was available to make the Powerstar “photography ready.” Enhanced Starbright Coatings were another popular add-on for discriminating purchasers. That’s the basic Powerstar, a DC servo motor driven Super C8.

The Powerstar C8 proved to be a very popular SCT, and Celestron kept producing it for nearly 10 years. During this time the telescope went through an almost

unprecedented (for Celestron) number of revisions. In addition to the Powerstar, there are Powerstar IIs, Powerstar IIIs, Powerstar IVs, and Powerstar PECs. The nicest Powerstar to stumble across is the last of the breed, the Powerstar PEC. In addition to the features of the original Powerstar, this early 1990s telescope has, as the name suggests, a DC drive with a Periodic Error Correction Feature. And unlike earlier DC Celestrons, it is powered by an *internal* (9 volt) battery. Other deluxe features are Starbright Coatings as standard equipment, and an included hand controller. The only slightly sub-par aspect of the scope is a little 30mm finder. The other Powerstars? They are a mixed and somewhat confusing bag. Some have 50mm finders, some include dewshields, and some come with hand controllers. Some were sold without a tripod/wedge and may be on the used market with a variety of wedge/tripod combinations.

The Powerstars are all capable telescopes, and if one is in good condition (and includes the all-important hand controller and enhanced optics) it would be a fine used buy. Are there any specific known problems with the Powerstar series? Not really. Even the last and best of them, the Powerstar PEC is at heart a simple telescope with relatively simple and trouble free electronics (though not as simple and trouble-free as the AC drive telescopes which preceded it). The only thing to avoid here is *a Halley-time telescope*. The original Powerstar debuted at the time of the comet craze, and the Powerstar II was introduced before the dust had settled and Celestron had had time to clean up its optical act. If you're offered a Powerstar or Powerstar II, a star test of the optics is definitely called for before closing the deal. Mechanically the scopes from this era should be fine.

Please note that Celestron did a final Powerstar 8 in the early-mid 90s, but discarded the Powerstar name. This scope was advertised as the "C8+," but, naturally had nothing at all in common with the C8+ of earlier years. This was a Powerstar, really with a DC drive. It was sold contemporaneously with the more expensive Ultima C8.

This is a good time to mention that you should be suspicious of ANY Meade or Celestron telescope produced from about 1986-1990. During the telescope buying frenzy that accompanied the return of Mr. Edmond's comet, Celestron and Meade basically wore out their tools and their workers. Some very poor SCTs were produced during this period of time. Some very good ones too. But I would never purchase an SCT from this time period unless I had the opportunity to test it and was sure I knew what to look for. Trust, yet verify!

The Meade LX-5

Meade never has been a company that would allow the competition to come out with a new model without a quick answer of its own. It wasn't very surprising, then, when Meade premiered a new telescope at almost the same time that Celestron brought out the Powerstar 8. This was the LX-5, the successor to the company's popular LX-3. This new scope didn't immediately mean the end of production for the well-received "3", though. The LX-3 remained on sale for quite a while after the introduction of the new Meade SCT.

The first reaction many amateurs have on seeing an LX-5 for the first time is, “Wow!” It is a *very* impressive scope with a beautiful Meade-blue OTA and an improved control panel that seems positively covered with dials, switches and indicators. And, in fact, one of the big improvements of this model over the LX-3 is an improved control panel and hand paddle. In addition to the inputs for DC power, a hand controller and a declination motor, the LX-5 adds a plug for an electric focusing motor. The drive now includes both 2x guiding and 8x microslowing speeds.

Meade also threw in some wonderful deluxe accessories that, even today, are rarely included in the basic purchase price of an SCT. The LX-5 dispenses with the visual back and 1.25” diagonal combination that had been standard equipment on previous Meade and Celestron 8 inch models. Instead, the scope comes with a 2” star diagonal that threads directly onto the rear port of the telescope. This may have been offered only as another bit of oneupsmanship for features, a battle that was well underway between Meade and Celestron by this time. But the 2 inch unit was useful. At this time, the late 80s, 2 inch giant eyepieces like the TeleVue Naglers and Meade Ultra Wide Angles were becoming more and more popular with serious amateurs. Another treat for the LX-5 owner is the fact that it isn’t saddled with a 30mm finder as is the original Powerstar. Meade apparently didn’t think even a *50mm* model was sufficient for the beautiful new telescope. The LX-5 sports a *60mm* finder, and not just any finder, but an illuminated model with a right angle adapter.

This finder scope certainly can help in locating dim targets; under dark skies every one of the Messier objects if visible in this big unit. Unfortunately, all this is somewhat spoiled by the right angle star diagonal that is attached to this finder. Oh, it’s comfortable to use, but since the star diagonal includes a mirror, everything you see in the finder is mirror reversed right-to-left. What this means is that what you see in your finder will *never* match what’s on your star chart—a definite handicap. The large size of this finder scope also creates a problem. All the LX-5s I’ve seen are off balance due to this heavy accessory.

One very special optional accessory Meade offered for the LX-5s is its CAT system. In Meade’s usage, CAT didn’t mean “catadioptric,” instead, it stands for *Computer Aided Telescope*. By the early 90s, the company was marketing this digital setting circle computer for the LX-5. The CAT unit *did* work, but it had the drawbacks common to *all* the early telescope computers. The LX-5 had to be near-perfectly polar aligned for these setting circles to achieve much in the way of accuracy. The computer in the CAT wasn’t nearly smart enough to take polar misalignment and other problems into account. The CAT didn’t offer the library of thousands of objects we take for granted in today’s digital setting circle computers, either--the CAT mounted on one of these old CATs merely indicates the telescope’s current Right Ascension and declination. The whole Computer Aided Telescope installation also has a slightly Rube Goldbergesque flavor, too. The computer hand unit bolts onto your hand controller, wires and cables run every which-way, and the encoders that register the telescope’s direction are turned by tiny, easily lost rubber belts. The CAT is an historical curiosity and nothing more, offering the modern observer nothing but frustration.

The LX-5 is one of my favorite used telescopes. It offers everything the LX-3 and the Powerstars have and *more*. An LX-5 with enhanced optics and a working hand controller is usable for long exposure astrophotography and practically any other

demanding telescopic task. If the telescope has been taken care of, there's not too much to go wrong. Importantly, Meade abandoned the silvered secondary of the LX-3 by the time the LX-5 came on line, so there's no need to worry about the secondary coating rotting away. Despite the scope's lack of a PEC feature, I would tend to choose the LX-5 over the Powerstar, It is certainly superior to the LX-3 in every way.

The LX-5, like the LX-3 was also produced in a 10 inch version. You are much more likely to find a 10 inch LX-5 than an LX-3, because the bigger scopes had become much more popular with amateurs by the time the 5 came out. The 10 inch LX-5 has had a reputation of being too heavy for its mounting, but the examples I've used over the years have been reasonably steady, definitely good enough for photography on calm, windless nights. The telescope can also be mounted on Meade's beefed-up 'Superwedge,' which is sold for the current LX-200. The 10 inch LX-5 had a lot of appeal for the amateurs of the time, since it was far fancier and had many more features than Celestron's competing telescope, the "old-fashioned C11" (which *still* had an AC drive at this late date!).



Crikey! That LX-5 sure had a lot of bells and whistles way back when!

The Ultima 8

For about a year and a half, all was quiet on the CAT front. Oh, Celestron *did* bring its Compustar series of telescopes to market, but these high-priced CATs (which will be discussed later) were of very little interest to the vast majority of amateurs. Except for the Compustar introduction, Celestron confined its SCT advancements to tinkering with the configuration of the Powerstar. But then, in late 1988, new telescope ads, new *Celestron SCT*, telescope ads hit the astronomy magazines. The new CAT from Celestron was dubbed the *Ultima 8*. “Ultima” is very reminiscent of the word “ultimate,” and that’s a fair description of this classic SCT. Even today, many SCT users consider the Ultima 8 to be *the best 8 inch Schmidt Cassegrain ever produced by anybody*.

What makes the Ultima 8 so special? That the telescope was optimized for photography, and included just about every luxury feature that a CAT purchaser of the time could want. The OTA was a stock black Celestron tube, but its optics came standard with the desired Starbright coatings. The corrector was a deluxe version that was made of Crown glass, which many amateurs consider superior to the “float” glass normally found in SCTs. There have also been rumors over the years that the optics in the Ultima 8 were hand picked for excellence at the factory. I have no evidence that this was the case, but the optical performance of every Ultima 8 I’ve seen has been simply *outstanding*. The rest of the Ultima’s appointments were similarly fancy. The 50mm finder was not only large enough for easy object location, but it also included an adapter which allowed you to use it in a right angle configuration or straight-through if you didn’t like mirror reversed images. There was an illuminator and a special crosshair reticle rigged to the finder eyepiece which, when used with an included slide-rule calculator, made accurate polar alignment a breeze.

But the Ultima’s pluses don’t stop there. It’s *real* attraction is its superb, steady mount. The fork is huge and massive, completely redesigned from the much lighter model used on the Powerstar and the Super C8+. The drive base this big fork is mounted on is likewise completely new and much heftier than what was found on other Celestron and Meade telescopes of the time. The large polar shaft of the Ultima mount rides on a big 4” ball bearing assembly, adding greatly to the basic steadiness of this fork. The drive on the scope is similar to what was used on the Powerstar PEC and features the same multiple speeds (Solar, Sidereal, King, Lunar, and one slewing speed) seen on today’s Celestar Deluxe.

There are still more luxuries to be found on this very special scope. The Ultima, in its initial production run, was equipped with a rechargeable lead acid battery within the drive base to provide power. This is a very convenient feature, and one that still hasn’t been duplicated in the new SCTs. The hand controller isn’t quite as elaborate as the Meade LX models, but it is well made and includes switches for an electric focuser, and for the built-in red LED map light. Of course you wouldn’t mount your beautiful Ultima on just any wedge and tripod. This telescope was provided with a heavy duty and full-featured wedge which rode on a strong, rubber-covered tripod. Need to transport your Ultima? Forget those cheap looking footlockers. In a real tour-de-force, Celestron threw in a molded airline-shippable carrying case for this *Ultimate* 8 inch SCT!

Was there anything bad about the Ultima? Well there was the amount of money you had to pay to get one. At around \$2300.00, this was the highest price we’d seen for a

mass produced 8 inch CAT. And that heavy fork mount and base are wonderful for celestial picture takers, but result in a *very* heavy 8 inch telescope. This is probably the heaviest 8 inch SCT *ever* produced, exceeding even today's computer loaded models. Other than that, there's not much you can say against this telescope. They just don't make 'em like this anymore.

Should you look for an Ultima 8? If you're an astrophotographer interested in an SCT, the answer is a most definite *yes!* The drive is uncommonly accurate, and the mount is solid and steady. I've even been able to get good photos with my personal Ultima 8 on evenings when the wind was blowing big Dobsonian reflectors around like wind vanes. It would be fair to say that the U8 makes celestial photography just about as easy as that naturally difficult art can ever be. I've often embarrassedly commented to friends that this scope almost takes pictures by itself!

The Ultima 8 was produced for about 6 years, and you will find some slight variations in the different production runs. The nice rechargeable battery was eliminated toward the end of the Ultima 8's lifetime and was replaced with a 9 volt transistor battery powered unit. The features of this later drive were identical to those of the rechargeable unit otherwise. This may have been done to cut costs, or it may have been done because having to charge the drive battery was a little more inconvenient than it seemed at first. The excellent 50mm finder was left in place on the last Ultimas, but the right angle viewing attachment was scrapped. But not all of the changes were cost-cutting measures. Toward the end of the Ultima 8's life, in a move that really improved performance, the "heavy duty Ultima wedge" (which *wasn't* really heavy duty enough for such a heavy scope) was replaced with a modified C11 wedge.

Are there any *bad* Ultimas? A very few, very early Ultimas were produced with drives which *do not* have the PEC feature. I'd avoid this version if you happen to run across one (not likely). The Ultima 8 was eventually joined by two sisters, an Ultima 9 1/4 and an Ultima 11. These two bigger versions use the same drive base and fork as the 8 inch telescope, and are therefore less steady.

The U8 continued in production until the mid 1990s, and the 9 1/4 and the 11 were around until late 1999. I may be a little prejudiced since I own an Ultima 8, and have used it more than any other CAT over the last 5 years, but I just *love* the U8. I, like many other Ultima owners, wouldn't dream of trading it for even the latest and greatest computer-loaded CAT!



I LIKE it! I like it! The *Ultima*, I mean!

Meade LX-6

Meade, as you'd expect, didn't take the introduction of the Ultima 8 lying down, they quickly responded with a new and *different* telescope of their own, the LX-6. What's really new about this scope as compared to the LX-5? At first glance, not much. The fork is basically identical to what is found on the previous telescope, and so is the drive base. The control panel has added a few new features, including a built-in input for the Meade Computer Aided Telescope System (which by now Meade was also referring to as the *DRS*, the Digital Readout System). The hand controller has continued to evolve, with the most noticeable new feature on this being that the display for the DRS can be added internally to the controller rather than bolted-on as in the LX-5. As supplied, the space for the DRS is a blank panel that was removed and replaced with the DRS LED readout when/if the user purchased the computer option. A red LED map light is now on the hand paddle too, just as on the Ultima 8 hand unit. But the LX-6 was, when it was introduced, looked upon as a revolutionary telescope, and none of these changes sound very revolutionary. What made the LX-6 different? Its focal length. Until this time, *all* commercial Meade and Celestron SCTs had been offered in a focal ratio of f10 only. The new Meade was rated at **f6.3**. It was *only* available in this focal ratio; there is no f10 LX-6.

This new scope was immediately hailed by astrophotographers. Picture takers using Schmidt Cassegrain telescopes had gotten used to working with f10 telescopes. But they weren't happy about it. This long focal length meant that it was impossible to image large objects and it also meant that exposures had to be long. In photographer's parlance, an f10 system is *slow*. The Meade f6.3 changed this, giving photographers wide fields comparable to those enjoyed by imagers using the new short focal length APO refractors. Visually, an f6.3 SCT is also nice, giving low power wide angle views with reasonably short focal length eyepieces.

The introduction of the f6.3 optics of this telescope also led to an unfortunate misunderstanding. Some folks got the idea that the images produced by the LX-6's f6.3 optics would *always be brighter* than those of an f10 system. VISUALLY. This is, of course, untrue. At the *same magnification*, the brightness of images in an f10 scope and an f6.3 scope are identical. The f6.3 *just allows you to obtain lower magnifications with a given eyepiece*. It's nice, of course, to be able to obtain low power without resorting to large and expensive extra-long-focal length eyepieces. I'm not sure how this mistaken idea took hold. The Meade advertisements of the time I've gone back and looked at are careful to state that, "**Images are brighter and fields wider when using the same eyepiece as an f10 telescope.**" Admittedly this wording is a little confusing, and I have the sneaking suspicion that some dealers, hoping to boost sales of this premium priced scope (\$2000.00 U.S. for an 8" LX-6 in 1990) may have hinted that its visual images were also brighter than those in the old f10s.

What good's one of these old f6.3 telescopes today? After all, you can buy a reducer/corrector now that will turn your f10 into a 6.3 for less than a hundred dollars. A native f6.3 focal ratio is still nice, though, especially if you're a photographer. F/6.3 reducers really *do* work, but they may produce vignetting—the image may not cover your

entire film frame. For CCDers, an f6.3 OTA may be especially desirable, since the standard f6.3 reducer can be used to 'speed' the telescope up to about f4, giving the wide fields that electronic picture takers crave. Meade still sells f6.3 versions of their top of the line CATs and they continue to be very popular with advanced astrophotographers.

Then a used LX-6 would be a wonderful buy if you're an astrophotographer or enjoy wide field viewing? Perhaps. Mechanically and electronically the telescope itself is every bit as good, or even slightly better than, the well-loved LX-5. The LX-6 features all the luxury accouterments that made the "5" popular: a big 60mm finder, a 2" star diagonal and more. But I would advise any prospective LX-6 purchaser to be wary and to be sure to test the telescope thoroughly. The problem is the *optics*. Today's LX-200 f6.3 telescopes produce beautiful images. But it apparently took a while for Meade to get the hang of making really good f6.3 mirror/corrector sets. Some LX-6s *do* have very good or even excellent optics. But it is a fact that many are distinctly *average* in this area, and that quite a few poor scopes made it out the factory door and into the world. If you run across a nice-looking LX-6, go ahead, but be sure to star test the telescope carefully. This is *mandatory*. You cannot *depend* on an LX-6 having acceptable optics. Also, please note that even the best f6.3 optics may not be quite as sharp as f10 sets. Edge of field performance, especially, is not likely to be as good. Is it worth putting up with less than sharp stars at the periphery of the field to gain photographic and visual wide fields? That's for you to decide, but many observers reply with an enthusiastic "Yes!" Like the LX-5, the 6 was also available in a 10" version. This scope features the same f6.3 optics as the smaller model.



Hubba-hubba! Now ain't that *somethin'*?! I *wanted* an LX-6, real bad, but a good bottle o' Rebel Yell was a *lot* cheaper!

Meade Premieres

Meade considered the LX-6 a great success and promoted and advertised the new flagship scope aggressively. But they found it necessary to continue production of the older LX-5. It was clear from the beginning that not *all* amateurs were sold on the idea of an f/6.3 SCT, especially once rumors of problems with the fast optical system began to surface. Meade apparently didn't want to continue producing two different top-of-the-line telescopes, though, and eventually stopped manufacture of the LX-5. Actually, the LX-6 also disappeared at this time. Well, it didn't really disappear, it was just renamed, now being called the *Premiere*. The idea of the premiere series was to give the purchaser some choices. A number of different sub models of Premiere were offered. Most importantly, you could *choose your focal ratio*. Meade would supply the scope with either f/6.3 or f/10 OTAs. You could get an 8 inch or 10 inch, and you could even choose a scope with a smaller finder or less accessories if you couldn't quite manage the two thousand dollars that the top f/6.3 8 inch commanded.

What happened to this somewhat innovative way of selling CATs? Mostly, it was swept away by Meade's introduction of the LX-200 goto scope. All company resources were directed toward making the 200 a success, and the former top dog, the Premiere, naturally had to go. But the Premiere idea may not have had a long life even if there had been no LX-200. While the concept of choosing the optics and accessories of your new telescope appeared to be sound, in reality the whole thing seemed to confuse telescope buyers, especially novices.

Is the Premiere a good used telescope? Well, if you liked the LX-6, you'll also like the Premiere. It is almost identical to the slightly earlier model. The only difference, of course, is that you're quite likely to find a Premiere with f/10 optics. And, unfortunately, some of the nice LX-5/6 options may be missing if the scope's original purchaser had to save some money. As with the LX-6, an f/6.3 model's optics should be *carefully star tested* before purchase. There are substantially more LX-6s on the used market than Premieres, since the Premiere lasted only a short time, being phased out with the introduction of the LX-200 in 1992.

Celestron Classic

Celestron at this time, the early nineteen nineties, felt their CAT line was in pretty good shape. The wonderful Ultima 8 was making quite a splash and an even more upscale Ultima 11 was on the drawing board. Bargain purchasers were still attracted to the Super Polaris C8, the middle ground was held by the Powerstar, and the "cost is no object crowd" and small colleges buyers were captivated by the Compustars. But something didn't fit. The poor, old Super C8+. It wasn't cheap enough to attract bargain hunters, and it suffered very much in comparison to the more modern Powerstars. But wasn't there a place for a simple C8? A telescope very much like the original Orange-tube? An inexpensive SCT for people who didn't like the GEM-mounted Super Polaris? Celestron decided to find out. They created an inexpensive fork scope essentially by stripping down the Super C8+. It was to be called the 'Classic.'

The Celestron classic seemed like a breath of fresh air when it was introduced. It seemed to SCT fans of the time that every new model of CAT was more expensive than the last, with these steep price increases being justified by the addition of more and more features, many of which the average user couldn't afford, didn't want and wouldn't use. The Classic, on the other hand, is almost indistinguishable as far as features and performance, to the original and simple OT C8. It possesses an 8 inch f/10 OTA mounted on a light fork not much different from the original (the later OT, not the original with the beautiful sand-cast fork). The drive base eschews the fancy electronics being used in most other mid 1990s CATs, returning to the simple AC synchronous motor and spur gear system of earlier days. The finderscope has shrunk back to a small 30mm. You could get Starbright coatings for your Classic, but like in earlier times, they're optional.

In price this scope also hearkens back to Celestron's beginnings, being sold without tripod for a little over \$800.00, just like that first C8 Orange-tube. In order to be able to price the telescope like this given shrunken 1990s dollars, Celestron did have to trim a little fat. The dual motors that had been featured on Super C8s are gone, replaced by a single AC unit. The footlocker carrying case which had been a familiar feature of all Celestron SCTs also had to be dropped to keep the price down, and for this scope was an extra cost option.

Despite the retro-evolution, the Classic C8 turned out to be a very good, even *surprisingly* good telescope. Sure, the spur gear drive is not an astrophotographers's dream, but it is amazingly accurate. The optics are another strong point. By the time the Classic started rolling off the assembly line in Torrence, CA, Celestron had taken some steps to improve its optical Quality Assurance. The "iffy" SCT optics that had become a real worry in the late 80s were back to the usual and respected high Celestron standard.

The Classic 8 is a good all-round performer for the user of today who, like the scope's initial audience, doesn't need or want a lot of high tech gadgetry. This telescope is not nearly as pretty as a *real* classic C8, an Orange-tube, but it will be newer and is likely to be a better choice for many used telescope buyers. Anything to watch out for on this CAT? Quite a few Classics were sold without Starbright optical coatings. Don't buy one of these. Can you find a Classic today? There are quite a few of them out there, as the company kept the scope in production until the mid-nineties. Often a telescope advertised as a "C8" turns out to be a nice Classic rather than an actual Orange-tube C8.



We're talkin' Retro City...

Return of the 2080

Would you be surprised if I told you that Meade introduced a basic model SCT about the same time Celestron tried-out the Classic? I didn't think so. The original 2080 had been gone for a few years, since the introduction of the 2080 LX-3, which was very different from the original, simple AC telescope. The return of the original 2080 CAT was actually a very necessary move on Meade's part, as their line of telescopes really didn't have a bargain basement model at this time. Meade had, like Celestron, introduced a GEM mounted SCT. This 2080 GEM competed with the Super Polaris C8 in price and features. But it had never really caught on with consumers. Still needing an introductory CAT, Meade next tried a scope they called the 'MTS'. This boiled down to a fork mount OTA on a cheap and old-fashioned pedestal-style mounting. It was, if anything, less popular even than the Meade GEM. "Why," Meade executives undoubtedly thought, "not bring back the good old 2080?"

Why not indeed? The reintroduced 2080 was quite similar to Celestron's Classic and proved just as popular with budget-conscious consumers. The 2080 of the 90s is very much like the 2080 of the 80s. It's an f/10 OTA on a light-medium weight fork mount. The drive is, like the Classic, a simple synchronous motor unit. Meade did, however, choose to retain the original 2080's *worm gear* drive system, making for better tracking for astrophotography than can be achieved with the Celestron Classic spur gear. A tripod was included with the new 2080, just as with the original. But, unfortunately, it was *not* the same tripod that was used in the 1980s. Like Celestron, Meade just had to cut the corners to price this scope at around a thousand dollars like its forebear. One way they did this was by replacing the decent adjustable tripod shipped with the earlier scope with a light third-party extruded aluminum model. This sub-standard tripod is not much different from the too-light tripods found on some of today's inexpensive telescopes. The finder on the telescope is likewise cheapened, reverting to the small 30mm model found on the initial 2080 scope.

Except for this weak tripod and small finder, though, the reintroduced 2080 is a good bet for used shoppers. Like all AC drive telescopes, there isn't much to go wrong here. Try to get an MCOG version, of course. Replace the tripod with a new, sturdier model, add a drive corrector or an inverter, and you'll have a competent CAT capable of taking on most tasks. One thing to remember when looking at a used 2080 or Classic C8: These were inexpensive telescopes when they were sold new. Used prices for either telescope should be similarly lower than those charged for their fancier contemporaries. Don't let somebody charge you an LX-5 price for a spartan 2080. The 2080, like most other Meade scopes, could also be purchased in a 10 inch version, which is not a bad telescope, if a little shaky. The most desirable resurrected 2080s are the models labeled "2080B." These featured enhanced coatings, and often (though not always) a 50mm finder and a 2 inch star diagonal. The 2080 shows up with fair regularity on the used scene—it filled the cheap SCT slot until Meade updated it into the current LX-10 configuration.

Bad Old CATs! **Some SCTs to Avoid**

Criterion's Dynamax 8

This telescope, which came on the market not long after the OT in the 70s, was the first competitor for the C8. It was a failure in every respect. The Dynamax 8 isn't that bad *looking* a telescope, though. It *is* reasonably attractive, even if obviously cheaper than Celestron's telescope of the day, the Orange-tube. Reading the specs of the Dynamax, you might even be lead to think that it may actually have been a better buy than the comparably priced C8 (the Dynamax cost about \$800.00 without tripod, just like the C8). According to company literature of the time, the telescope is equipped with "exquisite optics" which enable the lucky Dynamax owner to take "professional quality pictures with ease and reliability." The drive sounds good, too, being described as an "AC/DC manual drive" which is "fully capable of long 'locked on' exposures." The Criterion company didn't neglect accessories, either. The proud new Dynamax owner would find not one but three eyepieces in the box (*those* were the days). A drive corrector was included in the purchase price, and an 8x50 finderscope was standard equipment.

All of this sounds very good. Was the Dynamax 8 just a telescope that was "ahead of its time?" Sadly, no. There's a lot *bad* about the poor Dynamax, starting with the optics. I don't doubt that some good units were produced, but I have *yet*, after 30 years, run into a Dynamax whose optics were any better than just fair. And many of them were poor, *very poor*—some I've seen being nearly unusable. Criterion claimed that the scope's mounting and drive were perfect for astrophotography, but even a quick look at one of these scopes shows this was hardly the case. Start with the fork. It was as light and flimsy as any I've ever seen. This is powered by a plain old AC spur gear drive that leaves a lot to be desired where accuracy is concerned. What of Criterion's claim that the scope had a DC drive? Spurious. The company felt justified in making this claim because the drive corrector could be powered by a 12 volt battery! If this is the case, the C8 Orange-tube equipped with a standard drive corrector could be considered to have a DC drive too! The included drive corrector wasn't anything to get excited about either. It turned out to be a very simple single axis model that used a single knob instead of push-buttons for control.

One thing the company was right about in their many advertisements was the sturdiness of the Dynamax's resin-impregnated tube. The Dynamax used a cardboard tube, there was no way around that fact. But despite fears of amateurs of the time, the tube was very durable. The main problem with the Criterion Dynamax 8 is what's *inside* the tube. The Dynamax was a pretty valiant effort, but it was *just not a good telescope*, and is not a bargain at *any* price. Even a free Dynamax would likely lead to more frustration than observing pleasure! Criterion also produced a lower priced 6 inch model. These telescopes are now fairly rare. Based on the 6 inch models I've had a chance to try, they are no better than the 8.

Bausch and Lomb's 8001 SCT

By the end of the 70s, Criterion had decided to throw in the towel. The Dynamax had never really caught on, and various problems with mechanical and optical production had resulted in the scope getting a bad name with the amateur community. Criterion eventually sold out to optics giant Bausch and Lomb who rereleased the restyled Dynamax 8 as the '8001.'

This telescope *looks* a lot better than the original Dynamax, but the optical problems remained. I have *never* seen an 8001 with good optics, and some suffer from severe mechanical problems in addition to their optical deficiencies. One example I tested recently had a severe alignment problem with its optical train. No matter how I adjusted the secondary mirror, it could not be perfectly collimated, resulting in very poor planetary images. According to the owner, the scope had been like this since day one, when he purchased it to view Comet Halley (natch). The fork mount is a little better than the Criterion version, but the drive is no more accurate than that found on the earlier Criterion-made telescopes.

Bausch and Lomb also produced a 4 inch SCT, which was heavily promoted during the Halley craze. Advertisements for the 4 inch turned up frequently in general-interest and laypersons' science magazines. This little telescope is of somewhat better quality than the larger 8001, but it is still average at best—in every way. The small SCTs produced by both Meade and Celestron are far better performers.

Unlike the Dynamax, the B&L telescopes turn up frequently on the used market. B&L apparently produced a rather substantial number of them during the mid 1980s. My feeling is that they are not worth bothering with unless the seller is practically giving them away. Like the earlier Dynamax, even then they may not be a bargain.

The Celestron Compustar

I hesitated for quite some time before deciding to place the Celestron Compustars in this "SCTs to avoid" section. The Compustar C8, when it was introduced in 1987, literally seemed like an observer's dream come true. Premium SCT optics on a high quality Celestron fork mount were part of the attraction of the Compustar. But what really got amateurs' attention way back when was the scope's *computer*. Yes, as the name implies, the Compustar came with a built-in computer system. And not just a Computer Aided Telescope Accessory which told you where the scope was pointed in Right Ascension and declination. No, the Compustar was a goto scope. That's right. Celestron premiered a computerized telescope a good five years before the Meade LX-200 came along.

So why is the Compustar almost completely forgotten? There are several reasons. One very big problem was the price. The Compustar 8's list price was nearly \$6500.00! The scope's actual selling price from dealers of around \$3500.00 was more reasonable, but still *far* out of reach of most SCT buyers in the 1980s. Another problem with the Compustar 8 was that it happened to hit the market just as the Comet Halley madness

reached its peak and started to decline. Just about everybody who'd planned on buying a new telescope had bought one by the time the Compustar came on the scene. The serious amateurs who might have formed a market for this luxurious and technically unparalleled telescope had been hearing about a lot of Halley related problems with Meade and Celestron optics and demurred, taking a wait and see attitude. But the biggest problem with the Compustar was that it was genuinely ahead of its time *and showed it*. Its electronics were *almost* there, but the technology was not quite ready for market.

What could a Compustar do, and how well could it do it? The heart of the Compustar is the computer control panel. This 7"x9" controller contained an LED readout display for the scope's computer, a keypad for entering commands and a set of directional pushbuttons for making drive corrections. The built in object-library of the Compustar is very respectable, even by today's standards. The scope could, at the touch of a button, be pointed at any one of nearly 8,000 objects. The computer is even capable of displaying limited data about each object.

So what's the problem? *One* of the problems was the scope's slewing speed—12 to 15 degrees per second. This is quite a bit faster than modern goto scopes like the LX-200, but it tends to be a problem rather than an advantage. Due to various hardware and software issues the scope tended to overshoot targets due to this high speed (you'll note that Celestron's modern goto scope, the Ultima 2000, slows down when it approaches its object). But the biggest stumbling block was accuracy. Like many of the digital setting circle computers of the time, the Compustar required a *precise* polar alignment in order to reliably find objects. Even with a good alignment, performance could be hit and miss. This is made obvious by the fact that many of these telescopes were sold with 2 inch star diagonals to accommodate a big 50mm eyepiece. If the target were to be placed in the field of view of the telescope, this f/10 OTA needed to be operated at the very lowest power practical. The Compustar *could* be an adequate performer if it were precisely aligned in a permanent observatory, however. Use in the field at remote dark sites was problematical for the telescope, though, both because of this need for precise polar alignment and because of the somewhat delicate nature of the telescope's electronics. This made the Compustar less than ideal for most amateurs of the time, since the need to travel to dark sites was a common feature of amateur life by the late 80s.

Might the Compustar be a good buy on the used market? It is possible to find used Compustar 8s reasonably priced. These telescopes are not exactly in high demand, and the new price of the telescope had fallen to about \$2700.00 just before the Compustar was phased out by Celestron in the early 90s. So you'll find some Compustar owners willing to let their scopes go for about the price of a Powerstar. But you would probably be better off with that Powerstar. With the Compustar, you are really on your own when it comes to support for this complex telescope (though there are a few enthusiasts around, who've turned this semi-sows-ear into a silk purse and who would no doubt be willing to help you). Celestron contracted with a third party to write the software and build the electronics used in the telescope's computer, so even if you can find a technician at Celestron who remembers the telescope, he or she will know very little—if anything--about the all important computer's workings. Another strike against the scope is that the Compustar computer suffers from the dreaded Year 2000 (Y2K) computer bug. The telescope computer is unable to handle dates after 1999, and this means that the scope will be unable to point the telescope at the Moon or planets after the turn of the century.

There are, fortunately, a few workarounds that can help alleviate this problem. Celestron has, in addition, *said* that they plan to work with consumers to update the scope's software. But this has not yet happened as of this writing.

This very fancy telescope has some nice features. But in many respects, buying a Compustar and expecting it to perform like an LX-200 is like buying an 80s vintage Apple II computer and hoping for Pentium II speed! Leave it alone and look upon it as an historical curiosity. A CAT that almost, but not quite, brought the high-tech future of astronomy to amateurs. Celestron produced a 14 inch Compustar too, which had the distinction of being the most expensive mass-produced SCT ever made, with a list price of \$22,000.00! It isn't likely the company sold to many 14s for this price, though. With almost no demand for the scope, by the time the 14 went out of production it was selling for the "bargain" price of \$9500.00!



Sale? Jus' goes to show, **life is like a box of chocolates!**

So, there you have it...a connoisseur's guide to CATdom. I expect to continue to update this file, so please send me your corrections, bits of lore, etc. for inclusion in the "next rev." And the times they are a changin'. It's time to add the Meade LX-50 to the used parade. Will it be the LX-200's turn next?!

Greetings from the Great Possum Swamp, Mobile Alabama, latitude 31 degrees north...

"Love for Each-Other Will Bring Fighting to an End"

Rod Mollise

Chaos Manor South

4 Septemeber 2000

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