StellarCAT's ServoCAT – Generation Two

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The ServoCAT - Quick Answers

- It's a tracking and goto system mainly for use in dobs, but retrofitable to nearly any telescope mount.
- DSC's (Argo Navis or Sky Commander) or a PC are required for the goto function
- Tracks as a standalone product (No DSC's needed)
- Installs on scopes: 8" and up
- Install time: 4-12 hours
- Install difficulty: moderate to easy (installation services are available)
- Small size of new unit allows mounting inside more rocker boxes
- Auto guider and planetarium support
- Wireless Hand Pad available
- Price: $1500 to $2700 depending on scope size and options.

It's time to let the CAT, as in Computer Assisted Telescope, out of the bag.

If you hang out in any of the online forums I frequent, y'all may already know that I installed a ServoCAT on my 18" f4.5 Obsession earlier this year, but what I couldn't tell you was that it was a new model. And I don't mean new as in not used, I mean new as in an upgraded unit with improved features and capabilities that until April 1st was unavailable to the general public.

I'm used to getting new toys to play with, but I'm NOT used to signing an NDA – A new toy and I can't tell anyone?? Geepers! But this was exactly my dilemma with StellarCATs (owner Gary Myers) latest version of the ServoCat. I've been involved with the beta test program for the last three months, and they've finally gone public.

It's not CN policy to review pre-release products, so I'd like to take a moment and confirm that the unit I've got installed on my 18" is identical in features and performance to the production products.

It is.

And now, on with the review.

I've been a dob guy since, well, since I got my first serious scope a decade or so ago. There was a short span of time when I moved away from dobs into SCT's, but after that short foray, you haven't been able to part me from my dobs. Years back, I found out what it really means to have a dob with good mechanics – so stable you can rest your hand on the tube, yet so easy to move, a mere finger tip accomplishes the task with ease. You'll often hear these described as "obsession-like" motions, and with good reason. Dave Kriege was one of the pioneers that brought premium dobs into the market place. But, these days, you don't have to have an Obsession to have obsession-like motions. I'd always felt with the dob tweaked right, that a drive wasn't necessary. Consider: with my better truss scopes, I'd always been able to observe at extremely high magnifications (600-800x) using the nudge nudge technique – it served me well for many difficult targets. In a word, I thought a drive was a luxury. Well, over the course of the last couple of months….

But wait, I'm getting ahead of myself here – lets back up a minute and take a look at the company and the product.

Obsession 36" and StarMaster 12.5"
Photo Credit – Gary Myers

StarStructure w/ Gen 1 Unit
Photo Credit – Michael Zammit

StellarCAT (previously RXDesign) has been in business since the mid-80's. Their first product was designed to track the moon with large radio antennas. Today, they are the company to talk to if you want to add an aftermarket (stand alone) goto / drive solution to your dobsonian. They sell the ServoCAT (18" and up), the ServoCAT Jr. and they are a US distributor for the Argo Navis.

And the product? The ServoCAT iteself?

Well, There are two versions. The ServoCAT and the Servocat Jr. Both are a commercial solution that's designed to add tracking and goto to any, repeat, ANY dobsonian on the market. The differences mainly lie in that the Jr's gearings are small in size, and generate less torque but it runs quieter and has a maximum slew rate of 10 deg a second, as compared the the ServoCAT's 5-6. The Jr is recommended for 8-15" and for Ultralights up to 18", where as the ServoCAT is recommended for scopes 18" and up. Both are designed to work on any dob (and other mounts as well – I'm informed the system is installed on an SCT fork, and various GEMs), and be easily installed on the end user. You don't have to be an electronics wizard or an ATM to install or use the CAT. You don't need to be tethered to a personal computer, or even DSC's if you just want tracking. When you are set up with the appropriate DSC (Argo Navis), not only will it track at sidereal, it will track at whatever rate is needed – including the appropriate planetary rate. It does all this and far more. This article concerns the second generation of the ServoCAT proper.

A bit o'history

Prior to 1995, you just couldn't get goto in a ready made package for a dobsonian.

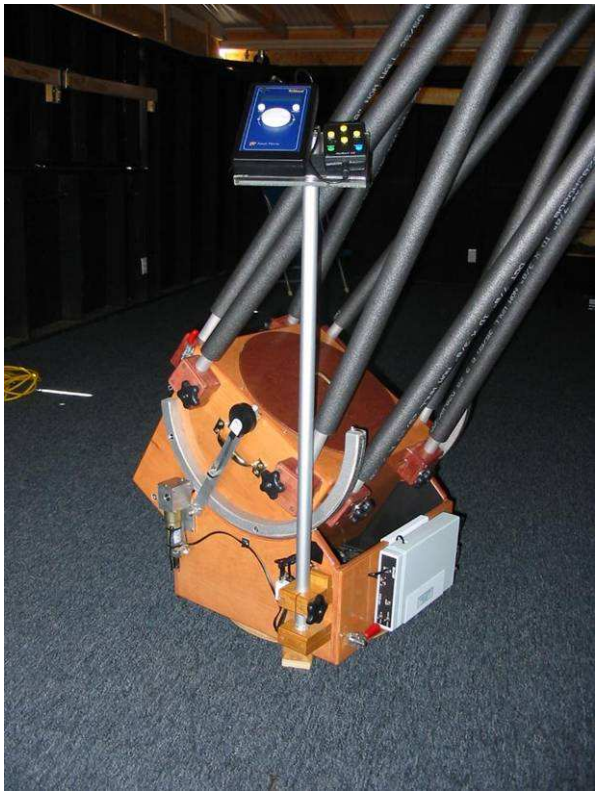
Then StarMaster introduced the Sky Tracker. A collaborative project of Sky Engineering and StarMaster, the application was, genius. For the first time, big dob owners had a turnkey solution, capable of both goto and tracking. Having used it several times myself, I can say that StarMaster's Sky Tracker works and works well. Unfortunately, for the rest of the dob world, if you wanted Star Tracker, you had to purchase a StarMaster. Rick Singmaster had cornered the market.

Other semi-solutions came and went and at least three stuck around; the Poncet platform, the Bartels drive and the Dob Driver (currently the Dob Driver II). But, looking around, I found some, for me, less than acceptable drawbacks and limitations associated with these products. They are not commercially available, add unwanted height to the telescope,

only track for a limited amount of time, require a PC for operation, or perhaps simply lack the feature set one is looking for.

In 2001 RxDesign (they would become StellarCAT in the fall of 2003) introduced the ServoCat. This unit worked with Sky Commander DSC's and offered a third party solution that was capable of working with any dobsonian telescope on the market.

The features included:



Obsession 12.5" - Photo Credit – Gary Myers

- 5-6+ deg slew rates (per axis)
- Settable user speeds
- Emergency stop functions
- Full goto functions from many popular devices and programs, including: Sky Commander (9000+ objects) or Argo Navis (30,000) objects, Megastar, Astroplanner, and The Sky (For PC and PDA)
- Provided an interface to the Planetarium view with popular astro programs and shows where the scope is pointed
- Hand pad that allows you to select three different slew rates
- Dual (simultaneous) axis movement
- High precision pointing (Local Sync)
- Slip return function – useful if the scope is "pushed" off target
- True spiral search (multiple speeds)
- SuperProgram mode adds multiple (programmer added) features
- Autocalibrate routines improve the calibration of the CAT, by tuning it specifically for your telescope (no PC required)
- Autoselect -allows use on multiple telescopes)

In 2002, Obsession became the first big name to hop on the ServoCAT wagon, and today, the system is available pre-installed from a variety of vendors – Plettstone, StarStructure, NightSky and many more. While StarMaster took the dobsonian revolution another step with it's Sky Tracker, StellarCAT has made it available for everyone. As of this date, Gary Myers, owner of StellarCAT informs me that they are ready to ship their 300th unit.

As of this writing, it's been installed on dobs as small as 8", and as large as 41.2".

And now, just a short while ago, StellarCAT launched its second generation ServoCAT.

Most features are accessible via the hand pad

This new unit has the same functionality of the earlier one, but the following features have been added (or changed):

- The CAT is now 40% (by volume) smaller
- The case is now manufactured of Black ABS
- Connections are easily accessible from the outside of the unit
- All cables are now detatchable, and use RJ45, RJ11 or RCA style plugs for ease of connection
- Optional RSU (Remote Status Unit) to display the LED's and Switches – err – *remotely*… This is very useful for installs where the unit is "inside" the rocker box
- Built in port for the auto-guider
- Ability to add a second guide only handpad
- Front LED's can now be shut off (for install inside a rocker)
- LED's added for Handpad connection and power status
- External AUX port for future upgrades
- Support for new Sky Commander XP4
- EasyTrack (allows tracking without DSC's)

Testers anyone?

Gary Myers approached me in early December looking for a tester for his soon to be released second generation ServoCAT. While I hadn't ordered the CAT with my 18" Obsession I knew it was something I wanted to add within the upcoming year. Although I was skeptical of the benefits of tracking, the 18" is my "ultimate" telescope, and I knew this was a system I had to have.

I'd considered the alternatives and rejected them: the Dob Driver because I didn't want to mess with dual pendants, and there was no way I was going to put up with a computer at the telescope. A platform was rejected because it would add precious inches to the overall height of the scope – thus taking away my main advantage in purchasing an Obsession in the first place – it's short height and small footprint. Additionally, I'd decided I didn't want a platform because it would be one more large piece of equipment to store and tote. And as for the Bartels system – well, although I am a computer guy, I'm not an ATM.

I debated for about 2 minutes and then committed. After talking with Gary about the other products available, I decided that I'd also go with the powered ground board. I'd debated about using onboard battery packs, but I've never liked adding the weight to the

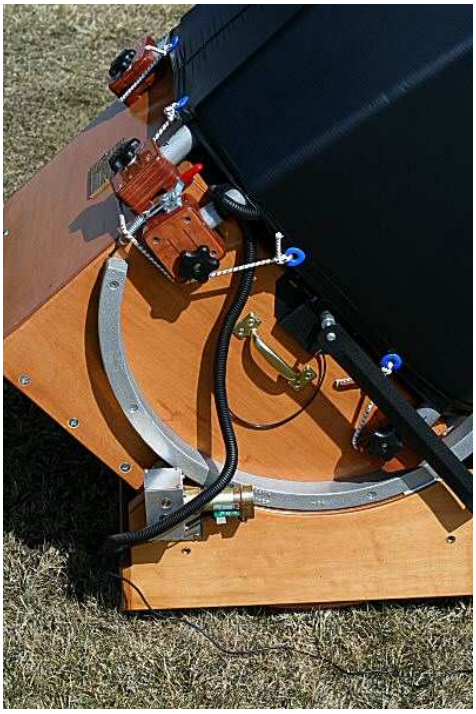
Well packed and clearly labeled

telescope, or the fact that you have to remove them to recharge. Jump start batteries are plentiful and cheap. They also are easily transported from the field for recharging, have large capacity and can be swapped out very quickly. The one disadvantage is that you have a power cord to deal with. On a typical scope, this means that you have to watch out for twisting the cords up with the telescope. The PGB solves this problem quite nicely. You are shipped a replacement ground board which has a plug on one of the feet. The cord never moves once it's plugged in – all power is transferred up through the ground board itself in a rather ingenious design.

I received my unit from StellarCAT at the end of December / beginning of January. My first pleasant surprise was when I opened the package. Their packing skills are supurb. Yes, there are a ton of little parts, but they all come in their own bags, grouped by function with a complete list of what you've ordered and what you should have. StellarCAT recommends you take some time and compare the two – as do I. Everything was clearly labeled and well packed. Everything you order should come like this.

Installation – or, if I can do this, ANYONE can do this…

Given that I was helping StellarCAT troubleshoot the new unit, I needed to do my install as soon as possible (the fact that I had a desperate desire to get goto working on my 18" scope had little to do with it). Having the carpentry skills of your typical woodland moose, I enlisted the help of a buddy of mine – the local HS shop teacher. In retrospect, while his aid made things simpler – I really needn't have bothered.



18" Obsession –One of the few signs of the CAT, the AZ servo and engage lever

The install was straightforward; StellarCAT provides excellent directions – in Video, DVD, written and PDF formats, parts lists, templates, as well as supplying a TON of installation pictures. Additionally, StellarCAT was nearly always available for those last minute tech support questions – and a good thing too. While nearly everything was perfect, there was a slight problem with the pivot pin – it had been manufactured to the wrong tolerances. A quick

call, and StellarCAT had a new pin out as soon as possible.
After a few "I paid $$$$$.$$ for this thing, and now I'm drilling holes in it? Ack!" thoughts, installation proceeded without much trouble. If you've been thinking about getting one of these but are daunted by the prospect of installing it yourself – don't be. While it's not a trivial process, StellarCAT has done so much prep work that if you are able to follow simple directions, and have an opposable thumb, you should be able to install the unit without too much trouble. If I can do this, anyone can. If you still have doubts about your ability to install, StellarCAT (or their partners) will install the ServoCAT for you. If you can't get your scope to them, you can elect to send them just the rocker box and ground board, and they will still do the bulk of the install. Being afraid of the installation is no excuse. None.

All told it took us 8 hours or so for the basic installation. We probably could have done it in less, but I had made the assumption (!) that the shop teacher would have all the equipment required. Bad assumption. Again, check the parts lists that StellarCAT supplies. Not only do they list what you should have in each container, they also list tools required for assembly – right down to specific drill bits and such.

First Light

After installation and auto calibration I was ready for first light. (Incidentally, auto calibration is an extremely easy procedure, I highly recommend spending the extra couple of bucks to get the autocal cable as it tailors the unit to your particular scope.) Here's first light described in my notes:

> *It was COLD last night - but clear. While I'd finished the bulk of the install a week or so ago, I still had to reroute my UTA power (I also installed the powered ground board option) run a few other cables and fine tune things a bit. In any case, I'd just (finally) brought the ServoCAT online earlier that afternoon.*
>
> *I couldn't resist however, and after shoveling a path, wheeled the 18" out for a run.*
>
> *After some initial tests described in the manual to ensure that the scope is setup properly (these took maybe 5-10 minutes) I was off and running.*
>
> *Overall, given my unfamiliarity with the system (and the failure of my hands to work properly in the extreme cold), I feel it went pretty well. By the end of the session, I had gotten to the point where goto's usually placed objects within the FOV of a 9mm Nagler (~265X), and it would remain in the FOV for 35-45 minutes.*
>
> *I didn't try anything fancy – in fact, outside of using the function button as described in the manuals to test the scope before initiating a goto – I didn't use the function buttons at all. Only slew, jog, guide and goto. I'll leave the detailed exploration for later.*
>
> *Even though the mirror never cooled last night Saturn was simply amazing. You'd*

get instances of (zot) perfect seeing and the detail was incredible. Ok, I admit it, Vic was right. The difference is stunning. Planetary observing is much better with a drive.

M42 was this bright vivid shade of blue with a texture of curdled milk throughout and hints of pink.

NGC2022 was just too cool in the 18".

My very first night with the ServoCAT, I was observing. Not testing, not trying to figure out how to work the thing – observing. The product is so simple to use that it just gets out of the way and lets you use the telescope – the VERY FIRST TIME. How cool is that?

Follow up sessions in the dead of winter confirmed my near perfect results every single time. Do you have any idea how cool it is to see (and have under your control) a large scope that slews (rapidly) from one side of the sky to another?

The Features

But this wasn't the end, far from it. There were numerous features to test out. First up – spiral searches – at multiple speeds yet - for those rare times the object wasn't in the eyepiece. It worked like a charm. I'll note that I suspect this fault has more to do with the databases I was downloading to my Argo Navis than with the ServoCAT, the Obsession or my installation – a guess that Gary Myers, owner of StellarCAT confirms.

Note the clean look – the red handles engage and release the servos

The Local Sync is a feature that's truly cool – rather than resyncing my argo I'd center the object and go into Local Sync mode. This is essentially the same as Meade's High Precision Pointing. The second set of encoders in the servos take note of where they are in relation to where the DSC is telling them the target is, and they add or subtract that value to compensate. This can VASTLY increase accuracy over 5-10 degrees of sky, and is extremely handy when going after targets at or near the limits of your equipment, or in crowded and confusing areas of the sky like the Virgo-Coma Supercluster.

Another major feature that I got to tryout was EasyTrack. EasyTrack allows you to have tracking WITHOUT having to have DSC's working or even installed. Simply point the telescope at the North Central

Pole (Polaris works decently for visual use as well), turn the CAT on and go. Ever been in the field and had an equipment failure? This helps to eliminate some of those issues. Don't have the money for encoders but want to upgrade to full goto down the road? The CAT is now an option. And last, but not least, EasyTrack also allows for greater precision in your DSC alignments since the scope will be tracking during the alignment process.

There were several things I haven't tried – guiding for one. The new autoguider port is ST-4 compatible. Additionally, since I don't have or want a computer at my scope, I didn't get a chance to play with the planetarium features. Incidentally, the ServoCAT is now supported under the Pocket PC version of The Sky – that I may have to try…

It's possible to use a ServoCAT on several different telescopes. You do need to buy another set of servos and some assorted hardware, but you don't need to buy another CAT – thus it's substantially cheaper to take it to another telescope.

The amazing thing about the ServoCAT is that since it's designed to work with nearly any mount under the sun (err – stars), it's configurable beyond belief. You can tweak the tracking to your hearts content. I'm currently satisfied with tracking an object for 35-45 minutes at moderate power (300x), and don't feel much of a need to tinker – on the other hand, I've seen reports of users tracking at 1000x for an hour!

But don't make the mistake of thinking that configurable beyond belief means that it's complicated – amazingly, it's not. StellarCAT has provided extensive documentation, but the truly amazing thing is that, in truth, you rarely need to refer to them. For the most part, it's intuitive or it's labeled.

Then for all you old school dob users, there are a couple of other benefits to the system that I'm sure you would enjoy. Balance issues are gone forever, as is the tendency of your scope to act like a wind vane.

Summary

Remember I was the guy, who at the start of this whole process didn't think I needed tracking?

I discovered that effective tracking does a number of things. In effect, it's an increase in aperture. Even though I truly felt the effort needed to nudge nudge was minimal, even though I could go to extremely high powers without tracking, I discovered I hadn't fully appreciated a couple of things. 1) There is a small amount of brain power required to process the nudge nudge, brain power that can be better put to use in other activities (especially, if like me, you are getting older day by day – and sometimes seemingly faster) and 2) Coma naturally induces a loss of detail as you move away from the sweet spot in any Newtonian refractor. By their very nature fast newts make a powerful argument for tracking.

Just for the heck of it one evening, I unclamped the drive to return to the nudge nudge mode (you can do this with the StellarCAT and not loose your alignment). Yes, those very buttery motions are nice, but it was a very short trip down memory lane. Once you've experienced tracking you don't want to go back.

And now it's time for those two little sentences I know a couple of you have been waiting for:

1. ***I was wrong.***

2. ***Gary, Vic and the rest: you were right.***

In retrospect, I'd now put tracking on the TOP of my list of must haves. I suspect that I'd even opt for a smaller newt with tracking to a larger one without.

StellarCAT's ServoCAT is an amazing piece of machinery, bringing tracking and goto to the common dob owner for a reasonable price.

I could go on for another 20 pages on the ServoCAT. I've only covered a small amount of its features, a small number of its benefits, a tiny portion of the overall experience. But one thing's easy - figuring out the best part.

It just works.

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