

YOUR FIRST TELESCOPE—A GRAB-AND-GO?

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This article is my opinion alone and does not represent the opinions of the Rappahannock Astronomy Club or any of its other members. - lsg

Beginning Astronomy Disorder

There is an affliction called Beginning Astronomy Disorder (BAD), where upon realizing one wishes to become an amateur astronomer one also wishes to buy a telescope “real BAD.” This is not really a BAD thing, because sometimes the new telescope owner acquires a lifelong interest in astronomy. But, a new scope can also discourage its owner. This is also BAD.

Articles. Google “first telescope” or “beginning astronomy” and you will find many excellent articles by amateur and professional astronomers. (Also see the appendix, below, and the RAC Beginner’s Resources article.) Generally the advice is to do visual and binocular observing first and go to some star parties and local astronomy club meetings before investing in a telescope. Many clubs also have loaner scopes. Why not try before you buy? Good advice. However, many wish to buy a telescope anyway. It is, after all, much more convenient to have your own telescope than to have to borrow one or to attend a once-a-month star party, weather permitting.

A plug for binoculars. **If you have binoculars, any binoculars, you already have a pair of wide / rich field astronomy telescopes!** There are several good books on binocular astronomy. There are ways to hold them steady so that it is comfortable to look, even to look straight up, at the sky at night. Binoculars are the best astronomy tool for looking at several neat things, like the Andromeda galaxy and the Pleiades star cluster and the Orion nebula. You can learn the Moon’s seas and ocean (Did you know the Moon has an ocean?) and its major craters and lunar highlands, all with binoculars. Cool!

Grab-and-go. But, OK, you want to buy a telescope. I suggest that if you have BAD you buy a grab-and-go telescope. If it’s a good one, you will always use it because of its convenience and quality, even if you eventually get *monstrous biggus telescopicus*. A big telescope, or one with a heavy mount, usually lives in its case or in the closet and gets put together on weekends. (There are ways around this problem, like having a house in the country with a homebuilt “astronomy shed” in the back yard, or having your big scope on wheels in the garage.) But good astronomy skies don’t just happen on weekends. It’s nice to be able to hop outside on a clear night and observe for ten or fifteen minutes without the inconvenience of setting up *monstrous biggus telescopicus*.

My definition: A good grab-and-go scope takes little or no setup and weighs less than twenty-five lbs including its tripod. You can leave your grab-and-go set up in a corner in your living room and easily carry it outside or put it in the car. Time required: pffft! Effort required: pffft! Pulled muscles: pffft!

How much to spend and what to buy?

Optical junk will wear out its welcome a few minutes after you begin to use it. That means you have to spend in the vicinity of \$200 for the scope. Sorry. However after you surf the net and the telescope catalogues and read the reviews on www.cloudnights.com you will realize that \$200 is inexpensive. Many small scopes cost much more. One might even say their cost can be astronomical. (You may, if you wish, throw a high-quality eyepiece at me in retaliation for this pun.) If you must have a sound-bite answer: **An adequate grab-and-go telescope with a decent astronomy tripod can be had for about \$500.**

There are still sooo many choices! Almost every telescope company: Meade, Orion, Celestron, Edmund Scientific, Vixen, Televue, Astro-Tech, Obsession, Questar, Synta, Zhumell, Williams Optics, SkyWatcher, etc., advertise one or more telescopes as grab-and-go. Some, like the Questar, are extremely expensive—\$4,000 and up. You do not need to buy one of those pricey jewels. There are much less expensive scopes with adequate or even excellent optics.

There are two flavors of grab-and-goes: There are wide-field, or so-called “rich field” scopes. (“Rich” sounds much better, don’t you think? I bet someone in marketing came up with that term.) There are also non-wide field “standard” scopes. I recommend not purchasing a wide / rich field scope for the following reason: lack of magnification. Yup, the dirty word of beginning astronomy. “Department store telescopes” are reviled for their low quality and for advertising magnifications of 500x to 600x which are totally useless. Amateur astronomers are frequently forced by atmospheric turbulence to run their scopes at under 100x. However, most wide field scopes, with their short focal lengths, cannot provide magnifications much above 50x. IMHO (in my humble opinion) to obtain satisfying views of Saturn’s rings or the cloud bands of Jupiter on a night with good seeing you need more magnification than that.

The Moon, Mars, Saturn and Jupiter are spectacular. They are the brightest and most detailed objects in the night sky. But you need a scope which is capable of at least 100x, and a clear, stable night to pull in reasonably sharp images of Saturn’s rings and Jupiter’s cloud bands. I recommend a scope with an aperture of at least 3 inches (80mm) due to the “50x per inch of aperture” rule, and with a fairly long focal length—over 500mm.

If you eliminate all of the grab-and-go scopes with less than those specifications what does that leave? A lot. There are many 80mm and larger aperture refractors (with lenses); Newtonian reflectors (with mirrors); and compound (having both mirrors and a glass lens) telescopes. The most compact are the compound Schmidt-Cassegrains and Maksutov-Cassegrains. The most aperture for the money are the Newtonians. Excellent refractors (glass lens scopes) are pricey, but almost maintenance-free, rugged, and often excellent for astrophotography.

Mounts

The weight and cumbersomeness of the mount and / or tripod will greatly affect your scope's portability and ease of use. As you peruse different scopes, think about their mount. If you have a picnic table a tabletop mount may work for you. Tabletop mounts are lightweight, inexpensive and compact, but won't work in the middle of a field without carrying along something extra to put them on—a stool perhaps. A photographic tripod is the most lightweight and transportable tripod, but sidereal tracking using ball or pan-and-tilt heads is almost impossible. An appropriately-sized equatorial or micro-adjustable alt-azimuth astronomy mount with hand controls will be stable and require no batteries. Anything with a heavy counterweight we can safely conclude will be, well, heavy. Tripods are included with the Meade ETX and Celestron NexStar and other computerized goto scopes, but you must learn to use software. Batteries are required. Things to keep in mind.

Mounting size. Bigger is not always better. You want a good, sturdy tripod. But, you do not need a 50 lb. tripod which is capable of supporting 200 lbs. to hold a 6 lb. scope. A huge, heavy tripod is not portable. Similarly, a backpacking tripod made of air-weight aluminum may work for a tiny camera, but will not work for a 10 lb. telescope. Look at tripods' and mounts' (or photography heads') specifications. The better ones state: "capacity x lbs." Err a bit on the side of caution. If your telescope weighs 5 lbs., get a mount which will handle at least 10 lbs. (After all, you may want to use it for a heavier scope later.)

Mounting expense. Often scopes are sold as OTA's, optical tube assemblies—no tripod or mount—which must be purchased separately. Many amateur astronomers end up with a tripod and mount which are more expensive than their telescope, so do not be surprised by the cost of a good tripod and mount. If the grab-and-go scope you select does not come with legs and you do not wish to risk using a photo tripod not made for astronomy, select a grab-and-go mount made for astronomy. Based on its reviews and specs, it looks to me like Astro-Tech's Voyager is one of the better micro-adjustable alt-azimuth mounts. Another is Vixen's Porta-II. **Does it make sense to put a \$200 telescope on a \$300 mount? You betcha.** In fact, that is exactly what Vixen does with several of its grab-and-go packages. (Google Vixen VMC110L.)

The Imperfect Solution

There is no perfect grab-and-go. Where you live, whether you want everything to fit into a backpack, whether your scope needs to be extra-rugged, how far you want to be able to carry it, whether you need to go up and down stairs, whether you want to put it into carry-on baggage, how much money you have to spend, whether you like computerized stuff, whether you mind buying batteries, whether you have an outdoor electrical outlet; whether you want to learn to align an equatorial mount, whether you have a wide or narrow doorway, your size and physical condition, whether you are interested in astrophotography—everything factors in.

My grab-and-go solution for me is a 3.5 inch (90mm) aperture, totally manual (no electronics), Celestron C90, Model 52268, 1250mm focal length, Maksutov-Cassegrain telescope with a full-sized Bogen / Manfrotto 055XB aluminum tripod with Bogen 410 geared head. **The combined weight of the scope, tripod, and head is 13 lbs.** My reasons: I like manual stuff; I don't have a picnic table; I can easily carry the scope / tripod on my shoulder; the head allows fine adjustment; the tripod has sufficient height for comfortable observing while sitting *or standing*; and the rig can also function as a spotting scope and as a telephoto lens.

My secret reason (don't tell anyone!) for buying the little C90 is that I can pretend it is a 3.5 inch Questar. If you compare the C90 and the Q3.5, you will see that they are both Maks and their apertures and focal lengths are similar.

Beware! Most spotting scopes and photography tripods and heads are wrong for astronomy! Even the 410 geared head and the 055XB tripod, which are both pretty good, have some image shift and rebound at 100x from the weight of my hand and the torque of turning the knobs when a sidereal adjustment is made. Do not blindly follow me. Keep researching scopes and mounts and portability until you find a grab-and-go setup which is right for you.

The C5. I certainly wouldn't mind having a Celestron C5 (a 5 inch Schmidt-Cassegrain), or any of the other types of scopes I have mentioned. The C5 would be brighter than my C90—but also heavier and more expensive. Thus the basic conflict—performance versus size, weight, and cost. Other solutions abound; should I wish to own a refractor, I might buy a Televue 85, or something similar but less expensive; should I wish a goto, there are 80mm, 90mm, 4 inch (101mm) and 5 inch (127mm) Celestron, Meade and other gotos which weigh much less than 25 lbs.

Parting Shots

How big is too big? My suggested weight limit of less than 25 lbs. for the scope and mount takes care of this question. For example, the Astro-Tech Voyager mount weighs a bit under 14 lbs. That leaves 11 lbs. for the telescope and eyepiece of your choice. A 127mm (5 inch) Mak, Schmidt-Cassegrain or Newt is usually less than 11 lbs. The Televue 85mm refractor weighs 8 lbs.

Why not a bigger scope? **Whatever you buy—THERE WILL ALWAYS BE A BIGGER TELESCOPE!!!** Even if you purchase a magnificent 36 inch Newtonian Dob, you can bet that someone out there has something that will beat it. Bigger scopes gather more light and therefore will pull in fainter stars, galaxies, and nebulas, true, but they also gather more dust because they are not used as often. Don't worry; a good small telescope shows much more than the naked eye. Learn your way around the sky before diving into a big expensive telescope with a similarly expensive mount. You can find every one of the 109 Messier Objects with a good grab-and-go. The goal here is portability and frequent use, not maximum star-counts. If you don't observe on a night which has excellent seeing (when the atmosphere is exceptionally stable), you will be missing

something. That song, “Don’t Worry, Be Happy,” was written for grab-and-go telescope owners. “Don’t worry (about buying a bigger telescope), be happy.”

Why not a wide-field scope? If you want to see big areas of sky at 25x or 50x, go for it! I love the Astroscan! A wide-field scope is an *excellent* tool to help you learn the sky. I just don’t want you to be disappointed when you see Saturn in miniature, and cannot see Jupiter’s cloud bands, and cannot see the smaller Moon features the way you can with a grab-and-go which is capable of 100x. Remember, if you have a pair of binoculars, you already have a wide-field telescope!

Mounting importance. The tripod / mount is more than half of the telescope, if that makes sense. A mount, just like a telescope, is a very personal thing. (Talk to any serious photographer about their favorite tripod and head, and they will expound at length upon the virtues of their equipment.) Read the www.cloudynights.com reviews of mounts, below. At star parties, ask telescope owners for some instruction on how their mount works, and if they will let you operate it.

Don’t shade your eyes—Accessorize. (Apologies to Tom Lehrer.) Budget perhaps an eyepiece and Moon and / or Oxygen III filters for your new grab-and-go, and an astronomy book / star chart / moon chart or a subscription to Astronomy or Sky and Telescope magazines.

And Finally

Don’t forget the basic grab-and-go question: **How far do I really want to carry this thing?**

Clear Skies!

APPENDIX

Dickinson and Dyer in The Backyard Astronomer (a great book!) suggest you buy a 6” Newtonian Dob as a first scope. Ed Ting, a well known amateur astronomer, suggests an 8” Dob. These are both excellent scopes. However, fully assembled, they are not easily carried through the front door and down the front steps.

There are dozens, if not hundreds of internet sites with articles concerning telescopes and mounts. The ones listed below are just to get you started. Don’t ignore bird watching and photography websites. Bird watchers and photographers also know optical equipment. Some of them even look at the stars!

Picking a Telescope

<http://www.epinions.com/elec-review-59E8-AD8AEDA-396533EF-prod2>

http://www.cloudynights.com/item.php?item_id=942

Mirror Scope / Glass Scope Comparisons

<http://photo.net/learn/optics/mirrors/>

<http://www.betterviewdesired.com/Catadioptric-or-Mirror-Scopes.php>

Tele Vue 85 Refractor Review

<http://www.betterviewdesired.com/Tele-Vue-85-APO.php>

Reviews of Tripods / Mounts

http://www.cloudynights.com/category.php?category_id=35&pr=2x8

http://www.cloudynights.com/item.php?item_id=1922

http://www.cloudynights.com/item.php?item_id=798

http://www.cloudynights.com/item.php?item_id=1432

<http://www.kenrockwell.com/tech/tripods.htm>

http://www.cloudynights.com/item.php?item_id=1344

Messier Objects

http://www.amazon.com/Atlas-Messier-Objects-Highlights-Deep/dp/0521895545/ref=sr_1_1?ie=UTF8&s=books&qid=1259180849&sr=1-1