

Saguaro Astronomy Club

Metro Phoenix, Arizona

SACNEWS



June 1991 — Issue #173

My Upgrade Odyssey or My Odyssey Upgrade by Dan Ward

Reprinted with permission from the Charlottesville Astronomical Society club newsletter.

When I went observing with my 17.5" Coultter Odyssey II telescope, I could always count on good views of deep sky objects. Like most amateurs, I have made my share of questionable purchases, but the 17.5" was NOT one of them. When I bought the scope, it was slightly used, but in mint condition. Coultter scopes come in a barebones condition — they are usable, but have no 'frills.'

Some folks like to sight down their tubes, but I like to use finders. For my first upgrade, I added a Telrad and a 9x60 finder to make it easier to star hop. The Telrad makes it easy to point at a general area of the sky, whereas the finder provides a field of view equal to the starcharts that I use, helping me zero in on faint deepsky objects.

The original Coultter focuser holds an eyepiece in by friction. Although it works well, as I began using more expensive eyepieces, I wanted to be able to lock an eyepiece in the focuser. I selected a 2" helical focuser on the basis of price as much as design and have been well satisfied with it.

I found the tube length to be a problem when taking the scope to star parties. I cut it the tube in half to solve the transport problem. This involved mounting wooden rings inside the tube with metal alignment pins, and putting latches on the outside of the tube to hold the two sections snugly together. That made the tube more transportable. Chris Schur designed the split tube assembly and helped make the modifications.

Because of the solid mirror cell on Coultter scopes, thermal equilibrium always took longer than I liked, so I replaced the original cell with one built by Phoenix telescope builder Pierre Schwaar. I also decided to replace the Coultter single bar diagonal holder with a four vane spider, which provides better adjustments for collimation. Although the view was good to begin with, these modifications made the images even better.

Coultter scopes have a Dobsonian base mount. A Dob-

Quick Calendar

Star Party — June 8

Saguaro Astronomy Club meeting

New Date — June 20

Deep Sky Subgroup Meeting — June 27

Deep Sky Observing Session — July 6

sonian is a simple Altitude-azimuth mount. It basically moves left to right along the horizon for azimuth and up and down for altitude. Astronomical objects appear to move in arcs across the sky, due to the angle of the Earth's axis. Astronomical objects drift out of the field of view of a Dobsonian scope fairly quickly. To compensate for tracking an arcing object, dobsonian users learn to nudge the scope horizontally while pushing the tube up or pulling it down.

After a little use, the nudging necessary to keep an object centered will become almost second nature. However, I have reached the point in my observing program where I am trying to do many drawings and I found it distracting to do the "dobsonian nudge" while trying to hold a pad and transcribe faint fuzzies onto a piece of paper. A driven equatorial mount was the appropriate next upgrade step.

After investigating different types of equatorial mounts, I ordered a BigFoot from Pierre Schwaar. Big-Foots have a well-deserved reputation for stability. I had seen several in operation at star parties over the past few years and have yet to meet a dissatisfied owner. Pierre offers several sizes and alternatives. I got a large model that could handle my 17.5" or my 13.1" scope, and ordered it with RA and Dec motors so I would be able to use it for astrophotography or CCD work.

Two months later, I set up the newly delivered Big-Foot in my backyard. My only experience with equatorial mounts was with my C8 fork, so there was some apprehension about how to maneuver this new, large device. Pierre gave me some pointers on getting the scope properly balanced and gave me a quick lesson on polar alignment and provided some tips about slewing across the sky.

In simple terms, an equatorial mounting differs from a

Dobsonian mounting in that the Azimuth motion is tilted so that it is parallel to the Earth's axis. As you move the scope "horizontally," it now sweeps an arc across the sky following the apparent motion of the stars in right ascension.

I was amazed at how easy polar alignment was. A sight tube fits into a slot on the side of the mount, and I simply adjust the base until Polaris is visible in the tube. The base has a large bolt for adjusting elevation, which makes latitude or leveling adjustments a breeze. You nudge the mount from side to side to adjust horizontally. Precise alignment for astrophotography would require fine tuning with the drift method; but for visual observing, polar alignment with the sight tube seldom takes me more than a few minutes.

Operation of the mount was easy. The polar shaft controls rotation in Right Ascension. A perpendicular shaft handles the movement in Declination. There are large handled bolts connected to friction clutches to loosen or tighten the motion for either shaft. Most of the time, I keep them loose, and the balance of the scope holds it on whatever I am looking at. It is easy to glide from object to object. When I locate an object that I want to draw (or photograph), I can lock it in for an extended view by hand tightening the clutches.

The ability to find an object and stay on it should not be undervalued. I have seen a definite improvement in the quality of my drawings and the caliber of my observations. Of all the modifications to my 17.5" scope, the upgrade to an equatorial base brought the greatest increase in my viewing enjoyment. While a Dobsonian scope was a good choice for me as a beginner, my observing needs have evolved. It was definitely time for an equatorial mount.

If I were starting again, I would take the following approach. First, I would still add the finder and a Telrad. Second, I would make the conversion from a Dobsonian base to the equatorial mount. The improved focuser allowed me to use better eyepieces and held them more securely, giving more peace of mind, so it would be number three. The improved mirror cell cut the amount of time needed to reach thermal equilibrium by half and would be my fourth priority.

The four vane spider for the diagonal yielded a slight improvement in my ability to collimate the optics, which would be fifth on my list. Converting to the split tube assembly really only helped with transportability. With the overall weight of the 17.5" and associated gear approaching 300 pounds, I find I only take it out on very exceptional nights. For those few nights, I could have lived with the one piece tube as it was. Splitting the tube would be my lowest priority and I probably would not do it again today.

Dobsonians are the least expensive way to get started with an 8" or larger scope. You can immediately start observing with a Dobsonian. As your skills grow and if your interests expand, you can trade up or upgrade. This ar-

ticle described the process I used to upgrade my 17.5". My total out of pocket expenditure for the scope and all the upgrades was under \$2,000 — less than the purchase price of most new 8" SCT scopes! Dobsonians are definitely worth considering as a first scope — especially with good equatorial mounts like the BigFoot readily available as an upgrade.

Comet Comments

by Don Machholz

One faint comet has been recovered lately. Otherwise there hasn't been much comet activity. This is typical of the last five years when few comets have been discovered or recovered in the months of March and April. Incidentally, the past five years have alternated between those which started with high comet activity (1987, 1989 and 1991) and those which started with low comet activity (1988 and 1990).

Periodic Comet Faye (1991n): T. Seki of Japan recovered this comet on Apr. 16 in the morning sky. At that time it was magnitude 18. This object, discovered in 1843, has a 7.4 year orbital period. It will be closest the sun at 1.59 AU on Nov. 16. This return is favorable, Periodic Comet Faye should be visible in amateur-sized scopes late this summer. By October it is expected to be roughly ninth magnitude.

Two other periodic comets, presently quite faint, should be visible to us in the coming months. They are Periodic Comet Hartley 2 and Periodic Comet Wirtanen. A long-period comet discovered earlier this year, Comet Helin-Lawrence, will also be bright enough for us to see near the end of the year and through much of next year.

Super Night at Sentinel

by Steve Coe

I knew that many people would be interested in observing once I saw that Saturday (May 11) afternoon was clear and cloudless from horizon to horizon. About 2:00 PM the phone started to ring with folks looking to drive to a dark site. We settled on Sentinel, a small town about 25 miles west of Gila Bend. This site is about 100 miles from town and has been a favorite dark site of the Deep Sky Crazies for quite a while. By the time we got on the freeway there were six in our convoy and we had fun chatting on the CB radio while driving to the site, mostly about what we planned to observe that evening.

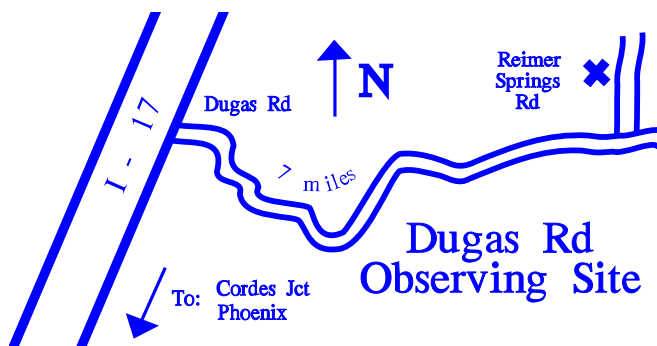
We arrived at the site, started to set up and there was no doubt this would be a great night. During the hour or so until darkness eight more observers showed up and the desert was full of telescopes. Bob Kepple and Glen Sanner, the editors of Observer's Guide magazine arrived from Tucson, on their way to the Texas Star Party. Also in that group was Father Lucien Kemble, a well-known Canadian observer.

Once darkness fell, the scopes turned to a wide variety of deep sky objects. I was observing galaxies in Bootes and Canes Venatici. M-51, the Whirlpool Galaxy, showed obvious spiral structure at 220X in the 13" f/5.6. After several hours the Summer Milky Way started to climb over the horizon and Bob Kepple and I started to look over some old favorites. M-11, a cluster in Scutum, is sliced into pieces by dark lanes at 135X. Father Kemble was awstruck by Omega Centauri and Centaurus A (NGC 5128) at 165X.

Bob Dahl and I spent some looking at the Coma Galaxy Cluster in his 20" f/5. At 150X, there are dozens of galaxies surrounding the central two galaxies. Around 1:00 AM Bob and I got ready to go, knowing that this would certainly be a night to remember.

Thanks to all who participated in this special evening at Sentinel: A.J. Crayon, Bob Dahl, George deLange, Paul Lind, Vince Mele, Tom Polakis, Gerry Rattley, Rick Rotramel, Chris Schur, Pierre Schwaar, and Rich Walker and their guests.

If you would like to join a convoy to the site, be at the Carefree Hwy. exit and the freeway at 6:00 PM on Sat. July 6th and we can all go up together. If you have a CB radio, it is fun to converse on the way. So, let's go up and get cool for the night. As always, if the sky is cloudy from the Monsoons starting up, you are on your own as far as deciding to go or stay home and hear about what a great night it became after the clouds blew away.



Bits and Pieces

1991 SAC Meetings	1991 SAC Star Parties
June 20 Changed!	June 8
July 25 Changed!	July 6
August 23	August 3
September 20	September 7
October 25	October 5
November 22	November 9
December 14 Party	December 28

Deep Sky Meeting

The Deep Sky meeting will take place on Thursday, June 27 at 7:30pm. All objects in the constellation Hercules are open for discussion.

Deep Sky Observing Session at Dugas Rd

On the night of July 6 the Deep Sky Group will sponsor an observing session at Dugas Road, north of Phoenix 60 miles. To get to the site, take the freeway north as if going to Flagstaff and take the Dugas Rd. exit, 5 miles north of Cordes Junction (the turnoff to Prescott). Turn right (east) on Dugas Rd. and go 7 miles from the freeway. There will be a brown sign that points out Reimer Springs Road. Take a left on Reimer Springs Road and go about half a mile to a large meadow on the left and that's the site. Traditional sedans will need to be careful. The road has some pretty deep ruts. At one point the road crests a ridge and you can look down on what will be the observing site.

Eclipse Viewing Planned

Dick Simmon of the East Valley Astronomy Club (EVAC) and Gene Lucas of SAC are organizing a public viewing session at Scottsdale Community College for the upcoming solar eclipse on Thursday, July 11. The sun will be partially eclipsed from approximately 10:30 AM to 1:00 PM. The maximum eclipse will occur at 11:41 in the Phoenix area. EVAC and SAC members interested in volunteering for the public observing session are asked to contact Simmon or Lucas for more details. Full information about the eclipse is being published in the latest issues of *Sky & Telescope* and *Astronomy* magazines.

Another Supernova

A new supernova was discovered recently in NGC 4902. Get a quick look, it is fading quickly. Meanwhile the one in NGC 4527 is decaying less quickly.

Directions to SAC Events

SAC General Meetings 7:30 PM at Grand Canyon University, Fleming Building, Room 103 — 1 mile west of Interstate 17 on Camelback Rd., north on 33rd Ave., second building on the right.

SAC Star Parties at Buckeye Hills Recreation Area — Interstate 10 west to Exit 112 (30 miles west of Interstate 17), then south for 10.5 miles, right at entrance to recreation area, one-half mile, on the right. No water and only pit toilets. Please arrive before sunset; allow one hour from central Phoenix.

SAC Deep Sky Subgroup Meeting at John & Tom McGrath's, 11239 N. 75th St., Scottsdale, 998-4661 — Scottsdale Rd. north, Cholla St. east to 75th St., southeast corner.

Skys shooting Comets

A Challenge for Astrophotographers

By Chris Schur
Part 3

This is the third part of a series of articles on photographing comets. In this article, I will put forth the more unusual cases, comets that bear strange appendages, or ones that move very quickly across the evening sky. And of course I couldn't forget the best comets of all, the Sungrazers!

Special Cases

Fastmovers. Occasionally a comet will swing close to the earth at such a rate that even short exposures blur their motion. About once or twice per decade you'd encounter one of these mavericks. Comet IRAS-Araki-Alcock was one such comet; large, bright and moving at 1.35 degrees per day! I tried to guide on the nucleus but even with drive corrector fast button held continuously down, I couldn't keep up with it. Admittedly such comets are quite rare, but you can allow for their occasional appearance by putting a switch on your drive corrector that will make the fast button really fast, and the slow button almost stall the motor. Most of the time you would not use such an option but it will be there, ready just in case. A more common option is the short focal length short exposure approach. Here I use a moderately fast film in a fast lens or mirror system such as a 135mm $f/2.8$ or Schmidt camera and keep the exposure under 5 minutes. This usually works, and that's how I managed to keep up with IRAS.

Antitails. Sometimes, but not always, the earth will pass through the orbital plane of a comet while it is still bright and not during full moon, and allows us to look at the image of the comet with the orbital plane superimposed upon it. The flat thin sheet of dusty material is then sometimes seen projected onto the comets coma as a thin band of material seldom extending more than a degree or two from the coma, while the tailward spike is often invisible on top of the tail itself. The sunward spike has a dark backdrop and can then be detected. Antitails are only visible for a few days at best, centered on orbital plane crossing, and are composed mainly of yellowish dust. They are seldom seen visually and color films don't have the contrast to record them. I suggest you shoot a comet during orbital plane crossing (CRAS Notices predict the date) even if nothing is apparent visually. Use a very high contrast black and white film with a gamma of at least 2. You will be able to significantly boost the contrast of the elusive phenomenon by using a yellow filter since it is a dust phenomenon. I had a 50cc yellow filter for the Schmidt camera, but some of the Wratten series maybe more suitable for your set up. I also found to my amusement that while the Schmidt did a great job recording the

antitail of comet Bradfield, the prime focus shot with a 10" scope showed no trace of it. It is important to have significant contrast to detect the feeble antitail.

Sungrazers. Many bright comets cannot be readily photographed properly due to the fact that they are immersed in the bright twilight, despite a brilliant nucleus and coma. Comet West back in 1976 was such an object at first, and to get a really good overall shot of the comet, I had to wait about a week for it to be in a darker sky. To avoid burned out shots from twilight fog, here are some suggestions. I keep around one of those 400mm $f/6.3$ "Girl watcher" telephoto for the purpose. Its slower f ratio means less sky fog, and long focal length gets me in close to where the comet's brightest parts are. Generally speaking, deep red filters will suppress the blue sky background for black and white shots, and is a good idea anyway to boost contrast. For color work with Comet Halley, I had good success with this lens and some yellow filters which also doubled the contrast without a severely discolored shot.

Split Tail Comets. Comets are composed of primarily two constituents, dust and ice. Most of the time, the two are indistinguishable in normal comets, or perhaps by a yellow or bluish tint in a small part of the tail. The recent Comet Wilson was such a comet, rather pale in color and appearing mainly white in color photographs. Comets Halley and West were good examples of a clear separation of the two tail types. The dust in a comet shines by mainly reflecting sunlight, and appears yellowish with the characteristic dark absorption bands seen in typical solar spectra. The gas however emits light as its molecules become excited by the solar ultraviolet radiation and numerous bright spectral lines appear mainly in the blue-green portions of its spectrum. These spectral lines give the gas tail a bluish tint, and under favorable conditions where the excitation is very high, especially around the comet's head and coma, a turquoise or emerald green color can be seen. In Comet West for example, the pale golden dust fan spread diffusely over the inner tail, while a series of blue rays emanated from the dust fan, and resembled an auroral curtain. What a comet West was! Obviously, only the brightest comets can have split tails, but they are always best photographed on color emulsions, preferably one with a good broad panchromatic response.

Newsletter Deadlines

Submissions to the newsletter are to be postmarked on or before the Wednesday, 10 days before the end of the month. Don't expect the newsletter editor to take information by phone. If you write down your submission, there is fewer chances of error.

If timely data needs to be included, please say so in your letter and be sure to include your phone number. The editor will contact you before printing the newsletter.