SKYWATCH

'Serving Mobile's Amateur Astonomy Community'
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MIR AND SHUTTLE SOAR OVER MOBILE!

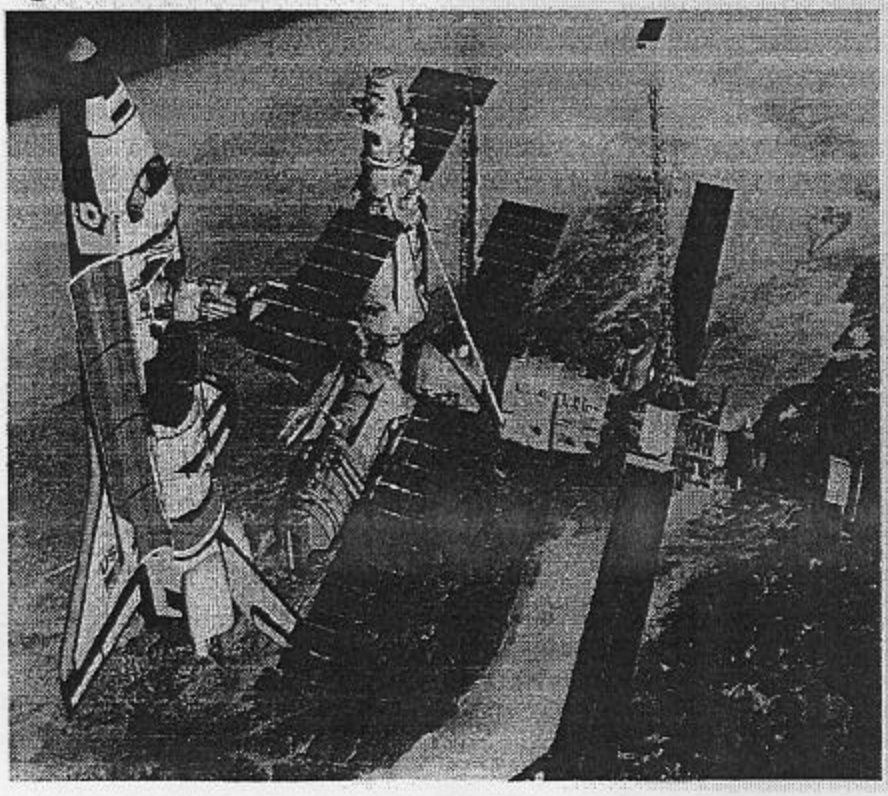
Seeing Mir and STS-71

It's one thing to read about the latest space mission, or to see images of it on the boob tube. But it's *quite another thing entirely* to witness an historic manned space flight with your own eyes. The feeling is completely different. Instead of the typical detached viewpoint which television coverage fosters, you feel some of the sense of wonder that has seemed to be sadly lacking in our nation's space program (or the reporting of it anyway) in recent years. In an effort to recapture the excitement I once felt for manned space flight, and to see whether I still felt the pioneering spirit of Mercury, Gemini and Apollo in my soul, I resolved to *somehow* see some part of the upcoming spectacular MIR/STS-71 docking 'live'.

It was immediately apparent that going down to KSC for the launch wasn't very practical. But how about watching the mission from home? Modern PC software has made satellite viewing 'easy'. I've used programs like *Traksat* and *STS Orbit Plus* to observe quite a few space vehicles (HST, shuttle missions, etc.). The only catch is that you must supply these packages with current (no more than about two weeks old) orbital elements in NORAD 2-line format. But with the coming of the INTERNET, this is now *really painless*. It's a simple matter to connect to NASA's Huntsville *Spacelink BBS* through the Internet (either Gopher or WWW--I always seem to have downloading problems with this service if I use TELNET) and obtain orbital elements. The major benefit of using the Internet is that, unlike in the past, you don't have to call Huntsville long distance. With the orbital elements plugged into my program (*STS Orbit*), I generated a list of Mir/STS passes over Mobile, and picked out the most favorable ones for observing--those nighttime passes with the highest maximum elevations. Unfortunately, our usual Summertime weather

National Aeronautics and Space Administration

Shuttle Docking with Russian *Mir* Space Station



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prevented me from seeing anything for the first day or two of the mission.

By the 1st of July, however, the weather had gotten a *little* better, and I noticed that there was a particularly good pass of the now linked MIR/STS-71 predicted for 9:39PM local time. With the many oak trees of the Garden District severely limiting the expanse of sky that I can see, it is particularly important for the pass of a space vehicle to be above about 30 degrees at maximum in order for me to have any chance of seeing anything. *STS Orbit* was predicting a maximum elevation for this pass of about 68 degrees, which seemed just about perfect. So I hunted-up my trusty 10x50 binoculars and waited for MIR HST to arrive in the skies of Mobile.

Stepping out side into the hot, humid night, I couldn't help but feel a trace of anxiety. Since we were due to leave for vacation the very next day, this would probably be my only practical chance of seeing the space complex (though I ran a pass prediction for Atlanta just in case). Would I really see Mir? Had I configured my prediction program correctly? Was I using the most recent orbital elements? 9:39 *came and went*, and though I stared intently into the northwestern skies, nothing appeared. Nothing....until...yes! There it was! At an estimated magnitude of -1 or brighter, the joined Russian and American space ships seemed to *outshine even mighty Jupiter!* I must have had the miraculous object in view for at lest 3 or 4 minutes before it climbed high into the heavens and disappeared into the Earth's shadow, leaving me gaping in wonder at the now placid Summer sky.

I know that the image I had that evening of Mir/STS climbing high into the July night will be retained in my mind forever. Maybe it was the strangeness of the vision of the rising space station soaring above the palms and oaks of the antique Garden District that made my short observation so striking. On a warm summer night, sitting on my front porch, it usually almost seems as if time has stopped or reversed its flow. The ancient trees and houses whisper to each other as they have done for countless summer nights, unaware of and undisturbed by the raucous 20th century. But here was an intruder that couldn't be denied, brighter than the brightest star, heralding the 21st century; proving that not all our glories need be in the past!

Note: If you think you'd enjoy 'satellite gazing' as an interesting adjunct to your astronomy hobby, let me know, and I can provide you with detailed information on the computer programs, books, and other resources that you'll need!

--Rod

From City Lights to Deep Space

As I've pointed-out several times before, the Fall skies are *not* a 'black hole' empty of deep sky objects. The autumn sky is *alive* with distant deep sky wonders. In fact, when I hear observers talk about a Great Autumn Void, I really have to laugh. You don't have to do much digging, even in the supposedly desolate Pegasus area, to find *many* literally amazing deep sky beauties. One thing that really makes this time of year nice for deep sky fanatics is that we can observe the best of both worlds. In the east the archetypal Fall constellations--Pegasus, Aquarius, Pisces--are definitely making their presence felt. And in the west Hercules, Cygnus, and the glorius Summer Milky Way are still very well placed for observing.

Another cliche that I find just as ridiculous as the one about the 'Great Autumn Void' is one that goes: 'All globular clusters look alike. When you've seen one, you've seen them all. Don't waste your time.' Now, globulars are just about my *favorite* deep sky object, so my hackles really rise when I hear this one! My usual impression is that the person who made this statement (usually a galaxy freak) just *couldn't* have looked at many globs. To me, globulars have become as individual and recognizable as human friends!

On tonight's journey, I'll introduce you to a few of my friends: M15, M2, M56, and M71, four dramatically different globulars. Before we get started though, I see that Hercules is getting a little low in the west. Don't want to miss observing M13 tonight. This will probably be one of our last chances to observe this marvel this year. Go ahead and take a look at M13. I'll wait.

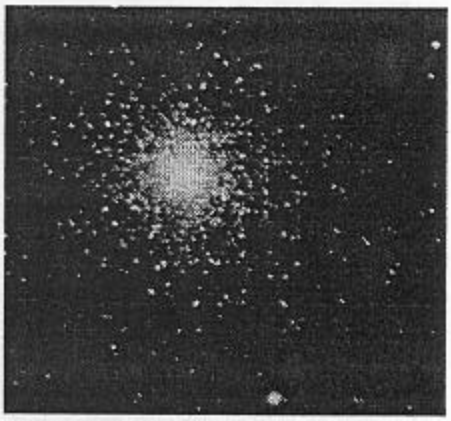
M15 (NGC 7078), 21h30m x 12°10', Mag 6.3 Globular Cluster, Shapely-Sawyer Class 4, Size 12'18" x 12'18".

M2 (NGC 7089), 21h33m x -0°48', Mag 6.5 Globular Cluster, Shapely-Sawyer Class 2, Size 13'54" x 13'54".

M71 (NGC 6838), 19h53' x 18°47', Mag 8.3 Globular Cluster, Shapely-Sawyer Class ?, Size 7'12" x 7' 12".

M56 (NGC 6779), 19h16m x 30°10', Mag 8.5 Globular Cluster, Shapely-Sawyer class 10, Size 7'6" x 7'6".

You're back. Good! Our first target for tonight is M15 in Pegasus. This is a spectacular object even in the smallest scope from city skies, but I must admit that darker skies and bigger telescopes change this globular from spectacular into unbelievable! While none of tonight's objects are particularly difficult to find, I think that M15 is really easy to hunt down. M15 can be found about 4°10' from ϵ Pegasi (Enif). A very simple means of finding this cluster is to extend an imaginary line from θ Pegasi through ϵ, and on for about 4°. You'll find that once you're positioned in this general area your finder and star atlas will make it very easy to locate this little beast. Pop in a low power eyepiece and you shouldn't have much trouble picking-out the somewhat small and



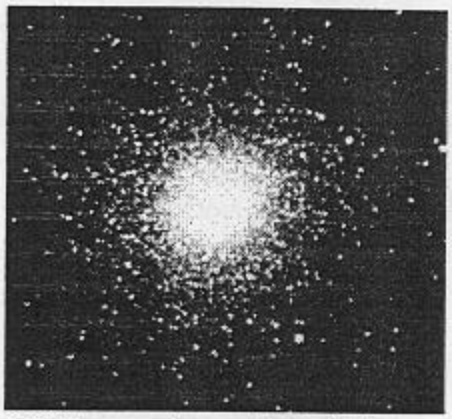
Globular Cluster M15 in all its glory--though photographs don't give much of an impression of the true brilliance of the core perceived by visual observers!

very bright core of this globular.

In fact, if your sky is as bad as mine is, M15's abnormally bright core may be about *all* that you can see with a telescope of 6" or less aperture. But even the core alone is a wondrous vision. In my 4" f11 Newtonian from a site in the Garden District, M15 was *'...very easily seen; far, far brighter than I expected in this aperture. Seems more or less round, with perhaps a hint of elongation n/s. Very concentrated core seems almost starlike. Some hint of mottling.'* The combination of the light pollution present in my downtown skies and M15's high degree of concentration makes this cluster quite difficult to resolve. I did, however, find that my 12.5" Newtonian would easily show *quite* a few cluster stars on even rather poor nights.

M15 is a Shapely-Sawyer class 4 globular, which denotes a fairly high degree of concentration (in this scheme a '1' is the most concentrated while a '12' is the loosest). But the core of this cluster is *abnormally* bright even for such a tightly compacted ball of suns. For many years professional astronomers speculated that the heart of this glob contained a black hole. Recent studies with the Hubble Space Telescope, though, tend to discredit this theory. Like so many other wonders of our universe, M15 remains a mystery!

Once you've had enough of M15 (I hope you spend a little time with it; maybe you should even make a drawing for your observing log?), set the controls of our starship of the mind for M2. M2, a highly impressive globular, is located within the bounds of the ancient and somewhat subdued constellation Aquarius. Luckily, M2 is bright at magnitude 6.5, and is located near the bright star β Aquarii. Position your scope about 4°47' north of the star, and you should have this glob in the field of your main scope in no time. As always, make use of a good star



M2: The most 'normal looking' of our quartet of Fall Globulars...

atlas (*Sky Atlas 2000* or better), and be sure you orient the charts to match the view in your finder scope (usually inverted).

Once I had M2 in the field of my 4", I found this cluster to be...tantalizing. While it was not really resolved at all--I couldn't seem to pick-out any of its tiny stars--I felt that the 6' round glow was just on the *verge* of resolving into a ball of stars. My log entry for M2 (with the 4") on a crisp Fall night about five years ago reads: *'Spectacular is the word. Maybe not as beautiful as M15, but lovely nonetheless. Round. Quite condensed. Seems almost resolved in this aperture.'* A couple of years ago I had an almost mind-bending view of this glob with my 8" f7 dob from under the dark skies of the Deep South Regional Stargaze in McComb Mississippi.

M2 is a Shapely-Sawyer class 2 globular, which tells us that it is highly condensed. It does, however, look much more like a 'normal' globular than the strange M15. Out of all of tonight's globs it is the one which most fits the mental image most of us have of what a globular cluster 'should' look like.

Before it gets too late, let's head west and rendezvous with our next star city, M71 in Sagitta. M71 is almost impossible to miss. It lies a little

outside a line drawn between δ and γ Sagittae, smack in the middle of this tiny arrow-shaped constellation. While the position of this glob is easy to find, once you're in the area you must examine the field carefully since this globular is very loose and is rather dim at magnitude 8.3.

The beauty of M71's field is apparent in this photgraph, but imagine how wonderful it is in real time!

Once you have the cluster located, just what you'll see depends on just how bad your skies are and, to some extent, how big your telescope is. I had an absolutely wonderful view of M71 from Deep South last year with my 12.5" scope. Set in a rich starfield, M71 was resolved into a sparkling, very loose knot of stars. Did it look more like a loose glob or a rich open cluster? I couldn't decide. Back in the city, M71 wasn't nearly as impressive when viewed with my 4" f11. It was worth a look, though: *'Fairly easy to see, though basically just a round, dim smudge. Rather large. No stars seen. No obvious core. Was completely invisible the last time I looked for it with this scope. Today a front moved through and brought--for here--fairly good skies* (9/24/1990).

M71 seems to confound astronomers. Is it a globular cluster or an open cluster? While it has generally been classified as a glob, spectroscopic studies which indicate that the cluster's stars are rather too metal-rich to belong to an ancient globular makes this classification suspect. Just another of many mysteries.

Our last destination is M56. While everyone knows and loves M57, hardly anybody looks at poor M56 which lies nearby. Maybe because this little devil is quite subdued at magnitude 8.5, and seems even harder to see than this magnitude value reflects (from the city, anyway). To find M56, use either the chart included with this issue of *Skywatch* or your own star atlas to position your scope at the cluster's location, which is a little less than halfway along a line drawn between Albireo (β Cygni) and γ Lyrae. Examine each field minutely, since I can just about guarantee that this cluster will not jump-out at you from light-polluted skies.

Once found, I opined that M56 was (with the 4"): *'Amorphous and quite a bit dimmer than I expected. Seeing is, however, quite bad tonight.'* (9/17/1990). From reasonably dark skies with the 12.5", though, M56 was bright, pretty, and rather well resolved, though not a 'knock-out' or 'showpiece' object.

M56 is a little small, but still pretty...

Well, it's starting to get late. But I see Orion rising in the east. If tomorrow isn't a work day, and if dew and fatigue don't shut me down, maybe I'll observe a *few* more deep sky marvels. But I've already almost had a surfeit of wonder. As I stand under the quiet fall sky amid dead and falling leaves, the images of these four great, mysterious forests of stars linger and will surely haunt my dreams.

--Rod

Book (magazine) of the month: *Astronomy Now*. The UK's premier astronomy magazine. While the price for this magazine is rather high at $5.50, if, like me, you just *can't* get *enough* of astronomy you may be interested. Single copies are readily available at Barnes and Noble books, and subscriptions are available for £38. In content, *Astronomy Now*'s technical level is similar to that of *Astronomy Magazine* (with fewer advertisements and fewer pages). Recommended.

Next Time: (Back) Into the Winter Milky Way!

Equipment Review

Celestron's Ultima 8

Your editor with new friend (at MSRSG '95)!

While I naturally gravitated toward Celestron, since I've had much more experience with their telescopes than I've had with Meade's instruments, I was willing to consider any currently manufactured SCT. A quick overview of the SCTs available for purchase from these two manufacturers revealed that, while there *are* more 'scopes available than their used to be, there aren't really as many SCTs to choose among as I'd thought at first.

Meade offers two basic models in different apertures: The 2080s and the LX-200s. The 2080 is a basic SCT with an AC drive, and is offered in 8" and 10" sizes. *Then* we have Meade's LX-200, the company's flagship 'scope, a computer-laden wonder which comes in 8/10/12/16" apertures. While there *is* also an LX-100 'available', it is really *a stripped down LX-200*, and there is some question in my mind about just how 'available' this model is, since I've never heard of anybody purchasing one.

At Celestron, whose product line is somewhat in flux at the moment, the picture is *slightly* more complicated. There are basically three types of 'scopes available: the C8+ (with or without digital setting circles), the 8"/11" PEC 'Ultima' telescopes, and the venerable Great Polaris (formerly Super Polaris) C8. But these model lines are supplemented by several others, some of which are new offerings and some of which are being

phased out. In the former category there's a pair of new German Equatorial telescopes, the G11 and G14 11" and 14" 'scopes, both of which are mounted on the same Losmandy German equatorial mount. In the latter category, we have Celestron's Compustar telescopes. These instruments, which were the first fully computerized SCTs (featuring automatic slewing to selected objects), are a bit long-in-the-tooth and are being replaced by Celestron's *still-being-developed* Ultima 2000 series (Celestron's answer to the LX-200). While the Compustars used to be available in 8/14" apertures, I haven't seen anything other than the 14" model available for sale lately (in addition, I haven't seen a fork mounted C14 for sale in a while--is the G14 the current 'C14'?).

There are a few SCTs and SCT-like telescopes (Maksutovs) made by *other* companies, but I didn't seriously consider buying any of these. In some cases the prices were *way* out of my range (the Questar 7 Mak and the Takahashi 9" SCT). And in some other cases there are doubts about quality (the Russian INTES Maks). All in all, I felt it best to stick with the two main players, Meade and Celestron. I also eliminated from consideration SCTs larger than 8". I've *seen* people struggle with these big 'scopes in the field. I also decided against the C5. By all reports this is a *great* little 'scope, but I just didn't feel I could justify buying a 5" when I *knew* I could handle a much more capable 8"

It's hard to consider buying an SCT these days without being drawn to the LX-200. This 'scope really has *everything*: automatic slewing to objects, digital displays, alt-azimuth mode, huge internal catalogs, you-name-it. But for me, I really felt it was too much. I wanted a high quality 'scope which I could use for <u>years</u> with a minimum of problems. In my opinion, which has been borne-out by talks with a number of LX-200 owners, the LX-200--while amazing--is a very complex piece of hardware/software which, unavoidably, is going to have more problems than a more traditional telescope. And the kind of <u>leisurely</u> deep sky observing that I like to do simply doesn't demand that I be able to 'observe hundreds of objects an hour' (though I wouldn't mind having a set of digital setting circles)!

I eliminated the 2080, the C8+ and the Great Polaris C8 fairly quickly. Surprisingly, once these 'bargain' telescopes were equipped with a *minimum* of options necessary to make them usable (drive correctors, batteries, decent-sized finders, tripods and carrying cases), they became as expensive as some of the top of the line 'scopes.

After these deliberations, there was only one candidate left: The Celestron Ultima 8 PEC. Following a little more soul searching, I picked-up the phone and placed my order for an Ultima 8 (with Astronomics, a dealer I've found to be reliable).

In about a week, the UPS man was at my door with the three big boxes which held my Ultima. This is one of the benefits of buying a popular SCT; most of the dealers have them in stock for immediate shipment. In contrast, Dobsonian fanciers are accustomed to waiting weeks or, more commonly, *months* for a new telescope (I speak from experience here)! A quick check showed than one of the three boxes held the Ultima 8 tube assembly, one held the tripod, and one the wedge. I began by unpacking the tripod.

The tripod, which is included with the Ultima 8 as a <u>standard accessory,</u> is quite impressive. Its legs are armored with about 1/4" of rubber which protects both the tripod and your woodwork from the inevitable bumps incurred when carrying an uncollapsed tripod out to the backyard. All in all, the tripod was well thought-out and sturdy, with a heavy-duty spreader which does a lot to help prevent vibration. One feature that I really liked was the removable rubber tips on the tripod legs. These tips can be left on when the 'scope is placed on a hard surface, or removed to reveal spikes for use on grass or dirt.

Next, I removed the wedge from its carton. At first I was somewhat <u>disappointed</u>. I had expected the standard wedge which has been included with the Ultima 8 since its introduction. Instead, however, I found an *Ultima 11 wedge*. Unlike its smaller brother, this wedge doesn't come standard with any fine-adjusters for azimuth or latitude. This was what bothered me at first. The latitude of the wedge is adjusted by merely loosening and tightening six hex-head bolts. And the wedge is fastened to the tripod by three more similar bolts which, when loosened, alllow the telescope to be moved in azimuth. Neither of these motions is really that precise,

so getting a dead-on polar alignment can be a bit trying. While Celestron includes an allen wrench for the three 'azimuth' bolts, I didn't find one in the box that would fit the six latitude bolts. Luckily, I had one in my tool box. When I actually started using my Ultima 8, I realized that this 'new' wedge is actually much steadier than the standard C8 wedges I've used in the past. I also discovered that Celestron offers micrometer latitude and azimuth adjusters for this wedge as an option. After I had the wedge securely fastened to the tripod, I turned to the final large box, the one that held my new Ultima 8.

Opening the box revealed one of the *best* features of the Ultima 8: its carrying case. This case is quite an advance over the footlockers which held earlier Celestrons, and which are (as far as I know) still used by Meade. The Ultima case is a foam lined Poly/Cycolac locking case which has been justly praised in most reviews of the telescope. While footlocker cases are usually adequate for transporting a telescope, I feel that the Ultima case is far superior. I've seen the 'footlockers' largely disintegrate over the course of a few years of heavy use. But I feel that the Ultima case will last over the long term. The only draw back is the case's fairly large size. With the heavy duty Ultima inside, its *quite a handful* (though still easily manageable). The case also provides storage space for the Ultima's standard accessories: the hand controller, a 1.25" visual back, a 1.25" star diagonal (prism type) and a 26mm Plossl eyepiece.

Inside the case was my *beautiful* new Ultima 8. As you might expect, I soon had the SCT mounted on its wedge with the three included knob-headed bolts. I then stepped back to admire my new friend. The Ultima 8 is nicely finished in Celestron's current (and attractive) black gloss paint, and is equipped with a 7X50 finder. One of the first things I noticed was the mount's fork. The arms are much larger than those on the standard C8, and, I feel, contribute a lot to the telescope's steadiness. Also welcome are the three handles mounted on the 'scope: one on the back of the tube and one on each of the fork arms. These make it much easier to move the telescope, and the handles on the fork arms are a *real blessing* when it comes time to mount this heavier than normal (approx. 50 lbs) C8 on its wedge. The Ultima 8 comes standard with Celestron's Starbright™ coatings and a Crown glass corrector plate.

Since I've owned and used SCTs before, I didn't have much need to refer to the manual except for directions on operating the R.A.drive, but it seems to be *much improved* (especially in the quality of the illustrations) over earlier Celestron manuals, and would, I believe, make assembling the telescope easy even for a novice user. Thankfully, the instructions contained in the Ultima section of the manual (which includes sections dealing with the C8+ and the Great Polaris C8) were clear and concise, and made it easy to figure-out how the drive system operated. Another help was the fact that Celestron has kept drive buttons and indicators to a minimum.

The Ultima's right ascension drive is powered by *a single 9 volt battery* for up to 35 hours of use (what a wonderful advance over the drive correctors and motorcycle batteries I had used in the past!). Four drive rates are available: Sidereal, King (a variation on sidereal rate which takes refraction into account), lunar and solar. These drive rates are accessed by pressing a button on the drive base. LEDs illuminate to show which rate is selected. The heart of the Ultima drive system consists of a DC powered servo motor which drives a highly accurate Byers worm gear system.

The Ultima drive is also equipped with a PEC (Periodic Error Correction) feature. *Every* telescope drive has small residual errors that must be guided-out during long-exposure deep sky photography. This is made *much easier* by PEC, which allows the user to 'record' and 'play-back' corrections, so *much* less guiding is needed during an actual observing run. The only draw-back to PEC that I can see is that the drive must be 'retrained' for *every observing session* since your 'recording' is lost when power is turned-off (unlike Meade's PPEC). I haven't taken any long exposure photos with my Ultima yet, so I haven't done much playing around with this feature.

The Ultima hand controller, which is well laid-out and fairly comfortable to hold, features a set of cursor buttons which allow the observer to make corrections

during guided astrophotography. Two of the buttons used in combination enable the user to slew the telescope at high speed E/W or N/S (assuming that you have installed the optional declination motor, otherwise N/S movements are made with the manual dec slow motion control). The hand controller also has a built in red LED flashlight (very handy) and buttons to control focus and declination motors when they are installed. The hand controller attaches to the 'scope with a standard telephone cable terminated in RJ-11 connectors. All of this is very nice, but during use it occurred to me to wonder why none of the SCT manufacturers has seen fit to develop a *wireless* hand control? After all, just about every other electronic/electrical device made these days features its own wireless 'zapper.'

A quick look out the window showed that *night was finally arriving*. In a few minutes I had my telescope out in the backyard and (very) roughly polar aligned. Now it was time for 'first light'! A look to the west showed that M42, the Great Orion Nebula, was still visible, though it was getting quite low in the west. Loosening the declination and RA locks I moved the Ultima toward Orion. After using Newtonians for so many years, aiming an SCT seemed awkward and different, but I was very impressed by how smoothly the 'scope moved.

Soon I had M42 in the field of a low power eyepiece. Though there was *much* light pollution, and the nebula couldn't have been more than 30 degrees above the horizon, it still looked beautiful to me! The Ultima revealed quite a bit of nebulosity, even under these poor skies, and the stars in the field were *delicious pin-points*. It's often said that Newtonians offer superior sharpness and contrast over SCTs, but my Ultima seemed to give the lie to this statement. The image of the Great Nebula was as sharp and contrasty as I've seen in *any* 8" telescope!

Since I love globular star clusters, it wasn't long before I had the Ultima pointing at the wonderful M3 which was getting decently high above the horizon in the east. While light pollution was really severe in this direction, the Ultima still resolved quite a few stars in this glob. I also discovered that the smooth and accurate drive on this telescope allowed me to use powers in excess of 200X, which helped darken the bright sky background, filling my field with cluster stars. The Ultima also seemed quite steady. Vibrations caused by a sharp rap on the tube died-out in a few seconds, and the telescope was stable enough to make focusing very easy--even at high power. While the 'image shift' caused by focusing, which is inherent in all SCTs (due to the fact that they are focused by moving the primary mirror), was present, it was defintiely minimal and not overly disturbing even at higher powers.

Another plus for the Ultima is the observing comfort that it offers. When I had M3 centered, I was able to sit back in my chair and really observe. No more Dob 'nudging' while standing for long periods! It made the process of making a drawing of the cluster really enjoyable. Another nice feature of the Ultima is the accessory tray formed by the top of the wedge. This allowed me to keep eyepieces, a flashlight, the hand controller, and a cup of coffee within easy reach, making for a truly luxurious observing run!

While the Ultima did a great job on its 'first light' outing, this has been overshadowed by the views it gave me during the recent Mid South Regional Stargaze. There, under the dark skies of rural northern Mississippi, the Ultima was really able to stretch its legs and reveal how much it could do. I observed many beautiful objects during the stargaze, but perhaps the most memorable was the lovely little galaxy M108. It sounds like a clichè, but the Ultima 8 seemed to bring this distant whirl of stars close enough for me to touch!

Do I recommend the Ultima 8? Wholeheartedly. While it is priced as a *premium* SCT (which it is), remember that this telescope will repay the initial investment with *years and years* of service. The only slight drawback that I can think of (assuming that an SCT is the right telescope for you) is the fact that the Ultima is rather heavy for an 8" Schmidt-Cat. But I found it to be really fairly easy to move and set-up and, when it was assembled and ready under the night sky, a joy to use!

Astrobytes

Deep Space 5 v5.03

$129.00 (there is a floppy based version with a smaller database offered for $89.00)

The David Chandler Co.
P.O. Box 309
La Verne CA 91750
(800)516-9756

Program requirements: 386 or higher processor, 570k base memory, 1 Mb extended, VGA, CD ROM drive.

A computer is not a glorified typewriter. Interacting with a computer program is much deeper and more involving in many ways than working with more traditional tools. We become very close to the programs which we use a lot, and often come to look upon them as old friends (or at least familiar adversaries!). Thus, it was with a great deal of trepidation that I greeted the news than one of the astronomy programs I've used and enjoyed the most, *Deep Space 3-D*, was about to undergo a major revision. According to the announcement, *DS3D* was being released on a CD which would include the *Hubble Guide Star Catalog*, and the program would offer a number of new features such as improved telescope control and support for digital setting circle encoders. I've tried a *lot* of astronomy software over the last several years, but other than *DS3D*, very little of it has really been much of a help in pursuing my personal observing programs. I wanted *DS3D*'s author, David Chandler, to keep improving the program as he's done over its entire life, but I really didn't want a radical change of a piece of software I've grown very comfortable with. In the end, I wasn't disappointed. *Deep Space 5* (the new name for *DS3D*) is indeed improved, but is still easily recognizable as the deep sky observing/charting program I've used more than any other for at least the last two years.

The first thing I noted when I received my copy of *Deep Space 5* was the fact that the author has substantially upgraded the packaging of the program. Previously, *DS3D* had the classic appearance of a shareware program--white label floppies sent to you in a plain disk mailer. This edition of the program, however, is quite different. The CD and ancillary floppy (3.5") are enclosed in a beautiful commercial-looking box. The CD itself is attractively labeled and is indistinguishable from any other 'professional-level' software offering.

Installation of *Deep Space 5* was very easy, and was basically the same as the procedure for *DS3D v4*. The installation instructions were very clear, and had me install the program from the CD (v 5.0) and then immediately upgrade to version 5.02, which is contained on the floppy. I received version 5.03 of the program recently, and I'm sure that this is what you'll receive when you order *Deep Space*, so you probably won't install v5.02. Though I really hadn't noted any *bugs* in 5.02, I installed 5.03 as soon as I received it and, so far, its operation has been flawless. One major improvement to the program since version 4, by the way, is the inclusion of a professionally bound and printed manual.

After starting *Deep Space 5*, I was very relieved to see that most things had remained pretty much the same. If you've never seen this program in action, refer to my previous reviews in this newsletter, or request a shareware version of the software (commendably, Mr. Chandler still releases a shareware version of *Deep Space*). But suffice it to say that *Deep Space 5* is an observing SYSTEM. Use of the charts and observing lists generated by this program has allowed me to see and record more deep sky objects than I ever thought possible. While a lot of other programs have started to catch-up to *Deep Space* in the quality of their printed output, none has matched it so far. For instance, no other program that *I've seen* offers *Deep Space*'s seamless integration of almanac/observing lists/widefield charts/detailed charts/finder charts/observing log!

As far as improvements to the basic program go, the most striking was the inclusion of the *GSC* (the main reason, I guess, for switching to CD as the program's distribution media). At first I thought that the fact that my largest instrument is a modest 12.5" Newtonian would make the *Guide Star Catalog* overkill for me (how *far* we've come since the 60s/70s is demonstrated by the fact that I consider my 12.5" 'modest' or even 'SMALL'!). But I quickly found-out that having stars down to mag 16 or so can come in handy. As you'll recall, I

recently did a survey of open clusters in Cassiopeia. I discovered that I really couldn't have easily located a couple of the tougher objects without finder charts generated with the *GSC*. *Deep Space* uses the approach that several other recent programs have employed for dealing with the *GSC*, in that it only becomes available when you are zoomed into a small area (sensible, since the only really practical use for the *GSC* is in generating field-sized finder charts). I *wish* I could communicate the excitement I felt when I printed my first chart using the *Hubble Guide Star Catalog*--I almost felt as if I were holding a POSS plate in my hands! It should also be noted that the entire SAO catalog of stars is now included with the basic program (formerly, it was an extra-cost add-on).

Another significant enhancement is less flashy, but has noticeably reduced the time I've spent producing charts. In past versions of the program, having *Deep Space* search for a deep sky object would always bring you to the proper point in the sky. But if you hadn't already added deep sky objects to this area, the point beneath your cursor would be blank! You would then have to navigate through several menus in order to place a label and symbol for your quarry on the chart. *Deep Space 5*, however, automatically places the object's symbol and label for you when the object you're searching for is found.

Finally, *Deep Space* now offers improved LX200 support as well as support for the digital setting circles produced by Tangent (which include the units offered by Lumicon, JMI, Orion and others). The program can also be used with the *Deep Space Navigator*, which is essentially a set of encoders for use only with a computer and the program (similar to JMI's SGT Max). While the documentation on these features makes them very impressive, I haven't been able to try any of them yet. I'm considering the purchase of a set of digital circles for my SCT in the fairly near future, however, so we'll see.

All in all, I consider Deep Space to be better and more usable than ever. Are there any other improvements or features I'd like to see? Well sure, a few (How about a Windows version? What about some star labels?), but, really, I continue to be more than satisfied with the program. I've had high hopes for quite a few of the newer astronomy programs but, unlike *Deep Space*, they have all *disappointed* when it comes to usability/usefulness (except *Megastar*). Excuse me, but I've got to go boot-up *Deep Space 5* and plan another wonderful night under the stars!

--Rod

Next time: *First Light*. Does this new multimedia astronomy CD 'out *Red Shift*' *Red Shift*?

Jupiter at Opposition

Last June, as we on the Gulf Coast *really* began to feel the hot breath of Summer, I found myself drawn to observe on just about *every reasonably clear night*. What could have gotten me out of the cool air-conditioned comfort to face hordes of insects and a humid, hazy atmosphere so wracked with light pollution that only the very brightest stars dared to show their faces? Jupiter!

While it's very true that the high pressure domes which were common early this Summer lead to hazy skies which are just about useless for any deep sky observations, these are the times when our skies are at their steadiest. During many past apparitions of Jupiter, I've had nights when I was lucky to get short glimpses of the planet's fantastic details when the atmosphere steadied-down every ten minutes or so. This year, though, in the weeks centered on Jupiter's opposition, we were blessed with unusually storm-free, steady seeing conditions which allowed extended views of the King of the Planets.

Since I had worked with these kinds of atmospheric conditions before, it was with a rising sense of anticipation that I set up my 8" SCT on the deck in my backyard on a quiet night about three weeks after opposition. I had chosen to use my Celestron Ultima 8 rather than one of my other telescopes mainly because of ease of setup--this was a week night and I didn't feel up to struggling with the 12". I also chose the SCT because a long-focal-length driven scope seemed appropriate for detailed planetary observations. With the scope set-up, all that remained was to wait for Jupiter to rise above one offending tree limb. While waiting, I sat and scanned the sky with 10x50 binoculars.

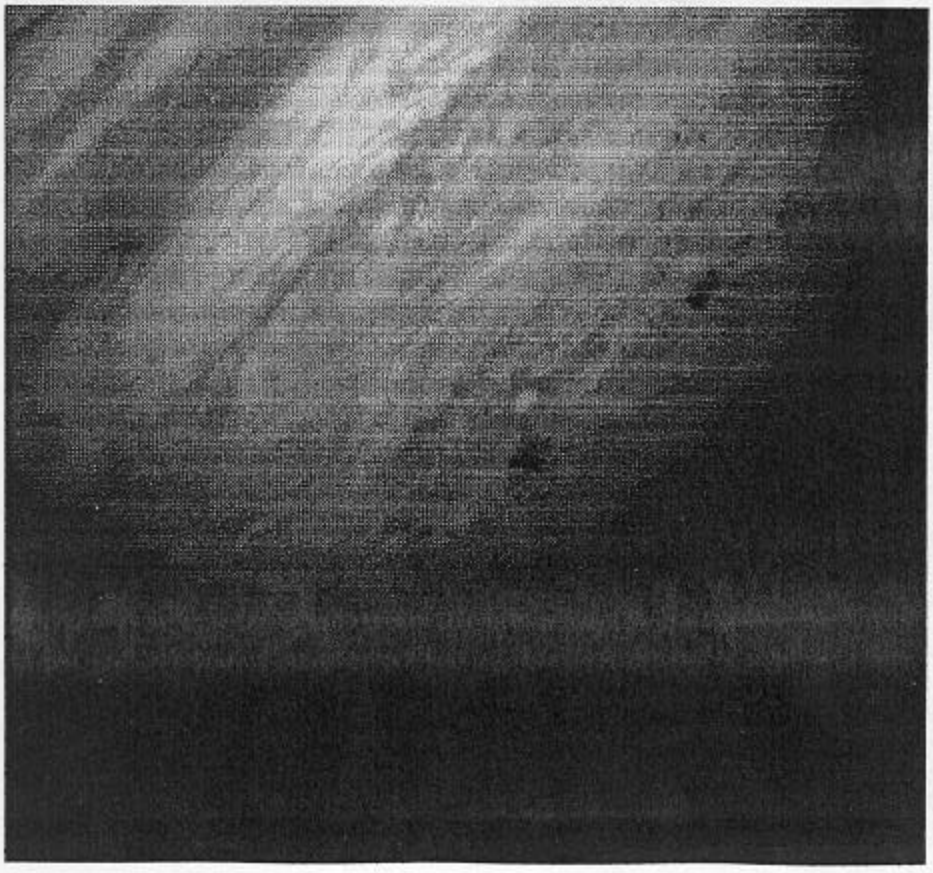
Amazingly, since light pollution was very, very bad on this night due to haze (a layer of haze reflects city lights, making a bad situation even worse), the binoculars *easily* revealed M13 rising with Hercules--the King of the Globulars surveying his domain once again. And how about a double star or two? Mizar, riding high with the Great Bear, was exquisitely beautiful. And there was Antares, still a little low on the horizon, twinkling furiously, and not looking *at all* like its normal red self, but sparkling green like some *fantastic emerald*. I could have

scanned the heavens for hours--it had been a long time since I'd felt the liberation that binoculars bring to the observer. No batteries, no eyepieces, no setting circles. You just *look*. The increasing cries of birds calling to their mates as darkness began to descend in earnest, however, brought me back from deep space. There was the C8 standing in readiness. It almost had the look of a thoroughbred racehorse champing at the bit and anxious to run! And in the east, rising higher and higher, was the brilliant beacon of Jupiter!

As I centered the planet in the C8's finder I was a little apprehensive. While Antares's twinkling had been pretty through binoculars, it didn't bode well for seeing conditions. But one look though the C8 instantly dispelled my fears. In a 26mm Plossl at 78X Jupiter was almost unbelievable. There was a wealth of detail immediately visible--I counted at least five cloud bands without even straining. Even more stunning was the planet's 3D appearance. When I increased magnification to about 170X this 3D effect was even more pronounced. On this night I had, I think, more of a feeling than ever before of Jupiter being a real world. The planet, motionless before me in a wide field eyepiece, and accompanied by its retinue of four little worlds, was *not* just some pretty picture in a magazine, or something on TV, but a *real place*.

The seeing continued to be almost *fantastically* good for the remainder of the evening. There were a few brief periods where Jupiter took on the appearance of a distant mirage in a great dark desert, but, for the most part, the atmosphere was rock-solid! The haze seemed to actually improve my views, cutting down on the giant planet's overwhelming brightness.

As I continued to observe, more and more details became visible: subtle loops and irregularities in the cloud bands, white spots, easily discernable variations in color. Perhaps the two most striking features of the planet, though, were the Great Red Spot and the planet's southern hemisphere.

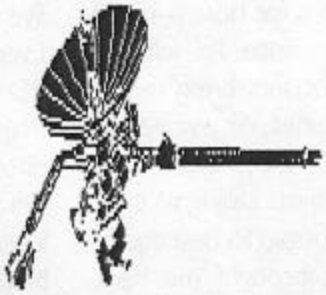


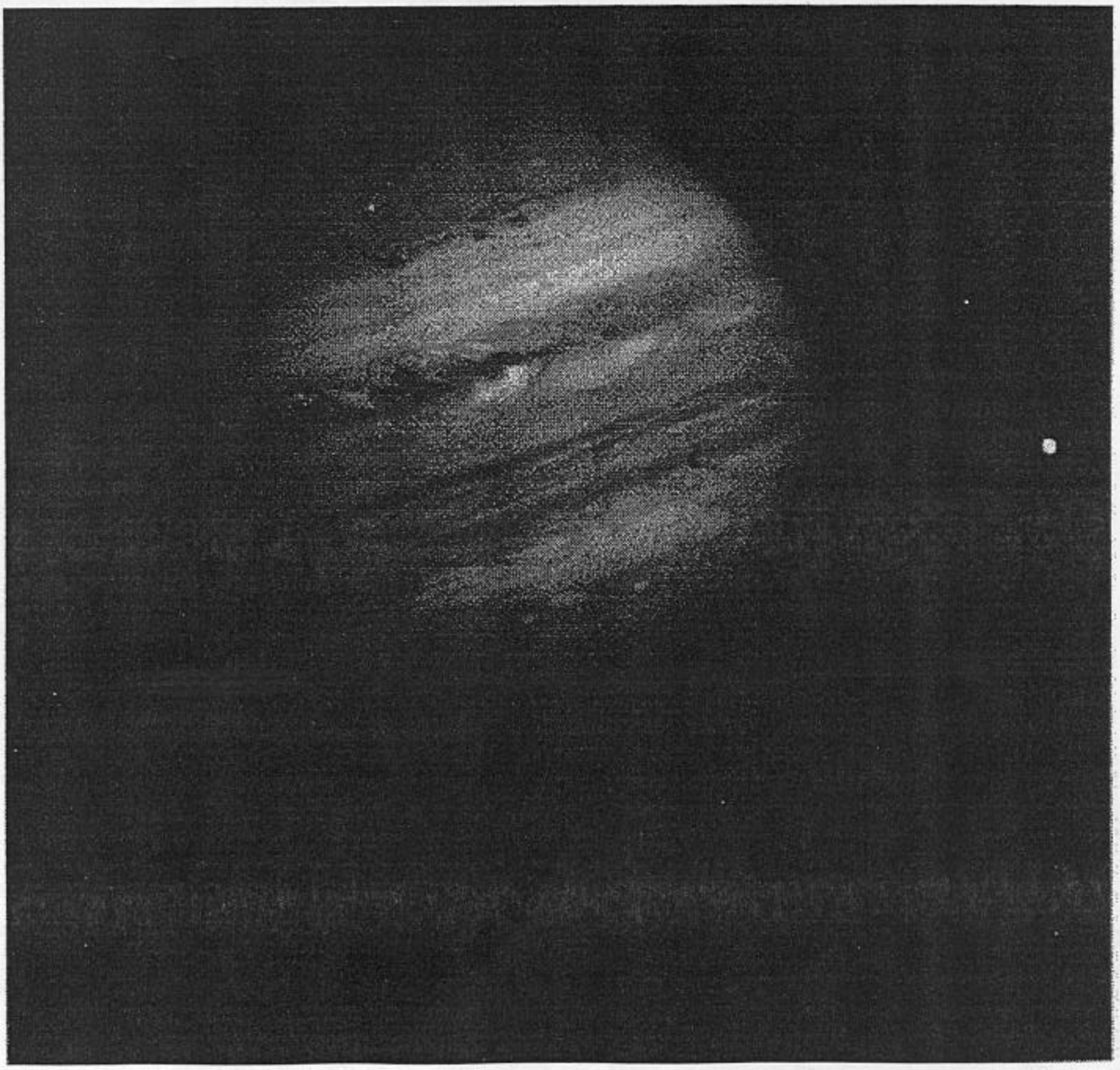
It doesn't seem possible that it's *already* been one year since the Great Comet Crash--Comet Shoemaker-Levy 9's collision with Jupiter. The vision of those dark pockmarks spreading across the face of Jove lingers in my mind! This event has quickly attained almost *legendary* status in the memories of both professional and amateur astronomers. So it was with a real sense of elation that I realized that, here in my backyard, on this quiet Summer eve I was still seeing the results of that Olympian cataclysm. The Southern Hemisphere of Jupiter was dark--*abnormally dark*; different in appearance from any view I've had of it over the last 30 years. Later, I logged onto INTERNET, and found that planetary scientists do indeed attribute this pall over Jupiter's Southern Hemisphere to the collision.

The night was getting older, but I hardly had any sense of that! I was flying through the depths of the Solar System, cruising the awe-inspiring Jovian system! I probably would have observed for *hours* more if I hadn't suddenly realized that the humidity was finally causing a chill to seep into the edges of my senses, distracting me from this vista of truly alien worlds. And I became aware of how long I'd been at the eyepiece when I discovered that the cup of coffee which I'd set down 'just a minute ago' was *stone cold!* As I packed my beloved telescope away, my mind struggled to reconcile the awesome scale and monumental

events of Jupiter with the quiet Summer night on Earth which surrounded me. Which is real and which is an illusion? Or are they both real, beautiful, but different aspects of our wondrous cosmos?

--Rod Mollise





My Back Pages

AstroPoem

My Billion Acres

I have a billion acres
And not a field to fence,
I pay no taxes on them
And they bear me no expense.

Many millions share them
But still my title's good;
No man can take them from me
But all can use, who would.

They bring me profits greatest
When their wonders I can share,
They need no cultivation
And I can't improve their care.

All they ask is contemplation
Profound and reverent,
For my starry billion acres
Are in the firmament.

--W.C. (Bud) Shewman
Moberly, Missouri 1963

Val Germann
Central Missouri Astronomical Association

Club Notes

The next regularly scheduled meeting of the Mobile Astronomical Society will be held on Wednesday October 4 at 7:00pm at the club's usual meeting place (the Environmental Sudies Center on Girby Rd.). Let's all make plans to attend, since a major topic of discussion should be the upcoming Deep South Regional Stargaze 13. Should be exciting!

Stop the Presses!

Will the recently discovered (23 July) Comet Hale-Bopp be the comet of the decade? Well, maybe. While the comet is still way out there beyond the obrbit of Jupiter, it is very bright (mag 11). Some astronomers attribute this brightenss to an 'outburst' of the comet. But maybe not! If the rather bright magnitude value reported is accurate, this could be the best comet we've had in a long, long time! Stay tuned for further reports!

Skywatch is published bi-monthly as a service to Mobile's amateur astronomers. Submissions are always welcome. Address correspondence to:

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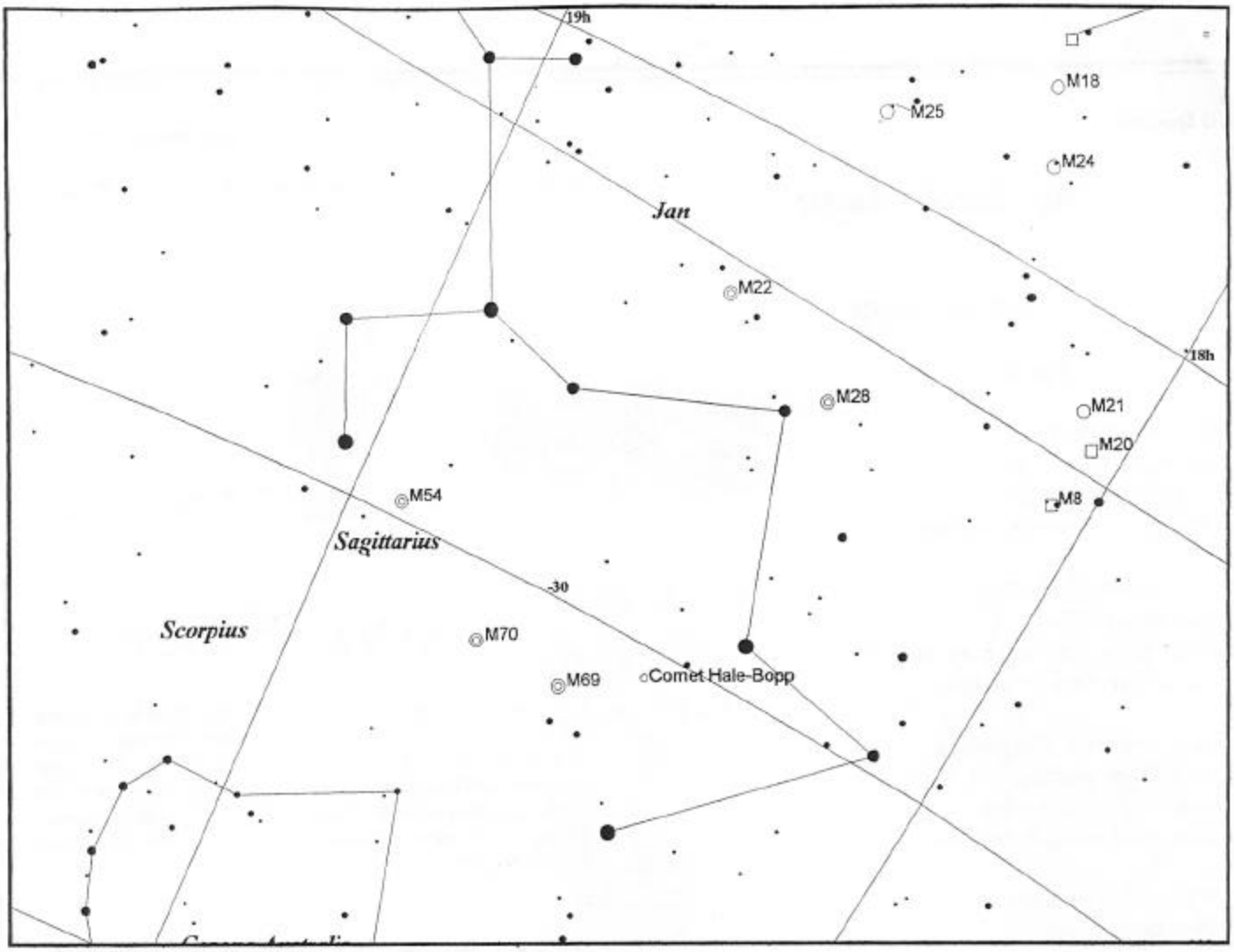

Comet Hale-Bopp Crosses the Stars of Sagittarius

Early one Summer morning two New Mexico amateurs, Alan Hale and Tom Bopp, both using 16 inch telescopes, independently discovered a new comet. What makes this discovery extremely interesting is the magnitude of the comet at discovery. While the comet was a relatively dim 11th magnitude, its distance was 7 AU, making it the most distant comet yet discovered by amateurs. The obvious question in our minds is: *'If this comet is already at mag 11 way out beyond Jupiter, how bright will it be when it hits the inner Solar System?* The obvious answer is very bright, since the object is 5 magnitudes brighter *right now* than it 'should' be. But we must be cautious, since the astronomical community has been 'burned' by comets before. And, indeed, it was being theorized early on that Hale-Bopp was undergoing an outburst, making it seem much brighter than it really is. However, as of mid August, the comet was maintaining a good mag 10 or so, suggesting that it was *not* undergoing an outburst. The comet is predicted to reach perihelion on 1 April 1997 with a predicted magnitude of 0 to -2. Could this be the one we've been waiting for? *(Chart generated with first light v1.0)*

The area of this month's From *City Lights to Deep Space*. As you can see, this area is a deep sky observer's treasure trove! This chart, generated with ***Deep Space 5 v5.03***, shows stars down to magnitude 8.5 and deep sky objects down to mag 10.