THE Prairie Astronomer

Volume 34 #3
March 1993

3-93

President's Message

by Dave Knisely

Convention time is drawing near. For those of you working on the centerpiece contest, be sure and start working on them now. Remember, keep the cost under $10.00. The only other rule is that the models have to represent some kind of telescope, either historical, or common. We will be contacting all those who signed up to help with the convention, so be prepared. If you have some vacation time coming, be sure and reserve some for June 10th through the 13th. If you are thinking about doing a presentation at the convention, the call for papers is going out now. The talks should be limited to about 20 minutes or so if possible, and need not be terribly technical.

How does everyone like the new program format at the meetings? If you have any comments, please let Tom Miller know. He is all ears for ideas and input. See You At The Meeting!!!

MARS DIGITAL IMAGE MAP

by Rick Johnson

Made from the Viking data this 6 CD-ROM set is quite different from the raw data taken by Viking (also available as a 10 volume set). The Viking images were made from various altitudes and camera angles. MDIM is a highly processed version of this data. The data was corrected for altitude, camera angle, lens distortions etc. to make a true map data base. All images have exactly the same scale across the entire image. It is as if the camera were directly above the area contained in each pixel of the map.

Actually there are several maps in this set divided into two main groups. The first and smallest group contains air-brushed images of Mars at two scales; 14.77 km per pixel and 3.69 km per pixel. The other set contains three purely photographic maps at scales of 3.69 km per pixel, 925 m per pixel and 231 m per pixel. The photos with this article were made from these last three maps. *[NOTE: the photo's can be found in the newsletter immediately following the aricle.]*

The low resolution map is actually a subsampling of the 3.69 km/pixel map down to 7.38 km/pixel so all of Valles Marineris would fit on the map. (Yes you can change the scale of the maps with the software provided.) The medium resolution map is a composite of parts of 4 different 925 m/pixel images (again something the software can do). The high resolution image is a very small part of the 231 m/km map frame. If you want higher resolution you must go to the original Viking data and process the images yourself. Even at this resolution, considering Mars has about 144,243,638 square km the map takes up 2.7 billion pixels and bytes of memory. The medium resolution map requires 168.6 million pixels and bytes while the low resolution map takes 10.5 million pixels and bytes. Only a CD-ROM can handle such a data huge base.

The high resolution map is divided into tiles that match those of a previously published 1964 high-resolution map. That is, each tile is 5 degrees of latitude and longitude at the equator. The longitude dimension is modified to account for the convergence of meridians beginning at 47.5 deg. latitude so that each tile in the MDIM retains roughly the same area. Thus, each tile contains about 1.6 million pixels!

One nice feature of the software (IBM, I don't know about Mac) is that you can browse through the 1/64 scale images until you find something interesting, then mark it with the cursor. Now enter DIS SOU (shorthand for display source) and it will automatically find the large scale image, load it and center it on that object. The exact longitude and latitude of any part of a frame can be quickly determined as each pixel of a map is a known fraction of a degree, 1/16, 1/64 and 1/256 for the three photographic maps. Thus, they can be used as a finder chart for images in the raw Viking data base which often contains images of far higher resolution but only of selected regions.

Unlike the Viking data base images only a small amount of image enhancement is

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necessary to view these maps. For many users this data base alone should suffice for studying the surface features of the Red Planet.

The makers of this map had a real balancing problem. They had many images of some regions to choose from. In other areas only a very few. This makes for some inconsistency in resolution and contrast across the map. Part of a tile may have been taken from a high contrast (lots of shadows) image and a part right next to it may be taken with an overhead sun so contrast is low. Also the angle it was taken at may have been different. This was often done to prevent shadows from hiding detail. It may be hard to see on a the small printed image but the medium scale image with this article contains many different images, some of which vary highly in contrast and original camera angle. Most 5 degree square tiles contain parts of 6 to 10 Viking images.

The six volume set is actually only part of the MDIM series. The full set will include 15 disks, 12 of which are now available. Volume 7, as yet unpublished, contains the Digital Topographic Map of Mars at 1/64 and 1/16 degree/pixel as well as MDIMs of the entire planet at these resolutions and the air-brushed maps previously mentioned. When it is available it would be a good starting place for those just getting started in digital image processing.

Volumes 8-13 consist of multi-look color MDIMs at 1/64 degree/pixel. Not all of the planet is covered and you must create the color images from three images of the same region taken with three different color filters.

Volumes 14 and 15 will contain multi-look MDIMs like 8-13 but in GIF format (all the other images are in FITS image format). I don't know if this means they will be processed color images or not.

To best view these images you need a computer with a CD-ROM drive and a compatible Super VGA card. (You can do fairly well with a standard VGA card but you can do little image enhancement and end up with contrasty images as standard VGA supports only 16 gray scales while SVGA supports 64.) The software supports ATI VGA Wonder and all Orchid or other ET-4000 based boards at all resolutions up to 1024 x 768 in 256 colors. The newer VESA standard boards are supported only at 1024 x 768 x 256. PGA and Paradise boards are supported only in 640 x 480 x 256. Everex boards are supported only at 640 x 400 x 256. Trident boards are only supported at 800 x 600 x 256 in some versions of the software and only 640 x 480 x 256 in other versions. Boards compatible with those mentioned probably will work.

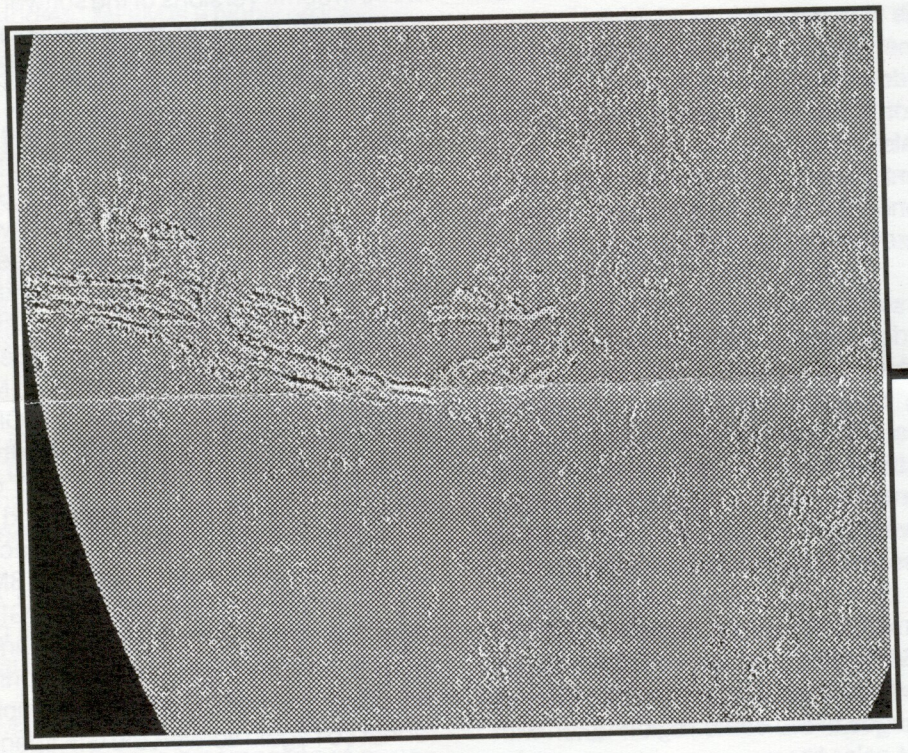
Software is included on each CD-ROM but is version 7.6 which doesn't do as much as version 7.9 Jim Rains found for me. See me for the more current version of the software. It is public domain so you may use it freely. If you are unsure if your video board works with the software, I can make up a floppy disk with the software and a test image to try before ordering.

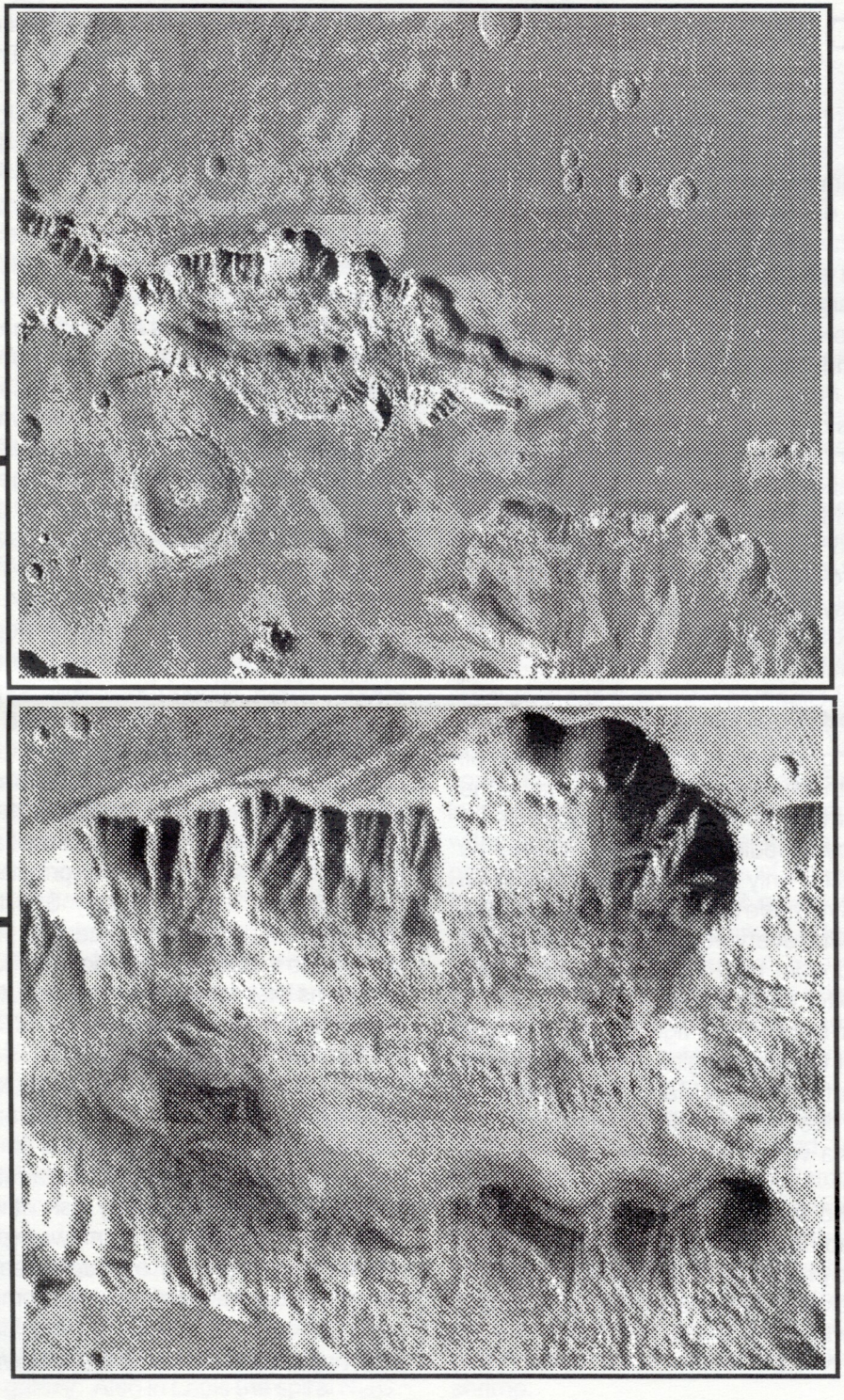
The CD-ROMs also work on Mac's and software for the Mac is on the CD-ROM. A Mac II (x, cx, ci) with at least 2 Mb (4 Mb or more recommended) with a 8 bit video card that supports 256 shades of black and white is required for the Mac version. The Mac software can directly print images. With the IBM version you must convert the images to GIF format then use software capable of printing GIF images. In my case I get best print with a Windows program that doesn't support GIF format so I again convert the GIF image to PCX format to print it. The conversions have no loss but the added steps do take time.

The CD-ROMs may be ordered from NSSDC (National Space Science Data Center), Code 633.4, Goddard Space Flight Center, Greenbelt, MD 20771. Disks 1-6 and 8-13 are now available. NSSDC ID 75-075A-01f/083A-01C. Cost is $20 for the first disk ordered, $6.00 for each additional disk plus a flat $2.50 mailing fee per order. $52.50 for the 6 disk set or $88.50 for all 12 now available. Checks are

to be made out to Hughes STX Corporation (though they accepted mine made out to NSSDC).

A door prize for this month's meeting will be a medium resolution (1.45 km/mm) photographic map of Valles Marineris, made from 36 tiles. Even at this scale the map is 8 X 2 foot! Sorry, but the high resolution map would have been 32 X 8 foot and that's a bit too big! The upper left corner of the map is at 2.5 degrees south latitude, 95 degrees west longitude. The lower right corner some 2200 miles east and 550 miles south is at 17.5 degrees south by 35 degrees west. In making this I learned a lot about flattening the sphere!





CD-ROM Drives

(Part 1)

by Rick Johnson

From comments I am hearing I don't think many out there understand what a CD-ROM drive can do for you. While not inexpensive they do cost less than one Nagler eyepiece and open a far larger window on the universe. Their main use is distribution of large volumes of software and data at very low cost. This is where they quickly pay for themselves.

Besides cost, data distributed on CD-ROM has another advantage over disks in that the data is readable across almost all computers. The CD-ROMs I have been reviewing are usable not only by PC users but by Mac users, VAX users, Micro-VAX users, Sun work stations, Unix based system, RISC based system, Silicon Graphics IRIS systems etc.

What is available and at what cost? How about a Gigabyte of the best shareware at a dollar per 50 Megabytes. 6000 GIF pictures of everything imaginable (including about all the images that have been in this newsletter the past year or two) for only $20. A complete 21 volume encyclopedia with movies as well as still pictures for only $49. None of these fit on any hard drive made today for less than $2000. Besides having every word the paper version of the encyclopedia has, CD-ROM based ones have far better look-up features.

For instance, in figuring out the data base size of the Mars Digital Maps I needed to know the surface area of Mars. Without leaving the word processor I opened a window to the encyclopedia which was on line on the CD-ROM drive. I typed "Mars, area" and in 5 seconds had the answer highlighted on the screen, I captured the number and transferred it to the word processor document with a couple mouse strokes. No chance of transposing digits that way.

Several people have told me they don't want a drive that you can't write to. True you can't write to a CD-ROM but since it contains your master you'd not want to anyway. No one in their right mind writes to a master disk for the danger of overwriting data you paid for. CD-ROMs make this impossible by design. Programs that require data be saved, as many do, save this data to a related subdirectory on your hard disk. This way the original data is perfectly secure on the CD-ROM while the changes and additional information is on the hard disk, usually taking up only one or two Meg of expensive storage space on the hard disk. The most economical hard drives cost about $2.00 per Meg of storage space while a CD-ROM costs only 1 cent per Meg of storage space.

For distributing programs or data CD-ROM is far cheaper when large volumes are required. A program like MegaStar that Tom ran at the February meeting requires 54 Meg of hard disk space and nearly as many floppy disks to install into the hard drive. An hour later you are up and running. Though to make room for such a large data base you probably had to delete 20 or 30 programs you used to find useful but now choose to do without since the hard disk was already nearly full. At least $50 of the cost of the program is in the floppies and the labor to copy them. If on CD-ROM the program could be distributed at a cost of only $10 to the seller allowing him to drop his price $40. For the user there is no install time and no need to forgo other programs that are on the hard disk. It is available the instant it is stuck into the CD-ROM drive. No hour of copying needed.

Corel now sells its full package only on CD-ROM. I installed Windows 3.1 and Works for Windows on the kids computer in less than a minute using the CD-ROM media rather than the 45 minutes it took via floppy disk. It won't be long before CD-ROM will be the only way such programs will be distributed. In a couple years CD-ROM drives will be standard on most computers.

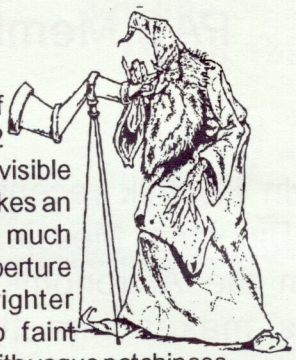
Part two of Rick's article will appear next month...

Observing Chairman's Report

by Dave Knisely

THE NEXT SCHEDULED STAR PARTIES WILL BE HELD ON FRIDAY APRIL 16th AND 23rd AT THE ATLAS SITE. Galaxies dominate the spring sky, but there are still a few open star clusters around for viewing. M44, the Beehive cluster is visible to the unaided eye just northwest of Delta Cancri, and resolves nicely in a good pair of binoculars. Telescope users will want to use very low power and over a degree of true field to view this object, due to its large size. The central core looks a bit like the constellation of Cepheus, with all the stars being bring and widely spaced. Another good cluster is M67, located two degrees west of Alpha Cancri. It is visible in binoculars as a faint hazy patch, but its stars are much fainter than those of M44. It is smaller than the Beehive, but it is also richer, with over 50 member stars being visible in an eight inch aperture.

In the mane of Leo is the bright spiral galaxy NGC 2903, located 1.5 degrees south of Lambda. A 2.4 inch refractor at low power will show it as a faint fuzzy oval patch with a brighter center, while a six will reveal the definite nuclear region and irregular outer haze. An eight inch will often reveal some mottling in the outer haze, while a ten will show much patchiness and hints of spiral structure in the galaxy. In the back leg of Leo is the trio of bright galaxies M65, M66, and NGC 3628. The two Messier objects are located about midway between Theta and Iota Leonis and can sometimes be glimpsed in a pair of 10x50 binoculars. M65 is highly elongated with a brighter center. On a good night, hints of dark lane along the east side can be seen in a ten inch. M66 is to the east of m65 and shows a little more detail. In an eight inch, hints of a spiral arm along the west side of the galaxy are visible, while a ten will show some mottling and vague hints of both arms. The third galaxy in the trio, NGC 3628, is barely visible in a four inch as a faint narrow streak northwest of M66. An eight inch will show hints of a dark lane, while a ten will show the lane down most of the length of the galaxy. Also in Leois the spiral NGC 3521, located a half degree east of 62 Leonis. Although visible in a three inch, it takes an eight to pick up much detail. A ten inch aperture will show its brighter nucleus and two faint outer fans of light with vague patchiness on each end.



Two of the brightest galaxies in the sky are located in Ursa Major. M81 and M82 are about two degrees east and slightly south of 24 Ursa Majoris, and both can be fitted in a one degree field of view. M81 is the brighter of the two, appearing as a faint fuzzy oval with diffuse outer edges when viewed in small instruments. It is a spiral, but the arms are very difficult to see. On a good night, a ten inch will reveal portions of them way out towards the edges of the outer haze, but they are narrow and extremely faint. M82 is a cigar-shaped fuzzy patch which shows some dark detail in moderate apertures. A size inch will show a narrow dark arc near the center, with larger telescopes revealing other dark patches on the outer edges of the galaxy. Also in Ursa Major is the spiral galaxy NGC 3941, located 6.2 degrees east and 3.4 degrees north of Nu. It is visible in a four inch as a moderate to small sized faint fuzzy oval with a brighter center. An eight inch will often reveal a small brighter nucleus and a faint patch of light in the southwest part of the outer haze.

As a final target, take a look at the "Ring Tail" galaxy, NGC 4038, located 1.3 degrees south and 3.4 degrees west of Gamma Corvi. A six inch telescope will show this galaxy as a fairly small faint diffuse oval of light with a protrusion on one end. An eight inch will make this protrusion into a noticeable hook on the south end, while a ten will reveal patchy ring-like detail in the main galaxy, making the whole thing look a little like a shrimp.

PAC Member Receives Binocular Messier Certificate

Kevin Koutnik recently received his Binocular Messier Certificate from the Astronomical Society. This makes him the second member of the club to receive the award. Kevin indicated that he sent John Wagoner, the binocular coordinator, his log which after review was returned to him at no charge. The number on Kevin's certificate was 91. Ron Veys is the other member who has received the award and Ron's certificate number was 72, so it seems that the awards are going out fast. Our congratulations go out to both Kevin and Ron for their work!

PLEASE NOTICE

If there is an asterisk on your mailing label it is time for you to renew your PAC membership!

The Prairie Astronomer

c/o The Prairie Astronomy Club, Inc.
P.O. Box 80553
Lincoln, NE 68501

First Class Mail

92025 09/93 FS 08
Earl Moser
P.O. Box #162
Hickman NE 68372

Next Meeting March 30, 1993