ODYSSEY 8
INTRODUCED JULY 1984

ODYSSEY COMPACT
INTRODUCED JANUARY 1982

ODYSSEY 1
INTRODUCED MAY 1980

ODYSSEY 2
INTRODUCED JANUARY 1982

Introduction

Congratulations on your purchase of an ODYSSEY telescope. You now have the basic tool for seeing the Universe. Add to this some knowledge of finding celestial objects under a dark sky and you'll experience the thrill of a lifetime-discovering the Universe.

It was in 1956 that a man named John Dobson developed what is known today as the Dobsonian telescope. The early Dobsonians were born out of sheer necessity. John was a monk in a religious order; had very little money, and had no elaborate tools or facilities at the monastery to make telescopes. In a monastery, under conditions divested of material objects, John produced something marvelously simple and of great benefit to many people. Your ODYSSEY traces a direct line back to those early years when John struggled to make a telescope. Your ODYSSEY has the simplicity and personality of Dobsonian telescopes. Oh yes, it would not be a "genuine" Dobsonian if it cost you a bundle of cash- that is an important part of the "technology."

We hope this guide will give you the information you need. If you have any questions please call or write us for a prompt reply. Parts and service are readily available.

<u>**UNPACKING**</u> Remove telesope assembly and mount from shipping box. Lift telecope and place onto mount. Place eyepiece into focuser. The telescope is ready for use. The small plastic bag attached to the shipping spacer for the tube contains: low power eyepiece, tube cap, and this operation guide. Check for any damage caused by shipment and if there is any, notify the shipper immediately to make a claim. When you first look thru the focuser without an eyepiece you will notice a dot on the center of the mirror. This is there for collimation of the optical system and does not interfere with the light that enters the telescope- the spot lies in the shadow of the obscuring diagonal mirror. You can remove it when you clean your mirror using a Stage 3 cleaning with alcohol. See the section on maintenance.

Seeing the <u>real</u> Universe

Operation

The operation of your Odyssey is very easy. Unlike many other complicated telescopes, this ease of operation gives you more time to observe and enjoy the Universe. Locate a place to set your telescope that is firm and level. Placing the telescope in the path of stray light will illuminate the field of view and dim faint objects such as galaxies, nebulae, clusters and comets. Always carry the telescope in two separate pieces, the mount and the tube assembly, to the observing site. Place the tube assembly in the mount, insert an eyepiece, point, focus, and look. The telescope will be ready to deliver the best quality images after being allowed approximately 30 minutes to adjust to the temperature of the observing site.

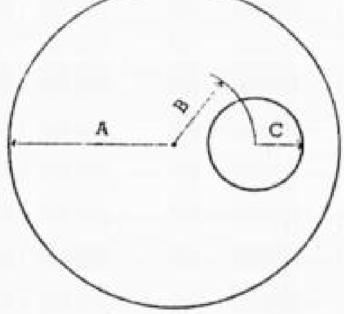
If your Odyssey is used in light polluted areas, you will be limited in seeing only the major bright objects such as: the Moon, planets and bright stars. Away from areas flooded with light, your Odyssey will reveal to you objects such as: galaxies with spiral structure, nebulae with color, star clusters with a myriad of stars.

SEEING THE MOON AND PLANETS

Under most conditions of viewing the Moon and planets, we are limited to resolution of details rarely less than 1 arc second. The Moon has an apparent diameter of 1800 arc seconds. Experienced observers say that for most nights of seeing an excellent 5-inch telescope (.90 arc second resolution) is all that is needed. What optical design will give the highest quality images for seeing detail on the Moon and planets? These are the unobstructed systems such as the refractors, the TCT's (Tilted Component Telescope), and the Herschelian telescopes. These systems have no obscuring secondaries or spider supports to lessen contrast such as Newtonians, Schmidt-Cassegrains, Maksutov-Cassegrains, and Classical Cassegrains. Odyssey telescopes are Newtonians and have obscuring secondaries. This is no problem for the low power objects such as galaxies and nebulae, but it can be for the higher power objects such as the planets. Odyssey telescopes, because of their large size in comparison with other telescopes, can perform an optical trick that will provide you with superior lunar-planetary performance. It is a device that astronomers learned about long ago using large telescopes. It is called the off-axis aperture stop. The off-axis aperture stop is nothing more than a flat round disk of cardboard with a specific sized and located hole cut into it. By placing this mask over the open end of the tube one creates a Herschelian telescope- one of the telescopes best suited for lunar-planetary use. And what a telescope it is for seeing detail! Under average seeing conditions, the masks smaller aperture intercepts less image damaging turbulence- easily outperforming larger telescopes. Magnifications in the range of 300 to 600 power are usable without serious image deterioration.

If the seeing is good, you'll notice no blurring of the image at these powers. The airy disk (The smallest size point discernible with a telescope) just becomes larger with higher magnifications- not fuzzier! The joy in owning this modified Herschelian is the thought that there is no better telescope to see lunar-planetary detail. It puts to rest the perfect telescope syndrome that is cruel and gives no peace to the seeker of perfection. You have that telescope and you see the finest in imagery.

THE OFF-AXIS APERTURE STOP



Materials needed: cardboard (larger sized than the tube), a compass, and a pair of sissors.

Size	A radius	B radius	C radius
8"	5-3/16"	2-9/16"	1-7/16"
10.1"	6.5"	3-1/8"	1-7/8"
13.1"	8"	4-1/16"	2-1/2"
17.5"	10-5/8"	5-3/8"	3-3/8"

You may substitute other materials for the cardboard such as opaque plastic or 1/8" Masonite.

TO MAKE: Take a compass and a piece of cardboard and draw a circle with the radius of A. Then, draw a circle within that circle with a radius of B. Both of these circles have the same center point. Then draw a circle with a radius of C with the center of this circle on the curve of circle B. Cut out the largest circle A and then cut out the smallest circle C.

TO USE: Tape or fasten the mask to the open end of the tube. Rotate the mask so the strut that holds the diagonal mirror is not in the path of light. You should see looking thru the focuser without an eyepiece a clean unobstructed circle of light. Use this mask whenever you want to see the Moon and the planets under high magnification. Use short focal length eyepieces to obtain the powers yor want. The use of a Barlow lens will double or triple the magnification of eyepieces. You will notice that most Barlows when used with Odyssey telescopes, operating at full aperture, will give fuzzy images. Barlows are not designed to provide sharp images with all focal ratios of telescopes. The lens designer has to pick a certain angle of light to design the lens around. Since the Odyssey's focal ratio is fast (4.5), the Barlow misses it. A common design for a Barlow is f/6 or higher. When you use the off-axis aperture stop, the resulting focal ratio is 11.8 and the Barlow works fine with this number. Always remember to observe objects as high as possible above the horizon to obtain the best quality images. If you suspect the seeing is poor, you can verify it by focusing slightly out from focus.

SEEING GALAXIES, NEBULAE, AND STAR CLUSTERS

There it is! The Orion Nebula like you never seen it before. The magnification is close to Visual Equalization. The area around the Trapezium is an intense fiery cloud of greenish- yellow gas. So intense is the color of illumination that it looks like an anodized metallicburst. Literally you've never seen it like this before. The intense radiation of ionized oxygen has an effect that no photograph could ever reproduce. This is the real thing! Even the dark areas are seen in such richness that they almost rival the radiated areas. What is it that makes this view so much better than you ever dreamed possible?

When you look thru a telescope are you seeing a correctly illuminated image? Does the brightness of the object keep up with it's size increase made by magnification? Whenever an object is magnified the light has to be increased by the square of the magnification. Magnify an object 4 times and you have to increase the light by 16 times. If you do not, the object will appear fainter than it actually is. This concept of keeping the light up with the magnification is called VISUAL EQUALIZATION and is very important when you want to see the universe thru a telescope. It's when a telescope is operated around VISUAL EQUALIZATION conditions that you will see a bright and radiating universe. For example: Take a 3" refractor and use the lowest power available to look at a galaxy. The low power eyepiece usually supplied is a 1" and it will produce 45 power. The galaxy will look 45 times closer or 45 times bigger. How much light should be collected to keep the brightness up to 45 power? Square 45 and the answer is: 2,025 times the light gathered by the eye which has one unit of light. Does the 3" aperture provide enough light? No, it does not, but something like a 13" would! The 3" is showing the galaxy at about 1/20th of the required brightness.

Take any telescope and multiply the aperture in inches by 3.629 and you will get the magnification required to obtain VISUAL EQUALIZATION (VE). Objects will have the correct size to brightness relationship. This magnification is called VISUAL EQUALIZATION MAGNIFICATION (VEM). The factor (3.629) that multiplies the aperture is called the VISUAL EQUALIZATION FACTOR (VEF). The important thing to remember is that VISUAL EQUALIZATION shows you the Universe with the minimum of visual distortion- the best you'll ever see it short of actual space travel. At any given magnification you will see more detail in galaxies, more detail and color in the nebulae, if the magnification is equalized with light. Some have said that you will see more under certain conditions if you increase the power and let the image dim a little, This is not the correct approach as it leads to uncertain results. Whatever the magnigication is increased to, you will see more at that magnification if it is Visually Equalized- fully saturated with light.

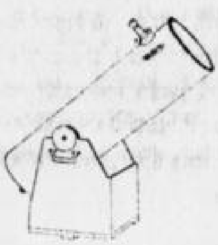
All Odyssey telescopes, and this is true of all telescopes with f/4.5 systems, are designed to obtain VISUAL EQUALIZATION with a 32mm f.l. eyepiece. Eyepieces with focal lengths down to 25mm will provide performance close to VIAUAL EQUALIZATION since the eye has difficulty is decerning differences of illumination around 25%. Using eyepieces with longer focal lenghths than 32mm, such as a 40mm eyepiece, will aperture down the mirror and provide less light. As a rule of thumb, do not use eyepieces with longer focal lengths than 32mm. The low power eyepiece provided with your Odyssey will give you a close approximation of VISUAL EQUALIZATION. The VIAUAL EQUALIZATION MAGNIFICATION of your telescope is given in this guide under specifications; see the 32mm eyepiece under EYEPIECE DATA. The magnification of an eyepiece used with a telescope is determined by multiplying the focal length of the main mirror by the conversion factor of 25.4 to convert to millimeters and then dividing that number by the focal length of the eyepiece in millimeters. For example: What is the power of a 12mm eyepiece used with Odyssey 1? Refer to the SPECIFICATIONS- Focal length of Odyssey 1 is 59". Multiply 59" by 25.4= 1498.6mm. Dividing this number by 12mm= 124.88 or 125 power. The SPECIFICATIONS lists a number of focal lengths and the resulting magnifications for each telescope.

USES OF EYEPIECES

25mm to 32mm-VISUAL EQUALIZATION of galaxies, open clusters, nebulae, and the Moon. (Use full aperture- no aperture stop).

12mm-Brighter clusters, nebulae, globular clusters, the Moon and planets. (Use the aperture stop on the Moon and planets).

6mm-The Moon, planets and double star splitting. (Use the aperture stop).



IT DOES NOT LOOK LIKE THE PHOTOS

Sometime in the future you will be showing someone a galaxy for the first time. You will receive a comment that is repeated time and time again. "It does not look like the photos." This comment is triggered by the biggest goof around these days in science. For years those who have been taking pictures of galaxies, nebulae, and star clusters have been turning distorted picture after distorted picture out without ever telling the public whats wrong with them. Not only did they start out with an inadequate, film, but they manipulated the images to look pleasing to our terrestial bent eyes. When you are out there with a telescope, it is hard not to say why the image might not be up to par. You will say it is a poor night of seeing, or it is hazy and the list goes on. It is the other way around with those who take the pictures. They arrogantly just caption the picture as being a specific object, and who is to argue with them?. The credits for the picture are ascribed to a famous large observatory.

Photographs of the Universe are distorted by film's narrow brightness range, seldom exceeding a 20 to 1 ratio. The sky out there presents us with a ratio of at least 6 trillion to 1! The photos are grossly overexposed. Ever see galaxies looking like floating bread dough in the sky? That is what you get. Then, if there is the slightess hint of color in a nebula they will just paint it in with the heaviest saturated color they can find. One object they have not even come close in reproducing faithfully is just the common star. What do you get? Just a round lifeless white dot.

Just tell your friend at the telescope that the scientists have been fooling the public about the way the Universe looks. That is the truth. Just say, "The Universe does not look like the photos."

Maintenance

Odyssey telescopes require very little attention and will serve you well for many years. One only has to use common sense in providing most care. For example, the mount is made of wood and the tube is made of pressed cardboard, so naturally, one should avoid leaving the telescope out in the weather.

Store the telescope in a horizontal position with the dust cover attached to the open end of the scope. This will keep dust from collecting on the main mirror. Be sure no direct or indirect sunlight can enter the tube when in use or when stored. This will prevent sunlight from striking the main mirror, concentrating the light and causing a fire.

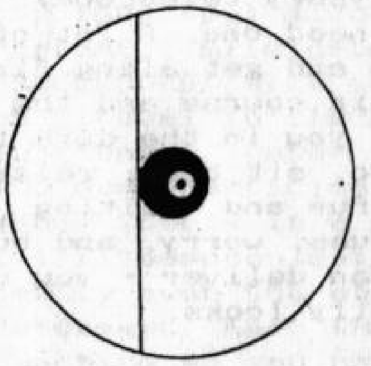
The bearing surfaces on Odyssey telescope should not be oiled or waxed. Doing so will destroy the smooth action of those bearings. When it is necessary to clean the bearings, take a soap dampened cloth and clean them, drying them thoroughly to get rid of any residue. If the bearings are impregnated with hard to get rid of dirt, scrub them with steel wool.

Be sure the 1/2" diameter bolt holding the ground board to the mount is slightly loose. Clean the red tube with and soap dampened cloth. The rubber end ring on the open end of the tube can be cleaned by a cloth slightly dampened with mineral spirits or fire starting fluid. The mirror strap screw should be torqued to 27" lbs. or 2-1/4 ft. lbs. Do not under or over tightened.

Coutler Optical can be contacted for parts you can not obtain locally. When your optics need recoating, please contact us for prices and shipping instructions. Our coating prices are among the lowest in the industry.

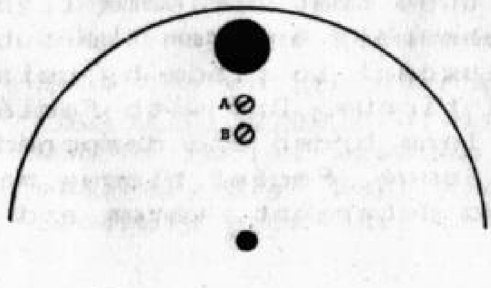
COLLIMATION

Collimation determines to a great extent how well your optics will perform. Initially, the optics have been properly set up at the factory and should require no further adjustment.



The diagram to the left shows how a properly collimated system should look. Be sure to center your eye in the focuser without the eyepiece. You will notice that not everything looks centered. The shadow of the diagonal, the dark disc, is pulled slightly to the left. The small light disc with the dot in the center is centered on the main mirror. The dot is painted on the exact center of the main mirror to aid in collimation.

The decentering to the diagonal (the dark disc) varies from approximately 1/8" for the 8" to 5/16" for the 17.5". The decentering is done to accommodate the steep cone of light coming from the main mirror. The shift off center is away from the focuser. This decentering is a characteristic of fast systems such as this one of f/4.5. If you do not see the system as previously shown, you will have to collimate using the 3 individual set of two screws on the back of the cell. The diagram on the left shows a portion of the cell as seen from the rear of the telescope. "A" screw is the adjustment screw. "B" screw is the locking screw. First, loosen all the "B" screws a few turns. Then, point the telescope up vertically. Turn one or more "A" screws in the direction whichever moves the



reflection of the diagonal flat to look correctly positioned. Then tighten the locking screws "B" to 20" lbs. of torque. If after repeating the above proceedure many times and you are still unable to obtain the correct appearance, you may have to loosen the two bolts that hold the diagonal strut in the tube for final adjustment.

Accessories

We do not advise you to buy everything you can inorder to enjoy visual astronomy. All you need is an Odyssey, maybe an extra eyepiece (a 12mm Kellner is inexpensive and just fine), a star chart and a good night of seeing. Our price list has a few items that may be of value to you. What about buying one of those expensive eyepieces? We would look a little foolish recommending an eyepiece costing more than an Odyssey telescope! What about a finder? You might not need one. A lot of observers just sight along the tube and get along fine. Getting out and observing is the main course and the less you have out there to distract you in the dark the more enjoyable the night will be. So, sit back, relax and enjoy visual astronomy that is fun and exciting. The visual way will save you a lot of fuss, worry, and bucks with an added plus no other media can deliver - you will seethe <u>real</u> Universe the way it really looks.

CLEANING OF ODYSSEY MIRRORS

<u>IMPORTANT:</u>Always clean the main mirror in it's cell. Be sure to shake excess water off the cell assembly as the cell is made of wood. Do not remove the diagonal mirror (The small mirror in the tube that reflects light to the focuser) from the strut assembly or from the tube to clean it. Always clean the diagonal in place by using a lens brush and dampened facial tissue. Dry with facial tissue. Clean eyepieces using a lens brush and dampened facial tissue. Dry with facial tissue. Facial tissue may be dampened with water, water and detergent, water and

alcohol, and alcohol, depending on the cleaning required. Always follow-up a tissue dampened with water and detergent with one dampened with water to remove any traces of detergent.
There are three stages of cleaning mirrors:

STAGE 1. When the mirrors are just dusty. Use compressed air and / or a large lens brush to remove dust. No aerosol air!

STAGE 2. When the mirrors are dusty and have a light film: rinse in water, lightly rub with a fully wetted soft paper towel, rinse off immediately, stand mirror on edge to drain off water, then blot water off mirror immediately with facial tissue. Do not use so called lens cleaners! They smear!

STAGE 3. When mirrors are dusty and have a greasy film use the proceedure described below.

Do not over clean the mirrors as it is not necessary. It would be good for you to see how dirty the observatory mirrors get before they are cleaned. Remember the mirrors have to get real dirty before one can notice a reduction in performance.

STAGE 3 CLEANING

MATERIALS NEEDED: One roll of soft white paper towels. One box of white unscented facial tissue. One qt. isopropyl alcohol (rubbing alcohol 70 percent content), mild detergent liquid dishwashing soap.
PROCEEDURE: With the mirror in the cell resting face up on a towel in the sink, turn on the cold water and play a stream of water on it's face. This will loosen some of the dust particles and wash them off. Dip a large wad of paper towels in a mild solution of dishwashing detergent (1/2 teaspoon detergent to 1 Pint of water). Then gently swab the entire surface of the mirror with the detergent. Keep the cold water going while doing the swabbing so you can immediately wash off the detergent solution. Then rinse off the detergent solution. VERY IMPORTANT: Do not let the surface become dry or water beads dry anytime before the final operation of drying the surface. Doing so will cause water marks to be formed that are almost impossible to remove without recoating the mirror. Move quickly from step to step over the surface of the mirror to prevent water marks. Now take a wad of paper towels and dip them into the alcohol. Caution: Do not turn over this swab or dissolved skin oils will deposit on the mirror. If this happens then you will have to repeat the above. It may take you more than once to get the proceedure right. Swab the entire surface. Immediately take a large wad of <u>facial tissues</u> and wipe the surface dry. Use another wad of facial tissues or more until the surface is entirely dry. Dust the mirror just before installing the assembly back into the tube.

TELESCOPE SPECIFICATIONS

These specifications are for a Newtonian telescope and are displayed upon entry of the primary's diameter, focal length, and minor axis of the diagonal mirror. The various blocks of information are as follows:

1. The mirror diameter, focal length, diagonal mirror minor axis, and focal ratio.

2. The area of the primary mirror, the area obscured by the diagonal, the percentage of area loss, the percentage loss of diameter, and the apparent diameter caused by the diagonal area. The faintest magnitude limit is determined by the apparent diameter.

3. The resolution limit for double stars from the formula of Dawes. The true diameter determines this figure.

4. The faintest or limiting magnitude one can see with apparent aperture as a limit. Conditions of optics cleanliness, atmospheric transparency, condition of the eye all influence this figure. The one listed is an average one.

5. One degree field in the focal plane, the angular coverage of a one inch field.

6. The angular coverage on a 35mm film format for width, length, and the diagonal.

7. The angular coverage for various eyepiece tube sizes.

8. The size of the Airy Disk or star image size in the focal plane.

9. The first eyepiece set of data gives the eyepiece focal length, power on the telescope, and exit pupil size for an exit pupil of 7mm or an RFT situation, then for the sharpest image for the instrument based on wave optics and the resolution of the eye based on a two minute eye resolution, and finally the condition for the maximum recommended power of 60 per inch of aperture.

10. The second set gives the power and exit pupil for some standard focal length eyepieces that might be used on the telescope.

MIRROR DIAMETER = 8
MIRROR FOCAL LENGTH = 36
OBSCURATION DIAMETER = 2.14
FOCAL RATIO F/# = 4.5

AREA PRIMARY = 50.26 SQ/IN
AREA OBSCURATION = 3.59 SQ/IN
AREA LOSS = 7.1%
DIAMETER LOSS = 27%
APPARENT DIAMETER = 7.7 INCH

DAWES LIMIT = 0.57 SEC/ARC

LIMITING MAGNITUDE = 14.5

1 DEG IMAGE SCALE = 0.63 INCH
1 INCH FIELD = 95.2 MIN/ARC

24MM FILM WIDTH = 90 MIN/ARC
36MM FILM LENGTH = 134.9 MIN/ARC
43MM FILM DIAGONAL = 162.3 MIN/ARC

0.965 TUBE FIELD = 91.9 MIN/ARC
1.25 TUBE FIELD = 119 MIN/ARC
2.00 TUBE FIELD = 190.5 MIN/ARC

STAR IMAGE SIZE = 2.3607E-04 INCH

EYEPIECE DATA

EYEPIECE	POWER	EXIT PUPIL
31.5	29	7
5.4	169	1.2
1.8	508	0.42
32	28	7.2
26	35	5.8
17	53	3.8
10.5	87	2.3
6	152	1.3
27	34	
12	76	

MIRROR DIAMETER = 10.1
MIRROR FOCAL LENGTH = 45.5
OBSCURATION DIAMETER = 2.6
FOCAL RATIO F/# = 4.5

AREA PRIMARY = 80.11 SQ/IN
AREA OBSCURATION = 5.3 SQ/IN
AREA LOSS = 6.6%
DIAMETER LOSS = 26%
APPARENT DIAMETER = 9.75 INCH

DAWES LIMIT = 0.45 SEC/ARC

LIMITING MAGNITUDE = 15

1 DEG IMAGE SCALE = 0.79 INCH
1 INCH FIELD = 75.9 MIN/ARC

24MM FILM WIDTH = 71.7 MIN/ARC
36MM FILM LENGTH = 107.6 MIN/ARC
43MM FILM DIAGONAL = 129.4 MIN/ARC

0.965 TUBE FIELD = 73.3 MIN/ARC
1.25 TUBE FIELD = 94.9 MIN/ARC
2.00 TUBE FIELD = 151.9 MIN/ARC

STAR IMAGE SIZE = 2.3607E-04 INCH

EYEPIECE DATA

EYEPIECE	POWER	EXIT PUPIL
31.5	36	7
5.4	214	1.2
1.8	642	0.42
32	36	7.1
26	44	5.8
17	67	3.8
10.5	110	2.3
6	192	1.3
27	43	
12	96	

MIRROR DIAMETER = 13.1
MIRROR FOCAL LENGTH = 59
OBSCURATION DIAMETER = 3.1
FOCAL RATIO F/# = 4.5

AREA PRIMARY = 134.78 SQ/IN
AREA OBSCURATION = 7.54 SQ/IN
AREA LOSS = 5.6%
DIAMETER LOSS = 24%
APPARENT DIAMETER = 12.72 INCH

DAWES LIMIT = 0.35 SEC/ARC

LIMITING MAGNITUDE = 15.6

1 DEG IMAGE SCALE = 1.03 INCH
1 INCH FIELD = 58.3 MIN/ARC

24MM FILM WIDTH = 55.1 MIN/ARC
36MM FILM LENGTH = 82.6 MIN/ARC
43MM FILM DIAGONAL = 99.4 MIN/ARC

0.965 TUBE FIELD = 56.2 MIN/ARC
1.25 TUBE FIELD = 72.8 MIN/ARC
2.00 TUBE FIELD = 116.5 MIN/ARC

STAR IMAGE SIZE = 2.3607E-04 INCH

EYEPIECE DATA

EYEPIECE	POWER	EXIT PUPIL
31.5	47	7
5.4	277	1.2
1.8	832	0.42
32	46	7.2
26	57	5.8
17	88	3.7
10.5	142	2.3
6	249	1.3
27	56	
12	125	

MIRROR DIAMETER = 17.5
MIRROR FOCAL LENGTH = 78.75
OBSCURATION DIAMETER = 4.25
FOCAL RATIO F/# = 4.5

AREA PRIMARY = 240.52 SQ/IN
AREA OBSCURATION = 14.18 SQ/IN
AREA LOSS = 5.9%
DIAMETER LOSS = 24%
APPARENT DIAMETER = 16.97 INCH

DAWES LIMIT = 0.26 SEC/ARC

LIMITING MAGNITUDE = 16.2

1 DEG IMAGE SCALE = 1.37 INCH
1 INCH FIELD = 43.8 MIN/ARC

24MM FILM WIDTH = 41.4 MIN/ARC
36MM FILM LENGTH = 62.1 MIN/ARC
43MM FILM DIAGONAL = 74.7 MIN/ARC

0.965 TUBE FIELD = 42.3 MIN/ARC
1.25 TUBE FIELD = 54.7 MIN/ARC
2.00 TUBE FIELD = 87.6 MIN/ARC

STAR IMAGE SIZE = 2.3607E-04 INCH

EYEPIECE DATA

EYEPIECE	POWER	EXIT PUPIL
31.5	63	7
5.4	370	1.2
1.8	1111	0.42
32	62	7.1
26	76	5.8
17	117	3.7
10.5	190	2.3
6	333	1.3
27	74	
12	167	

A FINAL WORD

I wish you the special moments you can experience when you are out there with your telescope under a dark sky, I can remember the many nights on a mountain top or in the middle of the desert that I touched the Universe and felt a sense of belonging to it. It is ironic that we all are trying to make sense out of this colossal Universe and yet we can see it staring back at us with it's light tempting us to understand it. It is these messengers of light, photons, that prompted John Dobson to say,"You first have to see the Universe inorder to understand it." It is now your unique opportunity with your own telescope to make a beginning.

I want to end this with a very sad and heartbreaking true story for one who was about to face death. The time is World War Two and a soldier is writting his last letter. This letter never reached his loved one. Here are some excerpts of that letter: "I was happy when I could sit at the telescope and look at the sky and the world of the stars, happy as a child that is allowed to play with the stars....Dearest, what is our life compared to the many million years of the starry sky! On this beautiful night, Andromeda and Pegasus are right above my head. I have looked at them for a long time; I shall be very close to them soon. My peace and contentment I owe to the stars, of which you are the most beautiful to me. The stars are eternal, but the life of man is like a speck of dust in the Universe."

Good luck, and good observing!

James A. Braginton

James A. Braginton, Idyllwild, Calif., 7/19/86

NOTES: