



THE  
WASP  
1976  
FEBRUARY

# A.T.M. *for the Frantic Fringe!*

"A Simple 6" Telescope for Beginners"

By: Garry Boyd

Although its design does not strive optical perfection, this instrument will show such phenomena as the rings of Saturn, the mountains on the moon, and Jupiter's satellites. Total cost: about \$65.00

In 1926 an article appeared in Scientific American magazine which described how a group of amateurs in Springfield, Vt., had mastered the formidable art of constructing an astronomical telescope. The details of construction had been worked out by Russel W. Porter, engineer and explorer, and were described in collaboration with the late Albert G. Ingalls, an editor of Scientific American. Within a year some 500 laymen had completed similar telescopes and were well on their way to becoming amateur astronomers.

Ever since those years many amateurs have constructed their own telescopes, with enough ambition to grind and polish their own mirrors. Today its much less complicating for beginners, for they can purchase pre-finished mirrors for about the same cost of a mirror kit and its aluminum coating.

The simplest reflecting telescope consist of four major subassemblies: an objective mirror which collects light and reflects it to a focus, a flat diagonal mirror which bends the focused rays at a right angle so that the image can be observed without obstructing the incoming light, a magnifying lens or eyepiece through which the image is examined, and a movable framework or mounting which supports the optical elements in alignment and trains them on the sky. About half the cost of the finished telescope is represented by the objective mirror. (Coulter Optical Co. has a 1/25 wave parabolic 6" F/10 mirror available for \$29.95)

The mounting of this telescope may be constructed while the mirrors are on order. In designing the mounting never permit appearance to compromise sturdiness. This telescope will have a maximum magnifying power of about 250 diameters and any jiggle arising in the mounting will be magnified proportionately. The mounting can be made from almost any combination of materials that chances to be handy: Wood, pipe, sheet metal, discarded machine parts and so on, depending upon the resourcefulness and fancy of the builder. The mounting designed on the next page is representative. The dimensions may be varied according to the requirements of construction.



After assembly, the optical elements must be aligned. You must look through the tube in which it slides and adjust the diagonal mirror until the objective mirror is centered in the field of view. Then adjust the tilt of the objective mirror until the reflected image of the diagonal mirror is centered. Replace the eyepiece in its tube and you are in business.

Those who construct this telescope will ultimately discover that it is not the best that can be built. To improve it consult the books recommended below and tackle the fine art of engineering a better mount.

### All About Telescopes

by: Sam Brown

available: Edmund Scientific Co.

\*Below some concepts for the  
\$65.00 Telescope, from Sam  
Brown's, All About Telescopes

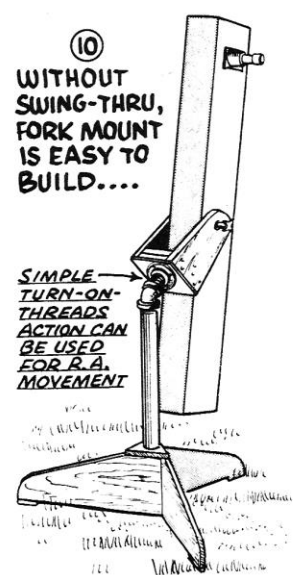
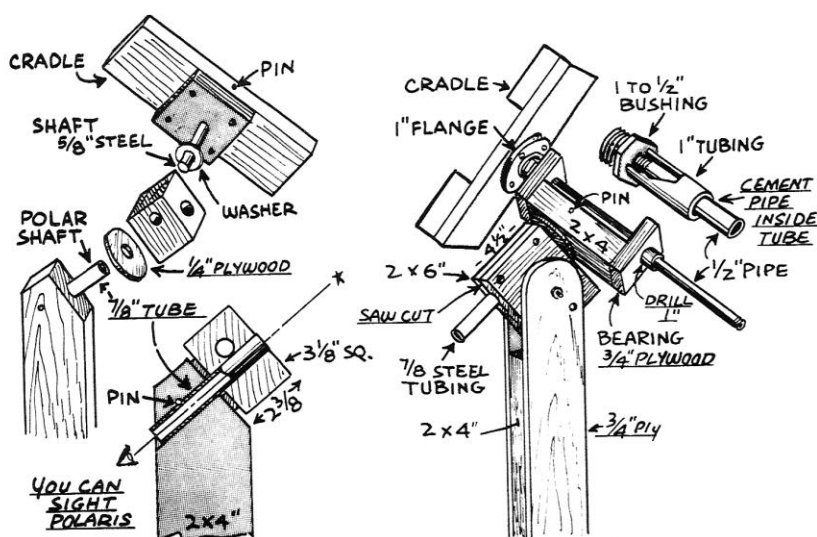
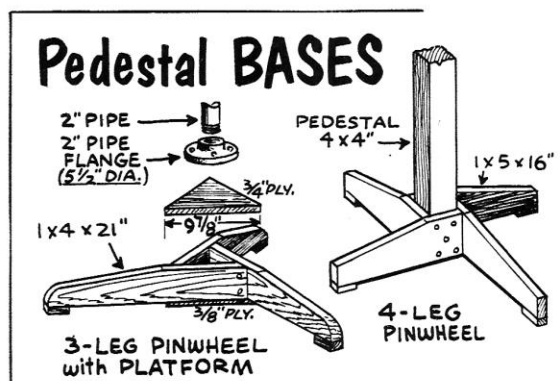
### Amateur Telescope Making

by: Albert G. Ingalls

Books, 1, 2, and 3 (3 vol. set)

available: Scientific American, also  
Edmund Scientific Co.

The 6" F/10 Telescope mirror can be  
purchased from Coulter Optical Co.  
P.O. Box K, 54121 Pinecrest Road,  
Idyllwild, Ca. 92349  
(see Sky&Scope, Jan. '76)





# SKY CALENDAR FEBRUARY 1976

Information for helping teachers and students observe the sky

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>45 min after sunset: Look low, just south of west, for thin crescent moon, about 1 3/4 days after New. As sky darkens, look for earthshine on moon's dark side.</p>	<p>45 min after sunset tonight, the moon is much higher than last night. Mars is nearly overhead as the moon sets almost 3 hrs after sunset.</p>	<p>Last month's star map now shows the sky 1-2 hrs after sunset. Take that map outside each evening thru Feb 15 and plot the moon's position on it.</p>	<p>45 min before sunrise (face SE): Mercury 12° lower left of brilliant Venus.</p>	<p>1 hr after sunset (face SW): Moon tomorrow night</p>	<p>GENERAL INFORMATION ON PLANETS FOR FEBRUARY: SEE BLOCKS FOLLOWING FEBRUARY 29.</p>	<p>45 min before sunrise (face SE): Mercury now 9° lower left of Venus.</p>
<p>Moon, just past First Quarter, is due south about 1 hour after sunset. As sky darkens, note Pleiades cluster above moon.</p>	<p>1 hr after sunset (look high in SE):</p>	<p>1 hr after sunset (look high in SE):</p>	<p>45 min before sunrise (face SE): Mercury 6° lower left of Venus.</p>	<p>1 hr after sunset (face east):</p>	<p>1 hr after sunset (face east):</p>	<p>45 min before sunrise: Mercury 5° lower left of Venus. They appear 4°-5° apart next 2 weeks.</p>
<p>Full Moon, rises just north of due east about half an hour after sunset. As sky darkens, note Regulus 6° upper left of moon.</p>	<p>Mercury at great- east elongation, 26° from sun. Look for Mercury 45 min before sunrise, 4.6° lower left of Venus.</p>	<p>Last month's map and this month's show the sky at times 2 hours apart. Note the position of Regulus on each map. Can you use this star to tell the time of night? See tomorrow's event.</p>	<p>Regulus, the brightest star in Leo, is at opposition tonight. Each year about this date, Regulus rises in the east around sunset, is high in south in middle of night, and sets in west around sunrise.</p>	<p>1 hr before sunrise (face SW): Spica is very close to the moon this morning. Seen from parts of S. America and the Pacific, the moon hides that star. How often does the moon pass Spica? See January Sky Calendar.</p>	<p>This morning and next 4 mornings, Mercury is at its closest to Venus, only 4.0° to lower left of that brilliant planet. See diagrams for Feb 21 and 24.</p>	<p>45 min before sunrise (face ESE):</p>
<p>Face south 1 hr before sunrise: Moon at Last Quarter (morning half moon).</p>	<p>Carefully note Mars' position against background stars next two weeks. It is now moving 1/3 degree east each day and passes 3° south of Elnath, Taurus' northern horn.</p>	<p>45 min before sunrise (face ESE):</p>	<p>This month's map, February Evening Skies, now shows sky 2 hrs after sunset. Note the three bright planets marking the pathway of the zodiac. Find the bright zodiac constellations Aries, Taurus, Gemini and Leo.</p>	<p>As Mercury moves toward superior conjunction (the far side of the sun), it gets lower each morning and more difficult to see. Binoculars help.</p>	<p>40 min before sunrise (face ESE): Venus, Mercury, and the moon form a pretty triangle.</p>	<p>40 min before sunrise: Last chance to see waning crescent moon. Look 13° lower left of Venus.</p>
<p>New Moon, sets with sun and is not visible. Look sharply low in W tomorrow night to see 1-day-old moon. It will set only 1 hr after sun.</p>	<p>Evening Planets, in order from west to east in the sky, are Jupiter, Mars, and Saturn. Their positions are plotted on this month's star map. Currently, each planet is the brightest object within its respective constellation. Jupiter is the bright "evening star" well up in the southwest at dusk. It sets in the west near 11 p.m. local time Feb 1 and 9:30 p.m. Feb 29. In early February a line from Castor to Pollux extended nearly twice its length leads to Saturn (see Feb 12, 13). At end of month reddish Mars passes between the tips of the Bull's horns. The <i>Graphic Time Table of the Heavens</i> (an excellent resource on planet visibility): Order for 75c from Maryland Academies of Science, 1111 Rockville Road, Rockville, Md. 20850.</p>	<p>Mercury Venus</p>	<p>Morning Planets: Venus, the brilliant "morning star" in SE at dawn, is steadily making its way toward the far side of the sun (to the position called superior conjunction, which it will reach in June). The observer who looks for Venus a fixed interval (for example 45 minutes) before sunup will notice the planet getting lower as weeks pass. In early February, Venus rises 2 hrs before sunup, but by month's end it rises barely an hour before. On what date will you last see Venus as a morning star this year? For most of this month tiny Mercury is easy to locate by using Venus as a guide. See</p>	<p>40 min before sunrise (face ESE): Venus, Mercury, and the moon form a pretty triangle.</p>	<p>40 min before sunrise: Last chance to see waning crescent moon. Look 13° lower left of Venus.</p>	<p>40 min before sunrise: Last chance to see waning crescent moon. Look 13° lower left of Venus.</p>

Magnitudes of the planets at midmonth: Venus -3.4; Jupiter -1.8; Saturn 0.0; Mars continues fading rapidly in February, from -0.2 to +0.5; Magnitudes of Mercury: Feb 2 +0.9; Feb 7 +0.5; Feb 27 +0.1. Motions of planets against star background: Venus, moving eastward about 1.2° per day, passes above Teapot in Sagittarius in early Feb, but can't be seen in dark sky after midmonth. Mars shifts 7° eastward in Taurus; Jupiter 5° eastward in Pisces; Saturn shifts 1.9° westward (retrograde), moving from Cancer back into Gemini.