

AST 195 PROJECT

Learning the Basics of Telescope Operation (A)

Upon completing the first project you should be able to read the instructions for your telescope, to put it together, take it apart, and figure out where the various pieces and accessories go.

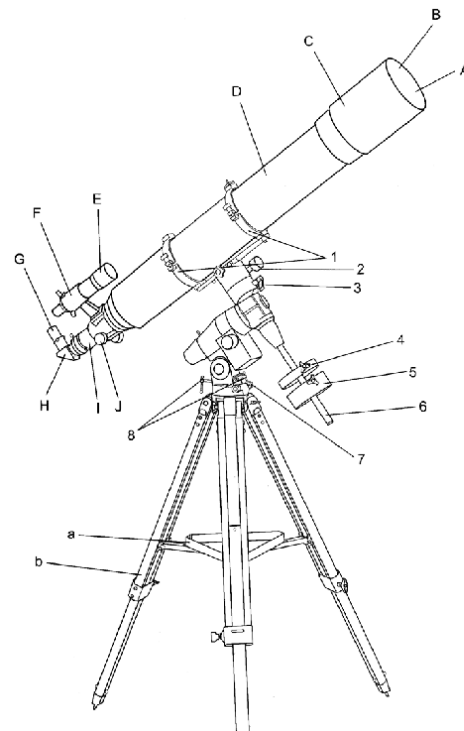
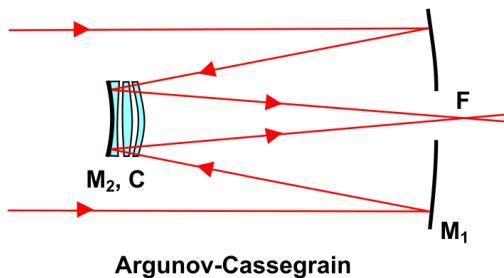
In this project you will learn the basics of telescope operation. The goal is to learn:

1. What the various parts do
2. How to calculate your telescope's magnification
3. The basics of how the telescope funnels light into your eye

While you can learn much on your own, you can get plenty of help in lab. Some people catch on to this more quickly than others, so **be patient**.

To complete this project, you will turn in work on paper for all three parts. *All written work is to be typed.*

I will provide assistance during lab time in showing you how to do of the things listed in this project. Take your time and learn this stuff well. Time spent learning the telescope now will save you much frustration when you move up to using it to observe the heavens.

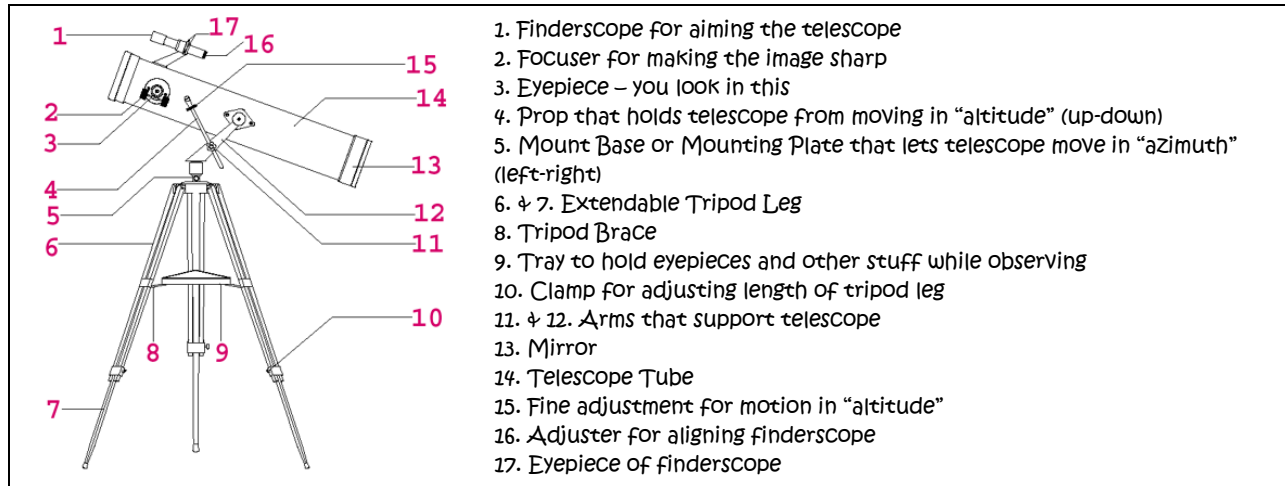


Sky-Watcher	
A	Dust Cap (not shown) Remove before Viewing
B	Objective Lens (not shown)
C	Sun Shade
D	Telescope Main Body
E	Finderscope
F	Finderscope Bracket
G	Eyepiece
H	Diagonal
I	Focus Tube
J	Focus Knob
1	Tube Rings
2	Flexible Control Cable
3	Declination Lock Lever
4	Counterweight Thumb
5	Counterweight
6	Counterweight Rod
7	Azimuth adjustment knob
8	Latitude Adjustment T-bolts
a	Accessory Tray
b	Tripod Leg

COMPLETING PART 1:

You are to write a brief description of your telescope (paragraph length). You are also to draw a diagram of your telescope (we do not need great art) that identifies what the various parts are and what they do, in your own words. Your telescope may come with such a diagram that will be helpful, but again, you need to create your own (*own drawing, own words*).

For example,



Also include a *photo* of you and your telescope together. The photo should show the telescope so that the parts listed in your diagram are visible.

COMPLETING PART 2:

- What is the focal length and aperture (lens diameter) of your telescope?
- What is the focal length of each of your eyepieces?
- What is the magnification of each of your eyepieces?
- Which eyepiece is the HIGH magnification (HIGH power) eyepiece? Which is the LOW magnification (LOW power) eyepiece?

The magnification of a telescope is calculated according to the following formula:

Focal length of telescope (the main lens or mirror)

$$\text{Magnification} = \frac{\text{Focal length of telescope (the main lens or mirror)}}{\text{Focal length of eyepiece}}$$

If your telescope has two eyepieces, then you will need to calculate the magnification for both. If your telescope has various accessories like “Barlow lenses”, put them away. We will not use them all semester.

COMPLETING PART 3:

Note whether the telescope is a “reflector” (uses mirrors) or a “refractor” (uses lenses) or a “hybrid” or “catadioptric” (uses both). Look up information on your type of telescope and find a description of how a reflector/refractor/catadioptric works. Draw a careful diagram (full page in size, and done very neatly in pencil with colors) of your telescope that shows how light enters the telescope and how the lenses or mirrors collect the light and direct it into your eye. This is often called a “light path” diagram.

Turn in all three completed parts.

You will receive 40 points on your project grade for Part 1, 30 for Part 2, and 30 for Part 3.

These parts will be “graded” – better work (neater, more thorough) will receive a higher score.