

## Binocular Talk Outline and Summary

Jay Reynolds Freeman, 2007

Jay\_Reynolds\_Freeman@mac.com  
http://web.mac.com/Jay\_Reynolds\_Freeman

**WHY?** Binoculars are inexpensive, easy to set up, and portable. Many people already have one. They let you try astronomy without too much time, money, or inconvenience.

**WHICH?** Any binocular improves over the naked eye. Buying? Try a cheap imported 7x50, or a 10x50 if you are over 40 -- your eyes have smaller pupils now. If you have more money, think about a model that has BAK-4 glass prisms and low-reflection coatings on all surfaces where the light beam goes from air to glass.

"7x50" means a *magnification of seven (7x)*, *50-mm diameter front lenses*.

Larger instruments -- 70 mm and up -- and binoculars with magnifications over 10, are hard to hold steadily by hand. Even heavier 7x50s give some people problems. I know no truly satisfactory tripod or other support, so think about size and bulk when you buy. Yet large aperture (big front lenses) is desirable in any astronomical instrument.

**WHAT CAN I SEE?** Several hundred deep-sky objects -- galaxies and stuff -- are accessible to an experienced observer with a 7x50 and good conditions. A hundred should be easy. You do need dark sky, charts, and an observer's guide.

You get to spy on celestial neighbors. The low magnification and wide field of view give good views of the "local" neighborhood in our galaxy, out to a few thousand light years.

**WHAT SHOULD I LOOK AT?** Have an observing program, so as not to be at a loss for what to do. Write down what you want to look at, and glance at your charts, before you go out to observe. A logbook makes for interesting reminiscing after the fact.

All the Messier objects can be detected in a 7x50, though many are tough.

**OBSERVING TRICKS:** For a steady view, use the "peer-through" grip: Hold the binocular between heels of hands and third and fourth fingers, with curled-up thumbs pressed against cheekbones. Your hands will be positioned as if to block reflections while peering through a store window. Keeping thumbs against cheekbones makes rigid contact between binocular and eye sockets, to keep images steady. This hand position also blocks stray light.

With larger instruments, move one hand out to the objective end, and leave the other in place. You support the binocular on both sides of its center of gravity, with at least some rigid contact between instrument and skull. When the outer hand gets tired, switch hands.

Be prepared to sprawl, lie down, or brace against cars, trees, and what-have-you.

To find a naked-eye object, gaze at it and lift the binocular into your line of sight.

Use averted vision, even on bright objects. Most have faint outer detail. Try M31 or the Orion nebula.

Know how big your field of view is, on your star charts. This knowledge helps identify the star field, and will assist when you are moving from one object to another.

In star-hopping, use relative directions, e.g., two fields that-a-way, then *turn right* 60 degrees. That saves keeping track of celestial north.

To avoid dew, let the binocular dangle in your sweater or jacket when not in use.

**HINTS FOR OWNING:** Vinyl tape seals joints and tape against dust. Keep it in the case, and keep the case in an area of moderate temperature and not too much humidity. Keep it out of strong sunlight -- plastic parts warp and exude goo. ***Do not*** leave it on the back shelf of a car, or in the trunk.

**TWO-SIDED-COINS:** It will be hard to locate things at first, and most everything will be dim. But you will learn the valuable skill of star-hopping from obvious objects to tough ones, and you will gain experience in using your eyes to see faint things. Many objects are faint, even through large observatory telescopes.

The only beginner's equipment useful in advanced visual work is eyes and brain. Train them!

### SOME INTERESTING THINGS TO LOOK AT:

All Messier objects can be detected in a 7x50. Those magnitude 8 or brighter are easy. Those magnitude 6 or brighter belong on the "very easy" list below.

Many wide double stars are pretty and colorful in binoculars.

#### VERY EASY (visible to the naked eye):

Alpha Persei Association	Loose naked-eye cluster in Perseus
Brocchi's "Cluster"	Asterism in Vulpecula -- the "coat-hanger cluster"
The Coma Berenices Star Cluster	Naked-eye star cluster in (surprise) Coma Berenices
The Double Cluster	Between Perseus and Cassiopeia
Jupiter	Galilean satellites easy in binoculars
The Milky Way	Oh, look at all the stars ...
The Moon	Much detail in any binocular
The North American Nebula	Naked-eye star cloud near Deneb Cygni
The Pipe Nebula	Huge dark nebula in southern Ophiuchus
Saturn	Rings detectable in binoculars

#### A LITTLE TOUGHER:

The Helix Nebula	Big planetary nebula in northern Aquarius
New General Catalog (NGC) 253	Magnitude-7 galaxy in Sculptor
NGC 288	Magnitude-7 globular cluster in Sculptor
Merope Nebula	In the Pleiades -- no problem in dark sky
The Veil Nebula	Cygnus supernova remnant -- need dark sky

#### CHALLENGE OBJECTS:

The Horsehead Nebula	Possible in 11x80, but very small
The Sculptor Dwarf Galaxy	I have seen it in a 10x70

### SOME GOOD BOOKS AND CHARTS:

Burnham's *Celestial Handbook*: Three volumes on visual observation and understanding of deep-sky objects. Readable, thorough, invaluable. Unfortunately, the science is getting rather dated. Notwithstanding, Burnham's should be in every observer's library.

Karkoschka's *Observer's Sky Atlas*: Portable, full-sky coverage, detailed finding charts for many objects

Mallas and Kreimer's *Messier Album*: Finder charts, drawing and photos made with small instruments.

Norton's *Star Atlas*: Old but good. My favorite "small" atlas. Bound as one volume.

Sky Publishing's *Messier Card*: Coordinates and descriptions of all Messier objects.

Tirion's *Sky Atlas 2000*. One of many popular amateur atlases. Many loose sheets. Excellent and beautiful cartography.