About this Brochure

This brochure is not intended to be a step-by-step guide to building your own telescope, but rather a quick-and-dirty introduction to the topic.

Many of the steps are easily done by anyone remotely comfortable around tools, but some of them (testing the optical quality of the homemade mirror for instance) require more expertise and experience. Luckily the Kingston Centre RASC ATM Group has that!

Our **Newest** project is the completion of the 24" Venor Telescope

Over the last few years we have built:

* Focault Optical Tester Completed 2000 August
* Dew Zapper Heaters Completed 2000 August 25
* Variable Height Observing Chair Completed 2000 August 12
* Canvas Telescope Cover Completed 2000 April
* Prototype Observing Table Completed 2000 March 31
* Barney 20cm (8") f4.5 Dobsonian Mount scope Completed 1999 August 31st Status
* 35 barn door (Type I) tracking mounts for 35mm photography. Completed 1999 Feb 16
* Laser collimating tool for telescope optics alignment Completed 1998
* Fitzgerald 20cm (8") f7 Dobsonian Mount telescope. Completed 1998 January.

In addition we have assisted in the following projects by members:

* 18 cm (7") Dobsonian Telescope (Bob Gully, 2000)
* 18cm (7") Dobsonian Telescope (Dave Pianosi, 2000)
* 18cm (7") Dobsonian Telescope (Kevin Kell, 1999)
* 18cm (7") Dobsonian Telescope (Kendra Angle, 1999)

(ATM brochure 2003 April)

Web Resources

http://members.kingston.net/rasc/atm.htm
Kingston's Group of ATMer's

http://www.atmpage.com/
The starting point for building a telescope!

http://zebu.uoregon.edu/~mbartels/scopes/scopes.html
Mel Bartel's Telescopes and Telescope Making Page Includes a complete guide for outfitting a dob with computer-controller equatorial tracking.

http://members.aol.com/sfsidewalk/dobplans.htm
Building a Dobsonian Telescope
Plans complete with plywood cutting patterns, presented by The San Francisco Sidewalk Astronomers.

http://www.integrityonline12.com/jfly/
Jim Fly's Telescope Home Page
Construction of an 8" f/5.9 Motorized DOB

http://chemwww.cwru.edu/~das/
Scopes and not much else Dave Sopchak's page features plenty of pictures of a 10" Dob and a detailed mirror grinding log

http://www.arrowweb.com/M1/atm/
Build Your Own Dobsonian Telescope!
Lin Robertson's step-by-step (with photos) guide to building a Dob with little or no tools, space, or experience.

http://koti.kolumbus.fi/~pulliy/atm.html
Pullinen's Amateur Telescope Making Page
This site in Finland includes photos of a Waineo style grinding machine, a Foucault tester, several scopes, and a very nice spider design.

The Royal Astronomical Society of Canada Kingston Centre

PO Box 1793
Kingston, Ontario
K7L 5J6

Infoline: 613-377-6029

Monthly Public Meetings

2nd Friday of most months (holiday long weekends are the exception) at 7:30pm

Queen's University
Stirling Hall, Theatre D
(enter from Queen's Crescent)

Electronic Mail:
<*rascexec@cliff.path.queensu.ca*>
Website: *http://www.rasc.ca/kingston*

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Please do not distribute after December 2003
(RASC-KC ATM brochure 2003 April

Amateur Telescope Makers Group

The Royal Astronomical Society of Canada

Kingston Centre

Established in 1961

Dedicated to the Advancement of Astronomy and Allied Sciences

Telescope Making

Why make your own telescope?
- you can usually build bigger telescopes for the same money as a retail telescope
- you can learn a lot about optics, mechanical support and design, and woodworking
- you can possibly make better optics than commercially available telescopes

How Much Time does it take?

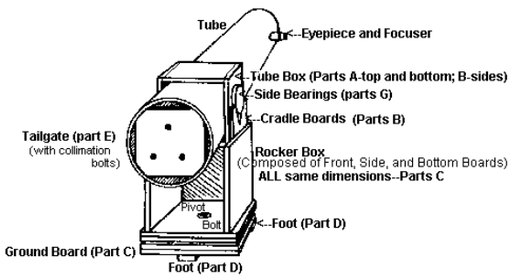
Including grinding a mirror, an 18cm (7") f4.5Dobsonian took about 36 hours over 6 months. Once we know what we're doing we could easily knock this down to 30 hours or less over two weekends.

A commercial 8" F6 Dobsonian retails for approx $525.00

How much does it cost?

Including grinding a mirror, an 18cm (7") f4.5 twin truss design cost about $310-$350.

Grinding your own mirror is the most time consuming process of the project, but you can always buy a finished mirror and make the rest of the telescope.



Parts Overview

Ground Board with Feet
(build from plywood)
Feet
(build or buy 3 hockey pucks $3)
Rocker Box
(build from plywood)
Tube Box
(build from plywood)
Main Tube
(buy an 8" or 10" sonotube - approx $10)
Tube Bearings
(build or buy commercially
Primary Mirror
(grind your own ($<100) or buy commercially (8"f6 $310))
Primary Mirror Holder (Cell)
(build from plywood)
Secondary Mirror
(purchase commercially $25-35)
Secondary Mirror Holder
(build or buy commercially)
Spider
(build or buy commercially $31)
Focuser
(buy commercially $45)
Eyepiece
(buy commercially $10-2000)
Finder
(buy commercially $20)

Miscellaneous tools and supplies:
screws, wood glue, teflon pads, bolts, paint or varathane, screwdrivers, jigsaw, drill

Mirror Grinding

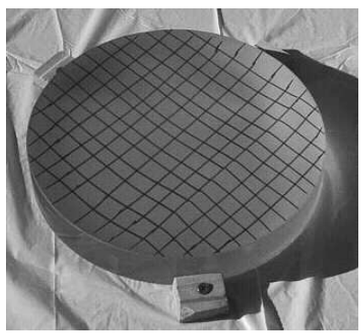
What are the steps needed to grind my own mirror?

Rough Grind
Fine Grind
Test for shape
Polish using cerium oxide
Test for polish
Figure using cerium oxide
Test for figure
Coat with aluminum (ship away)

Supplies Needed:

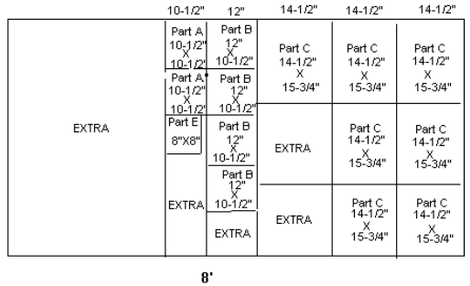
- a mirror blank (a 7" should be around $25-30), various sizes of grinding grit (#80, #120, #220, #320, #500, then 12 or 15-micron, then 5or 8-micron grit, polishing pads, Focault Optical Tester

Accuracy: by hand, you can easily figure to at least 1/4 wave accuracy, and with experience, achieve 1/10 wave accuracy! (Easily comparable with commercial grade optics).



A mirror blank with lines drawn on for a tool/mirror contact test

Telescope Body



You need a 3/4" piece of plywood for up to an 8" telescope

The size of the Telescope Body will depend on the focal length of your mirror. Eg a 7" f5 will have a focal length of 7*5=35" and a 7" f8 will be 56"

The **Ground Board** needs 3 feet to balance and provide the best stability (hockey pucks work well).
The Rocker Box rests on 3 teflon pads on the Ground Board and a carriage bolt to hold the assembly together (usually with springs and washers for tension)
The **Tube Box** is a friction fit box around the tube, meant to allow you to move and balance the scope.
The **Main Tube** is a cardboard sonotube used in concrete forms, painted or otherwise waterproofed on the outside and painted flat black on the inside.
Tube bearings can be made from wood and covered with arborite and rests on teflon pads on the cradle boards.
The **Primary Mirror Holder** is made of plywood, supports the mirror, and allows for collimation.
The **Secondary Mirror** must be a perfectly flat front silvered mirror and is usually easier to buy.
The **Spider** holds the **secondary mirror holder** in place which holds the **secondary mirror** in place.
The **Focuser** is easier to buy as is a **Finder** (Canadian Tire red dot gunsite).