

REFLECTIONS / REFRACTIONS

University Lowell
Astronomers

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Building a Star Finder as a Way to Understand RA / Dec and Equatorial Mounts

By Sandy Dugan

As a newcomer to amateur astronomy and before I invested in a telescope, I had read that each star has a unique Right Ascension (RA) and Declination (Dec) and that an equatorial mount is useful in locating objects. In order to understand these concepts, I designed and constructed what I call a "star finder." The process helped me to grasp the meaning of RA / Dec and the function of an equatorial mount. The instrument could be used for instruction; it can be taken apart for transportation. The total cost was about \$25.00.

Materials:

one sheet 1/4" plywood; two 5/8" wood dowels, one 7/16" wood dowel; two pvc "T" joints; cardboard, stiff plastic sheet; two threaded right-angle screws; two cork stoppers; four 5/8" interior diameter "O" rings; one screw eye; three bamboo skewers; duct tape.

Description:

--The base: two pieces of 1/4" plywood, approximately 3' 1" X 3', cut and fitted as shown. Image 1

--The Polaris axis: a 5/8" wood dowel, with holes drilled and attached to the base with screws and cork stoppers (for removal and transportation) at a 42° angle, as shown. (The latitude at Ann Arbor is 42° 16' 14" North.) Image 1



--The transverse piece: a 5/8" wood dowel attached to the Polaris axis by a pvc "T" fitting. Image 2

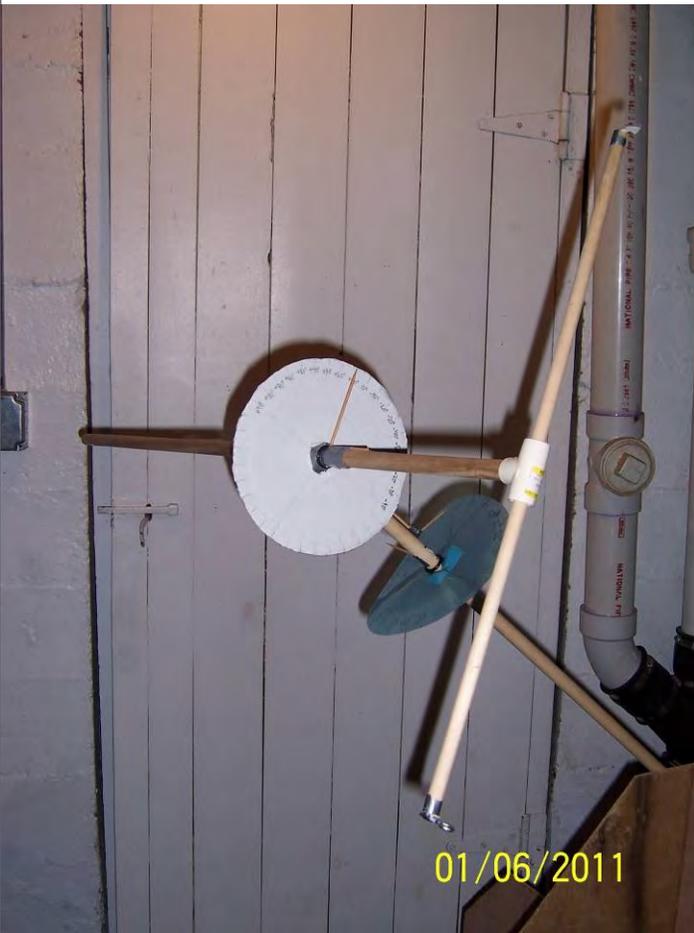


--The Declination dial: a cardboard circle divided into ninety-degree sectors; marked in 10° units, with +/- ; +90° and -90° are permanently aligned to the Polaris axis. A bamboo skewer bent at 90° is used to set the Dec. Image 3

--The Right Ascension dial: a stiff plastic circle divided into 24 equal one-hour units, marked 0 to 23, is held in place between two "O" rings; it is rotated to follow the apparent motion of the stars. A bamboo skewer bent at 90° is used to set the RA. Image 3



--The star pointer: a 7/16" wood dowel attached to the transverse piece by a pvc "T" fitting and aligned with the declination pointer. One end is fitted with a screw eye, the other with a small cardboard arrow for aiming. Image 4

**Function:**

In use, the RA dial is set for the time of night, and then only the transverse dowel moves; it rotates within the "T" fitting to reach the Dec setting, and the "T" fitting rotates on the Polaris axis to reach the RA setting. The observer then looks through the screw eye on the star pointer to see the appropriate star.

Use:

On a late fall evening, I set up the instrument, with the Polaris axis dowel aimed at Polaris. From star maps and with the help of other Lowbrows I had learned to identify by sight some of the constellations and brightest stars in the night sky; I also had a list of the 20 brightest stars with their RA / Dec. I moved the transverse piece to aim the star pointer at Caph (RA 00h 09m) in Cassiopeia and then set the RA dial on the instrument at 0. Referring to the star list, I moved the transverse piece so that the readings on the RA dial and the Dec dial matched some of those on the list; the star pointer then pointed close to the respective star. The instrument is very crude; star locations were only approximated. But building it and testing it provided the satisfaction of putting theory into practice. Subsequently, looking for a telescope to purchase, I went with an equatorial mount, without a motor. I am glad to have it; the RA / Dec dials provide approximate locations, but I rely mostly on "star hopping" to bring in objects of interest.

No Charge Astronomy: Part I A quick look at Freeware Astronomy Software

By Mark S Deprest

A presentation and demonstration of a few Astronomy Software program that can be downloaded and used FREE of charge, a.k.a. Freeware. We will look at some of my favorites and most useful programs.

So, what is Freeware? Simply put it is software designed by people like you and I for people like you and I that cost nothing to download and use. Most of these programs are pretty simple and do one or two very specific things really well.

Safe download site: <http://freeware.intrastar.net/astronomy.htm>

The first couple of programs are very simply and specific, they do one or two things really well.

1. Messier Marathon (German) for a copy email me at msdeprest@comcast.net I will send you a zip file of the program or you can do a “Google” search for “Messier Marathon” and download it from www.zdnetasia.com

This program will give you a text file of the proper observing order for a Messier Marathon any day of the year and any where in the world*.

*with user supplied co-ordinates

2. Jupiter ver.2 (French) for a copy <http://astrosurf.com/rondi/jupiter> or the link above.

This program shows you graphically the positions of the Galilean moons of Jupiter and the position of the GRS. The program also produces very nice spiral ephemeris charts (printable) of the Galilean moons positions for a user specified time period.

3. Mars Previewer II (USA) for a copy see the link above.

This program shows the face of Mars for a user specified place and time. (printable)

4. Virtual Moon Atlas ver. 5.0 (French) for a copy <http://astrosurf.com/avl> or the link above.

This is an impressive full feature Virtual Atlas of the Moon that no Lunatic should be without. Although the download time & size of the catalogs is a bit long & large (14 different catalogs of images & feature plus the program itself totals 645MB) (printable)

5. Stellarium ver. 0.10.2 (French) for a copy www.stellarium.org or the link above.

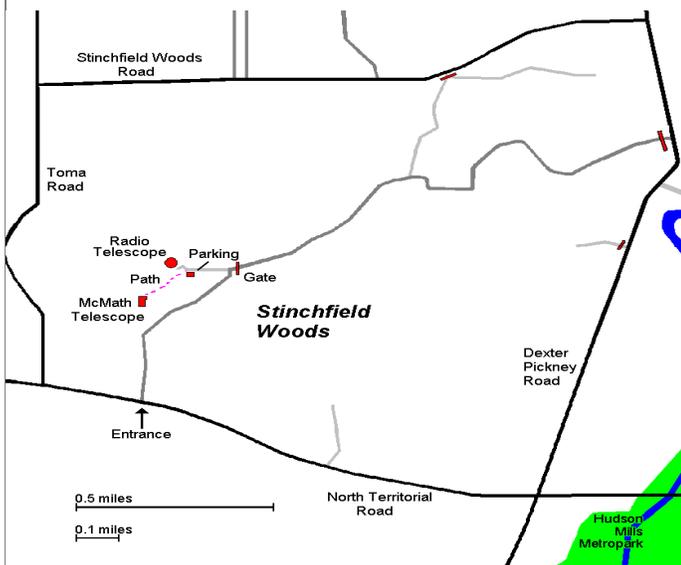
This a graphics laden planetarium program that is a great learning tool for beginners; and a wonderful program to display realistic skies any time and any where in the world. Many catalogs to download and add on, heavily graphic based so, it may take some time to download.

These programs are tested and bug and virus free to download and share. I hope you enjoy these as much as I do. I have many other freeware programs, so this talk might become a series of 3 or 4 ... stay tuned.

Places & Times

Dennison Hall, also known as The University of Michigan's Physics & Astronomy building, is the site of the monthly meeting of the University Lowbrow Astronomers. Dennison Hall can be found on Church Street about one block north of South University Avenue in Ann Arbor, MI. The meetings are usually held in room 130, and on the 3rd Friday of each month at 7:30 pm. During the summer months and when weather permits, a club observing session at the Peach Mountain Observatory will follow the meeting.

Peach Mountain Observatory is the home of the University of Michigan's 25 meter radio telescope as well as the University's McMath 24" telescope which is maintained and operated by the Lowbrows. The observatory is located northwest of Dexter, MI; the entrance is on North Territorial Rd. 1.1 miles west of Dexter-Pinckney Rd. A small maize & blue sign on the north side of the road marks the gate. Follow the gravel road to the top of the hill and a parking area near the radio telescopes, then walk along the path between the two fenced in areas (about 300 feet) to reach the McMath telescope building.



Public Open House / Star Parties

Public Open Houses / Star Parties are generally held on the Saturdays before and after the New Moon at the Peach Mountain observatory, but are usually cancelled if the sky is cloudy at sunset or the temperature is below 10 degrees F. For the most up to date info on the Open House / Star Party status call: (734)332-9132. Many members bring their telescope to share with the public and visitors are welcome to do the same. Peach Mountain is home to millions of hungry mosquitoes, so apply bug repellent, and it can get rather cold at night, please dress accordingly.

Membership

Membership dues in the University Lowbrow Astronomers are \$20 per year for individuals or families, \$12 per year for students and seniors (age 55+) and \$5 if you live outside of the Lower Peninsula of Michigan.

This entitles you to the access to our monthly Newsletters on-line at our website and use of the 24" McMath telescope (after some training).

A hard copy of the Newsletter can be obtained with an additional \$12 annual fee to cover printing and postage.

(See the website

<http://www.umich.edu/~lowbrows/theclub/>

for more information on joining the club).

Membership in the Lowbrows can also get you a discount on these magazine subscriptions:

Sky & Telescope - \$32.95 / year

Astronomy - \$34.00 / year or \$60.00 for 2 years

For more information contact the club Treasurer. Members renewing their subscriptions are reminded to provide the renewal notice along with your check to the club Treasurer. Please make your check out to: "University Lowbrow Astronomers"

Newsletter Contributions

Members and (non-members) are encouraged to write about any astronomy related topic of interest.



Lowbrow's Home Page

<http://www.umich.edu/~lowbrows/>

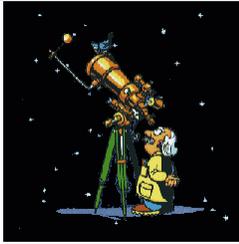
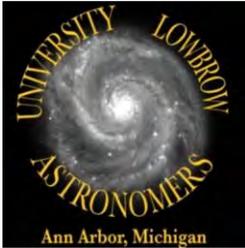


University Lowbrow Astronomers

**Coming Soon
To a Star Party
Near you!**

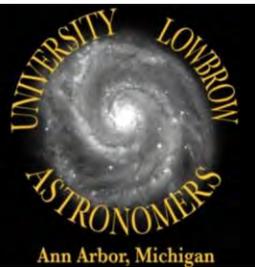
Image by Doug Scobel

Reflections & Refractions



Website

www.umich.edu/~lowbrows/



University Lowbrow Astronomers
P.O. Box 4465
Ann Arbor, MI 48106

Check your membership expiration date on the mailing label