

**Swift**  
***Guide to the Galaxy***

**User's Manual**

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## Introduction

Welcome to Swift Guide to the Galaxy, your personal celestial map program of what science fiction writer Gene Roddenberry called "the final frontier."

Astronomy is an ancient science, possibly as old as humankind itself. Ancient mariners navigated their vessels by the stars long before three kings from the East may have been guided to a miraculous event by the conjunction of Jupiter and Saturn. Farmers used the position of the stars to decide when to plant and when to harvest. Women used the stages of the moon to determine fertile times, and so to either aid or avoid conception. Several early astronomers even made fastidious astronomical calculations to prove the Earth was a sphere and not flat. A few of these early scientists faced persecution for promoting the truth of science in an age when religious leaders mandated what the people were to believe about astronomy.

Humankind has come a long way from superstition, due to modern technology that enables us to explore the stars and planets with telescopes, satellites and even the naked eye. Thanks to actual photos of stars and planets, we can now know precisely what we are seeing. With help from this program, you'll soon know a planet from a star, their names, and locations within constellations. Welcome, celestial traveler, to the night sky!

## Getting Started

## System Requirements

To use Swift Guide to the Galaxy, you will need:

- IBM compatible with a 386sx processor or better.
- Microsoft Windows 3.1.
- A hard drive with 2 megabytes (MB) of free disk space.
- A minimum of 2MB RAM
- A VGA or higher graphics adapter.

## Installation

- 1) Have Microsoft Windows up and running
- 2) Insert Swift Guide to the Galaxy diskette into a floppy drive.
- 3) From the Windows Program Manager, Select Run from the File menu.
- 4) If the disk is in floppy drive A, then type A:SETUP.EXE and then click on the OK button.
- 5) You will be prompted to name the directory into which the Swift Guide to the Galaxy files will be installed. The default directory path is C:
- 6) The setup program will decompress program files to your hard disk.

## Startup

Start Swift Guide to the Galaxy from the Galaxy Program Group by double clicking the Galaxy icon.

## Program Reference

### Sky Display

When Swift Guide to the Galaxy has finished loading, you will see the sky looking towards the southern horizon. The sky can be thought of as a spherical dome that rotates above us. Projecting this three dimensional dome onto your two dimensional computer monitor produces some distortion, particularly near the edges of your screen. However, you should have little trouble using Swift Guide to the Galaxy to identify the objects in the night sky.

### Identifying Objects

To identify an object on the sky display, move the mouse cursor to that object and click the left mouse button. A dialog box will appear that provides the object's name (if any), its type, and coordinates in right ascension and declination. For a planet, the Sun, or the Moon, a larger dialog box appears which contains an image of the object and physical data about it.

### Changing the View Direction

Just below the sky display are four arrow buttons which control the direction in the sky that you are viewing. By pressing the left or right arrow buttons, you can change the direction that you are "facing". This is the equivalent of turning in circles. The current direction, or azimuth, is displayed between the two arrows. Azimuth is measured in degrees from 0 to 359, where 0 degrees is due north, 90 degrees is east, 180 degrees is south as 270 degrees is west. Note that although the azimuth changes while holding down the arrow buttons, the sky will not be updated until the button is released. By pressing the up and down buttons, you change the elevation of the view. This is how far above the horizon you are looking.

### Time and Date Display

The current time and date for the sky are shown above the sky display.

### Location Display

The current location for the sky is shown to the lower left of the sky display. The name of the location is displayed if available, followed by the location's latitude and longitude.

### Animating the Display

To the upper left of the sky display is a button with a picture of a film strip on it. By clicking on this button, the sky display will change as the program's time changes. The rate of time change depends on the settings in the Animation Options menu. To turn off animation, click on the button again.

## **Swift Guide to the Galaxy Menus**

### File Menu

#### Open

Opens a dialog box for loading a previously saved sky display. The file extension for sky displays is .SKY. You can select a name from the file list, or type it in the edit box.

#### Save As

Opens a dialog box for saving the current sky display as a .SKY file. This file contains information about the current location, time, date and direction of the sky display as well as other user settings.

#### Print

Prints current sky display to your printer.

#### Exit

Exit quits Swift Guide to the Galaxy and takes you back to the Windows Program Manager.

## Location Menu

The Location Menu allows you to view the sky from anyplace on Earth. There are several methods for setting your location:

### List

Click on the List button for a list of cities. Select a city from the list box and click on the OK button. A quick way to find a city is to type in the first few letters of the city's name. The city list will automatically scroll to the names starting with those letters.

### Map

Clicking on the Map button brings up the World Map dialog box. Use your mouse to position the black cross hair anywhere on the map of the world and click the left mouse button. The current position is indicated by a yellow cross and the latitude and longitude are displayed in the lower left corner of the dialog box. Click on the OK button to select the current map position.

### Zip Code

Entering the first three digits of your postal Zip Code will provide a reasonably accurate latitude and longitude for most locations in the United States. You can do this by either entering the three digits in the Zip Code edit box, or clicking on the arrows.

### Latitude Longitude

If you know your latitude and longitude, it can be entered by clicking on the up and down arrow buttons to the right of the Latitude and Longitude boxes.

### Setting the Time Zone

If you selected a location from the City List or by Zip Code, the time zone for that location is set automatically. Otherwise you will need to enter the correct time zone for your location. The time zone value is the number of hours from Greenwich Mean Time (GMT). For the United States values for time zones are: Eastern Time (ET) = -5, Central Time (CT) = -6, Mountain Time (MT) = -7, Pacific Time (PT) = -8.

### Daylight Time

If your location is currently on Daylight Savings Time, click on the Daylight Time check box. An "X" should appear in the box when daylight savings time is active.

## **Time Menu**

### Date

The month, day and year can be set using the up and down arrow buttons to the right of the date display.

### Time

The time can be set using the up and down arrow buttons to the right of the time display.

#### Time Display

Time can be displayed as a 24 hour clock or 12 clock. When the 24 clock option is selected, 2:00 P.M. will appear as 14:00.

#### Set to Now

Clicking on the Set To Now button sets the time to your computer's current system time.

### **Search Menu**

The search menu allows you to search the sky for bright stars, solar system objects, constellations or Messier objects. After selecting the type of object that you are looking for, select the name of the object from the search dialog box and click on the OK button. If the object is visible from your location at the current time, the sky direction will turn to that location and a red circle will appear around the object. The name of the object will also appear.

### **Options Menu**

#### Display Options

Display options allow you to customize the appearance of the sky display. The check boxes in the Names group turn on or off labels for constellations, planets, stars or Messier objects. The Objects group turns on or off symbols for the objects. Other display options are:

##### Constellation Lines

When on, blue lines which define the 88 constellations are displayed.

##### Horizon Display

The ground, trees, houses, buildings etc.. On some systems, turning off the horizon display can significantly improve display speed.

##### Compass Marks

Displays a letter at the bottom of the sky display for the compass direction - N = North, E = East, S = South and W = West.

##### Ecliptic Line

Displays a red line representing the ecliptic, which is the path the sun follows through the year.

##### RA-Dec Lines

Displays green coordinate lines for Right Ascension and Declination.

##### Sky Color

When on the background color of the sky display will vary with Sun's position:

light blue when the Sun is above the horizon, dark blue during twilight, and black at night.

#### Number of stars

Up to 9000 stars can be displayed. To increase the number of stars, click on the right arrow of the scroll bar or drag the bar to the right. Note: the more stars that are being displayed, the slower the sky display will be.

#### Animation Options

The Animation options set the rate of time change when the Animation Button is on. There are three Animation Rate settings: Real Time, Sidereal Time and Fast. When the rate is set to Real Time, the sky display is continually updated to match your computer's system time. When set to Sidereal Time, the display is updated by one sidereal day at a time. At the sidereal time rate, the stars will remain fixed in the sky while the planets, Sun and Moon will move across the sky. Fast Time will advance the time by the rate set in the Increment options. The increment for fast time can be set to a number of days, hours or minutes. The precise increment can be changed using the up and down arrow keys to the right of the increment values.

#### **Lunar Menu**

##### Phases

Displays a lunar calendar for the current month. The Full Moon is represented by a solid white circle, a New Moon by a black circle and the phases in between approximating the lunar phase for that day. The month and year for the calendar can be changed by clicking on the left or right arrows next to the month and year display box.

##### Map

Displays a map of the near side of Earth's Moon. By moving the mouse cursor over the Moon's image the names of major map features will be displayed in a box below the picture. By clicking on the Find button, you can locate a feature by selecting its name and clicking the OK button. The mouse cursor will be placed at that feature.

#### **Help Menu**

The Help menu provides access to on-line help through Microsoft Windows' hypertext help system.

## **Appendix A - Glossary**

**Absolute Magnitude:** The brightness of a celestial object from a distance of ten parsecs.

**Apparent Magnitude:** The brightness of a celestial object as seen from Earth.

**Altitude:** The distance of a celestial object above the horizon.

**Azimuth:** The angular distance from north, eastward along the horizon.

**Celestial Equator:** A great circle on the celestial sphere above the Earth's equator.

**Celestial Pole:** Points of the celestial sphere which intersect with the axis of the Earth's rotation. The north celestial pole lies near the star Polaris.

**Celestial Sphere:** An imaginary sphere on which all celestial objects appear to be projected.

**Constellation:** Name for a group of stars that form a configuration in the sky. There are 88 recognized constellations named for objects, animals or mythical figures.

**Daylight Savings Time:** One hour change in the official time during the summer months.

**Declination:** Coordinate system used on the celestial sphere measured from the celestial equator, positive to the north and negative to the south.

**Double Star:** Two or more stars that appear very close to each other.

**Eclipse, Lunar:** Passage of the moon into the Earth's shadow.

**Eclipse, Solar:** Passage of the moon's shadow across the Earth.

**Ecliptic:** The apparent path of the sun across the sky during the year.

**Elevation:** Angular distance of an object above the horizon.

**Epoch:** The date selected as a point of reference.

**Equatorial Coordinates:** Coordinate system for describing the position of a celestial object. (See declination and right ascension.)

**Equinox:** One of the two intersections of the ecliptic and the celestial equator, occurring at the two times of the year when day and night are of equal length. The spring or vernal equinox occurs on or about March 21st. The autumnal or fall equinox occurs on or about September 23rd.

**Galaxy:** A huge system of stars, dust and gas. There are three classifications of galaxies: elliptical, spiral, and irregular.

**Globular Cluster:** A compact, spherical symmetrical cluster of stars containing tens of thousands to millions of stars.

**Horizon Coordinates:** The coordinates of a celestial object relative to the viewer's horizon. (See altitude and azimuth.)

**Light Year:** The distance that light travels in one mean solar year, approximately six trillion miles.

**Luminosity:** The absolute brightness of a star in comparison with our Sun.

**Magnitude:** A measure of the brightness of a celestial object. The brighter the object, the lower its' magnitude. A change of five magnitudes indicates a difference in brightness of a factor of 100.

**Meridian:** The great circle passing through the celestial poles and an observer's zenith.

**Messier Object:** One of 110 non-moving, nonstellar, deep sky objects, such as



galaxies, nebulae and star clusters, published by Charles Messier in 1787.

**Milky Way:** Home galaxy of our solar system.

**Moon:** The Earth's only natural satellite.

**Nebula:** A region of gas and or dust that can be seen as a luminous patch.

**Nova:** A star that suddenly dramatically increases its' brightness.

**Open Cluster:** An irregular group of stars.

**Parallax:** The difference in the apparent position of an object viewed from different points.

**Planetary Nebula:** A shell of gas ejected by a dying star.

**Polaris:** The North Star.

**Precession:** The slow rotation of the Earth's axis over a period of approximately 26,000 years.

**Retrograde Motion:** The apparent backward movement of another planet as observed from the Earth.

**Right Ascension:** The angle of a celestial object around the celestial equator measured in hours, minutes and seconds eastward from the vernal equinox.

**Sidereal Time:** Time reckoned by the stars. There are 366.25 sidereal days per year.

**Solar System:** Our solar system consists of the Sun, the nine planets, several dozen moons, millions of asteroids and trillions of comets.

**Solstice:** The northern or southern most points on the ecliptic. The summer solstice occurs about June 22nd and the winter solstice occurs about December 22nd.

**Spectral Type:** A classification of stars in the order OBAFGKM, signifying decreasing temperature from O to M. Each spectral class is subdivided by 10 numerals from 0 to 9.

Class	Color	Temperature °F
O	blue-white	60,000
B	blue-white	40,000
A	white	20,000
F	yellow-white	12,000
G	yellow	10,000
K	orange-yellow	7,000
M	orange-red	5,000

**Supernova:** Explosion of a massive star, producing a luminosity 10 billion times that of our Sun.

**Terminator:** The boundary between the sunlit and dark hemispheres of a planet or moon.

**Variable Star:** A star whose brightness varies with time.

**Zenith:** The point on the celestial sphere directly over the observer's head.

**Zodiac:** The 12 constellations that lie on the ecliptic.

## Appendix B - Constellation Names

Abbreviation

Name

Description

And	Andromeda	The Princess
Ant	Antlia	The Air Pump
Aps	Apus	The Bird of Paradise
Aqr	Aquarius	The Water Bearer
Aql	Aquila	The Eagle
Ara	Ara	The Altar
Ari	Aries	The Ram
Aur	Auriga	The Charioteer
Boo	Bootes	The Herdsman
Cae	Caelum	The Chisel
Cam	Camelopardalus	The Giraffe
Cnc	Cancer	The Crab
CVn	Canes Venatici	The Hunting Dogs
CMa	Canis Major	The Big Dog
CMi	Canus Minor	The Little Dog
Cap	Capricornus	The Sea Goat
Car	Carina	The Keel
Cas	Cassiopeia	The Queen
Cen	Centaurus	The Centaur
Cep	Cepheus	The King
Cet	Cetus	The Whale
Cha	Chamaeleon	The Chamaeleon
Cir	Circinus	The Compasses
Col	Columba	The Dove
Com	Coma Berenices	Berenice's Hair
CrA	Corona Australis	The Southern Crown
CrB	Corona Borealis	The Northern Crown
Crv	Corvus	The Crow
Crt	Crater	The Cup
Cru	Crux	The Cross
Cyg	Cygnus	The Swan
Del	Delphinus	The Dolphin
Dor	Dorado	The Swordfish
Dra	Draco	The Dragon
Equ	Equuleus	The Colt
Eri	Eridanus	The River
For	Fornax	The Furnace
Gem	Gemini	The Twins
Gru	Grus	The Crane
Her	Hercules	The Strongman
Hor	Horologium	The Clock
Hya	Hydra	The Sea Serpent
Hyi	Hydrus	The Water Snake
Ind	Indus	The Indian
Lac	Lacerta	The Lizard
Leo	Leo	The Lion

LMi	Leo Minor	The Little Lion
Lep	Lepus	The Hare
Lib	Libra	The Scales
Lup	Lupus	The Wolf
Lyn	Lynx	The Lynx
Lyr	Lyra	The Lyre
Men	Mensa	Table Mountain
Mic	Microscopium	The Microscope
Mon	Monoceros	The Unicorn
Mus	Musca	The Fly
Nor	Norma	The Carpenter's Square
Oct	Octans	The Octant
Oph	Ophiuchus	The Serpent Bearer
Ori	Orion	The Hunter
Pav	Pavo	The Peacock
Peg	Pegasus	The Winged Horse
Per	Perseus	The Hero
Phe	Phoenix	The Phoenix Bird
Pic	Pictor	The Painter's Easel
Psc	Pisces	The Fish
PsA	Pisces Austrinus	The Southern Fish
Pup	Puppis	The Stern
Pyx	Pyxis	The Compass
Ret	Reticulum	The Net
Sge	Sagitta	The Arrow
Sgr	Sagittarius	The Archer
Sco	Scorpius	The Scorpion
Scl	Sculptor	Sculptor's Tools
Sct	Scutum	The Shield
Ser	Serpens	The Serpent
Sex	Sextans	The Sextant
Tau	Taurus	The Bull
Tel	Telescopium	The Telescope
Tri	Triangulum	The Triangle
TrA	Triangulum Australe	The Southern Triangle
Tuc	Tucana	The Toucan
UMa	Ursa Major	The Big Bear
UMi	Ursa Minor	The Little Bear
Vel	Vela	The Sails
Vir	Virgo	The Virgin
Vol	Volans	The Flying Fish
Vul	Vulpecula	The Little Fox

### Appendix C - Brightest Stars in the Sky

Rank   Name                      Magnitude    Constellation

1	Sirius	-1.46	Canis Major
2	Canopus	-0.72	Carina
3	Arcturus	-0.04	Bootes
4	Alpha Centaurus	+0.00	Centaurus
5	Vega	+0.03	Lyra
6	Capella	+0.08	Auriga
7	Rigel	+0.12	Orion
8	Procyon	+0.38	Canis Minor
9	Achernar	+0.46	Eridanus
10	Betelgeuse	+0.50	Orion
11	Hadar	+0.61	Centaurus
12	Altair	+0.77	Aquila
13	Aldebaran	+0.85	Taurus
14	Antares	+0.96	Scorpius
15	Spica	+0.98	Virgo
16	Pollx	+1.14	Gemini
17	Fomalhaut	+1.16	Piscis Austrinus
18	Mimosa	+1.20	Crux
19	Deneb	+1.25	Cygnus
20	Regulus	+1.35	Leo

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