

in

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Chapter 1

in

1.1 SatTrack

SatTrack V4.0

What are SatTrack's Features?

Why SatTrack?

What About IFF.LIBRARY?

How do I register SatTrack?

How do I get started?

What is keyware?

What do I do if I have Workbench 1.3?

I have an alias to TZ, what do I do?

ORDER INFORMATION

SatTrack V4 is (C)

copyright

By Randy Stackhouse 1994.

Menus

Edit Windows

The Display

Color Files

SatTrack.lic File

Map Files

1.2 Time Zone Alias

SatTrack does not use the timezone alias. If this alias is defined, you will have to eliminate the alias before running SatTrack.

I will try to fix this in the next version of SatTrack.

1.3 Installing SatTrack V4 with Workbench 1.3

How to do it

The only problem with running SatTrack V4 with Workbench 1.3 is the usage of the `asl.library` from Workbench 2. Thanks to Nico François, Workbench 1.3 users can run SatTrack without this patch!

The patch requires two files:

`req.library` (placed in your `libs: dir` by `installlib`)
and `rtpatch` (the executable)

Read the instructions from Nico in the file `RTPATCH.DOC` for more information.

Installation is simple.

First run the SatTrack library installer from CLI with:
`execute installlib`

Next copy `RTPATCH` someplace where it can be accessed during your boot process. I suggest the `c:` directory.

Finally modify your `s:startup-sequence` to include the execution of `RTPATCH`. This is best done after the `WBSTARTUP` command.

1.4 SatTrack Features

SatTrack Features

SatTrack is a full-featured Satellite tracking program which uses mathematical formulas developed a hundred years ago. The program provides the ability to enter the numerical information needed to track any satellite that orbits the Earth. SatTrack can read both standards of satellite input format, as well as allowing for entering and modifying the information interactively. SatTrack allows for multiple databases, each with a capacity of 300 satellites.

SatTrack outputs the satellite information in several ways. First it can display the satellite information graphically on the Amiga screen. The display can be saved as an IFF picture for printing and modification using your favorite Amiga painting program (Dpaint, DigiPaint or one several public domain painting programs.) Information on satellites is also able to be written in a text form to a file or printer suitable for report generation or text editors.

SatTrack has the ability to simulate the tracking of a satellite from the future or past. This means that you can run SatTrack with a time and date of your choosing, either in the future or in the past. This allows you to quickly generate tracking information for events at other times.

Several new features are provided for Version 4.0 of SatTrack.

- o The overhead view, which provides for a sky view of satellites from your locations. This overhead view includes pointers of satellites that appear with a start of pass and end of pass time displayed.

- o Calculation of sun position. The position is displayed as a text string on the maps and as "N" for night and "D" for day after the time display.

- o The sun position is used to calculate illuminated satellites. The best time to see a satellite is when the satellite is in the sun and you are in the dark. Selection of the "Illuminated Only" menu option causes SatTrack to calculate and displays only satellites that are in sunlight and only display them when you are in the dark.

- o Line of Site calculations. Each satellite can be selected to only be tracked when they are within line of site of your QTH.

- o Amiga File Requesters are now used.

- o Support of RETINA display board. Setup_SatTrack program reads the Workbench screen size and creates a Sattrack Display according to the size.

- o Multiple satellite display lines. RETINA and hi-resolution displays can display more than one line of satellite information. The Setup_Sattrack program will determine how many lines can be displayed automatically.

- o Text showing the location of the satellite on the map.

- o Several other features...

=====
SatTrack also has a mode that alerts the user when satellite(s) of interest are within the range of possible viewing, or radio contact.

SatTrack is generally accurate to within about one half of a degree for satellites that have been described up to a year ago.

1.5 SatTrack Registration

SatTrack Keyware and Registration Information

This program is provided as KEYWARE. If you find the program useful and would like a permanent license, and for information on future updates and enhancements, you may become a registered user by sending your name and address plus \$20.00 to the author. (See the registration information file included with this program.)

DEMO keys of SatTrack will not track as accurately as registered keys, please beware of this when using DEMO keys.

Permission is granted for this software to be posted to bulletin boards, or similar public and private transfer methods, as long as all the files in the archive are kept intact. Please copy it anywhere that other Amiga users can be found.

DEMO keys of SatTrack can be provided with BBS or SHAREWARE DISTRIBUTION company information for advertizing your BBS or SHAREWARE business. Contact the author for more information, include 3 lines of ad information.

THIS SOFTWARE MUST NOT BE MODIFIED. MODIFICATION CAN RESULT IN INCORRECT TRACKING OF THE SATELLITES.

ORDER INFORMATION

1.6 Getting Started

=====

Getting started.....

Where to get information for tracking.

There are several great places that the needed information can be found to allow for tracking of satellites using this program. Keplerian (Kep for short) data is simply a set of numbers that describe the position of the satellite at a particular time. Below is a list of some places to obtain this data. They are updated weekly and daily for shuttles.

1) An Amateur (ham) Radio Operator. Kep data is broadcast over several different mediums in the amateur community. One is a digital mode of communication call packet radio. If you are a ham radio operator, check with your local club or several good articles in QST magazine. If not, you could contact a local ham club in the area, they will be more than happy to try to help you.

2) Contact NASA/Goddard. NASA provides a BBS that can be dialed up using your computer to obtain Kep information of any unclassified satellite. For more Information contact NASA at:

NASA/ Goddard Space Flight Center

Project Operations Branch 513

Attn: Orbital Information Group

Greenbelt, MD 20771, USA

3) Constant NASA/JSC (Johnson Space Center) at their BBS. To use the BBS, call (713) 483-2500. After connection to the modem, enter via your computer, 62511. This will connect to the BBS and allow you to register. At this writing, usage is free except for the toll of the call.

5) GENie, BIX and Compuserve. Users often provide information on current satellites via astronomy or radio BBSs or round-tables.

6) For shuttles, call the WA3NAN Goddard Radio Club at (301) 286-6673

1.7 SatTrack Keyware

Keyware and License information

SatTrack is provided as KEYWARE. KEYWARE is intended to provide you the best demonstration of the features of the program while still allowing for the support for further development. KEYWARE relies on a set of "keys" in a file that are verified by the program. Each set of keys is specific to the user. This tends to prevent the distribution of the software by licensed users, since the user's name, address and phone number is displayed during the startup of the program. DEMO keys are provided which will work but contain an expiration date. The SatTrack program will not operate after that date. DEMO keys also cause SatTrack to be more and more inaccurate as time goes on. (Registered users receive keys that NEVER expire, will work on ANY new versions and have NO REDUCTION IN ACCURACY over time) If you are interested in obtaining a registered set of keys, order early.

A short assessment of KEYWARE is provided:

- o Full features available, no disabled features in the demo.

 - o Copy protected via the display of the Licensees name and phone number. This tends to make users less likely to "loan" the software to other people when they cannot be sure that they will not in turn "loan" it to other people. Resulting in pirated software with YOUR name on it. Don't loan your license keys to anyone, don't take the risk.

 - o Registered users can get new versions automatically via GENie, BBS and other telecommunication methods. This assures the registered users' quick bug fixes since the author does not have to mail out copies to all the users. A new version can be installed using original set of registered keys, a registered user can obtain new version SatTrack via any means.
-

o Software key protection can be broken, if you have knowledge of:

Keplerian Orbital Mechanics, 68000 machine code, Key technology and any tricks by the author. Amiga users are some of the greatest computer enthusiasts in the world, only a certain type of person can fully understand the Amiga; a person like you. If you think you are qualified enough to break the protection schema of SatTrack, think about this; The efforts should take several hours at best. The completion of the task is always uncertain. If you think you can break in, consider spending your time producing a useful contribution to the Amiga. If you need ideas, give me a call, I have many. I don't have the time to produce them all, maybe you can!

CAUTION: attempting to change the keys or the address information will cause the program to abort or change several geographical or physical values resulting in incorrect tracking. DEMO keys will cause the program to become less accurate as time goes on. Consider becoming a registered user.

1.8 Order Information

ORDER INFORMATION:

There are two options when registering for permanent personalized keys. Personalized keys are all that you need to operate SatTrack. The SatTrack software will recognize that your new keys are permanent and enable all the features and accuracy required for tracking.

Registration is \$20 USA. Include your name, address and phone number along with registration fees to:

Randy Stackhouse

4 Sinclair Cir.

Indialantic, Fla USA.

32903

You will receive via US mail, information on how to install the keys that are also provided. Addresses and phone numbers must be verifiable. Include unlisted numbers, they will not be resold or released.

Optionally, include your GENIE, BIX or Compuserve address or fax number. If possible I will send the keys to you via these modes since they are usually faster than regular mail.

If you wish the most recent version of SatTrack, send a total of 25\$ US. This assures you the latest version of SatTrack and all needed files, including your personalized keys all delivered on a disk.

If you are outside of the United States, you must consider and include any extra postage required for delivery of your registration information. Include any special mailing instructions that are required for outside of the US.

Remember that a registered user will receive keys that never expire and will work on all future versions of SatTrack, regardless of the version.

1.9 Edit QTH

QTH Window

Using the Right-Amiga-Key along with the Q key, you can select the QTH window. QTH is an amateur radio term for home-location. Using the QTH window you can enter information such as your HAM call sign (or your first name if you are not a HAM). More importantly you need to enter your location on the earth. This location is described with longitude, latitude, altitude and the offset from GMT. Longitude and Latitude descriptions must also include a direction on the compass.

If you live above the equator, simple enter your Longitude as a positive value. If you happen to live below the equator you can either enter the Longitude as a negative number or enter it as a positive number and select the SOUTH radio button. If you choose to enter a negative value, SatTrack will change the value to positive and select the SOUTH radio button. Therefore after you enter your value you can check your information by viewing the positive number along with the SOUTH or NORTH radio button

SatTrack is "positive east", this means that Latitudes are entered as positive values for the "Eastern" hemisphere and negative for the "Western" hemisphere. If you live in the United States you should enter either a positive value or make sure that the EAST radio button is selected. If you live on the other side the prime meridian you should enter the value as negative or positive and select the WEST radio button

The UTC OFFSET is the final piece of information required to completely describe your location on earth. The UTC OFFSET should be entered as the number of hours difference between your time-zone and Universal Coordinate Time (UTC). The times for some selected times are: EST:5, EDT:6, CST:6, CDT:7, MST:7, MDT:8, PST:8, PDT:9. If you live east of latitude zero you should select a negative value. A value of zero will cause SatTrack to display all values for UTC time.

The final item in the QTH window is ALTITUDE. The ALTITUDE is your distance above "sea level" in meters.

SatTrack will save these values when you exit, therefore unless you need to change these values, you need not use the QTH window again. Remember, however, make sure that you change the UTC OFFSET in the event of daylight savings time.

1.10 screen_display

Screen Display

The SatTrack screen contains text information about the current satellite. The time is display at the bottom of the display. Time includes a "D" or "N". This represents "D" for Daytime and "N" for nighttime at your QTH This time is either the real-time as in real-time mode or the simulation time if SatTrack is operating in simulation mode. The satellite specific information include the Satellites Name, the orbit based on the displayed time. Also displayed is AZ for azimuth; this is the direction. (North equals 0, East equals 90 degrees, South equals 180 degrees and West equals 270 degrees). EL is the elevation of the satellite to you, a positive value means the satellite is above the horizon to you. Elevation is from zero at the horizon to 90 degrees if the satellite is directly above you. Range is the distance from you to the satellite in Kmeters. Height is the satellites altitude from the ground below the satellite to the satellite, the units is also Kmeters. Lat and Long is the position of the satellite, This is displayed using a number and the letters (N,S,E and W) SatTrack does not display negative values, The letter is used to eliminate any confusion about which hemisphere is negative. The United States is mostly W for west and N for north. Doppler is the offshift of the satellites frequency (as entered in the KEP EDIT Window) This off shift is measured in a difference from the frequency in KHertz. The phase is the relative to the satellite.

1.11 SatTrack Introduction

In recent years, many home computer enthusiasts have become interested in satellite tracking. Most of these trackers are amateur radio operators who are attempting to make two-way radio contact with the NASA Space Shuttle or the Commonwealth of Independent States' space station, MIR. Now, many people are attempting to track satellites to try and make visual contact. The Shuttle can easily be tracked and then seen, on a clear night, given the correct information, and this program.

Hundreds of other satellites are orbiting the earth, many are visible during the right conditions of location and the

position of the sun. The best viewing times are 1 hour before and after sun rise and sunset.

1.12 Menus

Menus

The Menus are standard Amiga Menus. They can be viewed by pushing and holding down the right mouse button. Most menu functions also have keyboard hot-keys which are listed to the right of each menu function item. All hot keys are used at the same time as the Right-Amiga-Key (RAK) as listed below.

PROJECT

EDIT

GLOBAL

DISPLAY

ALARM

PRINT

SCREEN

1.13 Project Menu

The project menu selections control input and output of information for SatTrack

PROJECT

Save Display

Save Keps DB

Load Keps DB

Print Keps

Input Keps

About

Quit

1.14 Edit Menu

The Edit Menu allows for user modification of Time, Satellite and QTH.

Edit QTH

Edit Time

Edit KEPS

1.15 GLOBAL Menu

This menu allows for global control of "radio buttons" for all satellites at one time. Selection of a sub-menu items cause modification of the selected option on the keys edit window.

Graph All On

Graph All Off

Print All On

Print All Off

Display All On

Display All Off

LOS All On

LOS All Off

1.16 DISPLAY Menu

This menu controls the displays for SatTrack.

Redraw

0 Longitude

90W Longitude

90E Longitude

OVERHEAD

1.17 ALARM Menu

options are planned for future upgrades.

Flash

1.18 PRINT Menu

The PRINT menu option contains two sub- items.

illuminated

print file

1.19 SCREEN Menu

upgrades should include more options.

To Back

1.20 Windows

Windows

SatTrack uses several windows to control, enter and display information for running. These windows can be accessed using the

EDIT
menu option.

License Window

QTH Edit

Satellite Edit

Time Edit

1.21 display

DISPLAY

The DISPLAY menu item has sub-items which control the world map display. SatTrack can display the world map in three different center points. The center can be placed at either 0,90 East or 90 West degrees or an overhead view. This allows hemisphere of the user to be centered in the display. Selection of any of there items causes history tracking to be erased.

1.22 PROJECT MENU

1.23 0_long

0 Longitude (RAK-0 0 longitude)

The 0 Longitude selection cause the map to be centered on the Prime meridian.

1.24 90e_long

90E Longitude (RAK-E East longitude)

The 90E longitude selection causes SatTrack to select the Americas. The display is centered on 90E longitude.

1.25 90w_long

90W Longitude (RAK-W West longitude)

The 90W longitude selection causes SatTrack to select the European to Asian section of the Earth. The display is centered on 90W longitude.

1.26 about

About

The about function displays information about the version and name and address of the author of SatTrack.
In case you were wondering, SatTrack is written by
Randy Stackhouse
4 Sinclair Cir
Indialantic Fla
32903

1.27 flash

flash (RAK-F Flash)

The Flash sub-menu items interact with the LOS Option selection for each satellite and the illuminate all option. If a satellite is within line-of-sight of the location stored in QTH, the satellite is said to be "visible". When a visible satellite has its LOS option turned on the display will flash or beep according to your Amiga Sound Preferences.

1.28 arg_of_perigee

Arg of Perigee: Argument of perfocus, The angle measured in the orbit plane from the line defined by the longitude of the ascending node to another line in the orbit plane, which contains the focus and passes through perifocus.

1.29 cat_number

Catalog Number: This is a number assigned to the specific orbiting object. This number will always be the same for the same object.

1.30 color_files

display_color.iff
save_colors.iff

The display_color.iff file and save_colors.iff files are used by SatTrack to allow you to define the colors uses for display and the SAVE DISPLAY sub-item menu command. The colors in the 00M, 90E and 90W are not used by SatTrack. The purpose of the display_color.iff file is to define the screen display colors. The IFF file can be edited by using your regular paint program. The file contains color boxes and text explaining the use of this color. Through your paint program you can change the colors that SatTrack will use for display. The save_colors.iff file is similar to the display_color.iff file except the colors defined in this file is used when saving the display to a file using the SAVE DISPLAY command. NOTE: Default colors selected for SatTrack were generated for minimal flicker for Amiga displays without video-enhancers.

1.31 Map Files

The files 00M.iff, 90E.iff and 90W.iff are Amiga IFF formatted graphics files. These three files contain the world map displays seen with the DISPLAY menu commands. If you wish you can edit these files to add any graphics that you wish, however do not move the location of the map information. Movement of the map information will cause SatTrack to track improperly.

1.32 copyright

Copyright

SatTrack is keyware. SatTrack may be freely redistributed without change or modification. It may be freely copied and distributed as long as there is no charge above a nominal fee for media and copying. SatTrack program and program files may not be modified or changed for personal use. Please upload SatTrack, along with all files, to your favorite BBS. No guarantee of any kind is given that the program(s) described in this document are 100% reliable. You are using this material on your own risk. SatTrack should not be modified. SatTrack is provided as key-ware, user registration is available.

1.33 db_entry

DB Entry #: a non editable display of the numerical location of the satellite in the database.

1.34 decay_rate

Decay Rate: or Drag; the effect of the drag on the satellite.

1.35 delete

DELETE Satellite: This button causes SatTrack to remove the currently displayed satellite from memory.

1.36 display_all_off

Display All Off

This option is the opposite of the Display All On. It will turn display of all satellites in SatTrack memory off.

1.37 display_all_on

Display All On

The display indicator allows for display of all SatTrack satellites in memory. The Display option control the text printout on the screen for a satellite.

1.38 display_sat

Display Satellite: When this radio button is selected, SatTrack will write the Satellites information on the screen as text at the bottom of the display.

1.39 eccentricity

Eccentricity: angle measured in the fundamental plane from the principal axis to a meridian which contains at its remote base point the outward projection (normal to principle axis) of the orbital object that circumscribes the actual ellipse of motion.

1.40 edit

EDIT

The sub items under the EDIT item allows for user editing of the particular date item. See the windows section of this manual for specific information on the sub-item.

1.41 edit_keps

Keop Edit Menu

The most commonly used window in SatTrack is the KEP EDIT WINDOW. This window is used to enter, delete or modify the information that describes the orbit of a satellite. The orbital values are listed below with a short description for your interest:

arg_of_perigee

cat_number

db_entry

decay_rate

eccentricity

element_set

```
epoch_rev  
epoch_time  
freq  
inclination  
mean_anom  
mean_motion  
new_sat  
  prog_files  
raan  
satellite_name
```

1.42 element_set

Element Set: a text string that describes the time that this keplerian element set was generated. For example, for shuttles the first set of information is JSC-001 for Johnson Space Center #1. JSC released the information. The element set is used to help you determine the difference between different measurements of the satellite. Any text can be used here.

1.43 epoch_rev

Epoch Rev: Rev for revolution. This is the orbit number, or the number of times the satellite circled the earth.

1.44 epoch_time

Epoch Time: This is the time that the other information was created for the orbiting object. The time is in modified julian in the format YYDDD.dddddddddd where YY is the year, DDD is the day of the year and dddddddddd is the number of hours, minutes, etc.

1.45 find

FIND Satellite: This button allows for quick search of existing satellites in the database. To assist in finding a satellite quickly, select this menu item and enter a satellite name or partial text string for the satellite in the "Satellite Name" area of the kep edit window. The first satellite name which matches the entered string will be displayed.

1.46 freq

Frequency: The frequency of the radio transmitter or receiver on the satellite. This value is used to calculate the doppler effect caused by the movement of you and the satellite.

1.47 global

GLOBAL

Each Satellite can be controlled independently of all other satellites in SatTrack memory.

This set of menu items allow for global control of all "radio-buttons" and their operations. These radio-button can be individually reviewed in the Kep Edit Window function. Sometimes the desire to change all the options of one type is required. These menu sub-items allow for the specified operation to be done to all satellites in SatTrack memory. The alternative is to run EDIT KEPS and manually change each one.

1.48 to_back

To Back

The TO BACK menu item causes the SatTrack screen to become the rear-most Amiga screen.

1.49 graph_all_off

Graph All Off

This item is the exact opposite of the Graph All On sub-item menu function. It causes all satellites in SatTrack memory to not plot on the world map display.

1.50 graph_all_on

Graph All On

Graph indicates that a particular satellite have its position plotted on the world map display. Selection of this sub-menu item causes all of the satellite in SatTrack memory to plot on the world map display.

1.51 edit_time

The Time Edit window allows many of the time controls within SatTrack. SatTrack usually operates in real-time mode, where the Amiga time clock is read and uses for tracking. This is selected using the USE CLOCK radio button. SatTrack also has a "simulation" mode where you can select a starting and ending time other than that of the clock. This allows you to run tracking information at some time in the future. This is helpful for determining when the satellite you are interested is visible. Add this feature with other SatTrack features such as the SAVE DISPLAY or PRINT FILE and you can generate and save tracking information of future events.

To simulate SatTrack tracking, there are two methods of entering simulation times; one is using a standard day, month, year and hour, minute time; the other is by using a year and Julian time.

Julian time is a real number that represents the number of days since the beginning of the year. The fractional portion of the Julian time is the hour, minute and seconds of the day. For

example, one second into January first is 1.0000115, noon on Jan 1 would be 1.50000. This along with a year describe the START or STOP time. Use the YEAR DECIMAL DAYS gadgets of the START DATE AND TIME to select a start time and the same gadget title under the END DATE AND TIME for selection of the stop time. Usually you would know the JULIAN star and stop date that you wished to run.

You can also run a simulation using the more standard date and time format. Select the IN MONTH/DAY radio button to indicate that you wish to run in simulation mode using the MM/DD/YY HOUR MINUTE start and stop time. MM represents the numerical representation for the month, January=1; February=2, etc. The hour is entered as a number from 0 to 23, minutes from 0 to 59. Enter the START DATE AND TIME as well as the END DATE AND TIME.

SatTrack will validate each gadget for valid values. A single invalid value will cause SatTrack to flash the display and clear out the offending gadget. Once all values are selected, click the close gadget to start the simulation. SatTrack will validate the completed time and if it finds an error it will flash the screen again. You will have to re-enter the TIME WINDOW to correct your values, upon entry to the TIME WINDOW, the mode will be reset to real-time as indicated by the selected USE CLOCK radio gadget.

Two other gadgets exist on the TIME WINDOW. These gadgets control the rate at which SatTrack updates the satellite data. The UPDATE RATE gadget controls the approximate time for all satellites that you have requested to be updated. If you have only one satellite selected and a UPDATE RATE of 3 seconds, SatTrack will attempt to update the satellite once every 3 seconds. If you have 3 satellites and have the UPDATE RATE value set at 3, SatTrack will attempt to update one satellite every second. Different Amiga processor will update at different rates. A 68030 w/ 68882 will fully update 60 to 80 satellites a second. A value of 0 for UPDATE RATE will cause SatTrack to attempt to operate at the fastest possible rate. This is usually preferred for simulation mode since the faster result is usually desired. For real-time mode, a value of zero will cause SatTrack to update satellites as fast as possible, however the time will not increment any faster than the Amiga clock time.

The final gadget on the TIME WINDOW is the SIMULATION CYCLE TIME. This gadget allows you to select the time increment for simulation. After the completed cycle of all operable satellites, the value specified in SIMULATION CYCLE TIME will be added to the current simulation time for the next iteration.

1.52 graph_color

GRAPH COLOR: is a color from 1 to 14 for the satellite to display for the history point and the text display. See the COLOR FILE for more information.

1.53 graph_sat

Graph Satellite: This radio button controls this graphing of the satellite position on the world map. Selection of this item will cause SatTrack to graph the satellite on the map.

1.54 iff.library

iff.library

The iff.library a public domain library created by Christian A. Weber of Zurich/Switzerland. Iff.library is provided to you along with all the documentation information provided in the original release. Copy the iff.library file to your LIBS: directory before using SatTrack.

1.55 illuminated

Illuminated Only (RAK-V Illuminated Options)

In order to actually look in the sky and see a satellite, the satellite, the sun and you must be in a specific position. The satellite must be "in the sun" and you must be "in the dark" This allow the satellite to be "illuminated". The Illuminated Only menu option allows for directing SatTrack to display only satellites that are illuminated. Selection of this menu option will cause only satellites that match the above criteria to be displayed, printed, or graphed.

1.56 inclination

Inclination: the angle between the orbit and equatorial planes measured in a plane perpendicular to a line defining the respective intersection.

1.57 input_keps

Input Keps (RAK-I Input)

Most satellite information that you will be able to find will be on computer bulletin boards or other external sources that result in a file. This file can be read directly into SatTrack using the Input Keps command. Valid file requester selection is INPUT. INPUT causes any keps already in SatTrack memory to be delete before the file requested is loaded.

There are two formats of satellite data that you will find from keps sources. One is called "NASA two line" format, the other is know as the "ARRL format". SatTrack is able to read both of these formats. SatTrack allows these formats to be mixed so if you happen use a terminal program to capture information in both formats, you need not separate them. Most terminal program's capture sessions also contain information text that is not related to the satellite information. (e.g. login information) SatTrack filters your file, ignoring all extraneous information.

Much effort went into making SatTrack understand the difference between satellite information and other information, but if SatTrack gets confused, you may need to edit out some of the non satellite information.

1.58 keps

Keps (RAK-K Kep Satellite Edit)

The Keps sub-item menu function causes SatTrack to enter the Satellite editing window. Satellite editing allows for viewing, adding, modifying or deleting any of the satellites currently in SatTrack memory. See the Kep Editing Window for more information.

See Edit KEPS

1.59 lic_window

License Window

The first window you will encounter is the License WINDOW. If you have not registered and installed your personal SatTrack keys, the License WINDOW provides information about how to register. Once you have registered, the License WINDOW will

present your information; that is, your name, address and phone number.

1.60 Input Keps

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Much effort went into making SatTrack understand the difference between satellite information and other information, but if SatTrack gets confused, you may need to edit out some of the non satellite information. clear this window, move the mouse pointer into the window and press the left mouse button. The window will disappear and you will now be in the running SatTrack environment.

1.61 load_keps_db

Load Keps DB (RAK-L Load)

Selection of the menu option informs SatTrack that the you wish to load a previously saved keps data file.

The Load Keps menu item allow the user to select a previously saved keps data base file and have it loaded into SatTrack. (See FILE SELECTION) The user may select LOAD to cause the database to be loaded. Selecting LOAD causes SatTrack to remove any previously existing satellites to be removed before the data

base file is loaded into memory. Remember that data stored in memory is not written to file unless you do a Save Keps DB.

1.62 los

Line of Site: This radio button controls special functions that operate based on whether the satellite is within "line of site" from your QTH (location). If the option is selected and the satellite is within "line of site" it will cause the FLASH functions to sound or flash the screen at each update. See the FLASH menu items. This button also controls special print functions. See the PRINT menu option for more information.

1.63 los_all_off

LOS All Off

This is the opposite of the LOS All On function. Selection of this sub-menu item will result in all satellites' LOS option being turned off.

1.64 los_all_on

LOS All On

This option sets the Line of Site (LOS) option on for all satellites. The LOS All On will cause all satellites to only be displayed when their elevation is greater than zero. This feature is used for radio-site tracking of satellites.

1.65 mean_anom

Mean Anomaly: mean motion times the ephemeris time minus the time of perifocal

1.66 line of site

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1.67 mean_motion

Mean Motion: Gravitational constant times the square root of latitude of the orbital object divided by semi-major axis raised to the 3/2 power.

1.68 new_sat

NEW Satellite: This button causes SatTrack to open a new location in memory for you to enter manual satellite information.

1.69 overhead

Overhead View (RAK-U West longitude)

The overhead view (or RAK-U for "up") provides a view of your "night sky". The view is that of a circle with which the center is directly above your location as specified in the QTH window. The Overhead view provides tracking of satellites which are within your home location's line of site. The overhead view is marked with "N", "S", "E" and "W" representing the north, south, east and west compass positions relative to your location. The Overhead view also contains 3 circles. Each circle represents a number of degrees elevation from your horizon. Zero is the horizon, 90 degrees is straight up, 30 and 60 are 1/3 and 2/3 the between the horizon and straight up.

1.70 print file

Print File (RAK-O Output Printfile)

The Print file option controls output to the preselected PRINT KEPS file. If the option is selected, any satellites which meet the selection criteria will be printed to the preselected file. This option allows the user to turn on and off printing to the PRINT KEPS file.

1.71 time

Time (RAK-T Time)

The Time window allows you to control the two tracking methods. The real-time tracking may be selected and a desired rate of satellite update may be selected. For simulation tracking you can select the start and stop time as well as the update cycle. See the Time Window section for more information.

See Edit TIME

1.72 print_all_off

Print All Off

This item is the opposite of Print All On sub-item menu function. It causes all satellites in SatTrack memory to not be printed if and when printing is enabled.

1.73 print_all_on

Print All On

Only satellites that have the Print indicator turned on will print to the output file when that option is requested. This sub-item causes all satellites in SatTrack memory to be set to

be printed when printing is enabled.

1.74 print_keps

Print Keps (RAK-P Print)

The print keps menu option allow you to dump all the satellite information to a human readable format. The execution of this command begins with a File Requester Window requests the user to select the file name where the keps should be written. The format of this file is compatible to the Input Keps function and can therefor be used as input to an INPUT KEPS command. This command can be used to verify, backup or transfer your database to PC based tracking programs.

1.75 print_sat

Print Satellite: Selection of this radio button will cause SatTrack to include this satellite in any printing activity. If the satellite meets the Line of Site or Illuminated Only option.

1.76 sattrack.lic file

SatTrack.lic

The SatTrack.lic file is a special file, specifically defined for each user. You need this special file configured with your name and phone number to prevent SatTrack from ceasing to operate at some time in the future when the DEMO license file expires. The DEMO license file also causes SatTrack to operate slightly off track of the actual satellite location. Registration as a user will get you the keys you need to 1) Have unlimited upgrades to SatTrack when they become available. 2) Never have SatTrack expire. 3) Cause Sattrack to be completely accurate. See the registration information in this document.

1.77 project

PROJECT

The PROJECT MENU provides control of all file input and output as well as system controls

1.78 qth

QTH (RAK-Q QTH)

The QTH is an amateur radio term for home. The QTH window allows you to enter your location in the world. Your location in terms of Latitude and Longitude and Altitude and your time-zone as a difference from GMT. See the QTH window section for more information.

See EDIT QTH

1.79 quit

Quit

The Quit menu option causes SatTrack to exit. SatTrack will not prevent you from quitting before saving changes kept information. The QTH file will be written out if you changed the QTH via the QTH menu option.

1.80 raan

R. A. of Node: Right Ascension, The angle measured in the plane of the equator from a fixed inertial axis in space (vernal equinox), to a plane normal to the equator (meridian) which contains the object.

1.81 redraw

Redraw

Redraw will simply redisplay the current selected map file, erasing all satellite history points.

1.82 satellite_name

Satellite Name: This is the name of the orbiting object, any name less than 15 characters is acceptable.

1.83 save_display

Save Display (RAK-G Graph)

Selection of this menu option tells SatTrack you wish to save to a file the current display as an IFF image. Upon selection of this menu, SatTrack presents the File Selection Window. Through this window you are able to select the file name that SatTrack will write out the display. Selection of either NEW or ADD will result in saving of the graphic display to the file specified. The colors saved with the file are specified in the IFF file "SAVE_COLOR.IFF" See the SAVE_COLOR.IFF file reference for more information on the colors used in the SAVE DISPLAY command. Selection of the printer device will not cause the graphics to be printed, you must use a paint program or the Commodore DUMPGRAPHICS program.

1.84 save_keps_db

Save Keps DB (RAK-S Save)

Execution of this menu option causes SatTrack to save all satellite information stored within its memory to a SatTrack Data base file. Selection of this option causes SatTrack to open a File Selection Window. Using this window you are able to

select the file where you wish the SatTrack memory information to be saved. After selecting a file name you select either WRITE. WRITE causes any information within the Data base file to be written over by current data within SatTrack. SatTrack Data bases contain extra information that raw data files don't contain. Data bases contain all the information seen in the kep edit window display. Use of SatTrack Data bases is the preferred way to store satellite information.
