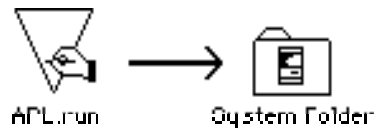# HST GROUND TRACK MAP

HSTMAP is a RunTime APL.68000 Application, and requires an APL.68000 interpreter (provided with HSTMAP) to execute. If you intend to keep HSTMAP on your system's hard drive, then you may want to copy the APL.68000 interpreter (the file APL.run) into your system folder.
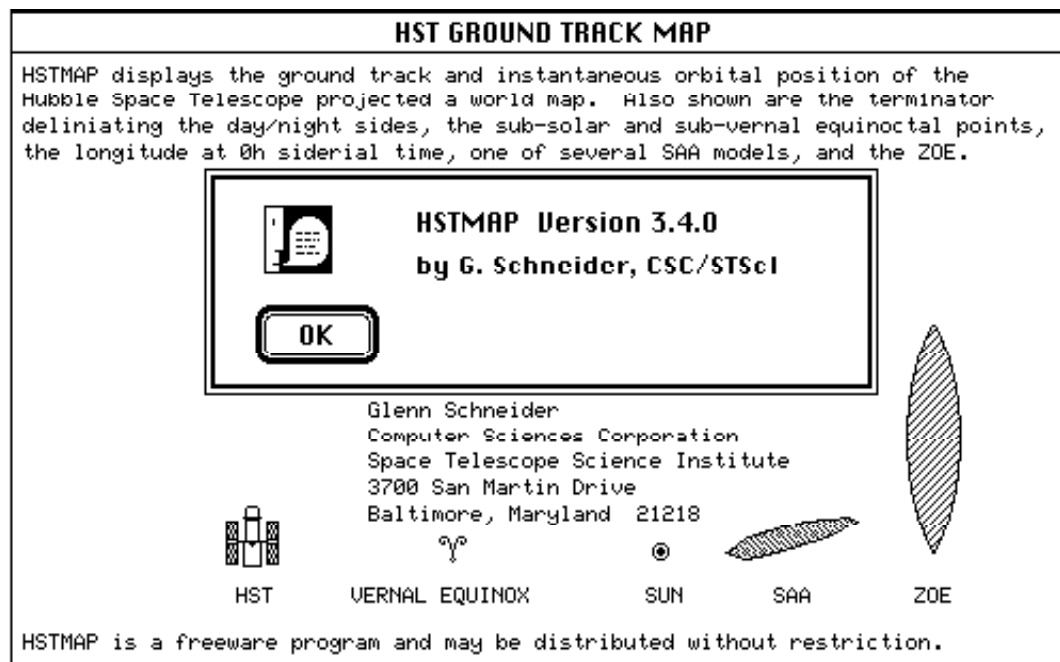

Of course, you may elect to run HSTMAP from a floppy disk. Moving a copy of APL.run into your system folder is not necessary, but it probably the most convenient way to set up the environment in which HSTMAP runs.

To run HSTMAP just double click on the HSTMAP icon:

The HSTMAP and APL.68000 menus, along with an HSTMAP window and introductory dialog will be presented on your screen.

After clicking OK, a second dialog will be presented which will allow you to specify the time zone correction to be applied to your Macintosh's system clock (HSTMAP does everything in U.T.).

U.T. = SYSTEM CLOCK TIME + [+5] HOURS

[CANCEL]   [OK]

Next you must specify a set of orbital parameters for HSTMAP to use. The set of parameters in the default dialog will allow HSTMAP to produce accurate results for mid-August, 1990. Note that there is an unpredictable in-track (one sigma) error in the orbit determination of HST of about 3 minutes of time per week. This will require, periodically, updating the orbital parameters used by HSTMAP. The new set of parameters will be posted on a, roughly, weekly basis on the INTERNET network news, node=stsci, newsgroup=sci.astro. Alternatively, users without INTERNET access, but with access to other networks may arrange to have orbital parameter updates sent to them via e-mail.

```
ORBITAL NUMBER   1682          ◉ SPSS     YYYYMMDD      HHMMSS.f
                                 EONOON    19900815      135601.0

         YYYYMMDD    HHMMSS.f    ○ nss      YYYYMMDD      HHMMSS.f
EASCNCR  19900815    124219.0      EODAY    19900126      221017.4

         YYYYMMDD    HHMMSS.f                YYYYMMDD      HHMMSS.f
EASCNCR+1 19900815   141907.0     EONIGHT   1900129       234958.4

NODAL REGRESSION RATE   -6.34944  Deg/Day        ☐ SAVE SETTINGS
◉ USE CPU CLOCK                                  ○ GET SETTINGS
         YYYYMMDD    HHMMSS.f
○ USE U.T. TIME->  1990818   153000.0       [CANCEL]   [OK]
```

You may save the entered parameters in a "settings" file for future use by clicking the SAVE SETTINGS box and then OK. Previously saved settings may be restored by selecting GET SETTINGS. In that case, to use those settings you will have to click OK three times. The first time acknowledges the request to get the saved settings. Those settings will then be displayed after a standard file dialog is presented to allow you to specify where to get the settings file from. The second OK click tells HSTMAP to transfer these values into the current input window and to compute derived parameter values. The third OK click will exit the input dialog.

Any of the South Atlantic Anomaly (SAA) models currently defined in the Project Database and used by the Space Operations Ground System/Science Planning and Scheduling System (tabulated below) may be overlayed on the HSTMAP display. The desired model is selected through the dialog shown below, right.

MODEL /CONTOUR DESCRIPTION	Flux (CM*2-S)$^{-1}$	Energy(MEV)
02 FGS Continuous Operation (Safety) CARD		
03 FOC Normal Operation (Safety) memo 7/20/89	> 10 ELECTRONS	> 3
04 FOC Health and safety cf CARD 2.4.2.19	> 200 ELECTRONS	> 3
05 SAA Performance (O.L.D.) 1/05/08	> 10 PROTONS	>10
	or >1000 ELECTRONS	> 0.5
06 FGS Performance (O.L.D.) 1/05/08	> 10 PROTONS	>10
	or >1000ELECTRONS	> 0.5
07 Non-SAA Continuous Operation (Performance)		
11 S/C (PCS w/o FGS) Continuous Operation		
13 FGS Operation (Newly Added)	>1000 PROTONS	>50
	at 600 KM	

```
┌─────────────────────────────┐
│ SAA MODEL TO DISPLAY        │
│ ◉ -- NONE                   │
│ ○ 02 FGS Safety             │
│ ○ 03 FOC Performance        │
│ ○ 04 FOC Safety             │
│ ○ 05 SAA Performance        │
│ ○ 06 FGS Performance        │
│ ○ 07 NON-SAA Perform        │
│ ○ 11 S/C (PCS w/o FGS)      │
│ ○ 13 FGS Performance        │
│ ┌─────────────────────────┐ │
│ │        CANCEL           │ │
│ └─────────────────────────┘ │
│ ┌─────────────────────────┐ │
│ │          OK             │ │
│ └─────────────────────────┘ │
└─────────────────────────────┘
```

The HSTMAP display will update approximately once every 30 seconds on an unencumbered Macintosh SE. Display and orbital parameters may be altered while HSTMAP is running through the items on HSTMAP menu. HSTMAP will take several seconds to respond to a menu input request.

The HSTMAP screen display may be routed a printing device which has been selected via the Apple Chooser. To do this, select PRINT MAP from the HSTMAP menu. Following this, the next screen output will be diverted to the printer. The printed output will be formatted in accordance any setups previously specified by the PAGE SETUP in the FILE menu. In an effort to conserve Laser printer toner cartridges, and printer ribbons, the nighttime portion of the Earth is not presented as black (inverted) when printed. The terminator is heavily delineated, and the nighttime portion of the Earth is easily inferred as it is on the opposite side of the terminator from the Sun. The HSTMAP window will be refreshed after the output has been routed to the printer.

HSTMAP may also be used to produce a tabular listing of the ground track of HST (Latitude and Longitude) as a function of time. This tabular listing may be sent to a generic TEXT (ASCII sequential) file, or directly to a printing device. To do this select TRACK TABLE from the HSTMAP menu. A dialog will be presented (shown at the right), which will allow you to specify the number of points along the track to tabulate, the time increment between points, and whether the output is to be printed or saved as a TEXT file. The U.T. of the first entry in the track table will be the time as specified in the orbital parameter input dialog, which has already been discussed. If the output is to go to a TEXT file, a standard Macintosh file dialog will be presented to allow you to specify the destination for that file.

Number of Points	30
Increment	2.00 Minutes

OUTPUT TO:

⦿ Text File   [CANCEL]

◯ Printer   [OK]

To exit from HSTMAP select the QUIT item on the bottom of the HSTMAP menu.

Questions and/or comments should be e-mailed to SCIVAX::GSCHNEIDER, or sent to:

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Computer Sciences Corporation
Space Telescope Sciences Institute
3700 San Martin Drive
Baltimore, MD 21218 USA

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