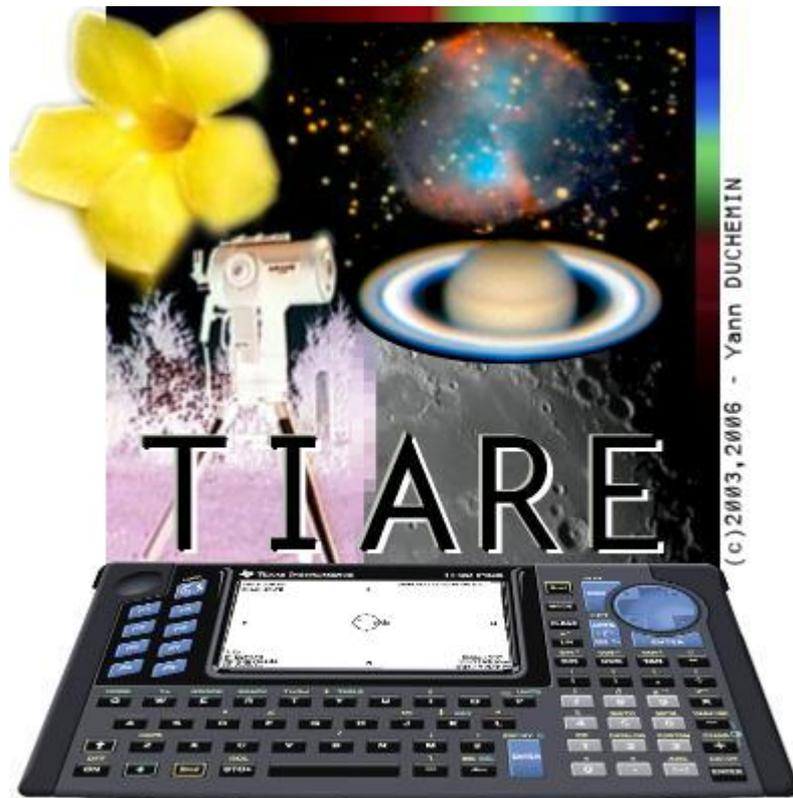


User's Guide

version: 0.06



For
TI89 – TI92(+)- V200
calculators

Many thanks to :

*The Sun,
The Air,
The Water*

and the Nature in general, to accord us the curiosity and sometimes the comprehension. Our planet is beautiful, take a short time to think about the Univers... save our Planet.

And (not in order)

*Claude DUPLESSIS,
Paul SCHLYTER,
Patrick CHEVALLEY,
Christian BUIL,
Jean MEEUS,
Kevin KOFLER,
Rusty WAGNER
Peter DUFFET-SMITH*



for their basics ressources

Contents

1 TIARE – Ephemeris for TI Calculator.....	4
1.1 Summary of capabilities.....	4
1.2 Installation.....	4
1.3 Launching.....	4
1.4 Calculators keys.....	5
1.5 Configuration.....	5
1.6 Uses.....	6
2 A brief menus' description.....	7
2.1 Graphic view.....	7
2.1.1 Moon.....	7
2.1.2 Jovian's Sat.....	7
2.1.3 Saturn.....	8
2.1.4 Mars.....	8
2.1.5 Sky.....	8
2.2 Ephemeris.....	9
2.3 Calendar.....	10

1 TIARE – Ephemeris for TI Calculator

Tiare is an astronomical ephemeris for Texas Instrument calculators. This version is in developpement to test some features and capabilities before the first release. Probably some screens could be different a few, because I've only a TI92+, and this software is primary for my use. For this reason, I've preferred to use the GNU GPL Version 2.0 license, this one permit to you any modifications for your conveniences. Just a remark about this project, I'm not a programmer, and the english language wasn't mine ;o)

1.1 Summary of capabilities

Tiare is made to give you some practicals informations to preparing or verifying yours observations... For example rises & sets' of major objects (like Sun, Moon), planets' elements (like apparent diameters, events), and in the futur many specials features like a special events calendars or managing your telescope with calculators ! I hope that you enjoy it, and help me to improve it.

1.2 Installation

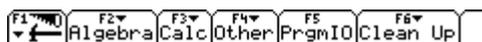
To install Tiare on your calculator, you only need to have a connection kit cable for your computer. To upload the correct file onto your calculator, read your software documentation and choose the correct file, for example :

- *tiare.89z* & *tiare_.89z* for a TI89
- *tiare.92z* & *tiare_.92z* for a TI92 and TI92+

Please verify before to use that you've enough free memory to execute AND use.

1.3 Lauching

Just to strike « tiare() » from your installation directory on the screen calculator :



```
tiare()  
-----  
MAIN          RAD AUTO          FUNC 0/30
```

If all works fine, you must obtain a similar screen :



1.4 Calculators keys



It's really easy to navigate inside the software, just to use the classical keys. Also to fill some dialogs boxes, you can use the numericals keys, and « ENTER » or « down arrow » to go to te next field.

1.5 Configuration

To use properly Tiare, you must give some observer parameters like time and observer coordonates. At this time, you must only use one site. Theses parameters are save in two files, respectivly named :

- **ficht** for the time
- **fichtp** for parameters
- **fichl** for the observatory

Naturally if you delete theses files, you must entered again the concerned informations ! Here, the window to configure the date and time observation :

TYPF + [ENTER]=OK AND [ESC]=CANCEL

DD: is the DAY (1 to 31)
 MM: is the MONTH (1 to 12)
 YYYY: is the Year (Around 1900 to 2100 not far)
 HH: is the HOUR (0 to 23)
 MM: is the MINUTES (0 to 59)
 SS: is the SECONDS (0 to 50)

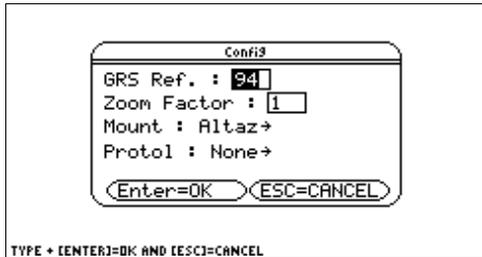
TYPF + [ENTER]=OK AND [ESC]=CANCEL

Longitude in DMS format (-90 to 90°)
 Latitude in DMS format (0 to 360°)
 Alt : ALTITUDE in meters
 GMT : Time Correction in reference to Greenwich (tz)

Example : If you observe from Geneve (46° North, 6° Est) Latitude and Longitute are positives

Long: 46°12'26" , Lat: 06°09'01" , Alt: 375 , GMT:1

-It's assumed that EST is positive, WEST is negative, NORTH is positive and SOUTH is negative -



Red Spot Ref.: is the latest meridian reference for the Great Red Spot on Jupiter. More information are available on

http://skyandtelescope.com/observing/objects/planets/article_107_1.asp for example, year 2006, 104° seem to be a good value.

Zoom factor: is uses for the gfx views (integer, up to 5)

Mount: Here you can choose between Altazimuta, Equatorial or German mount type.

Protocol: The list show the differents protocols whose are supported. If you doesn't want a minimalistic Goto choose none. (not implemented yet!)

1.6 Uses

For this software I had to choose some parameters to print or enter datas. I propose to you a reference table here :

Name	Format
DATE	Year / Month / Day , Hours / Minutes / Seconds YYYY/MM/DD HH:mm:ss
COORDINATES	Degrees, Minutes, Seconds internally converted in decimal degrees.
Notations	
δ	Declinaison in DMS
α	Right ascension in HMS
ϕ	Apparent diameter in arcseconds
ψ	Object phase in degrees
λ	Central meridian longitude in degrees
τ	Illumination in percent
ρ	Position angle in degrees

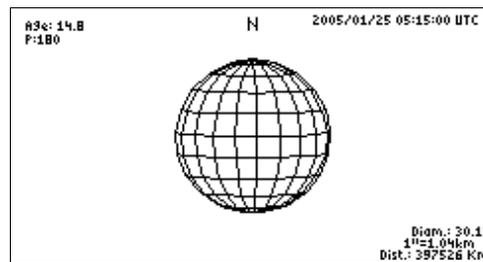
2 A brief menus' description

2.1 Graphic view

In this menu you can see a low resolution image for certain calculation. The first is for the Jovian's moons and his red spot, but please take a rounded time for your observations, it's not a really fine drawing. So, the alphanumeric informations are more interesting.

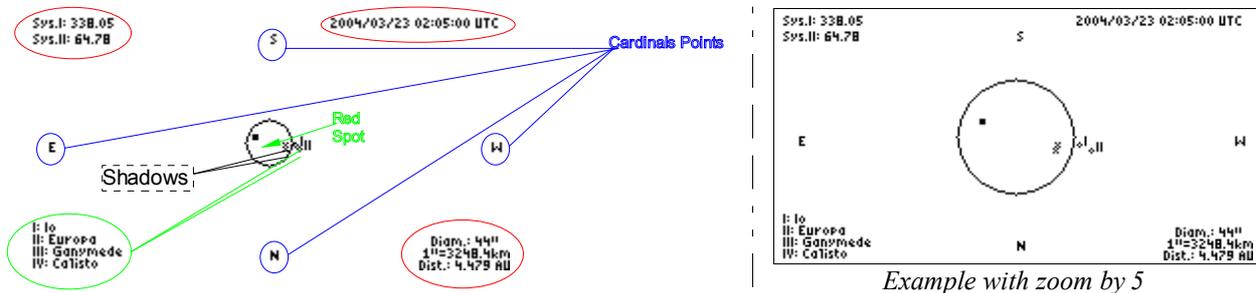
2.1.1 Moon

Just to view the moon appearance for the current date, example :



2.1.2 Jovian's Sat.

Take a look of this example for the 23rd march 2003 at 02:05 UTC (Zoom X2):



The graph is always centered around Jupiter, it's mean that your view doesn't have the same field during the different visibility period. The most important informations are surrounded in red.

On the top left corner, you can see the meridians position in the two major systems :

- Sys I for the equatorial zone
- Sys II for the north or south zones

The Sys III, corresponding at the magnetic meridian it's not researched at this time.

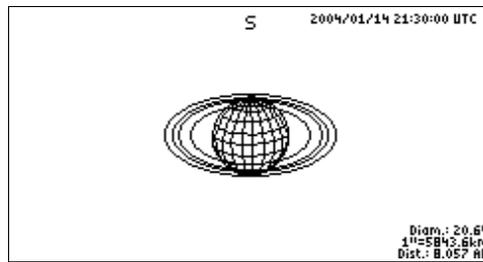
On the top right corner, it's the observation date's remainder.

In the bottom right corner, you can find the apparent diameter in arcseconds (a good information for the scale's screen !). Also, a simple transformation of the arcseconds in kilometers and the distances from the Earth in astronomical units. The zoom parameter is used here, and a good value is by 2.

In this version, the shadows' planetary aren't considered in the calculation, be careful when a moon appear from behind the Jovian disk umbra !

2.1.3 Saturn

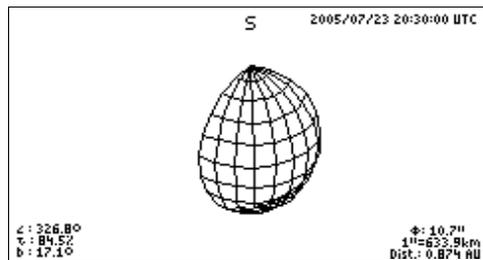
Here it's only the Saturn appearance with her majors rings :



The separation between each rings is voluntary exaggerated due to the limitation of the calculators screen resolution.

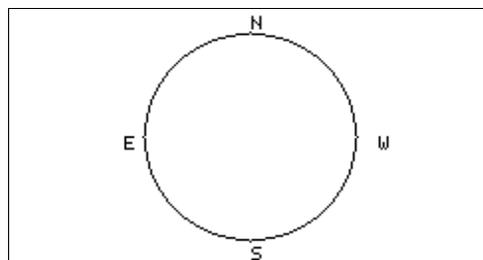
2.1.4 Mars

Always the same with Mars planet and some interesting informations :



2.1.5 Sky

It's a complete sky view with only the most brilliant stars and objects. In this version, **this function is also locked because I don't have enough memory to do it.** In fact, this latest beta version, is a sort of algorithms « patchwork » to test them, the next step will be to clean all my code and improve the results. It's the same for the user object tracking (comets for example).



2.2 Ephemeris

Here you can find the major informations for the solar system's planets. It's displaying for the Sun, Moon, Mars, Venus, Jupiter, Saturn their :

- Earth & Sun's distances
- Declinaison & Right Ascension
- Azimuth & Altitude
- Apparent diameter & phase (if existing)
- Rise & Set times

In smallest on the bottom left on the screen your LST for the Local Sideral Time and remaind the time that you've entered before (in universel coordinated time).

Look this example for the Sun:

```
Earth Dist.      Sun Dist.
1.0163 AU        0 AU
δ                α
23°26'15"        06h02m21s
Az.              Alt.
306°44'29"       00°33'03"
Rise:03h58       Set:20h13
+ :31.5'         ψ:90°
LST:13h58m56s
UTC:2005/06/21 20:00:00
```

In second way and only for some objects you'll have a special screen with more informations. In the Jupiter's case the program give to you the UT times for the Red Spot transit :

```
RS Transit:
> 01:41
> 11:36
> 21:32
```

2.3 Calendar

The calendar is still under developpement, but in this version it's permit to you to see the month of the current date enter in the corresponding menu. The date is remain in the fraction format and also the date is given in julian day.

Here an example :

2004/12/26 05:16:7 JD: 2453366.354167		DEC 2004					
Mon	Tue	Wed	Thu	Fri	Sat	Sun	
		01	02	03	04	05	
06	07	08	09	10	11	12	
13	14	15	16	17	18	19	
20	21	22	23	24	25	26	
27	28	29	30	31			

Please, don't forget to visit the TIARE's website for the new version, I can work about it only for some days per year. So if you have some remarks, coments, or if you want help me, write me :o)