

Library 543: TreeBrowser

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1. Disclaimer & Copyright

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2. Credits

Thanks to ACO for the HP 49G, Wolfgang Rautenberg for OT49, Eduardo M. Kalinowski for "Programming in System RPL", Mika Heiskanen for BZ and various post from different authors in comp.sys.hp48. Without them this program couldn't been written.

3. System Requirements & Installation

3.1. System Requirements

Library 543: TreeBrowser has been coded and compiled with Debug4x and is written in System RPL. It was tested with ROM 1.22 in RPN-Mode.

TreeBrowser requires at least ROM Version 1.19-6 and runs on the HP 49G and on the HP 49G+ / HP 50G.

3.2. Installation & Deinstallation

Transfer Library 543: TreeBrowser to your HP 49G and store it in a port. After a warmstart the library will be attached to {HOME} and is available.

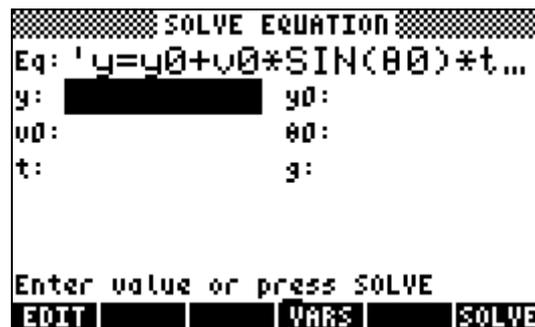
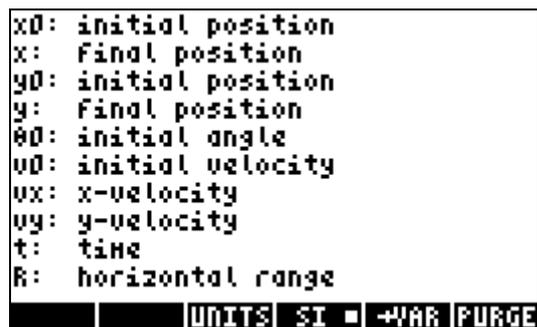
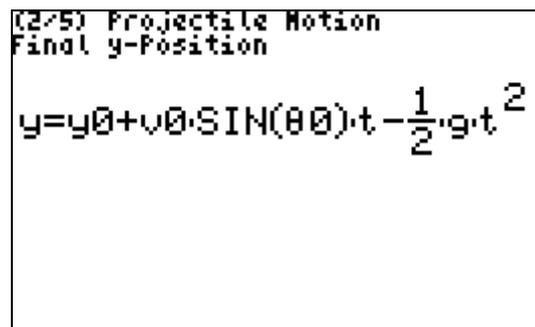
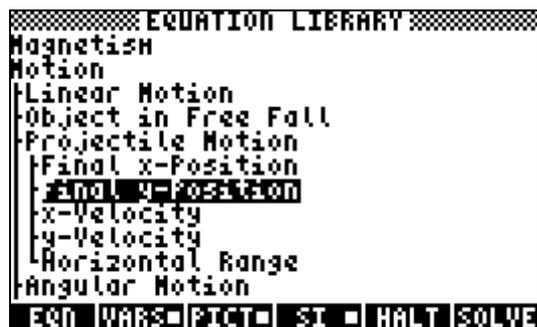
To delete the library either use the FILE MANGER or the command

```
:P#:543 DETACH      ( P# is the port number the library is stored in )
:P#:543 PURGE      ( so this is either 0, 1 or 2 )
```

4. Using The Library

4.1. Overview

TreeBrowser supplies an easy to use graphical environment for collections of formulas and shows them in a tree structure. The equations are passed to the built-in SOLVER of the HP 49G/49G+ for solving. TreeBrowser allows you to create your own collections of formulas easily and quickly. TreeBrowser supports an unlimited depth of the tree and supports units for the equation and pictures.



4.2. Using TreeBrowser

The library itself does not contain any executable commands. To use and run TreeBrowser one needs to provide the needed arguments on the stack.

TreeBrowser expects the following arguments on the stack (the arguments are not checked, the user or the program calling TreeBrowser is responsible for providing the correct arguments):

Level 5 { Picture List } empty list ({ }) if you don't want to provide any pictures
Level 4: { Data List } The numbers of items
Level 3: { "Variable" "list" "for" "Tree Browser" } in both lists must be the
Level 2: "Title" same !
Level 1: Binary Integer (BINT), a real number or a ZINT which represents the first
item to be shown (the first item is numbered as 1)

One starts the TreeBrowser with ROMPTR 21F 0 or with # 21F000h LIBEVAL.

The arguments for TreeBrowser can be supplied through a library, a directory or a program.

4.3. Example Of A Data-Set

{ Data-List }

The data structure must at least contain one main level and a level below this one. Below the level which contains the equations no sub-levels are allowed.

The depth of the list(s) and the number of items is only limited by memory and speed of the calculator. The last entry of a sub-level is either an equation or a program which creates an equation. If you provide a program which tests system flag 13 it is possible to have two different appearances of the equation.

```
{ "Variable" "list" "for" "TreeBrowser" { "optional" "unitlist" "for" "variables" } }
```

It is important, that the list of main items and the list of variables contain the same number of entries because the list of variables is used to determine the number of entries TreeBrowser will show!

If one wants to use units the last entry of the variable-list is an extra-list which contains the units as strings as they are keyed in on the command line. If there are units you need a string as a unit for every variable. If one variable has no unit "-" is expected as a placeholder. It is possible to have alternative units, so one can provide SI units and English units. In this case one needs exactly twice as much entries as there are variables, the fore part of the units-list are SI units and the rear part are English units.

As a divider between the name of the variable and the description of the variable a colon (:) or the equal sign (=) is used. If the description of the variable is longer than one line the following lines have to begin with space and as a placeholder in the units-list the nullstring ("") has to be used for this lines.

If you don't want to use a list of variables at all you need at least a list containing as many empty strings { "" "" "" "" "" "" "" "" "" "" ... } as there are entries in the list of main items.

The depth of the list of variables is independent from the depth-levels you provide for your data list but it can't be deeper than the data list. You can provide a different list of variables for each sub-level data list entry, but it is not possible to provide a list of variables below one. If you have a sub-level below, the variable list above will be shown.

{ Picture-List }

The structure of the picture-list is the same as the structure of the list of variables without the unit-list. If you don't want to provide any pictures at all use an empty list as argument ({}).

The picture-list contains a GROB (Graphic Objects) where a GROB should be shown and the real number 0 (0.) if no picture is shown.

Keep in mind, that you have to provide a list with the same number of entries for the list of variables and/or the picture list as there are entries in the current depth if you want these lists shown together with the current depth.

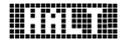
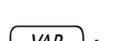
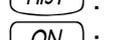
This probably sounds quite theoretically so it might be a lot easier to have a look at an example. Examples are shown in the files Variablen.S and Einträge.S which are best viewed if you open the file TestDaten.HPP with Debug4x.

Or, as an alternative, load an existing data-set in your calculator and disassemble it to have a look at it.

4.4. Used Keys

The following keys are used by the TreeBrowser.

Keys while the TreeBrowser is active:

-  : opens a tree
-  : closes a tree
-  : shows the equation if there is something to show and if one is on the lowest level
-  : shows variables (if there are any)
-  : shows picture (if there is any)
-  : sets or clears the user flag for using units with SI units (user flag 60 and 61)
-  : sets or clears the user flag for using units with English units (user flag 60 and 61)
-  : shows help for TreeBrowser
-  : temporary stops the TreeBrowser and gives access to the normal user stack. One has complete control over the calculator at this point. If an error happens by another program, for example, which is not covered by TreeBrowser your calculator may crash. The purpose of these functions is to allow simple calculations so that it is not necessary to leave TreeBrowser for this.  CONT brings you back to the TreeBrowser.
-  : starts the solver if one is on the lowest level and the equation contains =. System flag 30 controls if the solver of the HP 48SX or the solver of the HP 48GX is used.
-  : starts the Multiple Equation Solver, all equations of the lowest level are grouped together. The equations should be related by topic to each other if you want usable results (also see user guide of the HP 48GX).  CONT brings you back to the TreeBrowser.
-  : double click opens or closes a tree
-  : starts the solver if the equation contains =
-  : toggles between the way equations are shown, if you provide a program which tests system flag 13 it is possible to have two different appearances of the equation.
-  : opens a choose box to select the equations which will be passed to the Multiple Equation Solver.
-  : shows variables (if there are any)
-  : shows picture (if there is any)
-  : ends TreeBrowser
-  : opens or closes a tree

    : arrow keys to navigate or to move the screen

  : one page up

  : one page down

  : first entry

  : last entry

  : move screen to the right

  : move screen to the left

 : choose font

 : toggle fonts

 : hide / show title

 : hide / show menu

 : integrated help

Keys while an equation is shown:

 : previous equation

 : copies the current equation to the stack

 : next equation

 : toggles between big and small appearance of the equation (changes system flag 80)

 : leaves the equation view and jumps back to the TreeBrowser

 : previous equation

 : next equation

    : arrow keys to navigate or to move the screen

5. Things To Do

Support for animations for a future release is planned. It might be necessary that further arguments are needed to run TreeBrowser.

6. Version History

01.02.04	Version 1.0	First public version.
28.06.04	Version 1.1	Added support for showing pictures.
22.07.04	Version 1.2	Added support for units and the Multiple Equation Solver.
18.01.05	Version 1.7	Extension and adjustment in conjunction with TreeBrowserBuilder.
02.03.05	Version 1.8	Minor code optimization.
12.03.05	Version 1.9	Bug fixes.
30.08.05	Version 2.0	Adjustment to ROM 2.00 for the HP 49G+ and speed optimization. Bug fixes for the HALT-Environment.
21.09.05	Version 2.1	It is now possible to enter all values for the integrated solver in the command line. The fields of the form will then be filled with these values. Units may be stored in the message table of a library. A data list below the main level may be referenced through a ROMPTR.
27.10.05	Version 2.2	Bug fixes.
31.12.05	Version 2.3	Bug fixes.
01.09.06	Version 2.4	TreeBrowser Development Edition.
08.01.07	Version 2.45	Speed optimization, computation of the cursor and cleaning of the screen is now done in machine language.
13.02.07	Version 2.5	On ARM-processor-based machines the program starts with 203 MHz.
08.05.07	Version 2.6	Bug fixes, the modification of the solver while system flag 30 is clear lead to a crash if stored in port 2. Reduced soft menus to one page.
18.06.07	Version 2.7	Added help.
11.09.07	Version 2.8	Added support for dynamic soft menus, different font sizes, full screen mode.
18.12.07	Version 3.0	Bug fixes.
22.11.09	Version 3.10	Bug fixes. Adaptation to ROM 2.15.

7. Known Bugs

Fixed in Version 1.9
Fixed in Version 2.0

Pictures are not shown while an equation is shown. An empty picture list leads to a crash if in this case a picture should be shown.

The Multiple Equation Solver, the solver of the HP 48SX and the HALT-Environment are based on the same program code. Errors can happen in this environment which are not fully covered. Entering KILL, terminating the environment after ending a probably unstable application or terminating the environment while TreeBrowser was called from the File-Manager leads to a crash.

If the first item is above the number of lines that the screen shows (8 lines on a HP 49G and 11 lines on a HP 49G+) and if there are more than two screens the program crashes.

Fixed in Version 2.2

While changing the screen by using the page up or page down function the shown item does not match the corresponding data-set.

Fixed in Version 2.3

An error in the command line of the solver ends the TreeBrowser.

The built-in application TABLE ( ) crashes the calculator if run from a Parameterized Outer Loop (TreeBrowser runs as a POL) that prevents further suspended environments using 'HALT'. In this case the stack will be restored in the state it was before entering the HALT-Environment. This is, in my opinion, a bug in the OS, because it can be reproduced with built-in input forms.

Fixed in Version 2.4

While showing an equation pressing the softmenu-keys  –  leads to a crash. If the solver of the HP 48SX (flag -30 set) is active and units are chosen the program crashes.

Fixed in Version 2.7

Not enough free memory while starting the Equation Solver leads to a crash.