

HP-48G Series Calculator Appendix

Programs listed below are referenced in the *HP-48G Series Graphing Calculator Instructor's Guide* whose chapters are available at this web site. The programs appear in the order in which they appear in the directory listing given below. Programs should be transferred to your calculator via infrared transmission using the I/O mode of HP-48, using Kermit™ for a PC or Macintosh computer, or with the HP Serial Interface Kit for either of these type of computers. The HP Serial Interface Kit is available at the Hewlett Packard web site. Typing the programs into your calculator should be a last resort – this process is quite time consuming and even one misplaced symbol will cause the program not to run. If necessary, refer to your owner's manual for instructions on typing in the programs or transferring them via infrared transmission from another calculator.

The directory containing all the programs is called CALCC. The suggested directory structure for CALCC is listed below. Any program called by another program must be included in the same directory as the 'calling' program. Some of the programs listed below function only as subroutines of other programs. (Remember that the subroutines must be included in the same directory as the program using them.) All programs should execute properly if you use the directory structure listed below. The order of the programs within each directory is not important. Any other items in your directory should go at the end of each menu. Note: The menu items ending in *par* will be created as you use the other programs.

The FIT subdirectory should contain the following programs:

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The NDIF subdirectory should contain the following programs:

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The NUINT subdirectory should contain the following programs:

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The SREG subdirectory should contain the following programs:

The LOGIS subdirectory should contain the following programs:

PROGRAMMING NOTES:

- Hewlett-Packard calculators distinguish between upper- and lower-case letters. If you are typing in the programs that follow, be certain to match the case shown in the program.

Lower-case letters are obtained by pressing α \leftarrow followed by the desired letter key. Spaces between symbols are also important for correct execution.

- If you cannot find a particular command in a menu, consult the Appendix in your owner's manual. Also, you can type any command on the HP-48 using the keyboard keys and it will be recognized by the calculator.

You will find it convenient to have program STPLT in several of your directories. (Reference the organizational chart at the beginning of this Appendix.) If you are typing in these programs, after creating those directories, copy STPLT to them using the methods illustrated below for copying program APLY. Be certain you are in the directory in which you want the program to appear before pressing STO . Data should be stored in each directory in ΣDAT .

Program APLY is already in the EXAM directory of your HP-48G. To place a copy of it in your CALCC directory, do the following:

- Press \leftarrow ' (HOME) to enter your home directory. Press EXAM PRGS to find APLY on the menu (use NXT if necessary). If the EXAM directory is not in your HOME menu, type TEACH, and press ENTER to place it there.
- Press \leftarrow APLY to place a copy of the program on the stack.
- Press ' APLY to place the name of the program on the stack.
- Press \leftarrow ' (HOME) to enter your home directory and CALCC to enter your CALCC directory.
- Press STO . You should see APLY on the menu in your CALCC directory. If these steps do not cause the program to appear, it is listed below and can be entered manually.

You will find it helpful to organize the menus in your directories, placing the most frequently used keys at the beginning of the menu. We illustrate by organizing the CALCC directory:

- Press **VAR** and enter the CALCC directory if you are not already there.
- Next, create directories for the remainder of the programs in this Appendix. You will need the directories FIT, NDIF, and NUINT. Refer to your owners manual for instructions on creating directories.
- From the CALCC directory, press **←** **+** ({ }) and press the menu keys, in the order in which you want the programs to appear, from left to right, on your menu. We suggest { **ΣDAT** **EQ** **STPLT** **FIT** **F.VAL** **ALIGN** **NDIF** **NUINT** **APLY** }. Press **ENTER** .
- Press **←** **VAR** (MEMORY) **DIR** **ORDER** .
- Press **VAR** to see your ordered CALCC directory. You can reorder any directory at any time you want a different arrangement of programs and/or stored variables.

The next group of programs should be placed in the FIT directory. The programs for the SINREG and LOGIS directories are given following the other programs in this Appendix. EXPR and EQ are created by the curve-fitting programs when these programs are first run.

¹ Program PFIT is provided by Dr. Charles M. Patton of Hewlett-Packard's Calculator Research and Development team and is reproduced with permission.

Program STPLT should be copied to the FIT directory using the following instructions.

- Press $\boxed{\rightarrow}$ $\boxed{'}$ (HOME) to enter your home directory and $\boxed{\text{CALCC}}$ to enter the CALCC directory.
- Press $\boxed{\rightarrow}$ $\boxed{\text{STPLT}}$ to place a copy of the program on the stack.
- Press $\boxed{'}$ $\boxed{\text{STPLT}}$ to place the name of the program on the stack.
- Press $\boxed{\text{FIT}}$ to enter the FIT directory.
- Press $\boxed{\text{STO}}$. You should see $\boxed{\text{STPLT}}$ on the menu in your FIT directory.

The next group of programs is for fitting a sine model to cyclic data, and all the following programs must be placed in the same directory as program SFIT. These programs should be placed in a subdirectory of the FIT directory called SREG. The menu items EQ, A, B, C, D, Σ PAR, PPAR, MD, and S1 are created when the SFIT program is first run.

The next group of programs is for fitting a logistic model to data, and the programs that follow should be placed in another subdirectory of the FIT directory called LOGIS². All these programs must be placed in the same directory as program LOGISTIC. Programs AR.LI and SCPLT can be copied from the SFIT directory into this directory by following the same pattern of instructions as those given for moving program STPLT on page C-5 of this Appendix. The menu items EQ, A, B, C, T, ΣPAR, and PPAR are created when the LOGIS program is first run.

² All programs in the SREG and LOGIS directories as well as programs FABST, NSTO, GREC, LRECT, RRECT, MID, TRAP, and SIMP in the NUINT directory were written by Robert E. Simms of Clemson University and are reproduced with permission.

The next group of programs is for finding and displaying numerical differences. Program DIFF should be placed in a directory of the CALCC directory called NDIF. Program UP can also be placed in this directory. The menu items FDIF, SDIF, and %CHG are created by program DIFF the first time it is run.

The next group of programs is for numerically estimating definite integrals, and the programs that follow should be placed in a directory of the CALCC directory called NUINTG. All these programs should be placed in the same directory. Programs UP and F.VAL can be copied from the CALCC directory into this NUINTG directory. The other menu items are created when the numerical integration programs are first run.

