24. Installation Guide

24.1 Installation Guide for the PC - Version

24.1.1 Overview

The installation procedure of the Bernese GPS Software Version 4.0 is more involved than most of the commercial software packages running on PC. There are several reasons:

(1) The software system runs on DOS versions 3.3 and higher (where DOS version 7.0 is used under Windows 95) and therefore some adaptions may be necessary.

(2) The software is delivered as FORTRAN source code, i.e. it has to be compiled and linked first. This has the following advantages:

   a) Due to the huge differences between PC machines (old 386 with LAHEY FORTRAN v3.x up to Pentium pro with LAHEY FORTRAN 90 v3.x) some modifications (like the adjustment of dimensions) may be necessary and useful.
   b) Because the compressed source code needs only about 4-5 Mb of disk space, it can be distributed relatively easy using diskettes or by ftp. The complete software system (including the executables) needs about 55 Mb what might obviously cause some problems...
   c) The support is easier (e.g.“online correction” of software bugs).
   d) The LAHEY FORTRAN compiler allows certain optimizations according to your machine. This in general generates faster executables.

The installation of the software consists of two major parts:

(1) Preparation of the DOS environment:

   - Preparation of a DOS window (for machines running under WINDOWS 95 configuration).
   - Installation of the LAHEY FORTRAN compiler.
   - Modifications of the system configurations (`CONFIG.SYS`).

(2) Installation of the software:

   - Copying all installation files on your disk (via ftp or from diskettes).
   - Install the entire environment.
   - Adapt some options according to your hard- and software configuration.
   - Compiling and linking of the source code.

24.1.2 Preparations

This section describes some preparations and checks that have to be done in order to correctly install the software. By following all these steps you will create the DOS environment that is needed by the software. Therefore please **go through all these steps very carefully!**

24.1.2.1 Hardware Requirements on the PC

- IBM compatible PC
- 8 or more Mbytes extended memory (12 or more with LF90)
- at least 386 processor together with 387 or Weitek coprocessor or more
- 100 Mbytes hard disk

The maximum memory size needed depends not only on the size of networks you intend to process (on PC), but also on the processing mode (e.g. how many sites are processed simultaneously, status of ambiguity resolution, orbit improvement, etc). An extended memory of 8 megabytes should allow the processing of more than 10 sites simultaneously. The "tuning" of the program size according to the available memory is described in the chapter 3.2.3 of this installation guide.

The current version of the Bernese GPS Software (executable menu and mainframe programs plus auxiliary files) requires about 55 Mbytes of disk space.

The source code of all programs and subroutines uses about 6 Mbytes, the object code about 7 Mbytes of disk space. Of course this space is only required for the PC to be equipped with the source code.

24.1.2.2 Software Requirements on the PC

- DOS 3.3 or higher
- An ASCII text editor program such as the IBM PE-II Personal Editor II
- LAHEY OS/386 or PharLap Extended Memory Operating System
- LAHEY F77L-EM/32 or LAHEY LF90 Fortran Compiler

The editor program is used for the editing of (ASCII) text files. Any screen editor you can invoke with a one-line command (command or call of a batch file together with the filename) is suitable.

The LAHEY Compiler and Operating System are available at

Lahey Computer Systems, Inc.
P.O. Box 6091
Incline Village, NV 89450-6091
U.S.A.
Tel: (702) 831-2500 Fax: (702) 831-8123

24.1.2.3 WINDOWS 95 Configuration: Creation of a DOS-Window

If you are running the software on a PC equipped with WINDOWS 95 system you have to create a DOS-Window. In order to do this you might proceed as follows:

- start WINDOWS 95
- click the right mouse button (⇒ sub-menu)
- select “new”
- select “Shortcut”
- enter into COMMAND LINE field: `C:\WINDOWS\DOSPRMPT.PIF`
- select “continue”
- enter a name for this new window e.g "Bernese GPS Software V4.0"
- select “finish”
- click the new icon with the right mouse button (⇒ sub-menu)
- select “properties”
- select “program” and enter the following values into the corresponding fields:

First field:	Text of your choice
Cmd line:	`C:\WINDOWS\COMMAND.COM`
Working:	`C:\`
Batch file:	`C:\BERN40\GPS40\EXE\LOADGPS.BAT`
Shortcut key:	`None`
Run:	`Normal Window`

  Do not set any of the “Advanced...” options.
- select “Memory” and select the following values:
  - Conventional memory:

Total:	`520`
Initial Environment:	`2048`
Protected:	yes

  - Expanded (EMS) memory:

Total:	`Auto`

  - Extended (XMS) memory:

Total:	`None`
Uses HMA:	yes

  - MS-DOS protected-mode (DPMI) memory:

Total:	set to maximum value

- select “Misc” and set “Idle sensitivity” to `High`.

24.1.2.4 LAHEY Compiler

If you use the LAHEY F77L-EM/32 Compiler then please make sure that it has been installed in the subdirectory `C:\F77L3` (up to version 4) or `C:\F77L3\BIN` (version 5): We are using the following configuration file `F77L3.FIG` (Version 5): (all the options on ONE line)

```
/n0/n2/n4/n7/nA2/nB/nC/nC1/D/nF/nH/nI/nK/L/nO/P/Q1/nQ2/nQ3/R/nS/nT/
 nV/nW/nX/nZ1
```

If you use the LAHEY LF90 Compiler then please make sure that it has been installed in the subdirectory `C:\LF90\BIN`. Depending on the processing unit of your machine you have to activate the following option in the file `LF90.FIG`:

-t3	if you use a 80386 processor
-t4	if you use a 80486 processor
-tp	if you use a pentium processor

24.1.2.5 DOS Extender

- Ergo OS-386 (with LAHEY Fortran Versions up to 4)

  MAKE SURE that the LAHEY OS/386 Operating System has been installed in subdirectory `C:\OS386`.

  Files:

  ```
  OS.386 *)       WHATMEM.EXE    CONFIG.AIA  *)
  UP.EXE          EXPMEM .EXE    OS386.EXE  **)
  ```

  The files *) are needed for OS/386 Version 1.9 (⇒ May 90)

  The file **) is needed for OS/386 Version 2.1 (June 90 ⇒)

  `CONFIG.AIA` has to contain the path and the name of the OS/386 system:

  ```
  KERNEL=C:\OS386\OS.386
  ```

  `WHATMEM` may be used to determine the maximum memory size a program may use.

  `EXPMEM` shows the memory size an executable (`.EXP` file) will require to run.

- PharLap 386DOS:

  The DOS Extender coming with LAHEY Fortran F77-EM/32 version 5 or with LAHEY Fortran LF90 (all versions) should be installed into the same directory as the compiler.

  To disable the 386DOS-Extender banner enter the following commands:

  For LAHEY F77-EM/32:

```
CD \F77L3\BIN
CFIG386 RUN386 -NOSIGNON
```

For LAHEY LF90:

```
CD \LF90\BIN
CFIG386 RUN386 -NOSIGNON
```

24.1.2.6 CONFIG.SYS

MAKE SURE that the `CONFIG.SYS` file contains at least the following lines:

```
device=C:\WINDOWS\COMMAND\ANSI.SYS     (for WINDOWS 95)
device=C:\DOS\ANSI.SYS                 (for DOS)
buffers=25
files=100
break on
lastdrive=z
shell=C:\COMMAND.COM /e:2048 /p
```

The environment size (2048) depends on the number of environment variables that have to be defined. (If you get a corresponding error message during the execution of `SET` commands you have to increase this size.)

Below we will substitute two directories by the drive names `X:` and `Y:`. That's why we need "lastdrive" to be at least `Y`.

24.1.3 Installation of the Software System

You are now ready to start with the installation of the Bernese GPS Software itself. The first step of the installation procedure depends on how you received the software (on diskettes or by ftp).

24.1.3.1 Copying the Installation Files on Disk

- Diskette version:

  (1) Create a directory named `C:\GPS40TMP` or a directory of your choice: `MKDIR C:\GPS40TMP`
  (2) change to this directory: `CD \GPS40TMP`
  (3) put the first diskette into the diskette drive and copy all the files to your disk. If your diskette drive is `A:` then use `COPY A:*.*`
  (4) repeat step 3) with the second and the third diskette.

- FTP version:

REMARK:

You only can access this software account if the necessary permissions have been set for you. Please do not try to log into this account without permissions. If you are not sure or if you have questions then please let us know.

E-mail address: `rothacher@aiub.unibe.ch`

ALL YOUR ACTIVITIES ARE LOGGED.

(1) Create a directory named `C:\GPS40TMP` or a directory of your choice.

(2) Change to this directory: `CD \GPS40TMP`

(3) Log into the software account.
Login is only possible by ftp (no interactive login will be accepted)!!

internet number:	`130.92.24.22`
user name:	`BERNESE`
password :	*"you will receive the password and other important information"*

(4) Select DOS version: `CD DOS`

(5) Copying ASCII files:

```
ASCII
GET README.DOS
GET README.RNX
MGET *.BAT
```

(6) Copying BINARY files:

```
BINARY
MGET *.ZIP
MGET *.EXE
MGET *.LIB
```

(7) Exit from ftp: `BYE`

24.1.3.2 Adaptation of the File LOADGPS.BAT

You now have to *adjust* some of the parameters in `LOADGPS.BAT` according to your needs and your system. This file is in the same directory as all the other installation files (e.g. `C:\GPS40TMP`).

When editing this file you will see that it contains many comments that help you to make the correct choices. You only have to remove the `REM` at the beginning of the line containing the value appropriate to your system in order to activate the option.

A few remarks:

(1) You have to SET a few environment parameters:

`OPSYS:`	Set to `DOS`	for DOS version 3.3 to 6.2
	Set to `W95`	for WINDOW 95 systems
`LAHEY:`	Set to `77`	for LAHEY FORTRAN 77 users
	Set to `90`	for LAHEY FORTRAN 90 users
`LAHEY_V:`	Set to `4`	for LAHEY 77 versions 3 and 4
	Set to `5`	for LAHEY 77 version 5
	Set to `1 / 2 / 3`	for LAHEY 90 versions 1 / 2 / 3
`PROC:`	Set to `-T3`	for 386 processor
	Set to `-T4`	for 486 processor
	Set to `-Tp`	for Pentium processor
`DOSEXT:`	Set to `OS386-19`	for OS/386 1.9 Users
	Set to `OS386-21`	for OS/386 2.1 Users
	Set to `386DOS`	for Pharlap 386DOS Users

Remark for OS386 users: Adjust the path to the OS386 Dos Extender if necessary.

`DRV:` Set to the drive where you will install the source code. Usually the source/object/executable modules will be stored into special directories (see below) on drive `C:`.

However, if you prefer to install them on a different drive you may select drive `D:`. The environment variable `DRV` then has to point to `D:`. Choosing drive `D:` you will have to adjust the paths in some files (see 24.1.4.1 of this "installation guide")

The default drive is `C:`.

`SCREEN:` Set to `COLOR` if you use a color screen

Set to `B/W` if you use a monochrome screen

`LFDIR:` Points to the Fortran directory (e.g. `C:\F77L3\BIN`)

`CMPDRV:` Points to the actually used compiler directory (to be set if you copy the compiler to the RAM drive)

(2) The substitution `X:` will be used by most of the GPS programs to find general files of the Bernese GPS Software. The substitution of `I:` points to the include file directory (e.g. `C:\BERN40\LIB\INCLIB40\FOR`, it will be created later). The substitution of `L:` (e.g. `C:\BERN40\LIB`, also created later) will contain the subroutine libraries.

You may want to *include* a call to `LOADGPS.BAT` into your `AUTOEXEC.BAT` file. Otherwise you have to call `LOADGPS` after system startup before you can use the Bernese GPS Software. In the latter case you may want to copy this batch file to a subdirectory that is included in the path.

24.1.3.3 The Installation Batch File: `START.BAT`

After adjusting all the options in `LOADGPS.BAT` you are ready to create the directory structure, to copy the files into the corresponding directories and to unzip the entire software. All these steps are done automatically using the batch file `START.BAT`:

- change into your installation directory (default `C:\GPS40TMP`)
- run the START-file: `START`
  `START C:\`"*your_own_directory*"

  This file accepts one parameter containing the installation directory. You can omit this parameter when you use the default directory (`C:\GPS40TMP`).

24.1.3.4 User-Supplied Browser and Editor

Depending on your requirements you have to adapt the editor command. The menu system of version 4.0 accepts any editor or display program that may be called with a one-line command. You may distinguish between a *browse* type of program which displays files only (without the possibility to actually change the contents of the file) and *editor* programs, like e.g. PE2. The distribution diskette contains a simple browse program named `X:\EXE\BROWSE.COM` (use Esc to escape from program) that is used by default.

If you would like to use another browser you have to adapt the batch file `X:\EXE\B.BAT`. This file contains comments and hints on how to activate your own browser.

As default we call the PE2 editor to edit files from the menu system. If you would like to use another editor you have to adapt the batch file `X:\EXE\E.BAT`. This file contains a lot of comments and hints on how to activate your own editor.

The activated commands in `X:\EXE\B.BAT` and `X:\EXE\E.BAT` are then passed to the operating system to be executed. If you do not want to use a special browse program just use the call to the editor again.

24.1.3.5 DOS-Version Dependent Directory Listing Format

The menu system has to create and read directory listings in order to prepare file selection lists. Since the format of the directory listings depends on the DOS version and the *COUNTRY* code (set in `CONFIG.SYS`) this may cause some problems. The file `I:\FORMAT.DAT`, therefore contains the exact format of the directory listing. Please read through the comments in this file and activate (or create) the correct listing format.

Remark: As default the DOS version 7.0 for WINDOWS 95 is activated.

24.1.3.6 Adjustment of the Size of Executables

The size of some main programs as e.g. GPSEST or ADDNEQ heavily depend on the size of the declared arrays. All the major arrays are declared using parameters of the Fortran `PARAMETER` statement. Depending on the size of the available memory and the size of the GPS networks to be processed the parameters may have to be adjusted. The Lahey program `EXPMEM` in the subdirectory `OS386` may be used to control the size of the executable program at runtime. The size of the extended memory available on your PC can be determined using the Lahey program `WHATMEM`. Some space has to be taken into account for the run-time stack, too.

If you still use the F77 compiler/linker version 2, you have to delete the stack option `/ST:5004` in the link batch files (`X:\EXE\LKMENU.BAT`), `X:\EXE\LKMAIN.BAT`) *before* you link the programs.

24.1.3.7 Background Colors of the Data Panels

The subroutine `C:\BERN40\LIB\COMLIB40\FOR\L_DSPFLD.FOR` reads parameters for ANSY.SYS escape sequences from a file `X:\SKL\DSPFLD.OPT` (copied to `Y:\` by `LOADGPS`) in order to highlight input fields (`IHIGH=1`) and the status line (`IHIGH=2`) of data input panels and also to reset the fields to the standard background color according to user preferences. Path and name `Y:\DSPFLD.OPT` are hard-wired into `I:INCL_P.FOR`. If the program does not find the file it will use "black on white" for standard and "reverse video" for highlighted display.

You may change the selected colors in the file according to your preferences, the capabilities of the screen, and in accordance with the standard background color defined in `LOADGPS.BAT`. See also comments in `DSPFLD.OPT`.

There is a program `C:\BERN40\PGM\MENU40\FOR\PANTST.FOR` you can compile and link to test the effect of any changes you did to the subroutine `L_DSPFLD.FOR`. (Use the test panel `X:\PAN\PANTST.PAN`.)

24.1.3.8 Compiling and Linking

Before you compile and link the source you will have to reboot the system and execute the `LOADGPS.BAT` batch file.

Use the following commands (batch files copied from `X:\EXE` to `Y:` by `LOADGPS`) to compile source files:

`COMPLINK`	to compile and link the entire Bernese GPS Software. Depending on the performance of your machine you now have the time to either go for an extended lunch or only for a short coffee break. (486/33 Processor needs about 3 hours, Pentium/100 about 20 minutes).

After this step you start the software by typing `G`.

To facilitate the compile and link step for parts of the distribution you may use the following commands:

`LIBCOMP MEN`	to compile all subroutines in `C:\BERN40\LIB\MENLIB40\FOR`
`LIBCOMP GPS`	to compile all subroutines in `C:\BERN40\LIB\GPSLIB40\FOR`
`LIBCOMP AST`	to compile all subroutines in `C:\BERN40\LIB\ASTLIB40\FOR`
`LIBCOMP COM`	to compile all subroutines in `C:\BERN40\LIB\COMLIB40\FOR`

(`LIBCOMP` also recreates the corresponding object library.)

`PGMCOMP MAIN`	to compile all programs in `C:\BERN40\PGM\MAIN40\FOR`
`PGMCOMP MENU`	to compile all programs in `C:\BERN40\PGM\MENU40\FOR`
`PGMCOMP BPE`	to compile all programs in `C:\BERN40\PGM\BPE40\FOR`
`PGMLINK MAIN`	to link all programs in `C:\BERN40\PGM\MAIN40\FOR`
`PGMLINK MENU`	to link all programs in `C:\BERN40\PGM\MENU40\FOR`
`PGMLINK BPE`	to link all programs in `C:\BERN40\PGM\BPE40\FOR`

To compile individual modules use commands of the following list:

`CMENU pgmnam`	to compile files in `C:\BERN40\PGM\MENU40\FOR`
`CMAIN pgmnam`	to compile files in `C:\BERN40\PGM\MAIN40\FOR`
`CBPE pgmnam`	to compile files in `C:\BERN40\PGM\BPE40\FOR`
`CLMENL subnam`	to compile and store into `C:\BERN40\LIB\MENLIB40\LIB`
`CLGPSL subnam`	to compile and store into `C:\BERN40\LIB\GPSLIB40\LIB`
`CLASTL subnam`	to compile and store into `C:\BERN40\LIB\ASTLIB40\LIB`
`CLCOML subnam`	to compile and store into `C:\BERN40\LIB\COMLIB40\LIB`

Use the following commands to create individual executables:

`LKMENU pgmnam`	to create executables in `C:\BERN40\PGM\MENU40\EXE`
`LKMAIN pgmnam`	to create executables in `C:\BERN40\PGM\MAIN40\EXE`
`LKBPE pgmnam`	to create executables in `C:\BERN40\PGM\BPE40\EXE`

24.1.4 Additional Hints and Tips

This section contains some additional information about the installation that may be useful in some special cases.

24.1.4.1 Installation of Load Modules

If you want to separate the development environment from the production (or if you install the load modules on a second PC) you have to copy all `.EXP` files from the subdirectories `C:\BERN40\PGM\MAIN40\EXP`, `C:\BERN40\PGM\MENU40\EXP` and `C:\BERN40\PGM\BPE40\EXP` into `X:\EXE`.

In this case you have to:

- change the path to the programs in the data panels

```
X:\PAN\DAT021__.PAN
X:\PAN\DAT022__.PAN
X:\PAN\DAT023__.PAN
X:\PAN\DAT024__.PAN
X:\PAN\DAT025__.PAN
X:\PAN\DAT026__.PAN
```

to `X:\EXE`

- change the path to the panel programs in the option file

```
X:\SKL\MENU.OPT
```

to `X:\EXE`

- change the path to the programs in the batch files

```
X:\EXE\G.BAT
X:\EXE\JOB.BAT
X:\EXE\OBS.BAT
X:\EXE\PRCDEF.BAT
X:\EXE\RMAIN.BAT
X:\EXE\RMENU.BAT
X:\EXE\RUNGPS.BAT
```

to `X:\EXE`

24.1.4.2 Upgrade from Version 3.5 to Version 4.0

The source and object code of version 4.0 will be stored into different subdirectories than version 3.5, so there will be no conflicts.

If you have campaigns in the version 3.5 directory structure you still want to process, you could just include their names and paths into the new campaign list (you would then have to set the path to e.g. `C:\GPS35\`. However, the entire filename will then be too long, so you should include another substitution into the file `LOADGPS.BAT`, e.g. `SUBST Z: C:\GPS35`, so that the path to the old campaigns would be just `Z:\`).

You should also keep in mind, that observation files once written with the new version 4.0 will no longer be readable using version 3.5 .

24.1.4.3 MAXFILES Support (LAHEY Fortran 77 Versions up to 4 only)

In order to overcome the DOS limit of a maximum of 20 files simultaneously open you have to either purchase the Lahey Spindrift library or ask us for a specially linked version of GPSEST.

The Spindrift library contains (among other utilities) subroutine calls and a program `MAXFILES.EXE` to be used to increase the maximum number of simultaneously opened files. If you have Spindrift available you have to perform the following changes:

- Remove the comment `C's` in the following line of `GPSEST.FOR`:

```
CC    CALL MAXFILES(*998)
```

- Install the Spindrift library `UTIL3` into `C:\F77L3` (or wherever you installed the Lahey compiler

- Include the call to the Spindrift Library `UTIL3` into the Linker batch files `X:\EXE\LKMAIN.BAT`:

```
echo C:\F77L3\GRAPH3+C:\F77L3\UTIL3; >> Y:LKMAIN.LRF
```

  and `X:\EXE\LINKER1.BAT`:

```
C:\F77L3\GRAPH3+C:\F77L3\UTIL3;
```

  Copy the batch file `X:\EXE\LKMAIN.BAT` to `Y:\`

- Compile and link `GPSEST` (`CMAIN GPSEST, LKMAIN GPSEST`).

LAHEY Fortran 77 v5.x and LF90 does not need MAXFILES at all.

24.1.4.4 Individual User Subdirectories

If several people are working on the same PC you might want to have individual input option panels and program input files for each user.

You could create for each user his own master directory, say

`C:\BERN40\GPSUSER\username`,

substitute a drive name:

`SUBST U: C:\BERN40\GPSUSER\username`,

and create the subdirectories

`U:\PAN`	(user data input panels)
`U:\INP`	(input files for the "mainframe" programs)
`U:\OUT`	(user-dependent output files)
`U:\WORK`	(work directory for the user)

Modify the command in `LOADGPS.BAT` to substitute the user directory by `U:`, e.g. `SUBST U: C:\BERN40\GPSUSER\%1` and call `LOADGPS` with parameter “`username`”. Include a call into `UNLOADGPS.BAT` to deallocate `U:`.

24.1.5 Processing Examples

On our anonymous ftp we made available two examples which you can use to test the software. To download the examples use the following commands:

ftp :	`ftp ubeclu.unibe.ch`
login:	`anonymous`
password:	your full e-mail address
location:	`cd aiub$ftp`
	`cd BSWUSER`
	`cd EXAMPLES`

Here you will find a file named readme.txt with further instructions.

24.2 Installation Guide for the VAX - Version

24.2.1 Requirements on VAX/Alpha Systems

- VAX/Alpha Fortran Compiler
- VT-200 series terminals or compatibles. If you use other terminals you have to adjust or replace a few Fortran routines (VT200_CLRSCR, VT200_PUTSTR, VT200_DSPFLD, VT200_INPCHR).

24.2.2 Copying the Installation Files on Disk

We distribute the VAX/VMS version either via ftp or on tape. Depending on your version you have to execute one of the following tasks listed below:

24.2.2.1 Tape Version

There are two types of tape version available:

- Exabyte tape or
- Magnetic tape (density 6200 bpi)

Label of both tapes: GPS40

Please proceed as follows:

1) Create a directory of your choice that will contain all the installation files.

Example:
```
SET DEFAULT DISK$1:[yourhome]
CREATE/DIR/VERSION_LIMIT=1 [.GPS40TMP]
```

2) Change to this "installation directory": `SET DEFAULT [.GPS40TMP]`

3) Put the tape into the tape drive, allocate and mount the tape drive and copy all the files from tape into your installation directory. Afterwards you have to dismount and deallocate the disk drive in order to remove the tape.

Example: We had to use the following commands in order to copy all the file:
(Remark: the name "sys$tape" is system dependent. Please ask your system operator for the name of your disk drive.)
```
allocate sys$tape
mount sys$tape GPS40 tape
copy tape:*.* *.*
dismount tape
deallocate sys$tape
```

24.2.2.2 FTP Version

You may copy the software from our special software account to your machine. In order to make it accessible for you we have to define the corresponding permissions.

> REMARK:
>
> You only can access this software account if the necessary permissions have been set for you. Please do not try to log into this account without permissions. If you are not sure or if you have questions then please let us know.
>
> E-mail address: `rothacher@aiub.unibe.ch`

ALL YOUR ACTIVITIES ARE LOGGED.

1) Create a directory of your choice on your machine that will contain all the installation files.

Example:
```
SET DEFAULT DISK$1:[yourhome]
CREATE/DIR/VERSION_LIMIT=1 [.GPS40TMP]
```

2) Change to this "installation directory": `SET DEFAULT [.GPS40TMP]`

3) Log into the software account.
Login is only possible by ftp (no interactive login will be accepted)!!

internet number:	`130.92.24.22`
user name:	`BERNESE`
password :	*"you will receive the password and other important information"*

4)	Select VAX version:	`CD VMS`

5)	Copying ASCII files:	`ASCII`
		`GET README.VAX`
		`MGET *.COM`

6)	Copying BINARY files:	`BINARY`
		`MGET *.BCK_Z`
		`MGET *.EXE`

7)	Exit from ftp:	`BYE`

24.2.3 Installation of all Files

Since there may be different users on your machine(s) accessing the files you should make sure that the file and directory protections are set appropriately. Most files of the Bernese GPS Software will only be read or executed by the users. So you should set your default protection at least to "Group = Read and Execute"(`SET PROTECTION=(G:RE)/DEFAULT`) prior to the software installation.

24.2.3.1 File LOADGPS.COM

In order to facilitate operation and to keep as many files installation-independent as possible a command file LOADGPS.COM with definitions of logicals and symbols has to be created. You take the example for this file named LOADGPS$.COM in your installation directory and copy it to LOADGPS.COM in the same directory.

Edit the file LOADGPS.COM and set the parameters that will be used to create the directory structure (marked between two lines of "$***$")

In the file LOADGPS.COM you will find the following section:

```
:
$! Need Fully Resolved Name of the User Disk
$! (Logical Name of the Disk Is DISK$GPS in this Example
$!  Do NOT REMOVE the three quotation marks nor the colon!)
$!
$!       **************************
$        DISK_NAM = """DISK$GPS:"""
$!       **************************
$!
$        USER_DISK == F$PARSE('DISK_NAM',,,"DEVICE","NO_CONCEAL")
$!
$! General directory for system-wide GPS files: X:[000000]
$! ------------------------------------------------------
$! (BERN40 Is the parent directory of the installation.
$!  If you wish to create two or more subdirectories you have to separate
$!  them by a dot e.g "LOCAL.BERN40"
$!  Do NOT REMOVE the quotation marks)
$!
$!       ***********************
$        PAR_DIR == "BERN40"
$!       ***********************
$!
:
```

The parameter DISK_NAM points to the disk where you want to install the software. The parameter PAR_DIR ("parent directory") indicates the top directory of the software installation. There are two important cases you have to distinguish concerning the parameter DISK_NAM:

- case A:

  The parameter DISK_NAM points to the *top* directory of your disk (e.g. DISK$GPS is a substitution of _12dkb300:). The software then will be installed in _12dkb300:[BERN40...] (looking at the examples given above).

- case B:

  The parameter DISK_NAM does *not* point to the *top* directory of your disk (e.g. DISK$GPS is a substitution of _12dkb300:[GPS.]). In this case the subdirectory [GPS.] would be skipped and the software therefore would be installed in _12dkb300:[BERN40...]. If in this case you would like to install the software in _12dkb300:[GPS.BERN40...] you would have to include both subdiretories in the parameter PAR_DIR. This definition then would look like this:

```
$!      ***********************
$       PAR_DIR == "GPS.BERN40"
$!      ***********************
```

IMPORTANT:

The account you use to make the installation needs the privilege to create the parent directory (e.g DISK$GPS:[BERN40]) (see remark given above).

Additional adaptations may be necessary:

In order to run the GPS programs in a batch queue of your choice you have to define special symbols (BATCH1,BATCH2, ...) for each batch queue you want to use:

```
BATCH1  ==   "SYS$FASTBATCH"
BATCH2  ==   "SYS$BATCH"
BATCH3  ==   "SYS$SLOWBATCH"
  ...
```

Later on you will just tell the programs to use numbers 1, 2, etc. (0 will indicate foreground) (see Menu 0.1 of the software).

There are also definitions for a user-supplied editor, together with section files for the editor (see 24.2.4.1):

```
E*DIT   :== EDIT/TPU/NOINIT/SECTION=X:[EXE]EVE_SECTION.TPU
B*ROWSE :== EDIT/TPU/NOINIT/SECTION=X:[EXE]EVE_SECTION.BRS
```

(All special settings (see EVE_INIT.TPU and EVE_INIT.BRS) have been saved into a section file: The call to the editor is executed much faster using SECTION files than INIT files!). The asterisks in the definition above allows you to use E (instead of EDIT) or B (instead of BROWSE).

Of course you can use any suitable editor with your personal extensions and init files.

All other definitions of logicals and symbols are installation- independent and can be taken as given.

Do not forget to include a call to disk_nam:[par_dir.GPS40.EXE]LOADGPS.COM in the startup file (LOGIN.COM) of each user account.

24.2.3.2 Installation File BSINST.COM

After preparing the environment you must create the full directory structure and distribute all files into the corresponding directories. All these tasks will be handled fully automatically by running the file BSINST.COM. In order to do this you just have to change into your installation directory and to type the following command:

In order to install the FTP version :

```
@BSINST FTP
```

or if you are installing the TAPE version

```
@BSINST TAPE
```

The difference between the FTP and the TAPE version is, that all files of the FTP version are compressed in order to reduce the size of the files to be transferred by internet.

24.2.4 Source Code Changes

The following changes in the source code may or may not be necessary. If they are, it is important to make the changes before compiling and linking the source code. The reason is that you have to recompile and link the entire software system in order to activate these changes.

Adjustment of the Size of Executables

The size of some mainframe programs as e.g. GPSEST, ADDNEQ heavily depend on the size of the declared arrays. All major arrays are declared using parameters of the Fortran PARAMETER statement in the main programs.

Depending on the available memory or the size of the GPS networks to be processed the parameters may have to be adjusted.

24.2.4.1 User-Supplied Editor

Some programs will access a user-supplied editor through a one-line command passed to the operating system. You may use any editor or display program that may be called with a one-line command. You may distinguish between a "browse" type of program which displays files only (without the possibility to actually change the contents of the file) and editor programs, like e.g. TPU. We use the TPU editor with a special INIT file to define some additional keys (like F7 and F8 for left and right scrolling).

You will have to prepare one-line commands to call the editor/browse programs (e.g. by defining it in LOADGPS.COM, see above). These commands have to be "hard-wired" into I:INCL_P.FOR, before you compile the menu source programs and subroutines:

Example:

```
C
C  CALL COMMAND FOR EDITOR AND BROWSE
C  (ADJUST DECLARATION TO MATCH ACTUAL LENGTH!)
C  JUST THE FILENAME OF THE FILE TO BE EDITED WILL BE ADDED
      CHARACTER EDITOR*5,BROWSE*7
      DATA EDITOR/'EDIT '/
      DATA BROWSE/'BROWSE '/
```

In this example the menu programs will create the following command line each time a file 'filnam' has to be edited or browsed:

EDIT 'filnam' or BROWSE 'filnam'

This command line is passed to the operating system to be executed. If you do not want to use a special "browse program" just use the call to the editor again or define BROWSE accordingly in the startup file LOADGPS.COM (see example in 24.2.3.1).

24.2.4.2 Display Mode for Data Input Panels

The subroutine C:[LIB.COMLIB40.FOR]VT200_DSPFLD.FOR defines the method how to highlight input fields (IHIGH=1), the status line (IHIGH=2) of the data input panels, and also how to reset the fields to the standard display mode. Currently we use REVERSE ON / BOLD OFF for both types of input fields and REVERSE OFF / BOLD ON as standard display mode. Please look into the header comment of VT200_PUTSTR.FOR in the same subdirectory to check the possible settings.

There is a program FM:PANTST.FOR (= C:[PGM.MENU40.FOR]PANTST.FOR) you may relink to test the effect of any changes you did to the subroutine VT200_DSPFLD.FOR. (Use the test panel X:[PAN]PANTST.PAN).

The VT200_* routines use or expect escape sequences according to the VT200 standards. If you want to use other (non-compatible) terminals you have to create corresponding routines for your type of terminal.

24.2.4.3 Campaign List

The menu system uses a campaign list with the name defined in I:INCL_P.FOR:

```
DATA CMPLST/'X:[PAN]DAT11___.PAN'/
```

If you would like to have individual campaign lists for each user you would have to change the path into U:[PAN].

24.2.5 Compiling and Linking

LOADGPS.COM defines symbols together with command files in the directory X:[EXE] to facilitate the compile and link step of the different types of source files.

`COMPLINK`	to compile and link the entire Bernese GPS Software.

After this step you start the software by typing `G`.

To facilitate the compile and link step for parts of the distribution you may use the following commands:

`LIBCOMP MEN`	to compile all subroutines in `C:[LIB.MENLIB40.FOR]`
`LIBCOMP GPS`	to compile all subroutines in `C:[LIB.GPSLIB40.FOR]`
`LIBCOMP AST`	to compile all subroutines in `C:[LIB.ASTLIB40.FOR]`
`LIBCOMP COM`	to compile all subroutines in `C:[LIB.COMLIB40.FOR]`

(`LIBCOMP` also recreates the corresponding object library.)

`PGMCOMP MAIN`	to compile all programs in `C:[PGM.MAIN40.FOR]`
`PGMCOMP MENU`	to compile all programs in `C:[PGM.MENU40.FOR]`
`PGMLINK MAIN`	to link all programs in `C:[PGM.MAIN40.FOR]`
`PGMLINK MENU`	to link all programs in `C:[PGM.MENU40.FOR]`

To compile individual modules use commands of the following list:

`CMENU pgmnam`	to compile files in `C:[PGM.MENU40.FOR]`
`CMAIN pgmnam`	to compile files in `C:[PGM.MAIN40.FOR]`
`CLMENL subnam`	to compile and store into `C:[LIB.MENLIB40.LIB]`
`CLGPSL subnam`	to compile and store into `C:[LIB.GPSLIB40.LIB]`
`CLASTL subnam`	to compile and store into `C:[LIB.ASTLIB40.LIB]`
`CLCOML subnam`	to compile and store into `C:[LIB.COMLIB40.LIB]`

Use the following commands to create individual executables:

`LKMENU pgmnam`	to create executables in `C:[PGM.MENU40.EXE]`
`LKMAIN pgmnam`	to create executables in `C:[PGM.MAIN40.EXE]`

24.2.6 Hints and Tips

This section contains some additional possibilities to adapt the software to your personal need.

24.2.6.1 Installation of Load Modules

If you want to separate the development environment from the production environment (or if you install the load modules on a second VAX) you have to copy all `.EXE` files from the subdirectories `C:[PGM.MAIN40.EXE]`, `C:[PGM.MENU40.EXE]`, and `C:[PGM.BPE40.EXE]` into `X:[EXE]` (on the second VAX).

In this case you have to:

- change the path to the programs in the data panels

  ```
  X:[PAN]DAT021__.PAN
  X:[PAN]DAT022__.PAN
  X:[PAN]DAT023__.PAN
  X:[PAN]DAT024__.PAN
  X:[PAN]DAT025__.PAN
  X:[PAN]DAT026__.PAN
  ```

  to `X:[EXE]`

- change the path to the panel programs in the option file

  ```
  X:[SKL]MENU.OPT
  ```

  to `X:[EXE]`

- change the path to the programs in the command files

  ```
  X:[EXE]G.COM
  X:[EXE]PRCDEF.COM
  X:[EXE]RMENU.COM
  X:[EXE]RUNGPS.COM
  ```

  and in the symbol definitions of `JOB` and `OBS` in `LOADGPS.COM` to `X:[EXE]`

24.2.6.2 Installation of the User Environment

The data input panels, the input files for the "mainframe" programs, files keeping the latest file selections and some other files are user- (or better: account-) specific. Therefore you have to create special subdirectories in the environment of each user who wants to work with the Bernese GPS Software. (The user environment for your account is already created by the `BSINST.COM` installation file).

You may use the command file `X:[EXE]GPS_MAKEDIR.COM` as skeleton to create the user specific environment. Please make sure to run `LOADGPS` before you start `GPS_MAKEDIR`. This file will create the user environment for the account you are logging into. Generally this file does not need to be adapted.

`GPS_MAKEDIR` will create the directories

`U:[INP]`	(input files for the "mainframe" programs)
`U:[OPT]`	(Campaign specific data panel (used by BPE))
`U:[OUT]`	(user-dependent output files)
`U:[PAN]`	(your data input panels)
`U:[PCF]`	(Process Control Files (used by BPE))
`U:[SCRIPT]`	(Script files (used by BPE))
`U:[WORK]`	(work directory for the user)

and copy the necessary files from the master directories `X:[...]` into the corresponding user directories.

The directory `U:[WORK]` will contain files to manually start the execution of the "mainframe" programs, keep the latest selection of observation or other files (so that you may use `SELECTED` in the input panels) and some scratch files. You might clean up this directory from time to time without loosing vital information.

If you have one campaign list only (`X:[PAN]DAT11___.PAN`) you have to set its protection to at least G:RWE, otherwise it cannot be updated by anybody else in the group.

The path to each campaign directory is defined by the user. (We use `X:` as parent directory for the campaigns). You have to make sure that the protection of the parent directory allows the user to create the campaign subdirectories. His default protection has to allow "write access" to the newly created files by other users if others have to access the data, too. (However, working *simultaneously* on the same campaign by different users may lead to unpredictable effects).

24.2.7 Setting up the BPE

You are now ready to run the software but there are a few things which you will have to do to be able to run the BPE.

The BPE is capable of using different CPUs and different machines for what we call parallel processing. Therefore we have to tell the BPE which CPUs (machines) it can use. For this purpose you have to edit the file:

`U:[WORK]PCFCTL.CPU`

This file will look something like this:

```
# Process control CPU information
CPU      TRUE_NAME                      SPEED    NCPU SF   IDLE MAXJ JOBS
8******* 30**************************** 8******* 4*** 4*** 4*** 4*** 4***
CPU1     SYS$FASTBATCH                  SLOW        1  300  100    2    0
CPU2     SYS$BIGBATCH                   SLOW        1  300  100    2    0
CPUQIF   SYS$ASTROBATCH/NONOTI          FAST        1  300  100    2    0
```

Basically the only thing you have to change is the `TRUE_NAME` field and possibly the name of the batch queues defined on your system. (You may use the command "`show queue`" to get a list of the batch queues available on your system or ask the system administrator for details). Please make sure that an entry `CPUQIF` exists since it is used in one of the examples. Please refer to the documentation for information about the meaning of the other fields in this file.

24.2.8 Processing Examples

On our anonymous ftp we made available two examples which you can use to test the software. To download these examples use the following commands:

ftp :	`ftp ubeclu.unibe.ch`
login:	`anonymous`
password:	your full e-mail address
location:	`cd aiub$ftp`
	`cd BSWUSER`
	`cd EXAMPLES`

Here you will find a file named `readme.txt` with further instructions. Please use the DOCU40_1 example to test the BPE and the software at the same time.

24.3 Installation Guide for the Unix – Version

24.3.1 Requirements on UNIX Systems

So far the Bernese GPS Software 4.0 has been installed on the following UNIX Operating Systems:

SOLARIS	Sun Workstations under Solaris
SUN_OS	Sun Workstation with the older SUN Operating System
HP_735	HP systems
HP_835	HP Systems with HP Operating System 10.0
IBM_AIX	IBM systems under AIX
LINUX	UNIX on PC
SILICON	Silicon Graphics Machine
DEC_OSF1	DEC Alpha Processors under OSF1 (UNIX)
ULTRIX	DEC Vax Processors with older Version of DEC UNIX

The system requirements are:

- System V Fortran Compiler
- System V C Compiler
- System V Curses Library (C-Functions for Terminal interacting)

If you don't have System V available on your system you might not be able to use all curses functions called by the Bernese Software (e.g. the reverse display attribute).

24.3.2 Copying the Installation Files onto Disk

We distribute the UNIX version either via ftp or on MS-DOS floppy diskettes. Depending on the version you get you have to proceed according to one of the following two instruction parts:

24.3.2.1 Diskette Version

We assume that you have the necessary equipment to read MS-DOS diskettes and to transfer the files to your UNIX system. The MS-DOS diskettes contain the following UNIX compressed tar files:

`install.taz`	:	Installation Procedures
`astlib40.taz`	:	Fortran Source-Code of ASTLIB40
`gpslib40.taz`	:	Fortran Source-Code of GPSLIB40
`menlib40.taz`	:	Fortran Source-Code of MENLIB40
`comlib40.taz`	:	Fortran and C Source-Code of COMLIB40
`inclib40.taz`	:	Include files for Fortran and C Source
`main40.taz`	:	Main programs source code
`menu40.taz`	:	Menu system source code
`bpe40.taz`	:	BPE programs source code

`instexe.taz`	:	UNIX script files placed in `$X/EXE`
`instgen.taz`	:	GPS general data files `$X/GEN`
`instinx.taz`	:	Option file prototypes `$X/INX`
`instpan.taz`	:	Menu system Panel files `$X/PAN`
`instskl.taz`	:	Menu system Skeleton files `$X/SKL`
`instbds.taz`	:	BDS scripts (platform independent scripts)
`insthlp.taz`	:	Menu help panels
`instopt.taz`	:	Option panels for the BPE example
`instpcf.taz`	:	Process control files for the BPE
`instusc.taz`	:	User scripts for the BPE
`instxsc.taz`	:	General script for the BPE
`instdoc.taz`	:	Menu system documentation and installation guide

Proceed as follows:

1) Create an installation directory on your Unix system. We recommend to use `$HOME/gpsinst40` (we use `$INSTALL` as an abbreviation in the following text).

2) Change to this installation directory (`cd $HOME/gpsinst40`).

3) Put all files from the PC to this `$INSTALL` directory by using the binary mode of ftp and rename these files to the extension "`.tar.Z`" (e.g `comlib40.tar.Z`). Use the following ftp command file as an example (available on the first diskettes with the name `putall.ftp`):

```
"userid"
"password"
binary
cd gpsinst40
mput *.taz
```

On the PC you can use this file in connection with the ftp command to transfer the files automatically:

```
ftp 'internet address' < putall.ftp
```

4) Make sure that all the "`*.taz`" files are in lower case!

5) Rename the installation "`taz`" file:

```
mv install.taz install.tar.Z
```

6) Uncompress the compressed installation `tar.Z` file:

```
uncompress install.tar.Z
```

7) Extract the files from the installation tar file:

```
tar xvf install.tar
```

24.3.2.2 FTP Version

You may copy the software from our special software account to your computer. In order to make the software accessible for you we have to define the corresponding permissions.

REMARK:

You only can access this software account if the necessary permissions have been set for you. Please do not try to log into this account without permissions. If you are not sure or if you have questions then please let us know.

E-mail address: `rothacher@aiub.unibe.ch`

ALL YOUR ACTIVITIES ARE LOGGED.

Proceed as follows:

1) Create an installation directory on your Unix system. We recommend to use `$HOME/gpsinst40` (we use `$INSTALL` as an abbreviation in the following text).

2) Change to this installation directory (`cd $HOME/gpsinst40`).

3) Log into the software account (login is only possible by ftp – no interactive login will be accepted):

user name:	`BERNESE`
password :	"you will receive the password and other important information"

4) Select UNIX version: `cd unix`

5) Copying ASCII files:
```
ascii
get readme.unx
```

6) Copying BINARY files:
```
binary
prompt
mget *.taz
```

7) Exit from ftp: `bye`

8) Make sure that all the "`*.taz`" files are in lower case!

9) Rename the installation "`taz`" file:

```
mv install.taz install.tar.Z
```

10) Uncompress the compressed installation `tar.Z` file:

```
uncompress install.tar.Z
```

11) Extract the files from the installation tar file:

```
tar xvf install.tar
```

24.3.3 Preparing the Environment (File `LOADGPS`)

You will find a script file called `LOADGPS` in your installation directory (and also a file `LOADGPS.EXAMPLE` as a backup). Move this file to a directory which is on everybody's PATH definition.

`LOADGPS` will define the environment variables, links, and user-specific and general directories for the Bernese GPS Software.

It contains detailed descriptions and comments for the individual variables to be defined. Please read through this file carefully and set/correct the definitions according to your system. At least the definitions of the variables

`C`	(example: `C=/export/home/gpsauto/BERN40`)
`P`	(example: `P=/export/home/gpsauto/gpsdata1`)
`Q`	(example: `Q=/export/home/gpsauto/gpsdata2`)
`SHELL`	(example: `SHELL=/bin/sh`)
`OS`	(example: `OS=SOLARIS`)

have to be checked and adjusted.

You have to create yourself the directories named `$P` and `$Q` (see above), where the campaign data will eventually reside. The directory `$C` will be created during installation. Make sure that you have the protections correctly set to allow the creation of this directory. If you are not able to do this, ask your system administrator to create the directories `$C`, `$P`, and `$Q` with "`drwxrwx---`" mode.

`LOADGPS` and all other script files of the Unix version are designed for using either Bourne, Bourne Again or Korn Shell (IBM-AIX: use Korn shell!). The environment variable `SHELL` in the `LOADGPS` script defines the shell you want to use. If your login shell ist not Bourne or Korn Shell start the `LOADGPS` script by using "`sh LOADGPS`". Otherwise start this script file with "`exec LOADGPS`". If you want to keep your old Bourne or Korn shell you also have to enter "`sh LOADGPS`", or if you have changed the mode of `LOADGPS` to `x` "`LOADGPS`" will do. The directory containing the file `LOADGPS` has to be part of the path definition. For an automatic loading of the Bernese environment at start-up time you have to insert one of these commands as LAST!! line in your `.login` or `.profile`. Your system administrator will give you more information about that.

For the setting of the operating system variable "OS" you have the following possibilities:

SOLARIS	Sun Workstations under Solaris
SUN_OS	Sun Workstation with the older SUN Operating System
HP_735	HP systems
HP_835	HP Systems with HP Operating System 10.0
IBM_AIX	IBM systems under AIX
LINUX	UNIX on PC
SILICON	Silicon Graphics Machine
DEC_OSF1	DEC Alpha Processors under OSF1 (UNIX)
ULTRIX	DEC Vax Processors with older Version of DEC UNIX

With the environment variables `EDIT` and `BROWSE` (see `LOADGPS`) you may define the editor and browser program to be used by the Bernese GPS Software.

24.3.4 Installing all Source Code and Miscellaneous Files

You have to execute `LOADGPS` now before going on with the installation.

If this has been done you can start the automatic installation by executing the `$INSTALL/instgps` script file. First make sure that you are in the `$INSTALL` directory then type the command:

```
sh instgps
```

This script file will:

- create all necessary subdirectories.
- extract all source code from the tar files into the corresponding directories.
- extract all miscellaneous files into the correct directories.

After this installation step you will find the following directory structure on your system:

```
a) Main/menu Source code:
   $C/PGM
          /MAIN40         :   main programs
          /MENU40         :   menu system programs
          /BPE40          :   menu system programs
                    /FOR  :   source code
                    /OBJ  :   object files
                    /EXE  :   executables
b) Fortran and C subroutines/functions:
   $C/LIB
          /ASTLIB40       :   Fortran library of the Astronomical
                              Institute
          /GPSLIB40       :   Fortran library for GPS-Software
                              Subroutines
          /MENLIB40       :   Fortran menu system subroutines
          /COMLIB40       :   Fortran and C system dependent
                              subroutines
                    /FOR  :   source code
                    /OBJ  :   object files
          /INCLIB40 /FOR  :   Fortran and C include files
                              This files have no extension but
                              a leading "I:" in the filename to
                              keep the include statements in
                              the source code compatible to
                              the DOS and VMS versions.
c) Miscellaneous files:
   $X
          /EXE            :   GPS-Software script files
          /GEN            :   general data files like POLE, DATUM etc.
          /INX            :   examples of option files for GPS-Programs
                              only running outside of the Menu system
                              (see also RUNGPS program description)
          /PAN            :   all menu system panel files,
                              keyboard tables. etc.
          /SKL            :   menu system skeleton files for creating
                              main program option files.
          /DOC            :   documentations
          /BDS            :   BDS scripts (platform independent scripts)
          /HLP            :   Menu help panels
          /OPT            :   Option panels for the BPE example
          /PCF            :   Process control files for the BPE
```

`/USERSCPT`	:	User scripts for the BPE
`/SCRIPT`	:	General script for the BPE

If you run into troubles during the installation because of missing write access you have the chance to redo part of this step again. First make sure you have executed `LOADGPS` and that you are in the `$INSTALL` directory.

- `sh instpgm` : install only source code of main and menu programs
- `sh instlib` : install only source code of all libraries
- `sh instmisc` : install miscellaneous files

You should now exit from the Bernese environment with the command "`exit`" and re-load the environment with the following command (be sure to use capital letters):

```
LOADGPS NEW
```

The parameter "`NEW`" passed to the script "`LOADGPS`" will make sure that the `LOADGPS` script sets (or re-sets) all the necessary links. This new execution of the script `LOADGPS` will also create all the user-specific directories (see variables `$U` and `$T` in the `LOADGPS` file) and it will copy the master files available in the subdirectories of `$X` to the corresponding user-specific directories:

`$X/PAN`	$\longrightarrow$	`$U/PAN`
`$X/OPT`	$\longrightarrow$	`$U/OPT`
`$X/PCF`	$\longrightarrow$	`$U/PCF`
`$X/USERSCPT`	$\longrightarrow$	`$U/SCRIPT`

After having created the user-specific directories once, it will not be necessary anymore to call the script `LOADGPS` with the parameter "`NEW`". It is dangerous to do so if Bernese programs are running (e.g. scheduled by the BPE) during the execution of this command, because it resets some links.

24.3.5 Source Code Changes

The following changes in the source code may or may not be necessary. If they are, it is important to make the changes before compiling and linking the source code. The reason is that you have to recompile and link the entire software system in order to activate these changes.

24.3.5.1 Adjustment of the Size of Executables

The size of some main programs as e.g. GPSEST or ADDNEQ heavily depend on the size of the declared arrays. All major arrays are declared using parameters of the Fortran `PARAMETER` statement in the main programs.

Depending on the available memory or the size of the GPS networks to be processed the parameters may have to be adjusted.

24.3.5.2 Campaign List

The menu system uses a campaign list with the name defined in `I:INCL_P.FOR`:

```
DATA CMPLST/'X:/PAN/DAT11___.PAN'/
```

If you would like to have individual campaign lists for each user you would have to change the path into `U:/PAN/` .

24.3.6 Compiling and Linking the Source Code

You are now ready to compile and link the complete Bernese source code using the command:

```
COMPLINK
```

If you want to have a log file of the compilation you can use a command like this (might be slightly different for different platforms):

```
COMPLINK > COMPLINK.LOG 2>COMPLINK.ERR
```

where the file `COMPLINK.LOG` will contain all normal system messages and compilation warnings and the file `COMPLINK.ERR` will contain compilation errors (hopefully no errors will occur).

Depending on the performance of your system you may now go for a coffee break. After the successful compilation of all programs you should now have a working Bernese GPS Software System.

Start the Bernese Software by entering G.

To facilitate the compiling and linking of parts of the software (e.g. if something went wrong when compiling with the command `COMPLINK` or if you changed the maximum dimensions in a programs, . . .) you may use the following commands:

`LIBCOMP AST` : compile all routines in `ASTLIB40` for which no object file exists. If no compilation error occurred replace all object files in the archive. If you have to change one or more source code routines you can easily repeat this command. It will not compile if an object file already exists.

`LIBCOMP AST -a` : recompile *all* routines in `ASTLIB40`. If no compilation error occurred replace all object files in the archive. The option `-a` will delete all objects files of the specified library before the compilation. As the first parameter you may also use:

`GPS`	:	for `GPSLIB40`
`MEN`	:	for `MENLIB40`
`COM`	:	for `COMLIB40`

`PGMCOMP MAIN`	: compile and link all main programs (in `MAIN40`) for which the executable does not exist.
`PGMCOMP MAIN -a`	: recompiling *all* main programs. As the first parameter you may also use: `MENU` : for menu system programs `BPE` : for BPE programs.
`CLASTL` subname	: Compile the specified subroutine of `ASTLIB40` and add or replace the object module in `$C/LIB/libAST40.a`
`CLGPSL` subname	: Compile the specified subroutine of `GPSLIB40` and add or replace the object module in `$C/LIB/libGPS40.a`
`CLMENL` subname	: Compile the specified subroutine of `MENLIB40` and add or replace the object module in `$C/LIB/libMEN40.a`
`CLCOML` subname	: Compile the specified subroutine of `COMLIB40` and add or replace the object module in `$C/LIB/libCOM40.a`
`CMAIN` pgmname	: Compile and link the specified main program of `MAIN40`
`CMENU` pgmname	: Compile and link the specified main program of `MENU40`
`CBPE` pgmname	: Compile and link the specified main program of `BPE40`

24.3.7 Hints and Tips

This section contains some additional possibilities to adapt the software to your personal need.

24.3.7.1 Installation of Load Modules

If you want to separate the development environment from the production environment (or if you install the load modules on a second UNIX system) you have to copy all executables from the subdirectories `$C/PGM/MAIN40/EXE`, `$C/PGM/MENU40/EXE`, and `$C/PGM/BPE40/EXE` into the directory `$X/EXE` (on the second system).

In this case you have to:

- change the path to the programs in the data panels

  ```
  $X/PAN/DAT021__.PAN
  $X/PAN/DAT022__.PAN
  $X/PAN/DAT023__.PAN
  $X/PAN/DAT024__.PAN
  $X/PAN/DAT025__.PAN
  $X/PAN/DAT026__.PAN
  ```

  to `X:/EXE/`
- change the path to the panel programs in the option file

  ```
  $X/SKL/MENU.OPT
  ```

to `X:/EXE/`

- change the path to the programs in the command files

```
$X/EXE/G
$X/EXE/PRCDEF
$X/EXE/RMENU
$X/EXE/RUNGPS
```

to `X:/EXE/` .

24.3.7.2 Installation of the User Environment

The data input panels, the input files for the "main" programs, files keeping the latest file selections and some other files are user- (or better: login-) specific. Therefore you have to create special subdirectories for each individual user who wants to work with the Bernese GPS Software.

To create the user-specific directories you just have to execute the script `LOADGPS` with the parameter "`NEW`"

```
LOADGPS NEW
```

The complete user environment will then be created automatically. This includes the creation of the directories

`$U/INP`	(input files for the "main" programs)
`$U/OPT`	(Campaign specific data panel (used by BPE))
`$U/OUT`	(user-dependent output files)
`$U/PAN`	(your data input panels)
`$U/PCF`	(Process Control Files (used by BPE))
`$U/SCRIPT`	(Script files (used by BPE))
`$U/WORK`	(work directory for the user)

and a copy of all necessary files from the master directories in `$X` into the corresponding user directories in `$U`.

If you have one campaign list only (`$X/PAN/DAT11___.PAN`) you have to set its protection in such a way, that all the users of the Bernese GPS Software in your institute can access and modify this file.

The path to each campaign directory is defined by the user (e.g. `P:/`). You have to make sure that the protection of the parent directory allows the user to create the campaign subdirectories. The protection has to allow "write access" to the newly created files by other users if others have to access the same data, too. (However, working *simultaneously* on the same campaign by different users may cause unpredictable effects).

24.3.8 Setting up the BPE

You are now ready to run the software but there are a few things which you will have to do to be able to run the BPE.

The BPE is capable of using different CPUs and different machines for what we call parallel processing. For this purpose it uses the remote shell command (“rsh” or “remsh” for HPs). To be able to use the remote shell command the machines you plan to access using this command should be entered either in the system file

/etc/hosts.equiv

or in the user file

$HOME/.rhosts

Since the first possibility requires system access privileges we advice to use the “$HOME/.rhosts” file. If your system names are for instance “eomer1” and “eomer2 and your login on both machines is “rothach” then the two entries in the .rhosts file will look like this:

```
eomer1 rothach
eomer2 rothach
```

Of course both systems should have access to the campaign directory (disk) and to the same temporary environment ($T).

We also have to tell the BPE which CPUs (machines) it can use. For this purpose you have to edit the file:

$U/WORK/PCFCTL.CPU

This file will look something like this:

```
# Process control CPU information
CPU      TRUE\_NAME                      SPEED    NCPU SF   IDLE MAXJ JOBS
8******* 30***************************** 8******* 4*** 4*** 4*** 4*** 4***
CPU1     eomer1                         SLOW        1  300  100    2    0
CPUQIF   eomer2                         FAST        1  300  100    2    0
```

Basically the only thing you have to change is the “TRUE_NAME” field. Please make sure that an entry “CPUQIF” exists since it is used in one of the examples. Please refer to the documentation for information about the meaning of the other fields in this file.

24.3.9 Processing Examples

On our anonymous ftp we made available two examples which you can use to test the software. To download these examples use the following commands:

ftp :	`ftp ubeclu.unibe.ch`
login:	`anonymous`
password:	your full e-mail address
location:	`cd aiub$ftp`
	`cd BSWUSER`
	`cd EXAMPLES`

Here you will find a file named `readme.txt` with further instructions. Please use the `DOCU40_1` example to test the BPE and the software at the same time.

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