

**BASIC-PLUS-2
RSX-11M/M-PLUS
Installation Guide and
Release Notes**

Order No. AA-0158F-TC

February 1984

This manual describes the procedure for installing BASIC-PLUS-2 on RSX-11M/M-PLUS systems and accessing the release notes.

OPERATING SYSTEM AND VERSION: RSX-11M-PLUS V2.1
RSX-11M V4.1

SOFTWARE VERSION: PDP-11 BASIC-PLUS-2 V2.2

First Printing, November 1977
Revised, February 1984

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CHAPTER 1

INSTALLATION PROCEDURE

This chapter describes the procedure for installing BASIC-PLUS-2 V2.2 on RSX-11M/M-PLUS systems.

The BASIC-PLUS-2 compiler can be installed by any system user who has access to a privileged account. Compiler installation, however, is usually performed by a system manager.

Prior to installing this version of BASIC-PLUS-2, you must:

1. Make sure your system meets the minimum software and hardware requirements for BASIC-PLUS-2.
2. Read this manual and decide which options you want to choose for your compiler and environment.
3. Where necessary, create partitions for the secondary cache and resident libraries, if you want those options.

1.1 SOFTWARE AND HARDWARE REQUIREMENTS

The minimum operating system requirement for BASIC-PLUS-2 V2.2 is one of the following:

- RSX-11M V4.1
- RSX-11M-PLUS V2.1

The minimum file system requirement for BASIC-PLUS-2 V2.2 is:

- RMS-11 V2.0

The minimum system configuration requirements for BASIC-PLUS-2 V2.2 are:

- Any mapped RSX-11M V4.1 or RSX-11M-PLUS V2.1 system configuration, as defined in the current RSX-11M Software Product Description or RSX-11M-PLUS Software Product Description
- 32K words of virtual address space (in addition to the RSX-11M or RSX-11M-PLUS Executive) for the BASIC-PLUS-2 task image
- Any terminal with a half-duplex or a full-duplex driver

INSTALLATION PROCEDURE

- The following amounts of disk space:
 - 945 contiguous blocks for the BASIC-PLUS-2 compiler
 - 155 blocks for the BP2RES memory-resident library, if you select this option
 - 45 contiguous blocks for the BP2SML memory-resident library, if you select this option
 - 170 contiguous blocks for the BASIC-PLUS-2 Resequencer, if you select this option
 - 250 blocks for the BASIC-PLUS-2 object module library with the EIS hardware math package
 - 235 blocks for the BASIC-PLUS-2 object module library with the FPU hardware math package
 - 310 blocks for the BASIC-PLUS-2 Help file, if you select this option
 - 20 blocks for the error message file
 - 10 blocks for the BASIC-PLUS-2 ODL files
 - 240 contiguous blocks for the RUN support task image, if you select this option
 - 4000 temporary blocks for the installation procedure

NOTE

The values for block sizes are approximate.

- The following RSX-11M and RSX-11M-PLUS Executive directives:
 - ASTX\$ (AST Exit)
 - CMKT\$ (Cancel Mark Time and Cancel Selective Mark Time)
 - DIR\$ (Directive)
 - EXIT\$ (Exit)
 - EXTK\$ (Extend Task)
 - EXST\$ (Exit with Status)
 - GLUN\$ (Get LUN)
 - GTIM\$ (Get Time)
 - PLAS (Memory Management for BP2RES)
 - QIO\$ (Queue I/O)
 - RPOI\$ (Request and Pass Offspring Information)
 - SETF\$ (Set Event Flag)
 - SVTK\$ (Specify Vector Table)

INSTALLATION PROCEDURE

- The following programs:
 - File Transfer Program (FLX) - to transfer files from a magnetic tape (for magnetic tape distribution only)
 - Peripheral Interchange Program (PIP) - to manipulate distribution files
 - Task Builder (TKB) - to link the BASIC-PLUS-2 memory-resident libraries, if you select this option
 - Slow Task Builder (STK) - to link the object modules for the BASIC-PLUS-2 compiler
 - Librarian (LBR) - to modify object module libraries
 - Object Module Patch Utility (PAT) - to modify object modules to support changes in PRINT USING format characters, if you select this option
 - Monitor Console Routine (MCR) - to communicate with the operating system
 - MACRO Assembler - to assemble installation files for RUN support, if you select this option

NOTE

If these programs are present in the system UIC account but not installed on your system, the installation procedure will install them.

1.2 BEFORE INSTALLING BASIC-PLUS-2

Unless you are taking the default installation, you should choose the options you want your BASIC-PLUS-2 compiler to have before starting the installation. In particular, you must decide whether you want to install the optional memory-resident libraries and/or the secondary cache. If you choose to install either of these options, you will need particular information about your system resources to answer the questions in the installation dialogue properly. The following sections discuss these options in detail.

1.2.1 Choosing Memory-Resident Libraries

There are two BASIC-PLUS-2 memory-resident libraries, BP2RES and BP2SML. You can install one, both, or neither library. Tasks linked to a memory-resident library use less disk space than tasks not linked to a resident library. Also, two or more tasks linked to a resident library can share that library at run-time, reducing the amount of physical memory in use. However, due to its size and overlay structure, the large memory-resident library BP2RES can noticeably reduce run-time performance. Therefore BP2RES is recommended only for tasks that do not depend on fast execution or that are too large to task build without memory-resident library support. Note that the smaller library, BP2SML, has no effect on run-time performance.

INSTALLATION PROCEDURE

Once you decide to install either or both memory-resident libraries, you must select or create a partition for each library to reside in. You should do this before installing BASIC-PLUS-2. The large memory-resident library, BP2RES, requires a partition that is 17K words in size if you use the FPU hardware and a partition that is 20K words in size if you use EIS. The smaller library, BP2SML, requires a partition that is only 8K words in size using either hardware package. For information on how to create a partition, see the RSX-11M/M-PLUS DCL Manual or the RSX-11M/M-PLUS MCR Operations Manual.

Finally, once you have chosen the partition for each library you are going to install, write down the partition's name and base address. The BASIC-PLUS-2 installation procedure asks you for this information as part of the installation dialogue. (If you choose the GEN partition on an RSX-11M-PLUS system you need to specify only the name, not the base address.)

1.2.2 Choosing the Secondary Cache

Another option you can choose during the BASIC-PLUS-2 installation is secondary caching. The secondary cache is a work area in memory where the compiler stores some of the temporary work files during a compilation. (When there is no secondary cache, BASIC stores these work files on a physical device.) Storing the work files in memory minimizes the amount of disk I/O, thus reducing compilation time.

You also get to choose the size of the secondary cache. Once BASIC-PLUS-2 is installed, the size of the secondary cache is fixed and cannot be altered without reinstalling the compiler. Therefore, carefully consider the following issues before deciding whether to use secondary caching; and if so, what size secondary cache to use.

- Very small programs rarely need to access work files since the work files can usually fit within the physical memory the compiler allocates for itself. Thus the memory assigned to a secondary cache goes unused, wasting system resources.

Medium to large size programs do access work files and would benefit from secondary caching. In general, the larger the program the larger the work files the compiler needs to access, and thus, the larger the secondary cache needs to be for optimum compiler speed.

- A second consideration is the average number of compilations run at any one time and the available physical memory on your system. If you use a secondary cache, each compilation assigns physical memory for both the compiler and a secondary cache. That is, each compilation gets a secondary cache. In addition, the B22SHR and B22SHL memory-resident libraries are called into memory. (The compiler needs these libraries in order to access the secondary cache.) These libraries are shared by all current compilations.

However, if you chose a large secondary cache, it is possible that running several compilations concurrently will exhaust the system's physical memory. As a result, either: 1) tasks will be checkpointed (swapped in and out of memory) dramatically slowing down all tasks, including the compilation, or 2) the last compilation to start will not find enough memory for a secondary cache. In this case, the compilation runs without a secondary cache, putting its work files on disk.

INSTALLATION PROCEDURE

If you decide to install the secondary cache, you must select or create partitions for the libraries B22SHR and B22SH1 to reside in. Each library requires a partition that is 4K words in size. For information on how to create a partition, see the RSX-11M/M-PLUS DCL Manual or the RSX-11M/M-PLUS MCR Operations Manual.

Write down the partitions' names and base addresses. The BASIC-PLUS-2 installation procedure asks you for this information as part of the installation dialogue. (If you choose the GEN partition on an RSX-11M-PLUS system you need to specify only the name, not the base address.)

1.3 MOUNTING THE DISTRIBUTION MEDIUM

Once you are ready to begin the installation procedure, you must mount the distribution medium.

If your distribution medium is magnetic tape, you should:

1. Create a special privileged account other than [1,1], [1,2], or [*,54] to install and maintain BASIC-PLUS-2.
2. Log into the system, using the special privileged account to install BASIC-PLUS-2.
3. Place the tape on the magnetic tape drive with the write enable ring removed.

Make sure the file write protected indicator light is lit. Load the tape according to the instructions for your drive and check to see that the load point indicator light is lit. Set the ONLINE/OFFLINE switch to ONLINE and make sure the ready indicator light is lit. (The names of these indicator lights vary from drive to drive.)

4. Issue the MOUNT command with the FOREIGN qualifier.

```
DCL                                MCR
MOUNT/FOREIGN ddnn:                MOUNT ddnn:/FOREIGN
```

where:

ddnn: Is the name and number of the device on which
 the distribution medium is physically mounted.

If the default density of your tape drive is not the same as the density of the distribution medium, you must include the /DENS= qualifier to the MOUNT command to specify the correct density.

If your distribution medium is a disk, you should:

1. Create a special privileged account other than [1,1], [1,2], or [*,54] to install and maintain BASIC-PLUS-2.
2. Log into the system, using the special privileged account for installing BASIC-PLUS-2.
3. Insert the disk in the disk drive.

INSTALLATION PROCEDURE

4. Set the disk drive to the RUN position.

Make sure that the ready light is lit. (The name of this indicator light varies from drive to drive.)

5. Turn on the WRITE PROTECT switch for the disk drive.
6. Issue the MOUNT command with the label BP2V2:

```
DCL                                MCR
MOUNT ddnn: BP2V2                 MOUNT ddnn:BP2V2
```

where:

ddnn: Is the name and number of the device on which the distribution medium is physically mounted.

Make sure the logical name LB: is assigned to the device on which your system libraries are stored, so that all users can access BASIC-PLUS-2 libraries. LB: is used in the installation procedure as the logical name for the default device.

To assign a logical name, use this format of the DCL ASSIGN command or MCR ASN command:

```
DCL                                MCR
ASSIGN ddnn: LB:                   ASN ddnn:=LB:
```

where:

ddnn: Is the name and number of the device where the system libraries are stored.

You can also use a logical name to specify a device throughout the installation.

1.4 INSTALLING BASIC-PLUS-2

The BASIC-PLUS-2 installation procedure consists of two parts that must be performed from the MCR command level: the BP2BLD dialogue, executed by DIALOG.TSK, and the creation of installation command files, executed by BP2BLD.TSK. The BP2BLD dialogue is an interactive program that lets you choose options for the BASIC-PLUS-2 V2.2 compiler. The BP2BLD dialogue asks you questions and places your answers in the command file BP2DEF.CMD. The BP2BLD dialogue program also creates other installation command files, based on your responses to the dialogue, to copy installation files from the distribution medium to the temporary storage account you specify in the BP2BLD dialogue.

The installation procedure then performs the following functions:

- Linking installation files
- Executing installation command files

To run the BP2BLD programs, you must be at the MCR command level. To enter MCR from DCL, type:

```
SET TERMINAL/MCR
```

INSTALLATION PROCEDURE

Once you are at the MCR command level, copy the BP2RSX.CMD file from the distribution medium. If your distribution medium is magnetic tape, type:

```
FLX SY:/RS=ddnn:[1,10]BP2RSX.CMD/DO
```

If your distribution medium is disk, type:

```
PIP SY:/NV=ddnn:[1,10]BP2RSX.CMD
```

where:

ddnn: Is the name and number of the device on which the distribution medium is physically mounted.

Execute the BP2BLD programs by typing:

```
@BP2RSX
```

1.4.1 The Installation Dialogue

The BP2BLD dialogue is divided into the following sections:

1. Installing libraries, the secondary cache, RUN support, the BASIC-PLUS-2 Resequencer, and the Help file
2. Specifying the location for the compiler, the work files, the object module library, the BP2 ODL files, and the temporary installation files
3. Specifying whether or not to update the compiler
4. Specifying whether or not to delete the temporary installation files
5. Specifying whether or not to verify the installation

For some questions in the dialogue, you must answer either YES or NO. If you answer something else, the BP2BLD dialogue responds with the message "Please answer "YES" or "NO"."

For several questions in the BP2BLD dialogue, you must choose one of several answers. If you answer something other than the allowable choices, the BP2BLD dialogue responds with the message "Please answer one of the following:", listing the possible answers.

For several questions in the BP2BLD dialogue, your answer must be a certain number of characters. If your answer is more than the maximum number of characters, the BP2BLD dialogue responds with the message "Your answer must be less than n number of characters in length," substituting the maximum number of characters for n.

For several questions in the BP2BLD dialogue, your answer must be within a certain range of values. If your answer is not in the range, the BP2BLD dialogue responds with the message "Your answer must be in the range from n to n," substituting the allowable range for n.

For several questions in the BP2BLD dialogue, your answer must be an unsigned integer and within a certain range of values. If your answer is not an unsigned integer, the BP2BLD dialogue responds with the message "Your answer must be an unsigned integer in the range from n to n," substituting the allowable range for n.

INSTALLATION PROCEDURE

If you want to change an answer during the dialogue, but before the summary, you can back up one question at a time by pressing the escape key (ESC). However, if you attempt to back up beyond the first question, the BP2BLD dialogue responds with the message "This is the first question in the BP2BLD dialogue."

If you receive an error message during the installation, consult your RSX-11M/M-PLUS operating systems documentation.

To abort either BP2BLD program, press the CTRL key and the C key at the same time, and then type "ABO AT.". For example:

```
MCR
^C
MCR>ABO AT.
```

This section describes the BP2BLD dialogue and installation procedure. The shaded text is the dialogue as it appears on the terminal, and the indented text explains how you should answer the questions the BP2BLD dialogue contains. The explanations do not appear in the dialogue.

* What device is the distribution medium mounted on <MMO:> [S]:

Enter the name of the device or the logical name for the device on which the distribution medium is physically mounted.

BASIC-PLUS-2 VERSION 2 INSTALLATION

This starts the BP2BLD dialogue. The BP2BLD dialogue asks you questions so you can select the options for your BASIC-PLUS-2 compiler. The default answer for each question is in angle brackets. To select the default, press the RETURN key. If you do not want the default answer, type in the answer you want.

You should read the BASIC-PLUS-2 installation guide before you begin the BP2BLD dialogue. Some of the answers you select can result in additional questions or the omission of certain questions later in the dialogue. If you are not sure how to answer a question, you can either type a question mark (?) for a brief explanation or see the BASIC-PLUS-2 installation guide for more information.

The BP2BLD dialogue prints a summary of your answers at the end of the dialogue. If you want to change your answers, answer YES to the question at the end of the summary, at this point, the BP2BLD program runs the BP2BLD dialogue again. If you choose an option other than the default, your choice is enclosed in angle brackets as the default answer for that question.

If you want to change an answer during the dialogue but before the summary, type the escape key (<ESC>) to back up to the answer you want to change and then type the correct answer.

Do you want the default installation <YES>

Accepting the default installation or default answers installs a version of BASIC-PLUS-2 that fits on all systems. However, you can improve the performance of BASIC-PLUS-2 if you answer each question in the dialogue to customize BASIC-PLUS-2 to your system.

INSTALLATION PROCEDURE

If you want the default installation, answer YES. The BP2BLD dialogue asks the next question and then displays a summary of the options for the default installation.

You can also answer with the file name of an indirect command file. Using an indirect command file frees you from having to answer each question at the terminal.

To create an indirect command, use a text editor and create a file with the file type CMD. Enter your answer to each question in the dialogue on a separate line. A blank line indicates a carriage return that selects the default answer for that question. To execute your indirect command file, respond to this question with:

```
@filename.CMD
```

where:

filename Is the name of your indirect command file.

If you do not want the default installation, answer NO or specify the file name of an indirect command file and skip the information in this installation guide until you reach the "Do you want to install BP2RES" question.

What name do you want to use to invoke BP2 <BP2>

Enter the three-character name you want to use to invoke the BASIC-PLUS-2 compiler. This name becomes the first three characters of the file names for all BASIC-PLUS-2 components except for the following:

```
BASIC2.ERR  
BP2.HLP  
BP2RFA.HLP  
B2RESQ.TSK  
B22SHR.TSK  
B22SH1.TSK
```

For example, if you choose FPU, the file name for the BASIC-PLUS-2 compiler is FPUIC2.

At this point, if you chose the default installation, the BP2BLD dialogue displays a summary of the options for the default installation. The summary is written to the file nnnDEF.DOC as a record of the installation. Nnn is the three-character name you previously chose to invoke the BASIC-PLUS-2 compiler.

Here is a summary of the options you have selected:

```
This is a default installation  
BP2RES will not be installed  
BP2SML will not be installed  
Secondary caching will not be enabled  
RUN will be supported  
RUN will not support remote RMS file access  
The BP2 Resequencer will not be installed  
The BP2 HELP file will not be installed  
The hardware math package is EIS  
The name to use to invoke BP2 is BP2
```

INSTALLATION PROCEDURE

The BP2 compiler prompt is BASIC2
The device and account for the BP2 compiler is LB:[1,54]
The device and account for the BP2 compiler work files is SY:
The device and account for the BP2 object module disk library is LB:[1,1]
The device and account for the BP2 ODL files is LB:[1,1]
The device and account for the temp installation files is SY:
The device and account for the RMS-11 ODL files is LB:[1,1]
EDIT\$ will not upcase characters (octal 173 - 176)
The default time format is AM/PM
The PRINT USING currency symbol is \$
The PRINT USING decimal point is .
The PRINT USING third digit separator symbol is ,
The BP2 compiler will not be updated
The installation command files will be deleted
The compiler installation will be verified
Do you wish to change any of your answers <NO>

If you want the default installation, answer NO or press the RETURN key. Then, the BP2BLD dialogue responds with the following messages:

The BP2BLD dialogue is complete.
The installation will take about 1 hour to complete.

If you chose the default installation, you can now skip the questions that follow until you reach these same two messages on page 1-20 of this manual.

If you do not want the default installation or you want to change one of your answers, answer YES to this question. Then the BP2BLD program runs the BP2BLD dialogue again. What follows is each question in the dialogue and an explanation of how to answer each one.

Do you want the default installation <YES>

If you answer YES, BASIC-PLUS-2 is installed with the default options. Answer NO or specify an indirect command file if you want to customize BASIC-PLUS-2 to your system.

Do you want to install BP2RES <NO>

There are two BASIC-PLUS-2 memory-resident libraries: BP2RES and BP2SML. You can install none of the BASIC-PLUS-2 memory-resident libraries, one of them, or both of them.

Linking BASIC programs to the memory-resident libraries reduces the size of the task image. However, using BP2RES also slows down the execution of the task. Therefore, linking to BP2RES is only recommended for tasks that are not sensitive to run-time performance or that are too large to task build without memory-resident library support. See Section 1.2.1 for more information on choosing BASIC-PLUS-2 memory-resident libraries.

If you answer NO or take the default, skip the next three questions. If you answer YES, the BP2BLD dialogue asks you the next three questions.

INSTALLATION PROCEDURE

Enter the device and account for BP2RES <LB:[1,1]>

Enter the name of the device and the account where you want to store BP2RES. Select a device that can store approximately 155 blocks of disk space and an account that is accessible to all users. Be sure you have enough space on the disk before installing BP2RES.

What is the partition name for BP2RES <partition>

RSX-11M/M-PLUS systems require you to enter the name of the partition where you plan to install BP2RES. Choose a partition that can accommodate 20K words if you use an EIS processor, or 17K words if you use an FPU processor. The default partition name is BP2RES on RSX-11M systems and GEN on RSX-11M-PLUS.

If you answer with GEN or any other system-controlled partition on an RSX-11M-PLUS system, the library is checkpointable. Checkpointable tasks swap out of memory when they are not required, which helps to conserve system memory. If you specify a nonexistent partition, the partition defaults to GEN.

In addition, if you choose GEN as the partition name on an RSX-11M-PLUS system, the BP2BLD dialogue skips the next question.

On both RSX-11M and RSX-11M-PLUS systems, if you specify an existing partition other than the default, the installation procedure changes the partition name to match the library name: nnnRES, where nnn is the three-character name you choose later in the dialogue for invoking BASIC.

What is the absolute address for BP2RES <0>

Enter the base address of the partition name you selected for BP2RES. You can determine the address by using the DCL SHOW PARTITION command or the MCR PARTITION command. See the RSX-11M/M-PLUS Command Language Manual for more information on the DCL SHOW PARTITION command. See the RSX-11M/M-PLUS MCR Operations Manual for more information on the MCR PARTITION command.

NOTE

You must determine the absolute address of the partition before you answer this question. If you enter a carriage return or an incorrect address, the resident library will not be installed correctly.

The absolute address becomes the physical base address of the SET /MAIN=parname command on RSX-11M systems and of the SET /PAR command on RSX-11M-PLUS systems.

Do you want to install BP2SML <NO>

BP2SML is a BASIC-PLUS-2 memory-resident library that contains a subset of the BASIC-PLUS-2 OTS. It requires 8K words of physical memory and 8K words of virtual address space.

INSTALLATION PROCEDURE

BP2SML shares the advantages of BP2RES, except that BP2SML contains only a subset of the BASIC-PLUS-2 OTS. If you installed BP2RES and your site develops commercial applications, you may want to install both BASIC-PLUS-2 memory-resident libraries to make sure your applications run with each library as expected. See Section 1.2.1 for more information on choosing memory-resident libraries.

If you answer YES, the program asks you the next three questions. If you answer NO or take the default, skip the next three questions.

Enter the device and account for BP2SML <LB:[1,1]>

Enter the name of the device and the account where you want to store BP2SML. Select a device that can store approximately 45 blocks of disk space and an account that is accessible to all users. Be sure you have enough space on the disk before installing BP2SML.

What is the partition name for BP2SML <partition>

RSX-11M/M-PLUS systems require you to enter the name of the partition where you plan to install BP2SML. Choose a partition that can accommodate 8K words. The default partition name is BP2SML on RSX-11M systems and GEN on RSX-11M-PLUS.

If you answer with GEN or any other system-controlled partition on an RSX-11M-PLUS system, the library is checkpointable. Checkpointable tasks swap out of memory when they are not required, which helps to conserve system memory. If you specify a nonexistent partition, the partition defaults to GEN.

In addition, if you choose GEN as the partition name on an RSX-11M-PLUS system, the BP2BLD dialogue skips the next question.

On both RSX-11M and RSX-11M-PLUS systems, if you specify an existing partition other than the default, the installation procedure changes the partition name to match the library name: nnnSML, where nnn is the three-character name you choose later in the dialogue for invoking BASIC.

What is the absolute address for BP2SML <0>

Enter the base address of the partition name you selected for BP2SML. You can determine this address by using the DCL SHOW PARTITION command or the MCR PARTITION command.

NOTE

You must determine the absolute address of the partition before you answer this question. If you enter a carriage return or an incorrect address, the resident library will not be installed correctly.

The absolute address becomes the physical base address of the SET /MAIN=parname command on RSX-11M systems and of the SET /PAR command on RSX-11M-PLUS systems.

INSTALLATION PROCEDURE

Do you want to install the secondary cache <NO>

The secondary cache is a section of memory the BASIC compiler uses to store work files during a compilation. Storing the work files in memory reduces the compilation time by reducing the number of disk accesses the compiler must make to retrieve its work files. See Section 1.2.2 for more information. on secondary caching.

If you answer YES, the BASIC compiler uses secondary caching to store the work files in memory when the physical memory is available. If you answer NO, the BASIC compiler does not use secondary caching, and the work files are stored on a disk during compilations. If you answer NO, the dialogue skips the next seven questions dealing with secondary caching and its associated libraries, B22SHR and B22SH1.

What size do you want to make the secondary cache <8>

If you chose to install secondary caching in response to the previous question, the dialogue now asks how large you want the secondary cache to be. You can make the secondary cache any multiple of 4K words from 4K to 60K. Note however that large secondary caches waste system resources except when compiling extremely large programs. Your choice should be based on the average number of simultaneous compilations, the average size of the programs, and the amount of free virtual memory on your system.

Enter the device and account for B22SHR <LB:[1,1]>

B22SHR is one of two memory-resident libraries the BASIC compiler needs in order to access the secondary cache. Enter the name of the device and the account where you want to store B22SHR. Select a device that can store approximately 25 blocks of disk space and an account that is accessible to all users.

What is the partition name for B22SHR <partition>

Enter the name of the partition where you want to install B22SHR. You must choose a partition that can accommodate 4K words. The default partition name is B22SHR on RSX-11M systems and GEN on RSX-11M-PLUS. If you answer with GEN or any other system-controlled partition on an RSX-11M-PLUS system, the library is checkpointable. Checkpointable tasks swap out of memory when they are not required, which helps to conserve system memory. If you specify a nonexistent partition, the partition defaults to GEN.

In addition, if you choose GEN as the partition name on an RSX-11M-PLUS system, the BP2BLD dialogue skips the next question.

On both RSX-11M and RSX-11M-PLUS systems, if you specify an existing partition other than the default, the installation procedure changes the partition name to match the library name: B22SHR.

What is the absolute address for B22SHR <0>

Enter the base address of the partition name you selected for B22SHR. You can determine the address by using the DCL SHOW PARTITION command or the MCR PARTITION command. See the

INSTALLATION PROCEDURE

RSX-11M/M-PLUS Command Language Manual for more information on the DCL SHOW PARTITION command. See the RSX-11M/M-PLUS MCR Operations Manual for more information on the MCR PARTITION command.

NOTE

You must determine the absolute address of the partition before you answer this question. If you enter a carriage return or an incorrect address, the resident library will not be installed correctly.

The absolute address becomes the physical base address of the SET /MAIN=parname command on RSX-11M systems and of the SET /PAR command on RSX-11M-PLUS systems.

Enter the device and account for B22SH1 <LB:[1,1]>

B22SH1 is the other memory-resident library the BASIC compiler uses to access the secondary cache. Enter the name of the device and the account where you want to store B22SH1. Select a device that can store approximately 25 blocks of disk space and an account that is accessible to all users.

What is the partition name for B22SH1 <partition>

Enter the name of the partition where you want to install B22SH1. You must choose a partition that can accommodate 4K words. The default partition name is B22SH1 on RSX-11M systems and GEN on RSX-11M-PLUS. If you answer with GEN or any other system-controlled partition on an RSX-11M-PLUS system, the library is checkpointable. Checkpointable tasks swap out of memory when they are not required, which helps to conserve system memory. If you specify a nonexistent partition, the partition defaults to GEN.

In addition, if you choose GEN as the partition name on an RSX-11M-PLUS system, the BP2BLD dialogue skips the next question.

On both RSX-11M and RSX-11M-PLUS systems, if you specify an existing partition other than the default, the installation procedure changes the partition name to match the library name: B22SH1.

What is the absolute address for B22SH1 <0>

Enter the base address of the partition name you selected for B22SH1. You can determine the address by using the DCL SHOW PARTITION command or the MCR PARTITION command. See the RSX-11M/M-PLUS Command Language Manual for more information on the DCL SHOW PARTITION command. See the RSX-11M/M-PLUS MCR Operations Manual for more information on the MCR PARTITION command.

NOTE

You must determine the absolute address of the partition before you answer this question. If you enter a carriage return or an incorrect address, the resident library will not be installed correctly.

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The absolute address becomes the physical base address of the SET /MAIN=parname command on RSX-11M systems and of the SET /PAR command on RSX-11M-PLUS systems.

Do you want to support RUN <YES>

If you answer YES, you can execute programs in the BASIC environment with the RUN command, access the BASIC-PLUS-2 debugger in the BASIC environment with the RUN/DEBUG command, make object modules available for execution with the LOAD command, and execute immediate mode statements. If you answer NO, support for these options is not built and the BP2BLD dialogue skips the next question.

Do you want RUN to support remote RMS file access <NO>

BASIC-PLUS-2 programs can access files on other computer systems connected to your computer by DECnet. To provide this remote file access support for immediate mode statements and programs run in the BASIC environment, the RUN task must be linked to libraries that provide RMS-11 DECnet support. If you answer YES to this question, support for remote RMS file access is linked to the RUN task. If you answer NO, the RUN task is not linked to remote file access support.

Do you want to link the support for RUN with memory resident libraries <YES>

If you decided to install BP2RES, you may choose to link the support for the RUN command, the LOAD command, and immediate mode statements with the BP2RES and RMSRES memory-resident libraries. Programs run fastest when using the memory-resident libraries. However, the libraries must be stored in the account LB:[1,1] to be linked to the support for RUN. If RMSRES is not in LB:[1,1] or you chose to store BP2RES in another account, you must answer NO to this question.

Note that in addition to the BP2RES and RMSRES libraries, if you decided to include remote RMS support with RUN in the previous question, the DAPRES library that supports remote file access through DECnet will also be included. DAPRES must also be in LB:[1,1].

Answer YES to link the support for RUN with the memory-resident libraries. Answer NO to link the support for RUN with the BASIC-PLUS-2 object module library.

Do you want to install the BP2 Resequencer <NO>

The Resequencer is a BASIC-PLUS-2 utility that uses approximately 185 blocks of disk space and allows you to renumber the line numbers in your program.

If you answer YES, the Resequencer file is installed on the device and account you specify in the next question. If you answer NO or take the default, skip the next question.

INSTALLATION PROCEDURE

Enter the device and account for the BP2 Resequencer <LB:[1,54]>

Enter the name of the device and the account where you want to store the BASIC-PLUS-2 Resequencer. Select a device that can store approximately 185 blocks of disk space and an account that is accessible to all users. Be sure you have enough space on the disk before installing the BASIC-PLUS-2 Resequencer.

Do you want to install the BP2 Help file <NO>

The two BASIC-PLUS-2 Help files use approximately 310 blocks of disk space and provide on-line documentation for BASIC-PLUS-2. If you answer YES, the Help files are copied from the distribution medium to the device and account you specify in the next question. If you answer NO or take the default, skip the next question.

Enter the device and account for the BP2 Help file <LB:[1,2]>

Enter the name of the device and the account where you want to store the BASIC-PLUS-2 Help files. Select a device that can store approximately 310 blocks of disk space and an account that is accessible to all users. Be sure you have enough space on the disk before installing the BASIC-PLUS-2 Help files.

Which hardware math package do you want to use <EIS>

Enter the hardware math package you want to use with this version of BASIC-PLUS-2. You can specify EIS (Extended Instruction Set) or FPU (Floating Point Unit.) If your system has both types of math hardware, choose FPU, because it processes floating-point arithmetic faster and uses less virtual address space.

What name do you want to use to invoke BP2 <BP2>

Enter the three-character name you want to use to invoke the BASIC-PLUS-2 compiler. This name becomes the first three characters of the file names for many of the BASIC-PLUS-2 components. For example, if you choose FPU as the name to indicate the hardware math package being used, the file name for the BASIC-PLUS-2 compiler is FPUIC2.

What do you want to use as the BP2 compiler prompt <BASIC2>

When you are in the BASIC environment, BASIC-PLUS-2 displays a prompt that tells you the compiler is ready to execute commands, program lines, or immediate mode statements. You can answer with any three-character combination of letters and digits. The default prompt is used in examples throughout the documentation.

Enter the device and account for the BP2 compiler <LB:[1,54]>

Enter the name of the device and the account where you want to store the BASIC-PLUS-2 compiler. Select a device that can store approximately 945 contiguous blocks of disk space and an account that is accessible to all users. The device must also have approximately 240 free contiguous blocks if you chose to support

INSTALLATION PROCEDURE

the RUN command. Be sure you have enough space on the disk before installing the BASIC-PLUS-2 compiler. Note that the BP2BLD program automatically sets the file protection for the compiler.

Enter the device and account for the BP2 compiler work files <SY:>

The BASIC-PLUS-2 compiler opens three work files every time it is invoked. The first file is an internal representation of your program and is approximately the same size in blocks as the program currently in memory. The second file contains line tables and internal code, using approximately 130 blocks of disk space. The third file contains symbol tables and cross-reference information, if in effect, using approximately 255 blocks of disk space.

Select a device that is not heavily used, has a high transfer rate, and, if you have the option, is not on the same disk as the BASIC-PLUS-2 compiler. Select an account that is accessible to all users.

Enter the device and account for the BP2 object module disk library <LB:[1,1]>

Enter the name of the device and the account where you want to store the BASIC-PLUS-2 object module library file. If you chose EIS hardware, select a device that can store approximately 250 blocks of disk space. If you chose FPU hardware, select a device that can store approximately 235 blocks of disk space. Select an account that is accessible to all users. Be sure you have enough space on the disk before installing the BASIC-PLUS-2 object module library.

Enter the device and account for the BP2 ODL files <LB:[1,1]>

Enter the name of the device and the account where you want to store the BASIC-PLUS-2 ODL files. BASIC-PLUS-2 uses these ODL files when you add a file organization qualifier to the BASIC BUILD command or when your program uses an ORGANIZATION clause in an OPEN statement. Select a device that can store approximately 20 blocks of disk space and an account that is accessible to all users. Be sure you have enough space on the disk to install the BASIC-PLUS-2 ODL files.

Enter the device and account for the temp installation files <SY:>

These files are used for the installation and are temporary. During the installation, they are either created or copied from the distribution medium to the device and account you specify. Select a device that can temporarily store approximately 4000 blocks of disk space. Be sure you have enough space on the disk to accommodate the temporary installation files.

Enter the device and account for the RMS-11 ODL files <LB:[1,1]>

Specify the device and account where the RMS-11 ODL files reside. These files must already be on your system for the BASIC-PLUS-2 installation to complete properly.

INSTALLATION PROCEDURE

Do you want the EDIT\$ upcase (function code 32) to apply to characters in the range (octal 173 - 176) <NO>

In some countries, there are letters following "Z" in the alphabet. If you answer YES, the EDIT\$ function code 32 converts these lowercase letters to uppercase.

What do you want as the default time format <AM/PM>

You can specify AM/PM to use the 12-hour clock (AM and PM format; for example: 3:00 PM) or 24 to use the 24-hour clock, (for example: 15:00). The format you choose is used as the value for the TIME\$(0%) function.

What do you want as the character for the PRINT USING currency symbol <\$>

The dollar sign (\$) PRINT USING format character is used for the currency symbol in the United States and Canada. If you want to specify a symbol other than the default, enter it here and the PRINT USING statement will use it when formatting.

What do you want as the character for the PRINT USING decimal point <.>

You can specify another symbol for the decimal point to be used by the PRINT USING statement when formatting. If you want to specify a symbol other than the default, enter it here.

What do you want as the character for the PRINT USING third digit separator <,>

You can specify another symbol for the third-digit separator to be used by the PRINT USING statement when formatting. If you want to specify a symbol other than the default, enter it here.

Do you want to update the BP2 compiler <NO>

Patches no longer update the BASIC-PLUS-2 product. Now the compiler is updated by replacing its object modules, then linking them, and installing BASIC-PLUS-2 again. When you install updates for BASIC-PLUS-2, you must execute the BP2BLD programs and answer its questions again.

If you are updating BASIC-PLUS-2, answer YES, and the BP2BLD dialogue asks the next question. If you answer NO or take the default, skip the next question.

Enter the device and account for the update files <SY:>

Enter the name of the device and account where the files from the update distribution medium reside.

Do you want to delete the installation command files <YES>

These files are used during the installation process and are not of any use after the installation, unless you want to edit them to further customize BASIC-PLUS-2.

INSTALLATION PROCEDURE

Do you want to verify the installation <YES>

The verification procedure executes a number of BASIC-PLUS-2 programs to test the BASIC-PLUS-2 compiler, the RSX-11M/M-PLUS Task Builder, and terminal I/O. Answer YES to verify the installation.

What follows is a sample summary of options for a customized installation. The summary that is displayed at your terminal is written to the file nnnDEF.DOC as a record of the installation. Nnn is the three-character name you previously chose to invoke the BASIC-PLUS-2 compiler.

Here is a summary of the options you have selected:

This is not a default installation
BP2RES will be installed
The device and account for BP2RES is LB:[1,1]
The partition name for BP2RES is GEN
BP2SML will not be installed
Secondary caching will be enabled
The size of the secondary cache will be 8
The device and account for B22SHR is LB:[1,1]
The partition name for B22SHR is GEN
The device and account for B22SHR is LB:[1,1]
The partition name for B22SH1 is GEN
RUN will be supported
RUN will not support remote RMS file access
RUN support will be linked with memory resident libraries
The BP2 Resequencer will not be installed
The BP2 HELP file will be installed
The device and account for the BP2 Help file is LB:[1,2]
The hardware math package is EIS
The name to use to invoke BP2 is BP2
The BP2 compiler prompt is BASIC2
The device and account for the BP2 compiler is LB:[1,54]
The device and account for the BP2 compiler work files is SY:
The device and account for the BP2 object module disk library is
LB:[1,1]
The device and account for the BP2 ODL files is LB:[1,1]
The device and account for the temp installation files is SY:
The device and account for the RMS-11 ODL files is LB:[1,1]
EDIT\$ will not uppercase characters (octal 173 - 176)
The default time format is AM/PM
The PRINT USING currency symbol is \$
The PRINT USING decimal point symbol is .
The PRINT USING third digit separator symbol is ,
The compiler will not be updated
The installation command files will be deleted
The compiler installation will be verified

Do you wish to change any of your answers <NO>

If you answer YES, the BP2BLD dialogue responds with:

Answering <CR> to each question will produce the same compiler as answering 'YES' to the "Do you want the default installation?" question.

At this point, the BP2BLD dialogue program asks all the questions in the dialogue again. Note that if you selected an answer other than the default to a question, your answer is enclosed in angle brackets as the default answer for that question.

INSTALLATION PROCEDURE

If you do not need to change your answers, answer NO or take the default answer. Then the BP2BLD dialogue responds with:

The BP2BLD dialogue is complete.
The installation will take about 1 hour to complete.

At this point, the BP2BLD dialogue is complete. All your responses to the BP2BLD dialogue are written to the command file nnnDEF.CMD. You can use this command file as an indirect command file if you have to install BASIC-PLUS-2 again. A summary of the options you selected are written to nnnDEF.DOC. Nnn is the three-character name you previously chose to invoke the BASIC-PLUS-2 compiler.

Now the installation files are executed to:

- Create command files to copy certain files from the distribution medium to the work area.
- Link the object modules for the BASIC-PLUS-2 compiler.
- Install the BASIC-PLUS-2 compiler and memory-resident libraries, if you selected this option.
- Verify the installation, if you selected this option.

During this portion of the installation procedure, new libraries and tasks are created and previous versions removed. At this time, the system may display one or more informational messages. The messages indicate that modules are being replaced, partitions are being renamed, previous versions of tasks could not be found, or that duplicate copies of libraries already exist. For example:

```
Module "THREAD" replaced
REM -- Common not in system
REM -- Task not in system
Partition BP2RES has been renamed to FPURES
```

These messages are informational in nature and do not indicate an error in the installation procedure. When the installation procedure is complete, the system responds with:

The BASIC-PLUS-2 installation is complete.

Table 1-1 lists the names and functions of the temporary files that are created or are copied from the distribution medium during the installation. All files except BP2DEF.CMD, BP2DEF.DOC, and BP2INS.CMD are deleted if you select this option in the BP2BLD dialogue.

Some of the files listed below as beginning with the letters BP2 will begin with the three-character name you chose to invoke BASIC-PLUS-2 in the BP2BLD dialogue. This table uses the default name BP2.

Table 1-1: Installation Files

File Name	Function
B22S1X.CMD	Is a skeleton command file for building the B22SH1 library, if you want to install the secondary cache.

(continued on next page)

INSTALLATION PROCEDURE

Table 1-1 (Cont.): Installation Files

File Name	Function
B22SEC.CMD	Is a command file for building the secondary cache, if you selected that option.
B22SEC.MAC	Is a MACRO program for creating the secondary cache, if you selected that option.
B22SH1.CMD	Is a command file for building the B22SH1 library, if you want to install the secondary cache.
B22SHR.CMD	Is a command file for building the B22SHR library, if you want to install the secondary cache.
B22SRX.CMD	Is a skeleton command file for building the B22SHR library, if you want to install the secondary cache.
BP211S.ODL	Tells the Task Builder how to access the RMS libraries.
BP2BLD.CMD	Controls the installation process.
BP2BLD.TSK	Creates CMD files.
BP2CPY.CMD	Controls all copying of files from the distribution medium to the accounts you specified in the BP2BLD dialogue.
BP2DEL.CMD	Deletes temporary installation command files, if you selected this option.
BP2ECU.CMD	Links the BASIC-PLUS-2 compiler for systems with EIS math hardware.
BP2ECU.ODL	Tells the Task Builder how to overlay segments of the BASIC-PLUS-2 compiler while linking.
BP2EOL.CMD	Is created by BP2BLD.TSK, if you want to install the BP2RES memory-resident library for systems with EIS math hardware.
BP2EOL.ODL	Is created by BP2BLD.TSK, if you want to install the BP2RES memory-resident library for systems with EIS math hardware.
BP2EOS.CMD	Links the BP2SML memory-resident library for systems with EIS math hardware, if you selected this option.
BP2EOT.OLB	Is the BASIC-PLUS-2 object module library for systems with EIS math hardware.
BP2ERL.CMD	Builds the support for Run with the BP2RES memory-resident library for systems with EIS math hardware, if you selected this option.

(continued on next page)

INSTALLATION PROCEDURE

Table 1-1 (Cont.): Installation Files

File Name	Function
BP2ERL.ODL	Tells the Task Builder how to overlay segments of the support for Run while linking, if you selected this option.
BP2ERU.CMD	Builds the support for Run with the BASIC-PLUS-2 object module library for systems with EIS math hardware, if you selected this option.
BP2ERU.ODL	Tells the Task Builder how to overlay segments of the support for Run while linking, if you selected this option.
BP2EXL.CMD	Is copied from the distribution medium, if you want to install the BP2RES memory-resident library for systems with EIS math hardware.
BP2EXL.ODL	Is copied from the distribution medium, if you want to install the BP2RES memory-resident library for systems with EIS math hardware.
BP2EXS.CMD	Is copied from the distribution medium, if you want to install the BP2SML memory-resident library for systems with EIS math hardware.
BP2FCU.CMD	Links the BASIC-PLUS-2 compiler for systems with FPU math hardware.
BP2FCU.ODL	Tells the Task Builder how to overlay segments of the BASIC-PLUS-2 compiler while linking.
BP2FOL.CMD	Is created by BP2BLD.TSK, if you want to install the BP2RES memory-resident library for systems with FPU math hardware.
BP2FOL.ODL	Is created by BP2BLD.TSK, if you want to install the BP2RES memory-resident library for systems with FPU math hardware.
BP2FOS.CMD	Links the BP2SML memory-resident library for systems with FPU math hardware, if you selected this option.
BP2FOT.OLB	Is the BASIC-PLUS-2 object module library for systems with FPU math hardware.
BP2FRL.CMD	Links the support for Run with the BP2RES memory-resident library for systems with FPU math hardware, if you selected this option.
BP2FRL.ODL	Tells the Task Builder how to overlay segments of the support for Run while linking, if you selected this option.
BP2FTR.CMD	Modifies the object modules to support the EDIT\$, TIME\$, and DATE\$ options, if you selected these options.

(continued on next page)

INSTALLATION PROCEDURE

Table 1-1 (Cont.): Installation Files

File Name	Function
BP2FTR.ULB	Contains the object modules to support the EDIT\$, TIME\$, and DATE\$ options, if you selected these options.
BP2FRU.CMD	Links the support for Run with the BASIC-PLUS-2 object module library for systems with FPU math hardware.
BP2FRU.ODL	Tells the Task Builder how to overlay segments of the support for Run while linking, if you selected this option.
BP2FXL.CMD	Is copied from the distribution medium, if you want to install the BP2RES memory-resident library for systems with FPU math hardware.
BP2FXL.ODL	Is copied from the distribution medium, if you want to install the BP2RES memory-resident library for systems with FPU math hardware.
BP2FXS.ODL	Is copied from the distribution medium, if you want to install the BP2RES memory-resident library for systems with FPU math hardware.
BP2INS.CMD	Installs BASIC-PLUS-2 task images and memory-resident libraries, if you selected these options.
BP2RN1.CMD	Renames files created during the installation.
BP2RN2.CMD	Renames files created during the installation.
BP2RSQ.CMD	Links the BASIC-PLUS-2 Resequencer, if you selected this option.
BP2RSQ.ODL	Tells the Task Builder how to overlay segments of the BASIC-PLUS-2 Resequencer while linking.
BP2RSX.CMD	Copies the installation command files and executes BP2BLD.CMD.
BP2VE0.CMD	Verifies the installation, if you selected this option.
BP2VE1.CMD	Verifies the installation, if you selected this option.
DIALOG.DAT	Contains the dialogue text.
DIALOG.TSK	Executes the dialogue.
GLBADD.CMD	Is copied from the distribution medium, if you want to install the secondary cache.
RSXCFELIB.OLB	Is the compiler front-end library.
RSXLIB.OLB	Is the support for the compiler.

(continued on next page)

INSTALLATION PROCEDURE

Table 1-1 (Cont.): Installation Files

File Name	Function
THREAD.DAT	Contains data required by THREAD.TSK.
THREAD.TSK	Creates a file of definitions for the addresses of the routines to support Run.
THREAD.MAC	Is the file of definitions THREAD.TSK creates.
THREAD.OBJ	Is the object module created by assembling THREAD.MAC.

1.4.2 The Verification Test

BP2BLD runs a verification test that checks the BASIC-PLUS-2 compiler and Task Builder. If the verification test is successful, the following output is displayed:

```

PDP-11 BASIC-PLUS-2 V2.2-00

BASIC2

@SY:BP2VE0
NEW SY:BP2T0
10  DECLARE INTEGER I
20  DECLARE STRING J
30  PRINT 'BASIC-PLUS-2 INSTALLATION VERIFICATION'
40  FOR I = 1 TO 10
50      J = SPACE$(I) + NUM1$(I)
60      PRINT J
70  NEXT I
80  PRINT 'VERIFICATION 1 IS COMPLETE'
90  PRINT ERT$(0%)
100 END
REPLACE SY:BP2T0
COMPILE SY:/OBJ
BP2T0 10:12 AM          17-Feb-84
BUILD SY:
EXIT

BASIC-PLUS-2 INSTALLATION VERIFICATION
1
 2
   3
    4
     5
      6
       7
        8
         9
          10
VERIFICATION #1 COMPLETE
BASIC-PLUS-2

PDP-11 BASIC-PLUS-2 V2.2-00

BASIC2

@SY:BP2VE1
OLD SY:BP2T0
    
```

INSTALLATION PROCEDURE

```
80      PRINT 'VERIFICATION #2 COMPLETE'  
RENAME SY:BP2T1  
REPLACE SY:BP2T1  
COMPILE SY:/OBJ  
BP2T1   10:13 AM           17-Feb-84  
BUILD SY:  
EXIT
```

BASIC-PLUS-2 INSTALLATION VERIFICATION

```
1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
VERIFICATION #2 COMPLETE  
BASIC PLUS-2
```

If the verification was not successful, the system does not display the output. In this case, check to make sure the following software is installed:

- RMS-11
- The BASIC-PLUS-2 compiler
- The BASIC-PLUS-2 memory-resident library (or libraries), if you selected this option

If the software listed above is installed and the verification test is not successful, contact your DIGITAL software specialist.

1.5 DISMOUNTING THE DISTRIBUTION MEDIUM

After the installation is complete, dismount the distribution medium by:

1. Issuing the DCL DISMOUNT command or the MCR DMO command, if you used the MOUNT command
2. Unloading the drive and then removing the distribution medium

The format of the DISMOUNT command is:

```
DCL                MCR  
DISMOUNT ddnn: [BP2V2]    DMO ddnn: [BP2V2]
```

where:

- ddnn: Is the name and number of the device on which your distribution medium is physically mounted.
- BP2V2 Is the label. Specify the label if you used it to mount disk distribution.

Consult your drive's operation manual for information on how to unload the drive and remove the distribution medium. Store the distribution medium with a record of the installation.

CHAPTER 2

EDITING THE BASIC-PLUS-2 HELP FILE

If you decided to install the BASIC-PLUS-2 HELP file, you may also modify the information in it or add new information to it.

To modify the information in the HELP file, use a text editor to edit the file BP2.HLP. Search for the topic you want to change and then make your edits.

To add new information in the HELP file, you must:

1. Use a text editor to edit the file BP2.HLP.
2. Enter the new information in the format:

n Topic

text

Format

syntax

Example

example

where:

n	Is the level of specificity. You must specify a level in the range 1 to 9. The more general the topic, the lower the number. For example, STATEMENTS is a level 1, ON is a level 2, and ON GOTO is a level 3.
Topic	Is a BASIC-PLUS-2 language element. You must specify a topic.
text	Is an explanation of the topic. The text is optional.
Format	Is the title for the next piece of information. The title is optional.
syntax	Is the syntax for the language element. See the <u>BASIC Reference Manual</u> for the syntax of all BASIC-PLUS-2 language elements. The syntax is optional.

EDITING THE BASIC-PLUS-2 HELP FILE

Example Is the title for the next piece of information. The title is optional.

example Is an example of the language element. The example is optional.

Here is an example of the HELP format:

2 ASCII

The ASCII function returns the decimal ASCII value of a string's first character.

Format

```
          {ASC}
int-vbl = {ASCII} (str-exp)
```

Example

```
10      ASCII_VALUE% = ASCII(EMPLOYEE_NAME$)
```

3. Close and save the edited version of BP2.HLP.

4. Run the BP2RFA utility.

The BP2RFA utility takes the Record File Address (RFA) of the start of each HELP topic and places it in a file. When you ask for help on a particular topic, BASIC-PLUS-2 searches this file first to speed access to HELP information.

Mount the distribution medium and copy BP2RFA.TSK from it. See Section 1.3 for information on mounting the distribution medium. If your distribution medium is magnetic tape and your system is RSX-11M-PLUS, copy BP2RFA.TSK by typing:

```
FLX /RS/CO/BL:142/IM=ddnn:[1,10]BP2RFA.TSK/-RW/DO
```

If your distribution medium is magnetic tape and your system is RSX-11M, copy BP2RFA.TSK by typing:

```
FLX /RS/CO/BL:142/FB=ddnn:[1,10]BP2RFA.TSK/-RW/DO
```

If your distribution medium is a disk, copy BP2RFA.TSK by typing:

```
PIP /NV/CO=ddnn:[1,10]BP2RFA.TSK
```

where:

ddnn: Is the name and number of the device on which the distribution medium is physically mounted.

After you copy BP2RFA.TSK from the distribution medium, you can run the utility by typing:

```
RUN BP2RFA
```

The utility asks you:

```
Enter the device and account of help file: ?
```

Specify the device and account where BP2.HLP is located. Then the utility generates a new version of BP2RFA.HLP and places it in the device and account you specified.

CHAPTER 3

SETTING COMPILER DEFAULTS AFTER THE INSTALLATION

The BASIC-PLUS-2 installation procedure provides default values for many compiler commands and qualifiers. For example, the default integer size is WORD and the default real size is SINGLE. However, depending on the type of programs you write, these defaults might not be the most efficient for the users on your system.

To solve this problem, BASIC provides a method for customizing the compiler defaults at any time after the installation. In fact, you can change the defaults to suit your programming needs, whenever necessary.

3.1 THE SYSTEM INITIALIZATION FILE

The following example output from the SHOW command illustrates the compiler defaults as defined by the installation:

```
PDP-11 BASIC-PLUS-2 V2.2-00 using FPU with run support
ENVIRONMENT INFORMATION:      RMS FILE ORGANIZATION:
  Current edit line : 0      NO Index
  NO Modules loaded        NO Relative
  NO Main module loaded    NO Sequential
                          NO Virtual
DEFAULT DATA TYPE INFORMATION:  LISTING FILE INFORMATION:
  Data type : REAL          NO Source
  Real size : SINGLE        NO Cross Reference
  Integer size : WORD       NO Keywords
  Scale factor : 0          60 lines by 132 columns
COMPILATION QUALIFIERS:      BUILD QUALIFIERS:
  Object                    NO Dump
  NO Macro                  NO Map
  Lines                     NO Cluster
  Warnings                  Task extend : 512
  NO Debug records         RMS ODL file : LB:[1,1]RMS11X
  NO Syntax checking       BP2 Disk lib : LB:[1,1]BP2OTS
  Flag : Declining         BP2 Resident lib : NONE
  Variant : 0              RMS Resident lib : NONE
```

You can change these compiler defaults by creating a BASIC initialization file in the system account LB:[1,2]. The BASIC system initialization file is a file containing a subset of BASIC compiler commands that the BASIC-PLUS-2 compiler executes any time a user enters the BASIC environment. The new defaults you set in the system initialization file affect all users on the system.

To create a system initialization file, use a text editor to create a file named BP2INI.nnn in the account LB:[1,2] (where nnn is the three-character name you chose to invoke BASIC with). Table 3-1 lists the

SETTING COMPILER DEFAULTS AFTER THE INSTALLATION

BASIC commands you can include in the initialization file. For a complete description of these commands, see the BASIC on RSX-11M/M-PLUS Systems manual.

Table 3-1: BASIC Commands allowed in an Initialization File

Command	Function
BRLRES	Specifies the default BASIC-PLUS-2 memory-resident library
DSKLIB	Specifies the default BASIC-PLUS-2 object module library
LIBRARY	Specifies the default BASIC-PLUS-2 memory-resident library
LOCK	Sets qualifiers to the COMPILE or BUILD command
ODLRMS	Specifies the default RMS ODL file
RMSRES	Specifies the default RMS memory-resident library
SCALE	Sets the scale factor
SET	Sets qualifiers to the COMPILE or BUILD command
SHOW	Displays the current defaults

Each command must appear on a separate line of the initialization file. Comments are not allowed; however, you can include blank lines to improve readability.

Compiler commands within a BP2INI file function the same as commands entered from the terminal, with the exception that commands that normally prompt for library names must have library names supplied in the command line. For example, if the command DSKLIB appears in the initialization file without a library specification following it, the compiler displays the error message:

```
no file specified for a command initialization file
```

The following is an example of an initialization file:

```
SET /LIST
SET /DOUBLE/LONG
SCALE 4
SHOW
```

This BP2INI.BP2 file changes the default compiler environment so that:

- The COMPILE command produces a source listing.
- The default size for all floating-point data is DOUBLE, and the default size for all integers is LONG.
- The scale factor is 4.
- The compiler displays a list of the new default compiler settings.

SETTING COMPILER DEFAULTS AFTER THE INSTALLATION

Note that the compiler does not display the initialization file as it is processed. Thus users do not know whether an initialization file is being processed unless an error occurs in that file. You may want to include the SHOW command in the file to notify users of what the present defaults are.

If you do include the SHOW command, make sure it is the last command in the file. If not, the defaults the SHOW command displays can be misleading: they do not reflect the changes produced by commands that follow SHOW in the initialization file.

3.1.1 Private Initialization Files

The system initialization file affects all BASIC users on your system. Individual users can also set the compiler defaults for their own use with a private initialization file. Private initialization files follow the same rules as the system initialization file and have the same file name, but they are in the individual user's default account.

Note that the BASIC compiler performs the commands in the system initialization file first and then performs the initialization file in the user's default account. This way the user can override any system-wide defaults set by the system initialization file because the commands in his or her private file are performed last.

See the BASIC on RSX-11M/M-PLUS Systems manual for more information on private initialization files.

CHAPTER 4

RELEASE NOTES

Included on the distribution medium for BASIC-PLUS-2, is a file describing new features introduced in Version 2.2 and known problems. These release notes are in the file [1,10]RELNOT.DOC.

To read the release notes, mount the distribution medium (as described in Section 1.3) and copy the file [1,10]RELNOT.DOC from the distribution medium to your default account; or you can copy the file directly to a line printer if you want a hard copy of the release notes.

APPENDIX A

SAMPLE INSTALLATION

This is a sample BASIC-PLUS-2 installation on an RSX-11M-PLUS operating system. Note that the output your system generates may be different from this sample.

SAMPLE INSTALLATION

```
>ALL DK1:
>MOU DK1:BP2V2
>FLX SY:/RS=DK1:[1,10]BP2RSX.CMD/DO
>@BP2RSX
>* What device is the distribution disk mounted on <DL0:> [S]: DK1:
```

BASIC - PLUS - 2 VERSION 2 INSTALLATION

This starts the BP2BLD dialogue. The BP2BLD dialogue asks you questions so you can select the options for your BASIC-PLUS-2 compiler. The default answer for each question is in angle brackets. To select the default, press the RETURN key. If you do not want the default answer, type in the answer you want.

You should read the BASIC-PLUS-2 installation guide before you begin the BP2BLD dialogue. Some of the answers you select can result in additional questions or the omission of certain questions later in the dialogue. If you are not sure how to answer a question, you can either type a question mark (?) for a brief explanation or see the BASIC-PLUS-2 installation guide for more information.

The BP2BLD program prints a summary of your answers at the end of the dialogue. If you want to change your answers, answer YES to the question at the end of the summary, at this point, the BP2BLD program runs the BP2BLD dialogue again. If you choose an option other than the default, your choice is enclosed in angle brackets as the default answer for that question.

If you want to change an answer during the dialogue but before the summary, type the escape key (<ESC>) to back up to the answer you want to change and then type the correct answer.

Do you want the default installation <YES>

?NO

Do you want to install BP2RES <NO>

?YES

Enter the device and account for BP2RES <LB:[1,1]>

?LB:[1,1]

What is the partition name for BP2RES <GEN>

?GEN

Do you want to install BP2SML <NO>

?YES

Enter the device and account for BP2SML <LB:[1,1]>

?LB:[1,1]

SAMPLE INSTALLATION

What is the partition name for BP2SML <GEN>

?GEN

Do you want to install the secondary cache <NO>

?YES

What size do you want to make the secondary cache <8>

?12

Enter the device and account for B22SHR <LB:[1,1]>

?LB:[1,1]

What is the partition name for B22SHR <GEN>

?GEN

Enter the device and account for B22SH1 <LB:[1,1]>

?LB:[1,1]

What is the partition name for B22SH1 <GEN>

?GEN

Do you want to support RUN <YES>

?YES

Do you want RUN to support remote RMS file access <NO>

?YES

Do you want to link the support for RUN with memory resident libraries <YES>

?YES

Do you want to install the BP2 Resequencer <NO>

?NO

Do you want to install the BP2 Help file <NO>

?NO

Which hardware math package do you want to use <EIS>

?EIS

SAMPLE INSTALLATION

What name do you want to use to invoke BP2 <BP2>

?VDP

What do you want to use as the BP2 compiler prompt <BASIC2>

?T22EIS

Enter the device and account for the BP2 compiler <LB:[1,54]>

?LB:[1,54]

Enter the device and account for the BP2 compiler work files <SY!>

?SY:

Enter the device and account for the BP2 object module disk library <LB:[1,1]>

?LB:[1,1]

Enter the device and account for the BP2 ODL files <LB:[1,1]>

?LB:[1,1]

Enter the device and account for the temp installation files <SY!>

?SY:

Enter the device and account for the RMS-11 ODL files <LB:[1,1]>

?LB:[1,1]

Do you want the EDIT\$ upcase (function code 32) to apply to characters
in the range (octal 173 - 176) <NO>

?NO

What do you want as the default time format <AM/PM>

?AM/PM

What do you want as the character for the PRINT USING currency symbol <\$>

?

What do you want as the character for the PRINT USING decimal point <.>

?,

What do you want as the character for the PRINT USING third digit
separator <,>

?,

SAMPLE INSTALLATION

Do you want to update the BP2 compiler <NO>

?NO

Do you want to delete the installation command files <YES>

?YES

Do you want to verify the installation <YES>

?YES

Here is a summary of the options you have selected:

This is not a default installation
BP2RES will be installed
The device and account for BP2RES is LB:[1,1]
The partition name for BP2RES is GEN
BP2SML will be installed
The device and account for BP2SML is LB:[1,1]
The partition name for BP2SML is GEN
Secondary caching will be enabled
The size of the secondary cache will be 12
The device and account for B22SHR is LB:[1,1]
The partition name for B22SHR is GEN
The device and account for B22SH1 is LB:[1,1]
The partition name for B22SH1 is GEN
RUN will be supported
RUN will support remote RMS file access
RUN support will be linked with memory resident libraries
The BP2 Resequencer will not be installed
The BP2 HELP file will not be installed
The hardware math package is EIS
The name to use to invoke BP2 is VDP
The BP2 compiler prompt is T22EIS
The device and account for the BP2 compiler is LB:[1,54]
The device and account for the BP2 compiler work files is SY:
The device and account for the BP2 object module disk library is LB:[1,1]
The device and account for the BP2 ODL files is LB:[1,1]
The device and account for the temp installation files is SY:
The device and account for the RMS-11 ODL files is LB:[1,1]
EDIT\$ will not uppercase characters (octal 173 - 176)
The default time format is AM/PM
The PRINT USING currency symbol is \$
The PRINT USING decimal point symbol is .
The PRINT USING third digit separator symbol is ,
The BP2 compiler will not be updated
The installation command files will be deleted
The compiler installation will be verified

Do you wish to change any of your answers <NO>

? NO

The BP2BLD dialogue is complete.
The installation will take about 1 hour to complete.

Module 'THREAD' replaced

The BASIC-PLUS-2 installation is complete.

PDP-11 BASIC-PLUS-2 T2.2-00

T22EIS

SAMPLE INSTALLATION

```
@SY:VDPVE0
NEW SY:BP2T0
10     DECLARE INTEGER I
20     DECLARE STRING J
30     PRINT 'BASIC-PLUS-2 INSTALLATION VERIFICATION'
40     FOR I = 1 TO 10
50         J = SPACE$(I) + NUM1$(I)
60         PRINT J
70     NEXT I
80     PRINT 'VERIFICATION #1 COMPLETE'
90     PRINT ERT$(0%)
100    END
REPLACE SY:BP2T0
COMPILE SY:/OBJ
BP2T0  03:14 PM          17-Feb-84
BUILD SY:
EXIT
```

BASIC-PLUS-2 INSTALLATION VERIFICATION

```
1
 2
   3
    4
     5
      6
       7
        8
         9
          10
```

VERIFICATION #1 COMPLETE
BASIC PLUS-2

PDF-11 BASIC-PLUS-2 T2.2-00

T22EIS

```
@SY:VDPVE1
OLD SY:BP2T0
80     PRINT 'VERIFICATION #2 COMPLETE'
RENAME SY:BP2T1
REPLACE SY:BP2T1
COMPILE SY:/OBJ
BP2T1  03:14 PM          17-Feb-84
BUILD SY:
EXIT
```

BASIC-PLUS-2 INSTALLATION VERIFICATION

```
1
 2
   3
    4
     5
      6
       7
        8
         9
          10
```

VERIFICATION #2 COMPLETE
BASIC PLUS-2

DMO -- VT1: dismantled from DK1: *** Final dismount initiated ***
DEA -- Device mounted
>@ <EOF>

READER'S COMMENTS

NOTE: This form is for document comments only. DIGITAL will use comments submitted on this form at the company's discretion. If you require a written reply and are eligible to receive one under Software Performance Report (SPR) service, submit your comments on an SPR form.

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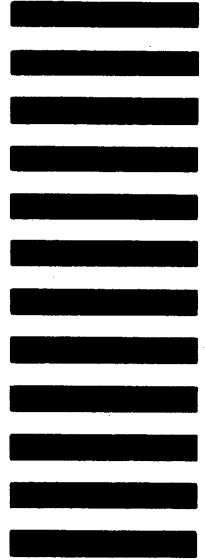
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