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WANG

TO: Users of CS Multiuser BASIC-2 Language

FROM: Wang Laboratories, Inc.

SUBJECT: Update to *CS BASIC-2 Utilities Reference Manual* (700-6855A.04)

DATE: May 1990

This update replaces portions of the *CS BASIC-2 Utilities Reference Manual* (700-6855A) to reflect changes and additions to the CS Multiuser BASIC-2 Operating System (Release 3.4).

To update the *CS BASIC-2 Utilities Reference Manual*, use the following collating instructions:

Remove	Insert
Title page through x	Title page through x
2-1 through 2-18	2-1 through 2-18
6-1 through 6-4	6-1 through 6-4
13-3 and 13-4	13-3 and 13-4

Retain the original Customer Comment form, Order form, and back cover. Insert the new forms behind the appropriate original pages. You may discard the new back cover.

The locations within the document where information has been added, modified, or deleted are marked with change bars (|) in the outside margin. A single change bar between two paragraphs indicates the location where a paragraph or more was deleted. Change bars are not used on pages that are part of an entirely new chapter or appendix.

CS

BASIC-2 Utilities Reference Manual

2nd Edition — July 1987

700-6855A

4th Edition — May 1990

700-6855A.04

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PREFACE

This manual describes the BASIC-2 utilities provided with the BASIC-2 operating system. The BASIC-2 utilities are programs that perform support and maintenance functions commonly used for system control and file maintenance.

- Chapter 1 introduces the BASIC-2 utility software and includes an overview of possible system configuration utilities.
- Chapter 2 provides specifications and operating instructions for the Partition Generator utility.
- Chapter 3 describes loading the system utilities.
- Chapter 4 discusses the Partition Status utility.
- Chapter 5 provides an overview of the utility used to install new system files.
- Chapter 6 describes the Format Disk Platter utility and includes information regarding both disks and diskettes.
- Chapter 7 details the Vertical Format Control utility.
- Chapter 8 discusses several aspects of system back up, including such topics as when to backup, backing up to a disk or diskette of a different size, and running the Backup and Recover utilities.
- Chapter 9 discusses the Move File utility and software transportation between systems.
- Chapter 10 discusses the Initialize Date and Time utility.
- Chapter 11 discusses the 2236MXE Command Mode Firmware utility and its various options for changing the configuration of the 2236MXE.

- Chapter 12 discusses the Generalized Printer Driver and its uses.
- Chapter 13 discusses using the Make a Reference List of File Names Utility.

This manual should be used in conjunction with the following manuals:

CS Introductory Manual (715-1213)
BASIC-2 Language Reference Manual (700-4080E)
CS-D User's Guide (715-2364)

This manual has been updated previously by three update packages, as follows:

Update Number	Publication Date
700-6855A.01	January 1988
700-6855A.02	February 1989
700-6855A.03	August 1989

This manual has been updated by the *CS BASIC-2 Utilities Reference Manual* Update (700-6855A.04). Refer to the cover memo for collating instructions.

CHAPTER 2
THE MULTIUSER BASIC-2 PARTITION GENERATOR

OVERVIEW OF THE @GENPART UTILITY

The Partition Generator (@GENPART) utility available on the Multiuser BASIC-2 system divides the system resources, memory, and peripherals among the users on the system.

When the Multiuser BASIC-2 option is selected from the System Software menu during master initialization, the system loads and runs the @GENPART program from the system disk. @GENPART allows you to interactively create a system configuration. Alternatively, you can customize @GENPART to automatically execute a designated configuration stored on the system disk. @GENPART also allows other programs resident on the system disk to be loaded into designated partitions and executed automatically when the system is configured. Configuration definitions created by the operator may be saved on the system disk in a data file called @SYSFILE.

PARTITION GENERATION (SYSTEM CONFIGURATION)

Partition generation (system configuration) divides the resources of the system among various users. This section discusses the use of the @GENPART utility program to create, save, and execute system configurations.

The CS/386 based BASIC-2 Operating System limits user partitions to the size of user memory in the system. The CS/2200 VLSI based and earlier Wang 2200 systems restricted partition sizes to the maximum memory available in individual memory banks. (References to memory "banks" do not apply to the CS/386.)

The CS/386 Operating System requires more space to store program text than does the VSLI based operating system. Individual partition size assignments may have to be increased.

System Configuration Parameters You Can Specify

You can specify the following parameters when configuring a system.

- The number of terminals
- The number of partitions
- The size of each partition
- The terminal associated with each partition
- The programmability of each partition
- The bootstrap program for each partition
- The addresses of the peripherals attached to the system
- The access to peripherals
- The system message
- The system reconfiguration password
- The CPU number (If the system is a CS/386)

The Process of System Configuration Using @GENPART

The process of master initialization, as described in the section entitled "Overview of the @GENPART Utility" creates a limited system having a single partition with all user memory controlled by Terminal 1. Only Terminal 1, any terminal printer attached to it, and the system disk drive are operative at this time. No other system devices are available until a configuration is executed. As a part of master initialization, the system microcode automatically loads and runs the BASIC-2 program file @GENPART from the system disk if such a file exists. (@GENPART is always assumed by the system to be the name of the system configuration program, whether Wang-supplied or user-written.) If @GENPART is not on the system disk, the READY (BASIC-2) message is displayed at Terminal 1.

When @GENPART is first executed, the parameters from the previous configuration (called "current") are loaded; a list of previously saved configurations is displayed along with a prompt inquiring if a different configuration is to be loaded; and the list of @GENPART options is displayed.

The user then proceeds to enter responses to the prompts displayed by each option and uses the function (SF) keys to advance from option to option. See the example of this general procedure in the "Generating a Sample Configuration" section of this chapter.

The standard Wang @GENPART program allows users two basic options:

- Creating configurations to be executed or stored for future use
  - If you are creating a configuration for the first time, or if you wish to modify a previously defined configuration, you can use the function keys to load and modify the old configuration or to create a new definition, execute it, and/or store the configuration for future use.

- Loading and executing previously defined configurations.

  - If you wish to execute a system configuration that has been previously defined and stored in the configuration file on the system disk without modifying it, you can select a configuration from the list of previous configuration names displayed on the screen and manually execute one. It is also possible to modify the @GENPART utility program so that a specified configuration is loaded and executed automatically when the system is master initialized. The section entitled "Customizing @GENPART" describes how to make this modification.

@GENPART OPERATING INSTRUCTIONS

@GENPART Options

Note: *References in the text below to memory "blanks" do not apply to the CS/386.*

SF '00 - Clear Partitions -- Clears the partition configuration parameters currently in memory. Allows you to specify the total number of terminals and the number of partitions; then advances to SF'04 (Edit Partitions). All CPU memory not assigned to partitions is available for CPU RAM disk. The Master Device Table is not altered when this function is selected.

For the CS/386 Operating System, any number of terminals from one to 16 may be specified. The total number of partitions cannot exceed 16. There are no bank restrictions and the largest partition size is limited only by the memory in the CPU.

For the non-CS/386 Operating System, any number of terminals from one to 16 may be specified. The number of partitions permitted in each bank can range from one to 16; however, the total number of partitions cannot exceed 16. There must be at least one partition in each bank that is to be used. Memory partitions must be contiguous; i.e., there should no memory remaining for partitions in Bank 1 before specifying memory for partitions in Bank 2.

SF'01 - Clear Device Table -- Clears the Master Device Table currently in memory; resets the peripheral default values to /215, /310, /320 and allocates these devices to all users; then advances to SF'05 (Edit Device Table). The default device addresses can be edited if necessary.

SF'02 - Divide Memory Evenly -- Divides the remaining memory in a bank equally among all partitions in that bank not yet allocated memory. By default, this division is performed for all banks. The CS/386 asks for the total amount of memory that you want to divide among the partitions. Then, it divides the memory equally among all the partitions not yet allocated.

SF'04 - Edit Partitions -- Displays and allows editing of partition parameters such as memory size, terminal assignment, programmability, and name of a program to be automatically bootstrapped. SF'04 does not allow addition of new partitions or deletion of defined ones for an existing configuration. The partition editing options are as follows:

Partition Size -- On a CS/386, the maximum partition size is limited by the maximum memory available in the CS/386, i.e., 8 MB. For all other CS units, the maximum partition size is 56K (except for Bank 1 which is 61K).

Terminal Assignment -- Any terminal number from 0 to 16 is valid. Terminal 0 is the null terminal; a partition assigned to the null terminal is always available to any requesting terminal. Any partition may be assigned to any terminal (a terminal can support several partitions), but *all partitions must be assigned* to a terminal, even if they are to contain background jobs that never print on the CRT or require keyboard entry. In general, the lowest numbered partition(s) assigned to a terminal should contain the foreground (interactive) job(s) for that terminal. Background jobs should be placed in the higher-numbered partitions. Only the terminal that a partition is assigned to can list or modify the program in that partition. Although other partitions can access global program text and modify global variables, it is not possible for other partitions to list or modify the program text in a global partition.

Programmability -- Any partition can be specified for disabled programming mode. The terminals connected to disabled programming partition(s) are inhibited from entering or modifying program text or performing a number of other system operations. As a result the operator is prevented from inadvertent or unauthorized use of certain programs and data.

Bootstrap Programs -- One or more programs that reside on the system disk can be loaded into the partitions and run automatically without operator intervention when a configuration is executed. This feature is particularly useful for setting up background and global partitions and forcing terminals to execute particular BASIC-2 software. When no bootstrap program is specified for a partition, the READY (BASIC-2) display appears on the CRT of the terminal currently attached to that partition when the configuration is executed.

SF'05 - Edit Device Table -- Displays and allows editing of the device addresses and allocation of all peripherals attached to the system. The Master Device Table default values are read from disk and displayed on the screen. All peripherals attached to the system (other than the terminals and terminal printers attached to them) must be specified in the Master Device Table.

By default, all peripheral devices are available to all partitions. However, devices can be assigned exclusively to one partition until the next system configuration is executed by entering the number of the partition that is to have control of the device in the Master Device Table. Console device addresses, i.e., /005 CRT, /001 keyboard, /204 terminal printers, and asynchronous MXE ports (e.g., A03, A04) are not specified in the Master Device Table.

For disk controllers that respond to more than one address, only the primary address must be specified (i.e., /310 but not /B10, et cetera). For all other multiaddress controllers, all valid addresses must be listed. For addresses that differ by the first digit only (device type), only the normal address must be specified. The default table values are the values of the saved configuration that was last used by the system. However, if the system platter was write-protected at that time, the default values are the ones used during the previous system configuration.

SF'06 - Edit $MSG -- Displays and allows editing of a user-defined broadcast message that is displayed on each screen whenever the READY message is displayed. The user-defined message is displayed on line 0 of the CRT immediately above the READY message.

SF'07 - Select Printer Driver -- Displays and allows editing of the Printer Table assignments to particular printer addresses and terminals. Printer Tables may be associated with a system printer by using the address associated with the controller for that particular printer. Printer Tables to be used by terminal printers all use address 204, however they are further defined as being associated with a particular terminal (the one that they are plugged into). For more information on the Generalized Printer Driver, see Chapter 12.

SF'08 - Load Configuration -- Loads a configuration from the system configuration file on the system disk. You can only execute a configuration file that has a "Y" next to its name. To modify any previously defined configuration other than the most recently executed configuration (configuration "current"), this option must be used to load the named configuration from the system platter.

SF'09 - Save Configuration -- Saves a system configuration in the system configuration file on the system platter under a user-specified name. The name has a maximum length of eight characters. If you specify a configuration name already in use, @GENPART verifies that you want to replace the old configuration with the configuration currently in memory. Note that the system disk must be unprotected to save configurations on it. The values of the Master Device Table currently stored in memory are saved to disk and may be used as default values during future master initializations (see '05 - Edit Device Table).

When a configuration is saved on either a VLSI or CS/386 CPU, a "Y" appears next to the configuration name indicating the type of CPU (VLSI or CS/386) that configuration will run on.

SF'10 - Delete Configuration -- Deletes a configuration from the disk configuration file.

SF'11 - Edit CPU Number -- For the CS/386, the relative CPU number 1-32 may be entered. This number is used with the platter hogging option.

SF'15 - Execute Configuration -- Allows you to review and then execute a configuration that belongs to the appropriate CPU type (VLSI or CS/386). This configuration is automatically saved in the configuration file on disk, under the name "current," when the configuration is executed if the disk is write-enabled. A "Y" appears next to the CPU type (VLSI or CS/386) to which the configuration belongs. (You cannot execute a configuration that does not have a "Y" next to the configuration name.)

Once a configuration has been executed, the system may be reconfigured again whenever the system is powered up, or when proper execution of the immediate mode form of the $INIT statement occurs. The configuration scheme, except for requested partition/terminal assignment change, remains in effect until the system is reinitialized.

GENERATING A SAMPLE CONFIGURATION

The following example illustrates how @GENPART could be used to configure a system. A system with 1MB of memory, three terminals, and a telecommunications option is to be configured. The configuration, named SAMPLE, has four partitions and 3 banks (VLSI). A 16-KB (30 KB for CS/386) telecommunications program is designated for automatic bootstrapping as a background job sharing Terminal 1 in partition 2. Disabled programming is specified for this partition so that it cannot be inadvertently modified. Partition 1 and 2 will have 45 KB and 16 KB respectively (60 KB and 30 KB for CS/386). Partition 3 and 4 will receive 56 KB (80 KB for CS/386). The remaining memory is allocated to RAM DISK. The system printer at address 215 uses the @PM016V2 printer driver.

In general, the order of executing options is as follows:

1. SF'08 to load a configuration
2. SF'00 to modify this configuration by adding or deleting partitions
3. SF'04 to create the new partition parameters
4. SF'05 to create the Master Device Table
5. SF'06 to create the broadcast message
6. SF'07 to create/modify Printer Table assignments
7. SF'09 to save the configuration with a name other than "current"
8. SF'15 to execute the configuration
9. SF'10 to delete the configuration

In the example that follows, these options are discussed in the probable order of use.

Load a Configuration (SF'08)

When @GENPART is first executed, the screen in Figure 2-1 occurs without pressing SF'08.

```
          ***** Multiuser BASIC-2 Partition Generation Program *****
                    (c) Copr. Wang Laboratories, Inc. 19xx


                                                          List of options:
O.K.  16onfigurations (#Partitions) (CPU number)     '00 - clear partitions
"Y"      current          ( 4)        ( 1)           '01 - clear device table

"Y"      CS/386           ( 4)        ( 3)           '02 - divide memory evenly
         VLSI             ( 4)        (..)           '04 - edit partitions
                                                     '05 - edit device table
                                                     '06 - edit $MSG
                                                     '07 - select printer driver

                                                     '08 - load configuration
                                                     '09 - save configuration
                                                     '10 - delete configuration

                                                     '11 - edit CPU number

                                                     '15 - execute
                                                     Press FN/TAB to exit

  Configuration 'current' loaded.  Name of configuration to load?
```

Figure 2-1. Partition Generation Screen on a CS/386

The last configuration executed, called "current," is automatically loaded if it was saved by the same CPU type (VLSI or CS/386). To load any other configuration, enter ---- name of a configuration that has a "Y" next to its name, then press RETURN. Since a completely new configuration is to be created, i.e., the total number of partitions in a previously defined configuration is to be modified, press SF'00 (Clear Partitions).

Clear Partitions (SF'00)

The program responds with a screen that first requests the number of terminals attached to the system. Prompts requesting the operator to specify the number of partitions in each bank of memory appear next. The amount of available memory in each bank is also calculated and displayed. The figures are then automatically updated after allocation of memory for each partition. Note that in the following display (see Figure 2-2A), the system has subtracted the 3 KB of system overhead from the available memory in Bank 1 and the unavailable 8 KB from the figure displayed for Bank 2.

Enter 3 for number of terminals and 2 for number of partition in Bank 1. Also enter a 1 for Banks 2 and 3. Entering a 0 for Bank 4 will cause the rest of the memory to be allocated to CPU RAM DISK.

```
          ***** Multiuser BASIC-2 Partition Generation Program *****
Available memory:  61  56  56  56  56  56  56  56
Remaining memory:  61  56  56  56  56  56  56  56

                                                        List of options:
No. of terminals? 3                                  '00 - clear partitions
No. of partitions in bank 1 ? 2                      '01 - clear device table
No. of partitions in bank 2 ? 1
No. of partitions in bank 3 ? 1                      '02 - divide memory evenly
No. of partitions in bank 4 ? 0                      '04 - edit partitions
                                                     '05 - edit device table
                                                     '06 - edit $MSG
                                                     '07 - select printer driver

                                                     '08 - load configuration
                                                     '09 - save configuration
                                                     '10 - delete configuration
                                                     '11 - edit CPU number

                                                     '15 - execute
                                                     Press FN/TAB to exit
```

Figure 2-2A. Sample Clear Partitions Screen (VLSI)

In Figure 2-2A, three terminals are attached to the system and there are two partitions in the first bank. The program automatically invokes option SF'04 (EDIT Partitions) to allow the editing of partition parameters.

For the CS/386, there are no memory bank restrictions. Three prompts will appear at this point. First, a prompt for the CPU number appears followed by a prompt asking the number of terminals and the last prompts asking for the number of partitions. Enter a 1 for the CPU number, a 3 for the number of terminals, and a 4 for the number of partitions.

```
***** Multiuser BASIC-2 Partition Generation Program *****
          (c) Copr. Wang Laboratories, Inc. 19xx

Available memory: 8,251 K
CPU number ( 0 - 31 )? 1
No. of terminals? 3
No. of partitions? 4

                                        '00 - clear partitions
                                        '01 - clear device table

                                        '02 - divide memory evenly
                                        '04 - edit partitions
                                        '05 - edit device table
                                        '06 - edit $MSG
                                        '07 - select printer driver

                                        '08 - load configuration
                                        '09 - save configuration
                                        '10 - delete configuration

                                        '11 - edit CPU number

                                        '15 - execute
                                        Press FN/TAB to exit
```

Figure 2-2B. Sample Clear Partitions Screen (CS/386)

Note that in the following display (see Figure 2-2B) the system is configured with 4 partitions, 3 terminals, and the CPU number is 1.

Edit Partitions (SF'04)

This option displays the default parameters for all partitions and initiates a cycle of prompts for altering these parameters. The cycle recurs continuously until another option is selected. You can modify the parameters for each partition. The display (see Figure 2-3A for VLSI and Figure 2-3B for CS/386) is updated each time an item is entered.

```
          ***** Multiuser BASIC-2 Partition Generation Program *****
Available memory:  61  56  56  56  56  56  56  56
Remaining memory:  61  56  56  56  56  56  56  56

                                                          List of options:
No. of terminals? 3                                    '00 - clear partitions
PARTITION SIZE(K) TERMINAL PROGRAMMABLE PROGRAM        '01 - clear device table
    1       -        1        Y
    2       -        2        Y                        '02 - divide memory evenly
    3       -        3        Y                        '04 - edit partitions
    4       -        1        Y                        '05 - edit device table
                                                       '06 - edit $MSG
                                                       '07 - select printer driver

                                                       '08 - load configuration
                                                       '09 - save configuration
                                                       '10 - delete configuration
                                                       '11 - edit CPU number

                                                       '15 - execute
                                                       Press FN/TAB to exit

Edit which partition (default = 1)?
```

Figure 2-3A. Sample Edit Partitions Screen (VLSI)

```
          ***** Multiuser BASIC-2 Partition Generation Program *****
                    (c) Copr. Wang Laboratories, Inc. 19xx

Available memory:  8,251 K
No. of terminals? 3          CPU number? 1             '00 - clear partitions
PARTITION SIZE(K) TERMINAL PROGRAMMABLE PROGRAM        '01 - clear device table
    1       -        1        Y
    2       -        2        Y                        '02 - divide memory evenly
    3       -        3        Y                        '04 - edit partitions
    4       -        1        Y                        '05 - edit device table
                                                       '06 - edit $MSG
                                                       '07 - select printer driver

                                                       '08 - load configuration
                                                       '09 - save configuration
                                                       '10 - delete configuration
                                                       '11 - edit CPU number

                                                       '15 - execute
                                                       Press FN/TAB to exit

Edit which partition (default = 1)?
```

Figure 2-3B. Sample Edit Partitions Screen (CS/386)

The following series of prompts is displayed in succession at the bottom of the screen.

```
Edit which partition (default = 1)?
```

In this example, the telecommunications program is run in Partition 2. Edit the parameters for Partition 2 by entering 2, then pressing RETURN. Note that an asterisk (*) appears beside the number of the partition whose parameters are being edited. The following prompt, requesting the amount of memory to be allocated to this partition, is then displayed.

```
Partition Size (default = 0 K)?
```

Any value greater than 1.25K and less than the amount of remaining user memory in the bank is a valid response. If a partition in Bank 1 is specified such that it resides entirely within the universal global area, a "u" appears next to the displayed partition number to indicate this condition. Running the telecommunications program in partition 2 requires 16 KB of memory. To allocate 16 KB of memory to Partition 2, enter 16 and then press RETURN.

The CS/386 does not have any bank requirements. A work and global partition may be any size greater than 2 K. When running programs on the CS/386, it is recommended to allow more memory space than used for the CS. To allocate 30 KB of memory to Partition 2, enter 30 and press RETURN.

The following prompt is then displayed.

```
Terminal (default = 2)?
```

The telecommunications program is a background job controlled by Terminal 1. To assign Partition 2 to Terminal 1, enter 1 and press RETURN. The following prompt then occurs.

```
Enable programming (Y or N)?
```

By default, programming is allowed for all partitions. Disabled programming is specified for Partition 2, however, to prevent inadvertent modification of the telecommunications program. To specify disabled programming mode for this partition, enter N, then press RETURN. The name of a program to be automatically loaded into this partition is now requested as follows.

```
Name of program to load?
```

The name of the telecommunications program that runs in Partition 2 is TELE-COM. Enter TELE-COM and press RETURN. When the configuration is executed, the telecommunications program TELE-COM automatically loads from the system disk into Partition 2 and runs.

At this point, editing of the parameters for Partition 2 is complete. For the VLSI CPU, Partitions 1, 3, and 4, however, require further modification. The remaining memory is divided evenly among the remaining partitions. Press SF'02 (Divide Memory Evenly) and the system responds with the following prompt.

```
Divide memory evenly in which bank (default = all)?
```

Since memory is to be divided evenly in all banks, press RETURN.

For the CS/386 CPU, a prompt asks for the amount of memory you want to divide evenly; or you can enter the desired memory for partitions 1, 3, and 4. Enter 240 and press RETURN. The system will assign 80 KB for partitions 1, 3, and 4.

The system returns to the initial EDIT WHICH PARTITION? prompt. Finally, the user must assign Terminal 2 to Partition 4. Enter this value into the table for Partition 4. Upon completion of this operation, the table display appears in Figure 2-4A for the VLSI and Figure 2-4B for the CS/386.

```
          ***** Multiuser BASIC-2 Partition Generation Program *****
Available memory:  61  56  56  56  56  56  56  56
Remaining memory:   0   0   0  56  56  56  56  56

                                                          List of options:
No. of terminals? 3                                  '00 - clear partitions
PARTITION SIZE(K) TERMINAL PROGRAMMABLE PROGRAM      '01 - clear device table
    1      45.00      1         Y
    2      16.00      1         Y         TELE-COM   '02 - divide memory evenly
    3      56.00      3         Y                    '04 - edit partitions
    4      56.00      2         Y                    '05 - edit device table
                                                     '06 - edit $MSG
                                                     '07 - select printer driver

                                                     '08 - load configuration
                                                     '09 - save configuration
                                                     '10 - delete configuration
                                                     '11 - edit CPU number

                                                     '15 - execute
                                                     Press FN/TAB to exit

Edit which partition (default = 1)?
```

Figure 2-4A. Sample Table for Partition 4 (VLSI)

```
          ***** Multiuser BASIC-2 Partition Generation Program *****
                      (c) Copr. Wang Laboratories, Inc. 19xx

Available memory:  8,251 K
No. of terminals? 3          CPU number? 1            '00 - clear partitions
PARTITION SIZE(K) TERMINAL PROGRAMMABLE PROGRAM       '01 - clear device table
    1      80.00      1         Y
    2      30.00      1         Y          TELE-COM   '02 - divide memory evenly
    3      80.00      3         Y                     '04 - edit partitions
    4      80.00      2         Y                     '05 - edit device table
                                                      '06 - edit $MSG
                                                      '07 - select printer driver

                                                      '08 - load configuration
                                                      '09 - save configuration
                                                      '10 - delete configuration

                                                      '11 - edit CPU number

                                                      '15 - execute
                                                      Press FN/TAB to exit

Edit which partition (default = 1)?
```

Figure 2-4B. Sample Table for Partition 4 (CS/386)

Once all partitions are edited, SF'05 (Edit Device Table) is used to leave the Edit Partitions cycle and invoke the Edit Master Device Table option. Note that it is legal to exit the Edit Partitions Cycle (SF'04) without answering all prompts.

EDIT Device Table (SF'05)

The Edit Device Table option displays the default values in the Master Device Table, that appear on the screen in Figure 2-5. Note that by default, devices are available to all users.

```
          ***** Multiuser BASIC-2 Partition Generation Program *****
                        (c) Copr. Wang Laboratories, Inc. 19xx
     DEVICE PARTITION        DEVICE PARTITION
1.   /215     all       17.                          List of options:
2.   /310     all       18.                  '00 - clear partitions
3.   /320     all       19.                  '01 - clear device table
4.   /330     all       20.
5.   /340     all       21.                  '02 - divide memory evenly
6.   /01C      1        22.                  '04 - edit partitions
7.                      23.                  '05 - edit device table
8.                      24.                  '06 - edit $MSG
9.                      25.                  '07 - select printer driver
10.                     26.
11.                     27.                  '08 - load configuration
12.                     28.                  '09 - save configuration
13.                     29.                  '10 - delete configuration
14.                     30.
15.                     31.                  '11 - edit CPU number
16.                     32.
                                             '15 - execute
                                             Press FN/TAB to exit

Edit which entry (default = 1)?
```

Figure 2-5. Sample Master Device Table

In this sample configuration a fourth device, the telecommunications controller, is used in addition to the three default devices. The device address of this controller is /01C. To add this device to the Master Device Table, enter the number 4 and then press RETURN. An asterisk (*) appears beside the number 4 in the table. Several prompts are now displayed in succession on the bottom of the screen, and the table is updated each time an item is edited. First, you are are requested to enter the device address with the following prompt:

```
Device address (default = /000, /000 to delete entry)?
```

Enter /01C and then press RETURN. Another prompt now appears requesting the user to allocate the device to one or all partitions.

```
Allocate device to which partition (default = all)?
```

Enter 2, then press RETURN to allocate the controller to Partition 2. This cycle recurs to allow you to edit all entries in the Master Device Table. Since the parameters for all peripherals and partition allocation are specified, you can select another function option to exit the Edit Device Table Cycle.

Broadcast Message (SF'06)

When you press SF'06 (Broadcast Message), the following line appears at the bottom of the CRT display.

```
    Broadcast message:
--------------------------------------------------------------------------------
```

Any message where the number of characters and spaces does not exceed the number of dashes displayed on the CRT is valid. For this example, enter * * * THE SYSTEM WILL GO DOWN AT NOON * * * and then press RETURN. When the broadcast message has been entered, you should next enter SF'07 to make the Printer Table assignment for the system printer at address 215.

Note: *The system is in EDIT mode during entry of the broadcast message. While in EDIT mode, all SF keys revert to the system-defined EDIT functions. The SF keys cannot be used for their @GENPART-defined functions until the entry of the broadcast message is complete and the system leaves EDIT mode. The broadcast message is not saved on disk.*

Select Printer Table (SF'07)

When SF'07 (Select Prt Driver) is pressed, the screen in Figure 2-6 appears.

```
          ***** Multiuser BASIC-2 Partition Generation Program *****
                (c) Copr. Wang Laboratories, Inc. 1986, 1987

                                                          List of options:
    Driver Table Name      Printer Address  Term #    '00 - clear partitions
                                                     '01 - clear device table
 1. @PM016V3                    215
 2.                                                  '02 - divide memory evenly
 3.                                                  '04 - edit partitions
 4.                                                  '05 - edit device table
 5.                                                  '06 - edit $MSG
 6.                                                  '07 - select printer driver
 7.
 8.                                                  '08 - load configuration
 9.                                                  '09 - save configuration
10.                                                  '10 - delete configuration
11.
12.                                                  '11 - edit CPU number
13.
14.                                                  '15 - execute
15.                                                  Press FN/TAB to exit

Edit which driver entry (default = 1)?
```

Figure 2-6. Select Printer Table Screen

In this example, the printer at address 215 is to use the Driver Table named @PM016V2. To add this association to the Generalized Printer Driver Table, enter the number 1 and then press RETURN. An asterisk (*) appears beside the number 1 in the table. Several prompts are now displayed in succession on the bottom of the screen, and the table is updated each time an item is edited. First, you are requested to enter the driver table name with the following prompt:

```
Enter Driver Table Name:  (enter "0" to delete from
configuration)
```

Enter @PM016V2 and then press RETURN. Another prompt now appears requesting you to enter the associated printer address.

```
Enter Associated Printer Address:
```

Enter 215 and then press RETURN.

Had the associated printer address been 204, another prompt would appear requesting the user to enter the associated terminal number.

```
Enter Terminal no. (between 1 and 16).
```

After specifying the terminal number or if no terminal number was needed, this cycle recurs to allow the user to edit up to 15 Driver Table Entries.

Since all partition generation parameters for the sample configuration have been specified, the configuration can now be saved for later use (SF'09) or executed (SF'15). Pressing SF'09 allows you to save this configuration on disk under a unique name.

Save Configuration (SF'09)

When SF'09 is pressed, the system requests a name for the new configuration by displaying the following prompt.

```
Check configuration to save.  Configuration name?
                                                --------
```

Note: *In order to save a configuration on the system disk, the disk must be write-enabled; otherwise, an error results.*

The configuration currently in memory automatically is saved under the name "current" if the system disk is not write-protected. However, each time a new configuration is executed, its parameters replace the old contents in the "current" file. A configuration should be saved under a unique name so that it can be retrieved for future use. The name to be used for the sample configuration just created is SAMPLE. Enter SAMPLE, then press RETURN. The configuration is saved under the name SAMPLE, and the edited values of the Master Device Table are saved on disk for future use as defaults.

Execute Configuration (SF'15)

Once all parameters of a configuration have been defined, the system configuration can be executed. To execute a configuration, press SF'15. The configuration table appears along with the following prompt.

```
Check configuration.  OK to execute (Y or N)?
```

This prompt requests you to verify the configuration parameters being executed. If N is entered, the system returns to the beginning of the Edit Partitions Cycle (SF'04). If Y (RETURN) is entered, the following prompt is displayed.

```
Reconfiguration password?  SYSTEM
```

The password allows the operator at Terminal 1 to reconfigure the system without powering down, while preventing unauthorized reconfiguration. Any alphanumeric string up to eight characters in length is permitted. The reconfiguration password is changed from the default value SYSTEM to some user-defined value. For example, enter SECRET. The configuration is executed and the reconfiguration password is now SECRET. In order to reconfigure the system without powering down, $INIT "SECRET" would be entered and executed to allow the system to invoke the control bootstrap routines that are usually invoked just after the system is powered up.

Delete a Configuration (SF'10)

Since this is only a sample configuration, delete it from the configuration file to save more space for actual configurations. To delete a configuration, press SF'10. The following prompt then requests which configuration to delete.

```
Delete which configuration?
                        --------
```

Enter SAMPLE, then press RETURN, and the configuration is deleted from the configuration file on the system disk.

Edit CPU Number (SF 11)

For the CS/386, the relative CPU number 1-32 may be entered.

CUSTOMIZING @GENPART

Once they have been initially defined and stored on disk, configuration parameters in a specified system configuration can be passed to the operating system and executed automatically during master initialization. The REM statements near the beginning of the @GENPART program tell you how to modify the program to operate in this manner.

It is also possible to create a customized configuration program by using the BASIC-2 statement $INIT. The discussion of $INIT in the *Multiuser BASIC-2 Language Reference Manual* presents various methods for producing a customized configuration program.

CHAPTER 6
FORMAT DISK PLATTER UTILITY

OVERVIEW

Before data can be recorded, the disk must be formatted. Formatting involves assigning a unique address to each sector on the disk, along with certain control information that allows the system to maintain the disk and check the validity of information. On some disks, formatting also certifies the disk and assigns alternate sectors to those sectors that do not meet certification specifications.

The Format Disk Platter utility formats fixed disks and software-formattable diskettes. You can format a diskette in either CS/2200 or DOS format. Running this utility produces the same results as executing a $FORMAT command, but prompts you to be sure that the proper disk is being formatted, since all previously recorded data is eliminated by the formatting process. On certain disk units (e.g., 2270, 2270A, and 2260B), formatting is initiated by pressing the format button located on the disk housing.

FORMATTING A REMOVABLE DISKETTE

After initializing the system, you can use the system disk drive for program and data files. However, a blank, unused diskette must be formatted before you can use it. Ordinarily, a used diskette is not formatted before storing additional files on it since formatting destroys any information previously recorded on the diskette. For this reason, diskettes containing packaged programs must never be formatted.

The permanent label attached to each diskette describes how to protect your diskette from accidental over-writing. Before programs or data can be written on the diskette, the write-protect feature must be disabled.

To format a diskette, use the following steps:

1. Remove the diskette from its envelope. Follow the instructions on the envelope to disable write protection.

2. Insert the diskette into the drive according to the arrows on the label. Close the drive latch.

3. Press the RESET key on the keyboard.

4. To initiate disk formatting, select the Format Disk Platter utility from the System Utilities menu (see Figure 3-1).

5. Respond to the prompts and follow the procedure described in the section entitled "Running the Utility."

   If formatting is unsuccessful, a format error (ERR93) appears. Generally, errors result for one of three reasons.

   - The drive latch is not tightly closed
   - The diskette is write-protected
   - The diskette is defective

   Remove the diskette from the drive and use another diskette.

Note: *If a diskette cannot be formatted, it cannot be used and should be discarded.*

FORMATTING A FIXED DISK

Before data can be recorded on a fixed disk, the disk must be formatted. To format the fixed disk, use the following steps:

1. Be sure the disk unit is powered on and in RUN mode.

2. Press the RESET key on the keyboard.

3. To initiate disk formatting, select the Format Disk Platter utility from the System Utilities menu (see Figure 3-1).

4. Respond to the prompts and follow the procedure described in the section entitled "Running the Utility."

   If formatting is unsuccessful, a format error (ERR 93) appears. A format error may occur if the disk unit has not been properly powered on or is not in RUN mode. Turn the disk off, back on, and repeat the formatting procedure. If the error persists, call your Wang service representative.

After you select FORMAT Disk Platter from the System Utilities menu, a screen similar to Figure 6-1 appears.

```
***** SOFTWARE FORMATTABLE DISK PLATTER FORMAT UTILITY *****
(c) Copr. Wang Laboratories, Inc.  XXXX
Release XX.XX.XX

Enter platter address: ___


RETURN                                    - Proceed
FN/TAB                                    - Previous Menu
```

Figure 6-1. Software-Formattable Disk Platter FORMAT Utility Screen

The program then prompts you to mount the selected drive, shown in a screen similar to Figure 6-2.

```
SOFTWARE FORMATTABLE DISK PLATTER FORMAT UTILITY
Platter Information

Platter address = D10
Mount disk to be formatted and press RETURN:

[1]   CS/2200 Format
[2]   DOS Format
 _

                                  RETURN    - Proceed
                                  FN/TAB    - Previous Screen
```

Figure 6-2. Platter Information Screen

This screen shows the drive you have selected and the size of the diskette for formatting. If you do not want to format this drive, press CANCEL/EDIT to return to the previous screen. You have the option of either formatting the diskette in CS/2200 or DOS format. Enter either a 1 or a 2 in the space.

If this is the drive you wish to use, then mount a disk in the unit as directed and press RETURN.

The utility now attempts to read sector 0. If a format error occurs, then the utility assumes that it is okay to FORMAT the unit.

If you are formatting a CS/2200 diskette and no error occurs, then the drive has been previously formatted. The utility updates the screen shown in Figure 6-2 to include the information shown in Figure 6-3.

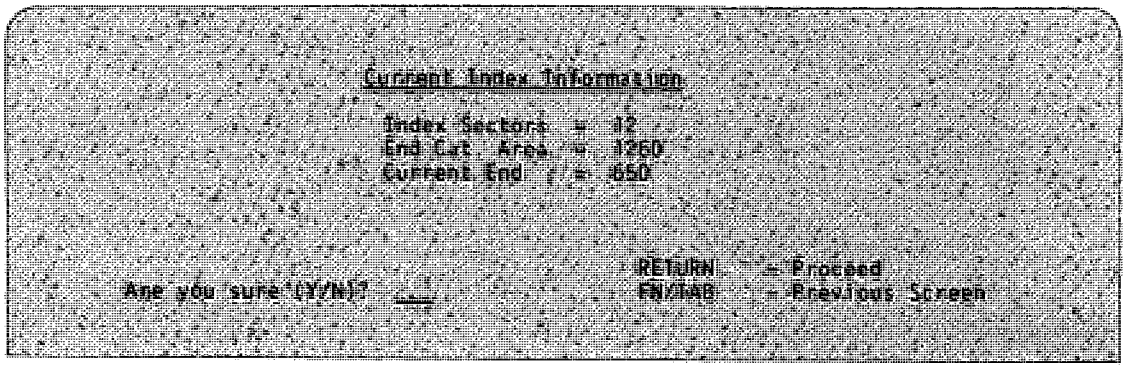

Figure 6-3. Current Index Screen

If you have accidently mounted the wrong unit, press N or FN/TAB. The utility then returns to the screen in Figure 6-2. If you need to change the device address, press CANCEL/EDIT; otherwise, press Y. The following message appears in the lower left corner of the screen:

(Formatting)

Format Completed

Upon completion of the format operation, you are given the opportunity to SCRATCH the newly formatted unit by entering the following information:

- The size of the index followed by RETURN.
- The size of the disk catalog followed by RETURN.
- The NEW or OLD index structure followed by RETURN.
- RUN/EXEC to SCRATCH the unit.

The message in the lower left hand corner of the screen changes, as follows:

(Creating Disk Index)

Upon completion of the disk creation, the screen is updated to read

Index Created - Press Any Key to Exit

- If you have an existing reference file name, enter the reference file name and then press RETURN.

  The screen displays:

  Make a Reference List of File Names -- (©) Copr. Wang Laboratories, Inc. 1989

  Source disk address _____

  Enter the address that contains the files and press RETURN.

  The screen displays:

  --- Sorting disk catalog - please wait ...

A screen similar to the one in Figure 13-1 appears.

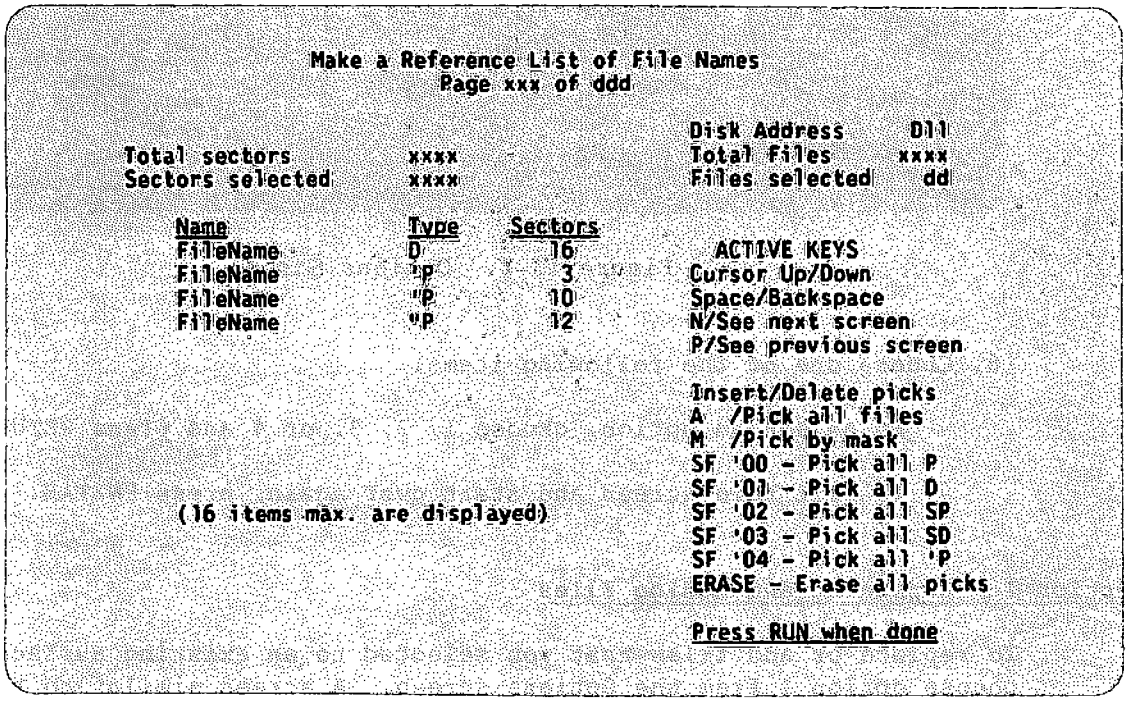

Figure 13-1. List of File Names Screen

4. Choose the items that you want to select. Use the cursor, space, backspace, insert, delete, next screen, previous screen, or letter keys to mark the items. The system marks each item that you select with a check mark.

5. Press RUN when you have finished selecting. A screen similar to the one in Figure 13-2 appears.

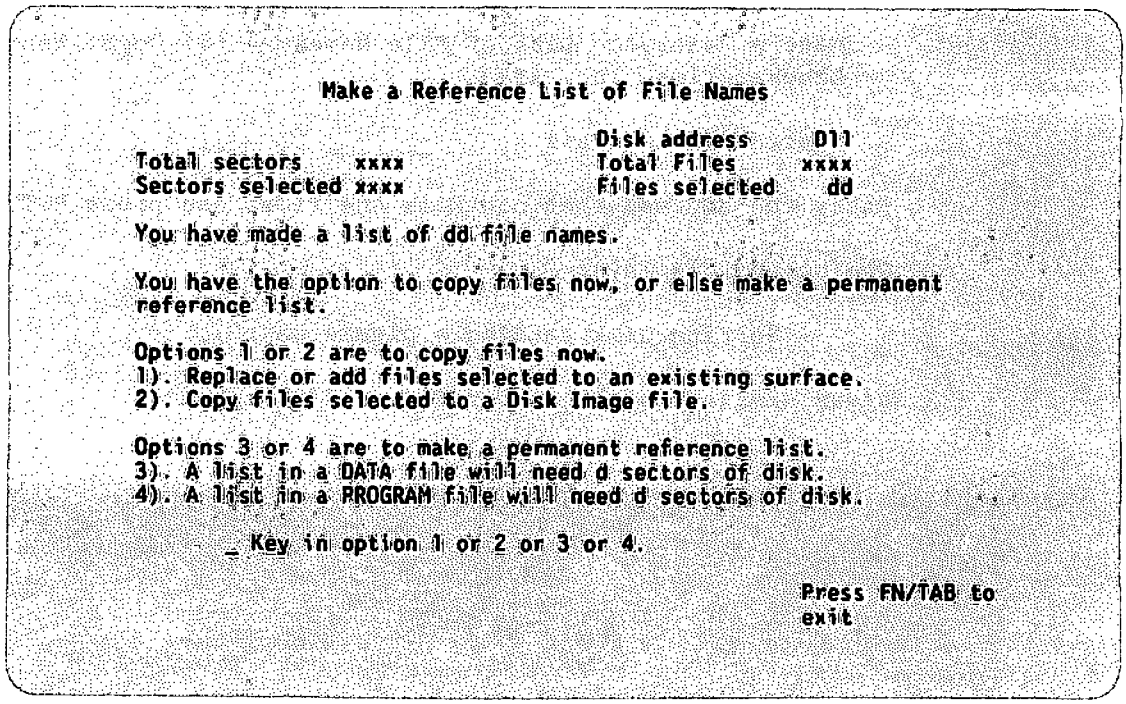

Figure 13-2. Options Screen

6. Choose one of the following items:

   - To select an option, choose 1, 2, 3, or 4 and press RETURN.
   - To exit this screen and start over again, press FN/TAB.

Option 1 - Replacing and Adding Files

To replace or add files that you selected to an existing surface, choose option 1 from the Options screen. A screen similar to the one in Figure 13-3 appears.

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