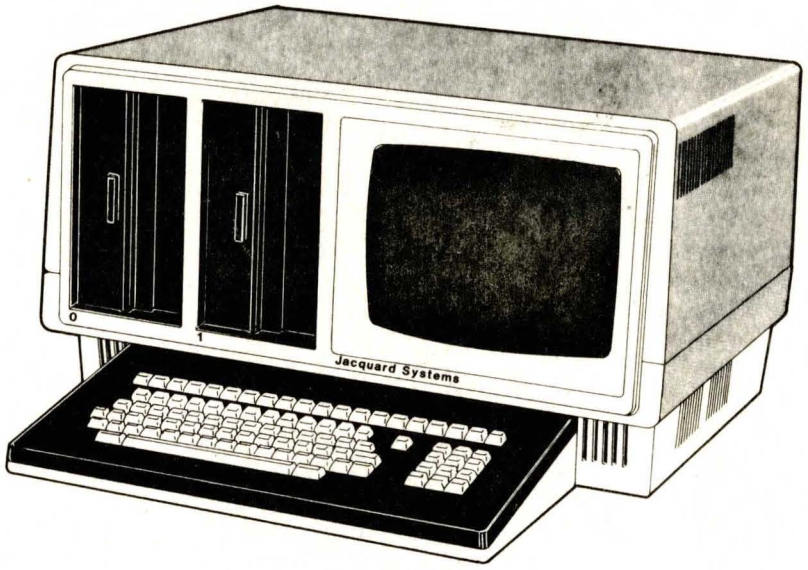
J500 SYSTEM GENERATION



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RELATED PUBLICATIONS

V1-005	System II Reference Manual
V2-005	System II Utilities Manual
V3-005	System II Error Messages
V1-018	J100 System Generation
V1-065	Type-Rite Installation Manual
V1-066	Binary Synchronous Communications
V1-073	Software Guide

PREFACE

This manual describes how to generate a customized version of System II for the Jacquard J500 computer.

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Chapter 1

INTRODUCTION

SYSTEM GENERATION

This manual describes the procedure for creating a customized operating system for the Jacquard Systems J500 computer. A companion publication, V1-018, covers the J100 procedure.

The procedure, known as a Sysgen (for System Generation), defines and names all devices (e.g., printers, disks) available on a particular computer and its terminals. At the completion of the Sysgen procedure, you will have a bootable operating system; i.e., one that is easily loaded from disk.

You may find one of the bootable operating systems already provided by Jacquard to be sufficient for your purposes, in which case no Sysgen is required. Instead, just load the existing system, install the desired applications, and begin your activities.

A Sysgen requires that you select an appropriate operating system configuration that will run most efficiently with the particular mix of applications you expect to be using on the J500.

If a J500 system requires more memory to store applications or to support more simultaneous users, you may create a smaller operating system. Reduce the devices defined to only those on the system and/or select a smaller operating system configuration. Response time usually increases as the size of the operating system in memory decreases, so the goal is to select the largest operating system configuration which fits into memory with the desired applications. This provides the best possible response time for the system (see Chapter 3 for further information).

SYSGEN METHODS

There are two alternative Sysgen methods available. The first procedure, called an Interactive Sysgen, is a method by which you proceed step by step, interacting with the computer, entering one piece of information

at a time through the keyboard. This method is described in Chapters 1 through 5 of this manual.

The second method allows you to store all Sysgen information and commands in a file and then execute the file to complete the Sysgen procedure automatically without entering more information at the keyboard. This method is sometimes called a Batch Sysgen. Once organized, a Batch Sysgen is simple and automatic, taking a relatively short time to change from one configuration to another, add a device, or change a parameter. This method is described in Chapter 7 of this manual.

Both methods require precise knowledge of the system hardware configuration (number of CRTs, floppy drives, printers, hard disks, etc.), and both require considerable knowledge of System II programs and utilities, and the manipulation of files, disks, floppies and System II commands.

REQUIRED DISKETTES

Two System Generation (SG) diskettes contain all files necessary to complete the Sysgen procedure. You may do the Sysgen procedure from these diskettes or copy their contents to a hard disk and then perform the Sysgen using the hard disk. The latter method is quicker and therefore preferred.

Also, a bootable system may be created on one system and then used to run another system. This means you can run the Sysgen procedure on a hard disk system, install the resulting bootable operating system on a diskette, then take the diskette to a floppy-only system and load (boot) the system.

Two General Files (GEN) diskettes are also provided. These are described in Chapter 5.

SGV DISKETTE

Two diskettes are required for a J500 Sysgen, the SGV and the SGF. The SGV diskette is labeled SGV1rr, a name which has these components:

SG	System Generation.
V	Roman numeral V, meaning J500.
1	First of a set of diskettes labeled SGV, in this case, the only one in that set.
rr	Release r.r of the software.

When you use this diskette to boot on the J500, the primary and nominal are set to FP00.

Among others, the diskette contains the program J500GN. It contains questions that, when answered, define hardware devices and features. These are validated, then stored in a system table file.

There are more than a dozen files with names in the form Zxxxxx.RB.

These must be on the primary disk since they handle, among other things, I/O for various types of disks.

Additionally, SGV contains a set of programs which may be useful before or after you run J500GN. These include:

CHATR	MEMREL
CHNOM	MEMORY
CHPRI	PAUSE
COPY	PCRT
DELETE	RENAME
DSKOPY	SI5DEF
EXEC	SORTM.SB
FILES	SPRCAT
FORMAT	STAD
KILL	TCUP
MEMLOK	

Finally, SGV contains all the FOxx1.SB bootstrap programs needed for FORMAT processing of J500 disks/diskettes.

SGF DISKETTE

The second diskette, SGF, is labeled SGF1rr. The name means System Generation Support Files for Release r.r only.

The SGF diskette also contains the RLDR utility, which links the system table file with a set of relocatable binaries (the Zxxxxx.RB modules). The result is a system binary file. In addition, the diskette contains several dozen files with names in the form xxxxxx.RB or Cn.RL.

SGF also contains three special programs which are used to convert RLDR output into a loadable version of System II:

UNSTAL An existing loadable version of System II is deleted by UNSTAL from the disk on which the new Sysgen is being built.

MKABS Based on the system binary file, a loadable system is created by MKABS on the disk being built.

INSTAL The disk addresses for the loadable system are recorded in a special Overlay Directory Sector on the same disk. This makes it possible to bootstrap the system into memory whenever necessary.

COPYING SGV AND SGF DISKETTES

Note that these diskettes contain files called SGV1rr.X1 and SGF1rr.X1 which copy the diskette contents to any other disk.

Chapter 2

J500GN

THE J500GN PROGRAM

The SYSGEN program (J500GN) generates a system table file (SYSTBL.RB). This file contains encoded definitions for all the devices which you expect to use with your system; it also contains various limits, table sizes, and other options. When created, the current date is given to the new system, then displayed whenever the system is rebooted.

TERMS AND CONVENTIONS

STANDARD DEVICE NAMES

For each device type covered by a separate question in the Sysgen process, there is a standard device name pattern, implied by the default answers described below. A standard pattern consists of some letters to indicate a device type, followed by some numerals. For example, FP00 and FP01 are floppy disk drives; LPT1 is a line printer; CRT1 is a computer terminal. Each device name must be unique in a given version of the system.

The use of these device name patterns is strongly recommended, because they appear as examples in all Jacquard reference and training manuals. If non-standard device names are chosen, the names of certain other files must be explicitly changed also.

Most of the questions about device types allow multiple answers: one line and one <RETURN> for each device definition. The next question appears only when you press <RETURN> on a blank line.

It is legal to define no devices at all for most types; just press <RETURN> after the question appears. You must, of course, define one CRT and disk in order to use the system.

DISK DEVICE MANAGEMENT PROGRAMS

The J500GN program copies both your device definitions and the disk input/output management programs for defined devices to the system table file (SYSTBL.RB). The disk management program files all have names which start with Z, for example, ZUVDSK.RB. They are delivered on the SGV diskette and must be on the primary disk during execution of the J500GN program. The description in this chapter of each disk definition question asked by the J500GN program shows which disk management programs must be on the primary disk to complete the definition of that disk type.

If a program file is missing, its name and a System Error 34 message will appear after all questions are answered. The J500GN program is not successfully completed if any System Error 34 occurs. You must copy the missing program files to the primary disk and execute the J500GN program again.

PRINTER AND COMMUNICATION DEVICE CHARACTERISTICS

Printer and communication device definitions end with a set of optional two-letter codes which are called characteristics or options.

These definitions are charted at the end of this chapter under the heading "Printer and Communication Device Characteristics Summary." Recommended device characteristics are included in the examples accompanying each printer and communication line question asked by the J500GN program. Refer to individual questions which follow in this chapter.

For example, a line printer might have some or all of the following options: FF, TS, LC, LU, FB.

```
LPT1 128 132 66 FF TS LC LU FB
```

PRINTER AND COMMUNICATION DRIVERS

All printers and communications lines are managed by System II programs called drivers. These are not copied to the system table file but are automatically loaded from the current primary disk whenever they are needed to operate a device. For example, the driver CDODRV.SB is loaded into memory, if it is not already there, every time that a line printer is opened. The drivers must be copied from the GENnrr diskettes.

When you review the contents of a primary disk you have built, be sure that the drivers for any devices to be used are included. Other drivers need not be included on the primary disk. The description in this chapter of each printer and communication question asked by the J500GN program shows which drivers must be on the primary disk in order to use that type of device.

THE COMMAND FORMAT

The command format for a Sysgen is as follows:

$~~J500GN~~ SYSGEN B=FP01:SYSTBL.RB [P=words]/<RETURN>
↳ J=5

where:

B= is the name of the system table file to be generated; any existing version is automatically deleted. You may include a device name or default to the nominal.

If this field is omitted, nomdev:SYSTBL.RB is assumed, where nomdev is the system nominal device.

Note that during this manual's recommended procedures, some diskette switching is involved; B=FP01:SYSTBL.RB requires that a blank diskette be placed in FP01.

P= is the partition size, the hexadecimal number of memory words to be used as workspace by this program. If this field is omitted, a value of hex 0200 is assumed. If the Sysgen will include more than four CRTs, then set the size to 3000 (P=3000).

If the error message, WORK SPACE EXHAUSTED, appears, the Sysgen must be restarted and a larger partition size must be specified.

The square brackets indicate optional fields; the brackets themselves should never appear in an actual command.

PROCEDURE

Throughout this document, we use the term "dbb" to represent the drive containing the "disk being built." Typically this is FP01, DA00, DD00, DE00, or DP00. Also, as in normal practice, whenever it is necessary to remove a disk or diskette, the Remove (RM or $REMOVE) command should be issued.

Begin with the following procedures:

1. Insert the SGV diskette for the new release in FP00.

2. Check the APL select switch to be sure the system is set to boot from a floppy.

3. Boot from FP00.

The SGV diskette in FP00 has a bootable version of System II.

FP00 will become the primary disk. It will also become the nominal disk for CRT1. These assignments are necessary for the commands given on the following page.

4. When you boot, the STAD utility is executed automatically; answer its two messages with the current date and time. Example:

```
ENTER DATE (YYMMDD): 81 03 01 <RETURN>
ENTER TIME (HHMMSS): 13 45 00 <RETURN>
```

5. If you intend to build your system on a formatted hard disk, place the removable disk in drive 0.

   Now you are ready to define your new system.

6. Insert the SGF diskette in FP01.

7. Enter the following command, first considering (if necessary) the definitions previously given under "The Command Format":

```
$J500GN B=FP01:SYSTBL.RB [P=words] <RETURN>
```

   The above command will cause the J500GN program to pose questions on the screen.

ANSWERING THE QUESTIONS

Each question must be answered and completed with a <RETURN> before the next question appears. Each answer consists of one or more fields, separated by any number of blanks. The order of the fields is fixed for each question.

To accept the default parameters, press <RETURN>. Alternatively, you can provide the answers from the keyboard. Each keyed-in response is validated immediately, and if unacceptable, will produce an error message. Incorrect entries must be corrected. Error messages are described in Appendix A.

If you forget to make an intended entry, or make an entry you do not want, it is not possible to go back and change it. In either case, you must abort the Sysgen process with <CANCEL>, then start over.

When a question expects a value, a date, a number, or a letter, as an answer, entering only <RETURN> is equivalent to entering the specific value shown as the default under that question. The only exception to this rule is the "Primary Disk?" question; this requires that you always enter the response.

If you need to enter some value other than the one indicated, enter it, then press <RETURN>. For example, after the question BUFFER POOL SIZE?, enter the desired value.

When a series of device definitions is expected, one or more complete lines are listed as defaults. If you want to include such a line, but have no changes to make, you need only enter the device given at the start of that line, followed by <RETURN>. This saves a lot of error-prone typing (see the LPT example given on the next page).

If you want to include a device definition line which differs from a default line in any field, including the name or any of the values which follow it, then you must type in the whole line, followed by <RETURN>.

Here is an example. The question for line printers has the default answer:

```
LPT1 128 132 66 FF TS LC LU FB
```

If you have no line printer, just press <RETURN> and the next question appears. In this case, no line printers at all are defined.

If you have a line printer named LPT1, with exactly the fields shown, enter:

```
LPT1 <RETURN>
```

Alternatively, you can define a printer, still named LPT1, by changing one or more of the fields:

```
LPT1 nnn nnn nn xx xx xx xx xx <RETURN>
```

The rest of Chapter 2 details the J500GN program questions and legal answers in the same sequence as they appear on the screen. Note that the default values under the questions also serve as examples of correct formats for the answers.

Question: BUFFER POOL SIZE (HEX)?

Default: 0C00

Press <RETURN> to accept the default value. If you wish to override the default value, enter a hex value (minimum 0400) and press <RETURN>.

This value sets the memory words allocated to the system buffer pool, which is described in the System II Reference Manual, V1-005. The appropriate size depends on application mix, disk types, and the size of the sector management table described below. Memory is wasted by setting the pool size too high; efficiency is reduced by setting the pool size and the SMT size too low. This value may be changed later with the CHBUFS utility.

The pool size should be at least 1400 hex (X'1400) for a system with double-density cartridge disks in the 512 words/sector format (standard name DAnn). Certain application packages, such as Type-Rite, may also need an allocation larger than the default value. See the installation manual for each package. In memory, the pool will always be preceded by an additional area, 1/16th the size of the pool itself, called the buffer control table.

Table 2-1 shows the maximum buffer size allowed for each system configuration. It is recommended that these figures be used for normal operations. Depending on the application to be operated, a larger buffer size may be possible with special system tuning.

Table 2-1. Configuration Memory and Maximum Buffer Pool Sizes

Configuration	Resident or Overlaid	Memory Size (Kilobytes)	Maximum Buffer Pool Size (Kilobytes)
1	R	25.3	7.2 (X'1C00)
2	O	21.0	8.2 (X'2000)
3	O	18.2	8.2 (X'2000)
4	O	17.3	8.2 (X'2000)
5	O	15.5	8.2 (X'2000)
6	R	20.3	8.2 (X'2000)
A	R	22.7	8.2 (X'2000)
B	O	18.4	8.2 (X'2000)
C	O	15.6	8.2 (X'2000)

Question: DISK SECTOR MANAGEMENT TABLE SIZE?

Default: 4

Press <RETURN> to accept the default value, or enter a decimal number, between 2 and 16. Press <RETURN> to override it. A general rule might be to start with 3 and add 1 for each CRT over 3.

This value sets the number of entries allowed in the sector management table (SMT), a queue which consumes part of the system buffer pool. Each entry contains the hardware address and the data for one recent disk I/O request. If another program needs the same sector, then the SMT data can be reused (under certain conditions) without another device access.

The larger the SMT, the more efficiently the system will run; this will be particularly evident during Type-Rite scrolling. But the smaller the SMT, the more memory will be available for other purposes. A value of at least 4 is recommended; the maximum is 16.

Question: FLOPPY DISKS (FPxx)?

Program Files: ZFPC.RB, ZFPDMT.RB, ZFPLP.RB, ZUFPDI.RB, ZUVDSK.RB

Defaults:

(a)	(b)
FP00	14
FP01	15

(a) Device name.

(b) Device address, in hex; the only valid entries are 14 for FP00 (on the left), and 15 for FP01.

Single and Double Density

It is legal, and highly advisable, to define each single-sided floppy drive under both this question and the next. The names in each pair (FP00 and FD00 for the left-hand drive; FP01 and FD01 for the right-hand drive) share a common device address.

Once this is done, the device name specified within a given program will determine which density is set for a drive from OPEN to CLOSE.

In particular, the device name specified to the FORMAT utility implies the density of the diskette being initialized, and all subsequent access to that diskette (until it is reformatted) must use a device name which implies the same density.

Each diskette should be clearly labeled with its density as soon as it has been formatted. Note that only the /I option of the FORMAT utility can change that density.

You must always define single-density names, because Jacquard software is distributed only on single-density diskettes.

Question: FLOPPY DISKS (FDxx)?

Program Files: ZADPC.RB, ZDPDMT.RB, ZFDLP.RB, ZUFDDI.RB, ZUVDSK.RB

Defaults:

(a)	(b)
FD00	14
FD01	15

(a) Device name.

(b) Device address, in hex; the only valid entries are 14 for FD00 (on the left) and 15 for FD01.

Question: FLOPPY DISKS (FAxx)?

Program Files: ZADPC.RB, ZFALP.RB, ZDPDMT.RB, ZUFADI.RB, ZUVDSK.RB

Defaults:

(a)	(b)
FA00	14
FA01	15

(a) Device name.

(b) Device address, in hex; the only valid entries are 14 for FA00 (on the left) and 15 for FA01.

Question: CARTRIDGE DISKS (DPxx)?

Program Files: ZADPC.RB, ZDPDMT.RB, ZDPLP.RB, ZUDPDI.RB, ZUVDSK.RB

Defaults:

(a)	(b)	(c)
DP00	18	0
DP01	18	1
DP02	19	0
DP03	19	1

(a) Device name.

(b) Device address, in hex; the only valid entries are:

18	DP00
19	DP01
1A	DP02
1B	DP03

(c) Platter number. The upper, or only, platter is 0. On a dual-platter drive, the lower platter is 1. Each platter is a separate System II logical device.

These are single-density drives: 100 tracks per inch, 3 megabtyes per platter. The hardware must be set for 12 sectors per track.

Single and Double Density

A system can include both single-density drives (defined with the question above) and double-density drives (defined with any of the next three questions).

Cartridges can be formatted on either type of drive, if they have been certified for 200 tracks per inch.

Once a cartridge is formatted in a given density, it cannot be accessed by a drive with a different density until it is been completely reformatted, a process which destroys all data.

Question: CARTRIDGE DISKS (DExx)?

Program Files: ZADPC.RB, ZDELP.RB, ZDPDMT.RB, ZUDEDI.RB, ZUVDSK.RB

Defaults:

(a)	(b)	(c)
DE00	18	0
DE01	18	1
DE02	19	0
DE03	19	1

(a) Device name.

(b) Device address, in hex; the only valid entries are:

18	DE00
19	DE01
1A	DE02
1B	DE03

(c) Platter number. The upper, or only, platter is 0. On a dual-platter drive, the lower platter is 1. Each platter is a separate System II logical device.

These are D3441 or D3481 double-density drives: 200 tracks per inch, 6 megabytes per platter. The hardware must be set for 12 sectors per track.

A 24-megabyte drive really contains two dual-platter units which share the same device address; the removable cartridge is unit 0, platter 0.

Question: CARTRIDGE DISKS (DDxx)?

Program Files: ZADPC.RB, ZDELP.RB, ZDPDMT.RB, ZUDDDI.RB, ZUVDSK.RB

Defaults:

(a)	(b)	(c)
DD00	18	0
DD01	18	1
DD02	19	0
DD03	19	1

Except for the default names, all of the information given for the previous question applies here.

This device type represents an older version of the disk I/O software, in which 600 fewer sectors were available. New users typically should not define this type.

Reformatting

Cartridges formatted as DDnn cannot be accessed by any other type of logical device. To convert a cartridge to the newer DEnn format, these steps must be followed:

1. Copy all current files somewhere else, one by one, using a DDnn-type source device specification. BLDCPY, BACKUP, COPY, HKOPY, or similar file-oriented utilities can be used; DSKOPY is not appropriate. Note that a loadable version of System II cannot be transferred from its absolute disk position.

2. Use the FORMAT utility on the cartridge, specifying a DEnn-type device name. A complete reformatting, not FORMAT/C, is necessary.

3. Copy back the files, one by one, using a DEnn-type target device specification.

Question: CARTRIDGE DISKS (DAxx)?

Program Files: ZADPC.RB, ZDALP.RB, ZDPDMT.RB, ZUDADI.RB, ZUVDSK.RB

Defaults:

(a)	(b)	(c)
DA00	18	0
DA01	18	1
DA02	19	0
DA03	19	1

(a) Device name.

(b) Device address, in hex; the only valid entries are:

18	DA00
19	DA01
1A	DA02
1B	DA03

(c) Platter number. The upper, or only, platter is 0. On a dual-platter drive, the lower platter is 1. Each platter is a separate System II logical device.

As in the two previous questions, these are D3441 or D3481 double-density drives: 200 tracks per inch, 6 megabytes per platter, 12 sectors of 256 words per track. However, for this device type, all System II software will act as if a track contained 6 sectors of 512 words per track.

There is no significant difference in capacity between DEnn (or DDnn) and DAnn drives. The advantage of DAnn is that sequential I/O is faster, because half as many device operations are needed to transfer a given file. The main disadvantage is that the system buffer pool must be larger for efficient operation, because each SMT entry will require 512 words, rather than 256. Also, hash files with small records will involve more wasted disk space than in the other formats.

Again, a cartridge disk formatted with a DAnn-type name cannot be accessed with any other type of logical device.

Note that DAnn access requires a maximum buffer size, set earlier, of 0200.

Question: PRIMARY DISK?

Default: FP00

The device name given here must have been defined earlier. It will become the primary disk at bootstrap time, an assignment which may then be changed at any time with the CHPRI utility.

There is no connection whatever between this entry and the switch-selected device from which the system is actually bootstrapped. They may be the same, they may be two drives of the same type, or of completely different types. The choice depends solely on the procedures intended for a system start-up. Note, however, that a system initial command file (SYSICF) will be executed at bootstrap time only if it is on the device specified here.

Question: DEFAULT NOMINAL DISK?

Default: FP00

This question is included for compatibility with J100 System Generation procedures, and may be answered with just a <RETURN>. Field (b) in the next question overrides any answer given here.

Note that no answer for this question will ever appear on a SI5DEF listing.

Question: J500 TERMINAL?

Defaults:

(a)	(b)
~~CRT1~~	~~see below~~
CRT1	28 DE00

(a) Device name.

(b) A disk device name, which must have been defined earlier. It will become the nominal disk at bootstrap time, an assignment which may then be changed at any time with the CHNOM utility.

If this entry is omitted, then the answer to the previous question will determine the nominal disk at bootstrap time.

Question: CHAR OUTPUT DEVICES, DATA PRODUCTS/ CENTRONICS/PRINTRONIX PRINTERS?

Driver: CDODRV.SB

Defaults:

(a)	(b)	(c)	(d)	(e)
LPT1	128	132	66	FF TS LC LU FB

(a) Device name.

(b) Words in I/O buffer, decimal. For a fast printer (over 30 cps) at least 128 is recommended.

(c) Columns per line, decimal; maximum 255.

(d) Lines per page, decimal; maximum 255. The default value assumes 11-inch paper at 6 lines per inch.

(e) Options, from FF, FS, FB, TS, LC, LU, TM, and ES (see "Printer and Communication Device Characteristics Summary," page 2-23).

This question covers only line printers (Data Products, Centronics, Printronix), not character printers (Diablo, Qume, NEC), which go under the next two questions.

Any number of definitions, each with a different name, may be used for the same address, so that the device behaves according to the device name used by a given program. In a running system, it is also possible for the ACUP utility to alter most definition fields for a device which is not open.

*Question: DIABLO/QUME PRINTERS?

Driver: DPRDRV.SB

Defaults:

(a)	(b)	(c)	(d)	(e)	(f)	(g)
DPR1	128	132	66	8	12	FF FS TS LC FB
DPL1	128	132	84	8	12	FF FS TS LC FB

(a) Device name.

(b) I/O buffer words, decimal.

(c) Columns per line, decimal; maximum 255.

(d) Lines per page, decimal; maximum 255. The default value for DPR1 assumes 11-inch paper at 6 lines per inch; DPL1 assumes 14-inch paper at 6 lines per inch.

(e) Vertical pitch, decimal; 1/48 inch units. With a pitch of 8, there are 6 lines per inch.

(f) Horizontal pitch, decimal; 1/120 inch units. Even number required for a Diablo HyType I. With a pitch of 12, there are 10 characters per inch.

(g) Options, from DS, ES, FB, FF, FS, LC, LU, NC, SF, TM, TS, QM, and QT.

This question covers a character printer (not a line printer) on a parallel interface. The default definitions all assume a Diablo HyType. For Qume and NEC printers, see the next page. For the Diablo HyTerm, a serial interface printer with an optional keyboard, see the next question.

OTHER PARALLEL CHARACTER PRINTER TYPES

The following definitions, under the question just described, are recommended for some other types of character printers. These are not defaults; in each case, a complete line must be entered, with whatever changes are desired.

Diablo, with sheet feeder:

```
DPR1 128 132 66 8 12 FF TS LC FB SF
```

Qume, standard:

```
QPR1 128 132 66 8 12 QM FF FS TS LC FB
```

Qume, with sheet feeder:

```
QPS1 128 132 66 8 12 QM FF TS LC FB
```

Qume, WideTrack:

```
QPW1 256 255 66 8 12 QM FF FS TS LC FB
```

The following printers will require not only the usual DPRDRV.SB driver, but also the corresponding wheel tables. The root portion of a wheel table name defines the printer type. The extension used is always .WT. For example, QTR1.WT would be the wheel table used for a Qume TwinTrack.

Standard wheel tables are supplied on diskette TBL1nn. See the System II Reference Manual for details on custom tables.

Qume, TwinTrack:

```
QTR1 128 132 66 8 12 FF FS TS LC FB ES QT
```

NEC, proportional spacing thimble mounted:

```
NPP1 128 132 66 8 12 FF FS TS LC FB
```

NEC, nonproportional spacing thimble mounted:

```
NPR1 128 132 66 8 12 FF FS TS LC FB
```

Note that the last two definitions supply two different names for the same printer. This allows the activation of wheel tables which match the differing character sequences of PS and non-PS thimbles (in this case, NPP1.WT versus NPR1.WT) according to the device name specified in a Type-Rite menu, a PRINT utility command, a program OPEN statement, or a similar context.

Question: CHAR INPUT/OUTPUT DEVICES, ASYNCHRONOUS COM LINES?

Driver: CDXDRV.SB

Defaults:

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)
ASY1	1E	128	80	66	0	4800	1200	0	8	0	1	TM
ASY2	1F	128	80	66	0	4800	1200	0	8	0	1	TM
ACY1	1E	128	80	24	0	4800	1200	0	8	0	1	EM LC TS IE
ACY2	1F	128	80	24	0	4800	1200	0	8	0	1	EM LC TS IE
ASH1	1E	352	132	66	0	4800	1200	0	8	0	1	LC FB TS FF FS DH

(a) Device name. ASYn is set for a general-purpose async line; ACYn is set for a remote async CRT. ASH1 is set for an async Diablo character printer.

(b) Device address in hex, either 1E or 1F.

(c) I/O buffer words, decimal. Partition space (not buffer pool space) twice this size, plus 34, rounded up to a multiple of 16, is obtained by the driver.

(d) Columns per line, decimal; maximum 255.

(e) Lines per page, decimal; maximum 255. The default value for ASY1 assumes 11-inch paper at 6 lines per inch.

(f) Read time-out, decimal, 1/10 second units; maximum, 32767. If 0 is specified, an infinite time-out is used.

(g) Write time-out, decimal, 1/10 second units; maximum, 32767. If 0 is specified, an infinite time-out is used.

(h) Baud rate, decimal: 50, 75, 110, 134 (meaning 134.5), 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600, or 19200.

(i)

Entry:	XMIT clock:	RCV clock:
0	internal	internal
1	internal	external
2	external	internal
3	external	external

Internal clocking is normally used. External clocking may be required for nonstandard rates, or for different rates when transmitting and receiving.

(j) Number of bits per character, not including parity or stop bits: 5, 6, 7, or 8.

(k) Entry: Parity generation and checking:

0	None
1	Odd
2	Even

(l) Stop bit length:

1	1 stop bit, normal for baud rates of 300 and above.
2	1.5 stop bits.
3	2 stop bits, normal for baud rate of 100.

(m) Options, from FB, FF, FS, EM, ES, IE, LC, LU, SF, TM TS, DH, DC, XO, NC, and HD.

Any number of definitions, each with a different name, may be used for the same address, so that the device behaves according to the device name used by a given program. The default lines for ASY1 and ACY1 are examples. (In a running system, it is also possible for the ACUP utility to alter most definition fields for a device which is not open.)

Note: The NC characteristic should be used for NEC printers instead of the DH characteristic specified in previous releases. Type-Rite 4.1 does not recognize the NC characteristic; if you are using Type-Rite 4.1 with the 9.0 operating system, continue to use the DH characteristic.

Question: GENERAL SYNCHRONOUS COMMUNICATION LINES?

Driver: SIL5DR.SB

Default:

(a)	(b)	(c)	(d)
COM1	1E	1200	3
COM2	1F	1200	0

(a) Device name.

(b) Device address in hex, either 1E or 1F.

(c) Baud rate, decimal: 50, 75, 110, 134 (meaning 134.5), 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600.

(d)

Entry:	XMIT clock:	RCV clock:
0	internal	internal
1	internal	external
2	external	internal
3	external	external

Question: BISYNC COMMUNICATION LINES?

Driver: CSEA00.SB

Defaults:

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)
BPE1	1E	2	512	-1	25	-1	-1	1	1	1200	3	PP
BPE2	1E	2	512	-1	25	-1	-1	1	1	1200	3	
BPA1	1E	2	512	-1	25	-1	-1	0	1	1200	3	PP
BPA2	1E	2	512	-1	25	-1	-1	0	1	1200	3	
BME1	1E	3	256	-1	25	0	0	1		1200	3	
BME2	1E	3	256	-1	25	0	0	1		1200	3	
BMA1	1E	3	256	-1	25	0	0	0		1200	3	
BMA2	1E	3	256	-1	25	0	0	0		1200	3	

(a) Device name.

(b) Device address, in hex; must be even; 1E or 1F is standard.

(c) Device type:

0	Jacquard BSC
1	IBM 2780
2	IBM 3780
3	IBM 3275
4	IBM 3270

(d) Block size, characters, decimal.

(e) Poll/select retry limit, decimal. -1 = unlimited.

(f) Line error retry limit, decimal. -1 = unlimited.

(g) Station CU, decimal, 0 to 31. -1 = unused.

(h) Station DN, decimal, 0 to 31; or 127. -1 = unused.

(i) ASCII/EBCDIC. 0 = ASCII, 1 = EBCDIC.

(j) Multipoint/point-to-point. 0 = multipoint, 1 = point-to-point.

(k) Baud rate, decimal: 50, 75, 110, 134, (134.5), 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, or 9600.

(l)

Entry:	XMIT clock:	RCV clock:
0	internal	internal
1	internal	external
2	external	internal
3	external	external

(m) Options, from DC, DE, MC, MM, NT, PP, SS, and TT.

Question: UNIVAC 1004 REMOTE JOB ENTRY COM LINES?

Driver: UJE5DR.SB

Default:

(a)	(b)	(c)	(d)
UJE1	1E	2400	3

(a) Device name.

(b) Device address in hex, 1E or 1F.

(c) Baud rate, decimal: 50, 75, 110, 134 (meaning 134.5), 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, or 9600.

(d)

Entry:	XMIT clock:	RCV clock:
0	internal	internal
1	internal	external
2	external	internal
3	external	external

For details, see UNIVAC Remote Job Entry Program, V1-052.

Final Question: AUTO-DIALER?

Driver: DILDRV.SB

Default:

(a)
DIL1

(a) Device name.

COMPLETION OF QUESTIONS

When the last question has been answered, there is a pause. The system table file is generated at this time. When the cursor and the message J500GN DONE appear, the program has terminated itself. You are ready for the RLDR step described in the next chapter.

PRINTER AND COMMUNICATION DEVICE CHARACTERISTICS SUMMARY

PRINTER AND ASYNCHRONOUS COMMUNICATION DEVICES

This section describes the various device characteristic options which can be specified during J500GN (or ACUP) for the asynchronous driver (CDXDRV.SB), for the line printer driver (CDODRV.SB), and for the parallel character printer driver (DPRDRV.SB).

Below is an alphabetical list of the various printer and asynchronous communication device characteristic options and their meanings.

DC Disconnect on close. Functional only on the J500 async driver. This option will cause DTR (Data Terminal Ready) to be turned off when the device is closed. The drivers will wait up to 30 seconds after turning off DTR for DSR (Data Set Ready) to also turn off.

DH Diablo HyTerm. Causes special handling to be performed for Diablo 1610, 1620, 1640 and 1650 model printers (also for NEC 5515 printers prior to System II Release 9.0). Note that this characteristic is the default for DPRDRV and need not be present for Diablo parallel printers. (See "Character Translation for Serial Printers and Async Lines," page 2-26. See also, NC, page 2-24.) Async driver option only.

EM Echo mode. Causes incoming characters to be transmitted back to the originating device. (Input and output translation performed before echo.) Async driver option only.

ES Extended set. Normally, a device driver will convert characters X'11 through X'1F and characters greater than X'7F to spaces (X'20). The ES option prevents this. Async driver option only. This option is required for NEC and Qume TwinTrack printers.

FB Form feed at bottom. This option will cause the driver to perform a form feed if the number of lines per page, as specified during Sysgen, is exceeded. Not for bisync.

FF Form feed at close. This option will cause a form feed to be performed when the device is closed. Not for bisync.

FS Form feed simulate. This option will cause a form feed to be simulated by the sending of the proper number of line feeds necessary to move to the top of the next form. Not for bisync.

HD Half duplex. This mode, functional only on the J500 async driver, will cause RTS (Request To Send) to be raised only during transmit. Normal operation is full duplex, RTS on continuously. Note that half-duplex operation on COM2 channel is not possible on a J500.This feature is available in System II, Release 9.0 and later releases only.

IE Input editing. This special feature allows a line of input to be edited before any data is returned to the application program. When in this mode, certain received characters are handled in a special manner. Async drivers only.

BEL (X'07 - Cntrl G) - Bell: Causes previous character to be deleted from the input buffer. If EM present, echoes # (bell echoed if beginning of line).

BS (X'08 - Cntrl H) - Backspace: Causes previous character to be deleted from the input buffer. If EM present, echoes BS (bell echoed if beginning of line).

CAN (X'18 - Cntrl X) - Cancel: Deletes current line from input buffer. If EM present, echoes CR (also LF if LC).

EOT (X'04 - Cntrl D) - End-of-text: Causes an end-of-file error return when read from the input buffer.

ESC (X'1B - Cntrl [) - Escape: Clears current line and input buffer. Returns CR to application. If EM, echoes CR (also LF if LC). If input device is primary terminal for job, will cause abort.

LC Line feed control. This option causes a line feed to be appended to carriage returns on output. On input, NUL, LF, and DEL will be ignored if the column number is 0 when they are received. Not for bisync.

LU Lower to uppercase. This option will cause lowercase letters to be converted to uppercase. Not for bisync.

NC NEC printer. Causes special handling to be performed for NEC 5515 printers. This feature is available in System II Release 9.0 and up only. Async and DPRDRV only.

TM Transparent mode. This mode allows data to be sent without any translation. It overrides the DH, ES, FB, FS, IE, LC, LU, NC, and TS options. TM will not override DC, EM, FF, HD or XO options. Async drivers only. It will use a .CT if present, no special handling of control characters.

TS Tab simulate. If a tab is received or transmitted, this option will cause the proper number of spaces to be received or transmitted to move the column to the next System II tab stop (0, 8, 16, 24... etc.). Not for bisync.

XO XON/XOFF. This protocol option will cause output to be suspended when an XOFF is received and resumed when an XON is received. It will also cause an XOFF to be sent if the receive buffer is within 20 characters of being full. XOFFs are sent continuously if the receive buffer is within 10 characters of being full. If an XOFF has been sent, an XON will be sent when the receive buffer is empty. Async drivers only.

QM Qume printer. This option enables special handling for the Qume Sprint 3 parallel printer. DPRDRV only.

QT Qume TwinTrack. This option enables special handling for the Qume TwinTrack parallel printer. DPRDRV only.

BISYNCHRONOUS COMMUNICATION DEVICE CHARACTERISTICS

Below is an alphabetical list of the various bisynchronous communication device characteristic options and their meanings.

DC Disconnect on close. Allowed only for point-to-point devices on dial-up lines. Specifying this characteristic causes a telephone connection to be broken when the device is closed. A standard disconnect message (DLE EOT) is sent, and the modem control signal, Data Terminal Ready, is dropped. For multipoint, typically EM3270, the line is closed only when no other EM3270 jobs are active or running.

DE Display errors. As appropriate, LINE ERROR n will appear on line 24 of the terminal for a job using BSC. While the BSC device is open, the job should attempt input from line 24 only in roll mode. If a detached job's predecessor job had no terminal, then no error display is generated.

MC Control station. Allowed only for a multipoint device. If the MC option is not specified, the device is assumed to be a tributary. An EM3270 device may not be a control station.

MM Multithread mode. Relevant only to users who will write their own communications programs in assembly language. The effect of the characteristic is to allow multiple system calls for reading and writing (RDx and WRx) to the same device at the same time. In single-thread mode (MM not specified), the driver allows only one read or write at a time on a device. MM is assumed for BRJE and EM3270 devices.

NT No translation file. The driver will not attempt to load a conversion table file if the device is opened. NT is required if nontext data are to be sent or received. For additional information, see Chapter 8 and Appendix F of the Binary Synchronous Communications manual, V1-066.

PP Primary station. Allowed only for a point-to-point device. If PP is not specified, the device is assumed to be a secondary station. PP should be specified if the device communicates with a host. If the devices are both Jacquard computers, and if it is possible that both will attempt to transmit at the same time, one must be designated as primary.

SS Seven SYN. Intended for lines with severe noise problems. Each transmitted block is preceded by seven SYN characters; otherwise, only three are sent. The trailing pad character usually expected at the end of each received block is ignored and may be absent. If SS is not specified, the trailing pad must be present, and must have four high-order (1) bits.

TT Transmit transparent. The TT option (and the NT option) must be specified if object programs and other binary data, rather than text, are to be transmitted. Devices for BRJE and EM3270 use are normally not defined as TT; by default their transmission mode becomes nontransparent.

CHARACTER TRANSLATION FOR SERIAL PRINTERS AND ASYNCHRONOUS LINES

Characters can be translated on both input and/or output. Translation is affected by the presence or absence of a code translation table, named devnam.CT, where devnam is the name of the device, and also by the presence or absence of the DH, ES, FB, FS, IE, LC, LU, NC, TM, TS and XO device characteristics (for details on translation table construction, consult the System II Reference Manual). Not true for bisync.

INPUT TRANSLATION (ASYNCHRONOUS COMMUNICATION ONLY)

Received data is handled in the following manner before being returned to an application making a read call.

XO If present:

X'11 (XON) - enables output (not passed through)
X'13 (XOFF) - disables output (not passed through)

TM If present, no special handling of control characters; the extension .CT used if present:

X'00-X'FF -> (UNCHANGED)

ES If not present, characters > X'7F changed to SP first:

X'80-X'FF -> X'20 (SP)

.CT If present, table translation performed next:

X'00-X'FF -> (CONVERTED VIA TABLE)

Note: Character not translated if translate character is 0.

After table translation:

```
X'00        -> X'0D (CR)          IF NO LC
X'01-X'03   -> X'0D (CR)
X'04        -> X'0D (CR)          IF NO IE
X'05-X'06   -> X'0D (CR)
X'07-X'08   -> X'0D (CR)          IF NO IE
X'09        -> (UNCHANGED) (TAB)
X'0A        -> X'0D (CR)          IF NO LC
X'0B        -> X'0D (CR)
X'0C        -> (UNCHANGED) (FF)
X'0D-X'0F   -> X'0D (CR)
X'10-X'17   -> X'20 (SP)          IF NO ES
X'18        -> X'20 (SP)          IF NO IE!ES
X'19-X'1A   -> X'20 (SP)          IF NO ES
X'1B        -> X'20 (SP)          IF NO IE!ES
X'1C-X'1F   -> X'20 (SP)          IF NO ES
X'20-X'60   -> (UNCHANGED) (NORMAL ASCII PRINTABLE)
X'61-X'7A   -> X'41-X'5A          IF LU
X'7B-X'7E   -> (UNCHANGED) (NORMAL ASCII PRINTABLE)
X'7F        -> X'20 (SP)          IF NO LC
```

OUTPUT TRANSLATION (SERIAL PRINTER AND ASYNCHRONOUS COMMUNICATION)

Data from an application making a write call is handled in the following manner before being transmitted:

TM If present, no special handling of control characters; the extension .CT used if present:

X'00-X'FF -> (UNCHANGED)

.CT If present, table translatation performed first:

X'00-X'FF -> (CONVERTED VIA TABLE)

Note: Character not translated if translate character is 0.

DH
NC If present (after .CT, if no TM):

X'00-X'7F -> Non-extended character. Causes shift in (X'0F) to be sent if in shift out state, then character value (except for X'10, X'1B and X'7F, handled as below).

X'10 (hidden character 1) -> X'1B + X'59 (ESC Y)

X'1B (ESC) -> Introduces an escape sequence: ESC and character following always sent transparently. In addition, certain three-character sequences sent transparently, and certain handling performed as listed:

Two-character escape sequences with special handling:

ESC D — Negative half-line feed. Decrements line counter one-half line.

ESC U — Half-line feed. Increments line counter one-half line; if FB is specified during Sysgen, checks if form feed needs to be sent.

ESC LF — Negative line feed. Decrements line counter one line.

Three-character escape sequences:

ESC HT n — Absolute horizontal tab; sets column number to new value.

ESC VT n — Absolute vertical tab.

ESC FF n — Set top of form.

ESC CR P — Remote restore.

ESC RS n — Set vertical motion index (VMI).

ESC US n — Set horizontal motion index (HMI).

ESC SYN n — Select print wheel size.

X'7F (hidden character 2) -> X'1B + X'5A (ESC Z).

X'80-X'FF -> NEC extended character causes shift out (X'0E) to be sent if not in shift out state; then character value (X'80).

If no TM, after .CT translate:

```
X'00-X'08  -> X'0D (CR)
X'09       -> (UNCHANGED) (TAB)
X'0A       -> (UNCHANGED) (LF)
X'0B       -> X'0D (CR)
X'0C       -> (UNCHANGED) (FF)
X'0D-X'0F  -> X'0D (CR)
X'10       -> (UNCHANGED) (DLE) (HIDDEN CHARACTER 1)
X'11-X'1F  -> X'20 (SP)         IF NO ES
X'20-X'60  -> (UNCHANGED) (NORMAL ASCII PRINTABLE)
X'61-X'7A  -> X'41-X'5A         IF LU
X'7B-X'7E  -> (UNCHANGED) (NORMAL ASCII PRINTABLE)
X'7F       -> (UNCHANGED) (DEL) (HIDDEN CHARACTER 2)
X'80-X'FF  -> X'20 (SP)         IF NO ES
```

Chapter 3

RLDR

On completion of all the questions in Chapter 2, proceed as follows:

1. Remove the SGF diskette from FP01. If you are building a diskette system, insert a blank floppy in FP01. For a cartridge disk system, insert a blank disk into drive 0 (removable platter).

2. Format the blank disk or diskette as follows:

   $FORMAT dbb:xxxxxx <RETURN> <RETURN>

   where dbb is the disk being built (FP01, etc.) and xxxxxx is the disk name. Enter up to six characters.

3. Remove the SGV diskette from FP00. Insert the SGF diskette in FP00.

The next step in System Generation is the creation, using RLDR, of a system binary file. This file is constructed from a large number of files on the current nominal disk, including a system table file (SYSTBL.RB). The result contains more than 50,000 characters.

RLDR is not a relocating loader, as its name would imply, but a file-to-file link editor; that is, it reads a set of disk files containing binary modules, and writes one new file in which all references among those modules have been resolved. A full description of RLDR appears in the System II Utilities Manual, V2-005. Here, we describe only the specialized use of RLDR as a part of the System Generation process. Note that all Z files (beginning with Z) from the SGF diskette must be on the nominal disk along with the SYSTBL.RB file in order to run RLDR successfully.

Continue by keying in a command with the format:

$RLDR/A B=dbb:SYSBIN Cn.RL/I [P=words] [L=listfil] <RETURN>

where:

/A	Adjusts the addresses printed on the load map (if L= is specified) to reflect absolute addresses. It is not necessary since it is a print-only option and does not affect the SYSBIN module; it adds X'100 to TSECT numbers on the map.
B=	Specifies the disk and the name of RLDR's output, in this case the system binary file which will eventually become your new version of System II. If you are building a diskette system, this should be FP01. For a cartridge disk system, use DA00, etc.
Cn	Represents the desired overlay configuration number of System II. For this release, replace n with 1, 2, 3, 4, 5, 6, A, B, or C.
Cn.RL/I	Means that file Cn.RL, on the current nominal disk, is an indirect file, containing the names of all the modules to be processed. One of these names is always SYSTBL.RB, which explains why a system table file with exactly that name, on the current nominal disk, must be available at this time.
P=words	Allows a partition size to be specified. The default value of 10,000 words will normally be sufficient, but if the message, TABLE FULL, appears, specify a value greater than 10,000 for this field.
L = listfil	Is the load map list file which lists where the modules are located in memory. This field is optional.

While the SYSBIN (relocatable object module) file is being created, the CRT displays the files as they are processed during pass 1. Pass 2 runs for several minutes and is complete when the screen cursor reappears.

Note that if the RLDR process terminates due to an error, the SYSBIN file must be deleted before RLDR is restarted; otherwise RLDR will fail again.

On completion of the RLDR step, continue with the next chapter.

EXAMPLES

For example, to generate a configuration 1 system, key in:

```
$RLDR/A B=dbb:SYSBIN C1.RL/I
```

To generate a configuration A system, key in:

```
$RLDR/A B=dbb:SYSBIN CA.RL/I
```

SYSTEM OVERLAYS

Overlays are operating system modules which normally reside on the primary disk until needed. When a specific overlay is needed, the resident software loads it into a reserved memory area. That module replaces, or overlays, the program that had previously been in that area.

The need for overlays arises from the limits to computer memory. The computer memory is allocated to CRT refresh memory, user partitions, overlays, and the resident executive.

The resident executive and overlay areas are assigned during the System Generation process. The user partitions are basically memory left over after allocation to everything else.

The resident executive requires a minimum amount of memory. This memory requirement may be increased by the installer's decision to make additional modules resident in memory, or reduced by a decision to assign modules to overlays. A system with properly configured overlays creates a good balance between memory demands and processing time. While configuration overlays slow down all jobs, they allow more concurrent jobs.

Except in systems which have a fully resident operating system, a fixed overlay area is reserved for nonresident operating system modules. The different overlay configurations, and the trade-offs involved in making various modules resident in memory or having them read from a disk when required, are the subjects of this section.

The illustrations used to support the following discussion show various numbered overlay levels. These numbers indicate the connectivity, or coupling, between the resident operating system and the overlays in that level. Level 0 is the resident operating system for the configuration shown. Level 1 consists of the overlays which are called directly by the resident system and can call programs in level 2; programs in level 2 can call programs in a level 3 overlay. The rule for overlays is that a program in a given overlay level may be called only by a program in the next higher overlay, and may call programs in the next lower overlay.

CONFIGURATION TRADE-OFFS

In order to select the optimum overlay configuration, the system designer must perform three separate activities. First, the system requirements must be studied in order to identify the current hardware characteristics (size of random-access memory, types and number of disks, printers, etc.) and operating requirements (number of simultaneous users, response time, language support, mix of programs, etc.). Next, the demands which these requirements place on the system must be considered. Finally, future requirements must be anticipated.

Some considerations in selecting the best configuration include:

- Size of installed memory
- Number and sizes of programs to be executed concurrently
- Languages in which application programs are written
- Possible need to remove or reassign the primary disk
- Response time requirements

CONFIGURATION 1

In general, configuration 1 (Table 3-5) is preferred whenever memory can hold the entire operating system and still support the required number of concurrent jobs. This configuration is fully memory-resident and is the fastest configuration which supports all system functions. Next in order of preference, if the excluded features are not required, is configuration A, the other fully resident configuration.

Configuration 1 is the most memory-intensive because it supports all system functions, and the software for these functions is in memory at all times. It is the most desirable configuration because program execution is not held up while overlays are being loaded.

Configuration 1 is the fastest available and should be installed whenever possible. If configuration 1 does not work on a particular system, do not change to configurations 2 or 3 until you have identified your operational needs, e.g., response time, what applications will be operated simultaneously, and have reviewed configuration options in Figures 3-1 through Figure 3-6.

If configuration 1 does not leave enough room in memory for desired applications, you may have to go to an overlayed configuration (2, 3, 4, 5, B or C). Also, if no BASIC programs will be operated, resident configurations 6 or A will increase the memory available for applications without reducing operating speed. Configurations 6 and A are both fully resident but are smaller than configuration 1 because BASIC support functions are left out.

CONFIGURATION 2

Configuration 2, shown in Figure 3-1, has a more evident tree structure, in three levels. This configuration is fairly fast because all functions except those associated with program loading are either in the resident system or in a level 1 overlay.

When a program (for example, PROG.EX) is invoked, either the operator enters a System II command, or an application program uses the LINK facility, then the resident system calls the level 1 overlay which contains the job initiation, partition allocation, and binary file loader programs.

If this configuration is selected for a system where new jobs are initiated frequently, the system response time will slow significantly, because each new job requires that a level 1 overlay be read into memory from disk. On the other hand, if relatively few new jobs are started, this configuration is probably acceptable.

CONFIGURATION 3

Configuration 3, as shown in Figure 3-2, has three levels within some overlays. Every time a function in another overlay is needed, that overlay is written into memory, replacing the overlay which was in memory. As might be expected, configuration 3 is slower than configurations 1 and 2, especially when job initiation, job termination, and file handling represent a large portion of the system activity.

CONFIGURATION 4

Configuration 4 (Figure 3-3) is similar to configuration 3. The significant difference is that in configuration 4, BASIC string processing and GOSUB/RETURN have been moved from the resident system to level 1. As a result, BASIC programs run somewhat more slowly under this configuration than with configurations 1, 2, or 3.

CONFIGURATION 5

Configuration 5 (Figure 3-4) differs from configuration 4 in that decimal arithmetic processing has been moved from the resident system to a level 1 overlay. It is the most heavily overlaid configuration and therefore the smallest configuration in memory which still supports all applications. Unfortunately, the larger number of functions in overlays makes this configuration the slowest one.

CONFIGURATION 6

Configuration 6 (Table 3-5) is entirely memory-resident. It does not support hash files, decimal arithmetic, or any BASIC functions. Therefore, it can support Type-Rite operations but not the operation of BASIC, Data-Rite, Data-Form, or Report-Rite products.

CONFIGURATION A

Configuration A (Table 3-5) is similar to configuration 1 in being totally memory-resident. The difference is that it does not support BASIC or programs written in BASIC, e.g., Account-Rite. It does support decimal arithmetic and hash files.

CONFIGURATION B

Configuration B (Figure 3-5) has the same overlays and performance as configuration 2, but, like configuration A, does not support BASIC or programs written in BASIC.

CONFIGURATION C

Configuration C (Figure 3-6) most closely resembles configuration 3, but like configurations A and B, configuration C does not support BASIC or programs written in BASIC.

Since configurations 6, A, B, and C do not support BASIC or programs written in BASIC, these configurations are excluded when the system must support the BLDCPY and DOCCRT utilities, device exercisers, Account-Rite, or Label-Rite.

CONFIGURATION-RELATED TABLES AND FIGURES

The following pages contain several tables and figures designed to help the user to understand the various configurations and their relationship to other important system functions.

Table 3-1 provides system configuration recommendations for each application product.

Table 3-2 shows which overlaid system function each application product uses. If an application uses functions which are overlaid in the system configuration chosen, the application will run more slowly than if the functions were resident in memory. This table provides details from which Table 3-1 was summarized.

Table 3-3 shows the compatability of system configurations to typical Jacquard Systems products.

Table 3-4 summarizes the system functions and how they relate to each configuration in terms of overlay structures.

Table 3-5 and Figures 3-1 through 3-6 show the structure of the various configurations.

Table 3-6 lists the system modules, their size, and their relationship to the various configurations.

The recommendations in Table 3-1 indicate relative speeds at which products will operate with different configurations; memory space needs are not addressed. Choose the best system configuration which fits in memory with the products to be operated. When more than one product will be operated at the same time, choose a configuration in which all products show a 1, 2, or 3 on the table. For example, if Type-Rite, Utilities, TSORT, and a program written in BASIC will operate simultaneously, follow the recommendations for Type-Rite with BASIC and choose either configuration 1, 2, or 3.

Table 3-1. System Configuration Recommendations

Software Products	Configurations								
	1	2	3	4	5	6	A	B	C
BASIC*	1	2	2	3	4	No	No	No	No
Communications products**	1	1	2	2	2	1	1	1	2
Data-Form	1	2	2	2	3	No	1	2	2
Data-Rite	1	2	2	2	3	No	1	2	2
Exercisers (except EXHASH)	1	1	2	2	2	1	1	1	2
File Security	1	1	1	1	1	1	1	1	1
Report-Rite	1	2	2	2	3	No	1	2	2
TSORT	1	1	2	2	3	No	1	2	3
Type-Rite with MP or CM	1	1	2	2	3	No	1	2	3
Type-Rite w/o MP or CM	1	1	2	2	2	1	1	1	2
Type-Rite with BASIC*	1	2	3	4	4	No	No	No	No
Type-Rite with Data-Form or Data-Rite or Report-Rite	1	2	3	3	4	No	1	2	3
Utilities (except BLDCPY, DOCCRT, HCREAT, HDELT, HKOPY)	1	1	2	2	3	No	1	2	3
Utilities/Exerciser (EXHASH, HCREAT, HDELT, HKOPY)	1	2	3	3	3	No	1	2	3

* A/P, A/R, CLIENT, G/L, Payroll, Account-Rite Security, User BASIC Programs, Mail-Rite, Label-Rite, BLDCPY Utility, DOCCRT Utility.

** EM3270, BRJE, OCR, TTY, URJE.

1 Best. Functions from Figure 3-1 which are used by the product are resident in memory. The product will operate most quickly.

2 Good. Product functions from Figure 3-1 are resident in memory or in one overlay. The product will operate quickly.

3 Okay. Product functions from Figure 3-1 are resident in memory or in one of two overlays. The product will operate more slowly.

4 Fair. Product functions from Figure 3-1 are resident in memory or in one of three or four overlays. The product will operate slowly; not recommended unless memory space is very scarce.

No Product does not operate. The configuration does not contain all features needed by the product.

Table 3-2. Application Products Overlaid Functions

Products	Product Functions			
	File Open/ Close	Decimal Arithmetic Processing	Hash File Processing	BASIC String Processing
BASIC*	No	Yes	Yes	Yes
Communications products**	Yes	No	No	No
Data-Form	No	Yes	Yes	No
Data-Rite	No	Yes	Yes	No
Exercisers (except EXHASH)	Yes	No	No	No
File Security	No	No	No	No
Report-Rite	No	Yes	Yes	No
TSORT	Yes	Yes	No	No
Type-Rite with MP or CM	Yes	Yes***	No	No
Type-Rite w/o MP or CM	Yes	No	No	No
Type-Rite with BASIC*	Yes	Yes	Yes	Yes
Type-Rite with Data-Form, Data-Rite or Report-Rite	Yes	Yes	Yes	No
Utilities (except BLDCPY, DOCCRT, HCREAT, HDELT, HKOPY)	Yes	Yes	No	No
Utilities/Exerciser (EXHASH, HCREAT, HDELT, HKOPY)	Yes	Yes	Yes	No

* A/P, A/R, CLIENT, G/L, Payroll, Account-Rite Security, User BASIC Programs, Mail-Rite, Label-Rite, BLDCPY Utility, DOCCRT Utility.

** EM3270, BRJE, OCR, TTY, URJE.

*** Type-Rite uses system decimal arithmetic processor except with configuration 6, where it uses its own decimal arithmetic processor.

Table 3-3. System Configuration Compatibility With Applications

Configuration	BASIC	Data-Form, Data-Rite, Report-Rite	Type-Rite
1	Yes	Yes	Yes
2	Yes	Yes	Yes
3	Yes	Yes	Yes
4	Yes	Yes	Yes
5	Yes	Yes	Yes
6	No	No	Yes
A	No	Yes	Yes
B	No	Yes	Yes
C	No	Yes	Yes

Table 3-4. System Configuration Summary

System Functions	Configurations								
	1	2	3	4	5	6	A	B	C
Sequential file management	R	R	R	R	R	R	R	R	R
System buffer management	R	R	R	R	R	R	R	R	R
System loader	R	R	R	R	R	R	R	R	R
Task scheduling	R	R	R	R	R	R	R	R	R
Terminal I/O management	R	R	R	R	R	R	R	R	R
Disk directory processor	R	R	1.	1.	1.	R	R	R	1.
File open	R	R	1.1	1.1	1.1	R	R	R	1.1
File create and change attribute	R	R	1.1.1	1.1.1	1.1.1	R	R	R	1.1.1

Table 3-4. System Configuration Summary (Continued)

System Functions	Configurations								
	1	2	3	4	5	6	A	B	C
Job initialization/ termination	R	1.	1.1.2	1.1.2	1.1.2	R	R	1.	1.1.2
Partition allocation and binary file loader	R	1.	1.1.3	1.1.3	1.1.3	R	R	1.	1.1.3
File close and free disk space	R	R	1.2	1.2	1.2	R	R	R	1.2
File delete and rename	R	R	1.2.1	1.2.1	1.2.1	R	R	R	1.2.1
Command parser	R	2.	2.	2.	2.	R	R	2.	2.
Disk space analyzer	R	3.	3.	3.	3.	R	R	3.	3.
System messages	R	4.	4.	4.	4.	R	R	4.	4.
Decimal arithmetic processor	R	R	R	R	7.	No	R	5.	5.
Hash file processor	R	5.	5.	5.	5.	No	R	5.	5.
BASIC string processor	R	R	R	6.	6.	No	No	No	No

R — Function is resident in memory.

#. — Level 1 overlay. Only one level 1 overlay is in memory at a time. When a level 1 overlay is written into memory, it replaces the previous level 1 overlay.

#.# — Level 2 overlay. A level 2 overlay is written into memory with its corresponding level 1 overlay. Only one level 2 overlay is in memory at a time.

#.#.# — Level 3 overlay. A level 3 overlay is written into memory with its corresponding level 2 overlay. Only one level 3 overlay is in memory at a time.

No — Function does not exist in the configuration.

Note: When the disk directory processor overlay (1.) is written into memory, the system writes the appropriate level 2 overlay (1.#) and level 3 overlay (1.#.#) into memory as well.

Table 3-5. System Configurations 1, 6, and A - Resident in Memory

System Functions	Configuration		
	1	6	A
Sequential file management	R	R	R
System buffer management	R	R	R
System loader	R	R	R
Task scheduling	R	R	R
Terminal I/O management	R	R	R
Disk directory processor	R	R	R
File open	R	R	R
File create and change attribute	R	R	R
Job initialization/termination	R	R	R
Partition allocation and binary file loader	R	R	R
File close and free disk space	R	R	R
File delete and rename	R	R	R
Command parser	R	R	R
Disk space analyzer	R	R	R
System messages	R	R	R
Decimal arithmetic processor	R	-	R
Hash file processor	R	-	R
BASIC string processor	R	-	-
Memory size - System II, Release 9.0:			
Words in hex	62A6	4F56	58A7
Kilowords in decimal	25.3	20.3	22.7

R Function is always resident in memory.

- Function does not exist in the configuration.

Notes:

1. Configuration 1 contains all system functions.
2. Configuration 6 has no decimal arithmetic processor, hash file processor, or BASIC string processor.
3. Configuration A has no BASIC string processor.

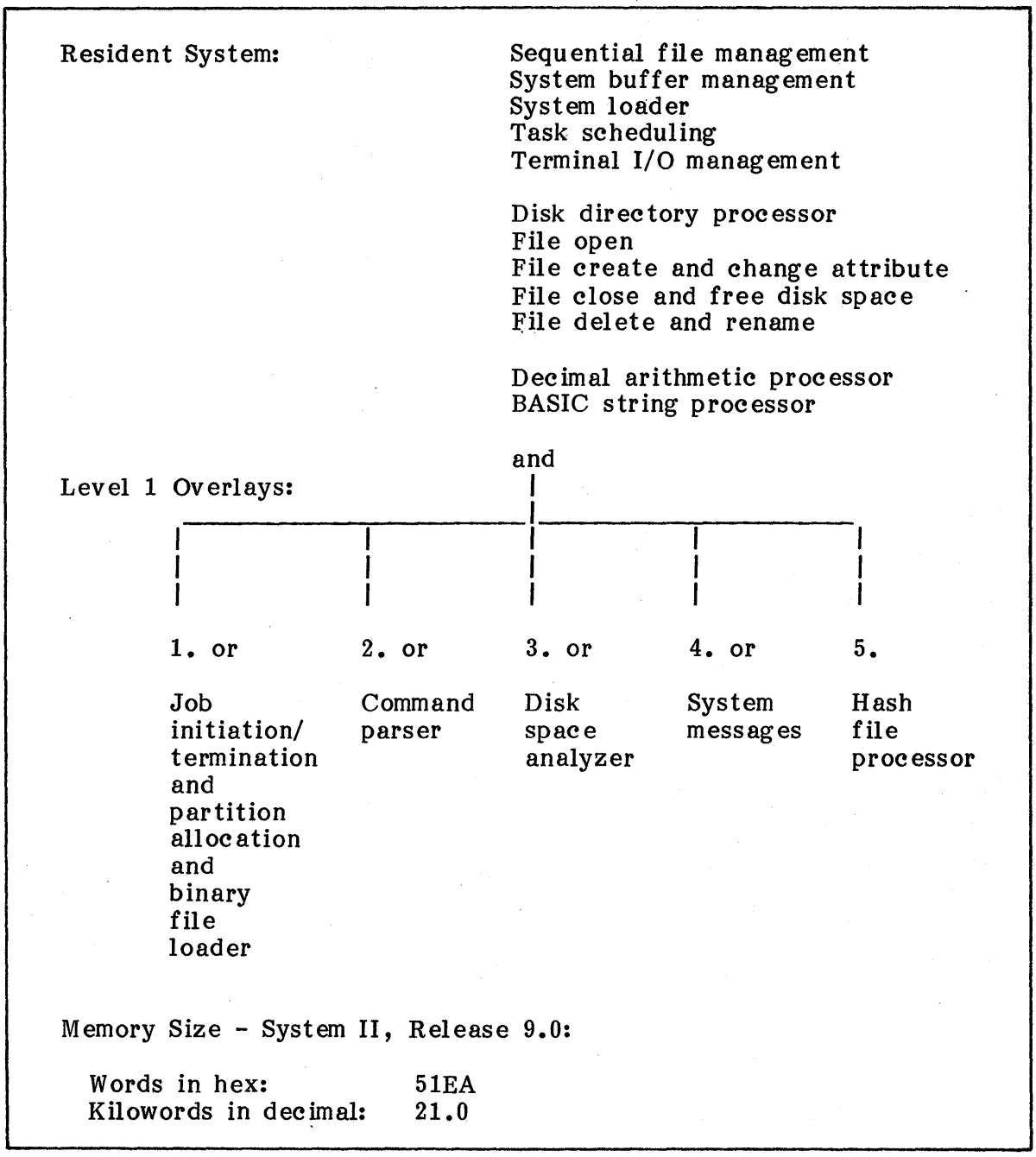

Figure 3-1. System Configuration 2 (Contains Overlays)

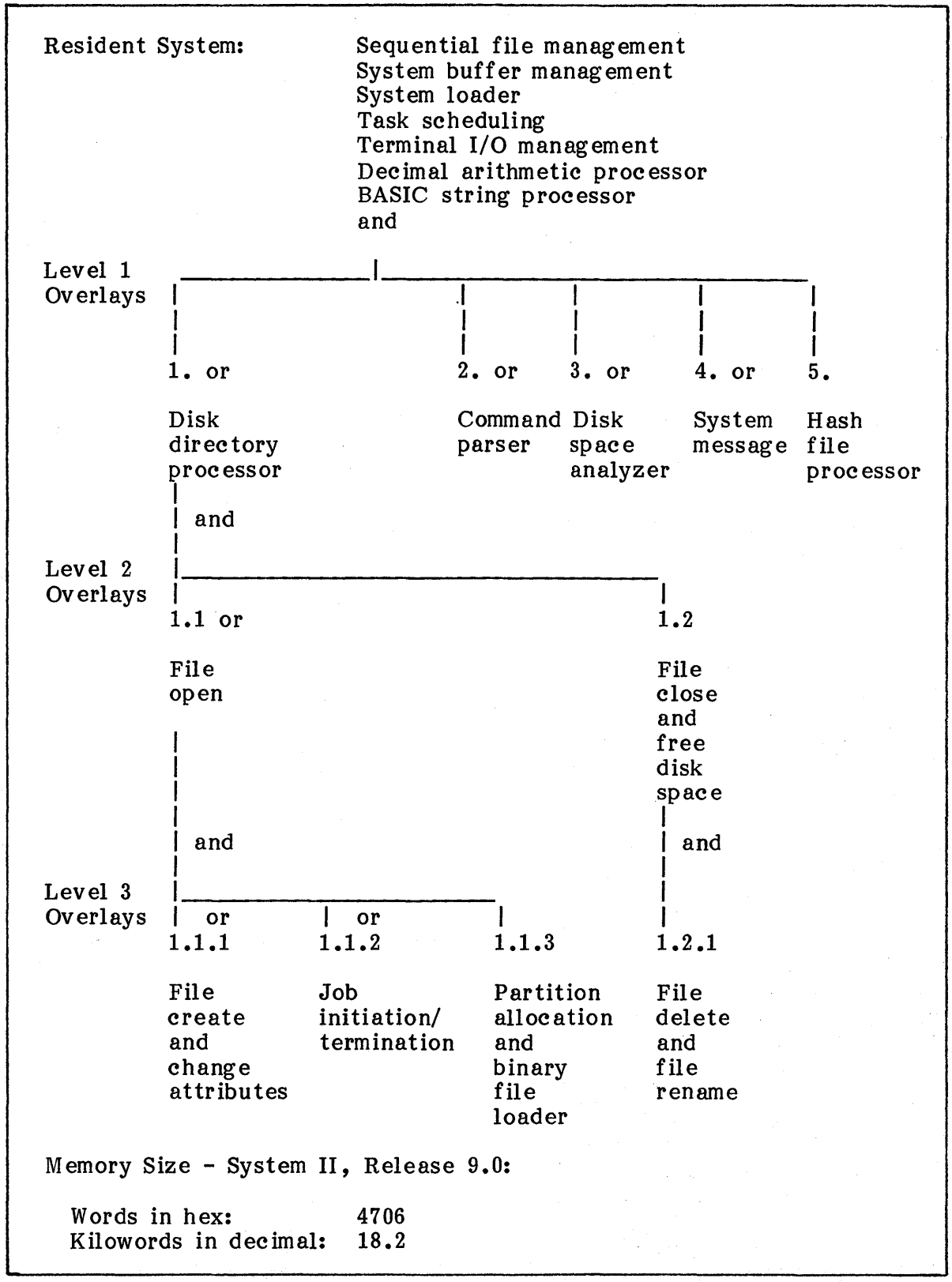

Figure 3-2. System Configuration 3 (Contains Overlays)

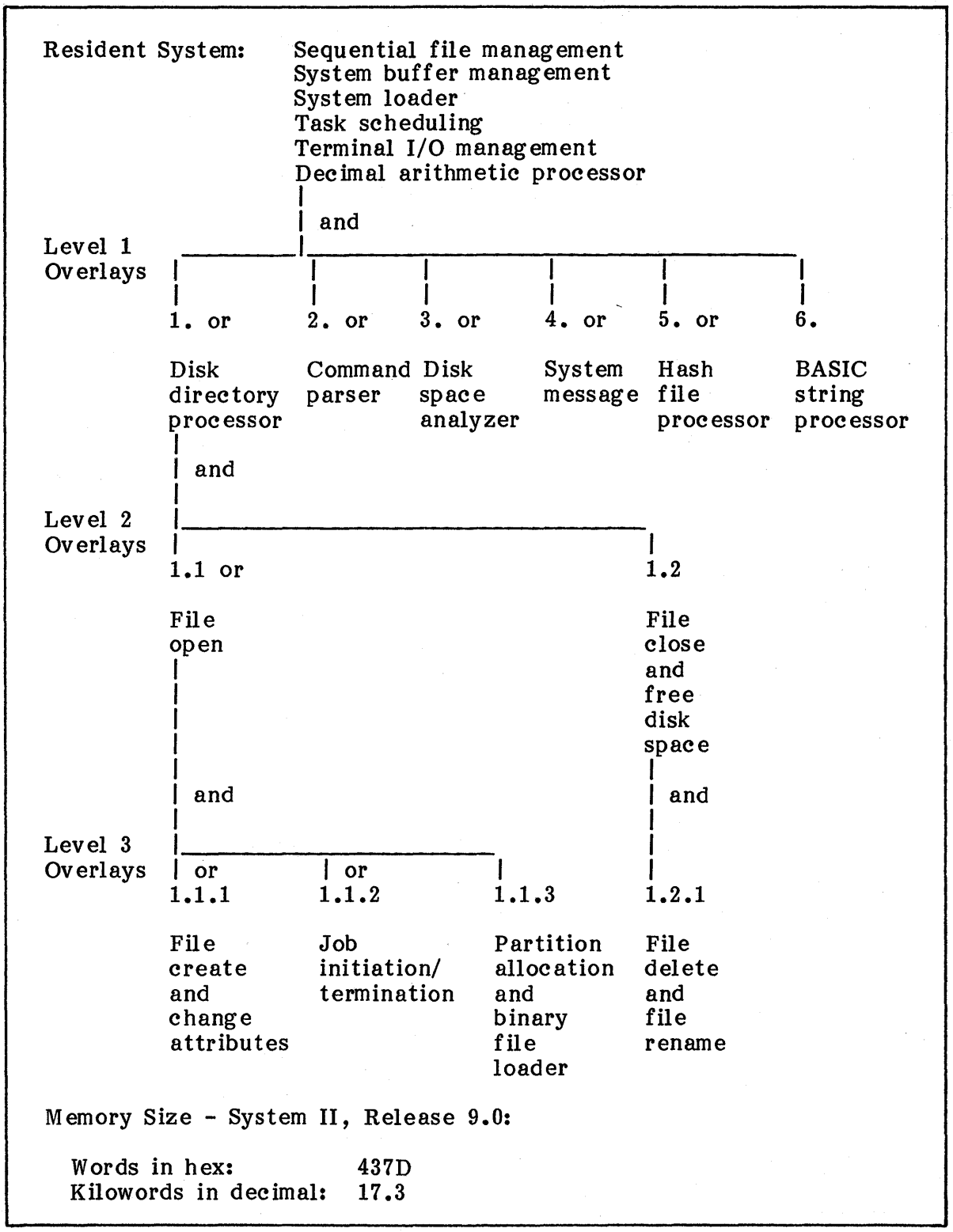

Figure 3-3. System Configuration 4 (Contains Overlays)

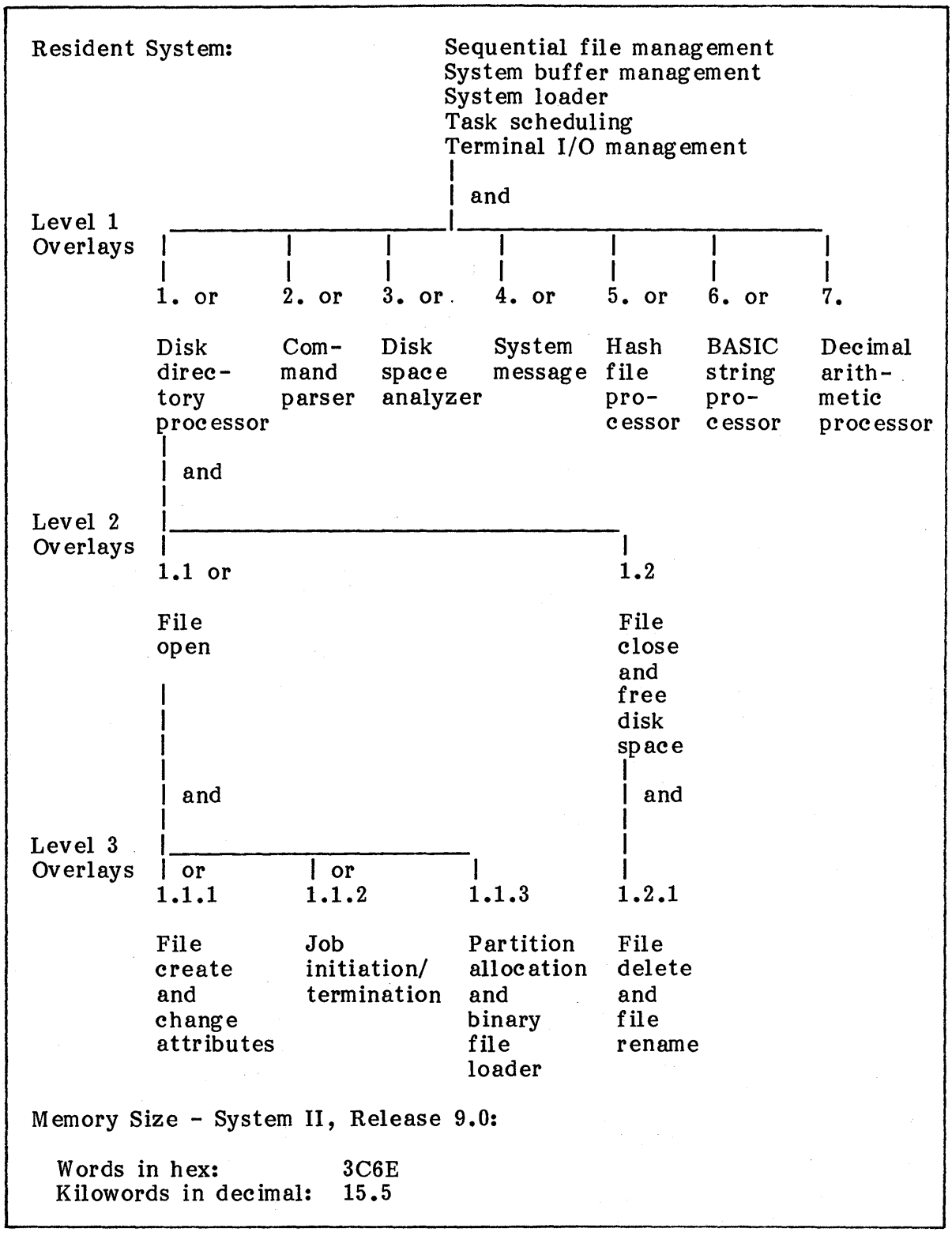

Figure 3-4. System Configuration 5 (Contains Overlays)

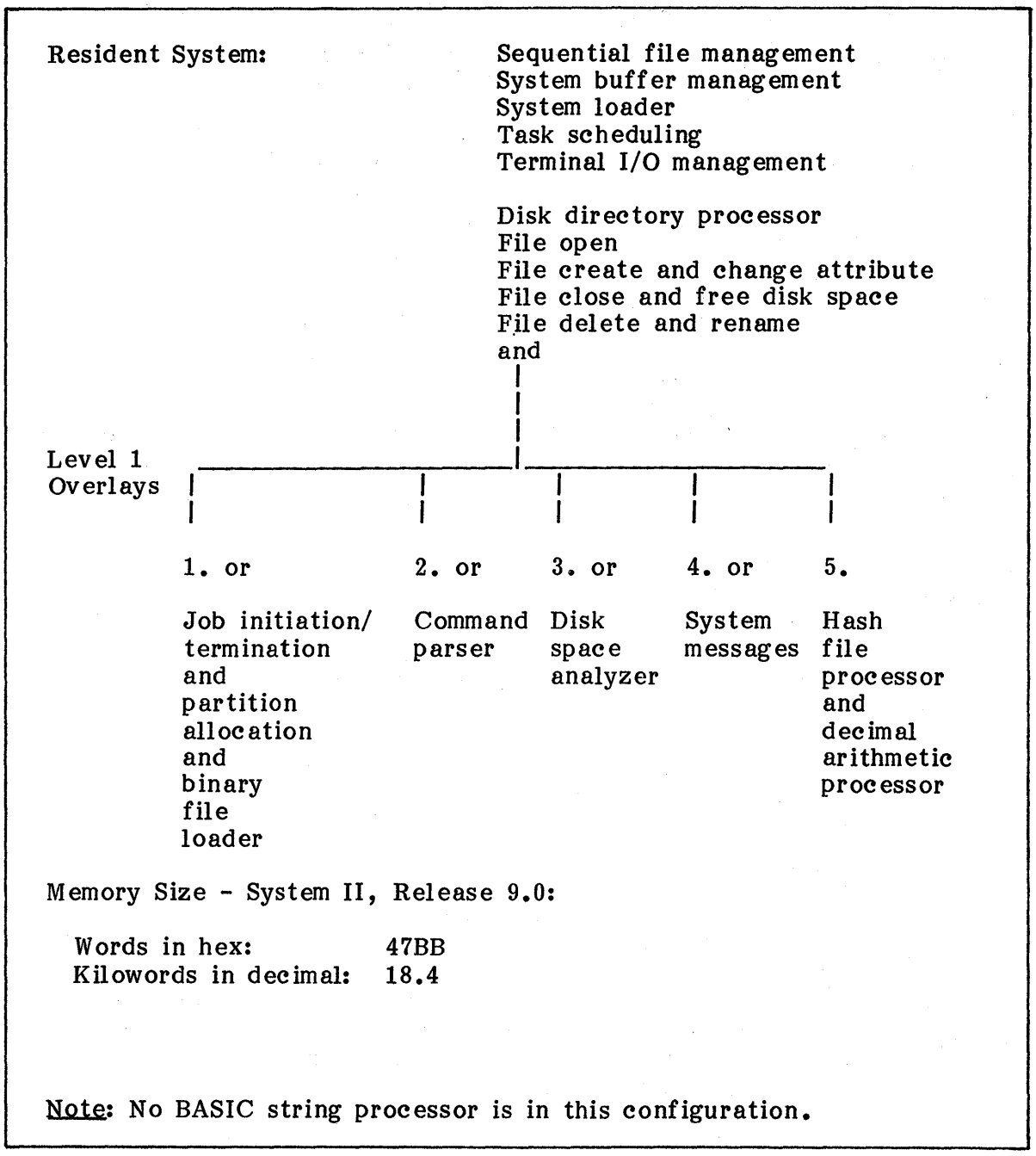

Figure 3-5. System Configuration B (Contains Overlays)

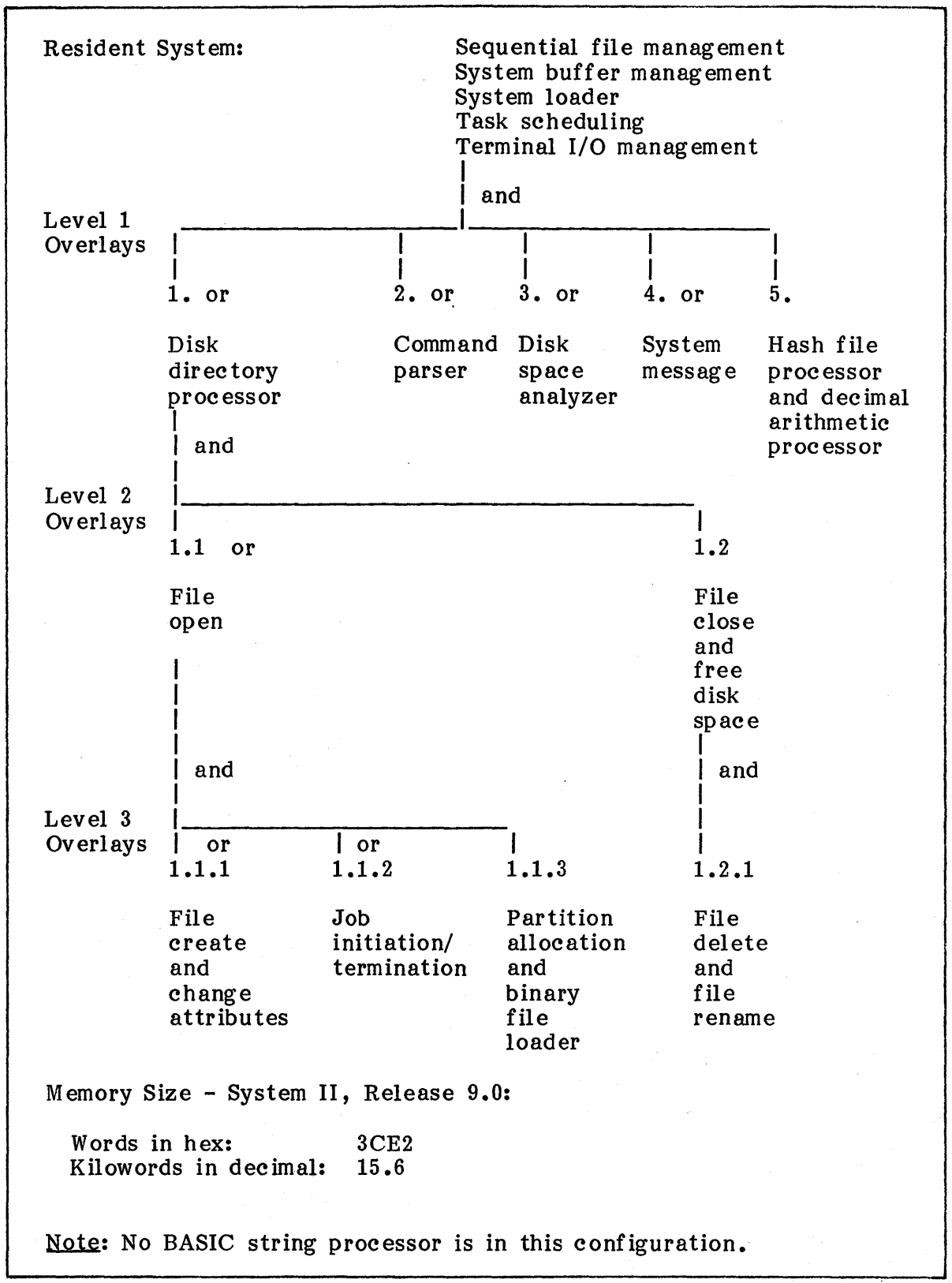

Figure 3-6. System Configuration C (Contains Overlays)

Table 3-6. System Module Summary

Module Name	Size (Words)	Configuration Overlay Level								
		1	2	3	4	5	6	A	B	C
BARITH.RB	2844	-	-	-	R	1	-	-	-	-
BARSTR.RB	4286	R	R	R	R	-	-	-	-	-
BHASH.RB	1681	R	1	1	1	1	-	-	-	-
BOPEN.RB	539	R	R	2	2	2	-	-	-	-
BSTRNG.RB	1899	-	-	-	1	1	-	-	-	-
CPLNK.RB	174	R	1	1	1	1	R	R	1	1
ERCODE.RB	690	R	R	R	R	R	R	R	R	R
SYSDEF.RB	2614	R	R	R	R	R	R	R	R	R
SYSSYM.RB	850	R	R	R	R	R	R	R	R	R
SYSTBL.RB	4643	R	R	R	R	R	R	R	R	R
ZABTM.RB	278	R	1	1	1	1	R	R	1	1
ZARITH.RB	2059	-	-	-	-	-	-	R	1	1
ZBGEXC.RB	177	R	R	R	R	R	-	-	-	-
ZBUFM.RB	513	R	R	R	R	R	R	R	R	R
ZCAERR.RB	128	R	R	2	2	2	R	R	R	2
ZCHSP.RB	224	R	1	3	3	3	R	R	1	3
ZCHTR.RB	346	R	R	3	3	3	R	R	R	3
ZCID.RB	157	R	R	R	R	R	R	R	R	R
ZCLOSA.RB	102	R	R	R	R	R	R	R	R	R
ZCLOSE.RB	193	R	R	R	R	R	R	R	R	R
ZCLRSM.RB	456	R	R	2	2	2	R	R	R	2
ZCMDPR.RB	1195	R	1	1	1	1	R	R	1	1
ZCREA.RB	664	R	R	3	3	3	R	R	R	3
ZDELT.RB	764	R	R	3	3	3	R	R	R	3
ZDIRIO.RB	457	R	R	R	R	R	R	R	R	R
ZDIRSB.RB	589	R	R	1	1	1	R	R	R	1
ZDSKSP.RB	160	R	R	R	R	R	R	R	R	R
ZDSKSQ.RB	288	R	1	1	1	1	R	R	1	1
ZFDA.RB	509	R	R	2	2	2	R	R	R	2
ZFPA.RB	202	R	1	3	3	3	R	R	1	3
ZGDA.RB	581	R	R	R	R	R	R	R	R	R
ZGJP.RB	210	R	1	3	3	3	R	R	1	3
ZGPA.RB	509	R	1	3	3	3	R	R	1	3
ZGSDAT.RB	123	R	R	R	R	R	R	R	R	R
ZHFUTL.RB	2233	R	1	1	1	1	-	R	1	1
ZIBF.RB *	152	1	1	1	1	1	1	1	1	1

Table 3-6. System Module Summary (Continued)

Module Name	Size (Words)	Configuration Overlay Level								
		1	2	3	4	5	6	A	B	C
ZINTP.RB	1118	R	R	R	R	R	R	R	R	R
ZISFAQ.RB *	114	1	1	1	1	1	1	1	1	1
ZJOBIN.RB	539	R	R	R	R	R	R	R	R	R
ZJOBN1.RB	2071	R	1	3	3	3	R	R	1	3
ZJOBN2.RB	366	R	1	1	1	1	R	R	1	1
ZJOBND.RB	635	R	1	3	3	3	R	R	1	3
ZKECLS.RB	152	R	R	2	2	2	R	R	R	2
ZKEFSC.RB	693	R	R	R	R	R	R	R	R	R
ZKEINT.RB	484	R	R	R	R	R	R	R	R	R
ZKEKH.RB	896	R	R	R	R	R	R	R	R	R
ZKEMSG.RB	751	R	1	1	1	1	R	R	1	1
ZKEOPE.RB	188	R	R	2	2	2	R	R	R	2
ZKEUR2.RB	466	R	R	R	R	R	R	R	R	R
ZLDOVL.RB	159	-	R	R	R	R	-	-	R	R
ZLDPRG.RB	437	R	R	R	R	R	R	R	R	R
ZLDR.RB	528	R	1	3	3	3	R	R	1	3
ZMTIO.RB	281	R	R	R	R	R	R	R	R	R
ZOCLOS.RB	618	R	R	2	2	2	R	R	R	2
ZOPDV.RB	260	R	R	2	2	2	R	R	R	2
ZOPEN.RB	921	R	R	R	R	R	R	R	R	R
ZOPFL.RB	455	R	R	2	2	2	R	R	R	2
ZOPNF.RB	683	R	R	2	2	2	R	R	R	2
ZQUEM.RB	188	R	R	R	R	R	R	R	R	R
ZREWND.RB	139	R	R	R	R	R	R	R	R	R
ZRNAM.RB	566	R	R	3	3	3	R	R	R	3
ZRWSEQ.RB	811	R	R	R	R	R	R	R	R	R
ZRWSIL.RB	77	R	R	R	R	R	R	R	R	R
ZSCALL.RB	274	R	R	R	R	R	R	R	R	R
ZSCHED.RB	1373	R	R	R	R	R	R	R	R	R
ZSEQIO.RB	568	R	R	R	R	R	R	R	R	R
ZSEQRW.RB	249	R	R	R	R	R	R	R	R	R
ZSMT.RB	395	R	R	R	R	R	R	R	R	R
ZSVTCB.RB	81	R	R	R	R	R	R	R	R	R
ZSYSIN.RB *	1143	1	1	1	1	1	1	1	1	1
ZSYSNX.RB	136	R	R	R	R	R	R	R	R	R
ZSYSPR.RB	314	R	R	R	R	R	R	R	R	R

Table 3-6. System Module Summary (Continued)

Module Name	Size (Words)	Configuration Overlay Level								
		1	2	3	4	5	6	A	B	C
ZTCAL1.RB	1216	R	-	-	-	-	-	-	-	-
ZTCAL2.RB	1295	-	R	-	-	-	-	-	-	-
ZTCAL3.RB	1337	-	-	R	-	-	-	-	-	-
ZTCAL4.RB	1364	-	-	-	R	-	-	-	-	-
ZTCAL5.RB	1400	-	-	-	-	R	-	-	-	-
ZTCAL6.RB	849	-	-	-	-	-	R	-	-	-
ZTCALA.RB	895	-	-	-	-	-	-	R	-	-
ZTCALB.RB	960	-	-	-	-	-	-	-	R	-
ZTCALC.RB	998	-	-	-	-	-	-	-	-	R
ZVCALL.RB	355	-	R	R	R	R	-	-	R	R

The size column specifies the decimal number of words. The values are exact for System II, Release 8.2, and are approximate for other releases.

R — Memory-resident.

1, 2, 3 — Overlay level. See Table 3-5 and Figures 3-1 through 3-6.

\- — Not used.

* — Temporary overlays used during system initialization, after which their locations become part of the buffer pool.

Chapter 4

UNSTAL, MKABS, AND INSTAL

In this Sysgen step, a system binary file is processed into a loadable system on a disk. In our recommended procedure, this disk is called dbb (the disk being built). Typically, this is FD00, FP00, DE00, or DD00.

For a better understanding of this step, some facts about how System II gets into memory will be helpful.

When it is activated at hardware level, a microcode program in the computer accesses a disk indicated by CPU switches. The program on sector 0 of the disk, written there during FORMAT processing, is loaded into memory at X'0001 and executed. That program, in turn, reads the same disk's overlay directory sector, a sector reserved for just this purpose by FORMAT. The overlay directory supplies the disk address of System II's own code, which is loaded into memory at X'0100 and executed.

These steps are supported by a hardware feature that executes a small ROM program that in turn executes a larger disk program, then finally executes an entire operating system. This series of steps suggests the proverbial phrase, "Pulling yourself up by your bootstraps," and explains why system loading is often called bootstrapping or even booting.

DELETE AN OLD SYSTEM

If you already have a loadable version of System II on your dbb disk, you must delete it at this point. If the system is earlier than Release 9.0, enter:

```
$UNSTAL dbb:SYS <RETURN>
```

where SYS is the file name used for your old system. For all systems supplied by Jacquard Systems, and for our recommended Sysgen procedure, this will always be SYS.

For Release 9.0 and later, the command is:

```
$UNSTAL [dbb] <RETURN>
```

where dbb is optional. If not supplied, the nominal is assumed.

The program name UNSTAL is meant to imply the opposite of install; that is, all of System II is deleted from the disk. The overlay directory itself is then cleared. On a floppy disk, this takes about one minute.

BUILD THE NEW SYSTEM

Now, to convert the system binary into a set of memory-image files, enter the command:

```
$MKABS dbb:SYSBIN dbb:SYS
```

Here, dbb contains the system binary file, SYSBIN, which is required to build the new system on the disk being built (dbb). A file called SYS is the output, and is the recommended name.

MKABS converts the system binary file into a set of memory-image files. There will be one file for the main part of System II, with the name dbb:SYS.00. There will be other files, with extensions numbered from 02 upwards for any overlays.

To copy a system to another disk, use either DSKOPY (if Release 9.0, COPY is faster) or MKABS, or copy all the system files over (output of MKABS) and continue with INSTAL.

INSTALL SYSTEM II

At this point, you have a disk with a memory-image version of System II.

However, it is not yet possible to load that system from the disk you have been building. The overlay directory sector must be set up with a command in this format:

```
$INSTAL dbb:SYS
```

At this point, you have a disk with a memory-image version of System II.

On systems with Release 9.0 or later, INSTAL writes the addresses of the system files and their lengths into the overlay directory sector and deletes their names from the directory.

Now remove SGF from FP00.

Finally, load the system (boot) from the disk or diskette with your new system. If you created a diskette system, then move the floppy from FP01 to FP00 before booting.

If your Sysgen was successful, the boot should cause the screen to display a line containing "System II," the release number, and the date.

The SYSBIN file on the dbb may be kept or cleared, as you choose. Due to the space limitations on a diskette-only system, it will be necessary to delete the SYSBIN file prior to continuing with Chapter 5, "Copying Software."

Continue with the next chapter.

Chapter 5

COPYING SOFTWARE

If you were able to load your newly created system, then your Sysgen was successful. However, this disk will not be ready for practical use until it contains a set of the latest Jacquard Systems utilities and device drivers.

GENERAL FILES, PART 1

Put the first General Files diskette into FP01. It is labeled GEN1rr, as opposed to GEN2rr. (Note that rr is the release level of the software you are using to build your system, i.e., 9.0.) Enter:

```
FP01:STAD
```

Set the current date and time, so that the catalog updates and listings will be correct.

Make sure that the disk you are building is the current primary by entering:

```
FP01:CHPRI dbb
```

Make GEN1rr the nominal disk by entering:

```
FP01:CHNOM FP01
```

If you wish to delete the SYSBIN file prior to copying the software (recommended for a diskette-only system), enter the command:

```
FP01:DELETE $SYSBIN
```

Execute the command file on FP01 to copy down files from this floppy to your new primary. Enter:

```
FP01:EXEC FP01:GEN1rr.X1
```

A series of CHATR, DELETE, and COPY commands will start rolling up the screen. Ignore an Error Code 34 message from CHATR or DELETE; it indicates that your primary did not have an old version of the file.

If other errors occur, check the System II Error Messages manual (V3-005). After you have cleared up the problem, it may be necessary to enter the EXEC command again, or to give your own specific commands.

If you copy files one at a time (instead of using the above procedure), you must enter CHATR, DELETE and COPY commands for each file.

CHATR is used to clear the old file's probable PF attribute, DELETE to eliminate the old file, and COPY to copy the new file from the nominal disk to the primary disk.

GENERAL FILES, PART 2

When the execution of command file GEN1rr.X1 is complete, and the cursor appears, your primary will contain all of the software on diskette GEN1rr.

Now remove diskette GEN1rr from FP01; insert GEN2rr. Enter:

```
$SPRCAT/S dbb
```

Note the space still available on the primary being built. If dbb is a single-density floppy disk, there will not be enough room for all the software on GEN2rr; you will have to make choices among the command files described below, or enter your own CHATR/DELETE/COPY sequences. For other types of disks, all of the software for GEN2rr should fit.

Later, you can eliminate any superfluous files from your primary by entering:

```
$CHATR $name

$DELETE $name
```

To run each command file, enter these two commands:

```
$EXEC FP01:GEN2rr.Xn

$SPRCAT/S dbb
```

in which Xn matches one of the descriptions below.

GEN2rr.X1

Files which can be used only on a J100:

BOOT
CDLDRV.SB
MUXDRV.SB
SIIDEF
SILDRV.SB

GEN2rr.X2

Files which can be used only on a J500:

CHRGEN
CHRGEN.SB
DIAL
DILDRV.SB
FLOPIZ
SI5DEF
SIL5DR.SB

GEN2rr.X3

Files for J100 magnetic tape support:

FDR
MT9DRV.SB
MTUTIL
TDSPLY

GEN2rr.X4

Files which can be used only with versions of System II which allow BASIC programming (configurations 1 through 5):

BLDCPY
DOCCRT
SRTLIB.SB

GEN2rr.X5

Files which typically are used only for writing and testing assembly language programs:

ALTER
ASM
DEBUGX.SB
RLDR

TABLES DISKETTE

The diskette labeled TBL1nn contains various wheel tables, keyboard mapping tables, J500 CRT fonts, and similar files.

If you have a NEC printer, a Qume TwinTrack, a non-English keyboard, or other special features in your system, refer to the System II Reference Manual (V1-005), the System II Utilities Manual (V2-005), the Type-Rite Installation Manual (V1-065), and other related documents for details, or consult your Jacquard representative.

The Type-Rite Installation Manual contains details of the character sets, keyboard mapping tables, wheel tables, conversion tables and overstrike character tables.

In general, setting up a new release of System II should include the copying of relevant TBL1nn files to your new primary disk.

OTHER SOFTWARE

The above step concludes the installation of a new release of System II and its associated files. Other software diskettes, such as those for BASIC and File Security, may be handled according to the procedures in the corresponding manuals, or by following these steps:

1. Insert the diskette in FP01, and enter:

```
$CHNOM FP01
$SPRCAT/U
```

2. Write down the names of the files you require on your primary. For each one, enter:

```
$CHATR $name
$DELETE $name
$COPY name $name
```

3. At any time, enter:

```
$SPRCAT/S dbb
```

   to see how much free space you still have on your primary.

4. To obtain a list of all the files on any disk, enter:

```
$SPRCAT/U disk
```

If you have installed support for your printer, and if your current nominal disk drive contains a usable medium, then a sorted list of file names, sizes, attributes, and dates may be obtained with:

```
$SPRCAT/D disk L=printer
```

For details, see the System II Utilities Manual under SPRCAT.

Chapter 6

PROCEDURE SUMMARY

This chapter contains a summary of the procedures for doing a System Generation for the first time on both floppy and hard disk systems.

TWO-FLOPPY SYSGEN PROCEDURE

Do each of the following in the sequence shown:

1. Insert the floppy diskette labeled SGV into FP00 and the diskette labeled SGF into FP01.

2. Check that the APL select switch is set to boot from a floppy.

3. Boot the system, and set the time and date.

```
ENTER DATE (YYMMDD): 82 03 28 <RETURN>
ENTER TIME (HHMMSS): 13 12 00 <RETURN>
```

4. Next, enter:

```
$J500GN B=FP01:SYSTBL.RB <RETURN>
```

   Include the P=words field if necessary.

   Answer the Sysgen questions as described in Chapter 2.

5. When the J500GN DONE message displays on the screen, enter the command:

```
$REMOVE FP01
```

   Now remove the SGF diskette from FP01 and put it aside for just a moment.

6. Insert a blank floppy in FP01.

7. Format the blank diskette. To do so, enter:

    $FORMAT FP01:xxxxxx <RETURN> <RETURN>

    where xxxxxx is the diskette name of up to six characters.

8. After the diskette formatting is complete, enter the command $REMOVE FP00, then remove the SGV diskette from FP00. Insert the SGF diskette into FP00.

9. You are now ready for the next step of the Sysgen process, RLDR. The RLDR step will take the answers you have given to the J500GN program questions and create a system binary file called SYSBIN.

    To do so, enter:

    $RLDR/A B=FP01:SYSBIN Cn.RL/I

    where n is the number or letter of the configuration of the operating system you choose. Configuration 1 is recommended for most cases.

10. When your cursor reappears, you are ready for the next step, MKABS. This step produces a system directory file called SYS from the system binary file (SYSBIN) created under RLDR. Enter:

    $MKABS FP01:SYSBIN FP01:SYS <RETURN>

11. When your cursor has returned to the screen, you are ready for the last step in the Sysgen process, INSTAL. During this step the system writes the addresses of the system files in a special directory location on the disk. It is this area on the disk that the system inspects when you depress the reset button. In order to INSTAL your new operating system, enter:

    $INSTAL FP01:SYS <RETURN>

    You now have a bootable operating system.

    Before going any further and copying on any other files, check to make sure that your new operating system will definitely boot. Remove the floppy containing your new operating system from FP01. Remove the SGF floppy in FP00. Place your new operating system floppy (which you removed from FP01) into FP00 and place a scratch diskette into FP01. Boot the system.

12. After you have completed copying the necessary utilities (including the utility SI5DEF) and the device drivers, print a listing of SI5DEF and place it in your account file. Also, give a copy of the system diskette and a SI5DEF listing to the service representative handling the hardware installation.

    To print the SI5DEF listing, enter:

    $SI5DEF L=DPR1 (or the name of the default printer)

It is also recommended that you print a detailed SPRCAT of the operating system floppy as well as any system files (SYSICF, TYPINT.SB, CRTn.NM) you have written and give them to the service representative.

Note: To conserve room on a customer's system floppy, first copy the SYSBIN file onto a blank formatted floppy and keep it in your account file. Then, delete the customer's SYSBIN file.

HARD DISK SYSGEN PROCEDURE

The following procedures use device type DE00 for illustration. You can, of course, use DA or DD also.

Do each of the following:

1. Place a blank unformatted disk into the disk drive.
2. Place the floppy diskette labeled SGV into FP00 and the diskette labeled SGF into FP01.
3. Check that the APL switch is set to boot from a floppy.
4. Boot the system, and set the time and date.
5. The first step in the Sysgen process is to format the blank disk. To do so, enter:

   $FORMAT DE00:xxxxxx <RETURN> <RETURN>

   where xxxxxx is the diskette name of up to six characters.
6. Next, enter:

   $[illegible]B=FP01:SYSTBL.RB <RETURN>

   Include the P=words field if necessary.

   Answer the Sysgen questions as described in Chapter 2.
7. When the J500GN DONE message displays on the screen, enter the command:

   $REMOVE FP00

   and remove the SGV diskette from FP00, returning it to its diskette jacket.
8. Enter:

   $REMOVE FP01

   Remove the SGF diskette from FP01, and insert it into FP00.

9. You are now ready for the next step of the Sysgen process, RLDR. The RLDR step will take the answers you have given to the sysgen questions and create a system binary file called SYSBIN. Enter:

    $RLDR/A B=DE00:SYSBIN Cn.RL/I <RETURN>

    where n is the number or letter of the configuration of the operating system you choose. Configuration 1 is recommended for most cases.

    Note that both the primary and nominal disks are defined as FP00 and that both the Z files on the SGF diskette and the SYSTBL.RB file are on FP00.

10. When the cursor reappears you are ready for the next step, MKABS. This step produces a system directory file called SYS from the system binary file (SYSBIN) created under RLDR. Enter:

    $MKABS DE00:SYSBIN DE00:SYS <RETURN>

11. When the cursor has returned to the screen, you are ready for the last step in the Sysgen process, INSTAL. During this step, the system writes the addresses of the system files in a special directory location on the disk. It is this area on the disk that the system inspects when you press the reset button. In order to install your new operating system, enter:

    $INSTAL DE00:SYS <RETURN>

    You now have a bootable operating system.

12. Before going any further and copying on any other files, check to make sure that your new operating system will definitely boot.

13. After you have completed copying the necessary utilities (including the utility SI5DEF) and the device drivers, print a listing of SI5DEF and place it in your account file. Also, give a copy of the system diskette and a SI5DEF listing to the service representative handling the hardware installation.

    To print the SI5DEF listing, enter:

    $SI5DEF L=DPR1 (or the name of the default printer)

    It is also recommended that you print out a detailed SPRCAT of the operating system disk as well as any system files (SYSICF, TYPINT.SB, CRTn.NM) you have written and give them to the service representative.

    To conserve room on a customer's system pack, first copy the SYSBIN file onto a blank formatted floppy and keep it in your account file. Then, delete the SYSBIN file from the customer's operating system disk.

Chapter 7

MODIFYING A SYSGEN

This procedure, sometimes referred to as a Batch Sysgen, allows you to make changes to an existing operating system without going through the usual screen dialog of questions and answers. The procedure is particularly useful when frequent System Generations are desired. It is designed to work with hard disk systems only.

PRELIMINARY PROCEDURE

The following procedure can be used to Sysgen an existing system of the same release level on a hard disk.

In the event that your system no longer has all of the Sysgen related System II modules that are on the SGV1rr and SGF1rr diskettes, be sure to copy them as follows.

Set the primary to your removable platter. Set the nominal to FP00, and insert diskette SGV1rr in FP00, where rr is the System II release number. Enter:

```
$EXEC SGV1rr.X1 <RETURN>
```

Programs are copied from FP00 to the primary disk. On completion, insert diskette SGF1rr in FP00. Enter:

```
$EXEC SGF1rr.X1 <RETURN>
```

More programs are copied to the primary disk. On completion, enter:

```
$CHNOM Dx00 <RETURN>
```

CREATE SPECIAL SI5DEF FILE

The SI5DEF utility lists the characteristics of the System II configuration currently running on your J500. By specifying a file (SI5DEF.QQ, below) as output from this utility, you will have a listing of all the current Sysgen questions and answers.

By using the EDIT utility you may then modify the output listing file to reflect your new system characteristics.

This modified file can then be used as input (I=) to the J500GN command.

Note that neither the default nominal disk nor the default keyboard type appear on a SI5DEF list file. If you want to use such a file as a Sysgen I= file, it may be necessary to insert an answer, depending on how you handle the CRT TERMINALS question.

Make sure the SI5DEF output created is the same as the release level under which you will be operating (different release levels may have different SI5DEF outputs).

Create the special SI5DEF file using the following procedure. Enter:

```
$SI5DEF L=SI5DEF.QQ <RETURN>
```

You may, of course, use your initials instead of QQ.

This creates SI5DEF.QQ with the SI5DEF questions and answers. Enter:

```
$EDIT <RETURN>
M SI5DEF.QQ
```

Use EDIT to make the desired line changes/additions (refer to previous chapters for detailed information).

When finished, press <CANCEL>. Enter:

```
Q <RETURN>
```

This keeps you in EDIT.

SI5DEF.QQ is then stored with the changes made. Keep this file for any future Sysgen changes.

CREATE SPECIAL COMMAND FILE

Create a command file (excellent for future Sysgens) as follows. Enter:

```
W NUSYS <F1>
```

Then, enter:

```
$DELETE SYSBIN
$J500GN I=SI5DEF.QQ B=SYSTBL.RB
$RLDR/A B=SYSBIN Cn.RL/I
$UNSTAL SYS (or UNSTAL dbb if Release 9.0 or later)
$MKABS SYSBIN SYS
$INSTAL SYS
$DELETE SYSBIN (optional)
```

In the $RLDR line above, n is the number or letter of the configuration you select. For example, if configuration 1 is desired, n=1.

On completion, press <CANCEL> and key in:

```
EX <RETURN>
```

The new file called NUSYS is stored and EDIT is exited. If you are working only with configuration 1, you are now ready to Sysgen. However, if you are working with any other configuration, your primary and nominal disks cannot be the same and you must create your new system on a new disk (not the current primary).

To continue, enter:

```
$EXEC NUSYS <RETURN>
```

The command file executes all of the steps necessary to complete System Generation.

On completion, load the system again (reboot).

PROCEDURE FOR ALL FUTURE SYSGENS

Future Sysgen changes on the same disk require only the following simple procedures:

1. Make the desired changes to SI5DEF.QQ file via EDIT.
2. File the updated SI5DEF.QQ file.
3. Execute NUSYS (a new system with changes will be created).
4. Load the system (reboot).

Appendix A

ERROR MESSAGES

ERROR PROCESSING

In the course of generating your system, any of the following messages may appear, usually in response to an incorrect entry by the operator. If possible, a caret will point at the first bad field. During an interactive Sysgen, a corrected line may then be entered.

One common problem is that the dbb disk has never been properly formatted. Another problem occurs if you fail to run UNSTAL prior to MKABS and INSTAL. The UNSTAL command, however, is not required for the initial Sysgen.

In addition to the following, the usual System II error codes may appear.

BUFFER SIZE > MAX ALLOWED

The specified buffer size is greater than the system's maximum buffer size, which was set in the third question.

EXCESS ARGUMENT

There are too many fields in this line.

ILLEGAL DEVICE CHARACTERISTIC

The indicated option is not acceptable for this type of device.

ILLEGAL INPUT FIELD

This field must be either a valid device name (one to four letters and numerals, starting with a letter), or a hex number (digits 0 through 9 and A through F only), or a decimal whole number.

INCOMPLETE INPUT LINE

Field missing.

NO DEFAULT VALUES EXIST FOR THIS DEVICE

A definition for this name requires a full set of fields.

NO SUCH DISK HAS BEEN DEFINED

This field must name a disk which has already been defined.

NOT A MULTIPLE OF HEX 10

This field must end with a 0.

NOT A POWER OF 2 FROM HEX 100 TO HEX 400

This field must be 0100, 0200, or 0400.

THIS DEVICE ALREADY DEFINED

This name cannot be used twice.

UNACCEPTABLE VALUE

This field does not agree with the documented requirements.

VALUE OUT OF RANGE

This value is either too large or too small.

WORK SPACE EXHAUSTED

More memory is needed to build the system table. A command field of P=0300 should be sufficient if the default was not.

DEVICE ADDRESSES MUST BE IN ASCENDING ORDER

The devices using driver MUXDRV.SB must be defined in ascending device address order. This forces all the devices using any one address to be defined together.

ERROR CODE 34

The specified old system was not found. Either you gave the wrong name, or there was no system to delete.

ERROR CODE 37

If an Error 37 (document already exists) occurs, UNSTAL may not have deleted SYS.00. Delete this file and try MKABS again.

UNRECOGNIZED DISK TYPE

Your dbb specification is unacceptable. Any other MKABS error message probably means that your input is not, in fact, a system binary file. Check the command line and try again.

PROGRAM DIRECTORY TOO LONG

Your system name is somehow unacceptable. Perhaps you have given the name of your RLDR output, which we have been calling SYSBIN, rather than your MKABS output.

NO OUTPUT FILE

The B= field is missing in the RLDR command.

SYMBOL TABLE FULL

Increase the value of P= parameter.

DISK RELEASE LEVEL < 9.0 OR NO SYSTEM INSTALLED

Occurs if the previous release cannot be installed. Delete any previous SYS.nn files and try again.

EXTENSION NOT ALLOWED

MKABS does not allow an extension in the output file name and UNSTAL does not allow an extension in the system name.

NOT A SYSTEM FILE

The system name entered in the UNSTAL command does not match the existing system name.

Appendix B

EXTENDED CHARACTER SETS

Four character sets are available with the J500 computer system. They are as follows:

- Technical Math/Times Roman (mathematical symbols)
- Scientific/Times Roman (scientific/chemical symbols)
- American Legal (legal symbols)
- French (French symbols)

Figures B-1 through B-3 illustrate the keyboard layouts for these character sets.

To have these character sets recognized by the keyboard, display on-screen, and print correctly, the following tables must be installed on the system:

1. The corresponding J500 font table. This table includes all of the characters in the keyboard mapping tables and translates the key pressed on the keyboard to the appropriate on-screen character. Figure B-4 is an illustration of the J500 font table, CHG2.FT, which corresponds to the new display generator on the J100. Figure B-5 illustrates the corresponding keyboard position of each character in the table. Installation of the J500 font table is described in Chapter 7 of the Type-Rite Installation Manual and in the System II Utilities Manual, under the CHRGEN utility.

2. The appropriate keyboard mapping table. This table contains the keyboard position of each character in the set. Installation of a keyboard mapping table and use of alternate keyboard mapping is described in Chapter 7 of the Type-Rite Installation Manual, V1-065.

3. The appropriate wheel table or conversion table. These tables translate the on-screen characters to the appropriate printed character. Wheel tables also provide information about printer hammer intensity and ribbon advance.

   Wheel tables (extension .WT) are installed for parallel printers. Conversion tables (extension .CT) are installed for serial printers.

   Wheel table and conversion table installation and use are described in Chapter 7 of Type-Rite Installation Manual.

In addition, the appropriate combination of printer and printwheel or thimble is required.

KEYBOARD TABLE COMPATIBILITY

The Keyboard Mapping Tables (see Table B-1) are compatible with a TCUP keyboard translation file. Use the TCUP utility to invoke keyboard translation for functions outside of Type-Rite.

LIMITATIONS AND RESTRICTIONS

The J500 font CHG2.FT is intended to become the standard for this machine. Within the character set certain control characters and special usage characters have been defined for possible later implementation in Type-Rite. If users are building their own font tables, they should not build characters represented by any of the following hex values:

AF
CO
CB
CF
E7 through FA
FD

Table B-1 below illustrates the names of the corresponding keyboard mapping tables needed for each character set to key and display the characters, as well as the printer that will support each character set.

Table B-1. Keyboard Mapping Tables

Character Set	Keyboard Mapping Table	Printer
Technical Math/ Times Roman	TMA1.KT	NEC
Scientific/ Times Roman	SCI1.KT	NEC
American Legal	LEG1.KT	NEC/ Diablo
French	FRN1.KT	Diablo

Table B-2 (described later) lists printer types, wheel types, wheel tables, character sets, wheels/thimbles, and supported part numbers. This list contains only those thimbles we support fully, including special symbols.

All tables described above and listed in Table B-2 are located on the new Tables diskette, which is currently available.

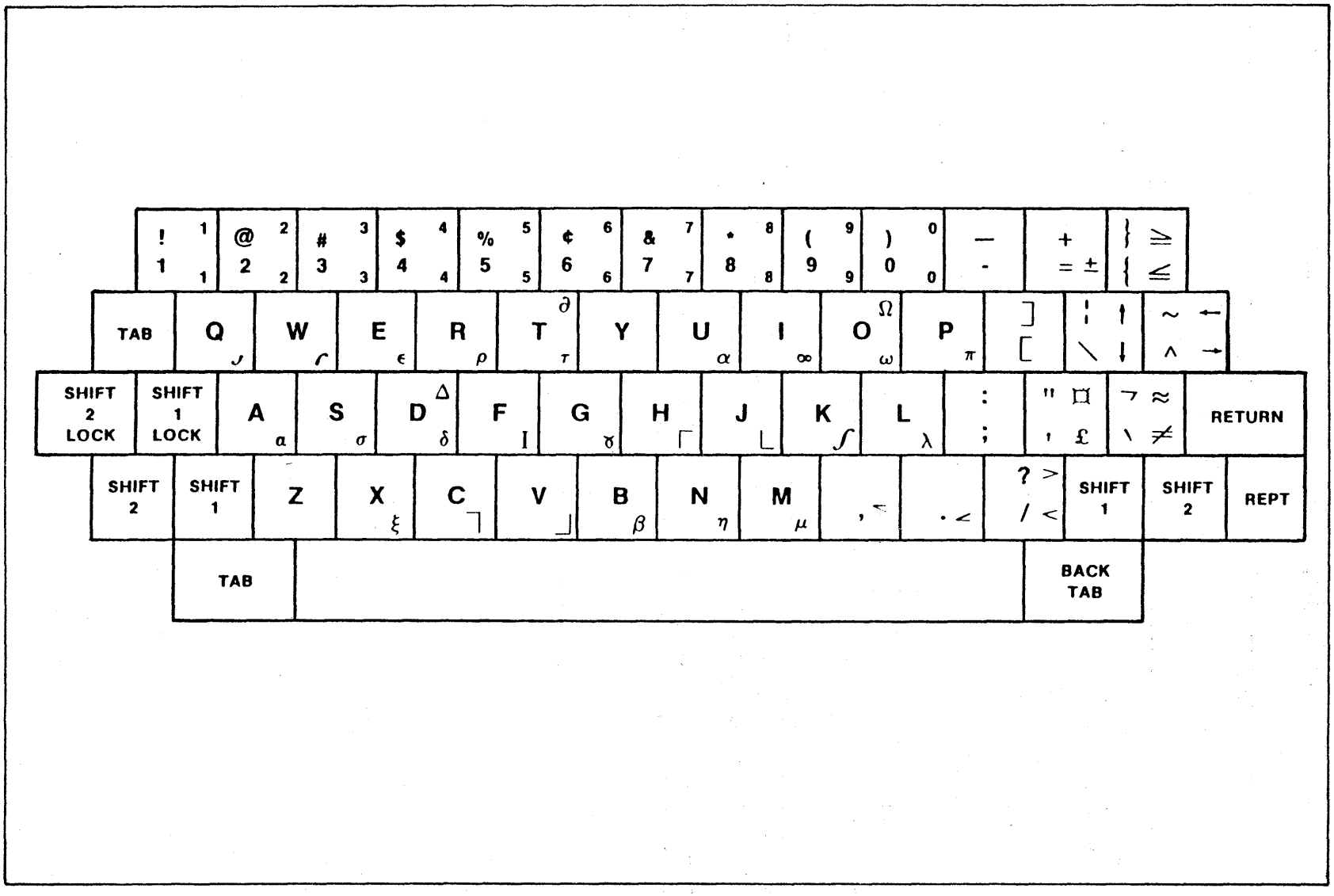

Figure B-1. Technical Math//Times Roman Character Set

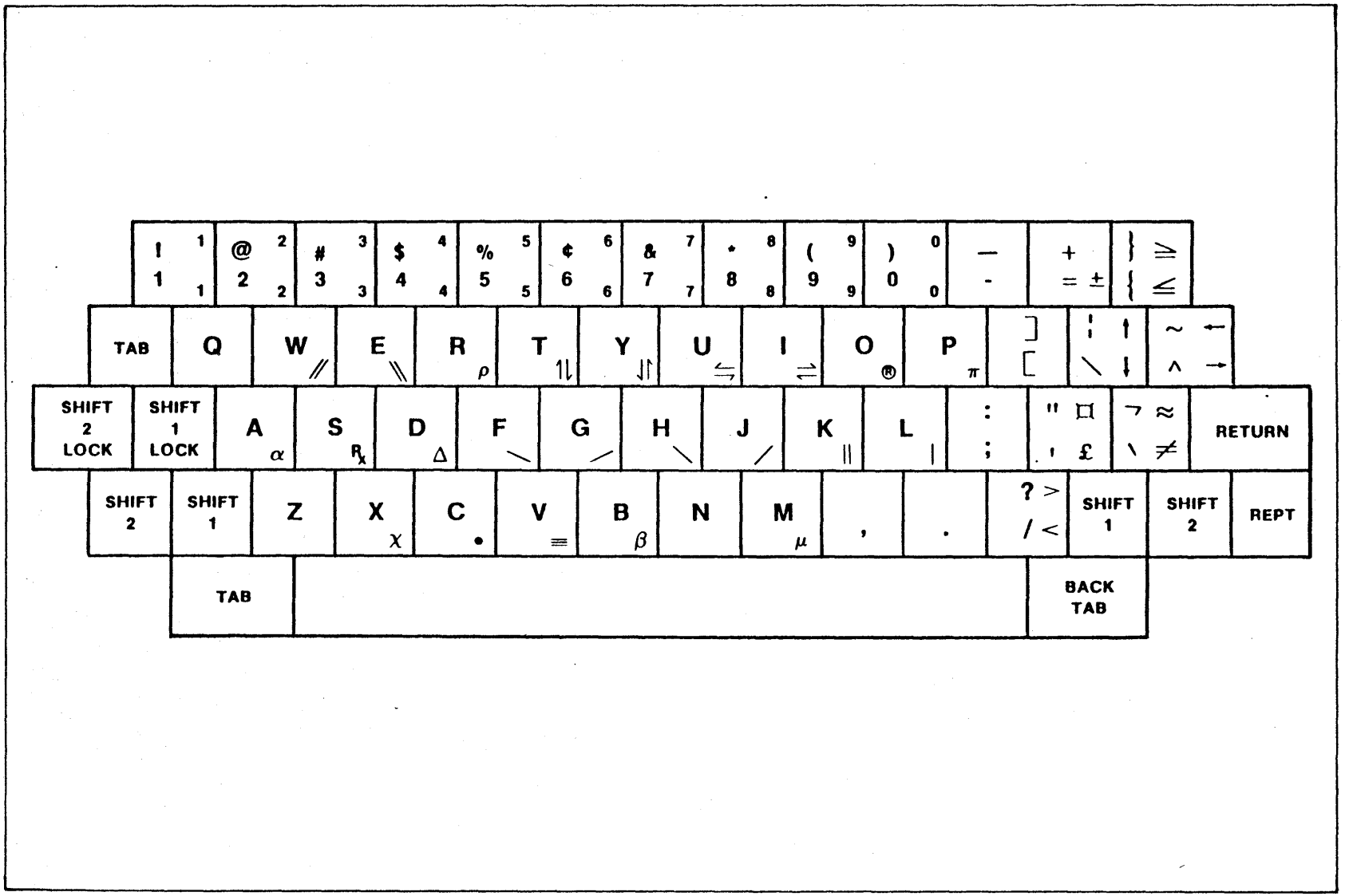

Figure B-2. Scientific/Times Roman Character Set

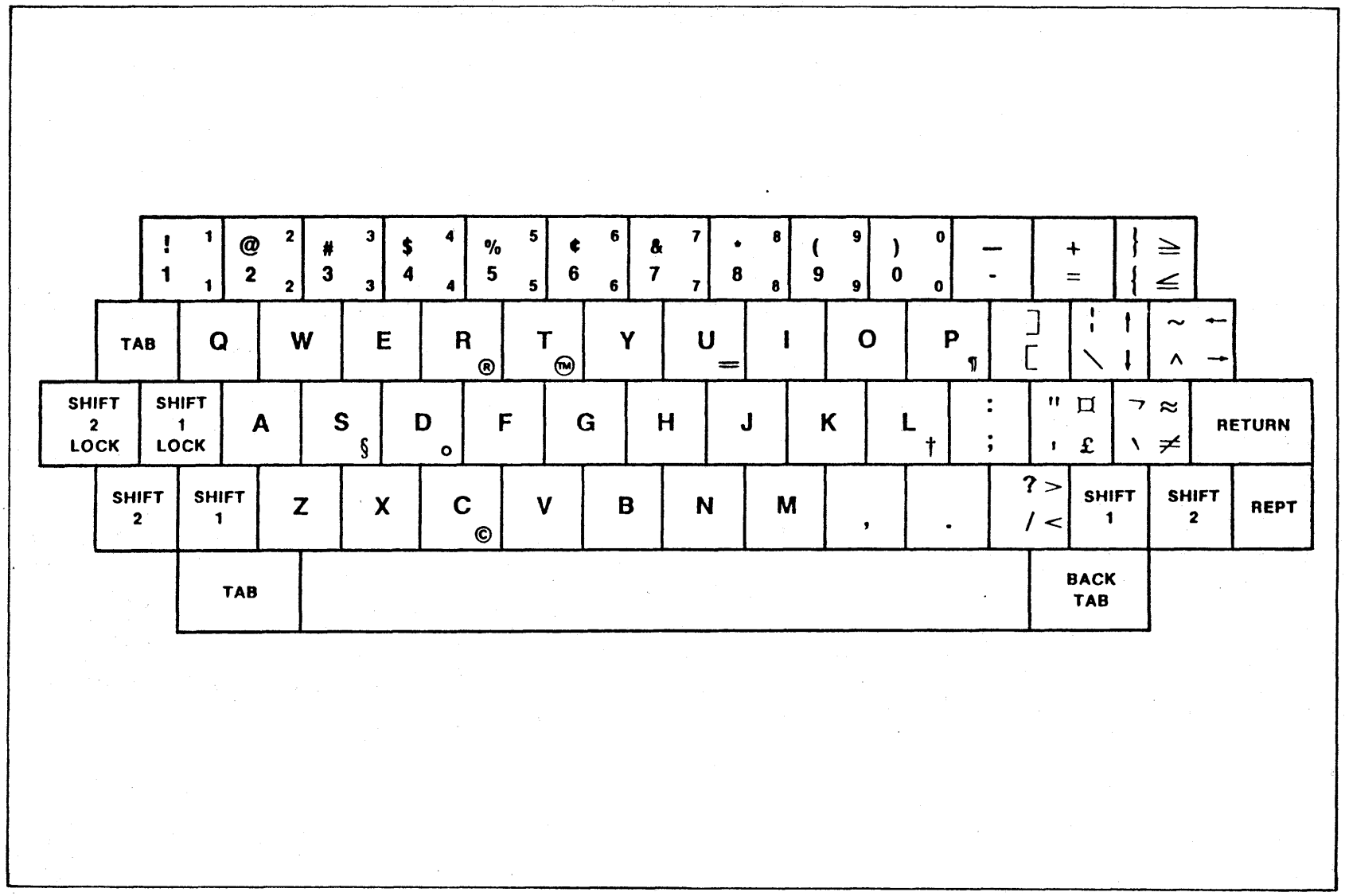

Figure B-3. American Legal Character Set

	NO SHIFT		SHIFT 1		SHIFT 2		SHIFT 1&2	
KEY NUMBER	DISPLAY SYMBOL	HEX CODE	DISPLAY SYMBOL	HEX CODE	DISPLAY SYMBOL	HEX CODE	DISPLAY SYMBOL	HEX CODE
1	-	1C	-	1C	-	1C	-	1C
2	-	1D	-	1D	-	1D	-	1D
3	-	1E	-	1E	-	1E	-	1E
4	-	1F	-	1F	-	1F	-	1F
5	-	0B	-	0B	-	0B	-	0B
6	-	1B	-	1B	-	1B	-	1B
7	-	05	-	05	-	05	-	05
8		06	-	06	-	06	-	06
9	-	01	-	01	-	01	-	01
10	-	10	-	10	-	10	-	10
11	0	F1	6	ED	↑	E3	¦	7C
12	1	F2	7	EE	→	E4	-	0D
13	2	F3	8	EF	↓	E5	-	-
14	3	F4	9	F0	←	E6	-	-
15	4	F5	\\	FB	0	E7	-	-
16	5	F6	//	FC	1	E8	-	-
17	6	F7	≡	FD	2	E9	//	FC
18	7	F8	↰	FE	3	EA	≡	FD
19	8	F9	↱	FF	4	EB	↰	FE
20	9	FA	5	EC	¤	E2	↱	FF
21	1	31	!	21	β	91	≥	81
22	2	32	@	40	à	92	Δ	A0
23	3	33	#	23	è	93	c	83
24	4	34	$	24	₧	94	Fr	84
25	5	35	%	25	₰	95	£	85
26	6	36	≈	E1	ù	96	x	E0
27	7	37	&	26	é	97	§	86
28	8	38	*	2A	s	98	AE	8A
29	9	39	(	28	Ⓐ	99	Ç	88
30	0	30	)	29	α	90	©	89
31	-	2D	_	5F	Å	8D	µ	BF
32	=	3D	+	2B	å	9D	Ä	8B
33	{	7B	}	7D	≡	DB	J	DD
34	-	08	-	08	-	08	-	08
35	-	16	-	16	-	16	1	31
36	-	15	-	15	-	15	2	32
37	-	03	-	03	-	03	3	33
38	-	09	-	09	-	09	-	09
39	q	71	Q	51	σ	D1	Ï	B1
40	w	77	W	57	\	D7	Ö	B7
41	e	65	E	45	⊤	C5	¡	A5
42	r	72	R	52	⇋	D2	ë	B2
43	t	74	T	54	⁞	D4	Ä	B4
44	y	79	Y	59	—	D9	ä	B9
45	u	75	U	55	±	D5	Ë	B5
46	i	69	I	49	⌐	C9	γ	A9
47	o	6F	O	4F	⏎	CF	ϵ	AF
48	p	70	P	50	Ω	D0	Ë	B0

Figure B-4. J500 Font Table CHG2.FT

	NO SHIFT		SHIFT 1		SHIFT 2		SHIFT 1&2	
KEY NUMBER	DISPLAY SYMBOL	HEX CODE	DISPLAY SYMBOL	HEX CODE	DISPLAY SYMBOL	HEX CODE	DISPLAY SYMBOL	HEX CODE
49	[	5B	]	5D	$\hat{\lambda}$	BB	$\hat{u}$	BD
50	\	5C	¦	7C	$\hat{\theta}$	BC	$\int$	DC
51	^	5E	~	7E	π	BE	•	DE
52	-	18	-	18	-	18	4	34
53	-	17	-	17	-	17	5	35
54	-	04	-	04	-	04	6	36
55	-	-	-	-	-	-	-	-
56	-	-	-	-	-	-	-	-
57	a	61	A	41	ω	C1	λ	A1
58	s	73	S	53	$\rightleftharpoons$	D3	$\ddot{\imath}$	B3
59	d	64	D	44	œ	C4	τ	A4
60	f	66	F	46	=	C6	$\hat{U}$	A6
61	g	67	G	47	$\leftarrow$	C7	ξ	A7
62	h	68	H	48	$\angle$	C8	ρ	A8
63	j	6A	J	4A	L	CA	I	AA
64	k	6B	K	4B	—	CB	∞	AB
65	l	6C	L	4C	$\top$	CC	δ	AC
66	;	3B	:	3A	ä	9B	æ	9A
67	'	27	"	22	É	87	$\neq$	82
68	`	60	¬	7F	$^{F}_{N}$	C0	°	DF
69	-	0A	-	0A	-	0A	-	0A
70	-	02	-	02	-	02	7	37
71	-	00	-	00	-	00	8	38
72	-	07	-	07	-	07	9	39
73	-	-	-	-	-	-	-	-
74	-	-	-	-	-	-	-	-
75	z	7A	Z	5A	$\mathrm{R_x}$	DA	$\hat{e}$	BA
76	x	78	X	58	/	D8	$\hat{U}$	B8
77	c	63	C	43	Œ	C3	$\hat{E}$	A3
78	v	76	V	56	/	D6	$\hat{I}$	B6
79	b	62	B	42	α	C2	$\hat{A}$	A2
80	n	6E	N	4E	$\int$	CE	∂	AE
81	m	6D	M	4D	J	CD	η	AD
82	,	2C	<	3C	Ö	8C	ö	9C
83	.	2E	>	3E	Ü	8E	ü	9E
84	/	2F	?	3F	Φ	8F	ϕ	9F
85	-	-	-	-	-	-	-	-
86	-	-	-	-	-	-	-	-
87	-	-	-	-	-	-	-	-
88	-	19	-	19	-	19	-	19
89	-	1A	-	1A	-	1A	0	30
90	-	0F	-	0F	-	0F	.	2E
91	-	09	-	09	-	09	-	09
92	(space)	20	(space)	20	$\leq$	80	$\leq$	80
93	-	0C	-	0C	-	0C	-	0C

Figure B-4. J500 Font Table CHG2.FT (Continued)

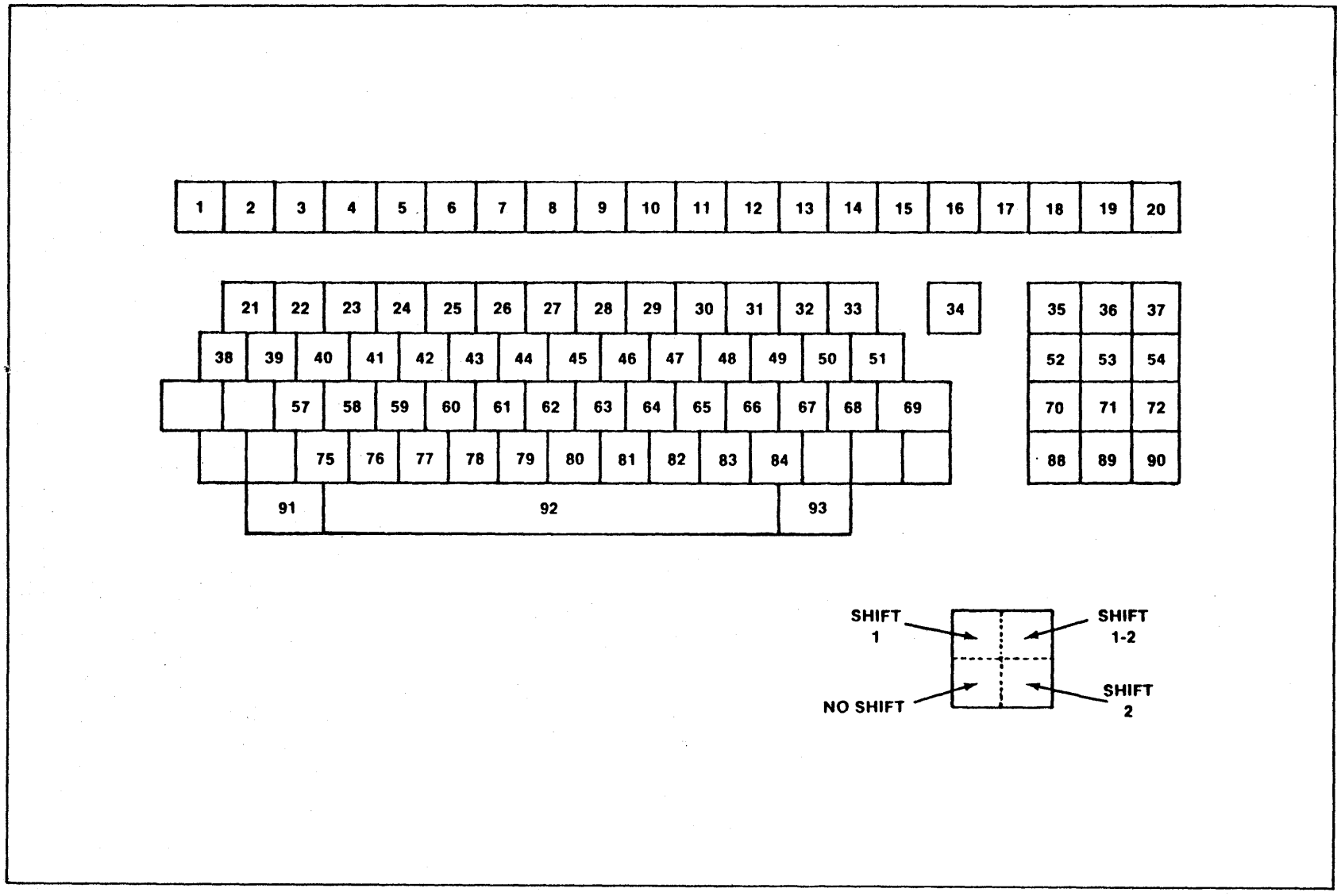

Figure B-5. J500 Font Table CHG2.FT Keyboard Layout

Table B-2. Printing Combinations Available

Printer/ Wheel Type	Wheel Table Name	Conversion Table Name	Character Set Supported	Wheels/Thimbles Supported	Wheel/Thimble Part Number
NEC	N/R	N/R	Standard ASCII	Pica 10	-222A
				Elite 12	-232A
				Courier 72	-212A
NEC	NPP1.WT	NPP1.CT	Standard ASCII	Bold P.S.	-502A
				Bold Italic P.S.	-612A
NEC	NLG1.WT	NLG1.CT	American Legal	Prestige Elite Legal 12A	-382A
				Prestige Elite Legal 12B	-472A
				Courier Legal 10A	-372A
				Courier Legal 10B	-462A
				Dual Gothic 12B	-522A

N/R Normally, wheel or conversion tables are not required for these wheels/thimbles.

Table B-2. Printing Combinations Available (Continued)

Printer/ Wheel Type	Wheel Table Name	Conversion Table Name	Character Set Supported	Wheels/Thimbles Supported	Wheel/Thimble Part Number
NEC	NFL1.WT (1)	NFL1.CT (1)	American Legal	Prestige Elite Legal 12A	-382A
				Prestige Elite Legal 12B	-472A
				Courier Legal 10A	-372A
				Courier Legal 10B	-462A
				Dual Gothic 12B	-522A
NEC	NC10.WT	NC10.CT	Standard ASCII	Courier 10	-262A
NEC	NFL2.WT (2)	N/A	American Legal	Super Courier	-482A
NEC	NTM1.WT	NTM1.CT	Technical Math	Technical Math/ Times Roman	-552A

(1) These tables support a special J100 display generator used in France.
(2) Any display generator with Standard ASCII will work.
N/A No table is available on the Tables diskette.

Table B-2. Printing Combinations Available (Continued)

Printer/ Wheel Type	Wheel Table Name	Conversion Table Name	Character Set Supported	Wheels/Thimbles Supported	Wheel/Thimble Part Number
NEC	NSC1.WT	NSC1.CT	Scientific	Scientific/ Times Roman	-642A
Diablo Plastic 96	N/R	N/R	Standard ASCII	Pica 10	38101-01
				Elite 12	38102-02
				Courier 10	38100-01
				Courier 72	38107-01
				Forms Gothic	38147
				OCR-B 10	38146
Diablo Plastic 96	DLG1.WT	DLG1.CT	American Legal	Prestige Elite Legal 12A	38105-01
				Artisan Legal	303201-01
				Courier Legal 10	38104-01

N/R Normally, wheel or conversion tables are not required for these wheels/thimbles.

Table B-2. Printing Combinations Available (Continued)

Printer/ Wheel Type	Wheel Table Name	Conversion Table Name	Character Set Supported	Wheels/Thimbles Supported	Wheel/Thimble Part Number
Diablo Plastic 96	DLG2.WT	DLG2.CT	American Legal	Courier Legal 10A	38108
Diablo Plastic 96	DMP1.WT(3)	DMP1.CT(4)	Standard ASCII		
Diablo Metal 88	N/R	N/R	Standard ASCII	Bold P.S.	38301
				Vintage 12	38302
				Titan 10	38303
				Titan 12	38305
				Elite 12	38311
				Trend P.S.	38312
				Trojan 10	38313
				Titan Italic 12	38314

(3) DMP1.WT is for 96-character plastic wheel use on a 1355 that would normally use 96-character metal wheels.
(4) DMP1.CT is for 96-character plastic wheel use on 1650 metal wheel printers.
N/R Normally, wheel or conversion tables are not required for these wheels/thimbles.

Table B-2. Printing Combinations Available (Continued)

Printer/ Wheel Type	Wheel Table Name	Conversion Table Name	Character Set Supported	Wheels/Thimbles Supported	Wheel/Thimble Part Number
Diablo Metal 88 (Cont.)	N/R	N/R	Standard ASCII	Letter Gothic 12	38315
				Roman P.S.	38306
				Cubic P.S.	38307
				Bold Italic P.S.	38308
				Gothic P.S.	38309
				Pica 10	38310
Diablo Metal 88	DTL1.WT	DTL1.CT	American Legal	Titan Legal 10	38304
Diablo Metal 96	N/R	N/R	Standard ASCII	Titan 10	311900-01
				Cubic P.S.	311901-01
Diablo Metal 96	DFR1.WT	DFR1.CT	French	Elite 12	311683-01

N/R Normally, wheel or conversion tables are not required for these wheels/thimbles.

Table B-2. Printing Combinations Available (Continued)

Printer/ Wheel Type	Wheel Table Name	Conversion Table Name	Character Set Supported	Wheels/Thimbles Supported	Wheel/Thimble Part Number
Qume	QWPS1.WT	N/A	Qume ASCII	WPS Sequence 1	N/A
Qume	QWPS2.WT	N/A	Qume Bilingual	WPS Sequence 4	N/A
N/A No table is available on the Tables diskette.					