How to

Load and Generate

Your

RDOS System

093-000188-02

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Preface

Before you can do anything useful with your Data General equipment, you must have an operating system up and running. This manual tells you how to bring up an operating system -- specifically, RDOS, our Real-time Disk Operating System -- on a Data General NOVA® or ECLIPSE® computer.

This manual assumes only that your disk(s), computer, and other peripherals are connected; i.e., that you are starting from scratch. If you already have an RDOS system running, go directly to Chapter 6 to generate other tailored RDOS systems. Chapters 2 through 5 apply only to your *first* system, If you don't have an RDOS system up yet, proceed.

Starting from scratch, the first part of the system generation procedure involves checking the disks you will use and bringing up the RDOS starter system. These steps vary, depending on what medium contains your system software. We describe them specifically in Chapters 2 through 5. We also describe using your original medium to back up your tailored RDOS system in Chapter 7.

After you have the starter system running, you'll use it to generate an RDOS system tailored to your own needs. We describe this step in Chapter 6.

We have organized the manual as follows:

Chapter 1 introduces RDOS and briefs you on the system generation procedure.

Chapter 2 explains how to bring up the starter system from *diskettes*.

Chapter 3 describes bringing up the starter system from *magnetic tape*.

Chapter 4 explains how to bring up the starter system from *cassettes*.

Chapter 5 describes bringing up the starter system from *paper tape*.

Chapter 6 leads you step by step through the system generation procedure (SYSGEN).

Chapter 7 explains starting up RDOS, shutting it down, accessing other disks, and backing up your system and files.

Chapter 8 covers the details of the disk initializer program, DKINIT.SV.

Chapter 9 names and describes the utility software supplied with RDOS systems.

Appendix A tells you what to do if you make a typing mistake.

Appendix B summarizes error messages and tells you how to correct errors.

Appendix C contains an ASCII character set.

Reader, Please Note:

We use these conventions for command formats in this manual:

COMMAND required *[optional]* ...

Where	Means
COMMAND	You must enter the command (or its accepted abbreviation) as shown.
required	You must enter some argument (such as a filename). Sometimes, we use:

$$\left\{ \begin{matrix} \text{required}_1 \\ \text{required}_2 \end{matrix} \right\}$$

which means you must enter *one* of the arguments. Don't enter the braces; they only set off the choice.

[optional]	You have the option of entering this argument. Don't enter the brackets; they only set off what's optional.

...	You may repeat the preceding entry or entries. The explanation will tell you exactly what you may repeat.

Additionally, we use certain symbols in special ways:

Symbol	Means
)	Press the RETURN key on your terminal's keyboard.
☐	Be sure to put a space here. (We use this only when we must; normally, you can see where to put spaces.)

All numbers are decimal unless we indicate otherwise; e.g., 35_8.

Finally, in examples we use

THIS TYPEFACE TO SHOW YOUR ENTRY)
THIS TYPEFACE FOR SYSTEM QUERIES AND RESPONSES.

R is the RDOS/DOS CLI prompt.

End of Preface

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Chapter 1
Introduction

What is RDOS?

Data General's Real-time Disk Operating system lets you manipulate disk-stored data and program files on Data General computers. You can communicate with RDOS by typing in commands directly from your computer's system console, or by coding calls to the RDOS software from within your own programs.

When Data General delivers your computer system, a company representative will show you how to turn all of the system components on and off, and, if applicable, how to operate the diskette drives, magnetic tape drives, cassette drives, and how to use the switches on the computer's front panel. Feel free to experiment until you are at ease operating all these pieces of computer hardware.

Then you'll be ready to install your RDOS system.

How Do I Get RDOS into My Computer?

Data General provides all the pieces of RDOS software you need, in one of four forms:

- On one or more flexible disks, called diskettes (along with any other software you order at the same time); or

- On one reel of magnetic tape (along with any other software you order at the same time); or

- On several tape cassettes; or

- In five or more trays of fanfold paper tape.

To get RDOS up and running, you first load an RDOS Starter System into the computer. This starter system is a skeleton version of RDOS which runs on any Data General computer configuration that will support RDOS. The minimum hardware on which you can operate it is:

- A suitable unmapped Data General computer;

- A moving-head or fixed-head disk drive;

- At least one of the following: a diskette drive; or a magnetic tape drive and control; or a single cassette drive and control; or a punched paper tape reader or an ASR 33 or 35 teletypewriter, high-speed paper tape reader;

- A system console: keyboard/printer or keyboard/display terminal.

The starter system supports *only* certain devices; e.g., it does not support a data channel line printer. See your software Release Notice for the latest information on supported devices.

When the starter system is running, you load and execute the RDOS System Generation *(SYSGEN)* program. The SYSGEN program asks you questions about your computer configuration. After you answer all its questions, it builds an RDOS system tailored for your specific hardware components and for the software that you intend to run under RDOS.

Finally, you'll learn some things about operating RDOS day-to day: starting it up, shutting it down, and how to save backup copies of your files.

Control Characters and BREAK Key

You'll be using several programs to bring up RDOS, and you may want to interrupt execution of these programs -- for example, if you make a mistake or change your mind about an answer. If so, type CTRL-A; that is, press the CTRL key, then, while you are holding CTRL down, press A. This interrupts execution of the command and returns you to the program.

You can suspend display on your terminal by typing CTRL-S, and restore it by typing CTRL-Q. This feature can help you read long files on a CRT terminal. We tell you about it here because you may inadvertently type CTRL-S and suspend display. If output suddenly stops, try typing CTRL-Q.

If your computer has a programmed console (described next), the BREAK key on the terminal keyboard stops execution of all software. To continue with the program that was running, type P) (capital P, then carriage RETURN) on the keyboard. We mention this here because, in the course of bringing up and running RDOS, you may inadvertantly hit the BREAK key. If everything stops, and the system console shows "!", try typing P).

Program Load

To prepare for system generation, you'll need to load programs from your RDOS medium (diskette, magnetic tape, etc.) into the computer's memory. Later, you'll need to load RDOS itself from disk. The process of bringing a program into memory is called program load.

The program load procedure depends on the kind of Operator's Console (front panel) your computer has. Broadly speaking, there are two kinds of Operator's Console. They are:

- Computers with programmed console. On these, the computer console has its own memory, microcoded with a loader program that loads other programs. The front panel console has three rocker switches, labeled LOCK, PL/RESET, and ON/OFF, as shown in the central panel of Figure 1-1. If your machine has a programmed console, you'll program load by typing characters on the "system" console (CRT or printing terminal).

- Computers with hardware data switches. On these, the computer front panel has hardware data switches, numbered 0 through 15, as shown at the top and bottom of Figure 1-1. You'll use these data switches, and some others, to load programs.

The First Steps

Let's get started:

1. Check that all equipment is plugged in.

2. Turn to the drive for the disk that will hold the RDOS system. If this drive has a thumbwheel drive number selector, make sure that the selector is set to 0. If the disk is sealed in the drive, or if the disk cartridge or pack has already been inserted in the drive, skip to step 3.

   If the disk cartridge or pack is not in its drive, you must insert it. The specifics are covered in the

illustrated Operator's Manual (014 series) supplied with the disk, but we outline them here for convenience.

If the drive is a dual-platter disk subsystem, you must insert the top (removable) platter or cartridge. Flip the disk ON/OFF rocker switch to ON. Pull down the clips at the sides of the drive front panel (if there are no clips, pull the latch underneath the drive grip); then slide the drive out of its cabinet. Remove the dust cover from the cartridge, lift the cartridge by its handle, place it in the drive, rotate it until it settles in place, and press the handle down to lock it. Place the dust cover on top and push the drive back into the chassis. (If any of these steps don't work, you have not inserted the cartridge properly -- try again.)

If your drive uses a pack of platters, insert the pack. Open the drive, unscrew the disk pack from its base, and grasping the pack by its handle, settle it in the drive. Turn the handle to secure the pack, then lift the handle to remove the dust cover, and close the drive.

3. Turn your system console (display terminal or printing terminal) ON and make sure its LINE/LOCAL switch is on the LINE position. On some DASHER™ consoles, the LINE/LOCAL switch is behind the console. You should always have the system console (and, later on, any other terminals the system will be using) on LINE before starting up software.

   If this is an upper/lowercase console, set it in ALPHA LOCK because some of the programs you'll be using don't accept lowercase letters.

4. Turn or press the disk and computer power switches to ON. If your source device (diskette drive, mag tape or cassette unit, paper tape reader) has a separate power switch, turn this device ON.

   Press the disk LOAD switch to its READY or START or RUN position (if any; depending on the disk model). Wait for the READY lamp to light.

5. Certified Data General disk packs and cartridges that must be formatted are shipped formatted. But if you are using uncertified disks, or need to reformat a disk, you must consult your local Data General field service representative.

6. If you are loading RDOS from diskettes, go to Chapter 2. If loading from magnetic tape, go to Chapter 3. For cassettes, go to Chapter 4. For paper tape, go to Chapter 5.
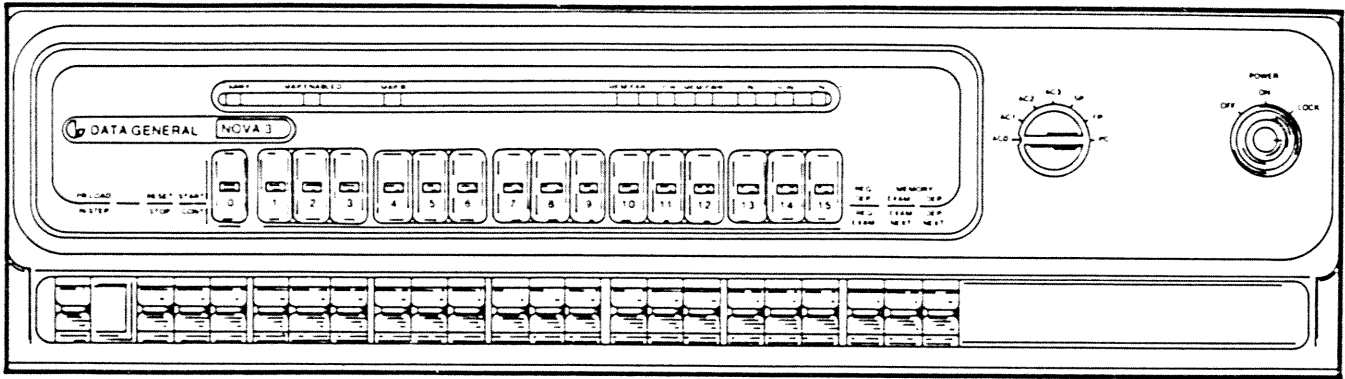
NOVA 3 Operator's Console
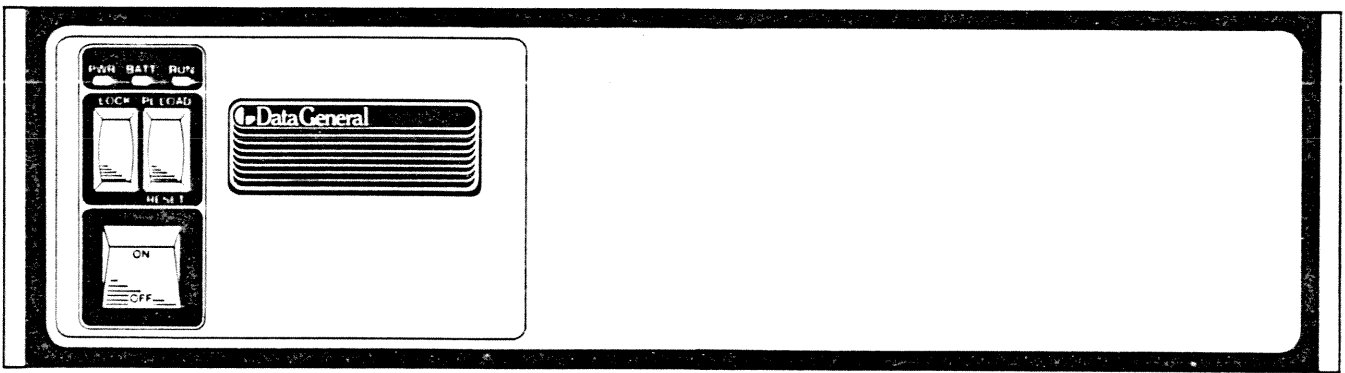
NOVA 4 Operator's Console
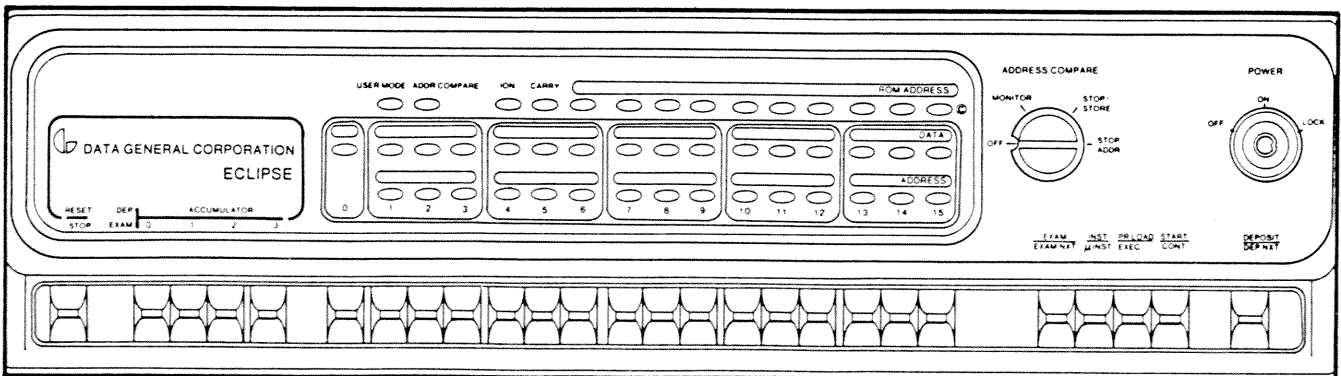
Commercial ECLIPSE Series Operator's Console

Figure 1-1. Some Data General Computer Front Panels

End of Chapter

Chapter 2
Loading the RDOS Starter System
from Diskettes

There are several different types of diskette/disk combinations. In one combination, the diskette and disk have separate controllers, which gives them different device codes. In another combination, the diskette and disk share a controller, which gives them the same device code; this adds a few steps to the procedure of loading the RDOS starter system. (The device code is essential because it is the number you will use to program load the computer from diskette or disk.)

Generally, we assume that your diskette is on its primary controller (device code 33_8, but, regardless of your disk/diskette combination and device code(s), we show you how to discover them and load the RDOS starter system using them.

The RDOS Diskettes

When you receive your RDOS system on diskettes, Data General supplies RDOS software on one to four diskettes. If you have a double-density diskette drive, this software fits on a single diskette. If you have a single-density diskette drive, the RDOS software fits on either three or four diskettes, depending on your type of computer.

Double-density diskettes have two read/write surfaces, thus they hold four times as much as single-density diskettes. A drive that runs one type of diskette cannot run the other.

In this chapter, you will use every RDOS diskette (one to four) that Data General supplied. Table 2-1 describes the programs included on the diskette(s).

Table 2-1. The RDOS Diskette(s)

Diskette #		Program Names	File Contents
Double Density	Single Density		
1	1	BOOT.SV	A program that can install a *bootstrap root* on the disk and, using this program, can execute other programs in the computer.
		DKINIT.SV	A disk initializer program that you must run on a hard disk before you can put any programs on it.
		FDBOOT.SV	A program that copies the starter system, FDBOOTSYS.SV, from file 0 on this diskette to your hard disk. FDBOOT then invokes the starter system.
		0	This file contains the starter system. FDBOOT reads and copies it to the hard disk.
		1	Contains system library files that you LOAD onto your hard disk.
	2	2	Contains utility programs (text editors, assemblers, etc.) that you LOAD onto your hard disk.
	3	3	Contains other utility programs and the system generation libraries.
	4	4	Contains certain hardware support programs. Depending on your hardware, you may not get this file or diskette.

Program Load

To read programs in from diskette, you must insert the appropriate diskette in diskette drive 0 and program load your computer. (For the rest of this chapter, the word "diskette" means a system diskette that you received from Data General and "disk" means the hard disk that will hold your tailored system.

Assuming that you have taken the preliminary steps described in Chapter 1, follow these steps to program load from diskette:

1. If your disk drive and diskette drive are on different controllers, make sure both drives have unit number 0 selected (if the drives have unit selector). (Only model 6098/6099, 6045, or 4234 disks can share a controller with a diskette; if you don't have one of these, your disk and diskette are on different controllers. If the diskette has its own controller, generally this is the second controller; the diskette name is "DP4" and its device code is 100073 octal. These will remain constant in the future. If the diskette has it own controller, skip to step 3.)

2. If your disk drive *does* share a controller with the diskette drive, you must make the diskette drive number 0 and the disk drive number 1.

   a. If *both* disk and diskette have thumbwheel drive number selectors, then you have a model 6045 disk. Dial "0" on the diskette selector and "1" on the disk selector; go to step 3.

   b. If *neither* disk or diskette drive has a selector, then you have a model 6098/6099 sealed disk/diskette subsystem. On this, you must use a switch to make the diskette drive number 0.

   Pull down the two clips at the side of the *disk* front panel and remove the panel. At the bottom of the disk drive, you'll see a two-inch cutout in the sheet metal, with arrows and type next to it. Examine this cutout and you'll see *two* small toggle switches. Ignore the left switch (WRITE PROTECT), and move the right switch (DRIVE 0 SELECT) to the left; i.e., to the position marked "DSK1/FPY0". This makes the diskette drive 0 (name DP0) and the disk drive 1 (name DP1). The diskette will remain DP0 and the disk DP1 throughout this chapter.

   Leave the disk panel off temporarily and proceed to step 3.

   c. If the diskette drive has a selector and the disk drive does not, then you have a model 4234 dual-platter disk subsystem. On a model 4234 disk, there is no select switch and the disk is always named DP0/DP0F when it is READY; this will require you to execute several extra steps, as noted, in this chapter. To make the diskette drive 0 (required for program load), flip the disk's LOAD/RUN switch to LOAD and dial 0 on the diskette selector.

3. Remove the appropriate Data General-supplied diskette from its envelope. This is diskette # 1 if your received three or four RDOS diskettes for a single-density diskette drive; it is the *only* RDOS diskette you received if you have a double-density diskette drive. Do *not* cover the write-protect hole on this diskette.

   Make sure power is on to the diskette drive. Open the door to the diskette drive by pressing the latch button (double-density diskettes) or by depressing the latch tab (single-density disketes). Slide the DG diskette, with its label up and heading toward you, firmly into its slot. When it stops sliding, release it and close the diskette door.

4. If your computer has a programmed console, go to step 5. If it has hardware data switches and automatic program load, go to step 6. If it has data switches and lacks automatic program load, go to step 7.

5. The display terminal or printing system console should show a number and an exclamation point (!) prompt. (If not, flip the computer power switch OFF and ON.) Find nn in Table 2-2, and type:

   1000nnL (often, 100033L)

   on the system console. Go to step 8.

6. For a computer with data switches and automatic program load, set the data switches as shown in Table 2-2. Lift the RESET switch, then the PROGRAM LOAD switch. Go to step 8. (On a SUPERNOVA, set the switches to 00033_8 and press CHANNEL START.)

Table 2-2. Diskette Device Codes

Disk/Diskette:	nn—	With hardware data switches, set these switches up, others down:
Disk and diskette on 1 primary controller (models 6045, or 4234).	33	0, 11, 12, 14, 15
Disk and diskette each with primary controller.	33	0, 11, 12, 14, 15
Diskette on secondary controller.	73	0, 10, 11, 12, 14, 15

7. Without automatic program load, you'll key a two-word program into the switches. Follow these steps (we tell you them here, then refer you to this section later).

    a. Set the data switches to 000376$_8$.

    b. Lift the EXAMINE switch, and, on a NOVA 3 computer, hold it up. Verify that the lamps lit match the switches in the up position.

    c. Find nn in Table 2-2 and set the data switches to 0601nn$_8$.

    d. Lift the DEPOSIT switch, and, on a NOVA 3 hold it up. Verify that the lamps lit match the switches set in the up position.

    e. Set switches to 000377$_8$.

    f. Depress the DEPOSIT NEXT switch and, on a NOVA 3, hold it down. Verify that the lamps lit match the switch settings.

    g. Set the data switches to 000376$_8$. Lift and release the RESET switch, then the START switch. You are now executing a two-word program that you just loaded into the computer's memory.

8. By either automatic program load hardware or your manual two-word program, the computer now reads program BOOT.SV in from the diskette and executes it. (If nothing happens, open and close the diskette door to reset the read/write head and try step 4 again. If this doesn't work, try step 4 again, but use the device code for the other controller.)

The bootstrap program asks the question:

FILENAME?

The Disk Initializer

BOOT.SV has typed out:

FILENAME?

9. Type in your response:

DKINIT)

Pressing the) (RETURN) key tells the computer to accept the value preceding the). If you make a mistake while typing in an answer but before pressing), press the DEL or RUBOUT key to erase the bad characters one by one. DKINIT echoes an underscore (_) for each character erased. For mistakes other than typing errors, consult Appendix B. If DKINIT stops responding altogether after an answer, turn the computer OFF and ON, open and close the diskette door, and start again at step 4.

You have asked BOOT to read and execute DKINIT.SV, the disk initializer program. DKINIT types out:

DISK INITIALIZER REV x.xx (xx = revision number)
DISK DRIVE MODEL NUMBER?

10. Skip this step unless you have a model 4234 disk. With a 4234 disk, dial "1" on the diskette drive selector; then flip the disk LOAD/RUN switch to RUN and wait for the READY light.

11. DKINIT is asking for the Data General model number of your hard disk. Type in the correct number from column 3 of Table 2-3 (e.g., 6099), 6070), etc.)

If you type in an unidentifiable model number, or give an illegal response to any DKINIT question, the program will type out an appropriate error message and repeat the question.

DKINIT now asks:

DISK UNIT?

which is a request for the name that identifies your hard disk.

12. Find your disk unit name in column 3 of Table 2-4 and circle it. You'll be typing in this disk name (or names) twice more in this chapter. Type in the name (e.g.; DP0) or DP1)).

Table 2-3. Disk Model Numbers

DGC Model #	Disk Drive Type	Type in
6001-6008	Fixed-head NOVADISK (no cartridge), .13 megabyte (mb) to 2 mb.	6001) to 6008)
6063 6064	Fixed-head (no cartridge), 1 mb. Fixed-head (no cartridge), 2 mb.	6063) 6064)
4047A, 4047B 4237, 4238	Front-loading cartridge, 2.4 mb.	4047) 4237) or 4238)
6045	Dual-platter disk with toploading cartridge, 10 mb. (5 mb. each disk)	6045)
6070	Dual-platter disk with toploading cartridge, double-density, 20 mb. (10 mb. each disk)	6070)
6099	Sealed moving-head disk, 12.5 mb.	6099)
4234	Dual-platter disk with toploading cartridge, 10 mb. (5 mb. each disk)	4234)
4048A	Toploading pack, 6 platters, 6.2 mb.	4048)
4057A	Toploading pack, 11 platters, 25 mb.	4057)
4231A	Toploading pack, 11 platters, 92 mb.	4231)
6060	Toploading pack, 11 platters, 96 mb.	6060)
6061	Toploading pack, 11 platters double density, 190 mb.	6061)
6067	Toploading pack, 5 platters, 50 mb.	6067)

Table 2-4. Disk Unit Names

DGC Model #	Disk Drive Type	Type in
6001-6008	Fixed-head NOVADISK (no cartridge), .13 megabyte (mb) to 2 mb.	DK0)
6063 or 6064	Fixed-head (no cartridge), 1 mb. or 2 mb.	DS0)
4047A, 4047B 4237, 4238	Front-loading cartridge, 2.4 mb.	DP0)
6070	Dual-platter disk with toploading cartridge, double-density, 20 mb.* unit name of removable cartridge unit name of fixed disk	DP0) DP0F)
6045	Dual-platter disk with toploading cartridge and drive selector, 10 mb., shares controller with single-density diskette * unit name of removable cartridge unit name of fixed disk	DP1) DP1F)
6099	Sealed moving-head disk, shares controller with double-density diskette.	DP1)
4234	Dual-platter disk with toploading cartridge, no drive selector, 10 mb., shares controller with single-density diskette * unit name of removable cartridge unit name of fixed disk	DP0) DP0F)
4048A, 4057A, or 4231A	Toploading pack, 6 or 11 platters, 6.2 to 92 mb.	DP0)
6060, 6061 or 6067	Toploading pack, 5 or 11 platters, 50 to 190 mb.	DZ0)

* The disks on these toploaders are logically distinct and you will run DKINIT on each.

13. Now, if your entries were correct, DKINIT requests a command:

COMMAND?

Type FULL):

FULL)

With this, you request a full initialization of the disk. DKINIT.SV will fully check out your disk, detect portions that will not retain information, and mark them so that RDOS will bypass them. It will also construct on the disk certain tables that RDOS needs.

DKINIT.SV asks you several questions during this initialization; these are more fully explained in Chapter 8, the Disk Initializer. For the moment, just key in the answers shown in boldface in the facing DKINIT.SV dialog and take it on faith that the program works. Ignore the CONTROL-A instruction. (If the dialog varies from that shown in the DKINIT.SV dialog, consult Chapter 8 or Appendix B for error recovery procedures.)

DKINIT takes some time to check out each pattern, so don't be alarmed when you have to wait. Typical time for a test pattern is up to 90 seconds for a single front-loading disk, and up to two and one-half minutes for a 6045 or 4234A disk. If you have a very large disk, like a 6061, the time can exceed a half-hour per pattern. While initializing a large disk, you may want to leave the computer and do something else. You can do so after the first pattern runs without error messages.

After you complete the facing DKINIT.SV dialog, the disk(s) is fully initialized and the computer halts.

Installing the Bootstrap Root

Next, you'll install the disk bootstrap root on your disk(s). This root will help you start systems or programs using only the program load steps. The program that installs the root is BOOT.SV. As you did with DKINIT, you must go through the program load steps -- this time to load the installer portion of BOOT.SV.

14. Open and close the diskette door. This ensures that the diskette read/write head is at the beginning of the diskette.

15. Skip this step unless you have a model 4234 disk. With a model 4234 disk, flip the disk LOAD/RUN switch to LOAD; then dial "0" on the diskette drive.

16. Program load your computer. If it has a programmed console, type:

1000nnL   (usually 100033L or see Table 2-2)

on the system console and proceed.

If the computer has data switches and automatic program load, lift the RESET switch, then the PROGRAM LOAD switch; proceed.

If the computer has data switches but lacks auto program load, execute step 7 and return here.

17. Once again, BOOT.SV types:

FILENAME?

(If nothing happens, execute steps 14 and 16 again.)

18. Type BOOT):

BOOT)

This reads in the installer portion of BOOT.SV BOOT says:

BOOT x.xx

BOOTSTRAP DEVICE SPECIFIER?

19. Skip this step unless you have a model 4234 disk. With a 4234 disk, dial "1" on the diskette drive; then flip the disk LOAD/RUN switch to RUN and wait for the READY light.

20. Respond with the same disk-identifying name (DP0), DP1), DZ0), etc.) from Table 2-4 that you gave to DKINIT.

BOOT now says:

INSTALL BOOTSTRAP (Y OR N)?

21. Type:

Y

and BOOT will say:

DONE.

BOOTSTRAP DEVICE SPECIFIER?

22. If you have a dual-platter toploader disk, type DP1F), then Y, to install the bootstrap root on the fixed disk. (Or, for a model 4234 disk, type DP0F) and Y.) BOOT will then ask SPECIFIER? again.

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```
COMMAND? FULL)
COMMAND DESTROYS ANY PREVIOUS RDOS DISK STRUCTURE
RDOS INIT/F MUST BE DONE ON DISK AFTER COMMAND
TYPE CONTROL-A NOW TO ABORT WITHOUT LOSS
```

a. *NUMBER OF PATTERNS TO RUN (1-5)?* 5)

    PATTERN #1 (155555)

    PATTERN #2 (125252)

    PATTERN #3 (052525)

    PATTERN #4 (000000)

    PATTERN #5 (177777)

    ALL PATTERNS RUN

b. *DO YOU WISH TO DECLARE ANY BLOCKS BAD*
   THAT ARE NOT ALREADY IN THE BAD BLOCK TABLE? NO)

   DEFAULT REMAP AREA SIZE IS xx BLOCK(S) LONG (make note of xx)
   IT NEEDS TO BE AT LEAST n BLOCK(S) LONG (n is the number of bad blocks DKINIT found)

c. *REMAP AREA SIZE (TYPE RETURN FOR DEFAULT)?*)

d. *REMAP AREA START BLOCK NUMBER (TYPE RETURN FOR DEFAULT)?*)

   DEFAULT FRAME SIZE IS dd
   MIN IS 1, AND MAX IS mmm (dd and mmm vary with the disk.)

e. *DISK FRAME SIZE (TYPE RETURN FOR DEFAULT)?*)

   FULL DISK INIT COMPLETE

   COMMAND?

f. For a single disk platter or disk pack, you're done; type STOP) and skip the rest of the steps in this table.

   For a dual-platter toploader subsystem (model 6045, 6070, or 4234) type

   DISK)
   DISK INITIALIZER REV x.xx

g. *DISK DRIVE MODEL NUMBER?* nnnn) (original model number)

h. *DISK UNIT?* DP1F)   (DP0F) for 4234 disks)

i. Repeat steps a. through e. to initialize the fixed disk. When DKINIT asks *COMMAND?*, type STOP).

Installing the RDOS Starter System

With the disk(s) checked out and the bootstrap root installed, you can now install the RDOS starter system.

23. BOOT is still asking for SPECIFIER? Get your diskette name from Table 2-5 and force BOOT to ask FILENAME by typing the diskette name and N:

    name)   (usually, DP0))

    INSTALL BOOTSTRAP (Y OR N)?

24. Type N:

    N

    FILENAME?

25. Answer BOOT's FILENAME? query by typing:

    SYS)

    BOOT now uses link SYS to load FDBOOT, which in turn loads the starter system and executes it. This may take three or four minutes. (If you get a *FILE DOES NOT EXIST* message from SYS) try steps 23 and 24 again.)

    Eventually, the starter system will come up and type out:

    NOVA RDOS REV x.x   (x.x is the revision
    DISK ID?   number)

26. Type in the same hard-disk name (DP0), DP1), DZ0), etc.) from *Table 2-4* that you gave to DKINIT.

    The starter system then asks:

    FULL INIT (Y/N) ?

Table 2-5. Diskette Names before System Generation

If you program loaded from code:	The diskette "name" is:
100033 on all but 4234 systems	DP0
100033 on 4234 systems	DP1
100073 on all but 4234 systems	DP4
100073 on 4234 systems	DP5

27. It's asking whether or not you want an RDOS full initialization on the hard disk. You want a full initialization from RDOS; this corresponds to the warning DKINIT gave you: *RDOS INTI/F MUST BE DONE ON DISK AFTER COMMAND.* Type:

    Y)

    The starter system now does an INIT/F and copies itself from the diskette to the disk. It then executes itself from the disk. This takes two or three minutes. You will see the messages:

    MASTER DEVICE RELEASED

    NOVA RDOS REV x.x
    DATE (M/D/Y)?

    The diskette has been released and the starter system is now running from the hard disk.

28. Enter the current date in the format (month day year); either a space or slash can separate your entries. For example:

    1 10 79)

    TIME (H:M:S)?

29. Enter the time in the format "hours minutes seconds". Hours should be in 24-hour form; either a space or colon can separate your entries. The seconds entry is optional; for example:

    14 10)

    Now the starter system invokes the Command Line Interpreter (CLI). The CLI allows you to communicate with RDOS from the console. The CLI prompt is:

    R

    With the CLI running, you can load the rest of the files from the system diskette(s). The original diskette # 1 is still in DP1; it contains more files to be loaded.

30. Start recording in the log file by typing:

    LOG/H)

    This records all CLI dialog (including filenames loaded) in disk file LOG.CM.

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31. Next, initialize the diskette and load files from it. The diskette name is shown in Table 2-5; it is usually DP0. Type:

INIT name)   (usually DP0))
R
LOAD/V name:1)   (usually DP0:1)

(The CLI displays filenames as it loads onto the hard disk. Wait for the R prompt.)

R

32. If you received three or four RDOS diskettes, you have a single-density diskette drive; go to step 33. If you received only one RDOS diskette, you have a double-density drive and your hard disk contains all the RDOS Software; go to Step 36.

33. To load from the remaining diskettes (single-density diskettes), remove the DG diskette from its drive. Don't RELEASE it first. Insert diskette # 2 in the diskette drive and type:

LOAD/V DP0:2)   (DP1:2) with a 4234 disk)

(CLI verifies filenames loaded.)

R

34. After receiving the R prompt, remove diskette # 2 from the diskette drive and insert diskette # 3. Don't RELEASE diskette. Type:

LOAD/V DP0:3)   (DP1:3) with a 4234 disk)

(verification)

R

35. Remove diskette # 3 from its drive and insert diskette # 4. Type:

LOAD/V DP0:4)   (DP1:4) for 4234 disks)

(verification)

R

36. Now, if you have a dual-platter toploader disk, make the fixed disk available to RDOS and give it a copy of BOOT.SV by typing:

INIT/F DP1F)   (DP0F) for a 4234 disk)
R
MOVE/V DP0F BOOT.SV) (DP0F for a 4234 disk)
BOOT.SV
R

We'll explain the INIT/F and BOOT.SV steps in the post-SYSGEN chapter.

37. To close the log file, type:

ENDLOG)
R

If your system console is a keyboard/printer, the typed filenames are your record of the files loaded. If your console is a display terminal, you must generate a tailored system before you can print the log file on the line printer.

38. You've finished loading the starter system files and are nearly done with the starter system procedure. Release the hard disk by typing:

RELEASE %MDIR%)

RDOS will then sign off by typing:

MASTER DEVICE RELEASED

39. If the disk and diskette share a controller, make the disk into drive 0 and the diskette drive 1 (except for a 4234 disk, which is already drive 0).

   a. If both disk and diskette drive have a drive selector, dial "0" on the disk and "1" on the diskette.

   b. If neither disk or diskette has a drive selector, turn to the disk front panel. Move the right-hand toggle switch, marked DRIVE 0 SELECT, to the right; i.e., to the "DSK0/FPY1" position. Replace the front panel cover on the disk drive.

You've finished the starter system procedure. For the first controller, the diskette name is now DP1 and will remain DP1 unless you change it, either with the toggle switch or diskette thumbwheel. For the second controller (code 73) the diskette name is DP5.

The "disk" name is "DP0", or, if the disk and diskette are on separate controllers, the name you gave DKINIT; e.g., DS0 or DZ0. (For a "DP"- type disk on the second controller, the disk name is "DP4".)

Remove the diskette from its drive and replace it in its outer envelope. You're done with the DG-supplied RDOS diskettes and can store them in a safe place.

To generate a tailored system, go to Chapter 6. This procedure will be *much* easier than what you've done already.

Figure 2-1 summarizes the steps you take to install the RDOS starter system from diskette. You may want to refer to this figure whenever you want to install the starter system from diskette.

Execute preliminary steps (disks in drives, power on to devices) described in Chapter 1.

1. If disk and diskette are on different controllers, make sure each is drive number 0.

2. If disk and diskette share a controller, make diskette "0" and disk "1":
   a. if both have selectors (model 6045 or 6070) dial 0 on diskette and 1 on disk.
   b. if neither has a selector (model 6099) remove disk front panel and throw toggle switch to DSK1/FPY0 positions.
   c. if only diskette has selector (model 4234), dial 0 on it and flip disk's LOAD/RUN switch to LOAD.

3. Make sure diskette drive is ON, open door, insert appropriate DG-supplied RDOS diskette (lone RDOS diskette for double-density, diskette #1 for single-density) in drive, close door.

4. If your computer has a programmed console, go to step 5; if it has data switches and automatic program load, go to step 6; if it lacks auto program load, go to step 7.

5. Get nn from Table 2-2 (usually 33) and type 1000nnL (usually 100033L on system console; go to step 8.

6. Get nn from Table 2-2 (usually 33) and set the data switches to $1000nn_8$ (usually 100033, with switches 0, 11, 12, 14, and 15 up, the others down). Lift the RESET switch, then PROGRAM LOAD. Go to step 8.

7. Set data switches to 376_8. Lift EXAMINE. Get nn from Table 2-2 (usually 33) and set switches to $0601nn_8$. Lift DEPOSIT, set switches to 377_8. Press DEPOSIT NEXT. Put down switch 15. Lift RESET, then START (on SUPERNOVA, CHANNEL START).

8. *FILENAME?*

9. DKINIT)

   DISK INITIALIZER REV x.xx

11. *DISK DRIVE MODEL NUMBER?* nnnn) (disk model number from Table 2-3)

Figure 2-1. Installing the RDOS Starter System from Diskette

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12. *DISK UNIT?* Dmm) (DP0), DP1), DZ0), etc., unit name from Table 2-4)

13. *COMMAND?* FULL)
    COMMAND DESTROYS...
    a. *NUMBER OF PATTERNS TO RUN?* 5)
        PATTERN NUMBER 1...

        (DKINIT runs patterns.)

    b. *DO YOU WISH TO DECLARE ANY BLOCKS BAD
        THAT ARE NOT ALREADY IN THE BAD BLOCK TABLE?* NO)
        DEFAULT REMAP AREA SIZE....
    c. *...TYPE RETURN FOR DEFAULT)?*)
    d. *... TYPE RETURN FOR DEFAULT)?*)
        DEFAULT FRAME SIZE...
    e. DISK FRAME SIZE (TYPE RETURN FOR DEFAULT)?)
        *FULL DISK INIT COMPLETE
        COMMAND?*
    f. For all but dual-platter toploaders, type STOP). For dual platter toploaders, DISK), same model number
        mmmm, then DP1F) (DP0F) for 4234s). FULL), 13a through 13e, then STOP).

14. Open and close diskette door.

15. Slip to next step unless you have a 4234. With a 4234, flip disk LOAD/RUN switch to LOAD, dial 0 on
    diskette thumbwheel.

16. Program load your computer:

    For programmed console, type 1000nnL (100033L or see Table 2-2).
    For hardware data switches and automatic program load, lift RESET, then PROGRAM LOAD.
    For hardware data switches without automatic program load, execute full step 7.

17. *FILENAME?*

18. BOOT)

    *BOOT REV x.xx
    BOOTSTRAP DEVICE SPECIFIER?*

19. Skip this step unless you have a 4234. For a 4234, dial 1 on diskette thumbwheel; flip disk's LOAD/RUN
    switch to RUN and wait for READY light.

20. *BOOTSTRAP DEVICE SPECIFIER?* Dmm) (DP0), DP1), DZ0), etc. from Table 2-4)

21. *INSTALL BOOTSTRAP (Y OR N)?* Y

    *DONE.
    BOOTSTRAP DEVICE SPECIFIER?*

22. For a dual-platter top-loading disk, type DP1F) (DP0F) for 4234), then Y.

23. BOOTSTRAP DEVICE SPECIFIER? DPn) (DP0), DP1), diskette name from Table 2-5)

24. *INSTALL BOOTSTRAP (Y OR N)?* N

Figure 2-1. Installing the RDOS Starter System from Diskette (continued)

25. *FILENAME?* SYS)

   NOVA RDOS REV x.x
26. DISK ID? DPm)   (DP0), DP1), DZ0), etc., from Table 2-4)

27. *FULL INIT (Y/N)?* Y)

   MASTER DEVICE RELEASED

   NOVA RDOS REV x.x
28. *DATE (M/D/Y)?* 1 10 79) (Enter current date.)

29. *TIME (H:M:S)?* 14 10) (Enter time.)

   R

30. LOG/H)
   R

31. INIT DPn) (DP0), DP1), diskette name from Tabel 2-5)
   R
   LOAD/V DPn:1) (DP0:1), DP1:1), diskette name)
     (filenames)
   R

32. For three or more diskettes, go to step 33. Otherwise load all files from the diskette:

   LOAD/V DP0:2) (or, from Table 2-5, name:2)) (filenames)
   R
   LOAD/V DP0:3) (or name:3))
     (filenames)
   R
   LOAD/V DP0:4) (or name:4))
     (filenames)   (Disregard error message, if any.)
   R

   Go to step 36.

33. Remove diskette #1 from drive, insert diskette #2 in drive, and type:

   LOAD/V DP0:2) (DP1:2) for 4234 disk)
     (filenames)
   R

——————————*Figure 2-1. Installing the RDOS Starter System from Diskette (continued)*——————————

34. Remove diskette #2 from drive, insert diskette #3 in drive, and type:

    ```
    LOAD/V DP0:3)    (DP1:3) for 4234)
    (filenames)
    R
    ```

    If you received only three diskettes, go to step 36.

35. Remove diskette #3 from drive, insert diskette #4 in drive, and type:

    ```
    LOAD/V DP0:4)    (DP1:4) for 4234)
    (filenames)
    R
    ```

36. Dual-platter toploader disks only:

    ```
    INIT/F DP1F)    (DP0F) for 4234 disks)
    R
    MOVE/V DP1F BOOT.SV) (DP0F) for 4234)
    BOOT.SV
    R
    ```

37. ENDLOG)
    R

38. RELEASE %MDIR%
    MASTER DEVICE RELEASED

39. If disk and diskette share a controller, make disk drive 0 and diskette drive 1 (except for 4234 disks):

    a. If both disk and diskette have a selector, dial 0 on disk and 1 on diskette.
    b. If neither has a selector (model 6099), move disk toggle DRIVE 0 SELECT switch to right, to DSK0/FPY1 position. Replace disk panel front cover.

To generate a tailored system, go to Chapter 6.

Figure 2-1. Installing the RDOS Starter System from Diskette (continued)

End of Chapter

Chapter 3
Loading the RDOS Starter System
from Magnetic Tape

The RDOS Tape

When you receive your RDOS system on magnetic tape, Data General supplies a tape with eight files or more. Each of these tape files (described in Table 3-1) has one or more programs in it. If you received the INFOS® file system (commercial ECLIPSE® systems only), your tape has more files; you'll be using them as described below.

Table 3-1. RDOS Magnetic Tape File Structure

File #	Program Names	File Contents
0	TBOOT.SV	A short program which you use to read in other files from this magnetic tape.
1	CLI.SV, CLI.OL, CLI.ER BOOT.SV BOOTSYS.SV	Programs which make up the RDOS Starter System (but are not readable by TBOOT.SV).
2	BOOTSYS.SV	The RDOS Starter System in a form that TBOOT.SV can read.
3	BOOTSYS.OL	
4	DKINIT.SV	A disk initializer program which you must run to prepare the disk before you put any RDOS system on it. TBOOT.SV can read this file.
5	BOOT.SV	This program installs a bootstrap loader on the disk, after which you can start up RDOS directly from the disk using the computer front panel switches. TBOOT.SV reads BOOT.SV.
6	RDOS Utilities	The appropriate utility programs for your license (assemblers, text editors, debuggers, etc.) are in this file. You load them onto the disk using the RDOS Starter System.
7	SYSGEN programs	You load these RDOS System Generation programs onto the disk using the RDOS Starter System; then you execute them to generate your tailored RDOS system.
INFOS only		
8	INFOS Libraries and Parameter files	INFOS needs these language libraries and files.
9	INFOS Utilities	These programs help you work with INFOS.
10	Release Notice	Latest notes on your system, in machine-readable format.

Program Load

As you can see from the tape file organization, you'll have to read TBOOT.SV into the computer before you can read and execute any of the other programs from the magnetic tape. To do so:

1. a. Remove the write-enable plastic ring from the tape, if this has not already been done. (This protects the tape from accidentally being written upon.)

   b. Select unit 0 on the tape drive you will use, and make sure that no other drive has the same number.

   c. Mount and thread the tape.

2. Using the tape drive panel switches, LOAD the tape and set the unit ON LINE. The READY, WRITE LOCK and BOT lights should be lit.

3. If your computer has a programmed console, go to step 4. If it has numbered data switches and automatic program load, go to step 5. If it has data switches and lacks automatic program load, go to step 6.

4. The display terminal or printing system console should show a number and an exclamation point (!) prompt. (If not, flip the computer power switch OFF and ON.) Type:

   100022L

   on the system console and go to step 7.

5. With hardware data switches and automatic program load, set the data switches to 100022₈ (switches 0, 11, and 14 up, the others down). Lift the RESET switch, then the PROGRAM LOAD switch. Go to step 7. (On a SUPERNOVA, set the switches to 000022₈, lift RESET, and press CHANNEL START.)

6. Without auto program load, you'll key a two-word program into the switches. Follow these steps (we tell you them here, then refer you to this version later).

a. Set the computer's front panel data switches to 000376₈ (switches 8 through 14 up, others down).

b. On a NOVA 3 machine, lift the EXAMINE switch and hold it up. Verify that the lamps that are lit match the switches set in the up position. Release the switch. For other machines, lift the EXAMINE switch and verify that the lamps lit match the switches set.

c. Set the data switches to 060122₈ (switches 1, 2, 9, 11, and 14 up, others down).

d. On a NOVA 3 computer, lift the DEPOSIT switch and hold it up. Verify that the lamps lit match the switch settings, and release the switch. On other machines, lift the DEPOSIT switch. Verify that the pattern in the DATA lights matches the data switch setting.

e. Set the data switches to 000377₈ (switches 8 through 15 up, others down).

f. On a NOVA 3 machine, depress the DEPOSIT NEXT switch and hold it down; verify that the lamps lit match the switch settings, and release the switch. For other machines, depress the DEPOSIT NEXT switch. Verify that both the ADDRESS and DATA lights match the switch settings.

g. Set the data switches to 000376₈ (put down switch 15). Lift and release the RESET switch, then the START switch. You are now executing a two-word program that you just loaded into the computer's memory.

7. The computer now reads TBOOT.SV (the first file) from the magnetic tape, and executes the TBOOT.SV program. TBOOT.SV types out:

   FROM MT0:

   on the system console.

The Disk Initializer

After TBOOT.SV has typed

FROM MT0:

8. Type in your response, as shown in boldface type in the following example:

   4)

Pressing the RETURN key tells the computer to accept the value preceding the ") ". If you make a typing mistake while typing in an answer, but before pressing RETURN, press the DEL or RUBOUT key to erase the bad characters one by one. DKINIT echoes an underscore (_) for each character erased. For mistakes other than typing errors, consult Appendix A.

You have asked TBOOT to read and execute the tape file which holds DKINIT.SV, the Disk Initializer program. You'll see the tape moving as TBOOT.SV loads the file into the computer.

TBOOT then directs the computer to execute DKINIT.SV.

DKINIT.SV types out:

DISK INITIALIZER - REV xx (xx = revision number)
DISK DRIVE MODEL NUMBER?

9. It's asking you for the Data General model number of your disk drive. Type in the correct number from the third column of Table 3-2.

If you type an unidentifiable model number, or give an illegal response to any of the DKINIT.SV questions, the program will type out an appropriate error message and repeat the question.

DKINIT then types:

DISK UNIT?

which is a request for the name of your disk.

Table 3-2. Disk Model Numbers

DGC Model #	Disk Drive Type	Type In
6001-6008	Fixed-head NOVADISK (no cartridge), .13 to megabyte (mb) to 2 mb.	6001) to 6008)
6063 or 6064	Fixed-head (no cartridge), for 1 mb for 2 mb.	6063) 6064)
4047A, 4047B, 4237, 4238	Front-loading cartridge, 2.4 mb.	4047) 4237) or 4238)
6045	Top-loading cartridge with fixed disk, 10 mb.	6045)
4234A	Top-loading cartridge with fixed disk, 10 mb.	4234)
6070	Top-loading cartridge with fixed disk, 20 mb.	6070)
6099	Sealed moving-head disk, 12.5 mb.	6099)
4048A	Top-loading pack (6 platters), 6.2 mb.	4048)
4057A	Top-loading pack (11 platters), 25 mb.	4057)
4231A	Top-loading pack (11 platters), 92 mb.	4231)
6060	Top-loading pack (11 platters), 96 mb.	6060)
6061	Top-loading pack (11 platters). Double density 190 mb.	6061)
6067	Top-loading pack (5 platters), 50 mb.	6067)

10. Type in the correct name from the third column of Table 3-3; e.g., DP0).

11. Then DKINIT requests a command, and you type:

    COMMAND? FULL)

With this response you request a full initialization of the disk. DKINIT.SV will fully check out your disk, detect any portions that will not retain information and mark them so that RDOS will bypass them. It also constructs and saves on the disk certain tables that RDOS needs.

DKINIT.SV asks you several questions during this initialization. These are more fully explained in Chapter 11, The Disk Initializer. For the moment, key in only the boldface answers in the dialog shown in the DKINIT.SV dialog following and take it on faith that the programs works. (Ignore the CONTROL-A instruction. If the dialog varies from that shown below, consult Chapter 8 for the correct error recovery procedures.)

The program takes some time to check out each pattern successively, so don't be alarmed when you have to wait. Typical time for a test pattern is up to 90 seconds for a single front-loading disk, and up to two and one-half minutes for each 4234A disk. If you have a very large disk, like a 6061, the time *per pattern* can exceed a half-hour. While initializing a large disk, you may want to leave the computer and do something else. You can do so after the first pattern runs without error messages.

When you complete the following DKINIT.SV dialog, the disk is fully initialized and the computer halts.

Table 3-3. RDOS Disk Names

DGC Model #	Disk Drive Type	Type In
6001-6008	Fixed-head NOVADISK (no cartridge)	DK0)
6063/6064	Fixed-head (no cartridge), 1 or 2 mb.	DS0)
4047A, 4047B 4237, 4238	Front-loading cartridge, 2.5 mb.	DP0)
6045, 4234A, 6070	Top-loading cartridge, 5 mb or 10 mb per disk*	
	unit name of cartridge	DP0)
	unit name of fixed disk	DP0F)
6099	Sealed moving-head disk, 12.5 mb.	DP0)
4048A	Top-loading pack (6 platters), 6.2 mb.	DP0)
4057A	Top-loading pack (11 platters), 25 mb.	DP0)
4231A	Top-loading pack (11 platters), 92 mb.	DP0)
6060/6061	Top-loading pack (11 platters), 96 or 190 mb.	DZ0)
6067	Top-loading pack (5 platters), 50 mb.	DZ0)

*Each disk on these top-loaders is logically distinct, and you will run DKINIT on each one.

COMMAND? FULL)
COMMAND DESTROYS ANY PREVIOUS RDOS DISK STRUCTURE
RDOS INIT/F MUST BE DONE ON DISK AFTER COMMAND
TYPE CONTROL-A NOW TO ABORT WITHOUT LOSS

a. *NUMBER OF PATTERNS TO RUN (1-5)?* 5)

   PATTERN #1 (155555)

   PATTERN #2 (125252)

   PATTERN #3 (052525)

   PATTERN #4 (000000)

   PATTERN #5 (177777)

   ALL PATTERNS RUN

b. *DO YOU WISH TO DECLARE ANY BLOCKS BAD*
   THAT ARE NOT ALREADY IN THE BAD BLOCK TABLE? NO)

   DEFAULT REMAP AREA SIZE IS xx BLOCK(S) LONG (make note of xx)
   IT NEEDS TO BE AT LEAST n BLOCK(S) LONG (n is the number of bad blocks DKINIT found)

c. *REMAP AREA SIZE (TYPE RETURN FOR DEFAULT)?*)

d. *REMAP AREA START BLOCK NUMBER (TYPE RETURN FOR DEFAULT)?*)

   DEFAULT FRAME SIZE IS dd
   MIN IS 1, AND MAX IS mmm (dd and *mmm* vary with the disk.)

e. *DISK FRAME SIZE (TYPE RETURN FOR DEFAULT)?*)

   FULL DISK INIT COMPLETE

   COMMAND?

f. For a single disk platter or disk pack, you're done; type STOP) and skip the rest of the steps in this table.

   For a dual-platter toploader subsystem (model 6045, 6070, or 4234) type

   DISK)
   DISK INITIALIZER REV x.xx
g. *DISK DRIVE MODEL NUMBER?* nnnn) (original model number)
h. *DISK UNIT?* DP1F)   (DP0F) for 4234 disks)

i. Repeat steps a. through e. to initialize the fixed disk. When DKINIT asks *COMMAND?*, type STOP).

>

Installing the Bootstrap Root

Next, you'll want to put the disk bootstrap root on your disk(s). This root will help you start systems or program using only the program load switches. The program that installs the root is BOOT.SV. As you did with DKINIT, you must bring in TBOOT.SV -- this time to load the installer portion of BOOT.SV.

12. Program load your computer.

   a. If it has a programmed console, type:

      100022L

      on the system console and proceed.

   b. If the computer has data switches and automatic program load, lift the RESET switch, then the PROGRAM LOAD switch; proceed.

   c. If the computer has data switches but lacks automatic program load, execute step 6 and return here.

13. Once again, TBOOT.SV types:

    FROM MT0:

    Type 5, the file number that contains BOOT.SV:

    5)

    Your response loads the installer portion of BOOT.SV BOOT says:

    BOOTSTRAP DEVICE SPECIFIER?

14. Respond with the same disk-identifying name (DP0), DZO), etc.) from Table 3-3 that you gave to DKINIT.

    BOOT now says:

    INSTALL BOOTSTRAP (Y OR N)?

15. Type

    Y

    and BOOT will say:

    DONE.

    BOOTSTRAP DEVICE SPECIFIER?

16. If you have a dual-platter toploader disk, type DPOF), then Y, to install the bootstrap on the fixed disk. BOOT will then ask SPECIFIER? again.

Installing the RDOS Starter System

With the disk(s) initialized and the bootstrap root installed, you can now install the RDOS starter system. Once again, you must bring TBOOT.SV in from file 0 of the tape to do this.

17. Program load your computer.

   a. If it has a programmed console, press the BREAK key on your *system* console, then type:

      100022L

      and go on to the next step.

   b. If your computer has data switches and automatic program load, lift the RESET switch, then the PROGRAM LOAD switch.

   c. If it lacks auto program load, execute step 6, then return here.

18. Once again, TBOOT.SV asks for file number:

    FROM MT0:

    Type 2, the file number that contains the starter system:

    2)

19. You have directed TBOOT.SV to load the RDOS Starter System into the computer. When it is brought in, it requests:

    FULL (F) OR PARTIAL (P OR < CR >)?

    asking you to specify either full initialization or partial initialization for your disk. You want full initialization. This corresponds to the warning that DKINIT.SV gave you: *RDOS INIT/F MUST BE DONE ON DISK AFTER COMMAND.* Type:

    F)

20. The program then asks:

    INITIALIZING WHAT DISK?

    Respond with the same disk-identifying name (DP), DZO), etc.) from Table 3-3 that you gave to DKINIT.

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21. The program then loads additional portions of the RDOS Starter System from another file of the mangetic tape and stores them on the disk.

    RDOS next asks for the current date. Type in the date (month, day and year) as follows:

    DATE(M/D/Y)? 1/10/79)

22. Next, it asks for the time. Type in the time (hours in 24, minutes, seconds), as follows:

    TIME (H:M:S)? 14 10)

    RDOS then reads file number 1 from the magnetic tape and saves its programs on disk. Included is the Command Line Interpreter program CLI, which lets you communicate with RDOS from the system console.

    When RDOS types the prompt letter

    R

    your RDOS Starter System is running. It is also stored on the disk with the filename BOOTSYS.SV. (Its overlay file is stored with the name BOOTSYS.OL.) Thus you can henceforth bring your Starter System into execution directly from the disk via the computer front panel switches.

*

Transferring the Remaining Tape Files

You still need to transfer several tape files to your disk: the utility programs you received under your license, and the RDOS system genertion program and libraries you need to generate your tailored system. (If you have an INFOS system, you need four more tape files.)

23. First, start recording in the log file.

    LOG/H)
    R

    records all console dialog in file LOG.CM.

24. Now, identify the tape drive to RDOS:

    INIT MTO)
    R

    Then, to copy the programs to disk, type:

    LOAD/V/R MTO:6)
    .
    .

    (The CLI verifies files loaded.)

    R

25. Load the next tape file:

    LOAD/V MTO:7)
    .

    (Again, the CLI verifies files loaded.)

    R

26. For an INFOS system, load more files, otherwise, go to step 27.

    LOAD/V/R MTO:(8,9,10))
    .

    (INFOS files loaded.)

    R

27. Type:

    RELEASE MTO)
    R

    to disconnect the magnetic tape drive from RDOS and rewind the tape.

28. Now, if you have a dual-platter toploader disk, make the fixed disk available to RDOS and give it a copy of BOOT.SV by typing:

    INIT/F DPOF)
    R
    MOVE/V DPOF BOOT.SV)
    BOOT.SV
    R

    We'll explain the INIT/F and BOOT.SV steps in the post-SYSGEN chapter.

29. Now close the log file:

```
ENDLOG)
R
```

If you have a teletypewriter as your system console, the typed list of filenames is your record of programs loaded. (If your system console is a display terminal, you must generate a tailored system before you can PRINT the log file on the line printer.)

Your RDOS starter system is now complete. If you want to generate a tailored system at this time, go to Chapter 6, and skip the section called DISK BOOTSTRAP.

If you want to rest for a while, type:

```
RELEASE DP0) (or DZ0), etc.)
```

This terminates RDOS operations. RDOS displays a sign-off message:

MASTER DEVICE RELEASED

You can now flip the disk's LOAD/RUN switch to LOAD, and remove the disk pack or cartridge (if this applies). Later, start at the beginning of Chapter 6 to generate your tailored system.

You're done with the magnetic tape, so use the tape drive switches to RESET and UNLOAD the tape. Store it safely without inserting a plastic write-enable ring. You can now turn the drive OFF, and power down your other equipment.

Figure 3-1 summarizes the steps you take to install the RDOS Starter System on disk from magnetic tape. You can use this figure whenever you want to install the starter system on disk; or you can use the DKINIT and bootstrap sections to introduce new disks to your system.

---

1. Remove write-enable ring from tape (if any), mount and thread tape; dial unit number 0 on tape drive.

2. Press LOAD and ONLINE switches on tape drive.

3. If your computer has a programmed console, go to step 4; if it has data switches and automatic program load, go to step 5; if it lacks auto program load, go to step 6.

4. Type 100022L on system console; go to step 7.

5. Make sure the data switches are set to 100022_8 (switches 0, 12, and 14 up, the others down). Lift the RESET switch, then PROGRAM LOAD. Go to step 7.

6. Set data switches to 376_8; lift EXAMINE. Set switches to 060122_8; lift DEPOSIT. Set switches to 377_8; press DEPOST NEXT. Put down switch 15. Lift RESET, then START (on SUPERNOVA, CHANNEL START).

7. *FROM MTO:*

8. *4)*

    DISK INITIALIZER REV x.xx

9. *DISK DRIVE MODEL NUMBER?* nnnn) (see Table 3-2 for nnnn.)

10. *DISK UNIT?* DP0) (or DZ0) DS0), etc.)

————Figure 3-1. Installing RDOS Starter System on Magnetic Tape————

11. *COMMAND?* FULL)
    COMMAND DESTROYS...
    a. *NUMBER OF PATTERNS TO RUN?* 5)
       PATTERN NUMBER 1 ...

    b. *DO YOU WISH TO DECLARE ANY BLOCKS BAD*
       THAT ARE NOT ALREADY IN THE BAD BLOCK TABLE? NO)
       DEFAULT REMAP AREA SIZE....
    c. *...TYPE RETURN FOR DEFAULT)?*)
       DEFAULT REMAP AREA START...
    d. *...TYPE RETURN FOR DEFAULT)?*)
       DEFAULT FRAME SIZE...
    e. *DISK FRAME SIZE (TYPE RETURN FOR DEFAULT)?*)
       FULL DISK INIT COMPLETE
       COMMAND?
    f. For all but dual-platter toploaders, type STOP). For dual platter toploaders, DISK), same model number,
       DPOF),
       FULL), then steps a. through e., then STOP).

12. Program load your computer:
    a. For a programmed console, type 100022L.
    b. For hardware data switches and automatic program load, lift RESET, then PROGRAM LOAD.
    c. For hardware data switches without auto program load, execute full step 6 earlier.

13. *FROM MT0:* 5)

14. *BOOTSTRAP DEVICE SPECIFIER?* DP0) (DZ0), DS0), etc.)

15. *INSTALL BOOTSTRAP (Y OR N)?* Y

    DONE.
    BOOTSTRAP DEVICE SPECIFIER?

16. For a dual-platter top-loading disk, type DPOF), then Y.

17. Program load:
    a. With a programmed console, press the system console BREAK key, type 100022L, and proceed.
    b. With the data switches and automatic program load, lift RESET, then PROGRAM LOAD.
    c. Without auto program load, execute full step 6 earlier.

18. *FROM MT0:* 2)

19. *FULL (F) OR PARTIAL (P or < CR >)?* F)

20. *INITIALIZING WHAT DISK?* DP0) (or DZ0), DS0), etc.)

21. *DATE (M/D/Y)?* 1 10 79) (Enter current date.)

22. *TIME (H:M:S)?* 14 10) (Enter time.)
    R

23. LOG/H)
    R

Figure 3-1. Installing RDOS Starter System on Magnetic Tape (continued)

```
24. INIT MT0)
    R
    LOAD/V/R MT0:6)
    (filenames)
    R

25. LOAD/V/R MT0:7)
    (filenames)
    R

    If you don't have an INFOS system, go to step 27.

26. LOAD/V/R MT0:(8,9,10))
    (filenames)
    R

27. RELEASE MT0)
    R

28. For dual-platter toploading disks only:

    INIT/F DPOF)
    R
    MOVE/V DPOF BOOT.SV)
    BOOT.SV
    R

29. ENDLOG)
    R
```

Optionally, RELEASE DP0) (or DZO, DSO, etc.) or go to
Chapter 6 immediately.

Figure 3-1. Installing RDOS Starter System on Magnetic Tape (continued)

End of Chapter

Chapter 4
Loading the RDOS Starter System
from Cassette Tapes

The RDOS Cassettes

When you receive your RDOS system on cassette tapes, Data General supplies a number of cassettes. For the organization of your cassettes, see the Release Notice supplied with your system.

To start, first find the software Release Notice heading that describes Cassette Common parts; these are the same for all RDOS systems. Then find the 11-digit part number of the cassettes that are numbered 1, 2, and 3 in Table 4-1. The loading order of the first three cassettes is critical. Write the numbers 1, 2, and 3 on the proper casettes, as shown in Table 4-1. You need not number the other cassettes because you'll load them by category.

Table 4-1. RDOS Cassette Tapes and Contents

Cassette #	Program Names	Cassette Contents
1	CBOOT.SV	A short program which you use to read in programs from the cassettes.
	DKINIT.SV	A disk initializer program which you must run to prepare the disk before you put any RDOS system on it.
	BOOT.SV	This program installs a bootstrap loader on the disk, after which you can start up RDOS directly from the disk using the computer front panel switches.
	BOOTSYS.SV	The RDOS Starter System is a form that CBOOT.SV can read.
2	BOOTSYS.OL	Disk overlays for the RDOS Starter System.
3	CLI.SV, CLI.OL, CLI.ER BOOT.SV	The Command Line Interpreter and Bootstrap Installer programs for the RDOS Starter System, in disk save file format.
4 5 6 7 8	RDOS Utilities (including SYSGEN program)	The appropriate utility programs for your license (assemblers, text editors, debuggers, etc.) are on these cassettes; you load them onto the disk using the RDOS Starter System. One of the utilities included is SYSGEN.SV, which you invoke to generate your tailored RDOS system.
9 10 11	RDOS libraries	SYSGEN.SV uses these libraries to build your tailored RDOS. (If you have a mapped ECLIPSE computer, you received six library diskettes, not three.)

Program Load

As you can see from the cassette organization, you'll have to read CBOOT.SV into the computer before you can read and execute any of the other programs from the cassette tapes. To do so:

1. a. First, flip all cassette plastic tabs to uncover the write-protect holes. (This protects the tape from accidentally being written upon. You should do this before inserting any of the cassettes in the drive.)

   b. Select unit 0 on the cassette drive you will use, and make sure that no other drive has the same number.

   c. Insert the first cassette (with DKINIT.SV) in the drive, and close the door.

2. Using the cassette drive panel switches, REWIND the tape and set the unit to REMOTE.

3. If you have automatic program load hardware, execute steps 3a and 3b. Then skip to step 4. Otherwise skip to step 3c. (All ECLIPSE computers and most NOVA computers, have program load hardware.)

   a. Set the computer's front panel data switches to 100034_8 (switches 0, 11, 12, and 13 up, others down). On a SUPERNOVA set the swtiches to 000034_8 lift RESET, and depress CHANNEL START.)

   b. Lift and release the RESET switch, then the PROGRAM LOAD switch.

      If you do not have the automatic program load hardware, then execute the following steps; otherwise skip to step 4.

   c. Set the computer's front panel data switches to 000376_8 (switches 8 through 14 up, others down).

   d. On a NOVA 3 machine, lift the EXAMINE switch and hold it up. Verify that the lamps lit match the switches set in the up position. Release the switch. For other machines, lift the EXAMINE switch and verify that the lamps lit match the switches set.

   e. Set the data switches to 060134_8 (switches 1, 2, 9, 11, 12, and 13 up, others down).

   f. On a NOVA 3 computer, lift the DEPOSIT switch and hold it up. Verify that the lamps lit match the switch settings, and release the switch. On other machines, lift the DEPOSIT switch. Then verify that the pattern in the DATA lights matches the data switch setting.

   g. Set the data switches to 000377_8 (switches 8 through 15 up, others down).

   h. On a NOVA 3 machine, depress the DEPOSIT NEXT switch and hold it down; verify that the lamps lit match the switch settings, and release the switch. For other machines, depress the DEPOSIT NEXT switch. Then verify that both the ADDRESS and DATA lights match the switch settings.

   i. Set the data switches to 000376_8 (put down switch 15). Lift and release the RESET switch, then the START switch. You are now executing a two-word program that you just loaded into the computer's memory.

By employing either automatic program load hardware or your two- word manual load program, the computer now reads CBOOT.SV (the first file) from the cassette tape, and executes the CBOOT.SV program.

The Disk Initializer

4. CBOOT.SV now types:

FROM CT0:

Type in your response:

1)

Pressing the RETURN key tells the computer to accept the value preceding the ")". If you make a typing mistake while typing in an answer, but before pressing RETURN, press RUBOUT to erase the bad characters one by one. DKINIT echoes an underscore (_) for each character erased. For mistakes other than typing errors, consult Appendix A.

You have now asked CBOOT to read and execute file DKINIT.SV, the Disk Initializer program.

5. DKINIT types out:

DISK INITIALIZER-REV XX (xx = revision number)

DISK DRIVE MODEL NUMBER?

It's asking you for the Data General model number of your disk drive. Type in *one* of the responses shown in the third column of Table 4-2.

If you type an unidentifiable model number or give an illegal response to any of the DKINIT.SV questions, the program will type out an appropriate error message and repeat the question.

Table 4-2. Disk Model Numbers

DGC Model #	Disk Drive Type	Type In
6001-6008	Fixed-head NOVADISK (no cartridge), .13 megabyte (mb) to 2 mb.	6001) to 6008)
6063 or 6064	Fixed-head (no cartridge), for 1 mb for 2 mb.	6063) 6064)
4047A, 4047B, 4237, 4238	Front-loading cartridge, 2.4 mb.	4047) 4237) or 4238)
6045	Top-loading cartridge with fixed disk, 10 mb.	6045)
4234A	Top-loading cartridge with fixed disk, 10 mb.	4234)
6070	Top-loading cartridge with fixed disk, 20 mb.	6070)
6099	Sealed moving-head disk, 12.5 mb	6099)
4048A	Top-loading pack (6 platters), 6.2 mb.	4048)
4057A	Top-loading pack (11 platters), 25 mb.	4057)
4231A	Top-loading pack (11 platters), 92 mb.	4231)
6060	Top-loading pack (11 platters), 96 mb.	6060)
6061	Top-loading pack (11 platters). Double density 190 mb.	6061)
6067	Top-loading pack (5 platters), 50 mb.	6067)

6. DKINIT then types:

DISK UNIT?

which is a request for the mneomonic identifying your disk. Type in one of the mnemonics in the third column of Table 4-3.

7. Then DKINIT requests a command. Type:

COMMAND? FULL)

With this response, you request a full initialization of the disk. DKINIT.SV will fully check out your disk, detect any portions that will not retain information and mark them so that RDOS wil bypass them. It also constructs and saves on the disk certain tables that RDOS needs.

DKINIT.SV asks you several questions during this initialization. These are more fully explained in Chapter 8, The Disk Initializer. For the moment, just key in only the boldface answers in the dialog shown in the following DKINIT.SV Dialog and take it on faith that the program works. (Ignore the CONTROL-A instruction. If the dialog varies from that shown below, consult Chapter 8 for the correct error recovery procedures.)

The program takes some time to check out each pattern successively, so don't be alarmed when you have to wait. Typical time for a test pattern is up to 90 seconds for a single front-loading disk, and up to two and one-half minutes for each 4234A disk. If you have a very large disk, like a 6061, the time *per pattern* can exceed a half-hour. While initializing a large disk, you may want to leave the computer and do something else. You may do so after the first pattern runs without error messages.

When you complete the following DKINIT.SV dialog, the disk is fully initialized and the computer halts.

Table 4-3. RDOS Disk Names

DGC Model #	Disk Drive Type	Type In
6001-6008	Fixed-head NOVADISK (no cartridge)	DK0)
6063/6064	Fixed-head (no cartridge), 1 or 2 mb.	DS0)
4047A, 4047B 4237, 4238	Front-loading cartridge, 2.5 mb.	DP0)
6045, 4234A, 6070	Top-loading cartridge, 5 mb or 10 mb per disk*	
	unit name of cartridge	DP0)
	unit name of fixed disk	DP0F)
6099	Sealed moving-head disk, 12.5 mb.	DP0)
4048A	Top-loading pack (6 platters), 6.2 mb.	DP0)
4057A	Top-loading pack (11 platters), 25 mb.	DP0)
4231A	Top-loading pack (11 platters), 92 mb.	DP0)
6060/6061	Top-loading pack (11 platters), 96 or 190 mb.	DZ0)
6067	Top-loading pack (5 platters), 50 mb.	DZ0)
*Each disk on these top-loaders is logically distinct, and you will run DKINIT on each one.		

COMMAND? FULL)
COMMAND DESTROYS ANY PREVIOUS RDOS DISK STRUCTURE
RDOS INIT/F MUST BE DONE ON DISK AFTER COMMAND
TYPE CONTROL-A NOW TO ABORT WITHOUT LOSS

a. *NUMBER OF PATTERNS TO RUN (1-5)?* 5)

    PATTERN #1 (155555)

    PATTERN #2 (125252)

    PATTERN #3 (052525)

    PATTERN #4 (000000)

    PATTERN #5 (177777)

    ALL PATTERNS RUN

b. *DO YOU WISH TO DECLARE ANY BLOCKS BAD*
   THAT ARE NOT ALREADY IN THE BAD BLOCK TABLE? NO)

   DEFAULT REMAP AREA SIZE IS xx BLOCK(S) LONG (make note of xx)
   IT NEEDS TO BE AT LEAST n BLOCK(S) LONG (n is the number of bad blocks DKINIT found)

c. *REMAP AREA SIZE (TYPE RETURN FOR DEFAULT)?*)

d. *REMAP AREA START BLOCK NUMBER (TYPE RETURN FOR DEFAULT)?*)

   DEFAULT FRAME SIZE IS dd
   MIN IS 1, AND MAX IS mmm (dd and *mmm* vary with the disk.)

e. *DISK FRAME SIZE (TYPE RETURN FOR DEFAULT)?*)

   FULL DISK INIT COMPLETE

   COMMAND?

f. For a single disk platter or disk pack, you're done; type STOP) and skip the rest of the steps in this table.

   For a dual-platter toploader subsystem (model 6045, 6070, or 4234) type

   DISK)
   DISK INITIALIZER REV x.xx
g. *DISK DRIVE MODEL NUMBER?* nnnn) (original model number)
h. *DISK UNIT?* DP1F) (DP0F for 4234 disks)

i. Repeat steps a. through e. to initialize the fixed disk. When DKINIT asks *COMMAND?*, type STOP).

Installing the Disk Bootstrap

Next, you'll want to put the Disk Bootstrap Loader on your disk. Like the CBOOT.SV program that lets you load files from cassettes, the Disk Bootstrap Loader loads files from disk. This allows you to start systems and programs using only computer front panel switches.

The program that installs this Disk Bootstrap Loader on your disk is BOOT.SV, which is file number 2 on the first cassette. As you did for DKINIT.SV, you must again bring in CBOOT.SV from cassette tape, then tell it to load file number 2.

8. If your computer has automatic program load hardware, lift and release the RESET switch, then the PROGRAM LOAD switch. (On the SUPERNOVA, depress the CHANNEL START switch.) Then go to step 9.

    If you do not have automatic program load, then follow these steps to bring in CBOOT.SV:

    a. Set the data switches to 000376$_8$ (switches 8 through 14 up, others down).

    b. Lift the EXAMINE switch and verify that the lights match the switch settings.

    c. Set the data switches to 060134$_8$ (switches 1, 2, 9, 11, 12, and 13 up, others down).

    d. Lift the DEPOSIT switch and verify that the lights match the switch settings.

    e. Set the data switches to 000377$_8$ (switches 8 through 15 up, others down).

    f. Depress the DEPOSIT NEXT switch and verify that the lights match the switch settings.

    g. Set the data switches to 000376$_8$ again. Lift and release the RESET switch, then the START switch. This loads and executes the two-word manual load program that reads CBOOT.SV from magnetic tape.

9. CBOOT.SV requests a file number. Type:

    FROM CTO: 2)

10. This response loads BOOT.SV, which in turn requests:

    BOOTSTRAP DEVICE SPECIFIER?

and you respond with the same disk-identifying (DP0), DK0), etc.) from Table 4-3 that you gave to DKINIT.BOOT.SV then asks, and you reply:

11. *INSTALL BOOTSTRAP (Y OR N)?* Y
    BOOT.SV says:

    DONE.
    BOOTSTRAP DEVICE SPECIFIER?

    For a top-loading disk, type DP0F) and Y.

    Otherwise, proceed.

Installing the RDOS Starter System

With the disk initialized and the Bootstrap Loader installed, you can now install the RDOS Starter System, which is file number 3 on the first cassette. Again, using the computer front panel switches, you must bring in CBOOT.SV which will in turn load the RDOS Starter System from tape.

12. If you have automatic program load, lift the RESET switch, then the PROGRAM LOAD switch. (Depress the CHANNEL START switch on the SUPERNOVA.) Go to step 13.

    If you do not have automatic program load, enter and execute the two-word manual program load sequence. The following steps should be familiar to you by now, but we will repeat them here in abbreviated form:

    a. Set the data switches to 000376$_8$ (switches 8 through 14 up). Lift the EXAMINE switch.

    b. Set the data switches to 060134$_8$ (switches 1, 2, 9, 11, 12, and 13 up). Lift the DEPOSIT switch.

    c. Set the data switches to 000377$_8$ (switches 8 through 15 up). Depress the DEPOSIT NEXT switch.

    d. Set the data switches to 000376$_8$ (i.e., put down switch 15). Lift and release the RESET, then the START switch.

13. CBOOT.SV says, and you reply:

    FROM CTO: 3)

14. You have directed CBOOT.SV to load the RDOS Starter System (BOOTSYS.SV) into the computer. When brought in, it requests:

    FULL (F) OR PARTIAL (P OR < CR >)?

    asking you to specify either full initialization or partial initialization for your disk. You want full initialization. This corresponds to the warning that DKINIT.SV gave you RDOS INIT/F MUST BE DONE ON DISK AFTER COMMAND. So type:

    F)

15. The program then asks:

    INITIALIZING WHAT DISK?

    Respond with the same disk-identifying (DP0), DK0), etc.) from Table 4-3 that you gave DKINIT.

16. The program reads to the end of the cassette, then rewinds it and types:

    LOAD CT0, STRIKE ANY KEY

    Remove cassette number 1 from drive 0. Mount the second cassette, containing BOOTSYS.OL, in drive 0 and strike a key.

17. The program loads additional portions of the RDOS Starter System from this second cassette tape and stores them on the disk. RDOS next asks for the current date (month, day, and year) and time (hours in 24, minutes, and. seconds) that you supply following the format of this example dialog:

    DATE (M/D/Y)? 1 10 79)

18. *TIME (H:M:S)?* 1 4 10)

19. RDOS needs the Command Line Interpreter (CLI) to communicate with you, so it again asks:

    LOAD CT0, STRIKE ANY KEY

    Mount the third cassette (with the CLI and BOOT.SV files) in drive 0 and strike a key. RDOS reads the cassette tape and copies its files onto disk.

    When RDOS types the prompt letter

    R

    your RDOS Starter System is running.

Making the Starter System Disk-Bootstrappable

At this point, your RDOS Starter System is stored only in memory. There is no corresponding save file on disk, although RDOS did, of course, write the overlay (BOOTSYS.OL) and Command Line Interpreter (CLI.SV, CLI.OL and CLI.ER) files onto disk. To save the starter system on the disk:

20. Remove the cassette in drive 0 and mount the first cassette (containing DKINIT.SV) in drive 0. This has BOOTSYS.SV in CBOOT.SV-loadable format as file number 3.

21. Type the commands:

    ```
    INIT CT0)
    R
    XFER CT0:3 BOOTSYS.SV/R)
    R
    CHATR BOOTSYS.SV S)
    R
    RELEASE CT0)
    R
    ```

    These steps store the RDOS Starter System as randomly-organized disk file BOOTSYS.SV, with save file attributes. You can henceforth bring it into execution directly from the disk, via the computer front panel switches.

Transferring the Remaining Programs

You still need several cassette files that are not yet on the disk: the utility programs you received under your license, and the RDOS System Generation program that you need to tailor your own RDOS system.

22. Remove the cassette from drive 0. At this point, you're done with the first three cassettes, so put them aside. Sort the remaining cassettes into "Library" and "Utility" categories. Then sort each category by ascending label; e.g., "TAPE 2 of 5", then "TAPE 3 OF 5", etc. You'll load the utility cassettes first, then the library cassettes.

23. Now type:

    ```
    LOG/H)
    R
    ```

    This starts recording console dialog in disk file LOG.CM so you'll know what files were loaded.

24. Now, copy the utilities from the utility cassettes. Remove the cassette in drive 0. Insert the first utility cassette from the utility pile, and type:

```
INIT CT0)
R

LOAD/V/R CT0:0)
    .
    .
```

The CLI displays the names of the files loaded. Wait for the R prompt.

```
R
```

25. Remove the cassette from drive 0. Insert the next utilities cassette from the pile and type:

```
LOAD/V/R CT0:0)
    .
    .
    .
R
```

Repeat this step (25) until you have loaded all cassettes in the utilities pile.

26. When the CLI prompt returns from the last LOAD, release drive 0:

```
RELEASE CT0)
R
```

and remove the last utilities cassette from drive 0.

27. Now you're ready to load the library cassettes. Insert the "SYSTEM LIBRARY" cassette in drive 0, and type:

```
INIT CT0)
R
LOAD/V/R CT0:0)
(The CLI verifies the files loaded.)
R
```

28. Release the drive:

```
RELEASE CT0)
R
```

Remove the SYSTEM LIBRARY cassette.

29. Now, you'll load the SYSTEM GENERATION LIBRARY cassettes. Select the first cassette (i.e., TAPE 1 of n), and insert it in drive 0. Type:

```
INIT CT0)
R
LOAD/V/R CT0:0)
```

(This time, the CLI prompts you to load the next cassette.)

LOAD CT0, STRIKE ANY KEY

30. Remove the cassette from drive 0, and insert the next SYSTEM GENERATION LIBRARY cassette. Strike a key.

(files loaded)

LOAD CT0, STRIKE ANY KEY

Repeat this step (30) until the CLI gives you an R prompt, instead of asking for the next cassette.

31. Release the cassette drive:

```
RELEASE CT0)
R
```

(If you have a mapped ECLIPSE computer, you received two sets of SYSTEM GENERATION LIBRARY cassettes. Select the set you haven't loaded (ARDOS or ZRDOS) and repeat steps 29-31 for this set.)

32. Now, if you have a dual-platter toploader disk, make the fixed disk available to RDOS and give it a copy of BOOT.SV by typing:

```
INIT/F DP0F)
R
MOVE/V DP0F BOOT.SV )
  BOOT.SV
R
```

We'll explain the INIT/F and BOOT.SV steps in the post-SYSGEN chapter.

33. Close the log file:

```
ENDLOG)
R
```

If you have a teletypewriter as your system console, and you'd like a printed record of the files loaded, type:

```
TYPE LOG.CM)
    .
    .
R
```

If your system console is a display terminal, you must generate a tailored system before you can PRINT the log file on the line printer.

34. Your RDOS starter system is complete. If you want to generate a tailored system at this time, go to Chapter 6, and skip the section called Disk Bootstrap.

If you want to rest for a while, type:

RELEASE DP0) (or DK0),etc.)

This terminates RDOS operations. RDOS displays a sign-off message:

MASTER DEVICE RELEASED

You can now flip the disk's LOAD/RUN switch to LOAD, and remove the disk pack or cartridge (if this applies). Shut off power to disks, computer, and console. Later, start at the beginning of Chapter 6 to build your tailored system.

You're done with the cassette tapes, so store them safely with the write-protect holes *uncovered*.

Figure 4-1 summarizes the steps you take to install the RDOS Starter System on disk from cassette. You may find it convenient to refer to this figure whenever you need to install RDOS onto disk

---

1. a. Using the Release Notice as a guide, number first three cassettes. Uncover the write-protect holes on all cassettes.
    b. Select number 0 on a cassette drive; turn other drives off or dial nonzero values on them.
    c. Insert first cassette (with DKINIT.SV) in drive 0.
2. With drive switches, REWIND tape and set to REMOTE.
3. With automatic program load, make sure data switches are set to 100034_8 (switches 0, 11, 12, and 13 up, others down). Lift RESET, then PROGRAM LOAD.

    Without APL, put 376_8 in switches, lift EXAMINE. Set switches to 060134_8; lift DEPOSIT. Set switches to 377_8; press DEPOSIT NEXT. Put down switch 15, lift RESET, then START (on SUPERNOVA, CHANNEL START).
4. *FROM CT0:* 1)
5. *DISK INITIALIZER REV xx (xx* = revision number)
    DISK DRIVE MODEL NUMBER? nnnn) (see Table 4-2 for nnnn)
6. *DISK UNIT?* DP0) (DK0), DP4),etc.)
7. *COMMAND ?* FULL)
    a. *COMMAND DESTROYS ALL .....*
        NUMBER OF PATTERNS TO RUN (1-5) ? 5)
        ****PATTERN* #1 ****and so on.
    b. *DO YOU WISH TO DECLARE ANY BLOCKS BAD*
        THAT ARE NOT ALREADY IN THE BAD BLOCK TABLE ? NO)
    c. *DEFAULT REMAP AREA SIZE ...*
        REMAP AREA SIZE (TYPE RETURN FOR DEFAULT) ?)
    d. *REMAP AREA START BLOCK NUMBER (TYPE RETURN FOR DEFAULT) ?*)
    e. *DEFAULT FRAME SIZE ...*
        DISK FRAME SIZE (TYPE RETURN FOR DEFAULT) ?)
    f. *FULL DISK INIT COMPLETE*
        COMMAND ? STOP) (or DISK), then step 7, with DP0F, for fixed disk on 6045 or 4234A units.)
8. RESET, then PROGRAM LOAD.
9. *FROM CT0:* 2)
10. *BOOTSTRAP DEVICE SPECIFIER ?* DP0) (DK0),etc.)
11. *INSTALL BOOTSTRAP? (Y OR N)* Y
    DONE.
    BOOTSTRAP DEVICE SPECIFIER ?
    For a top-loading disk, press CONTINUE, then type DP0F) and Y.
12. Execute step 3.
13. *FROM CT0:* 3)
14. *FULL (F) OR PARTIAL (P OR < CR >)?* F)
15. *INITIALIZING WHAT DISK ?* DP0) (DK0),etc.)

Figure 4-1. Installing the RDOS Starter System from Cassette Tapes

16. *LOAD CT0, STRIKE ANY KEY*
    Remove first cassette, insert second (containing BOOTSYS.OL). strike key.
17. *DATE (M/D/Y) ?* 1 10 79) (current date)
18. *TIME (H:M:S) ?* 14 10) (current time)
19. *LOAD CT0, STRIKE ANY KEY*
    Remove second cassette, insert third strike key.
    R
20. Remove cassette from drive; insert first cassette (with DKINIT).
21. INIT CT0)
    R
    XFER CT0:3 BOOTSYS.SV/R)
    R
    CHATR BOOTSYS.SV S)
    R
    RELEASE CT0)
    R
22. Remove cassette from drive; put first three cassettes aside. Sort remaining cassettes into "Library" and "Utility", then sort by ascending label.
23. LOG/H)
    R
24. Insert first utility cassette
    INIT CT0)
    R
    LOAD/V/R CT0:0)
    (Listing, then R)
25. Remove utility cassette, insert next utility cassette.
    LOAD/V/R CT0:0)
    (Listing, then R)
    Repeat step 25 for all utility cassettes.
26. RELEASE CT0)
    R
    Remove last utility cassette.
27. Insert SYSTEM LIBRARY cassette.
    INIT CT0)
    R
    LOAD/V/R CT0:0)
    (Listing, then R)
28. RELEASE CT0)
    R
    Remove SYSTEM LIBRARY cassette.
29. Insert first SYSTEM GENERATION LIBRARY cassette.
    INIT CT0)
    R
    LOAD/V/R CT0:0)
    (Listing)
    LOAD CT0, STRIKE ANY KEY

Figure 4-1. Installing the RDOS Starter System from Cassette Tapes (continued)

```
30. Remove cassette, insert next SYSTEM GENERATION LIBRARY cassette. Strike key.
    (Listing)
    Repeat step 30 unit CLI displays R prompt.
31. RELEASE CT0)
    R
32. For dual-platter toploader disks only: INIT/F DP0F)
    R
    MOVE/V DP0F BOOT.SV)
    BOOT.SV
    R
33. ENDLOG)
    R
    TYPE LOG.CM)
    .....
    R
34. RELEASE DP0) ( DK0) etc.)
    MASTER DEVICE RELEASED
```

Figure 4-1. Installing the RDOS Starter System from Cassette Tapes (continued)

End of Chapter

Chapter 5
Loading the RDOS Starter System
from Paper Tape

The RDOS Tapes

When you receive your RDOS system on paper tape, Data General supplies five or more trays of gray, fanfold, 8-channel punched paper tape. These tapes are described in Table 5-1.

There are many variations of RDOS; the one you have depends on the kind of computer you have. This chapter gives a general guideline, which will help you load required files and system utilities. For specific part numbers and descriptions of files unique to your system, see the Release Notice supplied with your software. This Release Notice lists common parts (tapes everyone receives) and tapes designed for your own machine.

You need the Binary Loader, Disk Initializer, Bootstrap Installer, Starter System and Command Line Interpreter (CLI) tapes to install the RDOS Starter System on your disk. To generate a tailored RDOS system, you also need the Relocatable Loader, the system generation program tape, and the various RDOS library tapes (A, B, C, I and O). The remaining tapes are utility programs, assembler definitions, mathematical routines, etc. You may load all of these remaining tapes on the disk, or load only those you need for your application.

The RDOS system generation library names contain the character string "RDOS", and end with the extension ".LB". In Table 5-1, we use the names "-RDOSA.LB, -RDOSB.LB, -RDOSC.LB, -RDOSI.LB, -RDOSO.LB" to indicate SYSGEN library tapes. The starting letter varies with the computer you have, as follows.

If you have a:	your library names are:
Unmapped NOVA	URDOSx.LB
Mapped NOVA 3/4	NRDOSx.LB
Other Mapped NOVA	MRDOSx.LB
Unmapped ECLIPSE	BRDOSX.LB
Mapped ECLIPSE	ARDOSx.LB or ZRDOSx.LB (both sets are supplied)

x is A, B, C, I, and O for all machines.

Names followed by "(E)" in Table 5-1 relate to ECLIPSE computers; those followed by "(N)" relate to NOVA computers. Unmarked names are common to both machines. For a current list of programs supplied, consult the Release Notice supplied with the software.

Table 5-1. RDOS Paper Tapes

Tape Contains	Program Filename(s)	Number of Tapes	Program Description
Binary Loader	BLDR.AB	1	Loads absolute binary (.AB) tapes - not for use with PROGRAM LOAD hardware.
Disk Initializer	DKINIT.AB	1	A disk initializer program which you must run to prepare the disk before you put any RDOS system on it.
Bootstrap Installer	BOOT.AB	1	This program installs a bootstrap loader on the disk.
Starter System	BOOTSYS.AB BOOTSYS.OL	1 2	The RDOS Starter System, which you load with the Binary Loader.
CLI	CLI.SV CLI.OL CLI.ER	4	The Command Line Interpreter interfaces the system console to RDOS; with it you can run RDOS from the keyboard.
Bootstrap Installer	BOOT.SV	1	In disk save file format (not readable by BLDR.AB).
Relocatable Loader Overlay Loader	RLDR.SV RLDR.OL OVLDR.SV	2 2 1	In disk save file format. (Read with CLI LOAD).
System Generation	SYSGEN.SV (N) BSYSGEN.SV (E) NSYSGEN.SV (N3)	1	RDOS System Generator.
RDOS Library A	-RDOSA.LB	3	Used in System Generation.
RDOS Library B	-RDOSB.LB	1	Used only if you have magnetic tape (otherwise not sent to you).
RDOS Library C Initialization Library	-RDOSC.LB -RDOSI.LB	3 1	RDOS libraries needed for system generation.
Overlay Library	-RDOSO.LB	3	
System Library	SYS.LB SYS5.LB	1 1	RDOS Rev 6 System Library RDOS Rev 5 System Library

Table 5-1. RDOS Paper Tapes (continued)

Tape Contains	Program Filename(s)	Number of Tapes	Program Description
Text Editor	EDIT.SV EDIT.RB	1	Provided in both disk save file and relocatable formats.
Multitasking Editor	MEDIT.RB	1	Multiterminal text editor.
Superedit	NSPEED.SV (N) SPEED.SV (E) NSPEED.ER	1	The Supereditor text editor.
Extended Assembler	ASM.SV XREF.SV	1	Assembles machine code.
Macroassembler	MAC.SV	1	Assembles machine code.
Cross-Reference Lister	MACXR.SV	1 1	For use with MAC Macroassembler.
Instruction Definitions	NBID.SR NSID.SR FPID.SR OSID.SR	1	For use with all assemblers.
ECLIPSE Definitions	NEID.SR NFPID.SR	1	For use with all assemblers.
Library File Editors	LFE.SV	1	Edits .LB library.
Disk Edit	OEDIT.SV	1	Edits files on disk.
Stand-Alone Disk Edit	DSKED.AB	1	Edits blocks on disk.
Interrupt Debugger	-IDEB.RB	1	Debugging program.
MCA Bootstrap	MCABOOT.SV	1	For dual-processor communications.
Tape Duplicator	DUP.AB	1	Operates stand-alone.
Relocatable Flt. Point	RFPI.RB	1	Software floating-point arithmetic.
Relocatable Math Library	MATH.LB		Mathematical functions.
RDOS Switches	RDOS.SR (unmapped N) -RDOS.SR (others)	1	As shown in the *RDOS Reference Manual;* used with all assemblers.
RDOS System Parameters	PARS.SR	2	
RDOS User Parameters	PARU.SR	1	

Program Load

The Absolute Binary Loader comes in two versions: one for use with automatic program load hardware, and the other for computers without automatic program load. (All ECLIPSE and NOVA 4 computers, and most other NOVA computers, have automatic program load.) Therefore, when this manual directs you to "read in the Binary Loader", you must use *only* the loader that matches your computer hardware. You can easily tell the two loaders apart because the loader used with automatic program load has all eight channels punched on the tape, but the loader for machines without the program load hardware has only five of the eight channels punched.

The loader for automatic program load hardware is one of the tapes included with the basic set of software and diagnostic tapes that Data General delivered with your computer. A copy of the loader for machines without program load is part of the RDOS paper tape package, as BLDR.AB.

How you read the respective loaders into the computer also varies according to whether or not you have automatic program load. With the program load feature, you simply program load the computer, using device code 10_8 for teletypewriter, or 12_8 for a high-speed reader, as described in the upper part of Tables 5-2 and 5-3.

If you don't have automatic program load, you have to toggle in a short bootstrap loader from the front panel data switches, as described in the lower part of Table 5-2 (high-speed paper tape reader) and Table 5-3 (teletypewriter reader).

In summary, when you are directed to "read in the Binary Loader", follow the steps shown in "Program Load Steps".

Before you try to read in any tapes, take a careful look at them. Each tape has a part number punched at the front (for example, 091-000004-04). DO NOT TRY TO READ IN THIS PART NUMBER; position the tape in the reader so that reading will start following the part number. In most cases, reading in the part number is a fatal error, and you will have to start again.

Program Load Steps

Features:	Teletypewriter Reader	High-Speed Paper Tape Reader
NO PROGRAM LOAD	Using BLDR.AB, execute steps 1-19 in the lower part of Table 5-3.	Using BLDR.AB, execute steps 1-19 in the lower part of Table 5-2.
WITH PROGRAM LOAD	Using the Binary Loader for PROGRAM LOAD hardware, execute step 1 in the upper part of Table 5-3.	Using the Binary Loader for PROGRAM LOAD hardware, execute step 1 in the upper part of Table 5-2.

Table 5-2. Binary Loader Bootstrapping via High-Speed Paper Tape Reader

IF YOU HAVE AUTOMATIC PROGRAM LOAD HARDWARE:

1. a. But Binary Loader tape in reader (arrows face up and to left), switch reader to RUN.

   b. If your computer has a programmed console, execute steps 1c and 1d. If it has hardware data switches, execute steps 1e and 1f.

   c. Place value 100012 in the data switch register. Type 11A/ after the ! prompt on the system console; the console will display a value. Type 100012) next to this value. This puts 100012 in the register.

   d. Type 12L on the system console. Wait for tape to stop. When it stops, switch reader to LOAD, remove tape, and go to the next step in the body of this chapter. For the DISK INITIALIZER, the next step is 2, for the BOOTSTRAP ROOT, it is 10; for the STARTER SYSTEM, it is 15.

   e. Set front panel data switches to 000012_8 (switches 12 and 14 up, others down).

   f. Lift the RESET switch, then the PROGRAM LOAD switch. Wait for the tape to stop. When it stops, switch the reader to LOAD, and remove the tape. Go to the next step in the body of this chapter. For the DISK INITIALIZER, the next step is 2; for the BOOTSTRAP ROOT, it is 10; for the STARTER SYSTEM, it is 15

IF YOU DO NOT HAVE AUTOMATIC PROGRAM LOAD HARDWARE:

1. Put Binary Loader tape in reader (arrows face up and to left), switch reader to RUN.

Step	Set These Switches Up:	−Octal:	Then Lift or Depress
2.	Core module * and 4 through 10, 12-15	0X7757	EXAMINE
3.	0,2,4,5,7,10	126440	DEPOSIT
4.	1,2,5-8,12,14	063612	DEPOSIT NEXT
5.	7-15	000777	DEPOSIT NEXT
6.	1,2,7,9,12,14	060512	DEPOSIT NEXT
7.	0,2,4-6,9	127100	DEPOSIT TAB
8.	Don't move switches	127100	DEPOSIT NEXT
9.	0,4-6,14,15	107003	DEPOSIT NEXT
10.	7-12,14	000772	DEPOSIT NEXT
11.	6,7	001400	DEPOSIT NEXT
12.	1,2,9,12,14	060112	DEPOSIT NEXT
13.	4,7-11,13,14	004766	DEPOSIT NEXT
14.	1,4,7,14	044402	DEPOSIT NEXT
15.	4,7-11,13	004764	DEPOSIT NEXT
16.	Core module * and 4 through 12	0X7770	RESET, then START
17.	------------------	--------	Wait for tape to stop. Switch reader to LOAD.
18.	Core module * and 0,4 through 15	1X7777	------------------
19.	Go to next step in chapter body.		

*CORE MODULE: Set switches 1, 2, and 3 according to the amount of memory in your computer, as shown in below:

Memory Size	Switches Up:	"X"−
16K (K = 1024 words)	2,3	3
20K	1	4
24K	1,3	5
28K	1,2	6
32K or more	1,2,3	7

Table 5-3. Binary Loader Bootstrapping via Teletypewriter Reader

---

IF YOU HAVE AUTOMATIC PROGRAM LOAD HARDWARE:

1. a. Put Binary Loader tape in TTY reader (arrows face up and toward you), switch reader to START.

    b. If your computer has a programmed console, type 10L next to the ! prompt on the system console. If it has hardware data switches, set data switches to 000010_8 (switch 12 up, others down). Lift the RESET switch, then the PROGRAM LOAD switch.

    c. Wait for the tape to stop and remove it. Go to the next step in the body of this chapter. For the DISK INITIALIZER, the next step is 2, for the BOOTSTRAP ROOT, it is 10; for the STARTER SYSTEM, it is 15.

IF YOU DO NOT HAVE AUTOMATIC PROGRAM LOAD HARDWARE:

1. Put Binary Loader tape in TTY reader (arrows face up and toward you), switch reader to START.

Step	Set These Switches Up	–Octal	Then Lift or Depress
2.	Core module * and 4 through 10,12-15	0X7757	EXAMINE
3.	0,2,4,5,7,10	126440	DEPOSIT
4.	1,2,5-8,12	063610	DEPOSIT NEXT
5.	7-15	000777	DEPOSIT NEXT
6.	1,2,7,9,12	060510	DEPOSIT NEXT
7.	0,2,4-6,9	127100	DEPOSIT NEXT
8.	Don't move switches	127100	DEPOSIT NEXT
9.	0,4-6,14,15	107003	DEPOSIT NEXT
10.	7-12,14	000772	DEPOSIT NEXT
11.	6,7	001400	DEPOSIT NEXT
12.	1,2,9,12	060110	DEPOSIT NEXT
13.	4,7-11,13,14	004766	DEPOSIT NEXT
14.	1,4,7,14	044402	DEPOSIT NEXT
15.	4,7-11,13	004764	DEPOSIT NEXT
16.	Core module * and +4 through 12	0X7770	RESET, then START
17.	---------------	---------	Wait for tape to stop. Switch reader to STOP. Remove tape.
18.	Core module * and 4 through 15	0X7777	--------------------
19.	Go to next step in chapter body.		

*CORE MODULE: Set switches 1, 2, and 3 according to the amount of memory in your computer, as shown below:

Memory Size	Switches Up	"X" –
16K (K = 1024 words)	2,3	3
20K	1	4
24K	1,3	5
28K	1,2	6
32K or more	1,2,3	7

The Disk Initializer

The first program you'll execute (exclusive of formatting the disk, if you did this) is the Disk Initializer. This program prepares the disk for RDOS, detecting any bad areas. To do this:

1. Read in the Binary Loader (Table 5-2 or 5-3).

2. Put the Disk Initializer tape (DKINIT.AB) in the reader. Switch the reader to RUN (or START).

3. If your computer has a programmed console, type P) on the *system* console. If it has hardware data switches and automatic program load, depress CONTINUE. Without auto program load, lift START.

4. When the tape stops, flip the reader to LOAD (or STOP) and remove the tape.

5. DKINIT.AB types out:

   DISK INITIALIZER-REV xx (xx = revision number)
   DISK DRIVE MODEL NUMBER?

   It's asking you for the Data General model number of your disk drive. Type in *one* of the responses shown in the third column of Table 5-4.

   If you type an unidentifiable model number or give an illegal response to any of the DKINIT.AB questions, the program will type out an appropriate error message and repeat the question.

Table 5-4. Disk Model Numbers

DGC Model #	Disk Drive Type	Type In
6001-6008	Fixed-head NOVADISK (no cartridge), .13 megabyte (mb) to 2 mb.	6001) to 6008)
6063 or 6064	Fixed-head (no cartridge), for 1 mb for 2 mb.	6063) 6064)
4047A, 4047B, 4237, 4238	Front-loading cartridge, 2.4 mb.	4047) 4237) or 4238)
6045	Top-loading cartridge with fixed disk, 10 mb.	6045)
4234A	Top-loading cartridge with fixed disk, 10 mb.	4234)
6070	Top-loading cartridge with fixed disk, 20 mb.	6070)
6099	Sealed moving-head disk, 12.5 mb	6099)
4048A	Top-loading pack (6 platters), 6.2 mb.	4048)
4057A	Top-loading pack (11 platters), 25 mb.	4057)
4231A	Top-loading pack (11 platters), 92 mb.	4231)
6060	Top-loading pack (11 platters), 96 mb.	6060)
6061	Top-loading pack (11 platters). Double density 190 mb.	6061)
6067	Top-loading pack (5 platters), 50 mb.	6067)

6. DKINIT.AB then types:

   DISK UNIT?

   which is a request for the mnemonic identifying your disk. Type in one of the mnemonics in the third column of Table 5-5.

7. The DKINIT.AB requests a command, and you type:

   COMMAND? FULL)

   With this response, you request a full initialization of the disk. DKINIT.AB will fully check your disk, detect any portions that will not retain information, and mark them so that RDOS will bypass them. It also constructs and saves on the disk certain tables that RDOS needs.

   DKINIT.AB asks you several questions during this initialization; these are more fully explained in Chapter 8, The Disk Initializer. For the moment, just key in the boldface answers in the DKINIT.SV dialog, and take it on faith that the program works. (Ignore the CONTROL-A instruction. If the dialog varies from that shown below, consult Chapter 8 for the correct error recovery procedures.)

   The program takes some time to successively check out each pattern, so don't be alarmed when you have to wait. Typical time for a test pattern is up to 90 seconds for a single front-loading disk, and up to two and one-half minutes for each 4234A disk. If you have a very large disk, like a 6061, time per pattern can exceed a half-hour. While initializing a large disk, you may want to leave the computer and do something else. You can do so after the first pattern runs without error messages.

   When you complete the following DKINIT.SV dialog, the disk is fully initialized and the computer halts.

Table 5-5. RDOS Disk Names

DGC Model #	Disk Drive Type	Type In
6001-6008	Fixed-head NOVADISK (no cartridge)	DK0)
6063/6064	Fixed-head (no cartridge), 1 or 2 mb.	DS0)
4047A, 4047B 4237, 4238	Front-loading cartridge, 2.5 mb.	DP0)
6045, 4234A, 6070	Top-loading cartridge, 5 mb or 10 mb per disk*	
	unit name of cartridge unit name of fixed disk	DP0) DP0F)
6099	Sealed moving-head disk, 12.5 mb.	DP0)
4048A	Top-loading pack (6 platters), 6.2 mb.	DP0)
4057A	Top-loading pack (11 platters), 25 mb.	DP0)
4231A	Top-loading pack (11 platters), 92 mb.	DP0)
6060/6061	Top-loading pack (11 platters), 96 or 190 mb.	DZ0)
6067	Top-loading pack (5 platters), 50 mb.	DZ0)

*Each disk on these top-loaders is logically distinct, and you will run DKINIT on each one.

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Installing the Disk Bootstrap

Next, you'll want to put the Disk Bootstrap Loader on your disk. Like the Absolute Binary Loader program that lets you load paper tapes, the Disk Bootstrap Loader loads files from disk. This allows you to start systems or programs using only the computer front panel switches.

The program that installs this Disk Bootstrap Loader on your disk is BOOT.AB.

8. Put the Bootstrap Installer tape (BOOT.AB) in the reader. Then flip the reader to RUN (or START).

9. a. If your computer has a programmed console or data switches and automatic program load, repeat step 1 at the top of Table 5-2 (for high-speed reader) or top of Table 5-3 (for teletypewriter reader).

   b. If your computer lacks automatic program load, execute steps 1, 18, and 19 in the bottom of Table 5-2 (for the high-speed reader) or Table 5-3 (for teletypewriter reader).

10. If you have a programmed console, type P). With hardware data switches and automatic program load, depress CONTINUE. Without automatic program load, lift START.

   When the tape stops, flip the reader to LOAD (or STOP); remove the tape.

11. BOOT.AB now executes; it requests:

   BOOTSTRAP DEVICE SPECIFIER?

   and you respond with the same disk name (DP0), DK0), etc.) from Table 5-5 that you gave to DKINIT.

12. BOOT then asks, and you reply:

   INSTALL BOOTSTRAP (Y OR N)? Y

   BOOT now says:

   DONE.
   BOOTSTRAP DEVICE SPECIFIER?

   For a dual-platter toploading disk subsystem, type DP0F), then Y to install the bootstrap on the fixed disk.

Installing the RDOS Starter System

With the disk(s) initialized and the bootstrap root installed, you can now install the RDOS Starter System. This is tape BOOTSYS.AB and again you must bring in the binary loader to load it.

13. Put the RDOS Starter System tape (BOOTSYS.AB) in the reader. Flip the reader to RUN (or START).

14. a. If your computer has a programmed console or data switches and automatic program load, repeat step 1 at the top of Table 5-2 (for high-speed reader) or top of Table 5-3 (for teletypewriter reader).

   b. If your computer lacks automatic program load, execute steps 1, 18, and 19 in the bottom of Table 5-2 (for high-speed reader) or Table 5-3 (for teletypewriter reader).

15. With a programmed console, type P). With hardware data switches and automatic program load, depress CONTINUE.

   Without automatic program load, lift the START switch; then, when the tape starts moving, set all data switches down.

   When the tape stops, flip the reader to LOAD (or STOP) and remove the tape.

16. When the starter system has read in, it requests:

   FULL (F) OR PARTIAL (P OR < CR >)?

   asking you to specify either full initialization or partial initialization for your disk. You want full initialization (this corresponds to the warning that DKINIT.AB gave you, RDOS INIT/F MUST BE DONE ON DISK AFTER COMMAND) so type:

   F)

17. The program then asks:

   INITIALIZING WHAT DISK?

   Respond with the same disk-identifying name (DP0), DK0), etc.) from Table 5-5 that you gave DKINIT.

COMMAND? FULL)
COMMAND DESTROYS ANY PREVIOUS RDOS DISK STRUCTURE
RDOS INIT/F MUST BE DONE ON DISK AFTER COMMAND
TYPE CONTROL-A NOW TO ABORT WITHOUT LOSS

a. *NUMBER OF PATTERNS TO RUN (1-5)?* 5)

   PATTERN #1 (155555)

   PATTERN #2 (125252)

   PATTERN #3 (052525)

   PATTERN #4 (000000)

   PATTERN #5 (177777)

   ALL PATTERNS RUN

b. *DO YOU WISH TO DECLARE ANY BLOCKS BAD*
   THAT ARE NOT ALREADY IN THE BAD BLOCK TABLE? NO)

   DEFAULT REMAP AREA SIZE IS xx BLOCK(S) LONG (make note of xx)
   IT NEEDS TO BE AT LEAST n BLOCK(S) LONG (n is the number of bad blocks DKINIT found)

c. *REMAP AREA SIZE (TYPE RETURN FOR DEFAULT)?*)

d. *REMAP AREA START BLOCK NUMBER (TYPE RETURN FOR DEFAULT)?*)

   DEFAULT FRAME SIZE IS dd
   MIN IS 1, AND MAX IS mmm (dd and mmm vary with the disk.)

e. *DISK FRAME SIZE SIZE (TYPE RETURN FOR DEFAULT)?*)

   FULL DISK INIT COMPLETE

   COMMAND?

f. For a single disk platter or disk pack, you're done; type STOP) and skip the rest of the steps in this table

   For a dual-platter toploader subsystem (model 6045, 6070, or 4234) type

   DISK) *DISK INITIALIZER REV x.xx*
g. *DISK DRIVE MODEL NUMBER?* nnnn) (original model number)
h. *DISK UNIT?* DP1F) (DP0F) for 4234 disks)

i. Repeat steps a. through e. to initialize the fixed disk. When DKINIT asks *COMMAND?*, type STOP).

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18. The starter system then says,

TYPE ("O") for STTR ("1") for SPTR?

If you are using the teletypewriter reader, type 0 (no)). If you are using the high-speed paper tape reader, type 1 (no)). This process identifies either the teletypewriter or high-speed reader to the starter system.

The starter system needs to read its remaining files from paper tape in order to be complete. These tapes are:

- RODS Starter System overlays (BOOTSYS.OL) } 2 tapes

- Command Line Interpreter save file (CLI.SV)

- Command Line Interpreter overlays (CLI.OL) } 4 tapes

- Command Line Interpreter error messages (CLI.ER)

19. The program types:

LOAD SPTR, STRIKE ANY KEY

or

LOAD STTR, STRIKE ANY KEY

Put the first BOOTSYS.OL tape in the reader. Flip the reader to RUN (or START), then touch any key on the console keyboard.

20. Since this file is segmented, the starter system will again say:

LOAD SPTR, STRIKE ANY KEY

or

LOAD STTR, STRIKE ANY KEY

directing you to repeat the tape-loading operation for BOOTSYS.OL tape number 2.

21. After the starter system reads and digest the tapes, RDOS asks for the current date (month, day, and year) and time (hours in 24, minutes, and seconds) that you supply following the format of this example:

DATE (M/D/Y)? 1 10 79)

22. *TIME (H:M:S)?* 1 4 10)

23. RDOS next needs the CLI tapes, so it reissues the messages:

LOAD SPTR, STRIKE ANY KEY

or

LOAD STTR, STRIKE ANY KEY

Remove the tape from the reader and flip the reader to LOAD (or STOP). Put the first CLI tape in the reader, then repeat this step (23) for the CLI tapes in the numbered order (tape 1 of 4, etc.) shown on the tapes. RDOS will give you the LOAD message for each tape to be read in. Don't worry about the pregnant pauses during tape reading; this is normal. It's also normal for the tape to sometimes pass all the way through the reader, rather than halt at the end of the punched data.

After it reads and digests the last tape, RDOS types the prompt letter

R

and your RDOS Starter System is fully operational.

Making the Starter System Disk-Bootstrappable

At this point, your RDOS Starter System is stored only in memory. There is no corresponding save file on disk, although RDOS did write the overlay (BOOTSYS.OL) and Command Line Interpreter (CLI.SV, CLI.OL and CLI.ER) files onto the disk. To save the starter system on disk:

24. Put the RDOS Starter System absolute binary tape (BOOTSYS.AB) in the reader. Then flip the reader to RUN (or START).

25. For the high-speed reader, type the command:

MKSAVE/Z $PTR BOOTSYS)

If you're using the teletypewriter reader, type:

MKSAVE/Z $TTR BOOTSYS)

RDOS types:

LOAD SPTR, STRIKE ANY KEY

or

LOAD STTR, STRIKE ANY KEY

Now, strike a key. Don't worry about the long pauses while the tape is reading in; this is normal.

26. After the tape reads in, flip the reader to LOAD (or STOP) and remove the tape.

27. Now, find the tape which holds the rest of the bootstrap program; its name is BOOT.SV. Put it in the reader, then flip the switch to RUN (or START).

28. For the high-speed reader, type:

    LOAD/V $PTR)

    For the teletypewriter reader, type:

    LOAD/V $TTR)

    RDOS will verify the files loaded.

29. After the tape stops, flip the reader to LOAD (or STOP) and remove tape.

Steps 23-29 store the RDOS Starter System as disk save file BOOTSYS.SV, and load the rest of the bootstrap. You can henceforth bring BOOTSYS into execution directly from the disk via the program load steps.

Transferring the Remaining Files

You still need to transfer some or all of the remaining tapes to disk before you can execute any of the utility programs, or generate a tailored RDOS using the RDOS System Generation program. We recommend that you read in at least these paper tapes:

- Relocatable Loader, 2 tapes (RLDR.SV/RLDR.OL)

- System generation program (SYSGEN.SV for NOVA computers, NSYSGEN.SV for mapped NOVA 3/4 computers, BSYSGEN.SV for ECLIPSE computers).

- System generation libraries (-RODSx.LB. These names are in Table 5-1. There are five libraries and at least nine tapes).

- System Library (SYS.LB).

30. To record the filenames of the tapes you will read in, type:

    LOG/H)
    R

31. To load each tape (except those with the .AB extension, like DSKED.AB), follow these steps:

    a. Put the tape in the reader. Then flip the reader to RUN (or START).

    b. For a high-speed reader (except for .AB tapes) type the command

       LOAD/V $PTR)

       If you are using the teletypewriter reader type:

       LOAD/V $TTR)

       RDOS types out:

       LOAD SPTR, STRIKE ANY KEY
       or
       LOAD STTR, STRIKE ANY KEY

    c. Now, strike a key. RDOS reads each tape, and types out the name and creation data of each file as it loads.

    d. When RDOS finishes reading, it types the "R" prompt. Switch the reader to LOAD (or STOP) and remove the tape just read.

       If the tape is segmented, RDOS will ask for the next tape. Remove the tape; insert the next tape (tape 2 of 2, etc.), then strike a key. Don't do anything else. If the tape is *not* segmented, RDOS will type the "R" prompt. Then, remove the tape; insert the next; and type the LOAD/V command.

32. To load a tape with an .AB suffix, specifically Disk Initializer (DKINIT.AB) or Stand-Alone Disk Edit (DSKED.AB), do not type the LOAD/V command. Instead type:

    MKSAVE/Z $PTR {DKINIT})
               {DSKED}

    or

    MKSAVE/Z $TTR {DKINIT})
               {DSKED}

33. Now, if you have a dual-platter toploader disk, make the fixed disk available to RDOS and give it a copy of BOOT.SV by typing:

    INIT/F DPOF)
    R
    MOVE/V DPOF BOOT.SV)
    BOOT.SV
    R

    We'll explain the INIT/F and BOOT.SV steps in the post-SYSGEN chapter.

34. Close the log file by typing:

    ENDLOG)
    R

    If your system console is a teletypewriter, the typed filenames are your record of the files loaded. If your console is a display terminal you must generate a tailored system before you can print the log file on the line printer.

35. Your RDOS starter system is now complete. You're done with the paper tapes, so store them safely as backup copies. If you want to generate a tailored system now, go to Chapter 6 and skip the section called Disk Bootstrap.

    If you want to rest for a while, type:

RELEASE DP0) (DK0, etc.)

This terminates RDOS operations. RDOS displays a sign-off message:

MASTER DEVICE RELEASED

and the computer halts. You can now flip the disk's LOAD/RUN switch to LOAD (if this applies), and shut off power to disks, computer, and console. Later, start at the beginning of Chapter 6, to build your tailored system.

Figure 5-1 summarizes the steps you take to install the RDOS Starter System on disk from paper tape. You may find it convenient to refer to this figure whenever you need to install RDOS.

---

1. Read in the binary loader (Table 5-2 or 5-3).
2. Put tape DKINIT.AB in reader, flip to RUN (or START).
3. With programmed console, type P) on system console. With hardware data switches and automatic program load, press CONTINUE. Without auto program load, lift START.
4. When readers stops, flip switch to LOAD (or STOP); remove tape.
5. *DISK INITIALIZER REV xx* (*xx* = revision number)
   DISK DRIVE MODEL NUMBER? nnnn) (See Table 5-4 for nnnn)
6. *DISK UNIT?* DP0) (DK0), DP4), etc.)
7. *COMMAND?* FULL)
   a. *COMMAND DESTROYS ALL ....*
      NUMBER OF PATTERNS TO RUN (1-5)? 5)
      PATTERN #1 and so on.
   b. *DO YOU WISH TO DECLARE ANY BLOCKS BAD*
      THAT ARE NOT ALREADY IN THE BAD BLOCK TABLE? NO)
   c. *DEFAULT REMAP AREA SIZE ...*
      REMAP AREA SIZE (TYPE RETURN FOR DEFAULT))
   d. *REMAP AREA START BLOCK NUMBER (TYPE RETURN FOR DEFAULT)?*)
   e. *DEFAULT FRAME SIZE ...*
      DISK FRAME SIZE (TYPE RETURN FOR DEFAULT)?)
   f. *FULL DISK INIT COMPLETE*
      COMMAND? STOP) (or DISK), then step 5, with DP0F, for fixed disk on 6045 or 4234A units.)
8. Put tape BOOT.AB in reader, flip to RUN (or START).
9. a. With a programmed console, or data switches and automatic program load, execute step 1 in Table 5-2 or Table 5-3.
   b. Without automatic program load, repeat steps 1, 18, and 19 in Table 5-2 or 5-3.

10. With a programmed console, type P). With hardware data switches and automatic program load, press CONTINUE. Without automatic program load, lift START.

    When tape stops, flip reader to LOAD (or STOP); remove tape.

11. *BOOTSTRAP DEVICE SPECIFIER?* DP0) or DK0), etc.)

12. *INSTALL BOOTSTAP (Y OR N)?* Y
    DONE.
    BOOTSTRAP DEVICE SPECIFIER?

    For top-loading disk units, type DP0F), then Y, for fixed disk. Continue.

Figure 5-1. Installing the RDOS Starter System from Paper Tape

13. Put Starter System tape, BOOTSYS.AB, in reader; flip to RUN (or START).

14. a. For programmed console, or hardware data switches with automatic program load, repeat step 1 in Table 5-2 or 5-3.

    b. Without automatic program load, repeat steps 1, 18, and 19 in Table 5-2 or 5-3.

15. With a programmed console, type P). With hardware data switches and automatic program load, press CONTINUE.

    Without automatic program load, lift START switch; when tape starts moving, set all data switches down.

    When the tape stops, flip reader to LOAD (or STOP), remove tape.
16. *FULL (F) OR PARTIAL (P OR < CR > ?* F)
17. *INITIALIZING WHAT DISK?* DP0) (DK0),etc.)
18. *TYPE ("0") FOR $TTR ("1") FOR $PTR* 1) (or 0) for $TTR)
19. *LOAD $PTR, STRIKE ANY KEY*
    Put tape #1 of BOOTSYS.OL in reader, flip to RUN (or START), touch any key. Wait for tape to stop.
20. *LOAD $PTR, STRIKE ANY KEY*
    Put tape #2 of BOOTSYS.OL in reader, flip to RUN (or START), strike a key.

21. *DATE (M/D/Y)?* 1 10 79) (current date)
22. *TIME (H:M:S)?* 14 10) (current time)
23. *LOAD $PTR, STRIKE ANY KEY*
    Put first CLI tape, CLI.SV, in reader; touch key. RDOS repeats question 23 for remaining CLI tapes; insert them in sequence.
    R
24. Put tape BOOTSYS.AB in reader, flip to RUN (or START).
25. MKSAVE/Z $PTR BOOTSYS) ($TTR for TTR.)
    LOAD $PTR, STRIKE ANY KEY
    Strike a key.
26. After tape reads in, flip reader to LOAD (or STOP); remove tape.
27. Put tape BOOT.SV in reader, flip to RUN (or START).
28. LOAD/V $PTR) (or $TTR)
29 After tape stops, flip reader to LOAD (or STOP); remove tape.
30. LOG/H)
    R
31. Ready tapes RLDR.SV/RLDR.OL, SYSGEN.SV (or NSYSGEN.SV or BSYSGEN.SV), the five system generation libraries, and system library, SYS.LB. You *can* load others now, if you want. To load .AB tapes, go to step 32.
    a. Put tape in reader, flip to RUN (or START).
    b. LOAD/V $PTR) (or $TTR).
        LOAD $PTR, STRIKE ANY KEY
    c. Strike key. Listing follows, then R
    d. Flip reader to LOAD (or STOP), remove tape; go to a.
32. For .AB tapes, put tape in reader, flip to RUN (or START).
    MKSAVE/Z $PTR filename) (or $TTR)
33. For dual-platter toploader disk only:
    INIT/F DP0F)
    R
    MOVE/V DP0F BOOT.SV)
    BOOT.SV
    R
34. ENDLOG)
    R
35. RELEASE DP0) (DK0),etc.)
    MASTER DEVICE RELEASED

———— *Figure 5-1. Installing the RDOS Starter System from Paper Tape (continued)* ————

End of Chapter

Chapter 6
Building a Tailored RDOS System

Disk Bootstrap

If you don't have a system running, you must bootstrap one into execution. For your first system, you'll bootstrap the RDOS Starter System. In fact, the following bootstrap instructions apply to any RDOS system on the disk, and you'll be using them whenever you bring up RDOS.

1. Power up all equipment if it is not already ON. Put the system console and line printer (if any) ON-LINE. Stop the computer, either by pressing the keyboard BREAK key (programmed consoles) or the front panel STOP switch (hardware data switches).

2. Insert the disk pack or cartridge into drive 0 (if applicable). Flip the LOAD/RUN switch to RUN and wait for the READY light.

3. Program load your computer from disk:

   a. If you have a programmed console, type 1000nnL on the system console. See the second column of Table 6-1 for nn.

   b. If you have hardware data switches and automatic program load hardware, set the data switches to 1000nn; see Table 6-1 for nn. Lift RESET, then PROGRAM LOAD. Go to step 4.

   c. If you do not have automatic program load hardware:

      • Set the data switches to 000376₈ (switches 8 through 14 up, others down); then lift EXAMINE.

      • Set the data switches to 0601nn. (See Table 6-1 for nn.) Lift DEPOSIT.

      • Set the data switches to 000377₈ (switches 8 through 15 up, others down). Then depress DEPOSIT NEXT.

      • Set the data swtiches to 000376₈ (put down switch 15) and lift RESET, then START.

Table 6-1. Disk Controller Device Codes

Disk Type	nn — (octal)	With hardware data switches, set these switches up (others down).
Fixed-Head Model 6063-6064		
Controller #1	26	0,11,13,14
Controller #2	66	0,10,11,13,14
Model 6001-6008		
Controller #1	20	0,11
Controller #2	60	0,10,11
Moving-head Model 6060-6061, 6067		
Controller #1	27	0,11,13,14,15
Controller #2	67	0,10,11,13,14,15
Other Disks		
Controller #1	33	0,11,12,14,15
Controller #2	73	0,10,11,12,14,15

4. Step 3 brings BOOT.SV off disk and into execution. It then asks:

   FILENAME?

   If you have an upper/lowercase console, hold down the SHIFT key, then type the name of the system or program you want to execute. For your first system, this is:

   BOOTSYS) (or FBOOTSYS) for diskette)

   Program BOOT.SV reads the system you specify into the computer, then relinquishes control to RDOS.

5. RDOS requests the current data (month, day, and year) and time (hours in 24, minutes, and seconds). Provide these in the format of the following example:

NOVA RDOS REV xx (xx = revision number)
DATE(M/D/Y)? 1 10 79)
TIME (H:M:S)? 16 53)
R

Now, you're ready to generate your tailored system.

The INFOS System

If you received the INFOS file system with your equipment (commercial ECLIPSE computers only), you may want to review the two INFOS questions which SYSGEN asks before proceeding. Also, you may want to check the memory requirements of the RDOS INFOS file structures in the table at the end of this chapter.

Multiplexors

SYSGEN asks questions about QTY, ALM, and ULM multiplexors. If you specify one of these, it then asks questions about line speed and interrupt characters. For your first system, you can default these. Later, if you decide on special characteristics for your multiplexed lines, read the section on multiplexors in Chapter 2 of the *RDOS Reference Manual* or the Release Notice supplied with your software.

If you want the new RDOS system to support Business BASIC, do not specify a multiplexor to SYSGEN. Business BASIC has its own multiplexor driver. For *Extended* BASIC, *do* specify a multiplexor to SYSGEN, if you want the new system to support a multiplexor.

System Generation

The R prompt indicates the the RDOS Command Line Interpreter will now accept a command. Your command, of course, is to generate a new RDOS system. The system-generation command is:

ISYSGEN for an INFOS-RDOS system;
BSYSGEN for an ECLIPSE system without INFOS;
NSYSGEN for a *mapped* NOVA 3 or NOVA 4 system; or
SYSGEN   for all other NOVA systems,

$\begin{cases} \text{ISYSGEN} \\ \text{BSYSGEN} \\ \text{NSYSGEN} \\ \text{SYSGEN} \end{cases}$ SYS. < SV/S SG/V LM/L >)

The RDOS system you generate will be stored in the disk file SYS.SV (rather than BOOTSYS.SV or FBOOTSYS.SV, which is the RDOS Starter System name). Its overlays will be stored in SYS.OL, the SYSGEN load map in SYS.LM and the SYSGEN dialog (see below) in SYS.SG.

In place of SYS as your system filename, you can type any other unique and previously-unused filename, perhaps one that identifies your tailored system. For example:

$\begin{cases} \text{ISYSGEN} \\ \text{BSYSGEN} \\ \text{NSYSGEN} \\ \text{SYSGEN} \end{cases}$ NICKSSYS. < SV/S SG/V LM/L >)

However, SYS is conveniently the default name for disk bootstrapping (described in detail in Chapter 7). If you choose a name other than SYS, mentally substitute your system name for the word "sysname" for the rest of this book. Do not generate a system with the same name as an existing system or program; this will delete the existing system or program and replace it with the new system.

All of your answers to SYSGEN are numeric and in decimal. If you default any answer by typing only RETURN ()), SYSGEN accepts this as a "0" answer. Although bullets (•) identify the questions that follow in this manual, no bullets appear on the system console.

SYSGEN first says:

type SYSGEN REV xx.xx
VALID ANSWERS ARE IN PARENTHESIS
RESPOND ACCORDINGLY

If you are running INFOS SYSGEN, ISYSGEN knows that you are using a mapped ECLIPSE system, and it skips the next question.

• *MAPPED SYSTEM? ("0"=NO "1"= YES)*

Answer 1) if you wish to generate a mapped system. If you answer 0) SYSGEN skips all the way to the "CORE STORAGE" question, below. For a mapped NOVA system, SYSGEN skips to the "NUMBER OF CHANNELS BACKGROUND" question, below.

INFOS SYSGEN asks the next question; ECLIPSE SYSGEN skips it:

• *PROCESSOR TYPE? ("1"=C/300 "2"=C/330 "3"=C/350)*

Answer with the type of ECLIPSE computer you have. If you answer 1) or 2), ISYSGEN skips to the "NUMBER OF CHANNELS BACKGOUND" question. If you answer 3), SYSGEN skips to the "BURST MULTIPLEXOR" question.

ECLIPSE SYSGEN wants to know about your computer type:

- *S/250 OR C/350 TYPE PROCESSOR? ("0"=NO "1"=YES)*

Answer 1) (yes) to generate a system for an S/250 or C/350; SYSGEN then asks the next two questions. Answer 0) to generate a system for C/150, S/200 or S/230, or C/300 or C/330. If you answer 0), SYSGEN skips the next two questions.

- *BURST MULTIPEXOR CHANNEL (BMC) ("0"=NO "1"=YES)*

A burst multiplexor is a device for handling disk data; up to four model 6060/6061-6067 or 6063/6064 disks can be attached to it. It is available as an option with certain mapped ECLIPSE machines. Answer 1) if you have one or more model 6060-series or 6063-series disks attached to a burst multiplexor; otherwise answer 0). If you answer 1), SYSGEN will later ask you about disks wired to the BMC.

- *ARRAY PROCESSOR? ("0"=NO "1"=YES)*

If your main ECLIPSE computer is attached to an Array Processor, answer 1). A 1) answer reserves 4K of the ECLIPSE memory for the AP, and allows remapping of data between the main processor and the AP. If you do not have an AP, or if a Satellite Processor and not the main computer is attached to the AP, answer 0). In either case, SYSGEN skips the next question.

- *S/200 OR C/300 MAP? ("0"=NO "1"=YES)*

Answer 1) to generate a system for an ECLIPSE S/200 or C/300 processor. Answer 0) for a C/150, S/130, S/230, or C/330. If you answer 0), SYSGEN goes *back* to the previous question, "ARRAY PROCESSOR?"

- *MAXIMUM NUMBER OF CHANNELS BACKGROUND WILL USE (1-255)*

Answer with the maximum number of hardware I/O channels you will need to execute your background-mode programs. Each channel is a

gateway to an input or output device or file. If any of your programs explicitly address channels by number, type the highest number addressed (in decimal), even if this exceeds the number of channels used. RDOS will not run a program that requests more channels (or a channel with a higher channel number) than the number you have selected with your answer to this question.

The Command Line Interpreter requires 14 channels, thus *the new system will not run if you answer less than* 14). If you will be running Extended BASIC, you typically will need five channels plus a number of channels equal to the maximum number of files which can be open at one time by all BASIC users. The COBOL compiler, if you have it, requires a minimum of 25 channels; the RPG compiler requires 27 channels.

If you're not sure how many channels you will need, and you're not running COBOL or RPG, then try 16) This will accommodate most software. Then you can use the tuning option explained later to devise a more precise number after you have been running your RDOS system for awhile.

- *MAXIMUM NUMBER OF CHANNELS FOREGROUND WILL USE (0-255)*

See the previous question to determine the number of channels you need. Extended BASIC, COBOL, and RPG require the same number of channels in both background and foreground modes. If you type 0), you will have no foreground mode because reading programs from disk requires at least one channel. When unsure of what you need, try 16).

If you specified an unmapped system, SYSGEN asks:

- *CORE STORAGE (IN THOUSANDS OF WORDS, 16-32)*

Type the amount of memory storage your system has, in multiples of 1024 words; e.g., type 20 if you have 20,480 words.

- *NUMBER OF NOVADISK CONTROLLERS (0-2)*

A NOVADISK is a model 6001-6008 fixed-head disk. There are two kinds of fixed-head disk; the other kind is the model 6063/6064, which SYSGEN asks about next. Answer with the number of 6001-6008 disks you want this system to support.

If you have 0 or 2 of these disk, SYSGEN skips the next question.

- *DEVICE PRIMARY ("0") OR SECONDARY ("1")?*

  Answer 0) if your 6001-6008 disk is wired to the first device code; answer 1) for the second device code. The primary disk has device code 20_8 and disk-identifying mnemonic DK0; the secondary disk has device code 60_8 and mnemonic DK1.

- *NUMBER OF 6063/6064 DISK CONTROLLERS (0-2)*

  The 6063/6064 is the other, newer kind of fixed-head disk. Answer 0), 1), or 2), depending on the number of *controllers* you have for 6063/6064 drives. Each controller can handle up to four drives.

  If you have one 6063/6064 controller, SYSGEN asks:

- *DEVICE PRIMARY ("0") OR SECONDARY ("1")?*

  Answer 0) if your 6063/6064 controller is connected to the first device code; answer 1) for the second device code. The first controller has device code 26_8; it controls drives named DS0, DS1, DS2, and DS3. The second controller has device code 66_8; it controls drives named DS4, DS5, DS6, and DS7.

- *NUMBER OF DEVICES FOR CONTROLLER □1 (1-4) #1 (1-4)*

  Answer with the number of disk drives connected to the first controller.

  If you specified two 6063/6064 controllers, SYSGEN repeats this question for the second controller.

- *NUMBER OF 6060/6061/6067 DISK CONTROLLERS (0-2)*

  Answer 0), 1), or 2) depending on the number of controllers you have for 6060/6061/6067 series disk drive consoles. These drives hold multiple-platter disk packs. The primary controller has device code 27_8 and controls consoles DZ0, DZ1, DZ2, and DZ3; the secondary controller has device code 67_8 and controls consoles DZ4, DZ5, DZ6, and DZ7.

  If you answer 1), SYSGEN wants to know:

- *DEVICE PRIMARY ("0") OR SECONDARY ("1")?*

  Answer 0) if your 6060/6061/6067 controller is wired to the first device code (27_8); answer 1) for the second device code (67_8).

- *NUMBER OF DEVICES FOR CONTROLLER #1 (1-4)*

  Respond with the number of 6060/6061/6067 disk consoles connected to the first controller.

  If you specified two 6060/6061/6067 controllers, SYSGEN repeats this question for the second controller.

- *NUMBER OF OTHER TYPES OF MOVING-HEAD DISK CONTROLLERS (0-2)*

  This question covers the remaining models of disks. It includes all sealed moving-head disks, top-loading disk drives, and diskettes. Be sure to specify the number of non-6060 series controllers in the system, not the total of moving-head disks.

  If you have no other kinds of moving-head disk, SYSGEN skips the next five questions. If you answered 1), SYSGEN requests:

- *DEVICE PRIMARY ("0") OR SECONDARY ("1")*

  Generally, your moving-head disk controller will be primary, so answer 0). If you know for certain that it is connected to the second controller, answer 1). The primary moving-head disk controller has I/O device code 33_8 and the disk-identifying mnemonics DP0, DP1, DP2, and DP3 for drives 1 through 4 respectively. The secondary controller has device code 73_8 and mnemonics DP4, DP5, DP6, and DP7 for the second set of devices 1 through 4 respectively.

- *NUMBER OF DEVICES FOR CONTROLLER #1 (1-4)*

  Each sealed moving-head disk, each dual-platter top loader disk subsystem, and each diskete drive counts as one device.

  Give the number of drives connected to the first controller.

- *TOP LOADER(S)? ("0" = NO "1" = YES)*

  If you have Model 6045, 6070, or 4234A top-loading cartridge disk drives connected to the first controller, answer 1); otherwise answer 0). These drives include a built-in nonremovable disk and your answer identifies the extra storage to SYSGEN. The removable disk has mnemonics DP0, DP1, DP2, or DP3; the fixed disk has the same mnemonic but with the suffix F; i.e., DP0F through DP3F.

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If you specified two moving-head disk controllers, SYSGEN asks the two questions:

- *NUMBER OF DEVICES FOR CONTROLLER #2 (1-4)*

and

- *TOP LOADER(S) ("0"=NO "1" = YES)*

to which you respond as you did to the questions about the first controller. The second "other" type of disk controller has device code 73_8. For the second controller, the removable disk has mnemonics DP4, DP5, DP6, or DP7; the fixed disk (if any) has the same mnemonics, but with the F suffix: DP4F through DP7F.

- *ENTER BAD BLOCK POOL SIZE IN BLOCKS (0-512)*

RDOS needs a bad block pool in memory to pass over unusable disk storage. The bad block pool must be large enough to hold the bad blocks for all disks on your system; e.g., if you have two top-loaders (4 disks) and each disk has three bad blocks, the bad block pool must contain at least 12 blocks to allow all four disks to be intialized at the same time.

Ideally, you should enter the same value DKINIT assigned to the disk when you defaulted the DKINIT "DEFAULT REMAP AREA SIZE?" question in an earlier chapter. If you don't remember the DEFAULT size and DKINIT ran all patterns without an error, try 12) for each disk unless you have large disks. With one or more large disks (model 6060/6061/6067), try 60).

- *DUAL PROCESSORS (IPB)? ("0"=NO "1"= YES)*

Respond with 1) if your system has two computers connected by an InterProcessor Buffer; otherwise type 0).

- *ENTER NUMBER OF STACKS (1-10)*

RDOS can concurrently operate a number of I/O peripheral devices equal to the number of stacks you select. One stack is minimum in an unmapped system; spooling requires an additional stack, and each multiple concurrent task requires another stack. (Spooling saves output intended for a slow peripheral, such as a liner printer, on the disk until the peripheral device is ready to accept it.) In a mapped environment, you need one stack each for background and foreground program, one stack for spooling, and an additonal stack for every task that will be running concurrently.

RDOS automatically allots two extra system buffers for the fourth and each additional stack.

INFOS requires a minimum of three stacks. If you are running Extended BASIC, you need at least two stacks in an unmapped system and three stacks in a mapped system. However, system efficiency increases substantially if you allocate additional stacks (5 or more recommended in a mapped system) when supporting multiple BASIC terminals. See Table 6-2 for stack recommendations.

- *ENTER NUMBER OF EXTRA CELLS (0-64)*

RDOS runs more efficiently if you specify two extra cells (data buffers of 16 memory words each) for each simultaneous spooling device, except the system console. For example, if you have a system with one paper tape reader, one paper tape punch, one line printer, and one magnetic tape controller (which may have multiple drives), you would specify 8 extra cells. An INFOS system requires four cells in addition to spooling requirements.

Table 6-2. System Stack Requirments

System	System Stacks	
	Minimum	Recommended
unmapped	1	2
mapped	2	3
Extended BASIC unmapped	2	4 or more
Extended BASIC mapped	3	5 or more
INFOS	3	5

- *TUNING ("0"=NO "1"=YES)*

RDOS provides a self-monitoring feature called tuning. If you type 1), and later turn tuning on, RODS will record how often it needs a system stack, cell or system buffer (see below) but cannot get one because not enough were allocated at SYSGEN time. This information is kept in disk file SYS.TU (or sysname.TU if you named your RDOS sysname). You can PRINT this file at any time; or, at some future time when you are generating a new RDOS system, you can tell SYSGEN to obtain a corrected number of stacks, cells, and buffers by analyzing this file, and to use the tuning values in place of your typed answers. This self-tuning feature is most useful for tailoring an RDOS system that will be dedicated to a particular application. When tuning is on, it consumes one system buffer. For further information on tuning, consult the *RDOS Reference Manual.*

If you request tuning, SYSGEN asks:

- *SHALL TUNING BE WITH ("1") OR WITHOUT ("0") OVERLAY REPORT?*

The overlay report is appended to disk file SYS.TU (or your systemname.TU). In this file, RDOS keeps count of the number of times it needs each system overlay but must read it in from the overlay file because it is not core-resident. SYSGEN cannot use the overlay report to generate a more efficient system. But you can examine the report and decide if any overlay files are so frequently needed that you should allocate extra buffer space (see below) for them. When tuning is on and you have chosen an overlay report, the overlay report feature uses two extra system buffers.

- *ENTER NUMBER OF EXTRA BUFFERS REQUIRED (0-63)*

Extra buffers allow disk data and overlay files, which would otherwise be swapped out to disk, to remain core-resident. The more extra buffers you allocate, the faster and more efficiently RDOS will run because disk swapping time is reduced. Each extra buffer takes an additional 270 words and reduces the amount of memory available for your program by that much.

RDOS automatically allots a minimum of six buffers, or two per stack, whichever is greater.

Block I/O operations (records that you read from, or write to disk in multiples of 256 words) reduce the need for extra buffers, because RDOS does not use buffers for these. Conversely, adding users to a multiterminal Extended BASIC system increases the need for extra buffers if you want to maintain reasonable system response at the terminals. If you are unsure of how many extra buffers to allocate, we suggest:

Memory Size	Type In
20K	0)
24K	4)
32K or more	8)

You can then use tuning to pinpoint your requirements more precisely. Allocating more than 25 extra buffers does not measurably improve system performance.

An INFOS system requires a minimum of four extra buffers, with ten recommended, but runs very well with 20 or more extra buffers.

If you are executing INFOS SYSGEN, it asks the next two questions:

- *ENTER MAXIMUM ISAM/DBAM PAGE SIZE (IN K BYTES "2" "4" OR "6")?*

Specify the largest page size required for the ISAM/DBAM files you will be processing. Generally, answer 2). The optimum answer will depend on the design of your database; to determine it, you must read *The INFOS System User's Manual (RDOS).*

- *ENTER FILE CONTROL SPACE (IN BYTES 1-16)?*

Answer in multiples of 1024 bytes. The amount of file control space you select determines the number of INFOS files that can be open at one time. A good general answer is 8). The *INFOS System User's Manual (RDOS)* will help you design your data base and select the right amount of file space to support it.

- *MAXIMUM NUMBER OF SUBDIRECTORIES/SUBPARTITIONS ACCESSIBLE AT ONE TIME (0-64)*

RDOS allows you to divide each physical disk (called a primary partition) into sections called subpartitions or secondary partitions. Each subpartition can have one or more subdirectories. You can address each of these "directories" from the console or from your programs, as if it were a self-contained disk drive. For more details, consult *Learning to Use Your RDOS/DOS System,* or the *RDOS Reference Manual.*

The utility programs (Macroassembler, Text Editors, FORTRAN, etc.) do not require subdirectories; neither does an INFOS system.

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For Extended BASIC the installation's System Manager usually assigns a fixed-length subpartition to each BASIC user; so normally your answer will be the maximum number of terminals the Extended BASIC system supports, plus 1 for the shared library (usually kept in a subdirectory) and 1 for each disk (itself a directory) that contains any or all of these.

- *ENTER NUMBER OF CONTROLLERS FOR MTA (0-2)*

Be sure to enter here the number of magnetic tape controllers, not the number of tape drives. Each controller can support up to eight drives.

If you have one magnetic tape controller, SYSGEN asks:

- *DEVICE PRIMARY ("0") OR SECONDARY ("1")?*

The first controller has I/O device code 22_8 and the tape drives have identifying mnemonics MT0 through MT7. The secondary controller has device code 62_8 and the tape drive mnemonics are MT10 through MT17. If you have two controllers, one is by definition primary and the other is secondary.

SYSGEN then asks you to:

- *ENTER NUMBER OF DEVICES FOR CONTROLLER #1 (1-8)*

If you have second controller, SYSGEN asks:

- *ENTER NUMBER OF DEVICES FOR CONTROLLER #2 (1-8)*

Key in the number of magnetic tape drives attached to the respective controllers.

- *ENTER NUMBER OF CONTROLLERS FOR CTA (0-2)*

Cassette controller number 1 has device code 34_8 and the cassette drives have identifying mnemonics CT0 through CT7. Controller number 2 has device code 74_8 and the cassette drive mnemonics are CT10 through CT17.

If you specify only one controller, SYSGEN wants to know:

- *DEVICE PRIMARY ("0") OR SECONDARY ("1")?*

Then for one or two controllers, SYSGEN requests you to:

- *ENTER NUMBER OF DEVICES FOR CONTROLLER #1 (1-8)*

- *ENTER NUMBER OF DEVICES FOR CONTROLLER #2 (1-8)*

Respond in each case with the number of cassette drives attached to the controller.

- *AUTO RESTART ON POWER FAIL? ("0"=NO "1"=YES)*

Specify whether or not you want to have this option.

- *OPERATOR MESSAGES ("0"=NO "1"=YES)*

If you will be executing programs that use RDOS system or task calls to send messages to and retrieve messages from the system console, then answer 1). Neither the system utilities nor Extended BASIC need this feature.

- *RTC? ("0"=NO "1"=YES)*

Specify whether or not you have Real-Time Clock hardware.

If you have a clock, SYSGEN asks the next two questions.

- *DEVICE PRIMARY ("0") OR SECONDARY ("1")?*

The primary Real-Time Clock has I/O device code 14_8; the secondary clock has code 54_8. In either case, SYSGEN will ask you this question and the following question for only one clock, and RDOS will see only the one clock you identify during SYSGEN.

- *ENTER RTC FREQ (1=10HZ, 2=50HZ, 3=60HZ, 4=100HZ, 5=1000HZ)*

Unless you want a special frequency for programs you code yourself, answer 1) for a 10Hz clock. Extended BASIC, COBOL, and RPG expect and use 10Hz frequency. If you are synchronizing with the AC line frequency, then type 2) if you have 50Hz power and 3) if you have 60Hz power.

- *ENTER NUMBER OF PTR (0-2)*

If you specify one paper tape reader, it has I/O device code 12_8 and identifying mnemonic PTR (filename $PTR); the second reader has code 52_8 and mnemonic PTR1 (filename $PTR1).

- *ENTER NUMBER OF PTP (0-2)*

The first paper tape punch has device code 13_8 and identifying mnemonic PTP (filename $PTP); the second has code 53_8 and mnemonic PTP1 (filename $PTP1).

- *ENTER NUMBER OF LPT (0-2)*

  The first line printer has device code 17_8 and identifying mnemonic LPT (filename $LPT); the second has code 57_8 and mnemonic LPT1 (filename $LPT1).

  If you have one or two printers, SYSGEN asks two or four of the following questions, respectively:

- *ENTER COLUMN SIZE DEVICE #1 (80 OR 132)*

  Specify the column size of your first printer.

- *DATA CHANNEL LINE PRINTER? ("0"=NO "1"=YES)*

  If your first (or only) line printer is a data channel printer, type 1). Otherwise, type 0).

- *ENTER COLUMN SIZE FOR DEVICE #2 (80 or 132)*

  Specify column size for $LPT1.

- *DATA CHANNEL LINE PRINTER? ("0"=NO "1"=YES)*

  Answer 1) if your second printer is a data channel printer; otherwise 0).

Next, SYSGEN asks:

- *ENTER NUMBER OF CDR (0-2)*

  The first punched or mark-sense card reader has device code 16_8 and identifying mnemonic CDR (filename $CDR); the second has code 56_8 and mnemonic CDR1 (filename $CDR1).

- *ENTER NUMBER OF PLT (0-2)*

  The device code for the first incremental plotter is 15_8 and its identifying mnemonic is PLT (filename $PLT); the second plotter has code 55_8 and mnemonic PLT1 (filename $PLT1).

- *ENTER NUMBER OF MCA (0-2)*

  If you answer 2), the first Multiprocessor Communications Adapter has device code 06_8 and 07_8, and mnemonics MCAT and MCAR for transmitter and receiver, respectively. The second adapter has codes 46_8 and 47_8, and mnemonics MCAT1 and MCAR1.

If you specify only one MCA link, then SYSGEN asks:

- *DEVICE PRIMARY ("0") or SECONDARY ("1")?*

  To determine which set of codes and mnemonics to assign to the link.

- *QTY? ("0"=NO "1"=YES)*

  Answer 1) only if you want the new system to support a Type 4060 Asynchronous Data Multiplexor (but, for BASIC systems, see note under "Multiplexors", earlier). Answer 0) if you do not want 4060 support; SYSGEN then skips to the "ULM" question.

- *DEVICE PRIMARY ("0") OR SECONDARY ("1")*

  The primary 4060 is on device code 30_8 and has mnemonic QTY; the secondary unit is on code 70_8 and has mnemonic QTY1. The multiplexed lines have filenames QTY:xx or QTY1:xx, primary and secondary, where xx is the line number, 0-63.

  After you answer this question, SYSGEN skips to the "DEFAULT INTERRUPT CHARACTERS" question.

- *ULM? ("0"=NO "1"=YES)*

  A ULM (Universal Line Multiplexor) is a multiplexor that fits into a computer chassis instead of a separate communications chassis. A ULM can handle up to 4 asynchronous full-duplex lines or up to 8 half-duplex asynchronous lines; it can also handle 2 synchronous lines. RDOS supports only the asynchronous lines. To support the synchronous lines, you must use other DG software, like the Communications Access Manager, with RDOS.

  If you want the new system to support an ALM multiplexor or no multiplexor, answer 0); SYSGEN then skips to the "ALM" question. To have it support a ULM, answer 1); but, for BASIC systems, see note under "Multiplexors", earlier. If you specify a ULM, SYSGEN asks;

- *DEVICE PRIMARY ("0") OR SECONDARY ("1")?*

  The primary ULM is one device code 34_8, the secondary is on code 44_8. ULM mnemonics are ULM and ULM1, for primary and secondary devices; but the filenames of multiplexed lines are QTY:xx and QTY1:xx, respectively, where xx is the line number.

SYSGEN now asks about line speed:

- *LINE SPEED (BITS/SEC) ? ("1"=19200 "2"=50 "3"=75 "4"=134.5 "5"=200 "6"=600 "7"=2400 "8"=9600 "9"=4800 "10"=1800 "11"=1200 "12"=2400 "13"=300 "14"=150 "15"=110)*

Your answer selects the baud line speed for *all* asynchronous lines. (But it will not override the line speed set by hardware jumpers, if any.) Generally, a higher line speed means faster response to multiplexed terminals, but it also means that the main processor must service more interrupts in a given amount of time. If there are too many interrupts at a time, the system will report input buffer overflow errors, and input characters may be lost. Good general answers are 7) (2400), 9) (4800), or 8) (9600). For minimum screen service time, you can try a very high baud rate; then if input characters are lost, generate another RDOS system with a slower rate.

Alternatively, later, you can select a speed for *each* line by editing the ALM/ULM multiplexor source file, ALMSPD.SR, with a text editor, then assembling the edited ALMSPD.SR file with the macroassembler. Future SYSGENs will then use your custom ALMSPD binary file to implement the line characteristics you want -- because the line speed declared in the ALMSPD file overrides the speed you give to SYSGEN.

After you answer this question, SYSGEN skips to the "DEFAULT INTERRUPT CHARACTERS" question.

● *ALM? ("0"=NO "1"=YES)*

Answer 1) if you want the new system to support a Type 4255 through 4258 Asynchronous Line Multiplexor (but, for BASIC systems, see the note under "Multiplexors", earlier). If you don't want ALM support, SYSGEN skips to the "SECOND TTY" question. If you do want it, SYSGEN asks:

● *DEVICE PRIMARY ("0") OR SECONDARY ("1")?*

The primary ALM is on device code 34_8 and has the mnemonic ALM; the secondary ALM is on code 44_8 and has the mnemonic ALM1. The filenames of ALM lines are QTY:xx and QTY1:xx for the first and second ALM, where xx is a line number from 0 to 63.

● *ENTER ALM CLOCK FREQUENCY (0-3)*

An ALM has four clocks, and each is jumpered for a specific line speed. Choose the clock whose frequency matches the baud rate of your terminals. Often, DG jumpers the ALM clocks according to customer specification; but, if you are unsure of what clock to specify, try 0).

Later, you can select a specific clock for *each* line by editing the multiplexor parameter source file,

ALMSPD.SR, with a text editor, then assembling the edited ALMSPD.SR file with the macroassembler. Future SYSGENs will then use your custom ALMSPD binary file to implement the line characteristics you want -- because the clock specification declared in the ALMSPD file overrides the clock you give to SYSGEN.

SYSGEN now asks about interrupt characters for your multiplexed lines.

● *USE DEFAULT ALM/QTY INTERRUPT CHARACTERS ("0"=NO "1"=YES)*

The default interrupt characters for multiplexed lines are CTRL-A and CTRL-C. If you want users on your multiplexed lines to use these as interrupts, type 1). To select one or two different interrupt characters, type 0). Multiuser Extended BASIC systems require ESC (ASCII 27 in decimal) as one of the two interrupt characters.

If you type 0), SYSGEN asks for the new characters:

● *FIRST CHARACTER (ASCII DECIMAL CODE OR "128"=NONE)*

Type in the *decimal* code (as shown in Appendix C) of the interrupt character that will replace CTRL-A; or type 128) if you want only one character or none.

● *SECOND CHARACTER (ASCII DECIMAL CODE OR "128"=NONE)*

Respond with the *decimal* code of the interrupt character that will replace CTRL-C, or type 128) to omit a second interrupt character.

● *NUMBER OF NULLS AFTER CARRIAGE RETURN? (0-256)*

Under some circumstances, certain printing consoles may lose transmitted characters as the print head returns to column 0. Should this happen, you can use this question to specify enough nulls to allow the head to catch up. For your first system, try 0); then, if you lose characters from remote terminals, try adding nulls in increments of 3.

● *SECOND TTY? ("0"=NO "1"=YES)*

Answer 1) if you have a console connected to the second teletypewriter interface. Such a console is independent of multiplexors; a system can have one primary console or a primary and secondary console with or without a multiplexor. The device codes and filenames of the secondary console are 50_8 and $TTI1 for input and 51_8 and $TTO1 for output.

If you are running INFOS SYSGEN, it automatically selects option 2 for the next question.

- CORE DUMP FACILITY? ("0"=NO "1"=LPT "2"=MTA "3"=6030)

If the system comes down unexpectedly, the core dump program can copy the computer's memory state to whatever device you specify. You can also invoke it yourself (see Exceptional Status appendix of *RDOS Reference Manual*). (INFOS SYSGEN gives you the MTA dump option only.)

If you have system problems and want Data General's assistance, we will need a magnetic tape or diskette dump.

If you answer 2), SYSGEN asks whether the device is primary or secondary. Answer 0) if the drive to receive the dump is connected to the first controller; otherwise 1).

You can choose only one answer. Type 0) if you don't want the core dump; 1) to dump to the first line printer; 2) to dump to mag tape drive number 3 (the program gives you a chance to dial 3 before you dump); or 3) for the dump to diskette DP3 or DP7 (the program gives you a chance to dial 3 before you dump). The core dump feature requires between 100 and 200 memory locations.

The core dump question is the last in the SYSGEN dialog. SYSGEN now selects the modules for the new system from the SYSGEN libraries, and tells the Relocatable Loader to create the new system. The whole process takes a few minutes, so don't be alarmed at the delay. Soon, SYSGEN will return control to the CLI, which issues the prompt:

R

This indicates that your new system has been built.

The SYSGEN program itself does not build the new system. After you answer the last question, SYSGEN stores the system-creating command line in special file CLI.CM; then SYSGEN tells RDOS to execute the contents of file CLI.CM. This includes the Loader command that builds the new system. If you're curious about the system-creating command line, you can TYPE CLI.CM.

At this point you are still running under the starter system, since you have just generated your tailored system but haven't yet bootstrapped it into operation.

Bootstrapping Your Tailored RDOS

Now you're ready to start up your tailored system. Of course, you can do this by releasing the disk and using program load, as you did previously when you bootstrapped the RDOS Starter System. But a better way is simply to type:

BOOT SYS)   (or equivalent filename)
MASTER DEVICE RELEASED
type RDOS REV XX
DATE (M/D/Y)?

As you have done before, provide the date and time:

DATE (M/D/Y)? 1 10 79)
TIME (H:M:S) 17 50)
R

Congratulations. Your tailored RDOS is now running.

(If the new system doesn't come up, you may or may not receive an explanatory error message. Bring up the starter system, BOOTSYS or FBOOTSYS, as described at the beginning of this chapter. Type DELETE/V SYS.(LM,SG)) to delete the load map and dialog files, and execute SYSGEN again, using the same *sysname* to delete the defective system files. In the SYSGEN dialog, correct the error that prevented the new system from running, if the error message informed you what the problem was. Consult Appendix B if necessary. Then BOOT the new system as above.)

You should next print out and save the load map and SYSGEN dialog, so give the command

PRINT SYS.<SG LM>)

(or use the filename you substituted for SYS) to get a listing on the line printer. If you have no line printer, key

TYPE SYS.<SG LM>)

(or your equivalent) for a listing on the system console teleprinter.

Both the SYSGEN dialog and load map are important. The SYSGEN dialog is your record of the hardware and software features for which you configured RDOS; you can also use the disk stored SYS.SG (or equivalent) file to tune your RDOS system. Data General may from time to time issue corrections to RDOS as binary-word patches, and when you patch, you will need the load map to identify where on the disk the patch goes.

When you have an RDOS system running, you can invoke SYSGEN at any time to generate a new system. You might want to generate a new system to manage a different application, or to tune an existing RDOS system (described later in this chapter).

Figures 6-1, 6-2, 6-3, and 6-4 show sample SYSGEN dialogs for unmapped NOVA, mapped NOVA 3/NOVA 4, mapped ECLIPSE, and INFOS systems respectively.

To learn more about using RDOS, read Chapter 7, or consult *Learning to Use Your RDOS/DOS System, Introduction to the Real-Time Disk Operating System,*

RDOS/DOS Command Line Interpreter User's Manual, and *RDOS Reference Manual.* And when you are through experimenting with RDOS, be sure to *always* type:

RELEASE DP0)   (or DZ0), etc.)

MASTER DEVICE RELEASED

before you flip the disk switch from RUN to LOAD, or START to STOP, remove the disk pack or cartridge (if these apply), and power down your computer system. It's critically important to RELEASE the master device (which holds the RDOS system) before flipping switches to LOAD.

```
NOVA SYSGEN REV 6.40
VALID ANSWERS ARE IN PARENTHESIS RESPOND ACCORDINGLY

MAPPED SYSTEM? ("0"=NO "1"=YES) $0
   CORE STORAGE IN THOUSANDS OF WORDS  (16-32) $32
NUMBER OF NOVADISK DISK CONTROLLERS(0-2) $0
NUMBER OF 6063/6064 DISK CONTROLLERS(0-2) $0
NUMBER OF 6060/6061/6067 DISK CONTROLLERS(0-2) $0
NUMBER OF OTHER TYPES OF MOVING HEAD DISK CONTROLLERS(0-2) $1
   DEVICE PRIMARY("0") OR SECONDARY("1")? $0
   NUMBER OF DEVICES FOR CONTROLLER #1(1-4) $2
     TOP LOADER(S)? ("0"=NO "1"=YES) $0
ENTER BAD BLOCK POOL SIZE IN BLOCKS (0-512) $12
DUAL PROCESSORS (IPB)? ("0"=NO "1"=YES) $0
ENTER NUMBER OF STACKS (1-10) $2
ENTER NUMBER OF EXTRA CELLS (0-64) $4
TUNING? ("0"=NO "1"=YES) $0
ENTER NUMBER OF EXTRA BUFFERS REQUIRED (0-63) $6
MAXIMUM NUMBER OF SUB-DIRECTORIES/SUB-PARTITIONS
ACCESSIBLE AT ONE TIME (0-64) $8
ENTER NUMBER OF CONTROLLERS FOR MTA(0-2) $0
ENTER NUMBER OF CONTROLLERS FOR CTA(0-2) $0
AUTO RESTART ON POWER FAIL? ("0"=NO "1"=YES) $0
OPERATOR MESSAGES? ("0"=NO "1"=YES) $0
RTC? ("0"=NO "1"=YES) $1
   DEVICE PRIMARY("0") OR SECONDARY("1")? $0
   ENTER RTC FREQ (1=10HZ 2=50HZ 3=60HZ 4=100HZ 5=1000HZ) $1
ENTER NUMBER OF PTR(0-2) $0
ENTER NUMBER OF PTP(0-2) $0
ENTER NUMBER OF LPT(0-2) $0
ENTER NUMBER OF CDR(0-2) $0
ENTER NUMBER OF PLT(0-2) $0
ENTER NUMBER OF MCA(0-2) $0
QTY? ("0"=NO "1"=YES) $0
ULM? ("0"=NO "1"=YES) $0
ALM? ("0"=NO "1"=YES) $0
SECOND TTY? ("0"=NO "1"=YES) $0
CORE DUMP FACILITY? ("0"=NO  "1"=LPT  "2"=MTA  "3"=6030) $0
```

Figure 6-1. Unmapped NOVA SYSGEN Dialog

```
NOVA 3 SYSGEN REV 6.40
VALID ANSWERS ARE IN PARENTHESIS RESPOND ACCORDINGLY

MAPPED SYSTEM? ("0"=NO "1"=YES) $1
   MAXIMUM NUMBER OF CHANNELS BACKGROUND WILL USE(1-255) $18
   MAXIMUM NUMBER OF CHANNELS FOREGROUND WILL USE(0-255) $18
NUMBER OF NOVADISK DISK CONTROLLERS(0-2) $0
NUMBER OF 6063/6064 DISK CONTROLLERS(0-2) $0
NUMBER OF 6060/6061/6067 DISK CONTROLLERS(0-2) $1
   DEVICE PRIMARY("0") OR SECONDARY("1")? $0
   NUMBER OF DEVICES FOR CONTROLLER #1(1-4) $2
NUMBER OF OTHER TYPES OF MOVING HEAD DISK CONTROLLERS(0-2) $0
ENTER BAD BLOCK POOL SIZE IN BLOCKS (0-512) $12
DUAL PROCESSORS (IPB)? ("0"=NO "1"=YES) $0
ENTER NUMBER OF STACKS (1-10) $6
ENTER NUMBER OF EXTRA CELLS (0-64) $8
TUNING? ("0"=NO "1"=YES) $1
   SHALL TUNING BE WITH("1") OR WITHOUT("0") OVERLAY REPORT? $1
ENTER NUMBER OF EXTRA BUFFERS REQUIRED (0-63) $8
MAXIMUM NUMBER OF SUB-DIRECTORIES/SUB-PARTITIONS
ACCESSIBLE AT ONE TIME (0-64) $10
ENTER NUMBER OF CONTROLLERS FOR MTA(0-2) $1
   DEVICE PRIMARY("0") OR SECONDARY("1")? $0
   ENTER NUMBER OF DEVICES FOR CONTROLLER #1 (1-8) $1
ENTER NUMBER OF CONTROLLERS FOR CTA(0-2) $0
AUTO RESTART ON POWER FAIL? ("0"=NO "1"=YES) $0
OPERATOR MESSAGES? ("0"=NO "1"=YES) $0
RTC? ("0"=NO "1"=YES) $1
   DEVICE PRIMARY("0") OR SECONDARY("1")? $0
   ENTER RTC FREQ (1=10HZ 2=50HZ 3=60HZ 4=100HZ 5=1000HZ) $1
ENTER NUMBER OF PTR(0-2) $0
ENTER NUMBER OF PTP(0-2) $0
ENTER NUMBER OF LPT(0-2) $1
   ENTER COLUMN SIZE FOR LPT #1 (80 OR 132) $132
      DATA CHANNEL LINE PRINTER? ("0"=NO  "1"=YES) $1
ENTER NUMBER OF CDR(0-2) $0
ENTER NUMBER OF PLT(0-2) $0
ENTER NUMBER OF MCA(0-2) $0
QTY? ("0"=NO "1"=YES) $0
ULM? ("0"=NO "1"=YES) $1
   DEVICE PRIMARY("0") OR SECONDARY("1")? $0
   LINE SPEED (BITS/SEC)?("1"=19200 "2"=50 "3" =75
   "4"=134.5 "5"=200   "6"=600   "7"=2400  "8"=9600
   "9"=4800  "10"=1800 "11"=1200 "12"=2400 "13"=300
   "14"=150  "15"=110) $11
   USE DEFAULT ALM/QTY INTERRUPT CHARACTERS? ("0"=NO "1"=YES) $0
      FIRST CHARACTER? (ASCII DECIMAL CODE OR "128"=NONE) $27
      SECOND CHARACTER? (ASCII DECIMAL CODE OR "128"=NONE) $128
   NUMBER OF NULLS AFTER CARRIAGE RETURN? (0-256) $0
SECOND TTY? ("0"=NO "1"=YES) $1
CORE DUMP FACILITY? ("0"=NO  "1"=LPT  "2"=MTA  "3"=6030) $0
```

Figure 6-2. Mapped NOVA 3/NOVA 4 SYSGEN Dialog

093-000188-02

```
ECLIPSE SYSGEN REV 6.40
VALID ANSWERS ARE IN PARENTHESIS RESPOND ACCORDINGLY

MAPPED SYSTEM? ("0"=NO "1"=YES) $1
   S/250 OR C/350 TYPE PROCESSOR? ("0"=NO "1"=YES) $1
      BURST MULTIPLEXOR CHANNEL (BMC)? ("0"=NO "1"=YES) $1
   ARRAY PROCESSOR? ("0"=NO "1"=YES) $1
   MAXIMUM NUMBER OF CHANNELS BACKGROUND WILL USE(1-255) $27
   MAXIMUM NUMBER OF CHANNELS FOREGROUND WILL USE(0-255) $27
NUMBER OF NOVADISK DISK CONTROLLERS(0-2) $0
NUMBER OF 6063/6064 DISK CONTROLLERS(0-2) $0
NUMBER OF 6060/6061/6067 DISK CONTROLLERS(0-2) $1
   DEVICE PRIMARY("0") OR SECONDARY("1")? $0
   CONTROLLER #1 ON BMC? ("0"=NO "1"=YES) $1
   NUMBER OF DEVICES FOR CONTROLLER #1(1-4) $1
NUMBER OF OTHER TYPES OF MOVING HEAD DISK CONTROLLERS(0-2) $1
   DEVICE PRIMARY("0") OR SECONDARY("1")? $1
   NUMBER OF DEVICES FOR CONTROLLER #2(1-4) $1
      TOP LOADER(S)? ("0"=NO "1"=YES) $0
ENTER BAD BLOCK POOL SIZE IN BLOCKS (0-512) $25
DUAL PROCESSORS (IPB)? ("0"=NO "1"=YES) $0
ENTER NUMBER OF STACKS (1-10) $4
ENTER NUMBER OF EXTRA CELLS (0-64) $6
TUNING? ("0"=NO "1"=YES) $0
ENTER NUMBER OF EXTRA BUFFERS REQUIRED (0-63) $8
MAXIMUM NUMBER OF SUB-DIRECTORIES/SUB-PARTITIONS
ACCESSIBLE AT ONE TIME (0-64) $12
ENTER NUMBER OF CONTROLLERS FOR MTA(0-2) $1
   DEVICE PRIMARY("0") OR SECONDARY("1")? $0
   ENTER NUMBER OF DEVICES FOR CONTROLLER #1 (1-8) $1
ENTER NUMBER OF CONTROLLERS FOR CTA(0-2) $0
AUTO RESTART ON POWER FAIL? ("0"=NO "1"=YES) $0
OPERATOR MESSAGES? ("0"=NO "1"=YES) $0
RTC? ("0"=NO "1"=YES) $1
   DEVICE PRIMARY("0") OR SECONDARY("1")? $0
   ENTER RTC FREQ (1=10HZ 2=50HZ 3=60HZ 4=100HZ 5=1000HZ) $1
ENTER NUMBER OF PTR(0-2) $0
ENTER NUMBER OF PTP(0-2) $0
ENTER NUMBER OF LPT(0-2) $1
   ENTER COLUMN SIZE FOR LPT #1 (80 OR 132) $132
      DATA CHANNEL LINE PRINTER? ("0"=NO  "1"=YES) $1
ENTER NUMBER OF CDR(0-2) $0
ENTER NUMBER OF PLT(0-2) $0
ENTER NUMBER OF MCA(0-2) $0
QTY? ("0"=NO "1"=YES) $0
ULM? ("0"=NO "1"=YES) $0
ALM? ("0"=NO "1"=YES) $1
   DEVICE PRIMARY("0") OR SECONDARY("1")? $0
   ALM CLOCK FREQUENCY? (0-3) $0
   USE DEFAULT ALM/QTY INTERRUPT CHARACTERS? ("0"=NO "1"=YES) $1
   NUMBER OF NULLS AFTER CARRIAGE RETURN? (0-256) $0
SECOND TTY? ("0"=NO "1"=YES) $1
CORE DUMP FACILITY? ("0"=NO  "1"=LPT  "2"=MTA  "3"=6030) $0
```

Figure 6-3. Mapped ECLIPSE with Burst Multiplexor Channel SYSGEN Dialog

```
INFOS SYSGEN REV 2.40
VALID ANSWERS ARE IN PARENTHESIS RESPOND ACCORDINGLY

PROCESSOR TYPE? ("1"=C/300 "2"=C/330 "3"=C/350) $3
   BURST MULTIPLEXOR CHANNEL (BMC)? ("0"=NO "1"=YES) $1
   MAXIMUM NUMBER OF CHANNELS BACKGROUND WILL USE(1-255) $27
   MAXIMUM NUMBER OF CHANNELS FOREGROUND WILL USE(0-255) $27
NUMBER OF NOVADISK DISK CONTROLLERS(0-2) $0
NUMBER OF 6063/6064 DISK CONTROLLERS(0-2) $1
   DEVICE PRIMARY("0") OR SECONDARY("1")? $0
   CONTROLLER #1 ON BMC? ("0"=NO "1"=YES) $0
   NUMBER OF DEVICES FOR CONTROLLER #1(1-4) $1
NUMBER OF 6060/6061/6067 DISK CONTROLLERS(0-2) $1
   DEVICE PRIMARY("0") OR SECONDARY("1")? $0
   CONTROLLER #1 ON BMC? ("0"=NO "1"=YES) $1
   NUMBER OF DEVICES FOR CONTROLLER #1(1-4) $1
NUMBER OF OTHER TYPES OF MOVING HEAD DISK CONTROLLERS(0-2) $0
ENTER BAD BLOCK POOL SIZE IN BLOCKS (0-512) $25
DUAL PROCESSORS (IPB)? ("0"=NO "1"=YES) $0
ENTER NUMBER OF STACKS (1-10) $5
ENTER NUMBER OF EXTRA CELLS (0-64) $10
TUNING? ("0"=NO "1"=YES) $0
ENTER NUMBER OF EXTRA BUFFERS REQUIRED (0-63) $10
ENTER MAXIMUM ISAM/DBAM PAGE SIZE (IN K BYTES "2" "4" OR "6")? $2
ENTER FILE CONTROL SPACE (IN K BYTES 1-16.)? $8
MAXIMUM NUMBER OF SUB-DIRECTORIES/SUB-PARTITIONS
ACCESSIBLE AT ONE TIME (0-64) $10
ENTER NUMBER OF CONTROLLERS FOR MTA(0-2) $1
   DEVICE PRIMARY("0") OR SECONDARY("1")? $0
   ENTER NUMBER OF DEVICES FOR CONTROLLER #1 (1-8) $2
ENTER NUMBER OF CONTROLLERS FOR CTA(0-2) $0
AUTO RESTART ON POWER FAIL? ("0"=NO "1"=YES) $0
OPERATOR MESSAGES? ("0"=NO "1"=YES) $0
RTC? ("0"=NO "1"=YES) $1
   DEVICE PRIMARY("0") OR SECONDARY("1")? $0
   ENTER RTC FREQ (1=10HZ 2=50HZ 3=60HZ 4=100HZ 5=1000HZ) $1
ENTER NUMBER OF PTR(0-2) $0
ENTER NUMBER OF PTP(0-2) $0
ENTER NUMBER OF LPT(0-2) $1
   ENTER COLUMN SIZE FOR LPT #1 (80 OR 132) $132
      DATA CHANNEL LINE PRINTER? ("0"=NO  "1"=YES) $1
ENTER NUMBER OF CDR(0-2) $1
ENTER NUMBER OF PLT(0-2) $0
ENTER NUMBER OF MCA(0-2) $0
QTY? ("0"=NO "1"=YES) $0
ULM? ("0"=NO "1"=YES) $0
ALM? ("0"=NO "1"=YES) $1
   DEVICE PRIMARY("0") OR SECONDARY("1")? $0
   ALM CLOCK FREQUENCY? (0-3) $0
   USE DEFAULT ALM/QTY INTERRUPT CHARACTERS? ("0"=NO "1"=YES) $1
   NUMBER OF NULLS AFTER CARRIAGE RETURN? (0-256) $0
SECOND TTY? ("0"=NO "1"=YES) $1
```

Figure 6-4. INFOS SYSGEN Dialog

Patching Your System

Depending on your application's needs, you may want to apply patches (updates to individual words in the disk file) to your tailored RDOS system. Data General supplies patches on the medium on which you received your software (diskette, tape, etc.). You apply these patches with the PATCH and ENPAT utility programs; or, sometimes, by simply typing a CLI macro command. See the Update Notice supplied with your software for more information on patches.

Tuned SYSGEN

This section describes tuning your RDOS system for best performance. If you don't want to tune your system just now, skip to the next section.

Tuning allows SYSGEN to reconfigure RDOS from the information stored in the tuning file. To implement tuning, first generate a preliminary RDOS with the software parameters (stacks, cells, and buffers) you feel will support your application. Then, follow the following steps:

1. Start recording information in tuning file SYS.TU (or equivalent filename) with the command:

   TUON)
   R

2. Next, run your system long enough to give the tuning file adequate information on your application's requirements. Take all the time you need - even days or weeks.

3. Then, *turn tuning off* with the command:

   TUOFF)
   R

4. Now, generate a tuned system with the command:

   $\left\{ \begin{array}{l} \text{ISYSGEN} \\ \text{BSYSGEN} \\ \text{NSYSGEN} \\ \text{SYSGEN} \end{array} \right\}$ NEWSYS.<SV/S SG/V LM/L>↑)
      SYS</T.SG/A>)

   This directs SYSGEN to use the dialog saved in file SYS.SG from your previous SYSGEN, but to supply more efficient answers to the stack, cell, and buffer questions from the information stored in SYS.TU. The new RDOS is named NEWSYS.SV; its overlay file is NEWSYS.OL; the modified dialog file is NEWSYS.SG; and the load map file is NEWSYS.LM.

You can, of course, use names other than SYS and NEWSYS, but the two names *must* be different because you cannot generate and load a new system with the same name as your current system.

5. Wait for the R prompt. When you receive it, type

   PRINT NEWSYS.SG) or (TYPE NEWSYS.SG))
   .....
   R

   This provides hard copy of the tuned SYSGEN answers.

6. Now, *be sure to type:*

   DELETE/V SYS.TU) (or equivalent filename)
   DELETED SYS.TU
   R

7. Bootstrap the tuned system:

   BOOT NEWSYS)
   MASTER DEVICE RELEASED
   type RDOS REV xx
   DATE (M/D/Y)? 8/20/77)
   TIME (H:M:S)? 11:23)
   R

   If you like the new system, you will want to print its load map. If your computer has limited memory, you may want to use the NEWSYS.SG (step 5) answers and manually generate a system *without* the tuning feature. To do so, use the SYSGEN command format in step 10.

8. In either case, you may choose to replace your original system (which we have called SYS) with the one which has the tuned answers. You can do this by bootstrapping BOOTSYS or FBOOTSYS, then typing:

   DELETE/V SYS.<SV OL SG LM>)   (or filename
                                    of original
                                    SYS)
                                    (The CLI
                                    verifies files
                                    deleted)
   R
   RENAME NEWSYS.SV SYS.SV NEWSYS.OL↑)
     SYS.OL)
   R
   RENAME NEWSYS.SG SYS.SG NEWSYS.LM↑)
     SYS.LM)
   R

9. If your new system includes tuning, and you want to tune it, then you must have RDOS rename the tuning file. To do this, shut down the system, bring it up again under its new name, and type

TUON).

10. A variation of tuned SYSGEN will let you simultaneously tune and reconfigure your system. Simply omit .SG/A in the command line; that is, type:

$$\left.\begin{matrix} \text{ISYSGEN} \\ \text{BSYSGEN} \\ \text{NSYSGEN} \\ \text{SYSGEN} \end{matrix}\right\} \quad \begin{matrix} \text{NEWSYS.}</S \quad SG/V \quad LM/L> \\ \text{SYS/T)} \end{matrix}$$

Figure 6-5 shows the tuning-modified SYSGEN dialog for the RDOS system of Figure 6-2. The circled "answers" are those modified by the tuning.

Note that the dialog file (sysname.SG) for a pre-revision 6.4 RDOS system will not work with revision 6.4 and later SYSGEN programs, because the dialogs and delimiters differ.

How Much Memory Does RDOS Use?

If you have limited computer memory, you may want to check the amount of memory your new RDOS system requires. You can do this two ways.

The first way is to take the skeletal RDOS requirement shown for your machine, in either Table 6-3 or Table 6-4, and add to it the amount of memory required for each SYSGEN feature. The sum of the skeletal system and the SYSGEN features is the total amount of memory this RDOS system will use when it runs.

The second way involves checking in the new system itself; it depends on whether or not the new system is mapped. If the system is mapped, type the command:

GMEM)

when the system is running. The figure RDOS returns is the number of 2,048-byte blocks available for user programs.

If the system is unmapped, find the symbol SMON in the load map; the octal value next to SMON is the *lowest* NREL address the system will use when it runs. User programs can use almost all the space beneath the SMON figure. You can find SMON fairly easily with the Text Editor, by entering the following commands:

EDIT SYS.LM)   (or your *sysname*. LM)
*NSMON$L1T$$ The asterisk is the Editor prompt; "S" means press the ESC key.
SMON 051546   SMON is at 51546 (octal).
*H$$ Get back to the CLI.
R

In this example, the location of SMON is 51546_8, which is $22,638_{10}$. Thus your programs can use a maximum of about 22,600 words on this RDOS system--less 38 times the number of channels used by background and foreground programs--the default number is 8 for each.

The Next Step

If this is your first RDOS SYSGEN, or if RDOS is unfamiliar to you, proceed to Chapter 7, after SYSGEN.

Table 6-3. RDOS 6-40 Memory Requirements for NOVA Computer

Feature	Unmapped	Mapped NOVA 3/4
Skeletal RDOS (with 6 buffers)	8,165	11,469
Channels, per channel	0	38
First NOVADISK controller	197	197
Second NOVADISK controller	84	84
First 6063/6064 controller	339	344
Second 6063/6064 controller	38	38
Each 6063/6064 drive	68	68
First 6060/6061/6067 controller	464	467
Second 6060/6061/6067 controller	17	17
Each 6060/6061/6067 drive	68	68
ECC module (used for one or more 6063/6064s or 6060/6061/6067s)	166	225
First "other type" controller	410	407
Second "other type" controller	16	16
Each Top-Loader drive (also 6030 drive on same controller)	136	136
Each non Top-Loader drive	68	68
Bad block pool	6 per disk + 2 per block	6 per disk + 2 per block
Dual processors (IPB)	1,577	1,577
IPB with 6061/6062, add	84	84
Stacks, per stack	225	225
Extra cells, per cell	16	16
Tuning	270	270
With overlay report, add	604	604
Extra buffers, per buffer	270	270
Subdirectories, each	48	48
First MTA controller	590	588
Second MTA controller	86	86
Each MTA drive	17	17
First CTA controller	590	588
Second CTA controller	86	86
Each CTA unit	17	17
Auto restart on power fail	323	351
Operator messages	222	266
Real-time clock	0	0
First paper-tape reader	84	84
Second paper-tape reader	69	69
First paper-tape punch	77	77
Second paper-tape punch	62	62
First line printer	124	190
For data-channel printer, add	112	124
Second line printer	109	175
For second DCH printer, add	4	4
First card reader	275	275
Second card reader	201	201
First plotter	121	121
Second plotter	106	106
First MCA	597	638
Second MCA	186	186
QTY	986	1,048
ALM	1,105	1,167
ULM	1,128	1,190
Second TTY	258	258
Core dump facility		
Line printer	155	222
6030 diskette	130	148
MTA	105	123

Table 6-4. RDOS 6.40 Memory Requirements for ECLIPSE Computers

Feature	Unmapped	Mapped ECLIPSE S/250
Skeletal RDOS (with 6 buffers)	7,891	11,449
Channels, per channel	0	38
First NOVADISK controller	193	202
Second NOVADISK controller	81	81
First 6063/6064 controller	338	352
Second 6063/6064 controller	35	35
Each 6063/6064 drive	68	68
First 6060/6061/6067 controller	454	479
Second 6060/6061/6067 controller	14	14
Each 6060/6061/6067 drive	68	68
ECC module (used for one or more 6063/6064s or 6060/6061/6067s)	157	205
First "other type" controller	404	413
Second "other type" controller	13	13.
Each Top-Loader drive (also 6030 drive on same controller)	136	136
Each non Top-Loader drive	68	68
BMC	-	24
Array Processor	-	44
Bad block pool	6 per disk + 2 per block	6 per disk + 2 per block
Dual processors (IPB)	1,537	1,573
IPB with 6061/6062, add	83	83
Stacks, per stack	201	201
Extra cells, per cell	16	16
Tuning	270	270
With overlay report, add	604	604
Extra buffers, per buffer	270	270
Subdirectories, each	48	48
First MTA controller	587	585
Second MTA controller	84	84
Each MTA drive	17	17
First CTA controller	524	522
Second CTA controller	84	84
Each CTA unit	17	17
Auto restart on power fail	268	274
Operator messages	222	260
Real-time clock	0	0
First paper-tape reader	81	81
Second paper-tape reader	69	69
First paper-tape punch	74	74
Second paper-tape punch	62	62
First line printer	125	187
For data-channel printer, add	111	122
Second line printer	109	175
For second DCH printer, add	4	4
First card reader	272	272
Second card reader	201	201
First plotter	118	118
Second plotter	106	106
First MCA	591	626
Second MCA	180	180
QTY	963	1,019
ALM	1,082	1,138
ULM	1,105	1,161
Second TTY	258	258
Core dump facility		
Line printer	155	216
6030 diskette	130	150
MTA	105	125

093-000188-02

```
NOVA 3 SYSGEN REV 6.40
VALID ANSWERS ARE IN PARENTHESIS RESPOND ACCORDINGLY

MAPPED SYSTEM? ("0"=NO "1"=YES) $1
   MAXIMUM NUMBER OF CHANNELS BACKGROUND WILL USE(1-255) $18
   MAXIMUM NUMBER OF CHANNELS FOREGROUND WILL USE(0-255) $18
NUMBER OF NOVADISK DISK CONTROLLERS(0-2) $0
NUMBER OF 6063/6064 DISK CONTROLLERS(0-2) $0
NUMBER OF 6060/6061/6067 DISK CONTROLLERS(0-2) $1
   DEVICE PRIMARY("0") OR SECONDARY("1")? $0
   NUMBER OF DEVICES FOR CONTROLLER #1(1-4) $2
NUMBER OF OTHER TYPES OF MOVING HEAD DISK CONTROLLERS(0-2) $0
ENTER BAD BLOCK POOL SIZE IN BLOCKS (0-512) $12
DUAL PROCESSORS (IPB)? ("0"=NO "1"=YES) $0
ENTER NUMBER OF STACKS (1-10) $4
ENTER NUMBER OF EXTRA CELLS (0-64) $9
TUNING? ("0"=NO "1"=YES) $1
   SHALL TUNING BE WITH("1") OR WITHOUT("0") OVERLAY REPORT? $1
ENTER NUMBER OF EXTRA BUFFERS REQUIRED (0-63) $8
MAXIMUM NUMBER OF SUB-DIRECTORIES/SUB-PARTITIONS
ACCESSIBLE AT ONE TIME (0-64) $10
ENTER NUMBER OF CONTROLLERS FOR MTA(0-2) $1
   DEVICE PRIMARY("0") OR SECONDARY("1")? $0
   ENTER NUMBER OF DEVICES FOR CONTROLLER #1 (1-8) $1
ENTER NUMBER OF CONTROLLERS FOR CTA(0-2) $0
AUTO RESTART ON POWER FAIL? ("0"=NO "1"=YES) $0
OPERATOR MESSAGES? ("0"=NO "1"=YES) $0
RTC? ("0"=NO "1"=YES) $1
   DEVICE PRIMARY("0") OR SECONDARY("1")? $0
   ENTER RTC FREQ (1=10HZ 2=50HZ 3=60HZ 4=100HZ 5=1000HZ) $1
ENTER NUMBER OF PTR(0-2) $0
ENTER NUMBER OF PTP(0-2) $0
ENTER NUMBER OF LPT(0-2) $1
   ENTER COLUMN SIZE FOR LPT #1 (80 OR 132) $132
      DATA CHANNEL LINE PRINTER? ("0"=NO  "1"=YES) $1
ENTER NUMBER OF CDR(0-2) $0
ENTER NUMBER OF PLT(0-2) $0
ENTER NUMBER OF MCA(0-2) $0
QTY? ("0"=NO "1"=YES) $0
ULM? ("0"=NO "1"=YES) $1
   DEVICE PRIMARY("0") OR SECONDARY("1")? $0
   LINE SPEED (BITS/SEC)?("1"=19200 "2"=50 "3" =75
   "4"=134.5 "5"=200   "6"=600   "7"=2400  "8"=9600
   "9"=4800  "10"=1800 "11"=1200 "12"=2400 "13"=300
   "14"=150  "15"=110) $11
   USE DEFAULT ALM/QTY INTERRUPT CHARACTERS? ("0"=NO "1"=YES) $0
      FIRST CHARACTER? (ASCII DECIMAL CODE OR "128"=NONE) $27
      SECOND CHARACTER? (ASCII DECIMAL CODE OR "128"=NONE) $128
   NUMBER OF NULLS AFTER CARRIAGE RETURN? (0-256) $0
SECOND TTY? ("0"=NO "1"=YES) $1
CORE DUMP FACILITY? ("0"=NO  "1"=LPT  "2"=MTA  "3"=6030) $0
```

Figure 6-5. Tuning-Modified SYSGEN for Mapped NOVA 3/4 RDOS

End of Chapter

Chapter 7
After System Generation

This chapter tells you how to start up and shut down RDOS, describes full initialization, and explains how to introduce new disks to RDOS. Then it tells you how to create backup copies of disk files, including your new RDOS system, on your original medium: diskette, mag tape, cassette, or paper tape. The major sections are:

- Starting Up RDOS
- Shutting Down RDOS
- Full Initialization
- Accessing Other Disks
- Backing Up Your Files

If RDOS is new to you, you should read the first four sections and the appropriate file backup section. Later, you can review parts of the chapter as appropriate, after you acquire new disks or when you want to know more about any of the topics cited above.

To learn more about the CLI command shown here, see the *RDOS/DOS Command Line Interpreter User's Manual*, 093-000109. To learn more about *using* RDOS, read *Learning to Use Your RDOS/DOS System*, 069-000022.

Starting Up RDOS

After the purely mechanical steps of turning on devices, you start up RDOS "bootstrapping" it from disk. Bootstrapping (also called *Partial Initialization)* is simply loading RDOS (save file SYS.SV or sysname.SV) into the computer's memory, then running RDOS. You have already done this once, if you brought up the RDOS starter system from disk before generating your tailored RDOS.

In fact, you must bootstrap (do a partial initialization) each time you want to run RDOS. The disk from which you bootstrap must be the first drive on its controller: DP0, DP4, DZ0, DZ4, DS0, DS4, and so on. It must have a bootstrap root and a copy of BOOT.SV on it, but need not contain an RDOS system or CLI.

The preliminary steps are:

1. Turn on the system console and any other display terminals or printing consoles the system will be servicing. If the system console is an upper/lowercase console, put it in ALPHA LOCK because BOOT.SV does not accept lowercase letters.

2. Power up your computer by turning the POWER switch to ON.

3. Ready your disk(s). If you removed a removable disk cartridge or pack after your last RDOS session, insert it in its drive. If you have a nonremovable disk, or if you left a removable disk in its drive for convenience, proceed.

4. Press the rocker switch on the disk drive to READY or START or RUN, depending on your type of disk. Wait for the READY light.

5. Now, with the preliminaries done, you can bootstrap. If your computer has a programmed console, go to step 6. If it has hardware data switches and automatic program load, go to step 7. If it lacks automatic program load, go to step 8.

6. The system console should show an exclamation point (!) prompt. Check Table 7-1 for your disk device code (nn), then type:

1000nnL

on the console and go to step 9.

7. Make sure the data switches are set as shown in Table 7-1. Lift the RESET switch, then the PROGRAM LOAD switch, and go to step 9.

8. Key in a loader program via the switches:

a. Set the data switches to 000376₈ (switches 8 through 14 up, the others down); then lift EXAMINE.

b. Set the data switches to 0601nn (get nn from Table 7-1). Lift DEPOSIT.

c. Set the switches to 000377₈ (switches 8 through 15 up, the others down). Depress DEPOSIT NEXT.

d. Set the data switches to 000376₈ (put down switch 15). Lift RESET, then START.

Table 7-1. Disk Controller Device Codes

Disk Type	nn — (octal)	With hardware data switches, set these switches up (others down)
Fixed-Head Model 6063-6064 Controller #1 Controller #2	26 66	0,11,13,14 0,10,11,13,14
Model 6001-6008 Controller #1 Controller #2	20 60	0,11 0,10,11
Moving-head Model 6060-6061, 6067 Controller #1 Controller #2	27 67	0,11,13,14,15 0,10,11,13,14,15
Other Disks Controller #1 Controller #2	33 73	0,11,12,14,15 0,10,11,12,14,15

9. Your program load steps read the bootstrap root in from the beginning of the disk. The root invokes BOOT.SV, and BOOT.SV asks:

FILENAME?

Respond with the name of your RDOS system, or of any other stand-alone program you want to execute. DKINIT.SV, BOOT.SV, or an RTOS or RDOS system is a stand-alone program. For example, type:

MYSYS)

to bootstrap a system named MYSYS.SV on the bootstrap disk. If the system or program you want is on a different disk (not the one you are bootstrapping from), precede its name with a *directory specifier*. A directory specifier is simply the name of the disk (directory) that holds the system and a colon; e.g., "DP0F:". Thus your response to the *FILENAME?* query might be:

DP0F:MYSYS)

to bootstrap a system named MYSYS on disk DP0F.

If the "sysname" is SYS, and it is on the disk you are bootstrapping from, you can simply type) in response to *FILENAME?*, because SYS is the default name.

10. RDOS starts up, asking you for the date and time:

type RDOS REV x.xx
DATE (M/D/Y)   1 10 79) (current date)

11. TIME (H:M:S)? 13 10) (current time)

R

When the CLI's R prompt appears, your tailored RDOS is ready to execute your commands. At this point, you may want to turn or press the computer power switch to the LOCK position; this disables all other front panel switches and prevents anyone from inadvertently stopping RDOS by pressing them.

With RDOS up and running, you can proceed to develop and/or run programs; if you have a mapped system, you can allot memory to the foreground with the SMEM command and start up a foreground program with the EXFG command. Both SMEM and EXFG are described in the CLI manual.

BOOT Command

When you have an RDOS system running, you can bootstrap other systems or programs with the CLI BOOT command. You did this in Chapter 6 when you brought up your tailored system. BOOT will release the current system, then bring up the new system, just as if you had executed the program load steps. For example,

```
BOOT NEWSYS)
  MASTER DEVICE RELEASED
type RDOS REV x.xx
DATE? (M/D/Y) 1 12 79)
TIME? (H:M:S) 8)
R
```

If the system or program you want to bootstrap is on another disk, the disk must be initialized. (By *initialized*, we mean made part of the system with the CLI command INIT or DIR.) For example:

```
BOOT DP1:SYS96K)
  DIRECTORY NOT INITIALIZED: DP1:SYS96K
R
INIT DP1)
R
BOOT DP1:SYS96K)
  MASTER DEVICE RELEASED

type RDOS REV x.xx
DATE? (M/D/Y)
```

You can also BOOT stand-alone programs like DKINIT on other disks.

There is a variation of the BOOT command in which you type only the directory name of the disk that holds the desired program. BOOT then asks *FILENAME?* and you respond with the name of the program you want. For example:

```
BOOT DP0)
  MASTER DEVICE RELEASED
FILENAME?
```

BOOTing is most useful if you have more than one RDOS system on your disk(s) and want to switch among them according to your application.

When you bootstrap via the program load steps, your disk files are just as you left them when you last released the disk. When you BOOT, this releases the RDOS system, and all the things happen that occur during a normal RELEASE. These are described next.

Shutting Down RDOS

Before you shut off power to your equipment, you must always RELEASE the disk that holds the RDOS system. You can release this master disk by name; e.g.,

```
RELEASE DP0) (DZ0), DS0), etc.)
```

or you can use the CLI variable %MDIR%, which contains the name of the master directory; e.g.,

```
RELEASE %MDIR%)
```

Generally, after either command, the system will verify the release and shut down:

MASTER DEVICE RELEASED

There are two common cases where RDOS will not release the master device. First, if you have a foreground program running, as will often be the case in a mapped RDOS system, RDOS will tell you that the foreground is running. Make sure that all foreground users are off the system, then terminate the foreground by typing CTRL-F from the background console and type the RELEASE command again. Second, if RDOS has data spooled (stored on disk for slow output devices) it will tell you so. Generally, the output device is the line printer, so either wait for printing to stop or type SPKILL $LPT) to delete the spooled data; then type the RELEASE command again.

After you see the message

MASTER DEVICE RELEASED

you can take your disk off line by pressing the READY or RUN switch to LOAD, pressing the START switch to STOP, or simply pressing START, depending on your type of disk. Then you can flip the power switch to OFF, remove any removable disks from their drives (if you prefer), and turn off the power to the disk drive(s), computer, and other peripherals. If there are diskettes on your system, remove the diskettes from the drives before turning the drive OFF - but be sure you RELEASE them first.

RELEASE of the master device provides an orderly shutdown: it releases all disk directories and mag tape drives that were initialized, and -- in so doing -- it updates two crucial RDOS directory files and writes them to each disk. These files are the system directory (named SYS.DR) and the map directory (MAP.DR); they control all file access in the system.

Full Initialization

If, for any reason, the RDOS system stops before the master device has been RELEASED, the RDOS SYS.DR and MAP.DR directory files may be incorrect when you next bring up the system. Several things can stop the system before normal RELEASE: hardware or software failure, power failure without power fail support options, a user error in a program -- or, if someone turns off the computer or takes the master disk offline before RELEASEing the master device.

If the SYS.DR and/or MAP.DR files are wrong, as they could be if RDOS terminates abnormally, the same disk space could be allocated to more than one file. Also, any disk blocks that the spooler is temporarily using for output to slow devices (like a line printer or printing console) will be lost for user storage if the system comes down.

Therefore, if RDOS stops abnormally, we recommend that you fully initialize (INIT/F) all disks that were initialized when the failure occurred. INIT/F writes a new SYS.DR and MAP.DR file to the disk, thus ensuring file integrity, but in so doing *it effectively destroys all files on the disk* by overwriting pointers to them. Thus you should back up your files periodically, as described later in this chapter. By backing up your files, you minimize the amount of work that could be lost or destroyed by any kind of failure.

There are two ways to fully initialize your disk(s), as follows.

The first and most thorough way to do *full* initialization is to follow the steps described in your pre-SYSGEN chapter: Chapter 2, 3, 4, or 5. This allows DKINIT to find new bad blocks that might have caused the failure. After the starter system comes up, you type INIT/F to all other disks that were initialized when the failure occurred. The second way is to bring up an RDOS system from a backup disk pack or different disk and type INIT/F to all disks that were initialized at the failure.

After doing the INIT/Fs, you can LOAD, FLOAD, or MOVE your backup files, including your tailored system, onto your disk(s) from your backup medium. Then you can bootstrap your tailored system -- hopefully, having lost only a little work.

Accessing Other Disks

There are two steps that someone must follow for every new disk before RDOS can use it: a DKINIT FULL command and an INIT/F command. If you are using a disk under RDOS, you can assume that these two steps were performed; do not execute them again

because either one destroys all files on the disk. Two other steps are optional, but we recommend them for convenience. All steps assume that you are starting out with a Data General disk; if DG did not supply the disk, consult your local Data General field service representative. The steps are, in order:

1. Run a DKINIT FULL command on the disk. Mandatory for new disks, destroys all file structure on *old* disks.

2. Install a bootstrap root on the disk after bootstrapping BOOT.SV. Mandatory for the master disk, optional for other disks. Does not harm existing files.

3. Type an INIT/F command to the disk from RDOS. Mandatory for new disks, effectively destroys all files.

4. Copy file BOOT.SV to the disk via a CLI MOVE command. Mandatory for master disk, optional for other disks; does not harm existing files.

Step 1, DKINIT FULL, detects bad blocks and allows RDOS to recognize the disk; steps 2 and 4 allow you to bootstrap systems or programs from the disk; step 3, INIT/F writes an RDOS system directory file (SYS.DR) and map directory file (MAP.DR) to the disk. Generally, unless RDOS stops abnormally while this disk is initialized, you need execute these four steps only once for each disk.

As you may have noticed, the INIT command with /F is entirely different from INIT/F. INIT simply initializes a disk or tape for access and does not destroy anything; you'll be using it a lot in the future. INIT/F, however, writes a new system directory file (SYS.DR) and map directory file (MAP.DR) to a disk; these overwrite the old SYS.DR and MAP.DR files, if any. RDOS needs these directory files to use the disk. *After* someone has typed INIT/F to the disk and you have started using it to hold files, the SYS.DR directory points to all these files. At this point, using INIT/F to write a new SYS.DR effectively destroys all files on the disk.

Even INIT/F won't work with a new disk, however, until DKINIT has written an identifier and certain tables to the disk; this is why you must run a DKINIT FULL command on each new disk.

To summarize, make sure that you run a DKINIT FULL command on a new disk and type INIT/F to it from RDOS before trying to use it. Then, unless you acquire other new disks, have problems, or are processing diskettes for file backup, forget all about the DKINIT FULL command and the /F switch on the INIT command.

Accessing the Fixed Disk (Toploader Models 6045, 6070, or 4234 Only)

If you have a model 6045, 6070, or 4234 toploading disk, you gave it a bootstrap root, typed INIT/F to it, and gave it a copy of BOOT.SV in the pre-SYSGEN chapter; thus it is ready for file storage. You can initialize it (INIT command *without* /F) and use it just as you would the cartridge.

To use the RDOS system utility files, which are now on the cartridge, on the fixed disk, you can either copy them over to the fixed disk with the MOVE command or create LINK entries to them. Links use very little file space, and you'll probably be using them a lot in the future. Both the MOVE command and the LINK command are further described in the CLI manual and *Learning to Use Your RDOS/DOS System*.

Depending on your application, you may want to copy your tailored system and the CLI to the fixed disk. The files involved are SYS.SV and SYS.OL (or sysname.SV and sysname.OL), CLI.SV, CLI.OL, and CLI.ER; you can copy them over with the MOVE command. To bootstrap a system on the fixed disk, you must give the fixed-disk name as a directory specifier before the *sysname*. For example, when BOOT asks *FILENAME?*, reply:

DPOF:SYS)

to bring up a system named SYS.SV on the fixed disk.

Backing Up Your Files

As mentioned earlier, it's simple prudence to make backup copies of your tailored RDOS system and the source and data files you create under RDOS. You can back up files by date or name, or use CLI templates in the CLI MOVE and DUMP command. One procedure might be to back up new or modified files each day via MOVE or DUMP with the local /A switch, and to MOVE or DUMP *all* files each week.

Naturally, you need a backup medium for this. You can use other disk(s) if you have them, but you may well want to use the medium on which you received your RDOS system. The rest of this chapter tells you how to prepare your backup material - diskette, magnetic tape, cassette, or paper tape -- and how to dump your tailored system and other files to each.

Preparing a Diskette and Dumping RDOS Files to It

When you have a tailored RDOS system that you like, you should copy the system files to diskette. This section tells you how to prepare a blank diskette and copy your RDOS files and other files to it. Follow these steps:

1. Bootstrap RDOS if it is not already running.

2. Make sure the diskette drive is DP1. If the diskette has a thumbwheel selector, dial 1 on it. If it lacks a selector, then the toggle switch behind the disk front panel should be in the DSK0/FPY1 position. (The steps in Chapter 2 leave the switch in this, the correct, position.) Turn the diskette drive ON, if this applies. Get a blank Data General diskette and tape over the write-protect hole near the edge of the inner envelope. (DG supplies tape with its diskettes.) If the diskette is not a DG diskette, consult your local Data General field service representative. Insert the diskette in its drive.

3. BOOT DKINIT and run a FULL command on the diskette as shown in the following dialog. If your diskette drive does not have a thumbwheel selector, it is double density and (because it has two read/write heads) has four times the capacity of a single-density diskette. The model number of double-density diskettes is 6097. If the diskette *does* have a thumbwheel selector, it is single density and has model number 6030. Follow these steps to ready the diskette:

   a. BOOT DKINIT)
      MASTER DEVICE RELEASED
      DKINIT REV x.xx
   b. *DISK DRIVE MODEL NUMBER?* 6097) (or 6030) for single density)
   c. *DISK UNIT NAME?* DP1)
   d. *COMMAND?* FULL) *FULL INIT DESTROYS ANY PREVIOUS...*
      TYPE CONTROL-A NOW ....
   e. *NUMBER OF PATTERNS TO RUN (1-5)* 5)
      *** *PATTERN NUMBER 1 (155555)* ***
      (DKINIT runs patterns.)
      *** *ALL PATTERNS RUN* ***
      DO YOU WISH TO DECLARE ANY BLOCKS BAD...
   f. *...THE BAD BLOCK TABLE?* NO)
      DEFAULT REMAP AREA IS....
   g. *...RETURN FOR DEFAULT)?*)
      REMAP AREA START BLOCK...
   h. *... TYPE RETURN FOR DEFAULT)?*)
      DEFAULT FRAME SIZE IS...
   i. *...TYPE RETURN FOR DEFAULT)?*)
      FULL DISK INIT COMPLETE
      COMMAND?

j. If you want to prepare more diskettes for backup, remove the diskette from DP1, tape the write protect hole on another diskette, insert it in DP1, type FULL) and repeat steps 3e through 3i. Do this for all diskettes you want to prepare.

k. Type: STOP)

l. Press the disk drive rocker switch to LOAD or STOP or START, then back to READY or START or RUN, depending on your type of disk; wait for the READY light. (This resets the disk read/write heads to the beginning of the disk, where they must be to read in the bootstrap root.

4. Now bootstrap BOOT via the program load steps, install a bootstrap root on the diskette, then force BOOT to ask *FILENAME?* as shown:

a. *FILENAME? BOOT)*

   BOOT REV x.xx
b. *BOOTSTRAP DEVICE SPECIFIER?* DP1)

c. *INSTALL BOOTSTRAP (Y OR N)?* Y

   DONE.

d. *BOOTSTRAP DEVICE SPECIFIER?* DP0)
   (DZ0), DS0), -- name of the RDOS disk)

e. *INSTALL BOOTSTRAP (Y OR N)?* N

f. *FILENAME?*

5. Bring up your RDOS system as usual. When you receive the CLI prompt, do an INIT/F to the diskette:

   INIT/F DP1)
   R

6. Copy the system files, CLI, and BOOT.SV to the diskette via the MOVE command. Substitute your *sysname* for SYS if you named the RDOS system *sysname*.

   MOVE/V□DP1□SYS.<OL□SV>□†)
   CLI.<OL□ER□SV>□BOOT.SV)
   SYS.OL
   .
   (files copied)
   R

7. Release the diskette:

   RELEASE DP1)
   R

   Remove the diskette from DP1, write "RDOS System Backup" or equivalent name on its label (felt-tipped pens only), and replace it in the outer envelope.

8. If you ran DKINIT on other diskettes, insert one of them in DP1 and type:

   INIT/F DP1)
   R
   RELEASE DP1)
   R

   and remove it. Repeat this step until you have done INIT/F to all prepared diskettes. Store all diskettes safety, away from strong magnetic fields.

9. These steps give you a system backup diskette, and if you processed other diskettes, ready-made diskettes for file backup via the MOVE or DUMP command. You cannot bootstrap RDOS from the backup system diskette, but you can program load from this diskette if you make it DP0. BOOT will then ask *FILENAME?* and you can specify an RDOS system on a hard disk, if you need to.

10. To use a prepared diskette for backup, you'll simply insert it with its write hole covered in DP1, INIT it (without the /F switch) and copy over the files you want to back up. For example, assume that you want to back up all nonpermanent files created on or after February 14, 1979. You'd INIT the diskette, MOVE the files, and RELEASE the diskette:

   INIT DP1)
   R
   MOVE/V/K□DP1□2-14-79/A)
   .
   (files copied to diskette.)
   .
   R
   RELEASE DP1)
   R

   The MOVE command, and other commands like DUMP and FDUMP, are further described in the CLI manual.

Later, whenever you want to back up files, you'll issue a command sequence similar to step 10. You can use the same diskette, incrementing the date or using another method, until diskette file space is exhausted.

Before you flip your disk drive rocker switch to LOAD or STOP, wait for the LOAD light (if this applies), and cut power to your computer system, remember always type:

```
RELEASE DP0) (DZO), DS0), etc., or %MDIR%)
MASTER DEVICE RELEASED
```

Preparing Magnetic Tape and Dumping Files to It

When you have a tailored RDOS system that you like, you should copy the system files to magnetic tape. This section tells you how to prepare a blank tape and copy your RDOS files and other files to it. Follow these steps:

1. Bootstrap RDOS if it is not already running.

2. Get a reel of magnetic tape. If there is no plastic write-enable ring on the tape reel, insert one. (This allows you to write to the tape.)

3. Make sure that a tape drive on the first tape controller has 0 dialed on its thumbwheel; leave other drives OFF or dial nonzero values on their thumbwheels.

4. Mount and thread the tape on drive 0. Press the LOAD/UNLOAD rocker switch to LOAD; then press the ONLINE/RESET rocker switch to ONLINE.

5. INIT the tape:

   ```
   INIT MT0)
   R
   ```

6. Copy the system, CLI, and BOOT.SV files to the tape via the DUMP command. DUMP copies one or more disk files to a backup medium and places them next to one another in one destination file. For mag tape, the destination filename is a tape file number, which ranges from 0 to 99. The first file on the tape is 0, the second 1, and so on. To dump the RDOS system, CLI, and BOOT.SV, type:

   ```
   DUMP/V⊐MT0:0⊐SYS.- CLI.- BOOT.SV)
   ```

   (files copied to tape file 0)

   ```
   R
   ```

7. Although there is a lot of space left on the tape, you should probably reserve the whole tape as your backup tape. Type:

   ```
   RELEASE MT0)
   R
   ```

This rewinds the tape. When it stops, press the tape's ONLINE/RESET switch to RESET, then press UNLOAD to rewind the rest of the tape.

Attach a label that says "File 0: RDOS System Backup" or equivalent to the tape; remove the write-enable ring and store the tape in a safe place.

8. To back up other files, you'll use a procedure similar to steps 6 and 7, but you'll probably want to make use of sequential files on the tape. For example, assume that on February 14, 1979, you want to DUMP all files created or modified on or after February 13. Also assume that you are using a blank tape for this. You'd insert the write-enable ring, mount the tape, LOAD it, place it ONLINE, and type:

   ```
   INIT MT0)
   R
   DUMP/V/K⊐MT0:0⊐2-13-79/A)
   ```

   (disk files copied to tape file 0)

   ```
   R
   RELEASE MT0)
   R
   ```

   Then, the next day, February 15, you want to DUMP only those files created or modified on or after February 15. (File 0 contains files created or modified on the 13th and 14th.) You'd get the previous day's dump tape, insert a write-enable ring, put it ONLINE, and type:

   ```
   INIT MT0)
   R
   DUMP/V/K⊐MT0:1⊐2-15-79/A)
   .
   (disk files copied to tape file 1)
   R
   RELEASE MT0)
   R
   ```

   Thus you might proceed sequentially until space on the tape was exhausted. (But, for this work, you must specify tape file numbers sequentially. If you accidentally specify file 0 instead of file 1, the old file 0 will be overwritten on the tape, and all tape files after file 0 will be lost.)

As always, before you flip your disk drive switch to LOAD or STOP, wait for the LOAD light (if this applies), and cut power to your computer system, remember always to type:

```
RELEASE DP0) (DZO), DS0), etc., or %MDIR%))
MASTER DEVICE RELEASED
```

Preparing Cassette Tapes and Dumping Files to Them

When you have a tailored RDOS system that you like, you should copy the system files to diskette. This section tells you how to do this.

To create the copy:

1. Flip the plastic tabs on two blank (unused) cassettes so that they cover the write-enable holes.

2. Select unit 0 (of controller 0) on the drive you will use, and make sure that no other drive has 0 selected.

3. Insert one cassette into the drive, close the door and REWIND the tape.

4. Type:

```
INIT/F CTO)
R
DUMP/A/V  CTO:0  SYS.SV)      (or   equivalent
SYS.SV                        filename)
R
RELEASE CTO)
R
```

5. Insert the second blank cassette in drive 0; type:

```
INIT CTO)
R
DUMP/A/V⊐CTO:0⊐SYS.OL) (or filename of SYS)
SYS.OL
R
RELEASE CTO)
R
```

You have copied your tailored system and overlay files to the cassettes. Remove the cassettes and store them safely, with the tabs in the write-protect position.

Dumping files to cassettes resembles dumping to magnetic tape on reels, as explained in the previous section, step 8. But, because cassettes have much less file space than reel tapes, you'll need to use more of them for file backup.

Before you shut off power to your equipment, or flip disk drives to LOAD, remember always to type:

```
RELEASE DPO) (DKO), etc.)
MASTER DEVICE RELEASED
```

Backing Up Files on Paper Tape

When you have a tailored RDOS system that you like, you should copy the system files SYS.SV and SYS.OL (or sysname.SV and sysname.OL) to paper tape for backup. Your punched backup files substitute for the BOOTSYS.AB and BOOTSYS.OL files that came with your RDOS starter system. Follow these steps:

1. To punch these tapes on the high-speed punch:

   a. Turn on the punch and feed a few folds of tape.

   b. Type the commands:

   ```
   MKABS/Z⊐377/S⊐SYS⊐$PTP) (or equivalent)
   R
   DUMP/S/B⊐$PTP⊐SYS.OL) (or equivalent)
   SYS.OL
   R
   ```

   c. When punching stops, remove the tape from the punch bin, and turn the punch off. The starting address for the backup tape will be 377_8. Go to step 2.

2. To punch the tapes on the teletypewriter punch:

   a. Type the command:

   ```
   MKABS/Z⊐377/S⊐SYS.SV⊐$TTP)
   (or equivalent)
   ```

   b. Immediately turn on the punch. RDOS will punch tape feed (null characters), then the file. When punching stops and RDOS types the R prompt,

   c. Turn off the punch and type:

   ```
   DUMP/S⊐$TTP⊐SYS.OL)
   ```

   d. Again, immediately turn on the punch. When punching stops, RDOS types the R prompt.

   e. Remove the tape from the punch, and turn the punch off. The starting address for the backup tape will be 377_8.

3. Divide the two files into three separate paper tapes (discarding the three trailing characters at the end of the first and third, if you punched on the teletypewriter). Label the first-punched tape SYS.AB (or equivalent) with today's date; the second SYS.OL number 1 (or equivalent) and date it; and label the third SYS.OL number 2 (or equivalent). The overlay file you DUMPed is segmented into two tapes, separated by tape feed.

If you have more than one RDOS system on disk, you can punch these three tapes for any or all of them. It's also wise to check out these tapes, to see if they were correctly punched, with the following steps:

4. Put your SYS.AB (or equivalent) tape in the reader. Flip the reader to RUN (or START).

   Type either:

   MKSAVE/Z⊐SPTR⊐XX)

   or

   MKSAVE/Z⊐STTR⊐XX)

   for high-speed or teletypewriter reader, respectively.

   RDOS types:

   LOAD SPTR, STRIKE ANY KEY

   or

   LOAD STTR, STRIKE ANY KEY

5. Strike a key; then wait for "R" prompt.

6. Flip the reader to LOAD (or STOP). Then remove SYS.AB

7. Type:

   DELETE XX.SV)

   R

8. Load the SYS.OL (or equivalent) tape number 1, flip the reader to RUN (or START).

9. Type:

   LOAD/N/V $PTR)

   or

   LOAD/N/V $TTR)

RDOS types:

LOAD SPTR, STRIKE ANY KEY

or

LOAD STTR, STRIKE ANY KEY

10. Strike a key; then wait for the tape to stop. When the tape is through reading, RDOS types:

    LOAD SPTR, STRIKE ANY KEY

    or

    LOAD STTR, STRIKE ANY KEY (or equivalent)

11. Remove tape number 1 from the reader. Load SYS.OL (or equivalent) tape number 2, and strike a key. Wait for the tape to stop. When the second SYS.OL tape has been read, RDOS types:

    SYS.OL (or equivalent)
    R

12. Remove the second SYS.OL from the reader, and turn the reader OFF.

    When you complete this sequence, RDOS has read and checked all three of your tapes. If any of the tapes were mispunched, RDOS will give you a checksum error message. You can then try to punch and verify the bad file again.

13. RELEASE DP0) (DK0), etc.)
    MASTER DEVICE RELEASED

To produce paper tape backup of most other files, you can simply use the DUMP command with date switches, templates, or entire filenames, as described in the CLI manual. You need to use the MKSAVE and MKABS commands only for stand-alone programs, like RDOS systems, DKINIT, or BOOT.

Before you flip your disk drive switch to LOAD (if this applies) and cut power to your computer system, remember always to type:

RELEASE DP0) (DZ0), DS0), etc., or %MDIR%))
MASTER DEVICE RELEASED

End of Chapter

Chapter 8
The Disk Initializer

Introduction

Before you put any RDOS system on a disk, you must first initialize the disk with the Disk Initializer program FULL command. DKINIT will:

- Write the disk type onto the disk so that RDOS will know what type of disk it is accessing.

- Test the disk for bad blocks (on which information cannot be retained), and tell you where these blocks are.

- Construct a table of bad block identifiers, so that RDOS will bypass these blocks and put the table in a "remap area" whose size you specify.

NOTE: After you run the DKINIT FULL (or FRAME or REMAP) command on a disk, you must type INIT/F to the disk from RDOS before you can use the disk. INIT/F writes a file directory (SYS.DR) to the disk; RDOS needs this directory to access the disk. The starter system does an INIT/F for you; but thereafter you must INIT/F each new disk you will use on your system. Naturally, you should *never* issue an INIT/F to a disk that holds valuable data, because the new file directory will not include data for existing files, thus all existing files on the disk will be lost.

The disk initializer runs as a stand-alone program, which you read into the computer:

- From disk or diskette, via the bootstrap root and BOOT.SV; or

- From magnetic tape with the TBOOT.SV loader; or

- From cassette with the CBOOT.SV loader; or

- From paper tape using the Binary Loader.

To initialize a disk, DKINIT asks you a series of questions; you supply the appropriate answer with a) terminator. If the question indicates DKINIT will provide a default value, you may type only) to input the program-suppplied default value as your response. If you make a typing mistake, type CTRL-A (depress the CONTROL key, then type A) and DKINIT will repeat the question.

Initial Dialog

After you read DKINIT into the computer, it says:

DISK INITIALIZER - REV xx (xx = revision number)
DISK DRIVE MODEL NUMBER?

Respond with the model number for the drive in which you have already inserted the disk you're initializing:

DGC Model #	Disk Drive Type:	Type In:
6001-6008	Fixed-head NOVADISK (no cartridge), .13 megabyte (mb) to 2 mb.	6001)-6008)
6063/6064	Fixed-head (no cartridge), 1 mb or 2 mb.	6063) or 6064)
4047A, 4047B, 4237, 4238	Front-loading cartridge, 2.4 mb	4047) 4237) or 4238)
6099	Sealed moving-head disk drive, 12.5 mb	6099)
6045, 4234A	Top-loading cartridge with fixed disk, 10 mb	6045)
6070	Top-loading cartridge with fixed disk, 20 mb	6070)
4048A	Top-loading pack (6 platters), 6.2 mb	4048)
4057A	Top-loading pack (11 platters), 25 mb	4057)
4231A	Top-loading pack (11 platters), 92 mb	4231)
6067	Top-loading pack (5 platters), 50 mb	6067)
6060	Top-loading pack (11 platters), 96 mb	6060)
6061	Top-loading pack (11 platters), 190 mb	6061)
6097	Diskette, double density, 1.2 mb	6097)
6030-6038	Diskette, single density, .3 mb	6030)

If you type in an invalid model number, DKINIT says

UNKNOWN DRIVE TYPE

and repeats the question.

DKINIT next needs to know the logical name of the disk drive which holds your disk:

DISK UNIT?

Respond with the drive identifier, as determined by the drive type and device code (primary or secondary device). You need not initialize only on drive 0, although the directions you followed in Chapter 3, 4 or 5 specified drive 0 (or 4 for second controller) for compatibility with the other RDOS setup operations.

Device Code	Disk Drive Type	Respond With:
20 (primary)	Fixed-head NOVADISK	DK0)
60 (secondary)	Fixed-head NOVADISK	DK1)
26 (primary)	Fixed-head 6063/6064	DS0) through DS3)
66 (secondary)	Fixed-head 6063/6064	DS4) through DS7)
27 (primary)	Moving-head, 6060/6061/6070, disk packs	DZ0) through DZ3)
67 (secondary)	Moving-head, 6060/6061/6070, disk packs	DZ4) through DZ7)
33 (primary)	Front-loading cartridge	DP0) through DP3)
73 (secondary)	Front-loading cartridge	DP4) through DP7)
33 (primary)	Top-loading cartridge-removable -fixed	DP0) through DP3) DP0F) through DP3F)
73 (secondary)	Top-loading cartridge-removable -fixed	DP4) through DP7) DP4F) through DP7F)
33 (primary)	Packs and diskettes	DP0) through DP3)
73 (secondary)	Packs and diskettes	DP4) through DP7)

If you don't supply a correct identifier for the drive type you previously specified, DKINIT says

INVALID DEVICE NAME
PROGRAM CANNOT CONTINUE - ABORTING

and restarts at the DISK DRIVE MODEL NUMBER question.

After you correctly identify your disk, DKINIT will

- Recalibrate a moving-head disk; or
- Determine the size of a fixed-head disk; or
- Give a device timeout message, if no disk is present.

When the program requests a

COMMAND?

it's ready to execute one of eight functions. These are:

FULL)   - fully initializes the disk.

PARTIAL) - inspects the disk for bad blocks.

TEST)   - also inspects the disk for bad blocks.

REMAP)   - establishes a remap area for bad disk block accounting.

FRAME)   - defines frame size for the RDOS system directory (SYS.DR).

ENTER)   - enters bad blocks in the bad block accounting table.

LIST)   - describes the disk type and gives disk block accounting information.

DISK)   - restarts the DKINIT program (at "DISK UNIT?").

STOP)   - halts the computer.

If you enter a FULL, FRAME, or REMAP command, DKINIT tells you that the

COMMAND DESTROYS ANY PREVIOUS RDOS DISK STRUCTURE RDOS INIT/F MUST BE DONE ON DISK AFTER COMMAND TYPE CONTROL-A NOW TO ABORT WITHOUT LOSS

This warns you that existing data on previously-initialized disks will be lost if you proceed beyond this point. If you enter any command except FULL) and the disk has not been fully initialized, DKINIT says

DISK ID INCORRECT - ABORTING

and you must therefore fully initialize the disk with FULL).

After the dialog for each command (except STOP)), DKINIT will repeat the request,

COMMAND?

for the next command for this same disk. You must type DISK) if you wish to initialize another disk.

Full Initialization

When you type FULL), DKINIT will fully initialize the disk, checking for bad disk blocks and building a list of these so that RDOS will not use them. You can specify one to five patterns for DKINIT to use in carrying out the bad block check. It will write each pattern (in blocks of 256 words) onto every disk block; read the disk block into a different area of memory; and compare word for word the original pattern against the retrieved block, to discover any errors. If DKINIT can never successfully write and read-check the block, it adds the block to its bad block list.

The patterns for each 16-bit word in the block are:

Pattern #	Bit Configuration	−Octal
1	1101101101101101	155555
2	1010101010101010	125252
3	0101010101010101	052525
4	0000000000000000	000000
5	1111111111111111	177777

For example:

FULL)

COMMAND DESTROYS ANY PREVIOUS RDOS DISK STRUCTURE RDOS INIT/F MUST BE DONE ON DISK AFTER COMMAND TYPE CONTROL-A NOW TO ABORT WITHOUT LOSS

NUMBER OF PATTERNS TO RUN (1-5)? 5)

PATTERN #1 (155555)
PATTERN #2 (125252)
PATTERN #3 (052525)
PATTERN #4 (000000)
PATTERN #5 (177777)
ALL PATTERNS RUN

DKINIT continues with the first question in the REMAP dialog (see below) and the FRAME dialog (also see below); finally it concludes:

FULL DISK INIT COMPLETE

COMMAND?

It may type out error messages. These are:

Error Message	Take This Action
ILLEGAL NUMBER OF PATTERNS	Specify a number between 1 and 5.
CRITICAL DISK BLOCKS ARE BAD RDOS CANNOT BE BUILT, ABORTING	Reformat the disk.
TOO MANY DISK ERRORS TO COMPLETE	Reformat the disk.

Disk Remap

The REMAP function establishes a new remap area on the disk; it requires full initialization. You must REMAP as part of full initialization, and you may also want to REMAP if one of the disk blocks within the remap area is bad. When you type:

REMAP)

DKINIT says:

COMMAND DESTROYS ANY PREVIOUS RDOS DISK STRUCUTURE...

Then, DKINIT asks:

DO YOU WISH TO DECLARE ANY BLOCKS BAD THAT ARE NOT ALREADY IN THE BAD BLOCK TABLE?

If you respond YES), DKINIT needs the

BAD BLOCK NUMBER (TYPE RETURN TO STOP)

Type in the physical block number (in octal), or the head, sector and cylinder location, separated by commas. DKINIT acknowledges your response with:

BAD BLOCK ENTERED
BAD BLOCK NUMBER (TYPE RETURN TO STOP)

Continue to enter bad blocks until you have specified them all. Then type only) to the BAD BLOCK NUMBER request, and DKINIT will ask:

DO YOU WISH TO DECLARE ANY MORE BLOCKS BAD? NO)

When you answer NO) DKINIT tells you that the

DEFAULT REMAP AREA SIZE IS xx BLOCK(S) LONG
IT NEEDS TO BE AT LEAST yy BLOCK(S) LONG

REMAP AREA SIZE (TYPE RETURN FOR DEFAULT)?

where xx and yy vary according to the type of disk you are remapping. Specify the new length (126 maximum) you want for the remap area (a default response, if you wish). Then DKINIT asks for the

REMAP AREA START BLOCK NUMBER (TYPE RETURN FOR DEFAULT)?

The default remap area is at the end (highest physical block numbers) of the disk, but if this section has bad blocks you may want to move it elsewhere. You can enter either the physical block number (in octal) or the head, sector and cylinder location, separated by commas. On large moving-head disks, if you put the remap area in the middle cylinders you will reduce RDOS head positioning time; however, you may not be able to create as many very large contiguous files. As part of the FULL command, DKINIT continues with the FRAME dialog; otherwise it asks:

COMMAND?

to accept your next request. ·

Error messages that DKINIT might give you for REMAP are:

Error Message	Take This Action
THERE IS NO CURRENT REMAP AREA, RUN FULL INIT TO ESTABLISH ONE	Respond FULL) to "COMMAND?".
ILLEGAL DISK BLOCK NUMBER	Correctly rekey your entry.
RDOS WILL NOT RUN WITH THIS BLOCK BAD, BLOCK NOT ACCEPTED	Reformat the disk, if this block is truly bad.
BAD BLOCK LIST IS FULL, UNABLE TO ENTER ANY MORE BAD BLOCKS	REMAP again, enlarging the remap area size.
NO ROOM FOR BAD BLOCK REMAP AREA DUE TO TOO MANY BAD BLOCKS - ABORTING	Reformat and fully initialize the disk.
ILLEGAL REMAP AREA START BLOCK NUMBER	Pick another area.
BAD BLOCK CONTAINED IN REMAP AREA SPECIFIED, PLEASE SPECIFY ANOTHER AREA	Pick an area with contiguous good blocks.

FRAME

With the FRAME command, you can alter the disk frame size. The frame size establishes the original number of disk blocks for the RDOS system directory, SYS.DR. RDOS runs most efficiently when all of your filenames for each directory fit within one frame; system response time slows considerably if RDOS needs to examine overflow frames. If you will have many directories or subdirectories with only a few files in each, you may want a smaller frame than the default size. If you will have few directories or subdirectories and many files in each, then you may require a larger

frame size than the default. Generally, a good frame size is approximately one-tenth the number of files that will occupy any directory or subdirectory on the disk. The frame size should be a prime number. Provide a frame size according to the following example:

COMMAND? FRAME)

COMMAND DESTROYS ANY PREVIOUS RDOS DISK STRUCTURE RDOS INIT/F MUST BE DONE ON DISK AFTER COMMAND TYPE CONTROL-A NOW TO ABORT WITHOUT LOSS

DEFAULT FRAME SIZE IS default, MIN IS 1, AND MAX is maximum

DISK FRAME SIZE (TYPE RETURN FOR DEFAULT)? 29)

COMMAND?

The default and maximum frame sizes will vary according to the type of disk.

Error Message	Take This Action
ILLEGAL FRAME SIZE	Specify a size between the minimum and maximum.

ENTER

The ENTER feature lets you declare bad disks blocks, just as it's done in the REMAP command, but DKINIT will use the existing remap area. If you declare a block bad, it will be identified in the bad block list. Declare the bad blocks according to the following example:

COMMAND? ENTER)

BAD BLOCK NUMBER (TYPE RETURN TO STOP) 136)

BAD BLOCK ENTERED

BAD BLOCK NUMBER (TYPE RETURN TO STOP))

DO YOU WISH TO DECLARE ANY MORE BLOCKS BAD? NO)

COMMAND?

Enter the block numbers in octal, either by physical block number or as a head, sector, and cylinder location separated by commas. The errors you can get are:

Error Message	Take This Action
ILLEGAL DISK BLOCK NUMBER	Correctly rekey your entry.
RODS WILL NOT RUN WITH THIS BLOCK BAD, BLOCK NOT ACCEPTED	Reformat the disk, if this block is truly bad.
BAD BLOCK LIST IS FULL, UNABLE TO ENTER ANY MORE BAD BLOCKS	REMAP again, enlarging the remap area size.
BLOCK IS PART OF BAD BLOCK REMAP AREA, IT CAN ONLY BE DECLARED BAD USING FULL INIT OR REMAP	Try to REMAP to a different area; if this doesn't work, reformat the disk.

PARTIAL

The PARTIAL command checks the disk for bad blocks and enters any new ones in the disk's bad block table. It does not destroy existing files. If RDOS, the CLI, or other programs have trouble accessing files, try running a PARTIAL on the disk. It if finds new bad blocks in the middle of one or more disk files, placing these blocks in the bad block table will truncate the file(s) involved -- this is often preferable to a FULL command, which destroys *all* files. If the new bad blocks overflow the bad block table, you must run FULL on the disk. A typical PARTIAL sequence is:

COMMAND? PARTIAL)

CHECKING FOR BAD BLOCKS

NO NEW ERRORS DETECTED ON DISK

PARTIAL INIT RUN COMPLETE

If DKINIT finds bad blocks, it identifies them in the form:
HEAD SECTOR CYLINDER BAD BLOCK NUMBER

| ... | ... | ... | ... |
| ... | ... | ... | ... |

Error and status messages are:

Error Message	Take This Action
UPDATING DISK FORMAT REV. NUMBER TO CURRENT.	None.
NEW ERRORS FOUND ON DISK, UPDATING BAD BLOCK TABLE TO INCLUDE THEM	None.
NOT ENOUGH ROOM FOR UPDATE SUGGEST FULL INIT	Re-initialize the disk.
CRITICAL DISK BLOCKS BAD SUGGEST FULL INIT	Reformat and/or re-initialize the disk.

TEST

The TEST command also checks the disk for bad blocks but does not update the revision level or identify bad blocks to the bad block table. (You have to do these things with the PARTIAL or ENTER command.) TEST is useful for checking a disk's compatibility with different drives. The TEST error messages concern bad blocks only.

List

LIST displays the disk drive type, status information, and any bad blocks that already exist on the disk. It differs from PARTIAL in that it doesn't run a new check on it. For example:

COMMAND? LIST)
6045 DISK DRIVE ON UNIT DP0F
FRAME SIZE = 53
REMAP AREA SIZE = 12
REMAP AREA START BLOCK NUMBER = 23064
THERE ARE NO BAD BLOCKS

The frame size is decimal, the START BLOCK NUMBER octal.)

DISK

The DISK command directs the program to the *DISK UNIT?* question, so you can work with a new disk pack.

STOP

The STOP command halts the computer. Press the front panel CONTINUE switch to restart the program at the "DISK...?" query.

End of Chapter

Chapter 9
RDOS Utilities

Table 9-1 describes the utility programs and source files that Data General supplies with each RDOS system. Many of these are accompanied by their own software manuals, as described. The source files (those that end in .SR) are in ASCII, thus you can TYPE or PRINT them to learn more about them.

Table 9-1. RDOS Utilities

Program Filename	Program Purpose
EDIT.SV	Text Editor (separate manual provided).
EDIT.RB	Text Editor relocatable binary file.
MEDIT.RB	Multiterminal Text Editor relocatable binary file.
NSPEED.SV	Super (text) Editor for NOVA computers (manual provided).
or	
SPEED.SV	Super (text) Editor for ECLIPSE computers.
SPEED.ER	SuperEditor error message text file.
ASM.SV	Extended assembler (manual provided).
XREF.SV	Extended assembler cross-reference generator.
MAC.SV	Macroassembler (manual provided).
MACXR.SV	Cross-reference generator.
LITMACS.SR	Literal macros for the macroassembler.
NBID.SR	NOVA Basic Instruction Definitions for all DG computers. (All these "-.SR" files are used primarily to build the Macroassembler permanent symbol file, MAC.PS.)
xRDOS.SR	Operating system identifier source file. "x" is "A" or "Z" for mapped ECLIPSE RDOS, "B" for unmapped ECLIPSE RDOS, "N" for mapped NOVA 3/4 RDOS, "M" for other mapped NOVA RDOS, and nothing for other RDOS systems.
NSID.SR	NOVA Stack Instruction Definitions.
NEID.SR	ECLIPSE Instruction Definitions.
NCID.SR	ECLIPSE Commercial Instruction Definitions.
N4ID.SR	Special/NOVA 4 Instruction Definitions.
NSKID.SR	NOVA Skip Instruction Definitions.
FPID.SR	NOVA Floating-Point Instruction Definitions.
OSID.SR	Operating System (RDOS) Instruction Definitions.
NFPID.SR	NOVA 3 hardware Floating-Point Instruction Definitions.
PARU.SR	RDOS User Parameter Definitions.

Table 9-1. RDOS Utilities (continued)

Program Filename	Program Purpose
PARS.SR	RDOS System Parameter Definitions.
ALMSPD.SR	ALM/ULM line specification source file, described in this manual and *RDOS Reference Manual*.
ALMSPD.RB	Assembled ALMSPD.SR with default line characteristics.
RFPI.RD	Floating-point Interpreter relocatable binary file (manual provided).
N3SAC3.RB	When loaded (RLDR) with a user program, this makes .SYSTM calls return the frame pointer, instead of the User Stack Pointer, in AC3, for NOVA 3/4s only (described in *RDOS Reference Manual*).
LFE.SV	Library File Editor (manual provided).
SEDIT.SV	Symbolic File Editor (manual provided).
OEDIT.SV	Octal File Editor (manual provided).
DSKED.SV	Stand-alone Disk Editor (manual provided).
xIDEB.RB	Interrupts-off debugger (debugger manual provided), "x" is "A" or "B" for mapped or unmapped ECLIPSE RDOS respectively, "M" for mapped NOVA RDOS, and nothing for other RDOS systems.
ENPAT.SV	Patch File Creation program (described in CLI manual).
PATCH.SV	Patch Installation program (described in CLI manual).
RLDR.SV	Extended Relocatable Loader program file (manual provided).
RLDR.OL	Relocatable Loader overlay file.
OVLDR.SV	Overlay replacement loader (described in RDLR manual).
xSYSGEN.SV	RDOS System generation program (described in this manual and CLI manual).
SYS.LB	System library, contains tasking code, buffered I/0 package, debugger; this library is tailored to your type of RDOS system. (It is described in the RLDR manual, *RDOS Reference Manual*, and debugger manual.)
SYS5.LB	Old (pre-rev 6.00 RDOS) version of SYS.LB.
MATH.LB	Diverse math routines (e.g., square root) for assembly language (described in *Relocatable Library File User's Manual*).
FDUMP.SV	Fast disk dump program (described in CLI manual).
FLOAD.SV	Fast disk load program (described in CLI manual).
VFU.SV	Vertical Format control program for data channel line printers (described in CLI manual).
MCABOOT.SV	Multiprocessor Communications Adapter bootstrap program (described in *RDOS Reference Manual* and CLI manuals).
CBOOT.SV	Cassette bootstrap loader program.
TBOOT.SV	Mag tape bootstrap loader program.
DKINIT.SV	Disk initializer (described in this manual).

End of Chapter

Appendix A
If You Make a Typing Mistake

If you make a typing mistake, but haven't yet pressed), use the DEL or RUBOUT key to remove the bad characters sequentially. Depending on your type of system console and the program, the bad characters will disappear one-by-one, or an underscore (_) or backarrow (<) will appear for each character erased. To stop execution *after* you have pressed), type CTRL-A for all programs except BOOT.SV.

General error messages and common problems are described in Appendix B.

Operation	Recovery
FILENAME? or FROM MT0: or FROM CT0: (bootstrap loaders)	Type DEL or RUBOUT, then rekey the filename or number.
DKINIT (Disk Initializer)	Type CTRL-A (depress the CONTROL key, then type A) to repeat the last question.
BOOT.SV or BOOT.AB (Bootstrap Installer)	Type DELs or RUBOUTs to backspace over the miskeyed letters, then rekey the correct letters.
BOOTSYS.SV, FBOOTSYS.SV, INFOS300.SV or SYS.SV (RDOS system)	Type DELs or RUBOUTs to backspace over the miskeyed letters, then rekey the correct letters. Type backslash ("\" to rekey the entire line. Type CTRL-A to get the R prompt.
SYSGEN (RDOS System Generation)	Same as for the RDOS system.

End of Appendix

Appendix B
Errors and Error Messages

This appendix describes common errors and problems that can occur during the system generation process and how to recover from them.

Errors that DOSINIT may display while executing a COMMAND are described in Chapter 8.

Error messages appear in Table B-1 alphabetically.

Table B-1. Errors and Error Messages

Message	Probable Cause(s)	Take This Action
Nothing (during bootstrap attempt)	Bootstrap disk not inserted in first drive of controller, or not READY.	READY bootstrap disk in proper drive.
	Wrong device code.	Correct device code as shown in program load steps, Chapter 7.
	Abnormal termination of program or system.	Press disk drive switch to LOAD or STOP, then back to READY or START; wait for READY light. This resets disk read/write head to track 0. See "Shutting Down RDOS" in Chapter 7 for impact of abnormal system termination.
	Disk does not have bootstrap root and BOOT.SV on it.	Install these as described in pre-SYSGEN chapter.
! or ?	For NOVA 4 machines, programmed console is in console mode (someone may have accidentally hit the BREAK key).	Type P)
??	Tape read error on mag tape or cassette.	Try again.
CHECKSUM ERROR IN SYSTEM OVERLAY FILE	Inconsistency in overlay file.	Reload SYS.OL or equivalent.
DEVICE-OFF LINE-UNIT n	The disk you specified is not on line or doesn't exist.	Put disk n on line or correct the command.
DEVICE IMPROPERLY SELECTED	Tape or cassette unit not LOADed and ONLINE.	Put tape or cassette ONLINE.
DEVICE TIMEOUT xxx	Same as DEVICE OFF LINE.	Same as DEVICE OFF LINE.
DISK ERROR - STATUS xxx	Disk format error.	Consult disk hardware manual.

Message	Probable Cause(s)	Take This Action
DISK FORMAT ERROR	RDOS cannot access the disk.	Run DKINIT FULL) on the disk; then INIT/F it.
FATAL ERROR - unit STATUS = xxxxxx	Hardware problem with mag tape or cassette.	Consult *Peripherals* manual.
FILE DATA ERROR	RDOS cannot access the file or disk.	You may have forgotten to run DKINIT on the disk (be sure to INIT/F it afterward).
		If the filename mentioned is SYS.DR, you must type INIT/F to the disk.
FILE DOES NOT EXIST	RDOS cannot find the file you specified on the disk you specified.	You may have given the wrong file specifier (e.g., DP1:x or MT0:x) to the starter system. Check and rekey command.
	This RDOS system does not support the specified device.	Generate another RDOS system with support for the device.
FILE NOT FOUND	BOOT cannot find the file specified on the disk you specified.	Check the directory specifier (e.g., DP1:x or MT0:x) and/or filename; rekey command line.
FILE IS NOT EXECUTABLE	The file is not an executable save (.SV) file.	Use correct filename in command.
HARDWARE FAILURE	Hardware problems.	Run disk and CPU reliability tests.
ILLEGAL FILENAME	An illegal character was part of the command line.	Rekey command line.

Table B-1. Errors and Error Messages (continued)

	Probable Cause(s)	Take This Action
INSUFFICIENT MEMORY FOR SYSTEM OPERATION - SYSGEN ERROR	The computer doesn't have enough memory to execute memory to execute this system or program.	Bootstrap the starter system and regenerate an RDOS system for less memory.
INSUFFICIENT MEMORY TO LOAD PROGRAM	Same as previous cause.	Same as previous action.
MASTER DEVICE DRIVER NOT LOADED -- SYSGEN ERROR	This RDOS system does not contain a device driver for the disk you are trying to bootstrap from.	Bootstrap the starter system and regenerate the RDOS system; make sure to tell SYSGEN that you *do* want support for this type of disk controller and, generally, that the controller is primary.
NO SUCH DIRECTORY	This RDOS system does not recognize the disk you specified.	Check file specifier (e.g., DP1:x or MT0:x); rekey command.
OVERLAY FILE VACUOUS	There is no overlay file on disk for this system.	Load the overlay file.
PARTITION IN USE TYPE C TO CONTINUE	Bootstrap of any system or program after RDOS has terminated abnormally.	See "Shutting Down RDOS" and "Full Initialization" in Chapter 7 for impact of abnormal system termination.
SPTR DRIVER NOT LOADED SYSGEN ERROR	This RDOS system does not include support for the paper tape reader.	Bootstrap starter system and regenerate the RDOS system with support for SPTR and SPTP.
UNKNOWN DEVICE SPECIFIER	The current program doesn't recognize this devicename.	Type the correct devicename.
WARNING: MASTER DEVICE MAP.DR IS ERRONEOUS	RDOS found inconsistencies in disk block allocation file.	Bootstrap RDOS or another disk and type INIT/F to this disk.
YOU LOADED TAPE #xxxxx - I WANT TAPE #nnnnnn	You tried to load the wrong tape.	Load the correct tape.

End of Appendix

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Within this index, the letter "f" after a page number means "and the following page"; "ff" means "and the following pages".