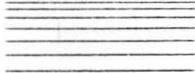


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CLUSTER/ONE

USER MANUAL

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Nestar Systems, Inc.

INTRODUCTORY NOTE

This manual is organized in eight sections:

- I. Introduction
- II. Set Up
- III. Bringing Up the System
- IV. Using the System
- V. Restrictions on Programs
- VI. Problem Isolation
- VII. Building a Library
- VIII. Disk Utilities

In this preliminary edition, Sections I. and V. and most of VII. are omitted; they are currently in preparation and are scheduled for completion shortly.

Your questions and suggestions are welcome.

5 September 1979

NESTAR SYSTEMS CLUSTER/ONE USER MANUAL

Table of Contents

	Introductory Note	i.
	Table of Contents	ii.
I.	Introduction	(in preparation)
II.	Installation Instructions	1
	A. Main storage unit	1
	B. Apple II interface	2
	C. Commodore PET interface	3
	D. Radio Shack TRS-80 interface	7
	E. ClusterBus interface cables	8
III.	A. Bringing up the system	9
	B. Drone initialization procedures	11
	Commodore PET 2001-8, -16 and -32	11
	Apple II	12
	Radio Shack TRS-80	13
	C. Reinitializing the drones in case of trouble	14
	Commodore PET 2001-8, -16 and -32	14
	Apple II	14
	Radio Shack TRS-80	14
	D. What to do if there is no response to a Cluster/One command.	15
IV.	A. Mounting diskettes	(in preparation)
	B. Summary of Commands	16
	C. Description of Cluster/One commands.	17
	@DIR	18
	@IEEE	19
	@LOAD	20
	@LOSE	21
	@OFF	22
	@REPLACE	23
	@RUN	24
	@SAVE	25
	D. Drone error messages	26
V.	Restrictions on programs	(in preparation)
VI.	A. Problem isolation	27
	B. Queen diagnostic facilities	29
	C. Listing of numerical error codes	31
VII.	A. Disk organization	32
	B-F The eight inch flexible diskette	(in preparation)
VII.	G. Protecting diskettes from erasure	33
VIII.	The disk utilities	34
	A. FORMAT program	35
	B. BACKUP program	38
	C. MERGE program	41
	D. DIRMAINT program	46
	Appendix A: Summary of Changes September 5, 1979	50

II.A Installation instructions for Cluster/One main storage unit

Unpack the Cluster/One storage unit, following the unpacking instructions included in the packing carton. Place the Cluster/One storage unit on an appropriate surface, leaving sufficient space for the PET 2001-8 console to sit on the left hand side of the storage unit. Note: the main storage unit weighs over 90 pounds; be sure that the surface has adequate structural support.

Ensure that the PET 2001-8 console is fully operational. Remove the packing material from the connector which exits from the left hand side of the Cluster/One storage unit. Place the PET to the left of the storage units, about 3 inches from the unit. Install the connector onto the PET, ensuring that it is fully and squarely installed. It is a very tight fit, and requires some force to apply, and must be pressed on absolutely squarely to seat.

Now follow the instructions in Section III.A of this manual, on "Bringing up the System".

This completes installation and test of the main storage unit.

II.B. Installation instructions for Apple II interface CLO-1004

1. Turn off the AC power to the Apple prior to installing the interface card.
2. Insert the interface card in a free slot inside the Apple, Slot 4 is convenient since it permits the ClusterBus cables to enter and exit a nearby slot in the rear

Note that the Apple II must have Applesoft in ROM, either in an Applesoft card in slot 0 or in the case of the Apple II Plus, on the main CPU board.

3. Apply AC power to the Apple, and enter Applesoft. You should now have the "]" prompt, and enter

```
CALL 51712 (return)
```

The response

```
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```

indicates that the interface is correctly installed.

4. When this is completed, proceed to connect the ClusterBus cables as described in Section II.E. You will find it convenient to remove the Apple interface cards when connecting the interface cables. Be sure that AC power is off when removing or inserting these interface cards.

II.C.1 Installation instructions for PET 2001-8 interface
CLO-1002

1. Be sure that the AC power to the PET is off when you attach or remove the PET interface.
2. Plug the PET interface CLO-1002 onto the memory expansion port on the right hand side of the PET, with the ICs facing the PET and the wire extending to the back.
3. Plug the small connector at the end of the wire onto the second cassette port at the rear right hand edge of the PET. The connector is polarized so that it cannot be inserted upside down. (The wire should be towards the corner of the PET.)
4. Turn on the PET. You should see the usual display. If not, immediately turn off power and check your work.
5. Enter

SYS 37376 (return)

If you see the message

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on your screen, the PET interface CLO-1002 is properly installed and operational.

6. Proceed to Section II.C.3 for instructions on the installation of the PET ClusterBus interface card CLO-1003.

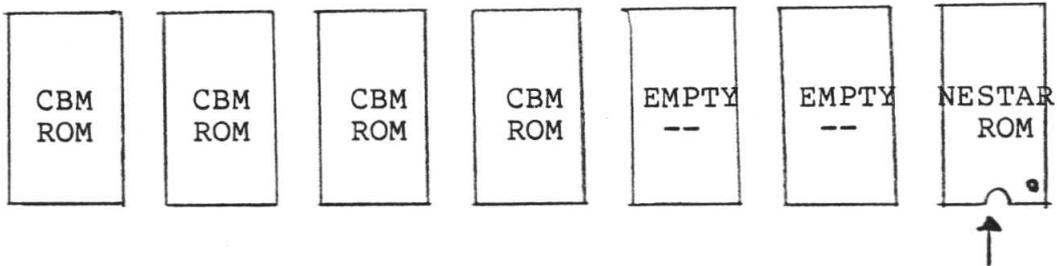
II.C.2 Installation instructions for CLO-1002-2 PET interface ROM on PET 2001-16 and -32.

The installation of the CLO-1002-2 ROM in the Commodore PET Models 2001-16 and -32 is quite simple; however you MUST follow these instructions very carefully and exactly. An error could damage the CLO-1002-2, or your PET or both. If you feel uneasy about proceeding, have the dealer from whom you purchased the Cluster/One system perform these steps.

1. Turn off the PET. Remove the power cord from the AC outlet.
2. Unscrew the four screws (use a Philips, i.e. cross point screwdriver) which hold the top half of the PET to its black base. The simplest way to accomplish this is to slide the PET forward over the edge of a table, and work from below. Do not damage the screwheads when removing the screws.
3. Lift the top of the PET upwards slowly. As you do so, look inside, and observe the three cable bundles which connect to the main PET board. As you lift you may see that one (or more) are too short to permit you to raise the cover fully and set the metal bar on the left hand side of the top into either of the left hand side screw clearance holes. If this is the case, simply slide the connector off the PET board. Do not simply yank the top of the PET open into full position, as this could pull these connectors from the board, bending a few pins in the process.
4. Set the bar clipped onto the left hand inside of the PET cover into one of the screw holes on the left.
5. Observe the row of integrated circuits just in front of the rearmost cable connector. There are four chips plugged in the left hand end, and three empty sockets to their right. There is one more chip soldered to the board on the right of the rightmost empty socket.

You are going to install the CLO-1002-2 in the rightmost socket of the three empty sockets.

6. Before opening the plastic package containing the CLO-1002-2, PLACE YOUR HANDS ON THE METAL CASE OF THE PET, in order to discharge any high static electricity charge you may have on your body.
7. Now remove the CLO-1002-2 from its package, and gently insert it into the rightmost of the three empty sockets ACCORDING TO THIS FIGURE.



BE SURE YOU DO NOT HAVE IT IN UPSIDE DOWN!!!

notice the position of the HALF CIRCLE

8. Make sure that you have not bent any pins of the ROM you have inserted either outside the socket, or more likely, bent UNDER the chip, without going into the socket holes.
9. You can now lower the PET cover, and reconnect any of the cable assemblies you may have removed when opening the cover.
10. Screw the top of the PET back onto the base using the screws removed earlier.
11. Reinsert the power cord, and turn on the PET. You should see the usual display. If not, immediately turn off the power, and check your work.
12. Type

SYS 37376 (return)

on the keyboard. If you see the message

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on your screen, the CLO-1002-2 is properly installed, and operational.
13. Proceed to Section II.C.3 for instructions on the installation of the PET ClusterBus interface card CLO-1003.

II.C.3 Installation instructions for PET ClusterBus interface card CLO-1003

The PET ClusterBus interface card plugs onto the PET IEEE-488 port. This port is on the rear of the PET, and is the rightmost connector when viewed from the rear.

The interface card is polarized so that it cannot be inserted upside-down or on the wrong connector. When properly inserted, the OUT contacts are above the IEEE connector, and the IN contacts below.

Section II.C.4 describes the interconnection of the ClusterBus interface cables.

II.D Installation instructions for Radio Shack TRS-80 interface CLO-1009

The TRS-80 interface may be used with Level II keyboard-only TRS-80s, or with the Expansion Interface (with or without disks).

If you have only a keyboard unit, follow these instructions:

1. Unpack the TRS-80 interface units and its 9V powerpack DC supply.
2. Turn off all power to the TRS-80 keyboard unit, and remove the plastic door of the rear left hand side of the keyboard unit.
3. Connect the wide 40 wire cable from the interface unit to the connector on the printed circuit board inside the door on the keyboard unit. Note that the RED stripe on this cable MUST BE to the right hand side of the connector, looking from the front of the keyboard unit.
4. Next plug in the powerpack, and insert the little jack into the TRS-80 interface. There is no switch on the interface unit, and power can be left on the unit at all times except when the cable to the TRS-80 is removed or attached.
5. Next, turn on the TRS-80 itself, and initialize Level II BASIC. Follow the instructions in Section III.B.3, to initialize the TRS-80 unit, and observe the proper response:

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6. At this time connect the interface cables following the instructions provided in Section II.C.4.

If you have an Expansion Interface, follow these instructions:

1. Ensure that you have all the latest modifications and improvements needed for the Expansion Interface. (The level supported by Nestar Systems at this time includes the "buffered cable" mod, and the "pig-tail" mod. We cannot guarantee that the interface to the Expansion Interface will continue to work for all future changes that Radio Shack installs.)
2. Connect the Nestar Cluster/One interface to the Screen Printer port, which is on the left hand side of the Expansion unit looking from the front. The RED stripe on the wire should be to the REAR of the Expansion Interface, with the cable descending from the connector.
3. Otherwise all steps are the same as described above for keyboard-only units.

II.E Installation instructions for ClusterBus interface cables

The ClusterBus cables connect the Drone stations to the main storage unit. These cables begin at the storage unit, and connect in a daisy-chained fashion to each Drone station in turn. A maximum of 15 units may be connected on one interface cable string. (If your Cluster/One system has the ClusterBus Extender Option CLO-1008 you will be connecting two independent strings, which each may have a maximum of 15 Drone stations.)

All interface cables are both color coded and polarized to simplify correct installation procedure. The general rule is that each stations has one connection IN to it, and one connection OUT to the next station. All cables have one end which connects to an IN and one end which connects to an OUT. All IN connections are labelled with GREEN dots, and all OUT connections are labelled with RED dots.

Begin by connecting one cable from the storage unit (OUT) to the IN connection of the first Drone station.

Power up and start the main storage unit as described in Section III.A. Power on and initialize the first Drone station, as described in Section III.B. Enter the command

```
@RUN "MENU"
```

and observe that the MENU program is loaded and runs. You can now request the SAMPLE program (number 1) etc.

Next connect an interface cable between this Drone station and the next station in turn. Test its operation, and the correct operation of the previous stations on the chain. Proceed sequentially in this fashion until all Drone stations are operational. Connecting all Drone stations simultaneously is not advised, since in case of difficulty it is not clear which unit is the cause of the trouble due to the parallel nature of the ClusterBus.

IMPORTANT NOTE: Any excess cable between Drone stations should never be coiled, but should be fan-folded and taped flat. Coiling the excess cable can cause unnecessary bus errors and should be avoided.

III.A Bringing up the system

This section describes how to start the Cluster/One system for on-line operation from a powered down state. Follow the instructions carefully, and obey the sequence shown below.

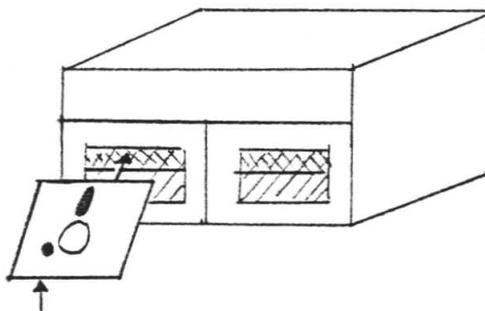
1. Turn on all Drone stations to be used. This must be at least half of the total number of attached Drones for the ClusterBus to transmit data. If this is not done, a series of error indications will appear on the Queen's INVALID BUS row.
2. Press the disk door latches and remove any diskettes in the drives. They should not be left in the drives when the system is not in use.
3. Turn on the Cluster/One Storage Unit by pressing the switch on the rear of the unit. The PET console should be OFF at this time.
4. Turn on the PET console and observe the screen. It should display

```
*** COMMODORE BASIC ***  
15359 BYTES FREE  
READY
```

(or, 31743 BYTES FREE with
option CLO-1001-8 installed)

If the correct display is not present, try again by turning off the PET console, waiting a moment, and trying again. If incorrect behavior persists, call your local Service Representative. In the interim, you may wish to remove the console from service and replace it by an alternate unit. Follow the procedure described in Section II.C.2.

5. Place a diskette containing a copy of the Cluster/One system code in Drive 1 (the left hand drive). The correct positioning is shown below:



Note the small round index hole
must be left of center.

6. Type the following command on the console keyboard. You can

use the red DEL key to erase an incorrectly typed letter.

SYS_47111 (return)

The system should briefly display the following sequence:

```
DISK ID: (name of disk)
C*PC      SR AC XR YR SP
;C6EE    00 FF F8 0E F8
R 81,Q
```

(The line beginning with ; may vary from the above values.)

The screen will clear, and the standard Cluster/One monitor display titles should appear as shown in Section VI.

After several seconds (during which time memory buffers are validated), the row labelled POLLING should display the letters A through O rolling across the screen. (Systems with the ClusterBus Extender Option installed will also see the letters a-o displayed.)

Cluster/One is up and running!!

If the system does not respond as described above, turn to Section VI for an explanation of error messages and suggested corrective actions.

III.B Drone initialization procedures

This section describes the procedures used to enable the Cluster/One interface on each of the personal computer stations attached to the Cluster/One system.

This initialization need be done only once, when the Drone is turned on, and need not be repeated except in unusual circumstances. These are described below.

1. Commodore PET 2001-8, -16 and -32.

Turn on the PET. Enter the command

SYS 37376 (return)

(for all models described above).

You should now see

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on your console. If you do not, either you have not correctly installed the Cluster/One interface or have some hardware problem which should be corrected by your Service Representative.

If you receive this message, all Cluster/One commands are now operational.

2. Apple II

Cluster/One commands are operational only from Apple II Applesoft ROM systems. You must first be in Applesoft to enable the Cluster/One system.

There are several ways to accomplish this. If you have a local minidisk system and it has been booted, type

FP (return)

to get into Applesoft BASIC. You should see the standard right bracket prompt. From the Apple monitor, there are two ways to get into Applesoft BASIC. If the switch on the Applesoft ROM card is up, type

(ctrl) B (return)

to enter Applesoft, and you should see the right bracket prompt. Another method, if the switch is down, is to type

C080 (return)

in Monitor mode, and you should now see the right bracket prompt. Once you have accomplished this, using one of the methods described above, enter

CALL 51712 (return)

and you should receive the message

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on your console. If you do not, you have not correctly installed the Cluster/One interface or have some hardware problem which should be corrected by your Service Representative.

If you receive this message, all Cluster/One commands are now operational.

3. Radio Shack TRS-80

Cluster/One commands are operational only from Radio Shack Level II systems. To enable the Cluster/One commands, first turn on your TRS-80 in the usual fashion, responding to the memory size command as desired.

Once in BASIC, enter

```
SYSTEM (return)
```

You should now receive the prompt

```
*?
```

and enter

```
/12345 (return)
```

At this time, you should receive the message

```
NESTAR SYSTEMS CLUSTER/ONE (TM)
```

on your console. If you do not, you have not correctly installed the Cluster/One interface or have some hardware problem which should be corrected by your Service Representative.

If you receive this message, all Cluster/One commands are now operational. In addition, you will find that the keyboard has been debounced by the Cluster/One interface firmware.

NOTES:1. ON LEVEL-II KEYBOARD ONLY UNITS

When you issue the SYSTEM command shown above the Cluster/One system uses the top 256 bytes of memory (below the limit, if any, set by MEMORY SIZE?). You should not reissue this command without first turning your TRS-80 off, then on again during a session.

2. UNDER DISK BASIC

You MUST reissue this command every time you reenter DISK BASIC.

3. The SYSTEM command described above has the effect of a NEW, that is, it erases the current program from memory.

III.C Reinitializing the Drones in case of trouble

This section describes the procedures to be used in case of difficulty at a Drone station. Note that there is one simple solution to any problem which will always work, at the cost of losing your current program-- turn off the Drone station, and proceed according to the initialization instructions in Section III.B.

1. Commodore PET 2001-8, -16 or -32

There is only one time when you normally need to reinitialize the Cluster/One interface. In normal operations, all Cluster/One commands should always be available, unless you have issued the

@IEEE

command, which totally resets the PET to its normal state, and permits IEEE operations via the IEEE connector (with the ClusterBus disconnected!!). After issuing this command, to reenter the Cluster/One system, you must issue the SYS 37376 command, as described in Section III.B.1.

2. Apple II

Once you have entered Applesoft, and initialized the Cluster/One interface you should not need to issue the CALL 51712 command, except for the following circumstances. If you intentionally, or accidentally press the RESET button (on non-Apple II Plus systems) and get to the Monitor, the proper procedure for reentering Applesoft is to type

(cntrl) C (return)

If you use

(cntrl) B

you must reenter the command CALL 51712 as described in Section III.B.2

3. Radio Shack TRS-80

On the TRS-80 there should be no normal sequence of events where you must reinitialize the Cluster/One interface. If necessary for some reason, you should first turn off, and then on, the TRS-80, and proceed according to the procedure shown in Section III.B.3.

Note that the Cluster/One interface must be reinitialized whenever you enter DISK BASIC from TRSDOS.

III.D What to do if there is no response to a Cluster/One command

This section describes the steps to be taken if there is no response to a Drone command after a reasonable amount of time has elapsed.

1. First check to see that the Cluster/One system is running. This can be observed by looking at the console diagnostic display, which should show the usual rolling letters in the POLLING row, with occasional pauses for servicing Drones. If this is not the case, notify the System Administrator who will analyze the situation and restart the system.
2. If the system appears normal, and others can issue commands and are receiving the normal responses, first reset your Drone station. The surest method is to turn your Drone station off, then on, and initialize according to the procedure shown in Section III.B. You may wish to perform the following attempts first:
 - a) Commodore PET: Enter a series of 6 or more @'s from the keyboard. Eventually you should receive a ?SYNTAX ERROR message, and the usual READY prompt. You can now reenter the previous command, or if the system is not operational, continue to work on your program in your local Drone until the system is up again.
 - b) Apple II: First try entering a (cntrl) C, which should return you to Applesoft. If this does not work, press RESET, and then (cntrl) C if you are in the Monitor. (Do not use cntrl-B as this will lose your current program, and also require reinitializing the Cluster/One interface.)
 - c) Radio Shack TRS-80: First press the BREAK key. If this does not recover and give you a READY message, press the RESET button on the left rear of the keyboard unit. If you now receive the READY message, you do not have to reinitialize the Cluster/One interface. Under DISK BASIC, this will re-boot the disk, and you must reenter BASIC from TRSDOS, and reenter the SYSTEM command as shown in Section III.B.3.

IV.B Summary of Commands

The following is a summary of the commands available under this Release of the Cluster/One system. The exact syntax is described in Section IV.C.

- @DIR displays a (possibly restricted) list of programs and their sizes from one of the disk units on your console.
- @IEEE PET only: disables the Cluster/One interface, and permits all IEEE commands. Make sure you remove the ClusterBus interface card before proceeding!!
- @LOAD loads a program from disk into a Drone.
- @LOSE permanently erases a program from the Cluster/One library.
- @OFF partially resets the Cluster/One interface, and permits local tape and disk operations at a Drone station.
- @REPLACE updates an existing copy of a program in the Cluster/One library.
- @RUN first LOADs, then RUNs a copy of a program from the Cluster/One library.
- @SAVE saves a copy of a program in the Cluster/One library.

IV.C Description of Cluster/One commands

This Section contains a description of each of the commands that are available under the Cluster/One system once initialized. The following Section describes the error messages you may receive, and their meaning.

Many of the commands use a filename and unit number in their syntax. In some cases they may be omitted, and the defaults are described below. A filename is a string of 1 to 16 characters, composed of the 64 ASCII symbols from blank to underscore (or back arrow), with the exception of : ? and *, which are reserved. Note that the filename must be a literal string, and not a BASIC variable or string expression. Sample filenames are: "LESSON 1", "HELP", "1RST LESSON".

Certain commands permit you to specify a filename in an abbreviated manner, by using ? or * in the name. These commands are: @DIR, @LOAD, @RUN and @LOSE. A ? is used to mean any one character, without specifying which. For example, @LOAD "?ELP" could load the program "HELP" if it exists. @LOAD "H??P" could also do the same.

A trailing * is used to match any sequence of letters, from that point on. For example, @LOAD "LESSON*" will load the first program encountered in the directory which begins with the characters LESSON, such as LESSON 1. @DIR "LESSON*",2 will list the names of all programs on disk 2 which begin with the characters "LESSON". The ? and * forms cannot be used in the commands @SAVE or @REPLACE,

A unit number specifies which of the two disk units a program resides on, and if omitted, defaults to drive 1. For example, @LOAD "HELP" loads HELP from drive 1, as does @LOAD "HELP",1. @LOAD "HELP",2 would load a program of the same name but from drive 2.

@DIR Directory list

The @DIR command is used to obtain a list of program names on your console. In its simplest form you can receive the names of all programs which are available for your Drone by entering

@DIR or @DIR,1 for disk unit 1
@DIR,2 for disk unit 2.

A partial directory listing can be obtained by including a filename, as in:

@DIR "J*",2 which lists only those programs beginning with J, on disk unit 2.

Note that @DIR "J" will list only the one program "J" (if it exists). You may use any legal filename form, as described above, including question marks, etc.

The directory list will display the disk identification, and any programs available for your Drone station, along with their size. The size is shown in decimal, and is the count of 256 byte blocks that each program occupies. Finally, the list shows the number of free blocks available on the referenced disk, again in units of 256 byte blocks.

The directory list may be cancelled while it is printing in the following manners: On the PET, press STOP. On the Apple, press (cntrl) C. On the TRS-80, press BREAK. In addition, on the PET, you may slow down the listing by holding down the RVS key.

WARNING: During the time that you are accessing the directory, other users cannot proceed until you are done. Be as selective as possible in directory requests, and complete your requests as rapidly as feasible. Typing (cntrl) S in Apple II Plus systems will freeze the display but will prevent other users from accessing the disk!! Don't use it!!

@IEEE Permit IEEE bus operations - PET ONLY

Once the Cluster/One system has been started at a PET Drone, the IEEE bus is reserved for communications with the Queen, and cannot be used for instrumentation, etc. Because of the nature of the syntax of PET commands, protecting against inadvertant use of the IEEE bus (which could interfere with all ClusterBus communications) also prevents use of the local tape cassette drive for DATA file use. Any attempt to OPEN a file will cause a SYNTAX ERROR, and not be permitted once the Cluster/One system has begun.

By issuing the command

@IEEE

the PET Drone station is restored to a form where OPEN statements are permitted. At this time, you should remove the ClusterBus interface card if you wish to use the IEEE bus, and connect instrumentation, printers, etc. It is possible to use DATA files on local cassettes as well at this time. The program residing in the PET is not destroyed, and may be used after issuing the @IEEE command.

Once the command has been issued, the system will not respond to Cluster/One commands (except by giving ?SYNTAX ERROR). You must reinitialize the system as described in Section III.B.1.

To use the local PET cassette recorder for loading and saving programs, see the @OFF command.

@LOAD LOAD a program into a Drone from the Cluster/One library

The @LOAD command is used to load any one program from the Cluster/One library into a Drone station. A copy of the program is made in the Drone's memory, and the original copy still resides on the disk. Any number of stations may load the same program if they wish to.

The @LOAD should be followed by a program name, as described above, with an optional disk unit number.

For example,

```
@LOAD "LESSON 1"
```

will load the program named LESSON 1, from disk unit 1, if it exists, and was saved from the same type of Drone as requested from. A program saved on a PET cannot be loaded into an Apple, etc. Programs saved on one model of the PET may be loaded into other models, subject to memory size limits.

The system will respond with

```
LOADED LESSON 1
```

in the above case, or

```
NOT FOUND
```

if the program does not exist.

Other examples of legal LOAD commands are:

```
@LOAD "??MM",2  
@LOAD "TEST*"
```

@LOSE Permanently remove program from Cluster/One library

The @LOSE command is used to remove, erase, delete, scratch, kill, unsave etc. a program in the Cluster/One library. The syntax is identical to @LOAD, described above.

A program may be specified exactly, as in:

```
@LOSE "TEMP 1.3"
```

It is possible to use the ? and * forms in names with the @LOSE command, but it is not advisable.

@OFF Partial disconnect from ClusterBus for local tape/disk operation

Once the Cluster/One system has been initialized at a Drone station, any attempt to load or save programs using locally attached tape cassette units or disks (from within BASIC) are disabled. Any such attempt will result in a SYNTAX ERROR message. This is done because of internal peculiarities of the interaction between the built-in tape and disk handlers, and the nature of the ClusterBus communications.

In order to permit use of the local tape or disk operations, issue the command

@OFF

and then proceed to use the local input output devices.

Once you have, for example, loaded a program into your Drone stations from a tape cassette and wish to save it on the Cluster/One system, you can simply issue the appropriate Cluster/One command. You need not, and should not reinitialize the Drone via a CALL, SYS or SYSTEM.

NOTE: 1. In the current release, an automatic @OFF is performed for TRS-80 Drones, so they do not need to issue the @OFF explicitly. This may change in future releases.

2. If you are running a TRS-80 Drone with TRSDOS BASIC, you must issue the CMD "T" command before CLOAD or CSAVE are operational under the Cluster/One.

3. If you have a BASIC Programmer's Toolkit (TM) installed in a PET Drone station, and wish to access it while connected to the Cluster/One system, first issue the @OFF command, then the Toolkit initialization sequence SYS 45056. To return to the Cluster/One issue the command SYS 37376.

@REPLACE Replace a program already in the Cluster/One library by a new version

The @REPLACE command is quite similar to the @SAVE command, in that it writes the program currently in your Drone station into the Cluster/One library, using a specified name, and on the specified unit. @SAVE will not permit you to save a copy of a program in the library using a name that is currently used by another program. If you indeed wish to replace the program by the same name in the library by a new version, you should use the REPLACE command. REPLACE first attempts to write a copy of the program from your Drone station to the disk and only when that has been done successfully, erases the previous copy. Thus, during the interim period, both programs are present on the disk. It is conceivable that there is not enough space on a disk to permit this to happen. In this case, and only if absolutely required, one could LOSE the original version, and then SAVE the new one. This is NOT a wise thing to do, since it is possible that even after LOSEing the original version there still is not enough room for the new version. (It might be bigger than the old one for instance.) Another reason for using REPLACE rather than LOSE and SAVE is to avoid losing a copy of a program should there be, say, a power failure just at the wrong time, i.e. after deleting the old version, and prior to saving a new one.

The syntax of REPLACE is identical to SAVE. A filename must be specified, and cannot contain ? or *.

For example,

```
@REPLACE "LESSON 1",2
```

will make the program currently in your Drone station the current version of LESSON 1 on disk unit 2.

Note that you may issue @REPLACE to a filename that is not currently on the disk, and it has the effect of @SAVE.

@RUN LOAD, and then RUN a program from the Cluster/One library

The @RUN command is identical to the @LOAD command, in its syntax and effects, with one addition. After a program is successfully loaded into a Drone station, the program is automatically started, as if a RUN command were issued.

The program will begin at the first line number found in the program.

Example:

```
@RUN "MENU"
```

will load, and then begin execution of the program MENU on disk 1.

NOTE: As a special case, the command

```
@RUN
```

by itself will load and run the first program found in the directory on disk 1. This can be very useful in providing a means to get to a general program which describes or directs users automatically to several other programs on a disk, e.g. by entering the four characters @RUN. You can arrange to have a given program appear as the first program in a disk directory using features of the DIRMAINT utility (Section VIII.D). The most convenient means is to first rename the selected program AAAAA, then sort the directory, and then rename AAAAA back to whatever name you wish it to have. @RUN will then execute that selected program.

@SAVE Save a copy of the Drone program in the Cluster/One library

The @SAVE command is used to make a copy of the program residing in a Drone station on one of the the disks in the Cluster/One storage unit. The copy saved on the disk is identical to the copy in the Drone, and contains only the program steps of the BASIC program, but no data variables.

The SAVE command requires a filename, and optional unit number, as in:

```
@SAVE "TEMP 1.3"
```

which makes a copy of your current program under the name TEMP 1.3 on disk unit 1. Once this is done, any other Drone of the same type as the one from which the saving has been done may load and run a copy of the program.

You cannot SAVE a program under a name that is already in use. See the REPLACE command description for the means of updating an existing program.

It is possible to have programs of the same name on a disk if they are for different Drone types. For example, it is perfectly reasonable to have programs named "MATH 1" for PET, Apple and TRS-80 all on the same diskette, each one identical or somewhat different from the others.

The name specified in the SAVE command cannot use ? or * qualifiers.

IV.D Drone error messages

1. SYNTAX ERROR: A command beginning with @ was ill-formed or illegal for this Drone. You may have mistyped the command, or specified an illegal option, such as disk unit 5.

SYNTAX ERROR will also result from attempts to use local Drone tape cassette or disk devices without first issuing the @OFF command.

2. PROGRAM TOO LARGE: The program specified is too large for either the Drone or Queen memory. You may determine if it is too large for the Drone memory by inspecting the program size on disk using the @DIR command. The storage available on the Queen is displayed on the console by the BUFFER TOP = message.
3. DISK ERROR: An unrecoverable error occurred when reading or writing to the diskette storage. Make sure the disk is properly installed and formatted. Retry the operation, possible trying an alternate disk drive.
4. NOT FOUND: The requested program file does not reside on the specified disk unit.
5. ALREADY THERE: You have attempted to @SAVE a program using the name of a program already present on the disk. If you wish to replace the existing copy, use the @REPLACE command.
6. DISK FULL: There is insufficient (contiguous) space on the disk, or in the disk directory, to save the program you have requested. You should use a different disk, or remove some programs from the current disk. It is possible to repack programs on a new disk using the MERGE utility program (Section VIII.C) so that all the free space is contiguous.
7. DISK NOT READY: The specified disk unit cannot be used. Check that a disk is installed, and is inserted, in the correct orientation with the door properly latched.
8. WRITE PROTECTED: You have attempted to write or erase a program on a disk which is write protected.
9. INVALID FILE NAME: The characters used in a program name are not entirely in the 64 basic ASCII characters (excluding : ? and *).
10. 2 SIDED DISK IN 1 SIDED DRIVE: You have attempted an operation on a disk which was formatted as double-sided, but are using a disk drive capable of using only one disk surface. You must use a different disk.

VI.A Problem isolation: difficulty during Queen startup

1. Problem: You enter SYS 47111 and there is no response at all, or ?ILLEGAL QUANTITY ERROR appears.

Possible cause: User entered SYS 47111 incorrectly.

Corrective action: Enter command again. If still not working, turn console off, then on, and try again.

Possible cause: Console hardware failure.

Corrective action: Console must be replaced, possibly by using an available equivalent Drone. Call Service Representative.

Possible cause: Failure in bootstrap ROM or disk controller.

Corrective action: Call Service Representative.

2. Problem: DISK ERROR message appears on screen.

Possible cause: Disk inserted incorrectly, damaged or not inserted.

Corrective action: Remove disk (be sure only one is present!) and reinsert in proper orientation. Reissue SYS command. Try alternate disk in drive to ascertain a physical disk problem.

Possible cause: Hardware problem with Drive 1.

Corrective action: Remove disk and place in Drive 2 (righthand drive). Issue SYS 47114 which will load system from Drive 2. Call Service Representative.

Possible cause: Memory failure in operating system area.

Corrective action: Test memory, and call Service Representative.

3. Problem: 2 SIDED DISK message.

Possible cause: The disk is recorded as a two-sided disk, but the drive can read only one side.

Corrective action: Use correct system disk.

4. Problem: NO SYSTEM FOUND message.

Possible cause: Attempting to bootstrap from disk which has no copy of the Cluster/One system as its first directory entry.

Corrective action: Use correct system disk.

5. Problem: BAD CHECKSUM message.

Possible cause: Incorrect system disk mounted, or hardware failure in disk controller or memory system.

Corrective action: Try alternative system disk, or Drive 2. If problem persists, call Service Representative.

6. Problem: Instead of clearing screen and beginning scan, BAD: FILE NOT FOUND message appears.

Possible cause: Incorrect system disk used. Program Q not present.

Corrective action: Enter X (return) to get READY message. Use alternate system disk, and reboot system.

7. Problem: Screen clears and displays RELOAD SYSTEM CODE message along with registers.

Possible cause: Memory failure in program storage region.

Corrective action: Turn off console, and then back on again, and restart system. If problem persists, call Service Representative.

VI.B Queen diagnostic facilities

The Queen station is continually monitoring the status of the Cluster/One system. This information is displayed on the Queen's monitor.

Sample display:

```
BUFFER TOP = 4000

POLLING:
RETRANSMIT:      E
TIME-OUT Q TO D:      !
TIME-OUT D TO Q:
INVALID BUS:
```

The line labelled BUFFER TOP indicates the highest memory address to be used by the Queen (in hexadecimal). This value is determined by the Queen during startup. It should be 4000 (or 6000 if Buffer Memory Option CLO-1001-8 is installed). A smaller value than this indicates failing memory; if the value is less than 2000 the failing memory is in the PET Queen console memory, otherwise it is in the Cluster/One Storage Unit.

The line labelled POLLING indicates which drone is currently being serviced. Drone stations are addressed by letter: A - O for a 15 Drone (single channel) Cluster System, and A - O, a - o for a 30 Drone (double channel) Cluster system. The letter corresponding to a Drone station should flash for a short period of time. If there are requests or problems encountered during the Queen-Drone conversation, the letter will stay lit on the screen until the Queen either rejects this Drone or the conversation terminates normally.

Under normal idle conditions, the letters corresponding to Drones will flash in a rolling fashion from left to right as the Queen completes a scan of all the stations.

When a Drone makes a request of the Cluster system, its letter will stay on the Queen's display until the request is satisfied.

There are several invalid or problem situations which the Queen can detect and will cause a mark to be made in the space directly under a Drone letter. The first is a RETRANSMIT. This means that

a message was sent which was not received correctly. The message is automatically sent again. This may happen because of static electricity, auto ignition noise, electric motors, etc. These are transient conditions and will be corrected by the automatic retransmit. Few, if any, retransmissions will occur in a normal system. If many retransmissions occur, it may indicate an electrically noisy environment. Proper shielding should correct this.

If a transmission does not complete normally during a given period of time, the Queen will stop all activity on the Bus and make a mark on the TIME-OUT Q TO D or TIME-OUT D TO Q row. After a small wait (approximately 1/3 of a second), the Queen will attempt to reconnect with the same Drone and restart the conversation. This wait-restart sequence will be tried three (3) times. If the Drone request is still not honored by this error recovery technique, a serious problem exists. This may be faulty cables, faulty connectors, cables improperly plugged in, or that a cable was disconnected from a Drone during the conversation. This may also point to a hardware failure in the offending Drone. In any case the Queen will continue to scan the other Drones. If all Drones on the system cause this condition, it may point to a hardware failure in the Queen.

A third error may be detected by the Queen. The Bus is continually checked for shorts and certain open circuit conditions. If any occur, a mark is made in the INVALID BUS row. No data transmissions will occur until this condition is fixed. Possible causes are:

1. More than half of the Drones are turned off (powered off units drain the electrical capacity of the ClusterBus)
2. Improperly connected Drones
3. Bad cables, connectors, etc.

A simple diagnostic technique to help isolate the problem is:

1. Unplug all Drones from the Queen, by disconnecting the Bus at its exit from the main storage unit. Normal scanning conditions should be reported on the Queen's screen. If not, the Queen ClusterBus drivers may be faulty.
2. Reconnect Drones to the Queen, one at a time in sequence, from the main storage unit. Observe which one causes the failure condition to reoccur.

This procedure should quickly isolate a failing stations which can be removed from the Cluster to restore normal system operation.

VI.C Listing of numerical error codes

In almost all circumstances, the numerical error codes used internally by the Cluster/One system are reported to the user in the form of an English description of a few words. In some cases, particularly for the rare or unexpected error codes a numerical value only will be reported. This list provides a complete key to these values.

VI.C.1. FILSYS errors

FILSYS errors are reported in decimal, as follows:

- 1 Disk error (see below)
- 2 File not found
- 3 File already present
- 4 Directory full
- 5 No space for file
- 6 Directory error (see below)
- 7 Illegal character in file name
- 8 2 sided disk in 1 sided drive

VI.C.2. Directory errors

Directory errors are reported in decimal, as follows:

- 1 Illegal block number
- 2 Internal error in bitmap processing
- 3 Unused
- 4 Two files allocated to same block
- 5 Attempt to free unallocated block

VI.C.3 Disk errors

Disk errors are reported in hexadecimal. The first part of the list is used for odd-numbered error codes. The second part of the list are individual error flags which comprise a hexadecimal byte.

- 03 Verify error
- 05 Disk change flag not reset
- 07 Bad disk format, not 256 byte blocks
- 09 Attempt to read file to non-existent memory

- 80 Not ready
- 40 Disk is write protected
- 20 (ignore)
- 10 Record not found
- 08 CRC error
- 04 Lost data
- 02 (ignore)
- 01 (see odd error codes above)

VII.A Disk organization

Cluster/One disks are physically recorded in IBM standard single-density format with 16 256 byte sectors on each of 77 tracks per side. The logical organization of the disks is unique to the Cluster/One, and the details of that organization need not be known or understood by the user. It is not compatible with any other file system from other manufacturers, such as CP/M.

The disk consists logically of two parts: the directory which describes the types, sizes, and locations of files on the disk, and the file area, which contains the files. Management of the space within the directory and file area is done entirely by the Queen. The limits on number and sizes of files depends, in part, on that organization, and may change with subsequent releases of the Cluster/One operating system. Current limitations are as follows:

	<u>single-sided</u> <u>disk</u>	<u>double-sided</u> <u>disk</u>
Number of files	127	255
Total number of file blocks	1216	2432

Each block contains 256 usable bytes. Files are currently stored contiguously, so occasionally a file cannot be saved although there are enough free blocks. Future releases may eliminate this problem; in the meantime the MERGE utility (Section VIII.C) can be used to compact the file area and produce a single contiguous free area.

Each file on the disk is of a particular type, indicated by a single character. The following types are of particular interest:

<u>TYPE</u>	<u>MEANING</u>
8	A machine-language program, such as a utility program which runs on the Queen
9	An Applesoft BASIC program for the Apple II
B	A BASIC program for the PET
D	A Level II BASIC program for the TRS-80

The various file types need not concern the Drone user, since the Queen lets each Drone see only those files which are appropriate for that computer. The file type designations are only needed for some operations done with utilities which run on the Queen; see the section on Utility Programs for more information.

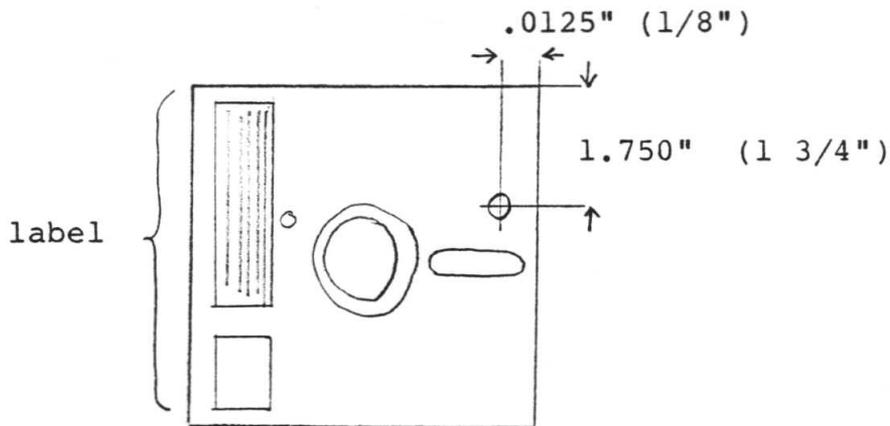
VII.G Protecting diskettes from erasure

You can protect all the programs on a diskette from being erased, or new ones from being added, by use of the write protect feature. A disk is write protected when the write protect notch is cut, or open. A disk without a notch, or with it covered is not protected.

NOTE: This is exactly the opposite convention from that used for 5 1/4 inch minidisks!

Some 8 inch diskettes come with the write protect notch already cut, in which case you need only cover or uncover the hole to modify the protection. You must use an opaque sticker when covering the hole. Make sure that the disk is not write protected when you take a fresh disk from a package and attempt to format it for use on the Cluster/One system!

If you need to cut a write protect notch, the diagram below indicates its position. First layout the center position, and then punch with a standard hand punch. Be very careful to accurately position the hole; an error could result in your not only protecting your programs, but destroying the disk inside the jacket as well!!



Direction of insertion →

VIII. The disk utilities

There are four utility programs provided with the Cluster/One system.

FORMAT is used to initialize new disks prior to their use in the Cluster/One system. This must be done or else DISK ERRORS will occur using diskettes as they come from a package.

BACKUP is used to make a complete copy of one disk to another. It is wise to periodically make copies of diskettes and safely store them for possible use should a diskette get physically damaged or worn, or suffer some catastrophic loss of information. Programs are valuable items and should be treated as such.

MERGE is used to copy all or part of one disk to another, on a file by file basis. Disks can be combined, divided or compacted using the MERGE program.

DIRMAINT is used to perform a variety of maintenance tasks involving a diskette directory. It can be used to rename a diskette, rename files, delete selected groups of files, among other functions.

VIII.A FORMAT

The `FORMAT` program is supplied on the system disk delivered with the Cluster/One unit, as are all the utility programs. All new disks to be used with Cluster/One (except the spare disk supplied by Nestar with your Cluster/One) must be initialized by the `FORMAT` program prior to their use.

`FORMAT` first writes special record information on each track of the disk. It then verifies that the disk is usable, by writing and reading data throughout the entire disk. During this phase, called `VERIFYING`, any errors, even transient ones, are reported on the console. A new disk should have no permanent errors; indeed not even retries should be required when verifying the disk.

If `FORMAT` reports errors, try removing the disk, reinserting it, and formatting again. Should the condition persist (but other disks are formatting correctly), return the disk and get a replacement. Disks with permanent errors are not usable and indicate some manufacturing or handling defect.

How to run FORMAT

1. Start the Cluster/One system, as described in Section III. Once the system is running, press the `STOP` key on the console.
2. Clear the screen of the console by pressing `SHIFT` and `CLR`.
3. Place a disk containing a copy of `FORMAT` in drive 1.
4. Enter

```
R 81,FORMAT* (return)
```

on the console. The expected response is:

```
LOADED: FORMAT version no.  
*** NESTAR DISK FORMATTER ***  
PLACE DISK IN DRIVE.  
ENTER DRIVE NO. WHEN READY.  
(PRESS STOP TO EXIT):
```

Should you receive the message

```
BAD: FILE NOT FOUND
```

either the disk in drive 1 does not contain a copy of `FORMAT`, or you have mistyped the command. Correct the problem and try again.

5. You may now remove the system disk if you wish and place disks to be formatted in either or both drives.

Be sure not to FORMAT a disk you want to keep data on! This is an irreversible process. Double check before proceeding beyond this point.

When you have done this, press the 1 or 2 key (followed by RETURN) to indicate which disk you wish to FORMAT.

6. Once you have pressed 1 or 2, the system will respond either

THIS IS A SINGLE SIDED DISK
or
THIS IS A DOUBLE SIDED DISK

followed by

ENTER DISK IDENTIFICATION
(MAX 16 CHARS):

7. Enter the disk identification you wish to have recorded on the disk. You should write the same name on the label on the top of the disk using a felt-tip pen. Do not use a ballpoint pen or pencil as they can damage the plastic surface inside the jacket.

You can correct the identification as you enter it, using the red DEL key. Press RETURN to signal that you have entered the full name.

8. The system will now respond

ENTER Y TO FORMAT DISK:

Entering Y (and RETURN) will cause the entire disk to be initialized, verified and the identification you have chosen to be written on the disk.

Any other entry will abort the program.

9. You will now see

FORMATTING...

on the console. This is the first phase, at which time the disk is being initialized with the Cluster/One format information.

Once all 77 tracks have been initialized, the console will display:

VERIFYING...

You should next see

DONE!

on the console.

Formatting a disk takes about two minutes for a single sided disk, and about four minutes for a double sided disk. All portions of the disk are checked, and all errors, even recoverable ones ("retries") are reported on the screen. A new disk, with any errors, is suspect, and should not be used.

10. To stop FORMAT: You may press STOP when FORMAT is requesting input and exit the program. Once you have replied Y and the system has displayed FORMATTING... on the screen, STOP will abort; the disk that was partially formatted must be totally reformatted prior to use in the Cluster/One.
11. To restart FORMAT: You may restart either by following the above instructions, from step 3, or, following the message ABORTED, entering G (return).

VIII.B BACKUP

BACKUP is used to make a full copy of one disk to another already initialized disk. It should be used periodically to preserve copies of your programs. Should a diskette become damaged by handling or wear, it may be impossible to recover the data from it, at which time a backup copy is invaluable. It is easy to fall into bad habits and not perform periodic backups of disks, since the general behavior of floppy disks are so reliable. But the first time a failure occurs, much like an insurance policy you hope never to have to collect on, having a recent backup is invaluable.

1. To run BACKUP, first bring up the system, and press STOP, giving a register display. Now clear the screen, by pressing SHIFT and CLR.
2. Place a disk containing a copy of the system code delivered with the Cluster/One in drive 1. Enter the following on the console:

```
R 81,BACKUP* (return)
```

The console should now display:

```
LOADED: BACKUP m.n      (m.n is the version number)
*** DISK COPY UTILITY ***
WHEN DISKS ARE READY, TYPE SOURCE DISK
NUMBER (1 OR 2):
```

(If you see the message BAD: FILE NOT FOUND it indicates that you have not placed the proper disk with a copy of the Cluster/One system code in drive 1, or you have mistyped the command shown above.)

3. You now may remove the system disk from drive 1, and place the disk you want to copy from in drive 1 or 2, and the disk you want to copy to in the other drive. Enter the number of the SOURCE disk drive (the disk you are copying from), and press RETURN.
4. The system will now display the identification of the disks as follows:

```
SOURCE: DISK 1          (or 2)
          1-SIDED, ID: name of source disk
DESTINATION: DISK 2     (or 1)
          1-SIDED, ID: name of destination disk
```

The console display will indicate 2-SIDED in place of 1-SIDED if appropriate. At this time, carefully verify that the source and destination IDs are correct, and that you want to totally replace all the data on the destination drive.

It is possible to copy a 1-sided disk to a 2-sided disk, but the system will respond with:

*** CAN'T COPY 2-SIDED TO 1-SIDED

if you attempt to perform the opposite. (Use the MERGE utility for this purpose.)

5. You will now be prompted for the name to be used for the copy which is about to be made. You may copy the name of the source disk to the new disk, keep the current name on the destination disk, or enter a totally new name of your choosing.

You can keep the source or destination IDs by replying Y to one of the following questions:

KEEP ID: source id Y/N?

KEEP ID: destination id Y/N?

If you do not reply Y to one of these two prompts, the system asks:

ID?

and awaits entry of a new name for the destination disk (maximum 16 characters).

6. BACKUP next prompts the user to determine how much of the disk should be copied.

TYPE "W" TO COPY THE WHOLE DISK,
TYPE CR TO OMIT UNUSED INNER TRACKS

Normally at this point the user should enter RETURN, in which case BACKUP will only copy that portion of the disk that is in use, which is faster than copying the entire disk.

7. Finally, the user has to enter Y in response to the following prompt:

TYPE "Y" TO START COPY

before the actual copying begins. If you wish to go back and change something, you may enter N and start again.

Entering Y now begins the copying process, which takes approximately one minute to copy a full single sided disk, and twice that for a full double sided disk.

If you press STOP during the copying operation, it will abort. The disk is NOT usable in this state, and should be recopied, or cleared using DIRMAINT.

8. The system will display its progress as it copies the disk, as

follows:

```
READING BLOCKS nnn TO nnn OF mmmm  
WRITING BLOCKS nnn TO nnn OF mmmm
```

where mmmm is the total number of blocks to be copied, at most 1232 for single sided disks, and 2464 for double sided disks.

Finally the message

```
DONE!
```

appears, indicating the entire copy has been performed.

Any errors detected during this time will cause an error message to be displayed and the copy process aborted. Should this occur, you should first remove and then remount the disks, and start the process from step 2. You may wish to reverse the source and destination drive order. If the problem persists on WRITING the destination copy, first reformat (and initialize) the destination disk, and then rerun BACKUP.

9. The system displays the message:

```
ANY MORE DISKS TO COPY?
```

on the console. Typing a "Y" will permit you to make additional copies of the source disk, or to change disks and backup other disks. You will receive the message

```
*** DISK COPY UTILITY ***
```

again, as in step 2, and should proceed as described above.

VIII.C MERGE

MERGE is a utility which can copy all or part of one disk to a second disk, without disturbing the programs already on the second disk. It can be used for such maintenance functions as:

- Combining files from two disks onto one
- Dividing one disk into two or more disks
- Copying from double to single sided disks
- Compacting the programs on a disk to allow shorter access time and the maximum possible contiguous free space.

MERGE works by copying from a SOURCE disk onto a DESTINATION disk; the SOURCE disk is never changed. The disks may be any combination of single and double sided media.

How to run MERGE

1. Bring up the system and press STOP to enter the monitor command mode and press SHIFT and CLR to clear the screen.
2. Place a disk containing a copy of the system code in drive 1. Enter the following on the console:

```
R 81,MERGE* (return)
```

The console will display:

```
LOADED: MERGE n.m      (n.m is the version number)
*** DISK MERGE UTILITY ***
WHEN DISKS ARE READY, TYPE SOURCE DRIVE NUMBER (1 OR 2)
```

(Underscored characters are in reverse video and represent possible choices for your input.)

3. You may now remove the system disk and insert the SOURCE and DESTINATION disks. Type a 1 or 2 to indicate which drive contains the SOURCE disk (the one from which to copy). Remember that the left-hand drive is 1, and the right-hand drive is 2. Type RETURN after your choice. (All input to MERGE must be terminated with RETURN).
4. The system will now read the volume IDs on the disks and print status information; for example:

```
SOURCE: DISK 1
1-SIDED, ID: PET USERS GROUP

DESTINATION: DISK 2
2-SIDED, ID: GAMES
```

You should verify that the source and destination IDs are correct. If not, press the STOP key, and the MERGE program

will be aborted. At that point you are in monitor command mode and you can return to step 2 and try again.

5. MERGE will now ask some questions to determine which files you wish to be copied from the SOURCE disk. You may choose to copy all of SOURCE, or you may restrict the files by specifying:

- A. A starting file name. Files before the specified file will not be copied. (Files are ordered as reported by the LIST DIRECTORY command of the DIRMAINT utility.)
- B. An ending file name. Files after the specified file will not be copied.
- C. A partial name match. Only files whose names match the specified pattern will be copied.

MERGE will ask you for these names with the following prompts:

```
ENTER STARTING FILE NAME
ENTER ENDING FILE NAME
ENTER PARTIAL NAME MATCH
```

You may enter or omit (by entering only RETURN) any of the names. If you enter all three, then only files which match the PARTIAL NAME MATCH which are not before the STARTING FILE and are not after the ENDING FILE will be copied. If you omit the STARTING FILE, files starting from the first one will be considered. If you omit the ENDING FILE, then all files from the STARTING FILE to the last file on the disk will be considered. Finally, if you omit the PARTIAL NAME MATCH, then all files between the STARTING FILE and the ENDING FILE will be copied. If all three names are omitted (by typing three RETURNS in succession), then the entire SOURCE disk will be copied.

The names may be specified simply as an unqualified name, such as

```
STARTREK
```

in which case the name must match exactly, but can be a file of any type. If you wish to specify the file type, you can do so by preceding the name with T: where T is the single character file type. For example:

```
B:STARTREK
```

specifies a PET BASIC file whose name is STARTREK.

For the PARTIAL NAME MATCH you will often want to specify the name incompletely, using the same convention described in the Section on Cluster/One commands, namely * to terminate the match and ? to match any one character. For example:

GAME*

specifies any file, of any type, whose first four characters are GAME, and

9:LESSON ?.0

specifies Applesoft BASIC files like LESSON 1.0, LESSON 2.0, etc.

If you want to specify only the file type and leave the name unspecified you can do so, for example:

D:

will choose all TRS-80 BASIC programs.

There are several standard ways in which these name qualifiers can be used; here are two examples:

1) To copy from a full double sided disk to two smaller single sided disks:

First run MERGE and omit all three names. When the DESTINATION disk is full, MERGE will give an error message and indicate which was the first file that it could not copy. Now run MERGE again with a new DESTINATION disk, and specify that file as the STARTING FILE NAME, with the other two names omitted.

2) To copy only files of a particular type:

Omit the STARTING and ENDING names, and specify only the T: part of the name for the partial name match.

6. After asking for the three names, MERGE will ask some more questions to determine how it should proceed:

ASK ABOUT EACH FILE? (Y/N)

If you specify Y, then MERGE will ask you about each file from the SOURCE disk which satisfies the START/END/MATCH NAME criteria, and give you an opportunity to decide whether to copy it, skip it or copy it with a new name. If you specify N, then files will be copied without asking about each one.

REPLACE DUPLICATES? (Y/N)
SKIP DUPLICATES? (Y/N)

These questions determine what is to be done if MERGE attempts to save a file on the DESTINATION disk and finds a file with the same name already there. If you choose neither to replace the duplicates nor to skip them, then MERGE will ask you individually about each such occurrence. (Not all of these questions may be asked. If the answer to a previous question

makes one unnecessary, MERGE will omit it.)

7. MERGE will now search the SOURCE disk for files which match the specified criteria, and copy them to the DESTINATION disk. Several messages may appear:

T:XXXXXX COPIED nn BLOCKS

indicates that the file of type T whose name is XXXXXX was successfully copied.

T:XXXXXX SKIPPED

indicates that the file was not copied because it did not satisfy the name criteria.

T:XXXXXX DUPLICATE SKIPPED

indicates that the file already exists on the DESTINATION disk and has been skipped according to your instructions.

T:XXXXXX REPLACE? (Y/N)

indicates that a duplicate has been found on the DESTINATION disk, and you have not specified that all duplicates should be either skipped or replaced. If you answer Y to this question, then the existing file on the DESTINATION disk will be replaced by the new one.

If you reply N to the REPLACE? question, or if you have asked to be asked about each file, MERGE will ask you how to process the file, as follows:

T:XXXXXX SKIP/COPY/RENAME?

You can choose to skip the file by answering S, in which case the file will not be copied. You can have the file copied with the same name by answering C, or you can have the file copied with a new name by answering R. If you select R, then MERGE will prompt you for a new name with

NEW NAME?

Enter the new file name, terminated with RETURN. If you do not give a name (by entering only RETURN), then the file will be saved with the old name. You may not change the file type; if you specify one it will be ignored.

8. When all of the files meeting the name criteria have been processed, MERGE will ask you if you want to run it again:

DONE. MORE DISKS TO MERGE?

If you type Y, MERGE will be reinitialized and will start the question sequence (step 3) from the beginning. If you type N

(or just RETURN), then you will returned to monitor command mode.

9. If at any point you wish to abort the MERGE utility, press and hold the STOP key. This will cause MERGE to terminate at the end of the current file if a transfer is in progress, or immediately if it is waiting for a typed response.

VIII.D DIRMAINT

DIRMAINT is a utility which allows you to perform various maintenance tasks which involve changing the directory of a diskette. Among the functions of DIRMAINT are:

- Renaming selected files
- Deleting selected files
- Renaming the diskette
- Listing the file names and types
- Sorting the directory into alphabetical order
- Clearing the directory (deleting all files)

DIRMAINT operates on a single disk, and makes all of the changes directly to the disk. It is wise to have a backup of the disk if there is any chance that the changes you make are not the ones you intended.

How to run DIRMAINT

1. Bring up the system and press STOP to enter the monitor command mode, and press SHIFT and CLR to clear the screen.
2. Place a diskette containing a copy of the system code in drive 1. Enter the following on the console:

```
R 81,DIRMAINT* (return)
```

The console will display:

```
LOADED: DIRMAINT n.m (n.m is the version number)
*** DIRECTORY MAINTENANCE UTILITY ***
WHEN DISK IS READY, TYPE DRIVE NUMBER
```

3. You may now insert the disk you wish to change in either drive, and type a 1 or 2 to indicate which. Remember that the left-hand drive is 1, and the right-hand drive is 2. Type RETURN after your choice. (All input to DIRMAINT must be terminated with RETURN.)
4. The system will now read the volume id on the disk and print status information; for example:

```
DISK 2
1-SIDED, ID: CLASS 5A
```

You should verify that the disk is the correct one. If not, press the STOP key, and the DIRMAINT utility will be aborted. At that point you are in monitor command mode and you can return to step 2 and try again.

In general, pressing the STOP key will cause the utility to abort. If you press it while it is awaiting input it will abort immediately; otherwise it will abort at the end of the

current operation.

5. DIRMAINT will now display a menu and allow you to select a function:

```

    CLEAR DIRECTORY      SORT DIRECTORY
    RENAME FILE(S)      DELETE FILE(S)
    VOLUME RENAME      LIST DIRECTORY   EXIT
    ?
```

The underscored characters are displayed in reverse video, and represent the single character (followed by RETURN) that you must type to select a particular function. If you enter an incorrect response (a letter other than C, S, R, D, V, L, or X) the menu will be repeated.

Some of the commands are executed immediately and return to the menu after completion, while others require additional information from you. The following sections describe each of the commands in detail.

5.1 CLEAR DIRECTORY

This command requires no additional information, and causes the entire directory, except for the volume id, to be cleared. The effect is to cause ALL FILES TO BE DELETED. Deleted file can NOT be recovered, so please exercise caution in the use of this command.

5.2 SORT DIRECTORY

This command requires no additional information, and causes the directory entries to be sorted in alphabetical order by type and name. There is usually no compelling reason to do so; the main consequence is simply that the directory list both on the Queen and Drones will be in alphabetical order.

The only operational difference between a sorted and non-sorted directory is that partial name matches (using * or ?) may retrieve different files after the sort, because the name search is performed in the order that the names appear in the directory. For example, if a disk contains the files

```

    LESSON B
    LESSON A
```

in that order, the command @RUN "LESSON*" would run LESSON B before sorting the directory, and LESSON A after sorting.

There is a minor performance benefit to be gained from sorting a directory from which many files have been deleted. Deleting a file causes its directory entry to be marked "empty", and although that entry will be used for a new file saved, it must be examined as part of the search for existing files. Sorting the directory causes all such empty directory entries to be

purged.

On disks which contain a copy of the basic file system (called "FILSYS"), that program must be the first in the directory in order to be located by the bootstrap routine. For that reason it will appear to be out of alphabetical order even after sorting the directory.

After the directory has been sorted, DIRMAINT will print the number of files sorted, and the number of empty entries that were purged:

```
87 FILES SERE SORTED
 4 EMPTY ENTRIES WERE MIGRATED
```

It then returns to the menu display.

5.3 RENAME FILE(S)

This command allows you to rename one or more files on the disk. It begins by asking you to give a fully or partially specified name of the files to be renamed:

```
ENTER FULLY OR PARTIALLY SPECIFIED NAME
```

You may simply enter a file name, or a partially specified name such as LESSON*. If you do specify a file type then any file matching the name will be a candidate for renaming. You can restrict the search to files of a particular type by giving the type character followed by a colon prior to the name, as in

```
9:LESSON*
```

DIRMAINT will search the directory for files that match the name you have given, and ask you for a new name for each one it finds. For example.

```
9:LESSON 2A ENTER NEW NAME
```

If you wish to rename the file, enter the new name. If you wish to leave the old name, just enter RETURN. You may not change the type of a file, only its name.

If the name you choose already exists, DIRMAINT will so indicate and give you a chance to try again. As before, simply entering RETURN will cause the old name to be retained.

After all names which match your pattern have been processed, the menu will reappear.

5.4 DELETE FILE(S)

This command allows you to delete one or more files from the disk, based on a name pattern that you specify. It will first

ask you to

ENTER FULLY OR PARTIALLY SPECIFIED NAME

Enter a name or name pattern in the same form as was described for the RENAME command. The name of each file on the disk which matches the pattern will be displayed, and you will be asked

OK TO DELETE?

Respond with Y to delete the file and N to leave it alone. After all files have been processed the menu will be displayed.

5.5 VOLUME RENAME

This command allows you to change the volume id of the diskette. It will prompt you for a new name with

ENTER NEW NAME

Respond with the new name (16 characters maximum) or with RETURN to retain the old name.

5.6 LIST DIRECTORY

This command allows you to get complete or partial listings of the directory. It prompts for a partial name match; if you enter RETURN then all files will be listed, otherwise only files which match the specified name (or type) will be listed. This differs from the directory list command (@DIR) on a Drone in that (1) all files can be listed, not just those program files for the particular drone type, and (2) some extra internal information from the directory entry is displayed. That information is not of concern to the user for normal maintenance operations.

5.7 EXIT

This command causes DIRMAINT to terminate and return to the monitor command mode.

Appendix A: Summary of Changes and Amendments

September 5, 1979

Installation instructions have been incorporated as part of this manual.

The section on Queen Diagnostic facilities describes the BUFFER TOP message, which is used to display the size of operational memory.

The section on Utility Programs has been greatly expanded, to describe two additional utilities supplied with the Cluster/One system, namely MERGE and DIRMAINT. The directory clear function formerly available as part of FORMAT has been removed, and is now part of the DIRMAINT program. In the case of errors, the FORMAT program provides additional verbal descriptions of the source of the problem.