dimension™

68000

DIMENSION 68000

SYSTEM USER'S GUIDE

Micro Craft Corporation

680-0001-100

PRELIMINARY

N O T I C E

Additional copies of this manual

may be ordered from your DEALER

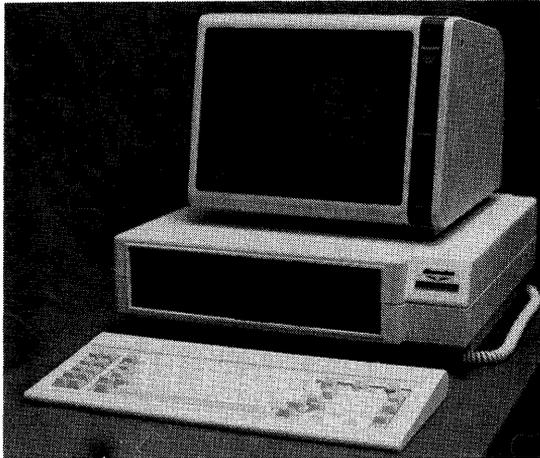by using the MICRO CRAFT part number 680-0001-100.

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MICRO CRAFT CORPORATION
Customer Support Department
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INTRODUCTION

A Typical DIMENSION 68000 System

WELCOME TO THE REALM OF THE DIMENSION 68000

You are now the owner of the most powerful, most compatible, most flex-
ible micro computer available in the world today. Also, you may be as-
sured that the designers of the DIMENSION 68000 intend to keep that
statement true for many years to come!

PLEASE, take the time to read through the first section, because only
then you can start to understand the tremendous power and flexibility
of the DIMENSION 68000.

The DIMENSION 68000 computer is an extremely powerful, flexible, versa-
tile, state-of-the-art, 32-bit computer that, with the appropriate op-
tions, is capable of operation with all standard software for such sys-
tem types as the following:

- IBM Personal Computer (TM)
- Apple II (TM), Apple II+ (TM), and Apple IIe (TM)   Personal Computers
- all Z-80 based Personal Computers, such as
     Kaypro (TM)
     TRS-80 Mod I, II, III (TM)
     Osborne (TM)
     etc.

This capability is possible with the addition of an Emulator Card for
the desired emulation type. Emulation means that, when equipped with
the desired emulator (or emulators), the DIMENSION 68000 will perform
like the emulated computer.

Even when the DIMENSION is not equipped with any emulator cards, it is
capable of performing the most demanding computing functions, like sci-
entific calculations and managing huge data bases. The basic DIMENSION
68000 provides direct memory addressing of up to 16 million bytes of
memory as well as simultaneously supporting up to four 5 1/4 inch and
up to four 8 inch floppy disk drives. The tremendous memory and disk
capacity enables manipulation of gigantic amounts of data.

Expansion capabilities include:

- Multi-User Interface (8 port, serial)
- Winchester-Type Hard Disk Interface
- Random Access Memory Expansion
- RGB Color Video Interface

INTRODUCTION
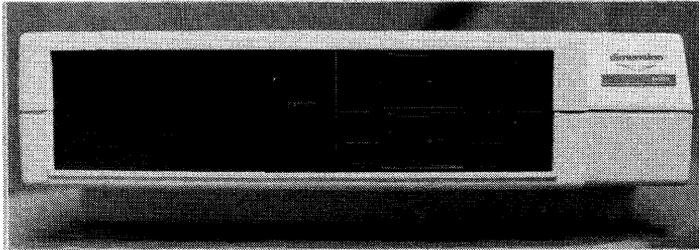
The Front Of The DIMENSION 68000 System Unit

CHAPTER 1

GETTING STARTED
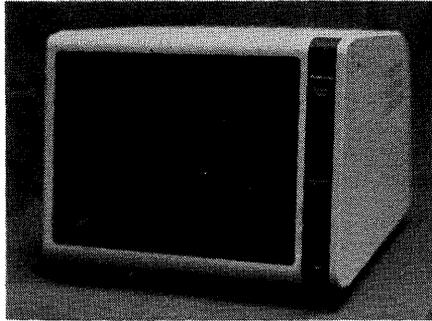
A Typical CRT
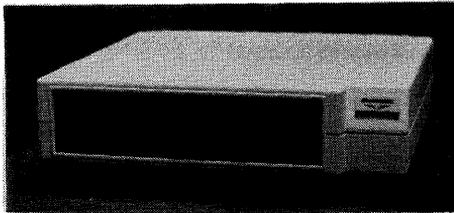
The DIMENSION 68000 System Unit
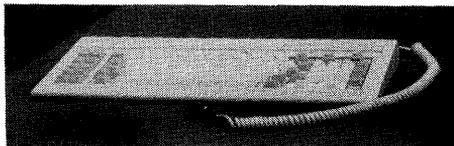
The DIMENSION 68000 Keyboard

CHAPTER 1

HOOKING IT UP

The DIMENSION 68000 system is composed of a minimum of at least three components, as follows:

- The System Unit
- The Keyboard
- The CRT (user supplied)

The System Unit is the heart of the DIMENSION 68000. Inside the unit are the electronic components that make up your computer. Visible from the front on the outside of the box are:

- The Disk Drives
- The RESET Button

Not visible from the front, but at the front is the ON/OFF switch. The ON/OFF switch is on the front, right-hand side, at the bottom.

On the rear of the unit, are several connectors that are used for connecting Input/Output (I/O) devices, such as the CRT, a printer, etc. Also on the rear panel is the receptacle for the power cord.

KEYBOARD

The Keyboard connects by means of a coiled cord with a DIN connector to the rear of the System Unit. The keyboard is the primary means of control of and communication with the DIMENSION 68000 computer. Since the Keyboard is physically separate from the System Unit, the Keyboard can be placed in various locations as needed.

CRT (user supplied)

The CRT (or monitor) is a customer supplied screen device for displaying the messages and information from the System Unit. The System Unit provides an EIA (Electronic Industries Association) RS-170 standard video output for connecting any "Industry Standard" CRT. The CRT is connected to the System Unit by means of a shielded cable with an "RCA" type connector on the end that plugs into the System Unit. The other end of that cable should be terminated with the type of plug (or connector) necessary to connect to the CRT being used. (This is usually another "RCA" plug.)

To utilize the system, the following connections must be made:

- PLUG the POWER CORD into the rear of the System Unit.
- PLUG the Keyboard into the rear of the System Unit. (The socket into which the Keyboard is pluged, is in the rear, under the right-hand side corner, when you are facing the unit from the front. Note: when installing the keyboard connection, that it is essentially a "blind" hole into which the connector must be inserted. The keyboard connector must be inserted with care, NOT with force. For the proper orientation of the connector, the screw on the side of the connector should be oriented straight up BEFORE inserting the connector.
- Connect a shielded cable from the CRT to the connector that is labeled "VIDEO" on the rear of the System Unit.
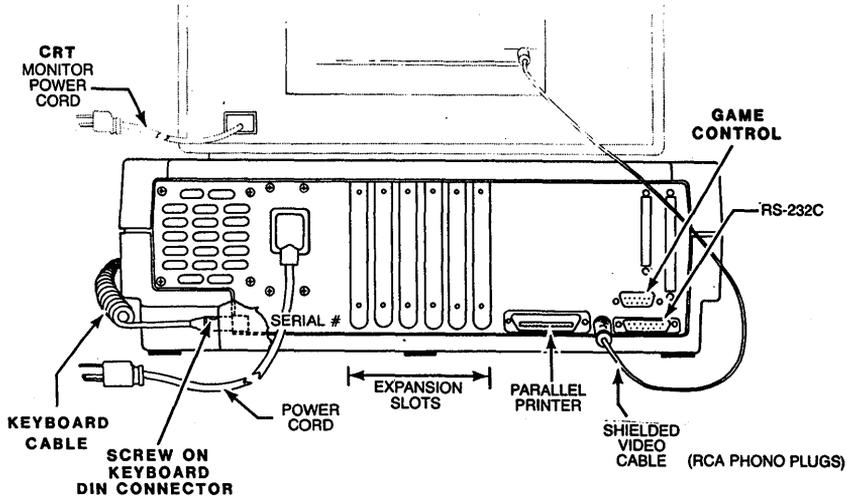
The Rear Of The DIMENSION 68000 System Unit

RESET

A

B

DIMENSION

POWER
INDICATOR

DISK LABEL UP

POWER
SWITCH
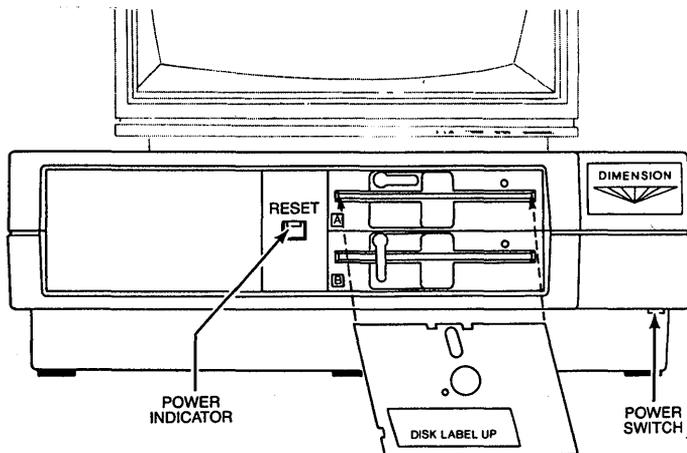
Inserting A Diskette Into The DIMENSION 68000

- OPTIONALLY, if there is a printer, it should be connected to the connector on the rear of the System Unit that is labeled "PARALLEL CENTRONICS PRINTER".
- OPTIONALLY, if there is a modem, it should be connected to the connector on the rear of the System Unit that is labeled "RS232C". This connection may be used for any device that uses the EIA (Electronics Industry Association) RS-232C interface.

*** CAUTION ***

BE SURE THAT EACH CONNECTION HAS BEEN FIRMLY SEATED PRIOR TO "POWERING UP" THE SYSTEM.

To "POWER UP" the system, use the following steps:

1 - TURN ON the CRT. Allow time for the CRT to warm up.

2 - TURN ON the DIMENSION 68000. The power switch is under the right front edge of the System Unit. When the power is turned on, the LED in the RESET Switch will come ON. For the first few seconds, the computer will perform a self test routine. After the self test routine, the computer will display the message below, then the LED on Disk Drive A will light up. The lighting of the LED on Disk Drive A indicates that the system is ready for a "bootable" diskette to be inserted into the disk drive. The system should display, on the CRT, the following:

Welcome to the Realm
of
Dimension Computing
by
Micro Craft Corporation

There will be a character sized block, displayed in reversed video (light in color, instead of dark) displayed on the left side of the screen under the above message. This block is called the cursor. Since the display on the screen is white letters on a dark screen, the cursor will be a block of light.

3 - INSERT a "SYSTEM 1" diskette into Disk Drive A. The "SYSTEM 1" diskette that you use should be a COPY of the "SYSTEM 1" diskette that was shipped with the DIMENSION 68000 System, NOT THE ORIGINAL. If you have not made copies of the "SYSTEM" diskettes, STOP! You need to make copies NOW! The section on BACKING UP later in this chapter tells how to make copies of your "SYSTEM" diskettes. So does APPENDIX B which is titled "THE BACK UP PROCEDURE."

After the "SYSTEM 1" diskette copy is inserted, the diskette will
be heard to operate (a gentle whirring will be heard) and then the
system will display the following message:

Micro Craft Operating System - CP/M 68K copyright DIGITAL RESEARCH Inc. 1983
Bios Version 2.2 Copyright Micro Craft Corp. 1983
        last revised mm/dd/yy

A>
A>|_| (the cursor is shown here as a block |_| located next to the 2nd
        prompt)

The A> prompt, which is the standard for all CP/M operating systems,
will be used frequently. It indicates that the A: Disk Drive is the
Disk Drive that is the CP/M default disk drive. When CP/M initially
loads, the default drive will be the A: Disk Drive. The A: Disk Drive
will remain the default drive until another drive is selected.

A detailed description of the CP/M operating system and of the programs
that come with it is available in the CP/M-68K Operating System User's
Guide and in the CP/M-68K Operating System Programmer's Guide.

The DIMENSION 68000 system is delivered with a BASIC interpreter that
was developed for the Micro Craft Corporation. The interpreter is call-
ed UNIBASIC. UNIBASIC stands for UNIversal BASIC. A detailed descrip-
tion of the UNIBASIC interpreter is available in the UNIBASIC User's
Guide and the UNIBASIC Reference Manual.

The DIMENSION 68000 system is normally delivered from the dealer con-
figured for a 128K system (the minimum). On the copy of the "SYSTEM 1"
diskette that you will be using, configure the operating system for the
amount of memory that resides in the computer system. To do the config-
uration, make sure the "SYSTEM 1" diskette copy is in DRIVE A: and that
the cursor is positioned after the CP/M prompt. Then, if the Random Ac-
cess Memory (RAM) size is 256K, then ENTER "SYS256". If the RAM size
is 384K, then ENTER "SYS384". If the RAM size is 512K, then ENTER
"SYS512". The diskette will spin for about 30 seconds and then stop.
The diskette will now "boot-up" with the operating system configured to
utilize all of the memory that resides on the computer system.

The term "boot-up" means, for a diskette, to be able to self load the
operating system into the computer system. This is accomplished by a
program called the "boot" program. The "boot" program first loads it-
self into memory and then executes itself. When the "boot" program ex-
ecutes itself, it then loads the operating system into memory and then
starts the execution of the operating system. Since the "boot" program
is considered a part of the operating system, the operating system is
said to load itself into memory "by it's own bootstraps" or to "boot".

BACKING UP

The DIMENSION 68000 System is shipped with two diskettes, the diskettes
are labeled "SYSTEM 1" and "SYSTEM 2". It is STRONGLY recommended that
you make copies of these diskettes, and then operate off of the copies.
This protects the originals. If anything should happen to the copies,
new copies can be made, as the originals are intact. The process of
making copies of any important diskettes, so as to protect them from
damage, etc., is called "making back-ups" or "backing up".

To BACK-UP the "SYSTEM 1" and "SYSTEM 2" diskettes, perform the follow-
ing steps:

1 - TURN ON the POWER

2 - INSERT the "SYSTEM 1" diskette into DISK DRIVE A:

3 - INSERT a BLANK, UNFORMATTED DISKETTE into DISK DRIVE B:

4 - When the CP/M prompt (A>) appears at the left side of the screen,
    type in the following command:

A>format<Retrn>

    where <Retrn> means the RETURN key (or the ENTER key)

5 - The format program will then display the DIMENSION 68000 FORMAT
    program select menu, which looks something like the following:

Micro Craft DIMENSION 68000 Disk Formatting Program
****** 5 1/4 Inch Drives ******
A = Micro Craft Standard 40 track
B = Micro Craft Standard 80 track
C = IBM-PC Single and Double Sided
D = TRS-80 Model III
E = KayPro
F = Cromeco Single Density
G = Osborne Single Density
****** 8 Inch Drives ******
H = 8 Inch 3740 Format, Single Density, Single Sided
I = 8 Inch TRS-16, Double Density, Double Sided
Select Type

6 - PRESS the A Key.

    The format program will then ask the following :

Which drive to use? (a-h)

7 - PRESS the B Key.

The format program will next ask the following:

Do you wish (F)ormat, (T)est, (D)ump,. (P)rint

8 - PRESS the F Key.

The format program will then display the following message.

Starting format

After the above message is displayed, the red indicator light on
disk drive B will turn on and disk drive B will make noise as the
disk head is positioned. The disk drive will make noises every time
it repositions the disk head for another track on the disk. Format-
ting the disk takes about 62 seconds. When the disk has been for-
matted, the disk is then tested. The format program will display
the following message:

Starting test

After the above message is displayed, the format program tests the
formatted diskette by attempting to read what was written on each
track of the diskette. In this fashion, each track of the diskette
is verified. If the format program cannot verify any part of the
diskette, an error message is displayed. The error message will i-
dentify specifically the disk head, the disk track, and the disk
sector where the error occurred.

Do not attempt to use a disk that fails this test.

9 - When the format program has finished, the format program will then
ask the following:

Another function (y) or return to cpm (n)

ENTER Y<Retrn>

10- REMOVE the diskette that has just been formatted from disk drive B
and put it aside to be used later.

INSERT another BLANK, UNFORMATTED DISKETTE into DISK DRIVE B:

11- The format program will again display the DIMENSION 68000 FORMAT
program select menu, as in step 5.

12- PRESS the A Key, as in Step 6.

13- PRESS the B Key, as in Step 7.

CHAPTER 1

14- PRESS the F Key, as in Step 8.

15- When this diskette has been formatted, the format program will a-
gain ask:

Another function (y) or return to cpm (n)

    ENTER N<Retrn>

16- The format program will display the CP/M prompt (A>). ENTER the
following command:

A>copy all a b [v]

    This command will load the CP/M-68K DISK COPY program and instruct
    the copy program to copy the contents of the diskette in disk drive
    A onto the diskette in disk drive B and to verify that the informa-
    tion is copied correctly.

17- After the above command has been entered, the format program will
display the following message:

(^C to ABORT)
RETURN to copy ALL from A to B

CHAPTER 1

18- PRESS the <Retrn> Key

This will start the copying process.   The format program will then
display the following message:

*** COPYING TRACKS ***

        Ø

As each diskette track is copied, the format program will display
the number of the track that it is copying on the next line.   So,
that when the format program is copying track 5, the format program
will be displaying the following message:

*** COPYING TRACKS ***

        Ø
        1
        2
        3
        4
        5

When the last track has been copied, the format program will
display the following message:

        21
        22
        23
        24
        25
        26
        27
        28
        29
        30
        31
        32
        33
        34
        35
        36
        37
        38
        39
disk full
A>

19- MAKE a diskette LABEL for the diskette that has just been copied. Write the label BEFORE it is put on the diskette. DO NOT ever put a label on a diskette and then write on the label with a hard writing instrument, such as a ball-point pen. If this is done, the diskette may be permanently damaged, and the diskette will NOT be usable.

If it is necessary to mark on a label that is already on a diskette, then use a felt-tip pen.

REMOVE the diskette from disk drive B and PUT the LABEL on the diskette that has just been copied.

20- PUT the diskette that was formatted earlier and set aside (in Step 10) into disk drive B.

21- ENTER the following command:

A>copy all a b [v]

22- The copy program will display the following message:

(^C to ABORT)
RETURN to copy ALL from A to B

REMOVE the "SYSTEM 1" diskette from disk drive A: and PUT the diskette in a safe place for safe keeping.

Diskettes should NOT be left in direct sunlight, they should not be exposed to magnetic fields, they should NOT be stapled, paper-clipped, or folded. The magnetic surface should NOT be touched. Nor should any liquid be spilled on the diskette. Also, diskettes should not be exposed to heat above about 120 degrees F., nor should they be exposed to cold below about 32 degrees F. (Do NOT leave diskettes in a locked automobile in the summer!)

23- INSERT the "SYSTEM 2" diskette into disk drive A:

24- PRESS the <Retrn> Key.

This will start the copying of the "SYSTEM 2" diskette.

25- When the copying is complete, REMOVE the "SYSTEM 2" diskette from disk drive A and PUT the diskette with the "SYSTEM 1" diskette in a safe place.

26- RE-INSERT the copied "SYSTEM 1" diskette and configure the CP/M operating system for the amount of memory on the system, as described in an earlier paragraph. It is a good idea to copy the configured diskette so that there is a back-up of the configured "SYSTEM 1" diskette. The steps to take are similar to the steps taken above.

After you're finished making your disk copies, go ahead and run an applications program or an emulation mode. Emulators are optional equipment and are not part of the basic Dimension. If you're a beginner, and you've made it this far - you're NOT a beginner anymore!

CHAPTER 1

CHAPTER 1

C H A P T E R   2

T H E   S Y S T E M   D I S K S

CHAPTER 2

CONTENTS of the DISKS

The DIMENSION 68000 system is shipped with two software diskettes. They
are:

Part Number   Description
------------   -----------
311-0001-100   SYSTEM 1
312-0002-100   SYSTEM 2

The "SYSTEM 1" diskette contains the following:

- the FORMAT utility program
- the COPY utility program
- the RESET utility program
- the CP/M-68K operating system
- the CP/M-68K utility programs
- the UNIBASIC basic interpretter

The "SYSTEM 2" diskette contains the following:

- the DIGITAL RESEARCH Assembler for the MOTOROLA MC68000
- the DIGITAL RESEARCH Linker
- the DIGITAL RESEARCH CP/M drivers

The FORMAT Program

The FORMAT program is a utility program that was written by the Micro
Craft Corporation. The FORMAT program is used to prepare a diskette for
use by the system. For the system to be able to use the diskette, the
magnetic suface must be partitioned into concentric circles (called
tracks) and subdivisions of the concentric circles (called sectors).
The FORMAT program creates, identifies, and numbers the tracks and sec-
tors on the diskette. The process of creating, identifying, and number-
ing the tracks and sectors on a disk or diskette is called formatting.

The FORMAT program can also be used to TEST the tracks and sectors on a
diskette, to DUMP the contents of a specific track on the diskette by
displaying them on the screen, and to PRINT the contents of a specific
track on the diskette on the printer.

The FORMAT program that comes with the DIMENSION 68000 system will handle diskettes in any of the following formats:

- the Micro Craft Standard 40 track format
- the Micro Craft Standard 80 track format
- the IBM PC Single Sided and Double Sided formats
- the TRS-80 Model III format
- the KayPro format
- the Cromenco Single Density format
- the Osborne Single Density format
- the 8 inch 3740 Single Sided, Single Density format
- the 8 inch TRS-16 Double Sided, Double Density format

A detailed explanation of the usage of the FORMAT program is included in the APPENDICES.

The COPY Program

The COPY program is a utility program that was written by Digital Research, Inc. The COPY program is used to copy the contents of one diskette to another diskette. The COPY program can copy all of the contents of a diskette, just the contents of the "boot" tracks of a diskette, or just the contents of the files (or non-boot) tracks of a diskette.

A detailed explanation of the usage of the COPY program is available in the CP/M-68K Operating System User's Guide.

The RESET Program

The RESET program is a utility program that was written by the Micro Craft Corporation. The RESET program is used to make the necessary changes in the operating system so as to allow the use of different disk formats selected. The RESET program will allow the following formats:

FOR 5 1/4 INCH DISKETTES
- Micro Craft Dimension 68000 40 track
- Micro Craft Dimension 68000 80 track
- CP/M-86 (IBM-PC Single Sided)
- CP/M-86 (IBM-PC Double Sided)
- TRS-80   CP/M 2.2 Single Sided
- KayPro   CP/M 2.2 Single Sided
- Cromenco CP/M 2.2 Single Sided, Single Density
- Osborne 1 CP/M 2.2 Single Sided, Single Density

FOR 8 INCH DISKETTES
- IBM 3740 Standard Interchange Format
- CP/M-68K TRS-16 Double Sided, Double Density
- User Defined Format

CHAPTER 2

A detailed explanation of the usage of the RESET program is included in the APPENDICES.

CP/M-68K UTILITIES

The CP/M-68K operating system comes with a number of standard utility functions and programs. These functions and programs are included for the ease of the users. Some of the utility programs are:

- AS68   - A 68000 ASSEMBLER
- DDT   - The CP/M-68K DE-BUGGER
- DIR   - Displays Disk File Directory
- DUMP   - The DUMP Program
- ED   - The CP/M-68K TEXT EDITOR
- LO68   - The CP/M-68K LINKER
- PIP   - The File Transfer Program
- RELOC   - The RELOCATION Program
- TYPE   - Displays File Contents

These utility functions and programs make using the CP/M-68K Operating System much easier to use.

PIP - PERIPHERAL INTERCHANGE PROGRAM

One of the utility programs that is extremely helpful to the user is the PIP program. PIP stands for Peripheral Interchange Program. The PIP program is used to copy, combine, and/or transfer files between peripheral devices. The disk drives are considered peripheral devices as are the keyboard and the CRT.

The PIP program is used as follows:

(Note: Items that are enclosed in braces {} are options or option lists. Items that are in lower case have a general meaning that is defined below the lower case usage. A vertical bar | separating items indicates that the items so separated are alternates.)

PIP dest-file {Gn}|dev=src-file{o}|dev{o}

```
where dest-file  = the filename of the destination file (i.e.  the file
                   being copied into)
      Gn         = the optional user number specification
      dev        = the device name (or drive name)
      src-file   = the file name, or file names,  of the source file(s)
                   (i.e. the file(s) being copied from)
      o          = the applicable  options  for the specification being
                   given
```

Example:

A>PIP B:=A:MYPROG.S

This example shows the file A:MYPROG.S is to be copied to the diskette
in the B: disk drive.

All of the above information is taken from the CP/M-68k Operating Sys-
tem User's Guide, and is explained fully there. The above information
is included as a help to DIMENSION 68000 user's.

UNIBASIC - UNIVERSAL BASIC (AS VERSION)

The DIMENSION 68000 system is shipped with a powerful BASIC language
interpretter called UNIBASIC.   The UNIBASIC supplied is very simililar
to APPLESOFT (TM) BASIC. Because of the similarity to APPLESOFT, it is
designated the AS Version. The AS Version of UNIBASIC was designed to
be as identical in usage to APPLESOFT as possible. The AS Version of
UNIBASIC has some very powerful language extensions past the capabili-
ties of APPLESOFT. These extensions include:

- higher resolution in the HIRES graphics mode
- more colors in the HIRES graphics mode
- more precision in the REAL numbers
- 8 character names for variable names instead of 2 characters

C H A P T E R   3

T H E   M A C H I N E

CHAPTER 3

KEYBOARD

The keyboard for the DIMENSION 68000 is a microprocessor controlled, 30
character per second (300 BPS), ASCII coded, TTL output level device.
The keyboard has 10 function keys and a combination numeric pad/cursor
control pad .

CRT INTERFACE

The CRT interface is an EIA RS-170 compatible interface. The voltage
output is adjusted to be 1 volt pk-pk nominal. The interface supplies
composite sync. The interface can supply either an interlace or a non-
interlace output signal. The DIMENSION 68000 sets the mode to interlace
to non-interlace as follows:

NON-INTERLACE   INTERLACE
-------------   ---------
20x20 TEXT   80x50 TEXT
40x24 TEXT   HI-RES GRAPHICS
80x24 TEXT
LO-RES and MEDIUM RES GRAPHICS

Interlace mode has two times the resolution as non-interlace mode. This
is because interlace mode has 525 horizontal lines on the screen, while
non-interlace mode has 262 1/2 horizontal lines.

REAL TIME CLOCK

Internal, interrupt driven, Real Time Clock and event timer, with pro-
grammable rates between 10 microseconds and 250 milliseconds.

PROCESSOR

The microprocessor used in the DIMENSION 68000 is an 8 MHz 68000 type
microprocessor. The 68000 microprocessor has 16 bit wide external data
paths. The internal architecture of the 68000 microprocessor is 32 bits
wide. The 68000 has the following registers:

- 8 DATA REGISTERS that are 32 BITS wide
- 7 ADDRESS REGISTERS that are 32 BITS wide
- 2 STACK POINTER REGISTERS that are 32 BITS wide
    1 for the USER
    1 for the SUPERVISOR
- 1 PROGRAM COUNTER REGISTER that is 32 BITS wide
- 1 STATUS REGISTER that is 16 BITS wide

Because of the internal architecture, the 68000 is properly described
as a 32 bit micro-processor.

Some of the features of the 68000 microprocessor are:

- 5 DATA TYPES
    Bit
    BCD Digits (4 bits)
    Bytes (8 bits)
    Words (16 bits)
    Long Words (32 bits)
- 16M byte direct addressing range
- 14 addressing modes on 61 basic instructions for over 1000 total in-
  struction types

DISK DRIVES

The standard disk drives used for diskettes in the DIMENSION 68000 sys-
tem are half height, 5 1/4 inch, double sided, double density, half
stepable, 40 track units. They are capable of storing up to 400K bytes.
Optionally, the DIMENSION 68000 system can be supplied with the follow-
ing types of drives:

- 80 track, 817K byte, 5 1/4 inch diskette drives
- 8 inch diskette drives
- 3 1/2 inch diskette drives
- 3 1/4 inch diskette drives
- Winchester-type Hard disk drives

Space is provided on the rear panel of the system unit for a 34 pin
connector and for a 50 pin connector. These connectors can be used for
connections to any externally mounted disk drives.

Micro Craft Corporation manufactures a disk drive expansion unit that
can contain two 8 inch diskette drives, or a mix of 3 1/2 inch diskette
drives, 3 1/4 inch diskette drives, and 8 inch diskette drives. These
diskette drives are packaged in an expansion chassis. The expansion
chassis also includes a power supply to supply the necessary voltages
and currents to operate the drives.

PRINTER PORT

The printer port on the DIMENSION 68000 system is an 8 bit, parallel, Centronics Standard type interface. The Centronics Standard interface uses TTL levels. The printer port signals are as follows:

```
PIN    SIGNAL      (NOTE: * INDICATES AN ACTIVE LOW, OR INVERTED, SIGNAL)
---    ------
 1     READY*
19     GROUND
 2     DATA 1
20     GROUND
 3     DATA 2
21     GROUND
 4     DATA 3
22     GROUND
 5     DATA 4
23     GROUND
 6     DATA 5
24     GROUND
 7     DATA 6
25     GROUND
 8     DATA 7
26     GROUND
 9     DATA 8
27     GROUND
10     ACKNLG*
29     GROUND
11     READY*
30     GROUND
12     NOT-USED
31     INIT*
13     NOT-USED
32     NOT USED
14     AUTO LINE FEED  (JUMPER PLUG CAN SELECT GND. OR +5V)
33     GROUND
15     NOT-USED
34     NOT-USED
16     NOT-USED
35     NOT-USED
17     NOT-USED
36     NOT-USED
18     NOT-USED
```

The JUMPER PLUG for pin 14 is inside the DIMENSION 68000. It is used to select the GROUND level to enable the AUTO LINE FEED or to select the +5V logic level in order to disable the automatic insertion of a line-feed, by the printer, after every carriage return. The JUMPER PLUG area is designated J13. Pin 1 of J13 is indicated by a paint dot. Jumpering from pin 1 to pin 2 gives +5V. Jumpering from pin 3 to pin 2 gives GROUND.

RS-232 INTERFACE

The RS-232 interface on the DIMENSION 68ØØØ is a full duplex, EIA volt-
age level, asynchronous interface. It provides the following signals:

```
PIN    SIGNAL
---    ------
 1     FRAME GROUND
 2     XMIT DATA (OUT FROM DIMENSION)
 3     RECV DATA (IN TO DIMENSION)
 4     RTS  +5 VDC ISOLATED THROUGH A 1K OHM RES.
 5     NOT-USED
 6     NOT-USED
 7     SIGNAL GROUND
 8     DCD  DATA CARRIER DETECT (IN TO DIMEMSION)
 .     .
2Ø     DTR  +5 VDC ISOLATED THROUGH A 1K OHM RES.
```

The RS-232 interface can be programmed for any baud rate from 5Ø bits
per second to 19,2ØØ bits per second.

GAME INTERFACE

The DIMENSION 68ØØØ has a game interface that uses the same game con-
trol units (joy-sticks) that the IBM Personal Computer uses. The game
interface uses an industry standard D-Subminiature, 15 pin male connec-
tor. The game interface contains the following circuits:
- 4 analog inputs
- 4 switch inputs (SPST)
- 1 power output (+5 VDC) which can be used to power a controller
- 1 strobe output.

SPEAKER

The DIMENSION 68ØØØ has a speaker inside. The speaker is connected to
the processor circuitry, and it is controlable by the user's program.

MEMORY

The random access memory in the DIMENSION 68ØØØ is a minimum of 128K
bytes installed. The random access memory can be expanded to 512K bytes
on the main board, and up to 16M bytes by using the expansion slots and
expansion memory boards. Additional memory, to the full capability of
the DIMENSION 68ØØØ, can be installed using an expansion chassis. All
memory used in the DIMENSION 68ØØØ is semiconductor. The Random Access
Memory (RAM) is organized in units of 128K byte blocks. This means that
increases in memory size are made in 128K byte increments.

EXPANSION SLOTS

The six expansion slots in the DIMENSION 68000 system may be used for additional memory, co-processors, additional input or output (I/O) ports, etc. as desired by the user. A description of the pinouts used by the expansion slots is available in the DIMENSION 68000 System Reference Manual.

ADDITIONAL MEMORY

The DIMENSION 68000 can support up to 16M bytes of memory. If the user desires to expand the RAM on the DIMENSION beyond 512K bytes, the additional memory may be added by installing cards that contain the extra memory.

CO-PROCESSORS

The DIMENSION 68000 can support other microprocessors co-resident with the 68000 type processor that resides in the system. The DIMENSION, by using co-processors, can emulate other personal computers. By using the 6512 processor as a co-processor, the DIMENSION is able to emulate the APPLE II. By using an 8086 processor, the DIMENSION is able to emulate the IBM-PC and the IBM-PC look-alikes. And, by using a Z-80, the DIMENSION can emulate most of the CP/M-80 machines and the TRS-80 units.

Micro Craft can provide the user with an APPLE II emulator card, an IBM emulator card, and a Z-80 emulator card. The emulator cards from Micro Craft do not have to be plugged into any particular slot. They are slot independent.

HARD DISK

The DIMENSION 68000 Winchester-type hard disk controller will plug into any expansion slot. It is a ST5061 type interface capable of handling 2 Winchester-type disks with a total of 300M bytes of storage.

PROTOTYPING KIT

Micro Craft Corporation has a prototyping kit which contains a prototyping board and all of the necessary documentation for anyone to be able to build a card that will properly plug in to and properly operate in the expansion slots of the DIMENSION 68000 system.

CHAPTER 3

C H A P T E R   4

T H E   S Y S T E M

CHAPTER 4

ARCHITECTURE

The DIMENSION 68000 is designed to have the hardware functions that are
inside the system to be software configurable. This is accomplished by
means of software controlled hardware latches that are placed between
the system bus and the various device controllers. The system bus car-
ries the address signals, the data signals, and the control signals for
the whole DIMENSION 68000 system. The device controllers handle the
following devices for the system:

- memory
- video display
- speaker
- disk drives
- keyboard
- RS-232 interface
- parallel interface
- game controller interface
- real time clock

MEMORY USAGE

The organization of the DIMENSION 68000 memory is detailed in the DI-
MENSION 68000 SYSTEM REFERENCE MANUAL. The overall memory usage is as
follows:

ADDRESSES	USAGE
000000 - 0000FF	INTERRUPT VECTORS
000100 - 0001FF	SYSTEM RAM AREA
000200 - 0011FF	VIDEO SCREEN TEXT AREA
001200 - 0012FF	SYSTEM FUNCTIONS
001300 - 00FFFF	CP/M TRANSIENT AREA
010000 - 01FFFF	CO-PROCESSOR AREA DURING EMULATION (MIN.)
020000 - 07FFFF	CO-PROCESSOR EXPANSION AREA
080000 - FEFFFF	RAM EXPANSION AREA
FF0000 - FF1FFF	ROMBIOS
FF2000 - FF7FFF	RESERVED GRAPHICS RAM
FF8000 - FFFFFF	PERIPHERAL CONTROL AREA

The DIMENSION 68000 has 8K of Read Only Memory (ROM) which is located
in memory between FF0000 and FF1FFF. This ROM is known as the ROMBIOS.
ROMBIOS stands for Read Only Memory Built-in Input / Output System. The
overall ROMBIOS usage is as a group of 68000 machine language routines
that handle the I/O requirements of the DIMENSION 68000.

I/O

The I/O requirements of the DIMENSION 68000 are handled by the machine
language routines in the ROMBIOS. The ROMBIOS functions are used to
handle the following I/O device requirements:

- the CRT Controller
- the Keyboard
- the Disk Drives
- the RS-232 Interface
- the Parallel Printer Interface
- the Real Time Clock

A detailed description of the ROMBIOS functions is contained in the DI-
MENSION 68000 SYSTEM REFERENCE MANUAL.

The DIMENSION 68000

The DIMENSION 68000 system is designed to allow software configuration
of the hardware controllers that are connected to the system bus. This
feature and the memory utilization design lend themselves to the easy
implementation of co-processor emulation of other microprocessor sys-
tems. Even the memory controllers are software configurable.

CO-PROCESSORS

The DIMENSION 68000 system was designed to allow co-processor emulation
of other microprocessor systems. The Micro Craft Corporation can supply
for the DIMENSION 68000 system, as options, three co-processor boards.
These co-processor boards plug into the expansion slots on the main
board inside the DIMENSION 68000 system unit. The co-processor boards
do not have to be plugged into any particular expansion slot. They are
slot independent. The three co-processor boards are the 6512 board, the
8086 board, and the Z-80 board. The system can have one board, two
boards, or all three boards installed at the same time. However, only
one co-processor can be in operation at a time.

6512

The Micro Craft 6512 co-processor board is supplied with the necessary
software to allow the DIMENSION 68000 to be able to emulate the Apple
II (TM), the APPLE II+ (TM), and the Apple IIe (TM) personal computers.

CHAPTER 4

8086

The 8086 co-processor board allows the DIMENSION 68000 to be able to emulate an 8086 or an 8088 personal computer. The Micro Craft Corporation supplies, with the 8086 co-processor board, the necessary software for the emulation of the IBM PC (TM) computer system and for the emulation of a CP/M-86 (TM) system.

Z-80

The Z-80 co-processor board allows the DIMENSION 68000 to be able to emulate a Z-80 personal computer. The Micro Craft Corporation supplies, with the Z-80 co-processor board, the necessary software for the emulation of the TRS-80 MODEL III (TM) computer system and for the emulation of a CP/M-80 (TM) computer system.

OTHER

The Micro Craft Corporation will be announcing other boards that plug into the expansion slots of the DIMENSION 68000 system. They will include boards to provide additional memory, boards to provide additional RS-232 interfaces, and a complete hard disk system. The Micro Craft Corporation encourages other manufacturers to provide boards for the DIMENSION 68000 system. The Micro Craft Corporation can provide a prototyping board and information that will make it easier to interface with the DIMENSION 68000 system.

CHAPTER 4

A P P E N D I X   A

T E R M I N O L O G Y

TERMINOLOGY

TERMINOLOGY

ALPHANUMERIC. Characters which consist of letters and/or digits.

APPLEDOS. Apple Disc Operating System: The disk operating system used in Apple computers.

APPLICATIONS PROGRAM. Programs, or software, designed for word-processing, games, education, home-finance, and other practical uses.

ASCII. A contraction for the "American Standard Code for Information Interchange. This standard defines the codes for a character set to be used for information interchange. It is used to store characters in memory and to transmit them to peripheral devices such as printers and other computers.

BACKUP. A copy of a file that can be used in the event that the original is lost or damaged, or used instead of the original to protect the original.

BASIC. A contraction for the "Beginner's All-purpose Instruction Code. It is a computer language that is easy to learn and use. BASIC is widely used with microcomputers. BASIC was developed at Dartmouth College with the assistance of General Electric.

BINARY. A characteristic, property, or condition in which there are but two possible alternatives. The binary number system using 2 as its base or radix, uses only the digits zero (0) and (1). Most computers store numbers in binary format.

BIT. A binary digit, either 0 or 1. The most basic unit of memory in a binary computer.

BIT MAPPED I/O. A technique whereby bits in memory are used to control the Input/Output.

BOOT. To ready a computer for use by loading the disk operating system into the computer's temporary memory, or RAM. The term derives from the idea that the "bootable" program loads itself into the system by it's own bootstraps.

BYTE. A group of eight adjacent bits that are treated as a single entity. A byte may be used to store a single character or a binary number.

CHAINING. The process where one program causes another program to execute when it finishes. The first program is said to "chain" to the second if it transfers control to the next program and it keeps the variables from the first program intact.

CHARACTER. A string of bits (a byte) which represents a symbol that can be displayed on a screen or printed.

CHARACTER COORDINATES.   The position on the screen denoted by a line
number and a character position within that line. The standard Dimen-
sion screen consists of 80 columns of characters by 24 lines of charac-
ters. See SCREEN COORDINATES.

CHARACTER SET.   All the characters that can be used with a particular
computer.   The Dimension character set consists of 256 characters.
Characters 0-127 are the ASCII character set.   The other 128 are
special symbols.

CHIP.   An integrated circuit made by etching myriads of transistors
and other electronic components onto a wafer of Silicon a fraction of
an inch on a side.

COMMAND. An order to the computer to execute a task.

COMPILER. A computer program that translates a computer language such
as BASIC to a form known as machine language, which is a form that can
be interpreted or executed directly by a computer.

CONTINUOUS FORMS.   Sheets of perforated paper with sprocket holes on
the side that can be fed into a printer continuously rather than one
sheet at a time. (Usually Fan-Folded)

CONTROL KEY.   Key that executes commands, in conjunction with other
keys pressed simultaneously.

COPY.   To duplicate a file or program in order to retain the original
and work on the duplicate.   Usually refers to duplicating one disk to
another. Also see BACKUP.

COPY PROTECT.   A technique which prevents a diskette from being
copied.

CP/M.   Control Program for Microprocessors, developed by Gary Kildall
of the Digital Research Corp. The disk operating system that has become
an industry standard for business-oriented personal computers.

CPU (Central Processing Unit).   The chip that directs the flow of
information within the computer and does the actual computing.   Also
frequently used to refer to the physical part of the computer that
contains the CPU chip and other ancillary hardware.

CRASH. Abrupt computer failure.

CRT.   The Cathode Ray Tube in a television set or video display
monitor.

CURSOR. A small rectangle of light which marks the input position on
the screen.

DATA. Information that a computer processes.

DATABASE. A collection of related data, such as in inventory or a collection of names on a mailing list.

DEFAULT. A preset system parameter value that will be used unless it is changed.

DISK DRIVE. A device that uses a rotating platter or disk to store data and programs.

DISK OPERATING SYSTEM (DOS). The program that instructs the computer's CPU how to transfer information to and from a disk.

DISKETTE. A low-cost sheet of magnetic material enclosed in an envelope. A diskette can be put into a disk drive and used to store data.

DISPLAY. The information on a video screen.

DOCUMENTATION. Written instructions that tell you how to use computer hardware or software.

DOT MATRIX. A technique whereby characters are defined as a two-dimensional array of dots.

DOUBLE DENSITY. A way of putting information on a disk that allows the disk to store twice as much data as a single-density disk.

EDITOR. A computer program that can be used to enter and change data on the screen.

ENHANCEMENT. Improvement.

EXCLUSIVE-OR. A Boolean operation that is true(1) if either, but not both, of its inputs are true (1). Otherwise, the result is false (0).

FILE. A set of records stored on a device such as a diskette or tape.

FIRMWARE. A program stored in the computer's permanent memory, or ROM. Since such a program doesn't have to be re-entered every time the computer is turned on, it is "harder" than software.

FLOPPY DISK. A small, flexible sheet of magnetic media used to store data.

FONT. A set of characters.

FORMATTED DISK. A diskette that has been initialized with timing information so that it can be read and written by a computer.

FRIENDLINESS. How easy a program or computer is to work with. A "user friendly" program is one that takes little time to learn, or that offers on-screen prompts, or that protects the user from making disastrous mistakes.

GRAPHICS. Visual information constructed using objects such as lines, circles, and rectangles.

GRAPHICS LANGUAGE.   A set of commands that are used to describe how graphics images are to be drawn.

GRAPHICS PRINTER.   A printer capable of transferring graphics data to the printed page.   Most graphics printers print dots to represent the pixel elements.

HALF ADDER. A circuit that sums two binary (0 or 1) inputs.

HARD COPY. Text or other work printed on paper by a printer. Same as print-out.

HARD DISK.   A rigid disk used to store information.   Hard disks can store far more information than floppy disks and can write and read information more quickly.

HARDWARE.   The physical parts of a computer system as opposed to the programs, or software.

HIGH-LEVEL LANGUAGE. A programming language such as BASIC, written in a kind of English shorthand rather than in numbers and symbols.

IMAGE FILE.   A file on a diskette or other media that contains the bits that comprise a graphics image.   If this file is read into the area of memory that is mapped to the screen, the image is displayed.

INITIALIZE.   To reset the computer and its peripherals to a starting state before beginning a task.   Done automatically by the disk operating system.

INTERFACE.   A communication path between a computer and peripheral devices such as printers and disk drives.

INTERFACE CARD.   A printed circuit card providing the control logic needed for communication between the computer and an external device.

INPUT/OUTPUT (I/O).   An input device such as a keyboard feeds information into the computer.   An output device such as a printer or monitor takes information from the computer and turns it into usable form.   Modems, cassettes, and disks work in both directions, so they are I/O devices.   Input and output are also used as verbs: You input data from the keyboard.

I/O SLOT.   The location where an interface card plugs into the computer.

K. One kilobyte, or 1,024 bytes of memory.

LINKAGE. The establishing of a communication path between programs or parts of programs.

LITERAL. A string of characters within quotes, i.e., "LITERAL".

LOAD. To enter a program into the computer from cartridge, cassette, or disk.

MEMORY. An area inside the computer where data such as numbers, characters, and program instructions are stored. A computer's memory capacty is measured in units known as K's. One K is equal to 1024 bytes of memory.

MENU. A list of options displayed on the screen. The options can usually be selected by typing a single letter or number.

MICROPROCESSOR. Another name for the CPU chip.

MODEM. Short for modulator-demodulator--a piece of equipment that links two computers over a telephone line.

MONITOR. A supervisory program that controls the sequencing of other activities. Video device; quality of display is better than that of a television set's.

MS-DOS. A disk operating system developed by MicroSoft. Used in modified form by the IBM Personal Computer, under the designation PC-DOS, and now used in a number of other computers as well.

ON-LINE. An I/O device is on-line if it is attached to the computer via an active interface. Otherwise, it is off-line.

OPEN (FILE). Before a file can be read or written, the program must locate the file and open it.

OPERATING SYSTEM. Programs, such as monitors and compilers, that enable you to use a computer.

OVERLAY. A technique whereby a program that is too large to fit in memory is divided into segments that are loaded only as they are needed.

PAGE. The basic unit of a file. Each page is one screen of data--either text or graphics.

PARALLEL INTERFACE. A port that sends or receives the eight bits in each byte all at one time. Many printers likely to be used in homes use a parallel interface to connect to the computer.

PARSE. A procedure or technique used to separate a group or groups of characters (i.e. letters, words, or numbers) from a line of text so that the groups or phrases may be used in later processing.

PASCAL. A general-purpose computer language that is easy to understand and to use.

PC-DOS. IBM's name for the disk operating system used in the IBM Personal Computer. Similar to MS-DOS.

PERIPHERALS. Accessory parts of a computer system not considered essential to its operation. Printers and modems are peripherals.

PIXEL. A picture element. Each pixel defines one dot on the screen.

PORT. The gateway that connects the computer to its outside world.

POWERFUL. Usually refers either to a computer with a lot of memory or a lot of processing speed (a DIMENSION 68000 computer with 256K RAM is "powerful") or to a program with unusual versatility (a spreadsheet is a "powerful" business tool).

PRINT CONTROL CHARACTERS. Character codes that are not printed on paper. Instead, they are used to cause a printer action such as move to the top of the next page or to skip a line.

PRINTER. Transforms computer's output into hard copy.

PRINTOUT. See HARD COPY.

PROGRAM. A sequence of instructions written in a computer language such as BASIC that controls what a computer does.

PROGRAMMABLE KEY. Another term for user or program defined key.

PROMPT. An on-screen hint to the user about what to do next.

RAM. Random Access Memory: "Temporary" memory on chips. You can store data in RAM or take data from RAM at very high rates of speed. It's temporary, or volatile, because information stored in it disappears when the computer is switched off.

READ. To extract data from a computer's memory or from a tape or disk.

RESET. See INITIALIZE.

ROM. Read Only Memory: "Permanent" memory on chips. You can read permanently stored programs from ROM but cannot store information in it. It's permanent memory because the information stored in ROM remains there when you turn the computer off. (Also called firmware)

SAVE.   A command to the computer to store completed work on tape or disk.

SCREEN COORDINATES.   The x,y location of pixel elements on the screen. The Dimension high-resolution screen consists of 640 rows.   Each row contains 480 pixels.

SCROLL.   To move a video display up or down, line by line, or row by row, character by character.

SEGMENTATION.   The process of dividing a program into pieces that can be overlayed in memory.

SERIAL INTERFACE.   A port that sends or receives the eight bits in each byte one by one, much like beads on a string. Printers that will be located far from the computer usually require a serial interface.

SOFT-FUNCTION KEY.   See USER-DEFINED KEY.

SOFTWARE.   Another name for programs.

SPECIAL-FUNCTION KEY.   Usually understood to mean the CONTROL, SHIFT, ESCAPE, ALTERNATE, or PRINT SCREEN keys.

STORAGE.   Usually refers to long-term storage, such as storage of files on tape or disk.

SUPPORT.   Help available from computer and software merchants.   Also used as a verb to describe what things are compatible with each other, as in: "with a Z-80 card, the DIMENSION 68000 will support CP/M-80 and TRS-80 software."

TRSDOS. TRS Disk Operating System: The disk operating system used in Tandy Radio Shack's personal computers.

TYPE-AHEAD BUFFER.   A set of memory locations that is used to store characters as they are typed. The program may accept these characters from the buffer at a slower rate than they are typed.   A type-ahead buffer is used so that if characters are being typed faster than the program can accept them, they are not lost.

USER-DEFINED KEY.   A key whose function you or a program can change, so that a command or sequence of commands can be exected with a single keystroke.   Same as programmable key and soft-function key. Unlike a special-function key, a user-defined key may have a predefined purpose.

UTILILTY PROGRAM.   A program that can be used for basic file operations such as formattiing and copying diskettes and printing files.

VOLUME. A device capable of storing one or more files. Each diskette has a volume name that identifies it. Devices such as printers and disk drives sometimes are specified by a volume number.

WINCHESTER DRIVE. A form of hard disk permanently sealed into a case.

WRITE. To enter information into memory or onto a tape or disk.

WRITE-PROTECT. Any technique that prevents a diskette or tape from being written on. The write-protect notch is located on the right side of a 5 and 1/4 inch diskette. If this notch is covered with a piece of tape, data on the diskette cannot be written over because the write electronics are prevented from doing so by a sensor that senses the absense of an open notch.

A P P E N D I X   B

B A C K - U P   P R O C E D U R E

BACK-UP PROCEDURE

BACK-UP PROCEDURE

The DIMENSION 68000 System is shipped with two diskettes, the diskettes
are labeled "SYSTEM 1" and "SYSTEM 2". It is STRONGLY recommended that
you make copies of these diskettes, and then operate off of the copies.
This protects the originals. If anything should happen to the copies,
new copies can be made, as the originals are intact. The process of
making copies of any important diskettes, so as to protect them from
damage, etc., is called "making back-ups" or "backing up".

To BACK-UP the "SYSTEM 1" and "SYSTEM 2" diskettes, perform the follow-
ing steps:

1 - TURN ON the POWER

2 - INSERT the "SYSTEM 1" diskette into DISK DRIVE A:

3 - INSERT a BLANK, UNFORMATTED DISKETTE into DISK DRIVE B:

4 - When the CP/M prompt (A>) appears at the left side of the screen,
    type in the following command:

A>format<CR>

    where <CR> means the "Retrn" key or the "Enter" key. Both of these
                keys cause the ASCII carriage return code to be
                generated.

5 - The format program will then display the DIMENSION 68000 FORMAT
    program select menu, which looks something like the following:

Micro Craft DIMENSION 68000 Disk Formatting Program
****** 5 1/4 Inch Drives ******
A = Micro Craft Standard 40 track
B = Micro Craft Standard 80 track
C = IBM-PC Single and Double Sided
D = TRS-80 Model III
E = KayPro
F = Cromeco Single Density
G = Osborne Single Density
****** 8 Inch Drives ******
H = 8 Inch 3740 Format, Single Density, Single Sided
I = 8 Inch TRS-16, Double Density, Double Sided
Select Type

6 - PRESS the A Key.

    The format program will then ask the following :

Which drive to use? (a-h)

7 - PRESS the B Key.

The format program will next ask the following:

Do you wish (F)ormat, (T)est, (D)ump, (P)rint

8 - PRESS the F Key.

The format program will then display the following message.

Starting format

After the above message is displayed, the red indicator light on
disk drive B will turn on and disk drive B will make noise as the
disk head is positioned. The disk drive will make noises every time
it repositions the disk head for another track on the disk. Format-
ting the disk takes about 62 seconds. When the disk has been for-
matted, the disk is then tested. The format program will display
the following message:

Starting test

After the above message is displayed, the format program tests the
formatted diskette by attempting to read what was written on each
track of the diskette. In this fashion, each track of the diskette
is verified. If the format program cannot verify any part of the
diskette, an error message is displayed. The error message will i-
dentify specifically the disk head, the disk track, and the disk
sector where the error occurred.

Do not attempt to use a disk that fails this test.

9 - When the format program has finished, the format program will then
ask the following:

Another function (y) or return to cpm (n)

PRESS the Y key.

10- REMOVE the diskette that has just been formatted from disk drive B
and put it aside to be used later.

INSERT another BLANK, UNFORMATTED DISKETTE into DISK DRIVE B:

11- The format program will again display the DIMENSION 68000 FORMAT
program select menu, as in step 5.

12- PRESS the A Key, as in Step 6.

13- PRESS the B Key, as in Step 7.

BACK-UP PROCEDURE

14- PRESS the F Key, as in Step 8.

15- When this diskette has been formatted, the format program will a-
    gain ask:

Another function (y) or return to cpm (n)

    PRESS the N key

16- The format program will display the CP/M prompt (A>). ENTER the
    following command:

A>copy all a b [v]

    This command will load the CP/M-68K DISK COPY program and instruct
    the copy program to copy the contents of the diskette in disk drive
    A onto the diskette in disk drive B and to verify that the informa-
    tion is copied correctly.

17- After the above command has been entered, the format program will
    display the following message:

(^C to ABORT)
RETURN to copy ALL from A to B

18- PRESS the <CR> Key

This will start the copying process.   The format program will then
display the following message:

*** COPYING TRACKS ***

        Ø

As each diskette track is copied, the format program will display
the number of the track that it is copying on the next line. So,
that when the format program is copying track 5, the format program
will be displaying the following message:

*** COPYING TRACKS ***

        Ø
        1
        2
        3
        4
        5

When the last track has been copied, the format program will
display the following message:

        21
        22
        23
        24
        25
        26
        27
        28
        29
        3Ø
        31
        32
        33
        34
        35
        36
        37
        38
        39
disk full
A>

BACK-UP PROCEDURE

19- MAKE a diskette LABEL for the diskette that has just been copied.
Write the label BEFORE it is put on the diskette. DO NOT ever put a
label on a diskette and then write on the label with a hard writing
instrument, such as a ball-point pen. If this is done, the diskette
may be permanently damaged, and the diskette will NOT be usable.

If it is necessary to mark on a label that is already on a disk-
ette, then use a felt-tip pen.

REMOVE   the   diskette   from disk drive B and PUT the LABEL   on   the
diskette that has just been copied.

20- PUT the diskette that was formatted earlier and set aside (in Step
1Ø) into disk drive B.

21- ENTER the following command:

A>copy all a b [v]

22- The copy program will display the following message:

(^C to ABORT)
RETURN to copy ALL from A to B

REMOVE the "SYSTEM 1" diskette from disk drive A: and PUT the disk-
ette in a safe place for safe keeping.

Diskettes should NOT be left in direct sunlight, they should not be
exposed to magnetic fields, they should NOT be stapled, paper-
clipped, or folded. The magnetic surface should NOT be touched. Nor
should any liquid be spilled on the diskette. Also, diskettes
should not be exposed to heat above about 12Ø degrees F., nor
should they be exposed to cold below about 32 degrees F. (Do NOT
leave diskettes in a locked automobile in the summer!)

23- INSERT the "SYSTEM 2" diskette into disk drive A:

24- PRESS the <CR> Key.

This will start the copying of the "SYSTEM 2" diskette.

25- When the copying is complete, REMOVE the "SYSTEM 2" diskette from
disk drive A and PUT the diskette with the "SYSTEM 1" diskette in a
safe place.

26- RE-INSERT the copied "SYSTEM 1" diskette and CONFIGURE the CP/M op-
erating system for the amount of memory on the system.

If the system has 128K bytes of Random Access Memory (RAM) install-
ed, then ENTER the following command:

A>sys128

If the system has 256K bytes of Random Access Memory (RAM) install-
ed, then ENTER the following command:

A>sys256

If the system has 384K bytes of Random Access Memory (RAM) install-
ed, then ENTER the following command:

A>sys384

If the system has 512K bytes of Random Access Memory (RAM) install-
ed, then ENTER the following command:

A>sys512

The execution of the "SYS" command will cause the CP/M-68K opera-
ting system to be configured to the memory size specified in the
"SYS" command.

It is a good idea to copy the configured diskette so that there is
a back-up of the configured "SYSTEM 1" diskette. The steps to take
are similar to the steps taken above.

A P P E N D I X   C

T H E   F O R M A T   P R O G R A M

FORMAT

The FORMAT Program

The DIMENSION 68000 system is shipped with the Micro Craft Corporation FORMAT program. The FORMAT program is used to FORMAT diskettes, TEST diskettes, DUMP the contents of a track on the diskette to the screen, and to PRINT the contents of a track on the printer.

For a diskette (or a disk) to be usable by a computer system (any computer system), the magnetic surface must be prepared. To prepare the magnetic surface, the surface is magnetically partitioned into concentric circles which are called tracks. All of the tracks are numbered. The track that is closest to the outside edge of the diskette is track number 0. The track that is closest to the center of the diskette has the highest number.

All of the tracks are subdivided in to short lengths which are called sectors. All of the sectors that are on a given track have the same length. All of the sectors are numbered. The first sector on a track is sector number 0. All diskettes have a reference mark (which is a hole) that is near the large hole in the center of the diskette. The reference mark is used to indicate the starting point (as the diskette is rotating) for the first sector on any of the tracks on the diskette.

All of the sectors on a diskette (or on a disk) have an address block, or header, at the beginning of each sector. The header identifies the number of the track and the number of the sector.

The FORMAT portion of the FORMAT program creates, numbers, and identifies the tracks and the sectors on a diskette.

The TEST portion of the FORMAT program reads each sector on each track on the entire diskette to make sure that the sectors are all readable.

The DUMP portion of the FORMAT program reads each sector on a track and displays the data from each sector on the CRT screen as it is read.

The PRINT portion of the FORMAT program performs identically to the DUMP portion of the FORMAT program with the addition that as each sector is displayed on the CRT, it is also printed on the printer.

To use the FORMAT program, the DIMENSION 68000 must be running the CP/M-68K operating system. The FORMAT program is shipped to the user on the "SYSTEM 1" diskette. To execute the FORMAT program TYPE the following command after the CP/M prompt:

A>format<CR>

This command may be entered in lower-case letters or in upper-case letters.

The <CR> indicates the key marked "Retrn" or the key marked "Enter".
The "Retrn" key and the "Enter" key generate the code for a carriage
return which is identified by the <CR> key mark in this manual.

When the FORMAT program is loaded, the first thing it will display is
the select menu, which looks something like the following:

Micro Craft DIMENSION 68000 Disk Formatting Program
****** 5 1/4 Inch Drives ******
A = Micro Craft Standard 40 track
B = Micro Craft Standard 80 track
C = IBM-PC Single and Double Sided
D = TRS-80 Model III
E = KayPro
F = Cromenco Single Density
G = Osborne Single Density
****** 8 Inch Drives ******
H = 8 Inch 3740 Format, Single Density, Single Sided
I = 8 Inch TRS-16, Double Density, Double Sided
Select type

At this point, PRESS the letter key for the type of diskette format
that is desired. The FORMAT program will then ask the following:

Which drive to use? (a-h)

PRESS the letter key for the drive desired. When the drive has been
selected, the FORMAT program will then ask the following:

Do you wish (F)ormat, (T)est, (D)ump, or (P)rint?

PRESS the letter key for the function desired.

If the "F" key is pressed, then the program will display the following:

Starting format

The program will position the heads in the disk drive selected and be-
gin to format the diskette. After the diskette is formatted, the mes-
sage "Starting test" will appear and the program will test the diskette
just as if the test function had been selected. This will verify that
the format operation was successful, and will also check for defective
spots on the diskette.

If the "T" key is pressed, then the program will display the following:

Starting test

FORMAT

If the "D" key is pressed, then the program will display the following:

Which track?

The program requires the entry of a two digit number. Enter the number of the track desired. The range of the two digit number is from 00 to 99. If the number entered is larger than the highest track USED, the program will repeat the question.

If the "P" key is pressed, then the program will display the same message as for the DUMP function above. Entry of the track number is also the same as for the DUMP function. If the printer is not connected, the program will lock up and the system will have to have the Reset Button pressed. If the printer goes off-line during the printing of the track, the program will wait until the printer is back on-line before continuing.

****** NOTICE ******

Caution must be exercised when entering the "F", "T", "D", or the "P" ! If a character other than "T", "D", or "P" is entered, the program will perform the "F" (FORMAT) function!

When the function requested has completed, the FORMAT program will display the following question:

Another function (y) or return to cpm (n)

If there is another function desired, PRESS the "Y" key. If not, PRESS the "N" key.

The program will accept either lower-case or upper-case for the "Y" and the "N" keys. The program requires either a "Y" or a "N" response. Any response other than a "Y" or an "N" will cause the question to be repeated.

If a "Y" is entered, the program will again display the select menu and ask the questions in the sequence that is described above.

If a "N" is entered, the program will end and the system will display the CP/M prompt.

FORMAT

A P P E N D I X   D

T H E   R E S E T   P R O G R A M

RESET

The RESET Program

The DIMENSION 68000 system is shipped with the Micro Craft Corporation RESET program. The RESET program allows the user to select the format to be used for each disk drive on the DIMENSION 68000 system. When the power is first turned on for the DIMENSION 68000 system, the system sets each of the disk drives for the default disk configuration. the default disk configuration is the Micro Craft Standard 40 track configuration.

When the DIMENSION 68000 system is in the CP/M-68K operating system and is at the CP/M prompt, at the bottom of the screen is displayed (in reverse video - black letters on white background) the configuration of all the CP/M disk drives on the DIMENSION 68000 system. (The display also shows the amount of memory that the user has at his disposal.)

The RESET program is run under the CP/M-68K operating system. To use the RESET program, ENTER the following command at the CP/M prompt:

A>**reset<CR>**

The command can be either upper-case letters or it can be lower-case letters. The <CR> symbol indicates the key marked "Retrn" or the key marked "Enter". The "Retrn" and "Enter" keys generate the code for a carriage return which is identified by the <CR> mark in this appendix.

This will cause the RESET program to execute. When the RESET program begins, it will display select menu similar to the following:

```
Micro Craft operating system - CP/M 68K Copyright DIGITAL RESEARCH Inc. 1983
Bios version X.X Copyright Micro Craft Corp. 1983
        last revised MM/DD/YY
Select disk configuration
      *** 5 1/4 Inch Drives ***
A = Micro Craft Dimension 68000 40 track
B = Micro Craft Dimension 68000 80 track
C = CP/M-86 (IBM-PC Single Sided)
D = CP/M-86 (IBM-PC Double Sided)
E = TRS-80 CP/M2.2 Single Sided
F = KayPro CP/M2.2 Single Sided, Single Density
G = Cromemco CP/M2.2 Single Sided, Single Density
H = Osborne 1 CP/M2.2 Single Sided, Single Density
      *** 8 Inch Drives ***
I = IBM 3740 Standard Interchange Format
J = CP/M-68k TRS-16 Double Sided, Density
Z = User Defined Format

Backspace erases last entry, Retrn completes selection
Select Character >
drive A:|_|
```

where |_| is the cursor

ENTER the letter for the disk format configuration desired for drive A:. When this is done, the RESET program will increment to allow an entry for drive B:. As each entry is made, the program will increment to allow an entry for the next letter until it receives the selection for drive H:. The user can conclude the entry sequence at any point by entering <CR>.

If no entry is made for a specific drive, the operating system is reset so that the drive has no configuration selected.

When the entry sequence is finished, the CP/M-68K system will display, at the bottom of the screen, the current disk configuration, which will look something like the following:

CPM68K DISKS are|A:=A|B:=A|C:=B|D:=B|E:=I|F:=I|G:=I|H:=I|Usr=00219K

Also, when the entry sequence is finished, the program will end and the CP/M system prompt will be displayed.

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